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Balancing Risk and Caution: The Precautionary Principle in Indonesian Environmental Law Context

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Abstract

This paper explores the application of the precautionary principle within the framework of Indonesian environmental law, emphasizing the delicate balance between risk assessment and precautionary measures. It examines the evolution of the precautionary principle in Indonesian legal discourse and its integration into environmental policy-making and decision-making processes. The analysis sheds light on the challenges and opportunities inherent in applying the precautionary principle within Indonesia's diverse environmental contexts. It highlights instances where precautionary measures have been effectively employed to mitigate environmental risks, while also addressing concerns regarding the potential for regulatory overreach and hindrances to economic development. By delving into case studies and legislative frameworks, this paper provides insights into how the precautionary principle is interpreted and operationalized within Indonesian environmental law. It underscores the

importance of incorporating scientific uncertainty and environmental ethics into policy formulation, while also emphasizing the need for flexibility and adaptability in responding to emerging environmental threats. Furthermore, the paper discusses avenues for enhancing the implementation of the precautionary principle in Indonesia, including capacity-building initiatives, stakeholder engagement, and the promotion of interdisciplinary research and collaboration. In conclusion, the paper highlights the significance of striking a balance between risk assessment and precautionary action in Indonesian environmental law. It underscores the importance of a nuanced approach that considers scientific evidence, societal values, and the principles of sustainable development in addressing environmental challenges while fostering economic growth and social welfare.

KEYWORDS *Precautionary Principle, Environmental Protection, Sustainable Development, Indonesian Policy*

Introduction

The intersection of economic development and environmental conservation[1] poses a profound challenge for nations like Indonesia, where burgeoning industries vie with ecological imperatives.[2] Central to navigating this complex terrain is the precautionary principle, a foundational tenet of environmental law advocating proactive measures in the face of uncertain risks, even absent conclusive scientific evidence.[3]

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1 Tisdell, Clement Allan, ed. *Economics of environmental conservation.* Vol. 1. Edward Elgar Publishing, 2005.

2 Kurniawan, Robi, and Shunsuke Managi. "Economic growth and sustainable development in Indonesia: an assessment." *Bulletin of Indonesian Economic Studies* 54.3 (2018): 339-361; Ilham, M. Irsyad. "Economic development and environmental degradation in Indonesia: Panel data analysis." *Jurnal Ekonomi & Studi Pembangunan* 22.2 (2021): 185-200.

3 Smith, Carl. "The precautionary principle and environmental policy." *International Journal of Occupational and Environmental Health* 6.3 (2000): 263-330; Van Asselt, Marjolein BA, and Leendert Van Bree. "Uncertainty, precaution and risk governance." *Journal of Risk Research* 14.4 (2011): 401-408.

Indonesia, endowed with unparalleled biodiversity and vast natural resources, stands as a poignant exemplar of this dilemma. The imperative to harness economic potential collides with the imperative to safeguard ecological integrity. Within this context, the application of the precautionary principle assumes paramount importance, serving as a linchpin in policy formulation and decision-making processes.[4]

In the broader context, the degradation of the environment poses a significant threat to the survival of both human populations and biodiversity. Moreover, the escalating impacts of global warming contribute to the phenomenon of climate change, further exacerbating environmental deterioration. Consequently, there is an urgent imperative for concerted efforts towards rigorous and sustained environmental protection and management, necessitating the active engagement of all stakeholders.[5]

Despite the passage of seven years since the 2002 amendment process to the 1945 Constitution, there has been a notable lack of attention given to constitutional studies concerning environmental issues. However, the amendments resulting from this process hold significant implications and offer a ray of hope for the establishment of constitutional guarantees for environmental sustainability in Indonesia, a nation situated within the equatorial realm. Central to this discourse are Article 28H paragraph (1) and Article 33 paragraph (4) of the 1945 Constitution, which serve as key provisions pertaining to the regulation of

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[4] *See* Prilandita, Niken, Benjamin C. McLellan, and Tetsuo Tezuka. "Framework for Identifying Autonomous DecisionMaking Process in Energy and Environmental Issues: Case Studies in Indonesian Communities (Rukun Warga)." *International Journal of Sustainable Future for Human Security* 3.2 (2015): 3-17; Sebayang, Karuniana Dianta Arfiando, and Darma Rika Swaramarinda. "Educational policy implementation in Indonesia: The art of decision making." *International Journal of Scientific and Technology Research* 9.1 (2020): 1286-1290; Petrich, Carl H., and Shelby Smith-Sanclare. "Environmental Challenges and Policy Responses in Indonesia." *Latin American Environmental Policy in International Perspective*. Routledge, 1997. 237-262.

[5] Meyer, William B., and Billie L. Turner. "Human population growth and global land-use/cover change." *Annual Review of Ecology and Systematics* 23.1 (1992): 39-61; Scanes, Colin G. "Human activity and habitat loss: destruction, fragmentation, and degradation." *Animals and Human Society*. Academic Press, 2018. 451-482.

environmental norms within the constitutional framework. These articles read as follows:

> *Article 28H paragraph (1): "Everyone has the right to live prosperously both materially and spiritually, to reside, and to enjoy a good and healthy living environment, as well as the right to access health services."*
>
> *Article 33 paragraph (4): "The national economy is organized based on the principles of economic democracy with the spirit of togetherness, equitable efficiency, sustainability, environmental friendliness, self-reliance, and balanced progress, aimed at achieving social justice and the prosperity of the people."*[6]

These provisions underscore the constitutional commitment to environmental protection, setting forth principles that emphasize not only economic development but also the preservation and sustainable use of natural resources for the collective well-being of the Indonesian populace.

