

International Law and Climate Change: Strengthening Global Governance, Equity, and Compliance for a Sustainable Future

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ABSTRACT

Climate change constitutes one of humanity's most pressing global challenges, with far-reaching implications for economies, environments, and communities worldwide. Climate change will, therefore, require an efficient international legal mechanism in terms of eliciting international coordination and accountability, as a transboundary problem. This article looks at the role played by international conventions, including the Paris Agreement and the UNFCCC, in controlling climate change and success and failure, specifically in compliance and access in developing nations. In addition, barriers to effective compliance, including intervention gaps, financial restrictions, and political will specifically in important institutions and countries, are determined and examined. Comparatively, through academic studies, case studies, and international conventions, in this work, areas for improvement in international legislative frameworks, including increased funding, technological advancement, and creation of flexible legal frameworks for dealing with emerging environment-related concerns, are prioritized.

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1. INTRODUCTION

Modern life has been significantly affected by climate change which is one of the most complex issues to tackle as of today. It has contributed to the rise in global temperatures, intense natural catastrophes, and the movement of ecosystems. It has posed a serious threat to life on earth. If the world continues to ignore the situation over time, then it would reach a point beyond which it will be impossible to reverse the effects of climate change. Almost all experts which include the Intergovernmental Panel on Climate Change (IPCC) are concerned and

with the emerging indications this can be termed as a crisis. These changes highlight the dangerous nature of the situation. A common political vision must be followed that seeks to resolve the crisis and accept the new realities [1], [2].

This global effort's legal backbone is international legislation that helps to organize activities in different jurisdictions. Conventions like the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement have laid the groundwork for joint constructive endeavors. These accords

seek effective collaboration between countries to reduce emissions and provide mechanisms for technology transfer and finance from developed to developing countries [3], [4]. Nevertheless, the adoption of these frameworks has had limited success due to enforcement challenges, and the dichotomy between economic growth and environmental sustainability.

The principle of equity is one of the most significant dimensions of governance in relation to climate change. Developing nations, overall, produce fewer greenhouse gases and most of them suffer its consequences. Coastal flooding, encroaching deserts, and extreme weather events consistently afflict nations least capable of dealing with them through financial and infrastructure weaknesses. For example, Sierra Leone and Bangladesh are some of the most vulnerable countries with both low emissions and low adaptability resources. This glaring dichotomy helps point out the exigency for international law to adopt equity and justice in its outlook [5], [6].

The political will and coordination of principal actors are also important for effectiveness in the international regime for climate change. All developed countries with greatest technological and financial capacities must implement actions under the Paris Agreement. At the same time emerging countries like India and China which are growing industrially should also try to achieve their development targets in a sustainable [1], [7].

The aim is to undertake a broad-scale study of international law relevant to international environmental law concerning climate change and to analyze its scope and coverage and its constraints. It identifies avenues through which legislation can be strengthened and avenues for enhanced cooperation in the world. In an attempt to respond to the question of how international law can effectively address the issue of governance in relation to climate, case studies, academic writings, and international conventions form its basis.

2. LITERATURE REVIEW

There are a number of studies that describe how international law aids in combating climate change and its importance in promoting global cooperation. This section analyzes important legal instruments, including problems of the developing world and multi-layered climate governance by non-state actors.

2.1 *Key International Legal Frameworks*

The processes to design and ratify treaties, pacts and protocols on climate issues set the legal mechanisms for the world to act together. The United Nations Framework Convention on Climate Change (UNFCCC), which was established in 1992, is the first treaty which has provided a basis for international climate change negotiations. It adopted the principle of common but differentiated responsibilities (CBDR) which acknowledges that all countries of the world must participate in the fight against climate change, however, it also places greater responsibility on developed nations due to their previous emission of greenhouse gases [3].

In the aftermath of the UNFCCC, the Kyoto Protocol of 1997 and the Paris Agreement of 2015 set more detailed obligations. While The Kyoto Protocol obligated developed nations to have cutting emission target, the role taken over by the Paris Agreement in a larger with an encouragement for all nations to nationally determined contributions (NDSs) are a significant one.

