



THE ROLE OF ENVIRONMENTAL LAW IN PROMOTING ENVIRONMENTAL HEALTH: A SUSTAINABLE DEVELOPMENT PERSPECTIVE

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ABSTRACT

The study examined the precautionary principle in environmental health, in line with sustainable development. This principle expresses a proactive approach to protecting the environment from potential harm before it occurs. This principle encourages taking precautionary measures to protect health and the environment, even in the absence of comprehensive scientific evidence regarding potential risks. The goal is to prevent environmental damage that may affect current and future generations, thus promoting sustainability. According to this principle, a healthy environment is one of the fundamental pillars of public health. Preventive protection measures to promote the right to a healthy environment include regulating industrial activities, raising public awareness, improving environmental legislation, and encouraging scientific research to develop sustainable environmental solutions. The study also included criteria for taking preventive measures, risk assessment, and the application of the "polluter pays" principle to ensure that society does not bear the cost of harm. The application of civil liability indicates that individuals or companies are responsible for the environmental damage they cause. The precautionary principle can modify the terms of civil liability to include potential actions that may harm environmental health. Regarding its impact on compensation, the precautionary principle can lead to the establishment of swift and fair compensation mechanisms that include compensation for potential damages, not just actual damages. It also helps create a more flexible and responsive environment for emerging environmental and health risks. The study concluded that the precautionary principle is important for early assessment of potential risks, which contributes to changing how compensation claims are handled in the event of environmental damage. The study recommended that the establishment of





guarantee funds be an effective step to secure adequate compensation for those affected by environmental damage, thereby protecting their rights.

Keywords: Environmental law; Civil liability; Precautionary principle; Environmental health; Sustainable development.

O PAPEL DO DIREITO DO AMBIENTE NA PROMOÇÃO DA SAÚDE AMBIENTAL: UMA PERSPECTIVA DE DESENVOLVIMENTO SUSTENTÁVEL

RESUMO

O estudo examinou o princípio da precaução em saúde ambiental, em consonância com o desenvolvimento sustentável. Este princípio expressa uma abordagem proativa para proteger o meio ambiente de danos potenciais antes que eles ocorram. Este princípio incentiva a tomada de medidas de precaução para proteger a saúde e o meio ambiente, mesmo na ausência de evidências científicas abrangentes sobre os riscos potenciais. O objetivo é prevenir danos ambientais que possam afetar as gerações atuais e futuras, promovendo assim a sustentabilidade. De acordo com este princípio, um meio ambiente saudável é um dos pilares fundamentais da saúde pública. As medidas preventivas de proteção para promover o direito a um meio ambiente saudável incluem a regulamentação das atividades industriais, a conscientização pública, o aprimoramento da legislação ambiental e o incentivo à pesquisa científica para desenvolver soluções ambientais sustentáveis. O estudo também incluiu critérios para a adoção de medidas preventivas, avaliação de riscos e a aplicação do princípio do "poluidor-pagador" para garantir que a sociedade não arque com o custo dos danos. A aplicação da responsabilidade civil indica que indivíduos ou empresas são responsáveis pelos danos ambientais que causam. O princípio da precaução pode modificar os termos da responsabilidade civil para incluir potenciais ações que possam prejudicar a saúde ambiental. Em relação ao seu impacto na indenização, o princípio da precaução pode levar ao estabelecimento de mecanismos de indenização céleres e justos que incluam a indenização por danos potenciais, e não apenas pelos danos reais. Também contribui para a criação de um ambiente mais flexível e responsivo a riscos ambientais e de saúde emergentes. O estudo concluiu que o princípio da precaução é importante para a avaliação precoce de riscos potenciais, o que contribui para mudar a forma como os pedidos de indenização são tratados em caso de danos ambientais. O estudo recomendou que a criação de fundos de garantia seja uma medida eficaz para garantir uma indenização adequada às pessoas afetadas por danos ambientais, protegendo assim seus direitos.

Palavras-chave: Direito ambiental, Responsabilidade civil, Princípio da precaução, saúde ambiental, desenvolvimento sustentável.





1. INTRODUCTION

1.1 Subject of Study

The protection of the environment and the human right to a clean and healthy environment free from pollution, alongside the right to sustainable development as outlined by the United Nations' Sustainable Development Goals (SDGs) (Al Atiyat, et al., 2024), have become a paramount concern on both national and international levels, this urgency arises in response to the persistent and escalating environmental degradation influencing various aspects of environmental health, resulting in numerous challenges such as air and water pollution, waste management issues, and the spread of diseases, The World Health Organization (WHO) systematically measures the consequences of environmental deterioration on human health and estimates that approximately one-quarter of global deaths and chronic diseases can be attributed to environmental and behavioral factors.

The responsibility for health protection lies with the state through its various institutions, which rely on legislative frameworks to fulfill their duties, recognizing the need for integrated legal roles, private law and its diverse branches can play a crucial role in environmental health protection within the framework of sustainable development, this study endeavors to explore this aspect, with a particular focus on civil law and its capacity to safeguard environmental health, it suggests a reevaluation of the roles of civil liability, which currently functions primarily in a compensatory or reparative capacity, while its preventive functions remain secondary (Hamdan, 2003).

1.2 Importance of the Study

The preventive role in matters of environmental health is significantly more effective than the compensatory approach of civil liability, especially given the severity of damages that can occur due to breaches in environmental health standards for sustainable development, Such damages are substantial, often irreversible, and extend beyond individual impacts, reaching collective and even global scales; Environmental health damages have a temporal dimension, affecting both current and future generations (Hassouna, 2015). Over the years, public authorities have increasingly confronted the risks and damages associated with environmental health by enhancing their interventions through preventive measures, these include measures like combating passive smoking, implementing waste management laws,





establishing health-monitoring organizations, and imposing stricter penalties on polluters and violators, even in cases of scientific uncertainty regarding environmental health risks (Qasem, 2024).

The precautionary principle has been adopted, this principle advocates for taking appropriate preventive actions to mitigate potential future risks associated with substantial and irreversible damage. Furthermore, civil jurisprudence has actively highlighted its role in this domain, it has utilized civil mechanisms that blend both reparative and preventive functions, adapting their rulings to apply to environmental health issues in line with sustainable development, additionally (Al-khawaja HA), the predominant scholarly view in Jordan and France favors applying the precautionary principle as a basis for civil liability, despite some opposition, this inevitably necessitates a reconsideration of the fundamental concepts, conditions, and implications of civil liability in its traditional form (Al-Kasassbeh, et al., 2024).