Building upon the aforementioned articles, it becomes evident that the 1945 Constitution has incorporated provisions for constitutional protection, ensuring citizens' rights to access a suitable living environment while also guaranteeing the preservation of a sustainable environmental framework amidst the ramifications of national economic endeavors. This constitutional mandate underscores the recognition that every citizen is entitled to constitutional assurances, facilitating the right to thrive and access a conducive and healthy living environment for personal growth and development.

In addition, environmental protection and management, as defined by Article 1 point (2) of Law Number 32 of 2009 concerning

[6] *See also* Kahpi, Ashabul. "Jaminan konstitusional terhadap hak atas lingkungan hidup di Indonesia." *Al Daulah: Jurnal Hukum Pidana dan Ketatanegaraan* 2.2 (2016): 143-159; Pasapan, Priya Tandirerung. "Hak Asasi Manusia dan Perlindungan Lingkungan Hidup." *Paulus Law Journal* 1.2 (2020): 48-58; Raya, Muhammad Yaasiin. "Instrumen Ekonomi Pada Dana Jaminan Untuk Pemulihan Fungsi Lingkungan Hidup." *El-Iqthisady: Jurnal Hukum Ekonomi Syariah* (2022): 96-105.

Environmental Protection and Management (UUPPLH), entails a systematic and integrated endeavor aimed at conserving environmental functions and mitigating environmental pollution and/or damage. This encompasses a spectrum of activities, including planning, utilization, control, maintenance, supervision, and enforcement of relevant laws.[7]

Environmental impact control is a critical component within this framework, entailing the regulation of activities conducted by all entities, especially corporations with substantial environmental footprints. It pertains to monitoring the consequences of alterations in the environment stemming from business operations and activities.[8] Hence, the imperative to safeguard and manage the environment emerges as a collective responsibility for the state, governmental bodies, and all stakeholders in advancing sustainable development. This commitment is vital to ensure that the Indonesian environment continues to serve as a vital resource and sustenance for its people and diverse ecosystems.[9]

Article 1 point (3) of Law Number 32 of 2009 concerning Environmental Protection and Management elucidates the concept of sustainable development as a deliberate and coordinated endeavor. It integrates environmental, social, and economic considerations into developmental strategies, thereby safeguarding the environmental

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[7] Sodikin, Sodikin. "Penegakan Hukum Lingkungan menurut Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan." *Kanun Jurnal Ilmu Hukum* 12.3 (2010): 543-563.

[8] Bedner, Adriaan. "Consequences of decentralization: Environmental Impact Assessment and water pollution control in Indonesia." *Law & Policy* 32.1 (2010): 38-60. *See also* MacAndrews, Colin. "The Indonesian Environmental Impact Management Agency (BAPEDAL): its role, development and future." *Bulletin of Indonesian Economic Studies* 30.1 (1994): 85-103; Boyle, John. "Cultural influences on implementing environmental impact assessment: insights from Thailand, Indonesia, and Malaysia." *Environmental Impact Assessment Review* 18.2 (1998): 95-116.

[9] Bäckstrand, Karin. "Multi-stakeholder partnerships for sustainable development: rethinking legitimacy, accountability and effectiveness." *European Environment* 16.5 (2006): 290-306; Abhayawansa, Subhash, Carol A. Adams, and Cristina Neesham. "Accountability and governance in pursuit of Sustainable Development Goals: conceptualising how governments create value." *Accounting, Auditing & Accountability Journal* 34.4 (2021): 923-945.

integrity while concurrently promoting the well-being and quality of life of both current and future generations.

Environmental management yields economic, social, and cultural benefits, and should be guided by principles such as prudence, environmental democracy, decentralization, and the recognition and respect for local and environmental wisdom.[10] Accordingly, the proper protection and management of the Indonesian environment are imperative, grounded in principles of state responsibility, sustainability, and justice.[11]

The concept of the living environment encompasses the interconnectedness of space, encompassing all elements, forces, conditions, and life forms, including human behavior. This interconnectedness profoundly influences nature itself, the persistence of life, and the welfare of humans and other living beings. Efforts in environmental management and monitoring entail the regulation and oversight of businesses and/or activities, ensuring they operate without significant environmental impact. These efforts are crucial for informed decision-making concerning the operation of businesses and/or activities.

Sustainable development serves as a benchmark not only for environmental preservation but also for development policies. This entails recognizing the importance of preserving environmental functions, fostering intergenerational equity, promoting awareness of community rights and responsibilities, preventing environmentally irresponsible development practices, and ensuring broad societal participation in the implementation of sustainable development initiatives at all levels of society.

Development initiatives guided by the principles of sustainable development have proliferated globally, yielding significant advancements across diverse sectors including technology, production, economic

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[10] *See* Haddad, Mary Alice. "Paradoxes of democratization: Environmental politics in East Asia 1." *Routledge Handbook of Environment and Society in Asia*. Routledge, 2014. 86-104; Mori, Akihisa. *Environmental governance for sustainable development: East Asian perspectives*. United Nations Publications, 2013.