In spite of NDCs not being compulsory and having a complex mechanism for compliance, academicians like [8], [9] conclude that they have played a role in enhancing international cooperation.

2.2 *Challenges Faced by Developing Nations*

International environmental laws at times have special challenges in imposing them over developing nations. International commitments are even harder to fulfil under constraints of

economic resources, low levels of institutional capacity, and sensitivity to impacts of climate change [6], [10]. Many emerging, particularly poorer countries, especially in Africa, such as Sierra Leone, do not have the wherewithal for the shift to renewable energy, nor to implement grand plans for climate change adaptation; The principle of CBDR needs to be better implemented. Developed countries have made guarantees in the past for financial support through the Green Climate Fund, but there is a slow and inadequate rate of disbursement [1]. According to [11], international law must compensate for this imbalance through the building of sanctions for the developed economies that do not transfer financing and technology.

2.3 *The Role of Non-State Actors*

Other non-state actors at the international level whether commercial actors, civil society organizations or even transnational networks also represent critical elements of the architecture of climate governance. These actors engage with state action and enhance it, filling gaps in information flows through technological change, advocacy and field implementation [12], [13].

The private sector has a vital role to play in addressing climate change, with its tremendous ability to shift how business is conducted. For instance, investment in renewable energy technologies emissions reduction alongside economic growth [14]. On the other hand, NGOs and advocacy groups often monitor the actions of the governments and the public regarding climate issues [15].

One of the suggestions made is to strengthen the international legal frameworks in a way that non-state actors could be incorporated into formal decision-making processes. This integration is likely to improve climate governance because these stakeholders can bring resources, skills, and networks into the fold [16].

2.4 *Gaps in the Literature*

Although the reviewed literature adds important contributions, much more needs to be done. For example, quite a bit remains to be done around the utilization of modern technologies like artificial intelligence and blockchain to improve the operationalization of international climate change treaties. In the same vein, the regional legal frameworks for the European Union and the African Union have not been studied thoroughly [2].

3. RESEARCH METHODS

This paper adopts a qualitative research strategy in order to examine how international law is employed to tackle the challenges of climate change. It involves reviewing both primary and secondary documents. A detailed investigation of the synergy between countries, the legal tools at their disposal, and climate policy writ large is logistically difficult and time-consuming to pursue.

The research relied heavily on legal materials available in the form of international documents such as the UNFCCC, the Kyoto Protocol, or the Paris Accord, and formed the basis of the research. The broad vision of this document is to give a comprehensive framework for climate change advocacy on a global scale. Key features, goals, and means of implementation were reviewed ... In theoretical aspects, objections and suggestions related to climate governance scholarly articles also represented an important area of study.

Here, it was shown how international climate law functions in practice through selected case studies. Nations like India, Kenya, and Sierra Leone serve as such examples with regard to the particular issues confronted by third world nations in the context of applying universal agreements. For example, the industrial growth versus climate goals conflict articulated by [5] in the India case demonstrates how tense the situation is for economic versus environmental advances in the region. In a similar vein, the horrific

consequences that climate changes such as Sierra Leone has to endure for being a nation that marginally emits pollutants, signifies the need for equity in international treaties [6].

The analysis covers the reports of other international bodies like the IPCC and the outcomes of important climate summits. These documents place the legal analysis of these issues into current context around the world. Scholars like [9], as well as, [16] focus the analysis on the enforcement gaps and the viability of compliance in relation to the growing need for international cooperation and innovations for accomplishing these objectives.

A thematic analysis was conducted, the purpose of which was to identify patterns from the datasets. Major themes included

enforcement and compliance issues, equity and justice from the developing nations perspective, and the role of technology in improving climate governance. The analysis was aimed to these themes to assess how international law can be made more responsive to deal with climate issues.

Although this approach has the identification of valuable insights, the particular limitations must be noted. She argued that the secondary data employed might potentially be weaker and incomplete since it was based on case studies. [14], [17] have proposed the use of field studies or quantitative research in order to handle such limitations effectively.