1.3 Objectives of the Study

Developed countries have not merely established laws for environmental protection and the sustainable development of health from associated risks and damages; they have also been diligent in ensuring the implementation of essential guarantees provided by their laws to address any issues that may curtail such unlawful actions. Their goal is to minimize the occurrence of environmental health damages, which affect all living beings, particularly humans. The subject of civil liability concerning environmental health in alignment with sustainable development is one of the most complex topics due to its recency, rapid evolution, and the escalation of damages to environmental health. Traditional civil liability rules often prove inadequate to cover these nuances. In many instances, estimating damages to environmental health becomes challenging, complicating the determination of appropriate compensation, additionally, there are obstacles related to the criteria required for accepting claims for damages (Adly Khalil, 1989).

Moreover, it is significant to highlight that environmental protection laws, including Jordanian Law No. (6) of 2017, do not thoroughly and adequately address civil liability for environmental pollution. These laws merely stipulate that those who cause harm to the environment must bear all costs required for remedying or removing these damages and may be liable for any resulting compensations. In cases where specific provisions do not exist within these environmental laws, reference is made to the general principles in civil law relating to liability for harmful acts to evaluate the





applicability of such provisions to environmental health damages, assess their adequacy, and secure just compensation.

1.4. Problem of the Study

The problem of this study arises significantly from the prolonged invisibility of health damages stemming from environmental risks, highlighting the urgent need for addressing these issues at their source, this can only be achieved through the adoption of appropriate preventive measures, The importance of protecting environmental health through preventive strategies surpasses the remedial approach currently taken by civil liability, underscoring the necessity to expand the role of civil liability by incorporating new rules to establish a preventive function alongside its remedial role. Currently, the preventive role of civil liability operates in a secondary capacity, which is inadequate for confronting environmental health risks.

This study seeks to explore new mechanisms with a preventive role, particularly within Jordanian and French law, such as the precautionary principle for environmental health and its potential applicability in Jordanian law. The key questions can be summarized as follows:

- What is the precautionary principle for environmental health in line with sustainable development?
- How is the relationship between health and the environment defined within the precautionary principle in the context of sustainable development?
- What preventive measures exist to protect the right to a healthy environment for sustainable development?

- To what extent does legal scholarship recognize the precautionary principle in environmental health for achieving sustainable development?
- What standards govern the adoption of preventive measures for environmental health?
- How feasible is the application of civil liability according to the precautionary principle to ensure sustainable development?
- What is the impact of the precautionary principle for environmental health on the conditions of civil liability?
- How does the precautionary principle influence compensation in the field of environmental health?

To address these questions, it is essential to examine several preliminary issues that significantly contribute to understanding and resolving the problem at hand. This includes reviewing supportive and opposing scholarly perspectives, presenting relevant legal texts, and discussing judicial rulings that have addressed the study's questions.





2. METHODOLOGY

This study adopts a comparative analytical descriptive approach, the descriptive methodology is utilized in various sections to illustrate the impact of risks on environmental health within the framework of sustainable development, and it aims to clarify the existing legislative texts for the protection of environmental health, analyzing these texts to assess their appropriateness and sufficiency for application.

Naturally, the study reviews multiple legal positions within comparative legal systems, particularly focusing on Jordanian, French, and U.S. law, along with relevant European directives. Additionally, it examines Jordanian, French, and American judicial rulings and interpretations that have addressed pertinent issues, providing a comprehensive understanding of the landscape surrounding environmental health protection.

2.1.Previous studies

Al-Musalmani and Maalouf (2022), Administrative Control: The State of Qatar as a Model. This study focuses on the efforts made by the State of Qatar to protect the environment from pollution. This study aims to measure the extent of Qatar's interest in this area, in terms of the mechanisms it has put in place to restrict individual activities and behaviors that may cause environmental pollution.

Al-Shakhatra (2022), The Concept of Harm in International Environmental Law: The study addressed environmental damage by clarifying the concept of this damage and identifying its most important characteristics and elements. It also presented the topic of environmental damage from various material, moral, and legal aspects. Some forms of environmental pollution were also studied, identifying the sources and forms of pollution. Furthermore, the topic of national obligations in the field of environmental protection was also addressed.

2.2. Study plan

The study will be divided into two main sections, followed by a conclusion that includes the study's findings and recommendations.

The Nature of Preventive Environmental Health in the Framework of Sustainable Development: Legal systems have recently focused their tremendous attention on the environment, as it is the place where humans live. This is evident in the special rules regulating cities, the establishment of green spaces within them, the





preservation of trees and forests, and other positive concerns that benefit the environment. This interest stems from human need for it. Advanced societies preserve their environment and work to protect it from any aggression that might cause harm, because the environment represents their place of residence, their shelter, their identity, and evidence of their behavior and civilization (Rajab, 2023). To clarify the nature of preventive environmental health in the framework of sustainable development, it was necessary to study it as follows:

2.3. Preventive Environmental Health within the Framework of Sustainable Development:

Scientific environmental development has become a fundamental pillar of societal values, which seek to preserve and protect it from all harm. Environmental protection, the necessity of preserving it, and addressing the effects of pollution have received attention from international agreements and national legislation, both in constitutions and relevant laws. They have also received attention from jurisprudence in all its branches. This topic has received the attention of numerous legal studies (Fathi, 2009). Therefore, it is necessary to clarify the concept of the preventive principle of environmental health within the framework of sustainable development and divide it as follows:

2.4. The Concept of the Precautionary Principle of Environmental Health: To explain the concept of the precautionary principle of environmental health, this will be done as follows:

Definition of the environment: The environment includes living organisms and elements such as air, water, and soil, in addition to the structures created by humans, which are the surroundings in which we live. The environment is linked to human health as a dynamic system affected by human actions, such as the release of greenhouse gases that contribute to global warming, which changes ecosystems and poses health challenges to humans and other organisms. The Jordanian legislator defined the environment in Environmental Protection Law No. (6) of 2017 as: "The environment that includes living and non-living organisms and the materials they contain, the surrounding water, air, soil, and interactions between any of them, and the facilities or activities that humans establish in them." The legislator did well in defining the environment because it included all living and non-living elements. This is also, what the Jordanian Administrative Court emphasized in defining the environment in Ruling No. (502) dated 11/28/2023.





2.5. Definition of health

Although health is not specifically defined in Jordanian legislation, the Public Health Law indicates the importance of providing basic healthcare services and promoting health awareness as essential factors for achieving community health. Joint health programs and international initiatives remain essential in promoting global peace and security by improving the health of all peoples.

