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Environmental Law and Climate Justice: Legal Pathways to Global Sustainability

Dr. Akhileshwar Rai
Principal, Manu Law College, Nichlaul,
Maharajganj, Uttar Pradesh
Email Id- akhileshwarrai16@gmail.com

Abstract

Both environmental law and climate justice provide legal and normative frameworks to regulate human relationships with the climate system, ensuring sustainable development and protecting vulnerable generations. This paper discusses how structural inequalities arising from climate change, in which major emitters and the most harmed belong to divergent socioeconomic backgrounds, are addressed through international and national legal tools grounded in the principles of distributional, recognitional, and procedural justice. It starts by tracing the history of environmental law and climate justice, such as the expansion of rights to future generations, and the history of historical injustices, such as slavery, colonialism, and the marginalisation of Indigenous practices, contributing to present claims for climate reparation. It is followed by the analysis of the main international agreements, multilateral environmental treaties, human rights standards, and climate finance mechanisms, highlighting both their advantages and disadvantages in delivering a comprehensive, equitable response to the climate crisis. On the national level, it takes into account regulatory policies to decrease emissions and promote renewable energy, the implementation of environmental rights and access to justice, and the latest so-called just transition that relates climate policies to the security of workers and social guarantees. Finally, it analyses accountability, compliance, and enforcement gaps amid large-scale deforestation and fossil fuel dependency. It indicates that the judicial role in climate governance and the acknowledgement of a right to a healthy environment are crucial to establishing climate justice, shifting its emphasis from fairness retrospectively to resilience prospectively for present and future generations.

Keywords: *Environments, climate justice, human rights, climate finance, just transition, accountability and enforcement, and global sustainability pathways.*

1. Introduction

Environmental law regulates human activities to achieve sustainable use of natural resources and safeguard the climate system. Climate system protection is the key to ensuring the functionality of ecological systems on the planet, which are the basic elements of human life (Kulovesi et al., 2019). Climate justice involves the concept of climate as a shared interest of humanity and the rights of people and organisations in their relationships with the climate system, irrespective of the jurisdiction of these people and groups (Yoon Kang, 2019). As a principle, justice can be perceived, first, as a means of managing interactions in the environment to provide a fair consideration of the needs, values, and interests of the current and future generations and all workers and communities (Villavicencio Calzadilla, 2017). Second, climate, as a common concern, necessitates a fair distribution of space and climate funds to realise widespread participation in the climate regime and to provide the legitimacy of governance and the commitment to emission reduction. Third, climate interactions can lead to injustices that give rise to climate claims and entitlement demands by victims against those accountable. The nature of climate interactions can also be temporal: entitlement can include a right to contribute to the full enjoyment of the climate commons permanently and/or to provide basic needs on an ad hoc basis. Finally, historical injustices that are caused because of slavery or colonialism affect the right to climate because they create the reparation demands that are retrospective and still valid regardless of the period that has elapsed since the first incidents.

2. The Conceptual Underpinnings of Environmental Law and Climate Justice.

The tenet of environmental law that the significance of nature to human dignity is central is reflected in environmental law; climate justice expands the tenet by outlining the unequal effects of climate degradation. Climate change is an expression of an inherent asymmetry: the perpetrators and the susceptible are always located across different socioeconomic levels.

Environmental law may be viewed as a social creation that, in response to social needs, intervenes in natural processes deemed harmful to human coexistence (Motupalli, 2018). Climate justice can be either a form of justice (the approach of governance as justice) or a question of justice arising from slavery, colonialism, or unacknowledged Indigenous practices (Kulovesi et al., 2019).

The concepts of distributional justice (equal access to a clean environment),

recognitional justice (understanding the cultural facets of the environment), and procedural justice (involving all stakeholders in the decision-making process) form the basis of justice in environmental governance. The issue of justice extends to the interaction between power and legitimacy. In cases of power imbalances, basic norms are frequently ignored even when formally observed.

2.1. Definitions and Scope

Environmental law describes the legal tools, ideas, institutions, and processes that regulate the relationships between society and the environment (Yoon Kang, 2019). Bringing justice, here interpreted broadly as fairness (Villavicencio Calzadilla, 2017), the notion of environmental justice highlights the entitlement of all individuals to a clean and healthy environment, especially for vulnerable individuals and populations. Hampering such entitlement is a crime towards climate, social, indigenous and gender justice, among other human rights.