3.1 Research Flowchart

Simplified Research Flowchart



Figure 1. Simplified Research Flowchart

3.2 Research Flowchart explanation

a. Identify the Research Problem

In any study, the identification of the problem is the

most important aspect. With my research, I will look at the intersection of international law and the existing problem of climate change. As a

phenomenon, Climate Change is without a doubt one of the most difficult and important problems faced in today's world. Its influence is ubiquitous with an issue in every region, such as a rise in sea level, heightened intensity and frequency of natural disasters, and fragmentation of ecologic and human infrastructure. It is an issue with no concern for state borders, and for that reason, it requires widespread problem-solving and cooperation at an inter-national level.

The effects of climate change can be described as both beneficial and very controversial. The impact of international law is one of its pivotal themes. UNFCCC, Kyoto Protocol, and Paris Agreement mark important milestones in international collaboration and are powerful examples of how addressing climate change is highly multifaceted. These treaties established common but differentiated responsibilities policy as a key part to eradicating global warming. But unfortunately, one of the inherent flaws was the fact that these very principles were never implemented into practical use. This lack of accountability and progress is directly connected to how weak these enforcement mechanisms are and the fact that commitments made by different countries are often without binding laws.

Another essential factor of the problem is the gap created by developed and developing countries with respect to fighting climate change. Adaptation and mitigation are easier for developed countries because they have contributed historically to greenhouse gas emissions and have the relevant technology and finances. On the contrary, developing nations have least capacity to produce and most of them suffer in terms of impact for lacking infrastructure and resources.

Sierra Leone and Bangladesh countries suffer with such a problem, with sea level rise and extreme weather events having a high vulnerability for them, even with least emissions in such countries.

The problem also encompasses how non-state actors such as businesses, non-governmental organizations, or even interest groups contribute to solving the problem, especially when it is stated that the government does not have sufficient means to fulfill the obligations. These actors have increasingly become key players in climate governance, driving innovation, advocacy, and implementation. However, their work will function in a manner not part of conventional structures of international law, and for that purpose, creates integration concerns in larger structures at a global level.

For most, defining a problem is in fact, putting together such interrelated concerns in a proper form for examination in a manner that will make a difference. This is an effort to investigate the international legal instruments for combating climate change and their efficiency, non-State actors' contributions to global climate governance, and the problems developing countries encounter. In doing so, it aims to facilitate the broader discussion on how international law can be effective in this particular complicated and immediate crisis.

b. Conduct Literature Review

A literature review is usually the first step towards gathering the scope of existing knowledge, available frameworks and the gaps surrounding the research issue. This extends to a flat-out analysis of the literature that deals with case studies, reports, and treaties relevant to the function of international law in climate governance. This is a very

critical step in the process because it provides clarity on what already exists and aids in identifying other gaps in the knowledge base and areas that need more exploration in the research.

The first step of the review is the examination of the international legal frameworks that have defined global climate governance. The UNFCCC which was created in 1992 was the first event that initiated the international collaboration with the introduction of the principle "common but differentiated responsibilities" (CBDR) which posits that all states are obligated to act regarding climate change but their scope of responsibility differs. This created a loophole that permitted developed civilizations to exonerate themselves from greater responsibility as a result of their prior emissions. The Kyoto Protocol and the Paris Agreement were other initiatives that followed the UNFCCC which aimed at progress by implementing international restriction on emissions targets with wider participation through national determined contributions (NDCs). These agreements have been subject to enormous scrutiny for both advantages and disadvantages. For example, [3], [8] illustrate the importance of the Paris Agreement because of its inclusiveness, but also criticize it for being voluntary, which weakens its enforceability.

Moreover, the review of related literature has pulled insight into the particular challenges that developing countries tend to grapple with. These gap analyses indicate that such countries are frequently inadequately funded and institutionally equipped to translate international climate laws into meaningful actions. In particular, [6] looks out for barriers that impede progress for countries such as

Bangladesh and Sierra Leone, which are already susceptible to the negative consequences of climate change, but do not get adequate investment and technological assistance from developed nations. It was pointed out that the concept of global climate equity is very often neglected due to the opportunistic pace of funds dispersal. This difference highlights more why attempts must be made to monitor how aid from developed countries is utilized and the immense accountability that they have towards the more vulnerable nations [18].