The World Health Organization defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. The enjoyment of the highest standard of health is a fundamental right of every individual, regardless of race, religion, political opinion, or economic or social status." In this context, multidimensional environmental health is evident in its close connection with recognized environmental and health concerns, highlighting the profound relationship between human health and the environment.

2.6. Definition of the precautionary principle

Jordanian lawmakers have not defined the precautionary principle. However, French lawmakers define the precautionary principle in environmental protection law as: "A situation of uncertainty regarding risks and damages, given the current state of scientific and technical knowledge, should not delay the adoption of effective and proportionate measures aimed at preventing the risk of serious and irreparable damage to the environment at an economically acceptable cost."

The precautionary principle adopts a philosophy that seeks to provide higher levels of safety by imposing sanctions or even prohibiting hazardous activities. This contributes to protecting individuals, ensuring their safety, and controlling risky behaviors in anticipation of potential harm. It is considered part of public health policies aimed at reducing risks in society in the name of the right to security. The precautionary principle is used to impose strict measures to avoid risks associated with uncertain damages, which places pressure on decision-makers and judicial bodies. It can also be used as a shield to defend regulatory discretion, isolating it from judicial oversight mechanisms and empowering it to take measures to mitigate risks to health and the environment (Al-Tarawneh 2022). Recognizing this principle has faced challenges, particularly given the divergence of practices between countries in the early 21st century. The United States and Jordan delayed imposing restrictions due to scientific uncertainty, while the European Union emphasized the importance of



the precautionary principle as a basis for regulation before there was conclusive evidence of potential harm.

2.7. Sustainable development

The Jordanian Environmental Law defines sustainable development in Article (2) as: "Development that achieves a balance between environmental safety and economic and social development, and ensures the safety of natural resources while preserving them to achieve a decent standard of living for future generations." The United Nations Environment Programme defines sustainable development as: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs, based on the wise management of environmental resources and potential."

The United Nations also defines sustainable development according to the SDGs as: "A process that aims to meet the needs of the present without compromising the ability of future generations to meet their own needs, while striking a balance between economic growth, achieving social justice, and protecting the environment."

From here, we find that sustainable development considers the time dimension as its foundation, meets the basic needs of the individual, takes into account the rights of future generations to natural resources, and considers the preservation of the biosphere in all its elements, while preserving the genetic diversity of living organisms, while instilling environmental ethics and positive attitudes toward the environment based on the philosophy of harmony with the environment. Sustainable development also does not result in the wealth of one segment of society at the expense of another.

The Relationship Between Health and the Environment According to the Precautionary Principle: Achieving healthy body health has become closely linked to environmental pollution, as human health is significantly impacted by the environment. This concept is not new, as the relationship between health and the environment has long been rooted, and individuals play a vital role in preventing risks to their health by preserving their environment (Fathi, 2009). The philosophical and scientific connection between health and the environment has declined as a result of the successes of therapeutic medicine and the discovery of antibiotics. This has led doctors to focus on individual issues and ignore preventive policies related to public health and its environment. It can be observed that medicine has diminished its interest in environmental issues, while environmental advocacy movements have



declined their focus on protecting human health. This separation is evident in institutional and legal approaches, as environmental and health issues are treated as two independent rights with their own legislation and administrative structures. Compensation for damages in health liability differs from environmental liability, as the former focuses on addressing harm to individuals, while the latter tends to address harm to the environment. However, in recent years, interest in environmental issues and public health has increased, leading to the emergence of the concept of the right to a healthy environment to enhance environmental health security (Al-Kurdi, 2003). Efforts continue to strengthen the links between health and the environment in accordance with the United Nations Sustainable Development Goals (SDGs), particularly in the face of contemporary threats such as climate risks, in addition to food, nuclear, chemical, and other known industrial risks

2.8. Preventive Measures to Protect the Right to a Healthy Environment

Attempts to translate the scientific concept of environmental health into a personal right seek to consider it a personal right. Constitutions, including the Jordanian Constitution, have recognized this right by stipulating that every person has the right to a healthy environment, and that protecting this environment is a national duty. The state is also committed to taking the necessary measures to preserve it and ensure the rational use of natural resources to achieve the Sustainable Development Goals (SDGs). This recognition also allows individuals to protect their right to environmental health through legal action, which requires judges to consider environmental damages and their effects on human health, considering environmental health a personal right to file a lawsuit. This has been worked on by organizing associations that can collectively exercise this right. To achieve effective protection of environmental health, preventive public policies must be developed that include several means, which we explain as follows:

2.9. Renewing methods of managing health and environmental risks

The approach to promoting the individual's right to a healthy environment, according to the expanded and multidimensional definition of environmental health, must be integrated. This approach should not be limited to simply preventing health risks, but rather requires understanding risks from multidisciplinary perspectives, taking into account all stakeholders. To achieve the Sustainable Development Goals,





it is essential to build frameworks for collective cooperation and eliminate the historical separation between institutional structures concerned with the environment and those concerned with health (Al-Tawil 2016). This vision is embodied in practice through the establishment of institutions and associations that express a serious commitment to addressing risks associated with food, health, and the environment. Health and environmental strategies have also been designed at the national and regional levels, incorporating the principles of sustainable development to ensure a balance between community needs and environmental protection. New studies have also been conducted to assess environmental impacts, enabling the analysis of risks to human health in conjunction with environmental risks (Alwan, 2017).

2.9. Expanding the scope of legislative reforms in the field of environmental health

Updating legislative instruments was necessary to align with the protection of the right to environmental health to achieve sustainable development goals, thus enhancing benefits for both individuals and society. The Jordanian legislator has recognized this right in the Constitution and the Environmental Protection Law, stating that every individual has the right to a healthy and sound environment, and that protecting this environment is a national duty. Preventive measures are key tools to address environmental risks that threaten the health of individuals. The prior licensing system is part of this effort to ensure operators adhere to environmental standards. The Jordanian legislator has made progress in establishing preventive mechanisms consistent with the principles of sustainable development. The Environmental Protection Law requires an environmental impact assessment to obtain approval that allows certain activities and projects that are likely to have an environmental impact. In Jordan, efforts to promote public health are evident through monitoring environmental and health risks, with an emphasis on the need to link health and the environment. Integrating the concept of sustainable development into these efforts is vital. Environmental Protection Law (6) of 2017 and the regulations contained therein represent a step toward considering health as a component of public health. This legislative framework embodies Jordan's commitment to working toward achieving sustainable development through improving public health and environmental protection. In contrast, France was a pioneer in this field under Law No. (806) of 2004.