Climate justice also implies the use of justice (in this context, climate fairness) in the allocation of climate effects and action. It therefore not only interacts with content and processes but also with identification and involvement in the global arena, and is cultivated by international discourses that bind the international community at the legal scale. These considerations, although increasingly perceived as falling beyond the legal system, are the focus of international environmental and climate law, in part because the environmental crisis overshadows the human and planetary levels and carries legal implications.

The transformation of natural capital into human capital and the subsequent marginalisation of future generations are inevitable aspects of the climate crisis. The meaning of justice, which is the just distribution of burdens and benefits across generations, is waning in comparison to climate justice. Planet-scale justice has been built in ways that vary in the extent to which it protects human rights (e.g., rights to development, equity, and the future) through a variety of combinations across all spheres of life.

The idea was commonly interpreted as caring only about people who are already alive, even as poverty, inequality, disenfranchisement, and environmental destruction led to the creation of climate justice as a separate legal directive. The idea that future generations would have their rights as well as those of the living emerged many years later. Although there have been minor improvements over the course of the late twentieth century, the problems of planetary-scale law, such as climate justice, have shown limited advances in the generalisation of

existing national legal systems; however, they are also necessary to govern the human subjects, involve the parties, and determine the oppositions.

2.2. Justice in the Environmental Governance.

The first commitment to the integrated management of the environment was made during the 1992 Earth Summit, e.g., the Rio Declaration on Environment and Development and Agenda 21. It also brought about the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change (UNFCCC). The latter, which is primarily aimed at stabilising the level of greenhouse gas concentrations in the atmosphere at a level that will not allow any further dangerous anthropogenic interference with the climate system, comprises regular Conferences of the Parties (COPs) that receive extensive media coverage and draw the attention of civil society.

The World Summit on Sustainable Development, held in Johannesburg, South Africa, between 26 August and 4 September 2002, reiterated the necessity of considering the interdependent and reciprocal nature of the effects of social, economic, and environmental factors in sustainable development activities. In 2015, the connection between sustainable development and climate change was included in the 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals. The Paris Agreement adoption of COP 21 further cemented the fact that the topic of climate and the sustainable development agenda in the world had become intertwined, where climate was now an important factor to be considered in all the present and future international negotiations, be it development, environment, trade, or human health (Villavicencio Calzadilla, 2017).

Table 1. Legal pathways to climate justice and global sustainability

Dimension	**Key legal tools/arenas**	**Justice focus**	**Example issues/references**
International environmental law	Stockholm, Rio, UNFCCC, Paris, MEAs, UNEP	Distributional & procedural	CBDR, participation in COPs

Dimension	Key legal tools/arenas	Justice focus	Example issues/references
Human rights law	Right to a healthy environment, clean air, and courts	Recognitional & substantive	Indigenous, vulnerable communities
Climate finance	Green funds, $100bn pledge, national frameworks	Distributional & accountability	Fair allocation, transparency
National regulation	Emission limits, renewables, and just transition laws	Distributional & labour justice	Workers' security, energy access
Accountability & litigation	Climate cases, loss & damage, corporate suits	Procedural & corrective	Fossil fuel phaseout, deforestation
Science–law interface	IPCC, MRV, evidence in courts	Epistemic & intergenerational	Precaution, adaptive governance

3. International Law Instruments and Frameworks.

The initial international efforts in environmental protection began with the Coordinating Council of the International Organisation of Motor Vehicle Manufacturers (OICA, n.d.) and the United Nations Conference on Human Environment in 1961 and 1972, respectively. Environmental deterioration proceeded ahead of

collaboration due to rapid industrialisation, urbanisation, population growth, and consumption. A global legal structure never came into existence, even though certain areas had legal standards and regulations established by some organisations. A resolution of the United Nations General Assembly requesting the proclamation of a comprehensive convention on the environment was adopted on 23 December 1989. Domestically, there was fragmentation and limited implementation, which weakened efforts to address global warming, biodiversity loss, waste management, and land use. The problem of weak enforcement and a lack of political pressure reduced the likelihood of securing independent multilateral environmental agreements. Historical responsibility is placed mainly on industrialised countries at both the international and national levels, while, at the same time, the money available to deal with climate change is not declining in developing countries but growing. There is growing pressure for a sustainable development strategy.

