

Examination of the Constituent Elements of Liability for Ecological Environmental Damage

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Abstract: Establishing liability for ecological and environmental damage is essential for executing compensation, yet there is currently limited research in this field. Studying the theory of liability for ecological and environmental damage can also guide its practical application. This paper examines the constituent elements of such liability, grounded in the polluter pays principle, to contribute to the theoretical research on ecological and environmental damage liability.

1. Introduction

Broadly speaking, the notions of liability and compensation stem from the tenets of tort law. In this domain, an injurious wrongful act grants the afflicted party the right to seek compensation, typically through damages. This can be achieved either by initiating a civil lawsuit against the offender or through private settlements. Environmental liability, on the other hand, encapsulates the methods through which significant polluters are mandated to amend or finance the restoration of the harm they have inflicted. This obligation is primarily anchored in a foundational duty to avert environmental degradation, rehabilitate the environment where the damage has transpired, and compensate when the harm is irreversible.

Though implementing liability and compensation structures isn't a universal remedy for environmental challenges, such rules hold considerable importance. They can function as an economic tool, fostering incentives to evade environmental harm. In specific scenarios, these rules can also promote preventive measures that extend beyond existing capabilities and seal regulatory gaps. Essentially, liability regulations offer an efficient mechanism to internalize environmental and additional societal costs into production and various activities, thereby actualizing the "polluter pays" principle.

In the context of the Reform Programme on Compensation for Ecological and Environmental Damage, the aforementioned concepts of damage compensation and accountability are brought to fruition by imposing liability on those obligated to compensate for ecological and environmental harm. By establishing this liability, compensation obligors are compelled to assume responsibility, thereby enabling the liability and compensation system to function effectively in safeguarding the ecological environment.

The compensation system for ecological and environmental damages in China addresses the broader impacts on the ecological environment in cases of pollution and ecological harm, while

excluding claims related to personal injuries and both individual and collective property damage. In contrast, many countries do not offer compensation for ecological damage unless there is accompanying personal injury or property damage. Some nations or regions, such as the European Union, have tackled this issue by implementing environmental liability frameworks to address the gaps in the environmental protection policies of their member states. An example is the EU Environmental Directive, which specifically omits compensation rights for private victims and instead emphasizes establishing liability for the prevention and remediation of environmental damage^[1]. Clarifying the liability for ecological and environmental damages is pivotal for enhancing the compensation system for such damages.

Liability for ecological damage is distinct from civil liability. Civil liability pertains to environmental torts resulting in personal and property losses through environmental mediums and falls under private law. In contrast, liability for ecological environmental damage relates to the harm to pristine environmental elements and their ecosystem functions, concerning the public interest of society and categorizing under public law. Consequently, understanding liability for ecological and environmental damages cannot be solely based on the principles of traditional civil tort liability, encompassing aspects like the nature, extent of liability, and establishment of causation.

2. Foundation for Liability in Ecological Damage

The notion that the detrimental outcomes of damage should be redirected to its origin is grounded in two fundamental principles of environmental law: the polluter-pays principle and the precautionary principle. The polluter-pays principle essentially dictates that the cost of preventing environmental damage should be borne by the polluter. The aim of this principle is to "internalize" the costs associated with pollution damage by allocating the expenses for prevention and compensation to those most capable of averting such damage.

The compensation system for ecological and environmental damages articulates a foundational principle, emphasizing that the compensation system for ecological and environmental damages should underscore the inherent value of the environment and the accountability associated with causing damage. It should reflect the ecological value of environmental resources, thereby encouraging compensation obligors to undertake the restoration of the impaired ecological environment. In instances where the ecological damage is irreparable, monetary compensation for alternative restoration will be enforced.

This approach essentially advocates for the establishment of a basic principle concerning the liability for compensating ecological and environmental damages, known as the "pollution and destruction yield compensation" principle. The "polluter pays" principle serves as a cornerstone to rectify the inequitable distribution of environmental burdens, characterized by the scenario where "enterprises pollute, and the public suffers." Furthermore, this principle forms the foundational basis and represents an expansion and extension of the established "polluter pays" principle, reinforcing the notion that those who cause environmental harm bear the responsibility for addressing and compensating for the damages.