Health policy also includes improving living conditions and promoting health in all environments, in addition to monitoring the health status of the population with a





focus on disease prevention. With recent scientific progress, debate is emerging about the use of certain materials, such as plastics and electromagnetic fields, expanding the scope of environmental and health responsibility to include multiple aspects, such as environmental law and public health law, to integrate these efforts with the concept of sustainable development. Furthermore, environmental responsibility extends to the economic aspect, as economic literature indicates that environmental responsibility is not merely a compensatory function, but also provides incentives to reduce pollution through The possibility of holding the polluter responsible, which creates this trend, supports sustainable goals and motivates prevention through the deterrent effect of these responsibilities.

3. PREVENTIVE MEASURES FOR ENVIRONMENTAL HEALTH

The precautionary principle is an important foundation in modern environmental legislation. It obliges countries to take the necessary measures to protect the environment and human health from potential hazards, conserve natural resources, and reduce risks that may negatively affect public health. The application of this principle is consistent with the Sustainable Development Goals. Implementing the precautionary principle requires cooperation between various parties to ensure the effective achievement of environmental and public health protection goals. Applicable laws should enhance accountability and define responsibilities to prevent environmental damage before it occurs, which requires the establishment of effective legal mechanisms to ensure the comprehensive application of this principle. This cooperation and support for sustainable health and environmental policies enables both communities and countries to achieve sustainable development goals and preserve the environment. Therefore, to explain preventive measures for environmental health, it must be presented as follows:

3.1. The Extent of Recognition of the Precautionary Principle of Environmental Health

Through this requirement, we show the extent of recognition of the precautionary principle as follows: Supporters of this principle argue that a preventative approach based on anticipating and preventing the occurrence of a risk should be adopted, as this is more effective in the field of environmental protection than confronting the risk itself after it has occurred, and less costly than treating it. Doubt must be interpreted in the interest of the environment, as this approach is





consistent with the principles of sustainable development, which focus on prevention rather than treatment. They also reinforce their view that some of the damage that may be inflicted on the environment as a result of engaging in an activity or using a product that has not been proven to be environmentally safe may never be remedied, or that the costs of treating it may be prohibitively high. Proponents of this trend assert that the potential and opportunities provided by the development of scientific research in this era facilitate the verification of the safety of activities and products. Furthermore, the need to ensure the environmental safety of activities and products may contribute to the development of scientific research and the use of the best available technologies, which enhances aspects of sustainable development. The tremendous scientific progress and competition among producers have opened the door to practicing activities or producing goods and introducing them into circulation and markets in record time and before subjecting them to tests that confirm their environmental safety. They also assert that if the precautionary principle had been implemented in the past, it would have been possible to avoid or - at least - mitigate many of the environmental problems and negative effects caused by practicing activities or introducing products whose environmental safety is questionable (Rajab 2023).

3.2. Arguments of supporters of the precautionary principle of environmental health

Arguments of opponents of the precautionary principle of environmental health
Proponents of this approach argue that the content of the precautionary principle remains vague and subject to disagreement, which poses serious obstacles to its adoption, as well as its implementation and legislative enforcement. They argue that a strict understanding of the precautionary principle, which calls for avoiding environmental risks when there is uncertainty and a lack of scientific certainty, will hinder the development of industry and other sectors and reduce the volume and diversity of production, which requires informed decisions to protect the environment and ensure the health of future generations. This approach also emphasizes that it could lead to imbalances and distortions in international trade. There are concerns that producers' need for scientific evidence of the environmental safety of an activity or product could lead them to attempt to influence researchers through money or other means. This poses serious challenges to scientific research and researchers, potentially affecting their impartiality and professionalism. This could also conflict with





the principles of sustainable development.

The legislative and judicial position of the preventive principle: Although the Jordanian legislator has not referred to the precautionary principle, there is legal evidence indicating that the Jordanian legislator has adopted this principle and is attempting to enforce it legislatively and administratively within the framework of integrated environmental management. One of the most prominent forms of enforcement of the precautionary principle in the Jordanian Environmental Protection Law is the legislator's requirement to conduct an environmental impact assessment study to obtain environmental approval for certain activities and projects. Regarding other mechanisms for enforcing the precautionary principle, it can be said that some state ministries, such as the Ministry of Environment, the Ministry of Industry and Trade, and others, are among the administrative bodies most exposed to the application of the precautionary principle in the exercise of their powers and the performance of their assigned duties. For example, in 2010, the Jordanian Minister of Agriculture refused to use genetically modified agricultural crops until their safety was proven, stating that this refusal would continue until specialized scientific bodies in Europe completed their study. As for the French legislator, the French Constitution did not explicitly stipulate the precautionary principle except in the environmental field. However, the constitutional judiciary linked this principle to the protection of people's health and safety, and this principle was even affirmed as a principle of constitutional value. The French legislator also codified in the Environmental Code the principle of preventive and corrective action, taking into account the source of environmental damage, using the best available technologies at an economically acceptable cost. This principle includes avoiding harm to biodiversity and the services it provides, and compensating for unavoidable or limited damage, taking into account the species, natural factors, and environmental functions affected. This principle must aim to prevent loss of biodiversity, or even aim to achieve gains in biodiversity.

The French Court of Cassation ruled that if there are doubts about the safety of a product, experimental studies and clinical observations that may prevent its use are considered indicators of a manufacturer's failure to fulfill their duty of care (Defoort 2008). The company is required to respond appropriately to address conflicting findings regarding the benefits and drawbacks of the product, with the aim of ensuring its safety and effectiveness. This ruling reflects the importance of corporate legal responsibility in protecting consumers and ensuring the provision of safe products. In the United States, the precautionary principle was the primary guide for regulatory





decision-making regarding public health risks for several decades. In the 1950s, the U.S. Food and Drug Administration (FDA) imposed a ban on food and color additives proven to cause tumors, regardless of their potential risk to public health. In the 1970s, the precautionary principle was enshrined in law through the Environmental Protection Agency's ban on leaded gasoline. The U.S. Court of Appeals recognized the importance of taking precautionary measures even in the absence of conclusive scientific evidence. However, in 1980, a shift in the judicial approach began, with the Supreme Court adopting a standard focused on scientific evidence and facts to assess risk, overturning previous standards based on a policy of minimizing exposure to benzene to the greatest extent possible. The Court also emphasized the need for evidence that benzene poses a significant health risk. Despite the long history of American application of the precautionary principle, this trend has gradually declined with increasing reliance on risk assessment as a prerequisite for any regulation. American laws typically require a comprehensive record of regulatory actions subject to judicial review. American tradition holds that it is better to bear the costs of delay and legal action than to be exposed to it. For unjustified regulatory risks, this thinking does not apply to the same extent in Europe, where regulatory decisions are less subject to legal challenge.