The engagement of non-state actors in climate change governance is another communication gap that has been documented in literature. Activist actors such as private businesses, Non-Governmental Organizations (NGOs) and transnational actor's alliances have proven to be remarkably useful in facilitating climate interventions. In particular, [16] have pointed to the absence of state involvement in these areas and how such actors are useful for advocacy, innovation, and differing forms of implementer-oriented advocacy. For example, the private sector has been instrumental to the propagation of renewable energy sources powered technologies and NGOs have more actively performed watchdog functions on the state and created public consciousness towards climate change problems. Nevertheless, their efforts have not been recognized, implying that there is an issue that requires some form of re-engineering within the established system of international law regarding climate change.

The research gap has been identified as part of the review of the literature. Much work remains to be done regarding the study of the international climate change law

regime, particularly the lack of application of emerging technologies such as AI, or even system processes like blockchain, to climate governance. Furthermore, regional legal frameworks such as those existing in the EU or AU focus on climate change have tended to be neglected in the whole setting of international climate governance. These gaps present opportunities for further research and innovation.

The literature review maps out the research landscape by studying previous works and spotting gaps in them. It provides theoretical and empirical bases for the paper, pointing out the lack of originality needed to enhance the international climate governance.

c. Define Research Objectives

Scoping is a critical part of the process that keeps the study relevant and focused. The scope will be determined through a review of literature, and problem determined and confirmed. To that purpose, objectives try to comprehend the policing concerns and gaps in terms of international climate law and then search for a way in which these can be addressed.

The emphasis of this paper is the examination of the international legal regime for sustainability in terms of effectiveness in the environmental realm. For instance, the UNFCCC, the Kyoto Protocol, and the Paris Agreement are the main treaties on global climate change issues, but the implementation has been proven problematic more than once. This research seeks to provide a tentative answer to the question of how the international climate change regimes function in practice and evaluate the effectiveness of the enforcement, accountability, and inclusiveness mechanisms. The emphasis lies on feasibility – are these agreements capable of fulfilling the

pledges of greenhouse gas emission reductions and international collaboration?

A further aim is to understand the specific obstacles that may be presented from the perspective of developing countries in complying with international climate legislation. These countries may, notwithstanding being the most affected by the consequences of climate change, suffer from inadequate financial support, institutional capacity, and technological infrastructure that would assist them in adapting to or mitigating such effects. The paper tries to portray, through specific examples such as Sierra Leone and Bangladesh, how imbalanced international climate governance is, while giving more equitable and just alternatives.

This research also seeks to know about the contribution of non-state actors in bringing improvement in international climate governance. Nowadays, global climate action is a widely contested issue and for private corporations, NGOs, and even advocacy groups it is among the most important topics, so their input is crucial. This research aims to determine how non-state actors may be more fully incorporated into the international legal system and aid in the formulation and implementation of non-governmental initiatives to supplement those of the state. This extends to appreciating the extent to which these actors participate in the formulation of ideas, influence the enactment of policies, and promote changes at the community level.

A final objective of this study is to pinpoint opportunities in reinforcing international legal frameworks. Such opportunities consist of analyzing novel enforcement mechanisms of gap enforcement, equity promotion, and

emerging technologies in climate governance. The research seeks to formulate new means for enhancing international law so that it responds quickly, provides thorough solutions, and is generally more effective concerning the consequences of climate change and related issues.

These, with respect to the stated, are meant to help the study in overcoming the multi-dimensional issue of international climate governance sequentially. They act as a basis for describing the usefulness of existing frameworks, the problems it poses, and how these issues can be addressed in terms of combating climate change.

d. Develop Methodology

No research can function without a methodology because it provides the structure and all the tools required to fulfill the study's objectives. A qualitative design is used in the research because it best captures the subtleties of national climate change law. A qualitative design is best for use in such a study, for it entails legal documents, issues regarding equity, and multi-stakeholder governance of climate.