The "polluter pays" principle was first introduced in 1972 by the Organization for International Economic Cooperation and Development (OECD) in their document titled "Environment and Economy: Guiding Principles on Environmental Protection Policies in the International Economy." The document proposed that for efficient utilization of limited environmental resources and to prevent distortions in international trade and investment, the costs of pollution prevention and control should be borne by the polluter. This essentially means that the expenses associated with maintaining an acceptable environmental state as determined by governmental agencies should be carried by those responsible for causing pollution. Consequently, these costs should be integrated

into the prices of goods and services responsible for the pollution. This principle also emphasized the need to avoid subsidies that might adversely affect international trade and investment.

This concept was further solidified in international law through its inclusion in various legal documents addressing environmental issues. Notably, in 1992, the Rio Declaration on Environment and Development, produced at the United Nations Conference on Environment and Development, incorporated this principle. Principle 16 of the declaration urges national authorities to work towards integrating environmental costs into their economic frameworks, emphasizing that polluters should typically bear the expenses of pollution while considering public interest and ensuring no negative impacts on international trade and investment.

The Rio Declaration stands as a significant and impactful testament to the central tenets of environmental law, showcasing the global importance of the "polluter pays" principle in environmental liability structures. Such is its significance that some academics have observed that the environmental liability systems of regions like the United States, the European Union, and Japan are now inextricably linked with this principle.

Originally, the "polluter pays" principle was not conceived as a liability principle, but rather as a framework for allocating pollution control costs. However, as governmental environmental protection initiatives widened and intensified, authorities increasingly adopted this principle to assign new legal responsibilities to private enterprises. The "polluter pays" principle offers a reasonable foundation for assigning liability for ecological damages. While a precise legal definition of this principle is yet to be firmly established, its essence is drawn from the equitable and logical idea that the entities causing pollution, not the government, should shoulder the abatement costs. Expanding on this, the fundamental assertion of the "polluter pays" principle is that the entities responsible for environmental pollution and ecological damage should be accountable for restoring or compensating for the harmed ecosystem, rather than governmental agencies.

3. Constituent Elements of Liability for Ecological Environmental Damage

The fundamental elements constituting liability for damages represent the central issues within the legal framework for compensation for such damages. These elements, in the context of ecological damage, denote the conditions necessary for assigning liability to the responsible party. The determination of these elements is vital in assessing whether ecological damage can be effectively thwarted, whether the incurred damage can be sufficiently restored and addressed, and whether the risks associated with environmental burdens can be fairly distributed.

3.1 Determination of damages

The presence of damage is a crucial factor and a prerequisite in establishing liability for ecological and environmental damages, thereby necessitating its existence for holding the offender accountable. The individual seeking compensation should provide evidence of such damage. Within the framework of liability for ecological and environmental damage, the harm caused by the offender through pollution and ecological destruction exhibits the following characteristics:

Firstly, there is the legal nature of the damage. Specifically, the damage in question must be ecological or environmental, resulting from the perpetrator's breach of certain regulations. If the damage incurred by the victim arises from violations of other legal provisions, different legal frameworks would apply. For instance, the Tort Liability Law would address claims for compensation for personal injuries and both individual and collective property losses, while laws such as the Law on the Protection of the Marine Environment and other pertinent regulations would handle compensation claims for damages to the marine ecological environment. For cases falling

under the former category, they would be considered within the realm of general tort liability and would be addressed through other applicable civil and commercial legal norms.

Secondly, the damage incurred must meet a certain threshold of significance. Not every adverse alteration to environmental and biological elements or the degradation of ecosystem functions they constitute should be deemed as damage resulting in liability. Identifying which level of damage or impact qualifies as defined damage is both crucial and challenging. In instances of minor impacts, the costs associated with assessing them might surpass the benefits, thereby necessitating the exclusion of such impacts from the definition of damage and, subsequently, from liability. The Environmental Protection Act also establishes thresholds for the degree of environmental pollution, utilizing descriptors such as "significant" and "serious" to characterize environmental damage or adverse effects. Additionally, there is a lack of uniformity in national, international, or European law concerning the criteria for these thresholds. Legal documents often employ terms like "significant," "obvious," or "considerable,"^[2] but the specific level of damage that satisfies these criteria remains ambiguous. For the liability system to operate effectively, it is essential to define threshold criteria below which the responsible entity will not be held accountable. Some "negligible" and "insignificant" damages could be exempt from liability. However, the onus of providing proof for such exemptions should fall on the perpetrator rather than the individual entitled to compensation, signifying a notable shift in the burden of proof. Moreover, setting the threshold criteria excessively high would undermine the effectiveness of liability.