[11] Monsma, David. "Equal Rights, Governance, and the Environment: Integrating Environmental Justice Principles in Corporate Social Responsibility." *Ecology Law Quarterly* 33.2 (2006): 443-498.

management, education, and information dissemination. These advancements collectively enhance the overall quality of human life.

Achieving developmental goals necessitates meticulous planning in accordance with established legal frameworks. Such planning provides a foundation for assurance, protection, certainty, and strategic direction in developmental pursuits. As noted by some scholars that the law emerges as a critical instrument in this endeavor, aiming to maximize the welfare of the populace.

The development function embodies a dual nature: on one hand, it aims to enhance the quality of human life (progressive), while on the other, it has the potential to diminish it (regressive). Hence, a comprehensive development plan is essential, encompassing the determination of development design, risk assessments, and strategies to mitigate these risks. Within a legal framework, planning and risk mitigation are executed through the application of law.

According to some studies, a notable failure in countries worldwide, including Indonesia, in achieving sustainable development lies in *the inability of policy makers to integrate the three pillars of sustainable development (ecological, economic, socio-cultural) and to integrate these pillars with good governance into the country's policy decision-making process.*[12]

This paper embarks on an interdisciplinary exploration of the precautionary principle within the Indonesian environmental law context. Through a comprehensive examination of its conceptual underpinnings, historical evolution, and practical implications, this study aims to elucidate the nuanced dynamics at play. Drawing upon case studies, legislative analyses, and comparative perspectives, it endeavors to unravel the challenges and opportunities inherent in its application within Indonesia's socio-political and economic landscape.

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[12] *See* Agussalim, Dafri, et al. "Localizing the sustainable development goals: assessing Indonesia's compliance towards the global goals." *Sustainable Development Goals in Southeast Asia and ASEAN*. Brill, 2018. 39-62; Qisa'i, Ahmad. "Sustainable Development Goals (SDGs) and Challenges of Policy Reform on Asset Recovery in Indonesia." *Indonesian Journal of International Law* 17.2 (2019): 231-252; Prakasa, Satria Unggul Wicaksana. "Forestry Sector Corruption and Oligarchy: Lesson Learn from the Laman Kinipan Indigenous People, Central Kalimantan." *Unnes Law Journal: Jurnal Hukum Universitas Negeri Semarang* 8.1 (2022): 87-104.

This study underscores the precautionary principle's role not merely as a legal doctrine but as a guiding ethos, urging policymakers, stakeholders, and citizens to navigate the delicate balance between progress and preservation with prudence and foresight. By shedding light on its efficacy in shaping sustainable development trajectories and fostering resilience amidst environmental uncertainties[13], this paper contributes to the discourse on Indonesia's quest for harmonious coexistence between human society and the natural world.

Cross-border Environmental Cases: How Indonesian deal with International Provisions?

In the intricate tapestry of Indonesia's environmental governance, the delicate interplay between sovereignty and responsibility looms large, particularly in the context of cross-border forest fire incidents. As the nation grapples with the complex dynamics of preserving its rich ecological heritage while fostering sustainable development, the principles of sovereignty and responsibility emerge as pivotal pillars shaping policy and legal frameworks.[14]

In addition, the notion of sovereignty underscores Indonesia's authority over its territorial borders, granting it the autonomy to manage its natural resources and environment. However, this sovereignty is intricately entwined with the responsibility to prevent harm to neighboring countries and the global community, especially in the face of transboundary environmental crises such as forest fires, especially in some transboundary cases.

Transboundary air pollution refers to pollution originating from a specific country, which crosses borders through air currents and can result in environmental harm in neighboring nations. This form of pollution,

[13] O'Brien, Karen, Bronwyn Hayward, and Fikret Berkes. "Rethinking social contracts: building resilience in a changing climate." *Ecology and Society* 14.2 (2009); Desjardins, Eric, et al. "Promoting resilience." *The Quarterly Review of Biology* 90.2 (2015): 147-165.

[14] Absori, Absori, et al. "The prospect of environmental law to achieve healthy environmental development in Indonesia." *Medico-Legal Update* 20.1 (2020): 204-208.

often manifesting as smog, has far-reaching impacts beyond the borders of its origin country, affecting not only Indonesia but also neighboring countries such as Malaysia and Singapore.[15] Recognized as a longstanding international concern, transboundary pollution, commonly referred to as Transfrontier Pollution, is characterized by the following definition: "*Pollution whose physical presence is wholly or partially located within the territory of one state and which causes harmful effects in the territory of another state.*"[16]

The issue of haze resulting from forest fires in Indonesia, which spreads to neighboring countries, has sparked protests against Indonesia due to the detrimental effects experienced by Malaysia and Singapore. These protests are grounded in concerns regarding the adverse impact of the haze on public health, including respiratory issues such as Upper Respiratory Tract Infection, coughing, inflammation, and lung disorders. Malaysia and Singapore contend that Indonesia's perceived lack of seriousness in addressing the root causes of forest fires, coupled with slow government response, exacerbates the spread of haze-related health risks.[17] Consequently, these protests underscore the international perception of

[15] Forsyth, Tim. "Public concerns about transboundary haze: A comparison of Indonesia, Singapore, and Malaysia." *Global Environmental Change* 25 (2014): 76-86; Islam, Rabiul, Ok Mohammad Fajar Ikhsan, and Kamarul Azman Khamis. "The role of international political economy on transboundary haze: A comparison study among Malaysia, Indonesia and Singapore." *International Journal of Management (IJM)* 11.7 (2020): 442-52.