Criteria for Taking Preventive Measures for Environmental Health: The precautionary principle is based on two basic factors: risk assessment. First, a comprehensive assessment must be conducted to determine the nature of potential risks and their impact on the environment. This assessment requires a thorough understanding of the risks, even in the absence of complete scientific certainty. Second, the adoption of temporary and proportionate measures to prevent harm after the assessment. Preventive measures must be taken proportionate to the level of risk identified. To clarify the criteria for taking preventive measures for environmental health, they will be studied as follows:

3.3.The principle of prevention and the necessity of proportionality

The application of the precautionary principle is based on the existence of a serious risk and irreparable harm, with the cost of preventive measures being economically acceptable. This framework allows flexibility for manufacturers in applying the principle, but also requires restrictions to avoid hindering scientific experimentation and progress. The application of the precautionary principle must be





based on a comprehensive assessment of risk and proportionality considerations, not simply the likelihood of a risk. Rather, it must be based on solid evidence. The French Court of Cassation has affirmed that the absence of scientific certainty is not a reason to delay effective preventive measures. Prior risk assessment includes the need for a cost-benefit relationship, whereby unproven risks must be compared with potential benefits. If the risks outweigh the benefits, intervention must be necessary. This approach seeks to reduce risks rather than eliminate them. It is also used to protect health safety against therapeutic risks. The French Court of Cassation also emphasizes the duty of manufacturers to ensure the safety of their products when there are any doubts) (Parance, 2016).

3.3. The precautionary principle and risk assessment

Knowledge of the impact of human activities on the environment and its health has become a topic of great importance. It is no longer possible to evade making necessary decisions, and delaying responses to environmental problems directly impacts environmental health. There is no magic formula for determining the appropriate amount of information needed to make wise decisions. Rather, it requires striking a balance between the costs of action and the potential risks associated with it. These decisions require careful evaluation of available information and basing them on scientific evidence to ensure positive outcomes for society and the environment as a whole.

Environmental and health issues are ideal areas for applying preventive measures, although there are differences in the principles followed. The American system relies primarily on risk assessment based on scientific records and available data, requiring clear evidence before taking any action. In contrast, the precautionary principle relies on risk assessment even in the face of scientific uncertainty. It encourages taking preventive measures when potential risks exist, even if information about them is incomplete or uncertain. Risk assessment involves organizing scientific information and data in a way that facilitates appropriate decision-making. This assessment is based on scientific policies and the expertise of specialists in the field. The information does not have to be comprehensive; it can include both proven and potential risks, reflecting the importance of proactively addressing environmental and health issues to ensure the protection of society and the environment. The Jordanian Environmental Protection Law requires the submission of environmental impact





assessment studies to the relevant authorities before implementing any projects, reflecting the importance of evidence-based assessment in environmental protection. In the United States, quantitative risk assessment is considered an essential element in the regulatory decision-making process, as demonstrated in the case of the *Industrial Union Management v. American Petroleum Institute*. Here, American courts require scientific evidence to prove the risk, placing the burden on the defendant to prove negligence. At the international level, discussions on health and environmental policy reflect the need for scientific evidence before making decisions. However, the European Commission allows greater flexibility in this regard. Some opinions point out that environmental regulation in the United States is often characterized by unknown consequences, which reinforces the idea of replacing evidence-based assessment with the precautionary principle to avoid potential environmental risks.

This requires a flexible legal system, which complicates private regulatory efforts when factual records are required to support actions. However, the precautionary principle is widely applied, which calls for integrating risk assessment with the precautionary principle, and improving public health and environmental infrastructure in conjunction with the Sustainable Development Goals. This will have a significant impact on achieving more effective protection of public health and the environment.

The idea of the precautionary principle of environmental health is constantly advancing, and it is clear that applying this principle to the current rules of civil liability will affect their terms, including expanding the concept of breach, the nature of damages, and recognizing the development of the presumption of causation. This will be addressed as follows:

3.4. Applying civil liability to environmental health based on the preventive principle

There is a jurisprudential trend that supports considering prevention as an independent legal rule that must be applied independently of the provisions of civil liability. This makes prevention a stable principle for confronting the rules of liability. This view is based on the fact that prevention is sufficient to perform its function without the need for amendments to civil liability. However, many opinions prefer to apply the preventive principle in the context of civil liability, as it has become likely that it can be applied to both public and private law persons. We will review what is included in this requirement as follows:





Various legal initiatives strive to incorporate the precautionary principle of environmental health in accordance with sustainable development into private law, particularly in the area of civil liability, either by incorporating it into existing provisions or by establishing new liability stemming from this principle. Environmental protection laws have proven their support for the idea of making prevention a stand-alone principle (Stevignon 2023). Numerous practical applications of the precautionary principle have been documented beyond the scope of environmental health, extending to diverse fields such as urban planning, public health, and penal legislation, strengthening its status as a reference. This principle has become a central focus of numerous decisions and continues to expand its scope of application after being linked to case law and legal systems that go beyond environmental health. For example, it has been effectively used in the areas of health and product safety. The European Court of Justice has also affirmed that this principle can be applied to broader areas related to public health, highlighting its growing importance and transcending influence across various legal disciplines. The precautionary principle of environmental health aims to enhance risk awareness with the aim of implementing effective measures to assess risks and prevent harm or mitigate its negative effects.

This principle can be extended to include rules related to consumer protection, such as European Union legislation that links food and health, demonstrating the deep interconnectedness of the precautionary principle with various branches of law. This interconnection embodies the integration between the protection of individuals and society and legislative policies, enhancing the effectiveness of measures taken to achieve higher levels of safety and comfort.

The question of the extent to which the precautionary principle is independent of the legal rules of prevention raises numerous questions in the context of environmental health, particularly regarding the conditions and implications of applying this principle in the field of civil liability. Some believe that the established rule of prevention should be subject to the provisions relating to civil liability, as any failure to take precautions in situations of uncertainty is considered a breach that warrants accountability. The shift to civil liability reflects the fundamental nature of the precautionary principle, which was originally linked to ethical principles. Prevention is considered a binding duty to prevent harm, highlighting the nature of prevention as an idea that converges with the concept of civil breach. Despite the prevailing trend toward integrating the precautionary principle into the framework of civil liability, there are opposing positions that emphasize the need to maintain prevention as an





independent principle, rather than a legal rule subject to the conditions of liability, as this could distort the essence of this principle (Danis 2017). We find that this approach, which considers prevention as a general principle that can be relied upon in civil liability, is the most accurate, as this principle can be extended to cover the field of environmental health. Judicial emphasis on the role of prevention in civil liability is of great importance, as judicial rulings have contributed to establishing the rules of prevention and related legal principles, such as the theory of neighborhood harm. This indicates the importance of activating the preventive role in civil liability, especially in cases of unusual neighborhood harm, which enhances the protection of individuals and society from potential risks.