International environmental law has been shaped by several international conventions since the adoption of the 1972 Stockholm Declaration and Action Plan. The general structure of the international environmental law includes five elements: (1) environment; (2) international cooperation; (3) principles; (4) specific, ad hoc conventions; and (5) the United Nations Environment Programme (UNEP) (P. (Lisa) Lukose, 2017) (Bardos, 1992; Muñoz, 1991) (Villavicencio Calzadilla, 2017) (Lukose, 2017). Based on an international legal approach, an interim solution is suggested in the form of an ad hoc climate convention that will be adopted until a full adoption of an integrated convention that governs uniform environmental behaviour. The declaration of the 1972 Stockholm Conference is a succinct articulation of national-level international commitment to environmental control. It was the same concept of national sovereignty over environmental issues that the Rio Declaration reflected. Even internationally, an international cooperative process towards certain environmental normalisation is still promoted.

3.1. Multilateral Environmental Agreements.

Multilateral Environmental Agreements (MEAs) govern interactions between States on a range of environmental issues, most of which are related to climate change, and all of which indirectly influence the realisation of the global sustainable development goals. What is even more the case is that some of these agreements are highly interrelated, as the adoption of one MEA has fuelled a global debate on climate change. The popularisation of the climate agenda has catalysed others.

Nevertheless, these arrangements have been confined to taking precautionary measures, without going into details as far as the liability is concerned.

Climate change and environmental degradation have been considered within diverse socio-ecological interpretative systems. However, the MEAs have been used to address climate-related environmental effects without considering the opposing socio-ecological factors. There are exemplary interconnections between the agreement on pollution (including air and water) and the bargain on the management of global commons. However, these instruments have solved climatic problems in the particular areas of their thematic focus, measurement and reporting systems, and enforcement. They have failed to offer a comprehensive framework for addressing the complexity of the climate crisis because the respective socio-ecological regimes under the MEAs are disconnected. Moreover, they have mostly been feeble in offering the leading players (industrialised nations and large emitters) appropriate incentives or punishments to encourage an alternative pathway of mitigation activities at the global scale (Ruhl, 2010).

3.2. Environmental Protection and Human Rights.

The relationship between the environment and human rights is becoming more established. Environmental abuse often infringes human rights and, at times, amounts to a direct violation. The international environmental law and international human rights law are different yet complementary legal regimes. The first one focuses on environmental protection and minimising environmental degradation, whereas the second focuses on empowering individuals and communities. There are three different dimensions that the intersection takes place, namely, the human right to a safe, clean, healthy, and sustainable environment; the understanding of a clean, safe, healthy, and sustainable environment as a precondition to fulfill other human rights; and the human rights of the people and communities who suffer adverse effects due to environmental degradation (Lewis, 2012).

There is also a correlation between human rights and the environment, which is reflected in a wide variety of national provisions. An in-depth examination of state constitutions by the United Nations Environmental Programme identified more than 90 nations that have enshrined some variant of a right to a healthy environment, clean air, or safe water. Many national courts are also becoming increasingly

experimental with a wide range of human rights and environmental issues, and a noticeable and ongoing trend has been the progressive judicial application of human rights (K Aery, 2016).

3.3. Financial Responsibility and Climate.

Climate finance is a priority in addressing climate change through legal tools and policy frameworks. Climate finance refers to the financial resources mobilised by governments and non-governmental organisations to promote mitigation or adaptation measures that minimise greenhouse gas emissions or strengthen resilience to the effects of climate change (J. Richardson, 2009). Developing countries will have to ensure that their global financial flows increase from USD 300 billion in 2015 to USD 4.5 trillion in 2030. In 2015, developed countries promised to allocate USD 100 billion annually by 2020 to help developing countries cut greenhouse gas emissions and adapt to changing climate conditions. Climate finance has numerous legitimate purposes, such as supporting the development of green technologies, low-carbon and climate-resilient development, eliminating fossil fuel subsidies, and ensuring fair transitions for vulnerable populations (Villavicencio Calzadilla, 2017).

The discourse of climate governance worldwide has centred on responsibility and accountability in finance (H. Cole, 2015). The legislative and regulatory framework for allocating and regulating climate finance at the national level has, however, received little attention. There is a need for governance structures and eligibility requirements to govern climate finance. Accountability frameworks must establish actors responsible for climate finance, disclose the amount of climate finance provided to beneficiaries, and reveal whether the beneficiaries received the intended support.