Thirdly, the valuation of damage requires the application of scientific measures. In cases of ecological damage, claimants seek financial compensation to cover a variety of costs arising due to harm to the ecological environment. These costs can encompass expenses related to ecological damage surveys, appraisals, assessments, post-restoration effect evaluations, emergency responses, clean-up, restoration, or monitoring. However, assessing purely ecological damage economically presents challenges as it diverges from the conventional method of determining civil liability compensation, where the responsible party pays for the resultant economic costs of the damage.

A more structured approach is found in the measures of damages in natural resource damage claims outlined by U.S. legislations such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Oil Pollution Act (OPA), and the National Marine Sanctuaries Act (NMSA). These laws define damages as: (1) the cost of restoring, rehabilitating, replacing, or acquiring the equivalent of the damaged natural resource (primary restoration); (2) the cost of compensating for the interim loss of value of the natural resource until its restoration to baseline condition; and (3) the reasonable cost of assessing those damages.

The European Environment Agency (EEA) Directive focuses on restoring the damaged natural resources, emphasizing restoration costs as the primary method for damage assessment. Given the time required to restore natural resources to their baseline conditions, the polluter is also held accountable for interim losses or damages during the restoration period. Besides restoration and interim loss costs, the responsible party is liable for expenses related to damage assessment, administrative, legal and enforcement, data collection, and monitoring and surveillance. The liability under the European Environment Directive is compensatory rather than punitive.

Assessing natural resource damages is intricate, particularly when many such resources lack market value. Various economic methods, including the factor income approach, market-based methods, travel cost methods, hedonic pricing methods, contingent valuation, and conjoint analysis, can be employed for this purpose. Some of these methods, such as contingent valuation used in the U.S., are controversial. Contingent valuation estimates damages by directly surveying individuals about their willingness to pay to protect a specific natural resource, aiming to gauge the public's valuation of resource protection and preservation.

Non-use values are evaluated to accurately determine compensation amounts for natural resource

damages. Experience in assessing natural resource damages is limited in EU member states and under most international environmental liability regimes. Many member states and international conventions typically use restoration costs as the primary damage measure. When restoration is not feasible for any reason, damages are quantified based on the principle of equity, considering the harm to natural resources, economic interest, and the extent of damage incurred during response actions such as clean-ups.

3.2 Principles of attribution

The principle of attribution is fundamental to tort liability, serving as the foundational base for identifying the constituent elements of liability and determining whether an actor's liability is established or not. This principle entails attributing the damage caused to the perpetrator. Employing the principle of attribution underscores the grounds and foundation of the perpetrator's responsibility, acting as the criterion and standard for determining their tort liability. It specifically addresses the perpetrator's subjective state of mind during the commission of harm before liability can be established.

China's Civil Code, through Article 1229, mandates that if environmental pollution or ecological destruction results in harm to others, the infringer is held accountable. Article 1232 allows for corresponding punitive damages if the infringer, violating legal provisions, intentionally pollutes the environment or destroys ecology, leading to severe consequences. The Civil Code generally applies the principle of strict liability to environmental pollution and ecological damage, with punitive damages applicable under specific conditions of illegality, subjective intent, and severe consequences. However, it appears that such punitive damages are restricted to cases involving severe personal harm, such as health or life, rather than applying to unconventional types of damage like ecological environmental damage, which is distinct from traditional personal injury or property damage.

It can be inferred that the explicit articulation of the principle of attribution for ecological and environmental damages is not fully detailed in the law. Nevertheless, the Civil Code's stipulations regarding damages to persons, property, and purely economic interests stemming from environmental pollution and ecological destruction offer some insights into liability for ecological damages.