For inquiry it utilizes thematic analysis as its key investigation tool. With thematic analysis, one can search for theme and pattern in information drawn from a variety of sources. This technique is appropriate for studying the enforcement gaps, equity issues, and the scope of development in international climate change law. Through this analysis, the research hopes to establish the problems and gaps existing in climate legislation and formulate practical recommendations.

Both primary and secondary sources are utilized in the stage of collecting data. All conventions at an international level, including the UNFCCC, Kyoto Protocol, and Paris

Agreement, are primary sources. All such documents form the backbone of international governance in terms of climate, and objectives, frameworks, and operationalization of such documents are analyzed. Secondary sources comprise scholarly articles, case studies, and reports published by international organizations, such as the IPCC, which provide key additional information and context that broadens the analysis.

The case studies serve an important purpose in this research. This research examines Sierra Leone, Bangladesh, and India for the practical application of international climate law. Sierra Leone is a high vulnerability and low-emitting country with extreme poverty and narrow financial and technological capacities. Bangladesh reveals the vulnerability to accelerated sea level rise and extreme events. India reveals, in contrast, the challenge of reconciling environmentalist with industrialization. These case studies highlight the practical implications and real-world relevance of the research undertaken in the paper.

This section emerges insights from global documents and outputs from significant environmental conferences. These reports serve the purpose of situating the analysis in value within the contemporary world so that the study does not lose its essence. The IPCC reports as well as the conversations from the Conference of the Parties (COP) are informative as to the state and directions international climate relations governance has progressed and struggled.

The weaknesses of the methodology are clearly stated for objectivity purposes. It is true that secondary information, as indicated, may not depict the actual situation that exists, and that certain selected

case studies may not be widely applicable as presumed. But these shortcomings are countered by the combination of information from many sources in order to make the analysis more comprehensive and defensible.

The developed methodology realistically satisfies the set tasks of the study. It guarantees that the research is based on authentic information, practical scrutiny is done, and the intricacies of climate governance on the international sphere are addressed thoroughly.

e. Collect Data

Data collection is integral to the research process because it helps ensure the study is accurate and based on good and verifiable information. This research uses evidence from many sources in order to better understand the complexity of global climate governance and the difficulties that come with it.

Primary data is obtained from various international legal documents and treaties. These include the UNFCCC, Kyoto Protocol, and Paris Agreement, which serve as the foundational frameworks for global climate governance. The purpose of these treaties is to establish a legal understanding of these agreements and focus on the core principles such as common but differentiated responsibilities (CBDR). Additionally, the approach these treaties take to enforcement, compliance, and accountability is analyzed. This study also serves to delve into the identified strengths and weaknesses of these documents as well as areas for improvement.

Secondary data is obtained from peer-reviewed academic articles, policy reports, and some case studies. The scholarly literature contains essays that are very useful, especially those concerned with legal

equity debates, enforcement challenges, and the role of other non-state actors in international law. Scholars such as, [3], [6], [16] explore these challenges comprehensively.

Information from the IPCC and reports from relevant international organization coupled with climate summits like the COP meetings serve as an important source of information for feeding into the data collection process as well as serving as a Primary Information source. These documents trace the advancement of participation by countries around the world and what obstacles they are encountering trying to reach their goals within the expected timeline. Moreover, their focus is wider at how the international legal framework is being structured to meet new challenges such as migration due to climate change and new technologies.

The primary information collection strategy also includes case studies. Political realities of international climate law are examined in sample particular countries. Emphasis was placed on the Sierra Leone case as an example of a resource less relatively low emission country with high vulnerability to climate change impacts. In the case of India, tradeoff between economic growth and environmental conservation is dealt with while Sierra Leone demonstrates the consequences of sea level rise and weather changes. These case studies target the outreach of the project and demonstrate the scope of issues related to global climate governance.

The objective of this part of the project is to ensure an adequate representation of the international climate law, which is achieved by using an exhaustive, systematic, and integrative approach to data collection. The combination of

primary legal sources, secondary sources such as academic books and articles, international documents, and empirical evidence provides the basis for further analytical and interpretative work.

f. Data Analysis

Data analysis is where the information that has been collected is processed in an organized manner. For this study, thematic analysis is used as the most prolific means of examining the data. In this way, this research is able to classify and make sense of the data in a manner that reveals how international laws on climate change could aid, or falter.