4. National Policy Mechanisms and Legal Instruments.

Over the last several decades, every nation across the globe has implemented laws, regulations, and policies to regulate the emission of greenhouse gases (GHG) and to accelerate the transition to renewable energy and climate change adaptation (Donlan, 2019). Control of emissions at the national level, encouragement of energy-related shifts toward renewable energy, recognition of environmental rights, and assistance during transitions to eliminate labour exploitation are the main avenues for combating climate change through legal engineering. The efficacy, strictness, and market responsiveness of the emission control measures, as well as the specification of the technologies supported, the facilitating structures, and the alignment with just transition goals, significantly influence the effectiveness, acceptability, and fairness of GHG reduction measures.

Simultaneously, access to environmental rights and grievance systems determines the functionality of the corresponding authorities and expertise, and the orientation of supplementary remedial objectives and emergent issues within the wider framework of the authorisation of non-institutionalised public demands and emergent issues. Lastly, overall specification of worker safeguarding, retraining, and minimal social security along decarbonization roadways suffices labour safeguard tactics to emergent conditions, facilitates the attainment of society-wide safeguarding ambitions, and fosters consensus on creating disruption-mitigating propositions.

4.1. Emission and Renewable Transition Regulation.

Climate change is a worldwide crisis that necessitates drastic, extensive, and unprecedented transformation on all social fronts. The legal means and mechanisms for transitioning to renewable energy systems can help countries accelerate reductions in greenhouse gas (GHG) emissions and achieve their Nationally Determined Contributions under the Paris Agreement. Cumulative GHG emissions can be reduced by national legal mechanisms that switch from fossil fuels to renewable energy, with a focus on the transport and energy industries (J. Doorey, 2016). Policies that should control GHG emissions can be flexible, efficient, non-distortive, and non-climate-based. These kinds of policies address already established behavioural distortions and enhance the use of energy and assets, encouraging adaptation that benefits the economy and welfare. Additionally, legal tools that support the transition toward low-emission transport and energy systems have significant co-benefits on air quality, human health, and sustainable development. These advantages are especially valuable for vulnerable groups, which must cope with several interconnected stressors.

The strictness and breadth of regulations to ease the transition to low emissions vary widely. There is policy uncertainty across the board that inhibits economies at any given level, but policy-stringency positions are correlated, i.e. the economic ones tend to adopt moderately stringent measures. There are likely welfare cuts under extreme stringency, meaning that overambitious policies would be costly and counterproductive to achieving low-emission transitions.

The preliminary policy decisions, which allow further tightening, provide an opportunity to gather more information on costs and other policy actions and technologies. The fact that early leaders in a low-emission transition are limited by trade-offs beyond their direct influence and are exposed to increased climate stresses. The abilities of countries to redress the climate challenges they

experience can be further improved by considering other local and global stressors, in addition to international cooperation.

4.2. Environmental Rights and Remedy Access.

The effectiveness and generation of climate justice and environmental law are addressed through the relationship between environmental rights and access to remedy, whether in judicial or administrative procedures. The legal access is explored in the context of climate justice, as climate change is defined as the allocation of rights and obligations over climate resources. Remedy access is understood as either judicial/administrative access that must pass two pre-preliminaries, namely, standing and timeliness. Whereas, in theory, everyone can become an initiator of action, jurisdiction can be limited to pre-determined classes. The calculations of standing suggest few avenues for citizens' action. Access terms then define remediation responses, such as adherence to stringent schedules for processing requests and the availability of procedural legal advisory services.

4.3. Just Transitions and Labour Issues.

The termination of a scientific breakthrough on climate change during the last two and a half decades supports the urgency of identifying climate change as a problem of global governance (J. Doorey, 2016). The Earth's systems are under the influence of climate change, whose consequences may be disastrous for both ecosystems and humanity. It poses a threat to the atmosphere, ecosystems, and communities, and endangers the future of the economy, society, and the world at large. Climate change will have tremendous implications for the labour market worldwide, though the role of labour law scholars in the discussion is minimal. The myriad consequences of climate change for labour markets, employers, and workers are poorly suited to management using the concepts, categories, and models of labour law. Environmental law, labour law, and environmental justice scholars could be united by a legal field structured around the idea of a just transition to a lower-carbon economy.

The new model of just transition operates at the global, national, and local levels, drawing on practical social processes and supported by the work of the International Labour Organisation (ILO), trade unions, governments, industries, and communities. The principle of just transition holds that the burdens and gains of sustainability transitions are to be widely shared across society. Efforts are being made to move the just transition approach into policy, but it has yet to become a realised norm.