Foreign legislation provides for three types of liability for civil liability, namely fault-based liability (based on intent or negligence), strict liability (limited defenses) and absolute liability (liability without a mode of exemption). They range from fault-based liability to absolute liability, with strict liability with limited defenses being the most common form, which means liability regardless of fault or negligence. In other words, the correctness of the actor's behavior is not the issue, but the occurrence of the damage is the decisive factor. In the case of damage to the environment caused by the operator's activities, the traditionally recognized defences are threefold, the first being that the damage was caused by a natural phenomenon such as an act of God (or natural disaster), which is "exceptional, unavoidable" and of an irresistible nature. Secondly, it is an act of war or hostilities. Alternatively, it may be caused by an intentional or grossly negligent act or omission of a third party, and new defenses were added in the 1993 Lugano Convention. The Convention exempts damage caused by compliance with specific orders or coercive measures of public authorities, as well as damage caused by hazardous activities lawfully undertaken in the interest of the person who has suffered damage.

In distinction to strict liability, fault liability necessitates the plaintiff to demonstrate that the perpetrator acted with intent or exhibited negligence or recklessness. Consequently, fault liability is infrequently enforced as it assigns the burden of proof to the potential plaintiff, rather than the

accused perpetrator. In cases of ecological damage, adhering to the principle of fault liability will sustain the ecological injustice where "businesses pollute, and the public bears the burden." This is because many enterprises or individuals may not exhibit subjective fault for ecological damage resulting from their operations, and even if such fault exists, establishing proof is exceedingly challenging. According to the principle "he who asserts must prove," under fault liability, the plaintiff must establish the defendant's subjective fault for environmental harm. Failing this, even if the defendant's actions have caused environmental damage, the plaintiff cannot compel the polluter to bear the damages, and the consequences of the damage still fall upon the public. The infringed ecological rights and interests will remain unaddressed.

Under strict liability, the plaintiff is relieved from proving the defendant's subjective fault and needs only to substantiate the damage incurred. Conversely, the defendant must demonstrate the absence of a causal link between its actions and the resulting damage. Failing to do so obligates the defendant to bear the liability for ecological and environmental damages.

Prioritizing strict liability over fault-based liability holds distinct advantages, most notably in preventing damage. Given the potential high costs of compensating for ecological damage, operators are incentivized to adopt environmentally responsible practices, even if this escalates operational costs. Strict liability isn't fundamentally about transferring damages to or penalizing the "wrongdoers." Instead, it determines who will bear the risks associated with activities, some of which may be deemed socially beneficial in a broader sense. From both legal and economic standpoints, this accountability prompts operators involved in potentially hazardous activities to steer clear of ecologically harmful practices. It elevates the duty of care towards environmental protection, encourages preventive measures against ecological damage, and integrates the costs of such damage into their operational framework.

Secondly, strict liability aims to expedite response times and minimize ecological damage. Aware of the obligation to compensate if damage occurs, a responsible operator is consistently motivated to respond promptly to incidents and curtail damage. This ensures swift compensation, benefiting victims and those entitled to remuneration under a strict liability framework. As it alleviates the burden of proof on potential plaintiffs—eliminating the need to prove intent or negligence and focusing solely on establishing damage—strict liability facilitates easier linkage between the damaging activity and the resultant harm. This simplification not only streamlines litigation but also, in some cases, encourages extrajudicial dispute resolution, accelerating the compensation process.

3.3 Causation

Causation stands as a pivotal element in establishing legal liability. Regardless of the principle of attribution, for liability to be established, a causal relationship between the act (encompassing both action and inaction) and the resulting damage is essential. The determination of causation often presents significant challenges in judicial practice, given that the rule of self-responsibility mandates individuals to bear the consequences of the damages resulting from their actions, necessitating the identification of the real cause of damage.

Causality fundamentally represents our understanding of the connections between objective entities. However, due to the complex interrelations between entities and the limitations of human cognition, we are often unable to fully comprehend or explicate all causal relationships. When a satisfactory explanation eludes us in specific cases, questions arise—how does the judge ascertain the liability of the perpetrator? What nature of responsibility is expected of the liable individual, and to what degree are they held accountable?