[16] Chander, Parkash, and Henry Tulkens. "Theoretical foundations of negotiations and cost sharing in transfrontier pollution problems." *European Economic Review* 36.2/3 (1992): 288-299; Gürtzgen, Nicole, and Michael Rauscher. "Environmental policy, intra-industry trade and transfrontier pollution." *Environmental and Resource Economics* 17 (2000): 59-71.

[17] Sari, Agus P. "Environmental and human rights impacts of trade liberalization: A case study in Batam Island, Indonesia." *Human Rights and the Environment.* Routledge, 2012. 134-157. *See also* Valencia, Mark J., and Abu Bakar Jaafar. "Environmental management of the Malacca/Singapore straits: legal and institutional issues." *Natural Resources Journal* 25.1 (1985): 195-232; Abdullah, Maizatulakma, et al. "The Southeast Asian haze: The quality of environmental disclosures and firm performance." *Journal of Cleaner Production* 246 (2020): 118958.

Indonesia's handling of the forest fire crisis and its implications for regional environmental and public health concerns.

Malaysia and Singapore have called upon the Indonesian government to promptly address the haze issue. Despite these urgent appeals, Indonesia did not immediately accede to the requests of the two neighboring countries. While the Indonesian government officially extended an apology to Malaysia and Singapore, conveyed directly by former President Susilo Bambang Yudhoyono, both nations have expressed dissatisfaction with this apology, deeming it insufficient.

Air pollution due to forest fires is contrary to the principles of international environmental law. Among them are the principle of *Sic utere tuo ut alienum non laedes*[18] which specifies that a country is prohibited from carrying out or permitting activities that can harm other countries and the principle of good neighborliness, which in essence the principle says the territorial sovereignty of a country must not be interfered with by other countries. This causes state responsibility because the occurrence of transboundary haze pollution that causes disruption to the environment of other countries is an act that is contrary to international law and results in losses suffered by neighboring countries.

The accountability of the Indonesian state regarding cross-border forest fires falls under the purview of International Responsibility, also known as international responsibility. The principle of state responsibility for environmental matters was initially delineated in the Declaration of the United Nations Conference on the Human Environment in

[18] "*Sic utere tuo ut alienum non laedes*" is a Latin legal maxim that translates to "Use your property in such a way as not to harm others." This principle encapsulates the concept of balancing individual rights with societal interests and responsibilities. It suggests that individuals have the right to use their property as they see fit, but that this usage should not infringe upon the rights or interests of others. In legal contexts, it often serves as a guiding principle for environmental protection and land use regulations, emphasizing the importance of considering the potential impacts of one's actions on the broader community. *See* Subramanya, T. R., and Shuvro Prosun Sarker. "Emergence of Principle of Sic Utere Tuo Ut Alienum Non-Laedes in Environmental Law and Its Endorsement by International and National Courts: An Assessment." *Kathmandu School of Law Review* (2017): 1-13. *See also* Gintoe, Chris Sostom. "Tanggung Jawab Perusahaan Multinasional dalam Kebakaran Hutan di Indonesia." *Maleo Law Journal* 3.1 (2019): 52-70.

Stockholm in 1972. Subsequently, this principle was further reinforced and endorsed in the second principle of the Rio de Janeiro conference in 1992 (Rio Declaration on Environment and Development).[19]

The principle of state accountability has evolved to become one of the fundamental tenets of international law, particularly in the aftermath of the world wars. This principle has undergone significant development, with several United Nations conventions delineating states as legal entities subject to accountability. Moreover, under specific circumstances, individuals can also be held accountable.[20]

Notably, the United Nations, through the International Law Commission, has been dedicated to formulating a legal framework for State Responsibility since 1949. This framework aims to provide a basis for holding states accountable for losses incurred, even in the absence of binding international agreements among the parties involved.

Furthermore, Phillip Jessup, a prominent figure in international law, posited that sovereignty should be comprehended as the freedom to engage in governmental actions to the exclusion of all other authorities, albeit subject to limitations self-imposed by international law. Jessup's perspective remains pertinent today, as the notion of unlimited sovereignty has become obsolete. In contemporary times, the issue of responsibility in international environmental law has garnered more attention than the rights of states, challenging the traditional exercise of sovereignty in a modern context.[21]

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[19] *See* Satterthwaite, David. "A new urban agenda?." *Environment and Urbanization* 28.1 (2016): 3-12; de Roo, Gert, and Donald Miller. *Integrating city planning and environmental improvement: Practicable strategies for sustainable urban development*. Routledge, 2017.

[20] Mason, Michael. "The governance of transnational environmental harm: Addressing new modes of accountability/responsibility." *Global Environmental Politics* 8.3 (2008): 8-24.

[21] *See* Jessup, Philip C. "International Law in 1953 AD." *Proceedings of the American Society of International Law at its annual meeting (1921-1969)*. Vol. 47. Cambridge University Press, 1953. *See also* Jessup, Brad, and Kim Rubenstein, eds. *Environmental discourses in public and international law*. No. 3. Cambridge University Press, 2012; Jessup, Brad. "Trajectories of environmental justice-from histories to futures and the Victorian environmental justice agenda." *Victoria University Law and Justice Journal* 7.1 (2017): 48-65.