5. Accountability, Compliance and Enforcement.

Within a global case to extend the current climate programs, the accountability and compliance gap operating at the global level to stop deforestation and the end of fossil fuel reliance may be resolved by monitoring activity data, administrations' reports on emissions, and news concerning national efforts proceeding towards International Energy Agency (IEA) fossil-electric-phase-out objectives. The coordination process may help align the national sectoral objective provision with multilateral, nascent sanctions, using networks such as the Climate Accountability Initiative and the Accountability Initiative on Fossil Fuels. In short, adequate information is available to help individual, national, and collective actors to support the legally justified commitments under the guidance of the Paris Agreement. A more comprehensive legal framework further enhances adherence among entities with a lax commitment, as the form of pressure to act is identified through the lens of mitigating co-benefits (Villavicencio Calzadilla, 2017). The required follow-up commitment increases transparency and clarifies responsibilities through calculations and real-time evaluation, as embraced by various regulations worldwide.

Judicialization of climate transparency and accountability is still growing, with courts becoming venues where states, companies, and energy producers can be held accountable for perceived non-use, or even obstructive use, of climate knowledge crucial to achieving climate goals. Litigants are increasingly resorting to compliance with domestic and international climate commitments, non-retrogression commitments, environmental impact reviews, and human-rights lawsuits related to the climate system. Such precedents are already provided by courts and human-rights institutions in favour of the provision of climate knowledge as part of climate action, which must be legally enforced in subsequent attributions of the private parties' further activities (Donlan, 2019).

5.1. Obedience Problems to World Deforestation and Fossil Fuel Reliance.

The issues of global deforestation and fossil fuel reliance pose significant compliance challenges with dismal consequences for public health and the planet's climate. The increasing amount of carbon dioxide in the atmosphere threatens the nutritional security of the whole planet, especially in tropical and subtropical areas where over 50 per cent of the world's population lives, leading to even more acute risks of vitamin, mineral and macronutrient deficiencies. The use of fossil fuels also contributes to changes in climate patterns through emissions that alter vegetation, undermining food production systems, in addition to

irregular rainfall that makes harvests a mystery. These effects have led to lawsuits seeking to hold offenders responsible for activities that are causing climate-related environmental changes (Donlan, 2019).

With the widening of the duty of care to activities with climatic impacts, governance reforms have been witnessed across much of the world, often legislatively established, to ensure adherence to their duty to avoid taking environmentally damaging actions. Juridicalization of climate responsibility has emerged as a popular and active field of law academics and a booming litigation industry, including lawsuits against state and corporate actors. Civil-society-and-Indigenous-People systems can easily initiate climate-accountability litigation. Systems in several jurisdictions can initiate major, comparatively low-cost climate-accountability actions and complement international actions to address compliance gaps in jurisdictions with no civil-society suit access. Achieving compliance with legal requirements regarding global deforestation and reliance on fossil fuels is deemed key to safeguarding essential environmental and human rights. However, the success of widespread governance reforms and legal interventions is hampered by various obstacles to compliance, including limited availability of resources, information, remedies, and operational means (V. Henn, 2021).

5.2. Climate Accountability Judicialization.

Litigation against climate change is vibrant in the publicity arena. Numerous lawsuits have been brought against governments and corporations worldwide in the past two decades to hold them responsible for global warming. These legal cases argue that greenhouse gas emissions are not aligned with international and national laws, constitutional provisions, and other interests of the people within the concerned jurisdiction (Onyeabor et al., 2016). Courts have been established to hear claims brought by individual litigants about the effects of climate change on their town or family. In Pakistan, floods, estimated to occur only once every 100 years, have hit the nation three times since 2010. The government was also forced to remit funds to residents who had requested it to pay the damages, and part of the money was consequently stated to have been expended on a government-oriented jail. The government was subsequently taken back to court to answer for the money (Ganguly et al., 2018). These advancements suggest that the courts are struggling to determine when climate change breaches the interests of the people or damages persons, even in terms of compensation for flood damage. Plaintiffs are also seeking legal

guarantees through the courtrooms to avert disaster.