This analysis is first started by going through the primary documents like the UNFCCC, the Kyoto Protocol, and the Paris Agreement extensively. It is these treaties that need to be analyzed to understand how their articles deal with the important issues of climate governance, including emission reduction targets, financial mechanisms and the equity principles. This section also incorporates and identifies the gaps for enforcement and accountability that are the most common problems for climate change agreements at the international level. Operationalization of common but differentiated responsibilities (CBDR) principle is one of the themes that is pursued to see how international law can work to see the needs of both worlds: developed and less developed.

The secondary data, which includes scholarly articles and reports, are reviewed so as to provide an analysis and grappling questions on the primary sources. For instance, [3], [16] articles might be critiquing the efficacy of international legal regimes and the difficulties faced from there. Reports from the IPCC and climate summits provide the

missing pieces of information which concern the state of global climate governance and predictions of new developments within this context.

Case studies underpin the thematic analysis. Evaluating the countries like Sierra Leone, India, and Bangladesh, it is interesting to see whether the challenges of global climate change law are to be achieved in practice. Sierra Leone's resource fragility, immensely high vulnerability, and poor development are flagging equity problems with global deals. India's developmental dilemma reflects an understanding of environmental pollution and economic growth. Whatever is left of Bangladesh's sea is already claimed by the sea and the country is suffering from higher temperatures, severe weather changes, strong altered monsoons and rising tides. All these above discussed phenomena demonstrate the need and severity of climate adaption which needs to be taken into account. These case studies assist in thinking straightforwardly and not around the bubble, which leads to reasonable conclusions.

Thematic analysis also includes the assessment of the role of international organizations, businesses, and NGOs in filling the voids in climate governance. The study considers how such actors contribute towards realization, advocacy, and innovation in terms of policy, and gauges how such negative actors counteract work conducted by States, and actions that must be taken in an effort to institution-allies such a role in international governance.

Such branches denote three categories: windows for innovation, gaps in enforcement, and concerns about equity. Enforcement gaps denote a lack of legally bounding agreements and a lack of accountability structures to nations

who sign these agreements. Equity issues center around the role that developed and developing countries play in climate change. Opportunities for innovation include new technologies and more efficient renewable energy sources as well as new climate governance systems.

The findings from this analysis provide a springboard towards what will need to be done in the next stage of the research where the conclusions and recommendations are more elaborately constructed.

g. Formulate Findings

This phase consists of merging the data analysis outcome into detailed, unique findings. The rationale for this step is to address the research queries and objectives, including the international law's contribution to climate change response efforts.

As revealed in the findings, international treaties, such as the UNFCCC and the Paris Agreement, have been instrumental in fostering international climate governance collaboration. These treaties serve as a basis for nations to negotiate and work together to achieve set targets for green-house gas emission mitigation and sustainable development. However, the study identifies weaknesses in the enforcement of these treaties. For example, the Paris Agreement's NDCs are non-binding, and as a result, many countries have not been able to fulfill their voluntary commitments. These situations illustrate the necessity of accountability and more stringent enforcement mechanisms, as [19] and others have argued.

According to the findings, developed and developing countries are not on equal footing when it comes to combatting climate change. Since developed countries have

significantly greater financial resources and have historically emitted the most, they are in a position to sustain and meet the evolving climate targets. In contrast, less developed countries like Sierra Leone and Bangladesh are unable to sustain the negative impact climate change inflicts on them due to a lack of resources and infrastructural capability. The study reveals that the developed countries have not provided the available financial and technological support needed, which makes it difficult for developing nations to adapt to the conditions inflicted by climate change. This issue makes it more difficult for the vulnerable nations to construct and implement effective changes.