Given our inherent limitations in proving and comprehending, the law crafts standards for identifying causal relationships—assessing the connection between behavior and outcome, and

determining the scope of responsibility to be shouldered by the perpetrator based on these standards. Typically, the onus of proving causation falls on the plaintiff. Causation is deemed established if the plaintiff can convincingly associate the defendant with the injury to the court's satisfaction. The court exercises discretion in admitting and evaluating evidence, relying on legally established causation criteria to decide whether a causal link exists between the infringing act and the resultant damage, whether legal liability should be imposed on the perpetrator, and the extent of such liability.

In a standard tort action, evidence is usually direct, tangible, and real, facilitating the development of essential facts for court presentation. Generally, the plaintiff bears the responsibility of establishing a sequence of events to demonstrate a link between the defendant's actions and the plaintiff's injuries. The provided facts or evidence should allow the trier of fact to reasonably infer that the defendant's conduct factually resulted in the plaintiff's injury. For instance, in a common road intersection accident, the evidence is relatively straightforward, enabling the plaintiff to easily establish a *prima facie* case for causation in fact, supported by surveillance and photographs showing the collision.

However, when addressing environmental damage liability, fulfilling the traditional standard of proof for causation—being real and sufficient—becomes challenging. Many cases might lack direct and tangible evidence entirely. Several factors, such as varying risk factors, unknown causative mechanisms, interaction of multiple hazardous substances, latency periods of harm, and others significantly burden plaintiffs under the traditional tort standard of factual causation. Consequently, proving causation in environmental damage claims emerges as a considerable technical hurdle to securing compensation. Additionally, the complexities of multi-party, large-scale, and long-term environmental damages contribute to causation uncertainty. In such cases, factual causation often relies on inferences and probabilities from diverse methods.

Countries in Europe exhibit varied approaches to this issue. Austria, Germany, Greece, and Spain necessitate high probabilities, near certainty, leading to the development of intricate theories and legislative measures to alleviate the plaintiff's burden of proof. In contrast, Belgium, France, Italy, and the Netherlands do not specify required probability levels, granting courts substantial discretion. England, Ireland, and Scotland have a lower threshold, requiring the plaintiff to demonstrate that the defendant's activity was a significant contributing factor, a criterion shared by Finland and Sweden.

In essence, absolute certainty in causation is elusive, but a fundamental level of persuasiveness is attained when evidence sufficiently allows the determination of whether the injury would have occurred absent the defendant's actions. In the United States, the legislature purposefully eased the stringent common law requirements of fault and causation, aiming to establish a comprehensive compensation program superseding the common law tort system of damages. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a pivotal statute in natural resource damages, does not discard the common law standard of causation but moderates it. This adjusted paradigm, if accurately interpreted and enforced, facilitates easier access to compensation, reflecting a shift in liability, evidentiary, and procedural standards.

According to theories of tort law, its primary objectives are twofold: compensation and deterrence, with damages aiming to reinstate justice and rectify injustice^[3]. The Ecological and Environmental Damage Reform Program in China establishes a broad legal framework for addressing ecological and environmental damages, extending beyond the boundaries of traditional liability. Within this framework, discussions emerged regarding the appropriateness of adopting a more lenient causation standard for ecological and environmental damages, in line with the principles of corrective justice and tort deterrence.

The unique nature of ecosystem damages indicates that the adoption of a more relaxed causation

paradigm aligns with the doctrines of both corrective justice and deterrence. Examining this from the corrective justice standpoint, there is a logical basis for easing the causation standard for ecological damages, primarily for two reasons.

Firstly, the conventional causation paradigm falls short in offering sufficient compensation due to the intricate nature of ecosystem damages. These complexities arise from multiple sources of harm, interactive effects between various damage sources, natural variability, limited understanding of ecosystems, and overarching global concerns such as climate change. The traditional approach to causation has been ineffective in ensuring adequate compensation in this context.

Secondly, the compensation received for ecosystem damages is designated for public benefit, aiming to restore the harmed ecosystems. This allocation eliminates the risk of an individual gaining unfairly from a relaxed causation standard. In cases where a more lenient causation paradigm might lead to overcompensation, the additional funds are directed back to the public sphere for ecological restoration. Given that modern tort law, especially the development of strict liability, addresses activities with high public harm potential in a risk society, a relaxed causation standard for ecological damages ensures that any overcompensation still benefits the ecosystem.