The principle of state responsibility emerges from a state's obligation to uphold the rights of other individuals or nations that may suffer harm. While environmental protection is inherently a collective responsibility shared by all citizens within a country, the state, as the governing body, bears specific obligations and responsibilities outlined in the constitution. In instances where an individual's actions within a country result in harm to another country or to the state itself, the state assumes responsibility due to its duty to safeguard the well-being of its citizens and mitigate any resulting adverse effects on external parties or its own territory.

Under this principle, the state possesses the sovereignty to govern its territory and is tasked with the responsibility to safeguard the well-being of all individuals and entities subject to its laws. The concept of state accountability, rooted in philosophical foundations, is inherently intertwined with sovereignty, an inherent attribute of entities recognized as states. Sovereignty, derived from the term "*sovereign*," represents the supreme authority wielded by a specific country. It is of utmost significance in defining a state's existence, shaping its relations with other nations, and regulating the conduct of its citizens within its territorial boundaries.

While sovereignty may seem theoretical, it holds tangible implications in practice. Initially, the principle of state responsibility primarily focused on internal implementation, evaluating a state's efficacy in providing peace and welfare for its citizens. As highlighted in the introduction, state responsibility encompasses both external and internal dimensions, extending to the citizens of the respective country.

A crucial distinction in the application of state accountability to citizens lies in the relationship between the state or government, responsible for executing state functions, and the citizens of the state. In various parts of the world, states bear the responsibility of ensuring political freedoms, security, healthcare, education, economic opportunities, quality services, legal order, and other fundamental rights to their citizens.

In the realm of international law, the principle of state responsibility is closely intertwined with state sovereignty, a cornerstone principle of international relations. The sovereignty of each state is further reinforced

by the doctrine of the equality of states in international law. This doctrine, developed since the inception of modern international law, underscores the importance of the relationship between the law of nations and natural law.

In instances where the main elements of an act fulfill the criteria for state responsibility, the offending state is obligated to undertake international accountability through both legal and diplomatic means. The initial step in initiating international accountability is to cease the conduct causing harm to other countries and ensure its non-repetition. This provision serves as the foundation for promptly halting actions that harm other countries at the earliest possible juncture. Additionally, it stipulates that a state responsible for causing harm to another state due to its international actions must provide reparations to the affected country. These reparations encompass all losses incurred, including both tangible and intangible losses.

Various forms of reparation may be pursued, including restitution, compensation, and other forms of redress, either independently or through a combination of all three. In cases of restitution, the offending state is required to restore the affected state to its previous condition as closely as possible.[22] If this proves inadequate, the offending state is further obligated to provide compensation for the assessed material losses.

State Efforts in Preventing and Reducing Cross-border Pollution: The Practices of the Precautionary Principle

States are mandated to implement measures aimed at curbing cross-border pollution, including establishing timelines for the reduction or elimination of transboundary pollution. These measures are essential for mitigating the adverse impacts of pollution that extend beyond national borders.

A. Application of the principle of Non-discrimination

[22] Larsson, Marie-Louise, ed. *The law of environmental damage: liability and reparation*. Vol. 1. Martinus Nijhoff Publishers, 1999.

Efforts to address cross-border environmental impacts are governed by the principle of nondiscrimination, which ensures that all affected parties are treated fairly and equitably regardless of nationality or other distinguishing characteristics. This principle, rooted in international law, prohibits discrimination in the allocation of resources, responsibilities, and opportunities related to environmental protection and management. It emphasizes the importance of inclusivity and cooperation among nations to effectively address transboundary environmental challenges.[23]

Furthermore, the principle of nondiscrimination extends beyond national boundaries to encompass various stakeholders, including communities, indigenous groups, and vulnerable populations. It underscores the need for inclusive decision-making processes that consider the diverse interests and concerns of all affected parties. By upholding this principle, countries can foster trust, collaboration, and collective action in addressing cross-border environmental issues.[24]

Exploring the principle of nondiscrimination in the context of cross-border environmental impacts reveals its multifaceted implications for international cooperation and environmental governance. It highlights the interconnectedness of environmental challenges and the importance of adopting inclusive and equitable approaches to address them effectively. Additionally, it underscores the role of international treaties, agreements, and institutions in promoting cooperation and solidarity among nations to achieve common environmental goals while respecting the rights and interests of all stakeholders.

1. Polluters who cause cross-border impacts must be subject to provisions equal to or more severe than those applicable in the polluter's own home country taking into account the special circumstances of the environment and the use of the area.
2. The application of responsibility for quality standards on environmental impacts that are transnational borders, should not

[23] Listiningrum, Prischa. "Transboundary civil litigation for victims of Southeast Asian Haze pollution: access to justice and the non-discrimination principle." *Transnational Environmental Law* 8.1 (2019): 119-142.

[24] Orellana, Marcos. "Investment agreements & sustainable development: The non-discrimination standards." *Sustainable Development Law & Policy* 11.3 (2011): 4.

exceed the quality standards in the country of origin of the polluter, how possible by taking into account the special circumstances of the polluted country's environment.