According to Ganguly, Puliyel and Raghavan, climatic litigation arises when climatic events affect the social and economic aspects of development. Climate change appears to have legal consequences at international, national, local, and transnational levels, as rising temperatures increasingly cause serious legal problems and lawsuits. Climate litigation is gaining support across India, Brazil, Kenya, Colombia, Mexico, and numerous other nations; each of the listed countries has a dedicated court for climate action or boasts well-qualified judges to hear climate cases. However, it is not only the state but also transnational companies that can be held responsible in climate litigation, so they should be regulated.

6. Case Studies: Climate Justice in Practice.

In his paper, Climate Change Adaptation and Vulnerability Reduction, Villavicencio Calzadilla examines the problem of climate justice issues being tackled at the global and regional governance levels through law and policy, using three case studies. The former consists of fair funding to adapt vulnerable countries in high-vulnerability regions, namely the Caribbean, the Pacific Islands, and sub-Saharan Africa. Several regional and multilateral agencies have developed financing schemes to meet these demands. However, the initial idea of a fair distribution of funds has been stuck, and the existing distribution patterns have not been based on climate change susceptibility. Moreover, budgetary constraints have led certain institutions to prioritise financing that, albeit indirectly, conflicts with the adaptation requirements of the most susceptible areas. Villavicencio Calzadilla says that allocation mechanisms should not be opaque, discriminatory, or inconsistent, and should also not be influenced by donors who may demand certain recipient countries.

The second case study focuses on how the socioeconomic and cultural rights of Indigenous Peoples are recognised and protected in national and international constitutional and legal frameworks when governments transfer territorial rights to third parties that restrict, undermine, or deprive those Peoples and communities of their rights, which are significant aspects of actual climate justice. Certain states have ratified international treaties and agreements that acknowledge these rights, and mechanisms and procedures to ensure the free, prior, and informed consent have been put in place for the possible co-management of the natural-historical heritages of Indigenous Peoples on their territories. These can ameliorate the

condition of certain Peoples even in non-jurisdictional areas. Within the framework of a new international arrangement yet to be settled, different models of agreements are under consideration to further promote climate justice in Latin America.

The third case study examines urban sustainability and environmental inequality in both developing and developed countries. These are problems that lie at the crossroads of reproductive and environmental justice and are directly connected not only to the fossil-fuel-driven development paradigm of modern capitalism but also to climate change. Villavicencio Calzadilla reviews particular proposals, such as the Tunza Programme launched by the United Nations Environment Programme in 2002 and the Urban Resilience strategy implemented as part of the Climate Action Programme, that have been promoted in urban areas worldwide to encourage the idea of civil rights in environmental planning. Villavicencio Calzadilla (2017) evaluates the efficacy of these measures in reducing emissions and advancing climate justice. He asks climate change activists to take note of urban sustainability and environmental inequality as key points for engagement.

Table 2. Illustrative climate justice case studies and themes

Theme/case area	**Region/actors**	**Main justice concern**	**Key lesson for law and policy**
Adaptation finance in vulnerable areas	Caribbean, Pacific, sub-Saharan	Fair allocation, transparency	Criteria-based, non-opaque funding
Indigenous land and forests	Amazonian Indigenous lands	Land rights, FPIC, biodiversity	Secure tenure, self-governance
Urban environmental inequality	Mexican and global cities	Environmental discrimination, services	Integrate equity in urban planning

6.1. Just Financing Adaptation in the Vulnerable Areas.

To ensure climate change adaptation is effective in areas at risk, it is important to pay attention to how adaptation financing is distributed, to the validity of such decision-making, and to the success of the investments introduced. It has been determined that the distribution of special funding to certain countries or regions is a serious problem in resource-abundant areas, where national governments can use financial transfers instead of addressing climate issues, thereby affecting climate justice (Byskov et al., 2021). Climate justice is also compromised when funding is not provided to poor regions in those countries that bear the dire impacts of climate change. However, one can ensure that financing delivered through the Adaptation Fund is distributed fairly (Villavicencio Calzadilla, 2017).

When the interests of vulnerable countries and populations are taken into consideration, the decision-making process surrounding climate adaptation financing can be equitable and aligned with the concept of legitimacy. Decisions on matters of adaptation that are legitimate must promote fair investment in future adaptation resources that can make vulnerable populations more resilient. The strategies of adaptation investment can thus be resilient to non-adaptation financial factors such as macroeconomic or governance shocks. Climate justice is tied to the systematic design of the project portfolio and investment strategy rather than the particular distribution of financing on a global scale.