3.5. Judicial Application of the Civil Liability of the Preventive Principle:

The precautionary principle of environmental health in accordance with sustainable development is characterized by ambiguity, despite being a normative rule stipulated in the Constitutional Environmental Charter and the Environmental Protection Law. However, some commentators express their objection to considering it a rule with strict norms, especially in light of the prevailing belief that only public authorities are addressed by it. In this context, jurists, especially those who advocate for the application of the precautionary principle in areas of private law, have discussed the importance of this rule as an effective tool within the framework of civil liability. This has resulted in the transformation of the precautionary rule from a mere rule of action to a private principle that enhances aspects of liability, opening new horizons for understanding the role of prevention in protecting rights and interests.

These discussions highlight the need for further reflection on how to activate the precautionary principle of environmental health to achieve sustainable development in broader contexts, reflecting its growing influence on private laws and enhancing its role in promoting justice and environmental protection. Accordingly, civil liability provisions should be applied in cases where the precautionary rule is violated, contributing to its stability as a fundamental component within the rules of civil liability.

As a result of this embodiment, the precautionary rule can be applied in relationships between individuals, whether in the public or private sectors (Al-Najjar 2017). The integration of environmental health prevention into the framework of civil liability has led to a shift in the nature of this liability, shifting the focus from compensating for damages to anticipating future risks. Civil courts have demonstrated





the imposition of penalties for failure to adhere to necessary precautions. The French Court of Cassation upheld this trend in its ruling dated March 3, 2010, in which the owners of land adjacent to a mineral water source had dug a well to irrigate their gardens. This prompted the source operator to demand that the well be closed, based on alleged violations of the precautionary principle. After the Court of Appeal rejected the closure request, the source operator appealed the decision, citing the failure to investigate the application of the precautionary principle. Despite its criticism, the Court of Cassation concluded that the Court of Appeal lacked a legal basis to support its decision, pursuant to Articles 1382 and 1383 of the French Civil Code. The Court of Cassation affirmed in its ruling that the expert had eliminated any potential risk of contamination, and therefore there was no justification for applying the precautionary principle in this case, meaning that there was no breach by the defendants. This ruling clearly embodies the application of civil liability rules, despite being linked to the application of the preventive rule for environmental health only. However, this ruling has been criticized by some jurists who believe that the preventive rule is based on an independent foundation, which raises questions about the feasibility of linking it to civil liability. These opinions indicate that the preventive rule aims to enhance awareness and implementation of necessary measures, including precautionary measures, and should not be considered part of the objectives of civil liability. Rather, it should remain a stand-alone principle for promoting health and protecting the environment.

The Impact of the Precautionary Principle of Environmental Health on the Conditions of Civil Liability: The application of the precautionary principle of environmental health in accordance with sustainable development affects the rules of civil liability. This is evident in its impact on basic elements such as breach, damage, causal link, and burden of proof. This impact is clearly reflected in the concepts of liability conditions, which gives civil liability a special status when linked to the rule of environmental health precaution. The application often relies on the theory of unfamiliar neighborhood harms and the precautionary principle. Some jurists have indicated that the precautionary principle has been unified in its application within the field of civil liability, even if this requires changing judicial precedents. To demonstrate the impact of the precautionary principle of environmental health on the conditions of civil liability, we will examine this as follows:

The Impact of the Preventive Principle on Breach: Civil liability can be based on breaches of the precautionary principle, as the obligation to protect environmental





health is a natural part of justifying civil liability in cases of danger. This concept is rooted in the framework of liability for breach and objective liability, thus bringing together the relationship between prevention and civil wrongdoing. The precautionary principle emerged as an extension of the general duty of prevention, reflecting the rediscovery of the moral and legal values of caution, which require taking preemptive measures without waiting for scientific certainty. This leads the judge to play a prominent role in evaluating the behavior of individuals according to the standards of the average person and determining the adequacy of the preventive measures taken.

The precautionary principle takes into account risks, including uncertain ones. A person is considered to be in breach if they fail to take the necessary measures to avoid a familiar risk, and also if they do not adopt a precautionary approach in situations of uncertainty. Failure to take precautions can be considered a breach, compared to the behavior expected of an average person. Clear examples of this include the condemnation of industrial companies for not taking adequate precautions to protect environmental health, or the criticism of drivers for not wearing helmets or seat belts (Al-Kurdi 2003). The concept of prevention goes beyond the limits of negligence, and objective liability may also result from a breach of the precautionary principle for environmental health, whereby individuals capable of taking the necessary precautions are held liable for damages resulting from their negligence. Furthermore, the challenge of integrating the precautionary principle within the framework of civil liability arises, as it cannot be applied in situations of uncertainty due to potential or suspected risks. Adapting civil liability to include such risks will be a major challenge, requiring precision and precise details in legal interpretations to ensure the effective protection of the rights of individuals and society .

The Impact of the Precautionary Principle on Harm: The application of the precautionary principle of environmental health significantly impacts the pillars of civil liability, leading to radical changes in the concepts associated with these pillars, the most important of which is the element of harm, which is considered the most important. Environmental health damages are characterized by special characteristics that distinguish them from traditional damages, as they are known as discovered damages (Andrey and Zucker, 2022). This name reflects their unique nature and gives them detailed features that are incomparable to indirect damages. Limiting the application of traditional rules may lead to the exclusion of many damages from the scope of restoration and compensation, as they may be difficult to prove as direct damages. Therefore, it is preferable to repair these damages through taking





preventive measures, rather than simply monetary compensation. The damages that justify the application of the preventive principle are characterized by several main characteristics: the probability of damage, the severity of the damage, and the inability to repair. We will present these characteristics sequentially to emphasize the importance of taking preventive measures to address potential damages, which calls for activating the preventive principle for environmental health to achieve sustainable development as an essential part of civil liability strategies. Strengthening the preventive principle represents an important step towards protecting environmental health, as it is an effective guarantee to avoid serious damages before they occur. We will present the damages as follows:

3.6. Unrealized damages

The precautionary principle of environmental health in accordance with sustainable development is based on scientific uncertainty, meaning that the damages to be prevented are potential and unrealized. This principle requires vigilance towards an uncertain risk, as it reflects a future dimension aimed at protecting against the consequences of potentially serious risks. However, the precautionary principle does not apply to all potential risks. Rather, it focuses on situations characterized by two main conditions: scientific uncertainty, which is associated with a reasonable probability of serious and irreversible damage occurring, affecting the interests of society. An example of this is the outbreak of the coronavirus in 2020, which once again demonstrated the need for countries to prepare to confront potential crises, including future cyber threats. The second condition is the differences in protection, which some indicate that an uncertain risk may exist in the areas of environmental and health risks, which reinforces the need to provide legal protection through precautionary measures. The state of uncertainty may contribute to establishing civil liability when there are scientific justifications that support the increased risk of these risks. Applications of prevention differ from civil liability, as civil liability requires that damages actually occur, meaning that they must occur or be inevitable. Conversely, potential damages are not eligible for compensation unless. Indeed, in American courts, it has been emphasized that the existence of an increased risk may not be sufficient to justify a lawsuit in the absence of actual bodily injury or damage. The difference in the nature of damages between the precautionary principle and civil liability can also be justified by the fact that the precautionary principle focuses on taking precautions against risks whose occurrence has not been





scientifically verified, while civil liability is limited to claiming compensation for damages that have actually occurred. Even in the event of a claim for compensation for a breach of the precautionary principle, it must be proven that the damage is a direct result of the breach, without the need for scientific certainty, allowing for proof through accurate and reliable evidence. Therefore, the precautionary principle remains a key tool for promoting caution and proactiveness in the face of risks, and it should be viewed as an essential component in achieving a balance between civil liability and protecting society.

If the precautionary principle is applied extensively, it could create burdensome restrictions that hinder industrial and research activities, leading individuals to believe that all risks can be anticipated and avoided. Therefore, it is necessary to strike a delicate balance between risk prevention and achieving sustainable economic activity, while reevaluating civil liability rules to effectively address pressing environmental and health needs, and recognizing new responsibilities that support the protection of society and ensure its safety (Al-Tarawneh, 2022).

The Impact of the Precautionary Principle on the Causal Relationship: If the rules of civil liability are applied to the precautionary principle, the damage will be linked to potential future damages, which are often serious and irreparable. Serious damage is defined as damage that is difficult or more complex to remedy, preventing restoration of the status quo. This is evident from French environmental law, which states that the precautionary principle applies as soon as a risk exists, without waiting for it to actually occur. However, defining serious damages may raise controversy, as not all serious damages are linked to irreparable damages. In the aforementioned ruling issued by the French Court of Appeal regarding the health risks caused by mobile phone antennas, the court confirmed the existence of a hypothetical risk that required precautionary measures. The court found that the operator had not taken the necessary precautions, leading to a ruling to issue compensation for moral damages (Hassouna, 2015).

These cases demonstrate clear differences between damages that trigger civil liability and potential damages. Under civil liability, the damage must have actually occurred, while the precautionary principle allows for precautionary measures to be taken before any damage occurs. Under French law, courts can rely on uncertain evidence to establish causation, allowing uncertain risks to be considered consistently with environmental and health needs. In contrast, American courts adhere to stricter standards, requiring concrete proof of damage.





This debate over the existence of a causal relationship includes numerous legal examples, including judicial presumptions and scientific evidence. In some cases, French courts have supported the possibility of relying on presumptions to establish causation, without the need for scientific certainty, particularly in the context of corporate damages (Fathi, 2009).

This situation requires a comprehensive reassessment of the legal rules related to civil liability, to better suit modern environmental and health challenges. This must include the integration of scientific evidence and the use of presumptions as effective tools for proving harm and causation, contributing to strengthening legal protection and reflecting the growing need to proactively address future risks (Attorney, 2022).

3.7. The impact of the precautionary principle on compensation in the field of environmental health

If the precautionary principle is based on the concept of potential risk based on certain evidence, even if it lacks scientific certainty at the present time, then this risk has a fundamental impact on the possibility of claiming compensation through judicial means in the event of a failure to implement the precautionary measures imposed by this principle. Therefore, it was necessary to clarify the impact of the precautionary principle on compensation in the field of environmental health as follows:

3.8. Societal Risk Tolerance and the Establishment of Guarantee Funds

The idea of establishing a guarantee fund emerged with the aim of securing effective compensation for those harmed, while also providing protection for producers from the risks associated with innovation. This was not considered a social acceptance of the risks resulting from progress. The expansion of the scope of application of the precautionary principle also sparked renewed debate about exemption from liability for latent defects in the context of new innovations. The issue of societal risk sharing relates to the urgent need for cooperation between the natural and human sciences, as the legal acceptance of uncertain risks depends on their social acceptability. In addition, the cost of risk research and compensation must be distributed fairly across diverse programs and innovative financing strategies (Defoort, 2008). Environmental damages have specific characteristics that distinguish them from traditional damages covered by civil liability rules. In this context, a working group was formed in France to reform environmental damages. It submitted a detailed report





to the Minister of Justice in 2013, which included several important proposals, including: recognizing full liability in the event of unnatural damage to the environment; defining reparable damages and procedures for stopping illegal activities; establishing a special environmental protection fund that authorizes a higher environmental authority to claim compensation; and setting a statute of limitations of ten years from the moment the plaintiff learns of the damage. Priority should be given to compensation in kind, as monetary compensation is only a secondary solution. Furthermore, a civil fine was proposed for the benefit of the Environmental Remediation Fund in the event that the person causing the damage commits a gross and intentional error. Some of these proposals were addressed in the 2016 French law, including emphasizing compensation in kind as a priority and considering specific expenses for preventing the damage as reparable (Stevignon, 2023).

The Impact of Risk on Compensation: Risk can have a profound impact on the assessment of compensation, as is evident when the nature of the risk and conflicting interests are taken into account. Furthermore, the type of compensation itself is affected by this context. Priority here is given to in-kind compensation, reflecting the urgent need to effectively and tangibly compensate for damages. The principle of full compensation must also be adhered to to ensure redress for environmental health damages, which contributes to achieving justice and protecting environmental and societal interests. We will present this through the following:

The impact of conflicting interests on the amount of compensation: In situations of uncertainty, the traditional approach to understanding tort compensation ceases. Difficulties focus on potential risks, especially when the risk is clear, which imposes the required liability on the perpetrator. When the concept of risk is introduced into the discussion, it becomes clear that objective liability cannot be extended indefinitely, which calls for a careful balance between conflicting interests and a call to compensate victims through the effect of guarantees rather than direct liability (Al-Zahawi, 2019). The preventive principle imposes a new dimension, as exceeding the limits of damage and the absence of precautions blurs the lines between responsibilities. Therefore, anyone who causes abnormal harm due to a failure to take appropriate precautions must guarantee compensation for victims without having to prove deceptive conduct. However, compensatory claims in this case differ from civil liability compensation, as compensation resulting from a breach of the preventive principle may be less effective than full compensation and is subject to certain conditions. The measure of risk is an obsolete structure that requires the





definition of clear thresholds, not limited to compensation, but also encompassing the effective and sustainable prevention of harm.