Moreover, non-state actors have an increased role in the governance of climate. Advocacy groups, NGOs and Corporations are minimizing the gaps created from the insufficient state sponsored policies. For instance, private enterprises are propelling the development of renewable technologies while NGOs are furthering policies to hold governments accountable. They quickly become critical players; however, the study reveals that their contributions are not formally acknowledged and often remain unrecorded in international law. Thus, a non-state actor has an opportunity to emerge and support the climate governance frameworks on a global scale.

In the same manner, research discusses novel possibilities for innovations in climate governance. Advanced technology including renewable energy development, carbon capture and storage, and climate modeling tools have great potential to improve mitigation and adaptation strategies. Unfortunately, access is frequently unequal and developing countries do not have the

means to effectively utilize these technologies. The author reiterates the concern voiced by some scholarship, like [6], [17] on the need for international agreements that address the issues of technology transfer and building capacities in the more vulnerable parts of the world.

In a nutshell, these findings offer an assessment that reflects on both the achievements made and the gaps that persist in international climate law. While these constructs have provided instruments for international cooperation and served as a trigger for activity, these instruments need more attention to be focused on carving out equity, innovation, and enforcement mechanisms. These findings provide context for the last stage of the research, which aims to formulate policy options that bolster international climate governance.

h. Develop Recommendations

The recommendations strive to bridge gaps and overcome obstacles in the findings in an attempt to make international law a strong pillar in regulating climate change. The recommendations strive to enhance enforcement, enhance fairness, and introduce innovation in worldwide frameworks for climate change.

The first recommendation is strengthening frameworks for climate at an international level through legally binding targets and penalties for defaulters. That lack of legally binding targets and penalties for defaulters weakened frameworks such as the Paris Agreement in effectiveness terms. To correct that, future frameworks must have legally binding targets with specific accountability provisions. Defaulting nations must have real penalties, such as penalties, or loss of access to international financial channels. That will compel compliance and make all

nations contribute towards global climate objectives.

Equity must become a significant part of reform in governing climate change. Developing nations, who suffer most from consequences of climate, need increased support to adapt and mitigate such consequences. Green Climate Fund and similar financial channels must be increased and harmonized to allow timely and satisfactory disbursement of funds. Rich nations have a moral obligation to make financial commitments and prioritize poor countries' needs. Besides, international frameworks must include provisions for technology transfer and capacity development in a manner that will enable developing countries to access and utilize new tools effectively.

The role of non-state actors, such as companies, NGOs, and advocacy groups, must become institutionally integrated in international regimes for dealing with climate change. They contribute immensely towards advocacy, innovation, and use at a grassroots level. Involving them in strengthening decision processes will mobilize assets and expertise, strengthening state processes. For example, public-private partnerships can become institution led in driving renewable use and development towards a future with a future.

Global climate law must, therefore, react to new sources of innovation. Emerging technology, such as artificial intelligence, blockchain, and renewable technology, can revolutionize governance for climate change. Global agreements must, therefore, make access and fair distribution of such technology accessible, with developing nations enjoying fruits of new technology development. Incentives for development and

research in green technology must, therefore, receive high prioritization in a move to develop at a high pace.

Lastly, international law must adapt to new emerging concerns, including migration for climate and artificial intelligence and environment intersectionality. Frameworks must, therefore, have a flexible and future-sensitive character, with an ability to adapt to new peril and new opportunity. There must, therefore, be a proactive stance, with countries cooperating in anticipation and preparation for future peril and vulnerability.

The aforementioned propositions constitute a blueprint for reforming international climate law in a form that will make it effective, equitable, and attuned to new aspects of climate change. Closing gaps in compliance, strengthening equity, and assuming a leveraging role for innovation, the international community can build a system of laws that will enable fair and sustainable governance for climate change.

3.3 Findings

There were a variety of important observations regarding international law and climate change that emerged through analysis. That international frameworks have placed a basis for taking actions is a fact, but numerous obstacles have yet to become a reality regarding effectiveness and compliance at the same time, there are emerging opportunities for further development of international climate governance, and that is a positive sign.