6.2. Native Americans, Land Rights, and Preservation.

Although the rights of Indigenous Peoples are frequently neglected when discussing climate justice, they play a pivotal role in ensuring biodiversity conservation and reducing greenhouse gas emissions through forests. The two are closely tied and cannot be separated, each relying on the acknowledgement of Indigenous land tenure and encouragement of self-driven control over such land (S. Walker & Paige, 2024). They are also much more important to global efforts to prevent biodiversity loss, since the median deforestation rates in Indigenous lands across the Amazon are significantly lower than in unprotected areas. The increasing appreciation of the importance of Indigenous Peoples as effective custodians of large ecosystems is being realised, particularly in areas where governing systems embrace the principles of free, prior and informed consent (Dannenmaier, 2008). These structures encourage collective leadership and the dignity of Indigenous worldviews that do not always align with mainstream ideas about resource extraction.

6.3. City Sustainability and Environmental Disparity.

The correlation of urban development, sustainability, and equity is close in both developed and developing countries. Worsening environmental conditions impact the urban environment, and most disadvantaged population groups tend to be the most susceptible. Modern city dwellers are obliged to take into account social, economic, and environmental sustainability in urban planning; this frequently involves conflicting ethical or practical principles. Nevertheless, global climate change is the priority. The need for professional assessment and adjudication arises in both developed and developing countries, in light of constitutional, republican, or classical liberal approaches. The political elite and the influential professional classes thus play a significant role in determining the organisation of the community; however, governance remains secondary to professional mastery. Along with personal and corporate accountability, the order of cities is final to urban sustainability, and the newly professionalised classes play a crucial part in the restructuring of urbanism to human and non-human advantage in the disciplines and in harmony with the metropolitan demands. The question of how human, urban, metropolitan, and community order subsequently develop, regulate, orient, and act is directly associated with synonymy, continuity, and simultaneity (Uden, 2019; Suhey Tristán Rodríguez, 2019; Carlson, 2018).

7. Scientific Advice and Evidence in Law.

Strategy has legal avenues that rely on sound scientific data and trustworthy evaluations. Science is frequently integrated into law, appearing in forms that can be enforced and that require certain practices, limit certain emissions, or set standards. Many laws incorporate the precautionary principle or adaptive management, which require adequate perception of uncertainty and risk schedules.

The implementation of laws or regulations is done through transparency, trust, and public support. To evaluate the effectiveness of a policy, citizens need reliable information about environmental conditions and how they change over time. The relationship between science and legal pathways is managed by monitoring, reporting and verification provisions once legislation has been adopted. Trust can be improved through regimes that enforce binding scientific evaluations, popular involvement in data gathering and an open data-access strategy. Uncertainty cannot be totally eradicated, yet with clear procedures, the few remaining data can be taken into consideration (Engel & Overpeck, 2013).

7.1. Introduction of Scientific Evaluations into the Law.

It will require establishing a robust and enforceable international climate change policy by translating climate change appraisals conducted by the Intergovernmental Panel on Climate Change and other legitimate bodies into adaptive, precautionary, and scientifically sound legal statutes (Ruhl, 2010). Scientific evidence to regulations, statutes, and plans will entail the systematic and clear consideration of the results of climate science reports in the legislative process, where the transfer of knowledge will be enabled by unbiased professionals (J. Adams-Schoen et al., 2015).

7.2. Information, Openness, and Supervising Systems.

Monitoring systems and data transparency also support fair climate change adaptation and good accountability, and are useful for effective local governance (Ruhl, 2010). Important matters related to adaptation issues include who will finance community adaptation practices, such as how the government will fund community efforts to erect seawalls, provide water supplies in drought-prone regions, and create jobs during redevelopment planning in various regions. The thoroughness with which heat-wave severity, air-quality deterioration, food, water, and energy access, post-extreme climate recovery, and similar issues are addressed can help avoid unfair outcomes. Although the climate is getting worse, it is still possible to make adaptation efforts overly preoccupied with a narrow set of physical changes and place-based conditions. The use of powerful disaster-policy programs and the introduction of multi-dimensional environmental justice approaches will help reduce harmful impacts on deprived groups, especially among the native population.