3.9. Priority of in-kind compensation

The French legislator has set compensation in kind as a priority in the field of environmental damage, resorting to monetary compensation only in exceptional cases, including legal impossibility or the inadequacy of available remedial measures. The judge may also rule on monetary compensation alongside compensation in kind, based on the general rules in force. Compensation in kind and monetary compensation may be appropriately combined, especially if the compensation in kind does not provide sufficient coverage for the associated environmental damage. According to the legislation, monetary compensation is considered appropriate only after the necessary remedial measures have been implemented (Stevignon 2022). Although monetary compensation may not be ideal for environmental damages, it is necessary when compensation in kind is impossible. Judges must accurately assess the damages in recognized monetary terms. Judges must investigate the extent of the damages and ensure that appropriate compensation is awarded. Difficulties in assessment or a low value of compensation do not constitute grounds for refusing compensation. The same principles governing compensation in cases of personal injury should apply to environmental damages. Difficulty in assessing damages does not mean the loss of the right to claim compensation, which reflects the importance of protecting environmental health rights and ensuring justice for those affected (Parance 2016).

3.10. The principle of full compensation

Since the introduction of compensation for environmental damage in French Civil Code under the 2016 Biodiversity Act, litigation surrounding the characterization of this damage has effectively contributed to determining its content. Judicial decisions seek to clarify the nature of this type of damage and establish an appropriate methodology for ensuring its assessment, based on the principle of full compensation, an area that remains within the discretion of trial judges. The scope of compensation includes all expenses incurred to prevent imminent damage, avoid its aggravation, or mitigate its consequences, making such expenses reparable. While priority always remains with compensation in kind, it can be complemented by monetary compensation in accordance with the general rules of liability. Thus, full compensation





for environmental damage can be achieved through either compensation in kind, monetary compensation, or a combination of both to ensure justice and adequate redress for those affected.

4.CONCLUSION

The topic was reviewed through a descriptive, analytical, and comparative study. After detailed explanation, it was ultimately necessary to present the most important findings and recommendations to address the study's problems, which we will present as follows:

- The precautionary principle is based on three main elements: the first is the presence of uncertain evidence indicating a potential serious risk; the second is the serious damage that could result from this risk; and the third relates to taking appropriate precautionary or preventive measures to prevent such damage in the future.
- Although the precautionary principle is not considered a source of law, whether in relation to legislation, custom, principles of natural law, or rules of justice, it remains a general principle that guides legislators when drafting legislation related to environmental and public health protection. It also serves as a reference for judges when issuing rulings related to these cases. The preventive principle relies on a variety of concepts, including ethical, scientific, and legal ones. This principle contributes to introducing a new concept of civil liability, shifting its role from a purely remedial dimension to a preventive or precautionary one.
- The preventive principle highlights the importance of early assessment of potential risk, which contributes to changing the way compensation claims are handled in the event of environmental damage. The establishment of guarantee funds is an effective step to secure appropriate compensation for those affected by environmental damage, thus protecting their rights.
- The research demonstrates how conflicting interests affect compensation assessments, necessitating a delicate balance between environmental protection and the rights of individuals to claim compensation. It emphasizes that in-kind compensation should be the primary option for addressing environmental damage, while monetary compensation should be used only as a secondary option. This recognizes all expenses incurred to avoid further damage, in order to achieve justice.
- The precautionary principle for environmental health reinforces the importance of adhering to necessary precautions, contributing to a radical redefinition of the concept of breach of civil liability.
- Expanding the concept of damage highlights the role of unrealized damages as a key element in the application of the precautionary principle. This enables stakeholders to address risks in the absence of clear scientific certainty, while also challenging the ability to prove damages in the context of civil liability, compared to potential damages covered by the precautionary principle. It also extends beyond traditional civil liability to include necessary precautionary obligations, leading to significant changes in the legal understanding of liability.
- Differences between French and American law point to how damages and causation are treated. French systems tend to strike a more effective balance with future risks, while American law requires plaintiffs to provide concrete evidence





confirming actual damages. They must show that the damage is not only potential but has already occurred. American courts sometimes seek to address environmental and health issues, but these remain conditional on proof of actual damage.

5. RECOMMENDATIONS

The necessity of strengthening the preventive principle as a fundamental element in legislation and public policies, given its rich array of diverse concepts encompassing ethical, scientific, and legal aspects. This principle must be adopted to provide an innovative concept of civil liability, transforming the nature of this liability from a purely curative dimension to a preventive or precautionary one. This enables risks to be anticipated and damages avoided before they occur, enhancing the moral and social value of liability and working to build a safer and more stable environment for society as a whole.

Incorporating a legal provision into the Civil Code, similar to what the French legislature has done, that aims to take effective measures to prevent environmental damage and its negative effects on individual health, rather than relying solely on the current rules governing the theory of unfamiliar neighborhood harms. This should be accompanied by a re-evaluation of legislative rules related to the environment and related legislation, strengthening the role of civil society organizations and legal associations licensed for the purposes of protecting health and the environment, and not limiting oversight to the competent administrative authorities alone.

Strengthen existing legal frameworks related to environmental protection by introducing amendments that incorporate precautionary principles and ensure effective compensation for those affected. Develop accurate scientific mechanisms to assess environmental risks, which will help inform decisions regarding compensation and prevention, ensuring effective damage reduction.

It is advisable to establish flexible legal mechanisms that allow for the use of uncertain evidence when proving causation, making it easier for those affected to claim their rights and increasing litigation efficiency.

Support innovation in establishing compensation programs, such as the use of technology to improve compensation mechanisms and reduce environmental damage. Cooperation between government entities and the private sector should be promoted to find effective and sustainable solutions to environmental damage, including shared responsibility, and through the establishment of interactive





communication platforms between civil society and government agencies to discuss environmental issues.

Conduct ongoing studies on the impact of environmental risks and evaluate legislative performance, which will help inform policy amendments based on the results obtained, while expanding the scope of in-kind compensation in cases of environmental damage to include a variety of potential damages, ensuring comprehensive liability coverage.

Achieving transparency in all compensation processes and legal procedures to ensure that rights are clear and accessible to those affected, and environmental impact assessments are a prerequisite for all new projects to ensure that the environment and human health are not harmed.

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