3. If the Pollution Pays Principle *is adopted*, its implementation cannot think about countries affected by environmental impacts that are transnational borders.
4. Any person who suffers from transnational transboundary pollution should not receive treatment that is different from someone who is famous from the country of origin of pollution.

The provided statements outline key principles guiding the management of cross-border environmental impacts. First, polluters causing transboundary harm should face penalties equal to or more severe than those in their home country, considering the unique environmental conditions of the affected area. Second, quality standards for environmental impacts should not exceed those of the polluter's country, but must also account for the specific circumstances of the impacted environment. Third, implementation of the Pollution Pays Principle should not neglect countries affected by transboundary pollution. Finally, individuals affected by such pollution should receive treatment equal to those affected within the polluter's own country, emphasizing the principle of nondiscrimination in addressing transnational environmental issues. These principles underscore the importance of equitable and cooperative approaches to addressing cross-border environmental challenges.[25]

B. Principle of Application of Early Warning System (Prior Notice) Against accidents that occur

The principles outlined offer a comprehensive framework for addressing cross-border environmental impacts with fairness and equity.[26]

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[25] *See* Kamminga, Menno T. "5 Principles of international environmental law." *Environmental policy in an international context.* Vol. 1. Butterworth-Heinemann, 1995. 111-131.

[26] *See* Schachter, Oscar. "The emergence of international environmental law." *Journal of International Affairs* (1991): 457-493; Plakokefalos, Ilias. "Prevention obligations

Eyal Benvenisti and other scholars emphasize the importance of holding polluters accountable for the full extent of their transboundary actions, proposing penalties that align with or exceed those enforced in the polluter's home country. This approach aims to deter irresponsible behavior across borders and ensure that polluters face appropriate consequences for their actions.[27] Additionally, scholars like Dinah Shelton advocate for a nuanced approach to setting environmental standards for transboundary pollution, emphasizing the need to consider both the origin of pollution and the specific environmental context of affected areas. This approach seeks to strike a balance between respecting the sovereignty of the polluting state and addressing the environmental needs of affected nations.[28]

The Pollution Pays Principle, endorsed by legal expert Daniel Bodansky and others, underscores the responsibility of polluters to bear the costs of environmental damage they cause. However, concerns arise regarding its application to cross-border pollution, particularly regarding the equitable distribution of costs among affected countries.[29] Scholars like Lavanya Rajamani highlight the challenge of ensuring that the financial burden of pollution does not disproportionately fall on already vulnerable nations.[30] Despite these challenges, the Pollution Pays Principle remains a

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in international environmental law." *Yearbook of International Environmental Law* 23.1 (2012): 3-43.

[27] Benvenisti, Eyal. *Sharing transboundary resources: International law and optimal resource use*. Vol. 23. Cambridge University Press, 2002.

[28] Shelton, Dinah. *International environmental law*. Vol. 4. Brill, 2021. *See also* Shelton, Dinah. "Describing the elephant: international justice and environmental law." *Environmental Law and Justice in Context* (2009): 55-75; Shelton, Dinah. "Using law and equity for the poor and the environment." *Poverty Alleviation and Environmental Law*. Edward Elgar Publishing, 2012; Shelton, Dinah L. "Comments on the Normative Challenge of Environmental 'Soft Law'." *The transformation of International Environmental Law* (2011): 61-71.

[29] Bodansky, Daniel. "The legitimacy of international governance: a coming challenge for international environmental law?." *American Journal of International Law* 93.3 (1999): 596-624; Bodansky, Daniel, Jutta Brunnée, and Lavanya Rajamani. *International climate change law*. Oxford University Press, 2017.

[30] Rajamani, Lavanya. "Ambition and differentiation in the 2015 Paris Agreement: Interpretative possibilities and underlying politics." *International & Comparative*

crucial tool for promoting accountability and encouraging polluters to internalize the environmental costs of their actions.

Furthermore, the principle of nondiscrimination, as elucidated by international law scholar Philippe Sands and others, emphasizes the importance of treating individuals affected by transboundary pollution equally, regardless of their nationality or geographic location.[31] This principle reflects broader notions of environmental justice and human rights, underscoring the need for inclusive and equitable responses to cross-border environmental challenges. By prioritizing fairness and equity in addressing transboundary pollution, policymakers and stakeholders can work towards fostering cooperation, accountability, and sustainable environmental management on a global scale.

C. Principle of Mutual Exchange of Scientific Data

Under the principle outlined, it is imperative that all States mutually furnish one another with pertinent scientific data regarding pollution that traverses national boundaries, unless such sharing is expressly prohibited by domestic laws or international statutes. This commitment to shared knowledge is integral to fostering global environmental stewardship and cooperation.

Renowned scholars emphasize that scientific collaboration and technical research programs must be conducted diligently to address the intricate dynamics of pollutant dispersion, its resultant impacts, and effective mitigation strategies for the collective benefit. By leveraging collective expertise and resources, nations can better identify pollutants' propagation routes, discern their ecological and human health ramifications, and devise comprehensive measures to curtail their adverse effects.[32]

Law Quarterly 65.2 (2016): 493-514; Rajamani, Lavanya. "The 2015 Paris Agreement: Interplay between hard, soft and non-obligations." *Journal of Environmental Law* 28.2 (2016): 337-358.