8. The Roads to Global Sustainability: Theoretical and Practical Future.

The sustainable development goals offer the most widely adopted concept of sustainable development, and global environmental law serves as a significant legal avenue for their achievement (Kulovesi et al., 2019). The objectives of global environmental law and other intergovernmental and expert agreements should be included in strategies, and their suitability for promoting particular objectives and targets should be evaluated. It is possible to identify gaps in which the area of focus under sustainable development remains small, conflicting or complementary relations are emphasised, and additional synergies are encouraged. The key points crucial to further analysis are the shared interests of humankind, the socio-economic relations between the

environment and development, environmental degradation and pollution, and climate-responsible behaviour. They should be quantifiable goals that guide and assess progress, and they should be incorporated into treaties, instruments, structures, schemes, plans, and tools aligned with national, regional, and industry strategies.

Simultaneously with the UN-based initiatives, there are other environmental protection treaties and standards that offer additional general tools to realise climate justice and various ways to sustainability. The ones that have been given a considerable focus are the UN Framework Convention on Climate Change, the Convention on Biological Diversity, the Convention to Combat Desertification, the Marseille Manifesto regarding ocean, Planetary Boundaries framework, European Union Biodiversity Strategy for 2030, Leaders Pledge for Nature, the New York Declaration on Forests, the Breakthrough Agenda, and the 2030 Water Resources Group. Various models continue to emerge in the legal arena, and there are multiple avenues to develop more environmental law that adopts a more comprehensive, holistic approach to sustainability.

8.1. Consistency between the Environmental Law and the Sustainable Development Goals.

The Sustainable Development Goals (SDGs), currently adopted by the United Nations, encompass social, ecological, and economic aspects of human interactions and outline directions for social equity, poverty reduction, ecosystem preservation, climate change mitigation, and biodiversity protection. The realisation of these radical goals is assured only by concerted effort. Nevertheless, the international community has often been aware of the inadequacy of progress in creating the proper environmental control system that could ensure global consensus-based action. Institutional development of environmental law goes hand in hand with environmental degradation. The substantive environmental goals tend to overlap with environmental governance devices, such as climate change, melting polar ice, forest destruction, and pollution. However, these goals are not entrenched in a comprehensive legal system that can guarantee coherence, effectiveness, accountability and equity. Environmental law has been justifiably criticised for its normative hollowing-out, whereby existing regulatory tools are not ambitious or stringent enough to achieve a sustainable future.

The law governing the environment must follow the principles of good governance, equity, legitimacy, and justice. It should be used to maximise its protective and restorative role for past, present, and future generations. The

Good Governance Principles: The Future of the Climate Agreement suggests combining these aspects into a legally binding tool within the United Nations Framework Convention on Climate Change. However, deforestation in the global South, which has been increasing, fossil fuel addiction, escalating emissions, and the absence of responsibility on the part of leading homeporting nations demonstrate the necessity of incorporating those principles into the very fabric of climate Change law. FutureSustain is aimed at building a more robust and unified normative framework of Environmental law and climate change justice - forging the future of Environmental law, the law of the environment, and its interrelated constitutive, substantive and remedial components.

8.2. New Legal Tools and Forms of Governance.

Global sustainability will only be achieved through the enhancement of existing laws and the exploration of new legal avenues and forms of governance. Various tools can be applied to the climate justice concept, including environmental constitutionalism, hybrid treaty design, and special-purpose trust funds, which allow high-scale, long-term, multiscale and inclusive responses. However, their relevance to developing and underdeveloped nations remains questionable, as the grandiose structures that explain interconnections between the local, global, temporal, and environmental spheres speak louder. New forms of governance, economics, and financial models present another array of adaptations in national legal instruments. The growing centrality of scientific knowledge in legal channels requires new regulations of knowledge evaluation, assimilation, distribution, and traceability, as well as leadership, high abilities, and investment (Villavicencio Calzadilla, 2017).

9. Conclusion

The issue of sustainable development is universal. The research, initially considered retrospective and bureaucratic, has contributed to policy practice and innovation in three areas of environmental law, policy, and climate. To begin with, the fairness of both wealthy and impoverished states has been increasing as the protection of fundamental rights and environmental systems continues to dominate climate justice. A second redefinition of prospective over retrospective equity expands the concept of future cohorts and demands forward-thinking in development. Last but not least, the shift to a vulnerability-focused equitable distribution of flows, developing resilience in the spectrum of integrated

environmental-social-political, opens new policy options that are no longer based on the concept of one-size-fits-all (L. Fischman, 2019; Ruhl, 2010).

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