In conclusion, considering the inherent complexities and the public-good nature of ecosystem damages, tort law seems well-positioned to accommodate a more lenient causation standard, aligning with its fundamental objectives of ensuring equity and promoting deterrence.

Conversely, easing the causation standard for ecological damage aligns with and promotes the deterrence purpose of tort law. Given the often irreversible and devastating nature of ecological damage, it is crucial to prioritize preventive measures. To mitigate such damage, companies are compelled to adopt stricter protocols regarding equipment maintenance and safety, enabling the principle of deterrence to take effect.

Judge Guido Calabresi, a distinguished American jurist, a Judge for the U.S. Court of Appeals, and a pioneer in economic analysis of law, insightfully articulated that the deterrence objective in tort law aims to strike an ideal balance between safety and harm. He emphasized that in a world where safety comes at a cost, it is essential to create incentives to avoid future harms that are worth avoiding.^[4] Thereby achieving a balanced trade-off. Judge Calabresi posited that selecting a suitable causation paradigm is instrumental in attaining this balance.

Furthermore, he elucidated that the notion of causation serves as a mechanism to allocate liabilities in line with societal objectives. Consequently, a stringent adherence to the causation concept would neither effectively fulfill the goals we can evaluate nor accommodate the introduction of objectives that we are unable to openly affirm or analyze.

In conclusion, concerning ecological damages, there is a consensus among legal scholars, practitioners, and environmental scientists that the traditional causation standards may not be apt. Before exploring a novel paradigm of causation – one that both provides a theoretical basis for accountability and preserves the principles of fairness inherent in tort law – some propose first examining the possibilities within the existing legal framework for adopting unconventional approaches^[5].

Tort law, in its modern application, continues to exhibit adaptability and competence in addressing intricate causation dilemmas. It has effectively navigated through unconventional scenarios through evolution and adaptation in diverse situations. For instance, in medical malpractice cases, courts assign liability when the defendant either heightens the risk of harm to the plaintiff or diminishes the plaintiff's chances of survival. In view of this, a more flexible causation standard aligns with the fundamental principles of tort law in the realm of ecological damages.

Hence, instead of pursuing an entirely new causation paradigm, it is more pragmatic to explore within the boundaries of tort law and leverage its capacity to manage complex causation issues by adopting a relaxed causation standard. Concurrently, a distinction is drawn between general and

specific causation. When addressing ecological damages, the challenge of proving specific causation significantly surpasses that of general causation. The framework that differentiates between the two is instrumental in concentrating the discourse on the evidence required by the governmental compensation right holder to secure compensation for ecological damages.

Moreover, challenges in proving causation can be mitigated by reversing the burden of proof. Article 1230 of the Civil Code stipulates the principle of shifting the burden of proof in environmental pollution and ecological damage disputes. The onus is on the tortfeasors to demonstrate the absence of a causal link between the prescribed mitigating or exempting circumstances and the tort and the resultant damage, thereby alleviating the burden of proof on the government compensation rights holder.

4. Conclusions

The principles of "polluter pays" and "precautionary" in environmental law mandate polluters to bear the costs associated with environmental damages. Initially introduced by the OECD in 1972, the objective of this principle was to "internalize" environmental costs, necessitating polluters to execute ecological restoration or provide financial compensation to alleviate environmental strains. Even though this principle hasn't been officially codified in the legal systems of the United States, the European Union, and other regions, it has been integrated as a point of reference within their environmental legal frameworks. The principle acts not only as a logical foundation for environmental protection but also underscores its significance in averting and addressing environmental damages. Employing the polluter pays principle as a foundation, the core components of liability for ecological and environmental damages should encompass the verification of the fact of damage, including assessing the legality and extent of the damage through scientific methods. The transition of the principle of responsibility attribution from fault-based to strict liability. Establishing causality is essential for legal responsibility and poses challenges in justice administration, necessitating specific causation standards. The plaintiff typically bears the burden of proof, and direct evidence like surveillance footage can clearly demonstrate causation. Tort law, aiming for compensation and deterrence, may require a lenient causation standard for ecological damage to ensure fair compensation and prevent irreversible harm. Given that traditional causation standards may be insufficient, there is a need to explore a more accommodative approach within tort law's framework.

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