[31] Sands, Philippe. "5International Environmental Law Ten Years On." *Review of European Community & International Environmental Law* 8.3 (1999): 239-242.

[32] *See* Emond, D. Paul. "Co-operation in Nature: A New Foundation for Environmental Law." *Osgoode Hall Law Journal* 22.2 (1984): 323-348; Beyerlin,

Furthermore, scholars underscore that this collaborative approach transcends mere data exchange; it underscores a commitment to proactive problem-solving and policy formulation aimed at safeguarding the integrity of the global environment. Such endeavors not only enhance environmental resilience but also promote sustainable development and equitable access to clean air, water, and land resources for present and future generations.

D. Principle of Dispute Settlement

In environmental cases, Lucy Reed asserts that alongside diplomatic negotiations, states should have recourse to court forums that are prompt, effective, and binding. Reed argues that such forums are essential for ensuring accountability and upholding environmental treaties and agreements. She emphasizes that timely access to judicial mechanisms strengthens the enforcement of environmental laws and fosters compliance with international environmental norms.[33]

James Salzman, echoes this sentiment, emphasizing the importance of effectiveness in resolving environmental disputes. He contends that court forums must possess the necessary expertise to adjudicate complex environmental issues and the authority to render decisions that can effectively address environmental harm and promote sustainable practices.[34]

Moreover, Daniel Bodansky, emphasizes the binding nature of decisions rendered by these court forums. Bodansky argues that binding rulings are crucial for ensuring compliance with environmental obligations and holding states accountable for their environmental actions. He asserts

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Ulrich, and Thilo Marauhn. *International Environmental Law*. Bloomsbury Publishing, 2011.

[33] Reed, Lucy, and Andrew Jacovides. "Great Expectations: Where Does the Proliferation of International Dispute Resolution Tribunals Leave International Law?." *Proceedings of the Annual Meeting (American Society of International Law)*. The American Society of International Law, 2002.

[34] Salzman, James, and Barton H. Thompson. *Environmental Law and Policy*. Foundation Press/Thomson West, 2003.

that adherence to binding judgments fosters environmental stewardship and contributes to the protection of global ecosystems.[35]

E. Principle of Equation to Listen

Each nation should embrace the principle of equitable treatment regarding cross-border environmental impacts, ensuring parity in both research endeavors and administrative actions. This commitment to fairness is pivotal in resolving disputes arising from environmental law, fostering cooperation and harmony among countries while addressing shared ecological concerns. Stiglitz, for instance, argues that without equal treatment, disparities in environmental regulation could lead to conflicts and hinder effective resolution of transboundary disputes.[36] Moreover, environmental economist Graziano emphasizes the economic benefits of equitable treatment, suggesting that it can promote sustainable development by incentivizing cooperation and reducing the risk of environmental degradation.[37]

In practice, implementing the principle of equal treatment requires robust mechanisms for dispute settlement that are founded on principles of fairness and inclusivity. Legal frameworks such as those proposed by Z, an expert in international environmental law, advocate for the establishment of transboundary dispute resolution mechanisms that prioritize impartiality and transparency. By providing avenues for affected parties to voice their concerns and seek redress, these mechanisms can help prevent escalation of disputes and foster trust among nations.

Furthermore, the principle of equitable treatment extends beyond formal dispute settlement processes to encompass broader aspects of

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[35] *See* Bodansky, Daniel. "Rules vs. standards in international environmental law." *Proceedings of the ASIL Annual Meeting*. Vol. 98. Cambridge University Press, 2004; Bodansky, Daniel. "International environmental law." *The Handbook of Global Climate and Environment Policy* (2013): 179-196.

[36] Stiglitz, Joseph E. "Regulating Multinational Corporations: Towards Principles of Cross-Border Legal Frameworks in a Globalized World Balancing Rights with Responsibilities." *American University International Law Review* 23.3 (2007): 1.

[37] Graziano, Kadner. "The Law Applicable to Cross-Border Damage to the Environment." *A Commentary on Art* 7 (2007): 71-86.

environmental governance. Scholars such as Hamilton argue that promoting equal access to information and participation in decision-making is essential for ensuring fair treatment of all stakeholders, including marginalized communities disproportionately affected by transboundary environmental impacts.[38] This holistic approach to environmental governance not only enhances the legitimacy of regulatory regimes but also strengthens compliance and enforcement mechanisms.

However, implementing the principle of equal treatment faces challenges, particularly in cases where power imbalances or conflicting interests among nations hinder cooperation. Shao, Liu, and Tian warn against the pitfalls of "*environmental inequality*," where economically disadvantaged countries bear the brunt of environmental harm caused by more affluent nations. Addressing these inequalities requires concerted efforts to address underlying socio-economic disparities and promote international cooperation based on principles of justice and solidarity.[39]

Therefore, the principle of equal treatment regarding transboundary environmental impacts is essential for promoting cooperation, resolving disputes, and advancing sustainable development goals. By incorporating insights from legal scholars, economists, and environmental experts, policymakers can develop robust frameworks for dispute settlement and environmental governance that uphold principles of fairness, inclusivity, and sustainability.

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[38] Hamilton, Matthew. "Understanding what shapes varying perceptions of the procedural fairness of transboundary environmental decision-making processes." *Ecology and Society* 23.4 (2018).

[39] Shao, Shuai, Liwen Liu, and Zhihua Tian. "Does the environmental inequality matter? A literature review." *Environmental Geochemistry and Health* (2021): 1-24. *See also and compare with* Boyce, James K., Klara Zwickl, and Michael Ash. "Measuring environmental inequality." *Ecological Economics* 124 (2016): 114-123; Pellow, David N. "Environmental inequality formation: Toward a theory of environmental injustice." *American behavioral scientist* 43.4 (2000): 581-601; Irfany, Mohammad Iqbal, and Stephan Klasen. "Inequality in emissions: evidence from Indonesian household." *Environmental Economics and Policy Studies* 18 (2016): 459-483; Dib, Jonida Bou, Zulkifli Alamsyah, and Matin Qaim. "Land-use change and income inequality in rural Indonesia." *Forest Policy and Economics* 94 (2018): 55-66.

Policies to Prevent Environmental Damage: A Global Challenges

The Stockholm Conference of 1971 marked a seminal juncture in the global acknowledgment of environmental degradation stemming predominantly from unbridled economic exploitation.[40] Within the discourse of the conference, two salient pronouncements emerged:

Primarily, the assembly affirmed the intrinsic human rights to freedom, equality, and dignified living conditions. It categorically denounced policies of apartheid, racial segregation, discrimination, colonialism, and foreign occupation, advocating resolutely for their eradication to uphold these fundamental rights.

Concomitantly, the conference underscored the imperative of conserving Earth's finite natural resources for the collective benefit of both current and forthcoming generations. Central to this imperative was the advocacy for meticulous planning and management to safeguard crucial elements such as air, soil, water, flora, fauna, and emblematic natural ecosystems. Furthermore, it emphasized the critical necessity of preserving and, where requisite, restoring or enhancing the Earth's capacity to sustain essential renewable resources.

Third, humans have a special responsibility to safeguard and wisely manage the heritage of wildlife and their habitats, which are now truly endangered by a combination of adverse factors. Nature conservation, including wildlife, must accept its importance in planning for economic development. *Fourth,* the earth's non-renewable resources must be used in such a way as to guard against the danger of their future exhaustion and to ensure that the benefits of such work are shared by all mankind. The disposal of toxic substances or other materials and the depletion of heat, in large quantities or concentrations that exceed the capacity of a safe and harmless environment, must be stopped in order to ensure that irreparable damage does not impact the ecosystem. The struggle of all mankind from pollution-prone countries must be supported.

[40] Pallemaerts, Marc. "International environmental law from Stockholm to Rio: back to the future?." *Greening International Law*. Routledge, 2014. 1-19.

In addition, *fifth,* in the long and winding evolution of human life in the world has reached a chapter, through the acceleration of science and technology, man has gained the power to change his environment in a variety of ways and on an unprecedented scale. Both aspects of the human environment, namely nature and human creation are equally important for well-being and for the realization of human rights.

Sixth, basically, the protection and improvement of the human environment is a major problem that affects people's welfare and economic development throughout the world. This is an urgent desire of the nations of the whole world and is the duty of all governments. *Seventh,* that on the basis of man continuously multiplying his experience and continuing to dig, discover, create and progress. Human's ability to change the environment, if used wisely, can bring constructive benefits to all nations and opportunities to improve the quality of life. Wrong or arbitrary application, the same force can seriously harm people and their environment.

In relation to the above, it can be observed that there is more and more evidence of the brutality of human behavior in various parts of the world, the level of pollution of both water, air, earth, and living things is at a dangerous level. Similarly, the occurrence of severe and unwanted disasters against the ecological balance of the biosphere, destruction and depletion of non-biological resources, and gross deficiencies. All of them are extremely harmful to physical, mental and human health, in a man-made environment. Especially in the environment and workspace that is the habitat of human daily life.

In developing countries, most environmental problems are caused by development. Millions of them continue to live, well below the minimum levels necessary for a decent human life, lack of adequate food and clothing, shelter and education as well as health and sanitation.

Therefore, developing countries must devote their efforts to development, given their priorities and the need to protect and improve the environment. Efforts to the same goal, industrialized countries should make efforts to reduce the gap themselves with developing countries. In industrialized countries, environmental problems are generally related to industrialization and technological development.

Conclusion

According to Law No. 23 of 1997, the environment is the unity of space with all objects and the unity of living things including humans and their behavior that carries out the life and welfare of humans and other living things. Environmental elements include biological elements (biotic), socio-cultural elements (culture), and physical elements (abiotic). Environmental damage due to natural events: volcanic eruptions, earthquake damage, cyclone damage, dry season, erosion and abrasion. Environmental damage caused by human activities: illegal logging, illegal buildings in watersheds, excessive use of natural resources, landfilling of swamps for settlement, and littering in any place. All humans must participate in efforts to preserve the environment because the environment is the place where we live. By preserving the environment we have saved thousands or even millions of lives. Because many lives were lost, many were caused by environmental damage.

This principle of state responsibility arises because of a state obligation to fulfill the rights of other people and / or countries that feel aggrieved. Based on this principle, the state has the sovereignty to govern its country and is obliged to protect and safeguard every subject and object of its country's law. The principle of state accountability in philosophical foundations is inseparable from the absolute sovereignty possessed by every entity referred to as the State

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