Perhaps the most important feature of international climate law is the capacity to create avenues of cooperation and discussion among nations. Treaties such as the Paris Agreement and the UNFCCC have created structures which lean countries towards the setting of emission reduction targets, technological innovations, and the financial support of the weaker countries. These frameworks

have been successful in accomplishing significant development in global governance of climate for enhancing collective responsibility. Nevertheless, in agreement with [2], [8], compliance is the greatest challenge. In case compliance-enforceability is not present, such settings will fall in the category of symbolic without real enforcement [19].

The observations even reveal variation that takes a toll in terms of impacts and reaction to climate change. Developing countries that have the least emission levels bear the biggest brunt of climate change. Countries like Sierra Leone and Bangladesh are very vulnerable to climate impacts like increased siltation, rising sea levels, and changes in weather patterns. Information on the principle of “common but differentiated responsibilities” (CBDR) has been in international legal documents, but aid in terms of funding and technology from the developed countries has been inadequate. [6] argues, however, that this lack of support does not allow developing nations to adequately implement important measures focused at adaptation.

Another key finding is regarding the increasing profile of non-state actors in international climate governance. Poorly implemented state-led initiatives are increasingly being replaced by initiatives formulated by business, civil society, and even international networks. Investment in the renewable energy and other sustainable technologies by the private sector has caused a lot of activity. NGOs have been at the forefront of advocacy and in pushing for accountability from the government. According to [16], these actors should be more actively included in the formal processes of decision making within the framework of international law.

Additionally, new opportunities are arising due to the international climate governance. For instance, as climate change litigation is gaining more focus, new avenues for accountability are

emerging. All around the globe, courts are being used for climate litigation, ranging from suing companies for their emissions to pressuring countries to tighten their policies. Such changes illustrate the progress in appreciation of moral and legal responsibilities that [18] elaborates on. In addition, the development of the renewable sources of energy, the climate modeling software, and other technological advancements also pose great opportunities, as noted by [3].

Nonetheless, these results also suggest that international law as a whole will face some serious challenges. Prioritize attention should be given to equitable solutions that address the needs of the most vulnerable nations. Scholars such as [10], [17] recommend stronger financial mechanisms, better enforcement, and more democratic decision making. Such changes are important for enhancing the effectiveness of climate governance and making it just and sustainable.

4. RESULTS AND DISCUSSION

The present work involves a critical analysis of international climate law opportunity, weaknesses, and strengths. Regardless of regimes such as the UNFCCC and the Paris Agreement having initiated worldwide activity with regard to climate, weaknesses in them serve to highlight an imperative for reform and innovation in working towards fair and sustained governance of the climate.

4.1 Critical Assessment of Existing Frameworks

Maybe the best feature of global climate law is that it can advance multilateralism. The Paris Agreement, for instance, is an unparalleled success at bringing nations together towards the shared goal of limiting the rise in global temperature to well below 2°C. Its adaptability in allowing countries to set their own nationally determined contributions (NDCs) has enabled the

achievement of near universal agreement. But it is also among its greatest weaknesses. Lacking legally binding enforcement mechanisms, most states fail to adhere to their commitments, as identified by [19]. This presents a challenge to the general accountability of international climate agreements.

The Kyoto Protocol, though more visionary in nature, has also been faulted on the basis of its narrow scope. It imposed binding obligations on the developed world mainly but left out major emerging economies like China and India, which are now among the biggest emitters of greenhouse gases in the world. Writers like [3] opine that this loophole diluted the potency of the protocol and created divisions between the developing and developed world.

4.2 Equity and Justice in Climate Governance

Equity is also a central term of global climate law. CBDR's notion recognizes the past emissions of the developed world and the enhanced capacity thereof to address climate change. This has not occurred equally, nonetheless. African and South Asian countries lack the capacity for the most part to shift into low-carbon economies or apply solid adaptation. Sierra Leone, for instance, as a low-emitting country, is disproportionately susceptible to sea-level rise and climate events [6].

Finance instruments, including the Green Climate Fund, were designed to mitigate this asymmetry by financing adaptation and mitigation in the developing world. But disbursement has been low and delayed, according to [18]. The lack of funds not only deprives cooperation between the developed and developing world but also diminishes the momentum required for climate action.

4.3 The Role of Non-State Actors and Emerging Opportunities

Non-state actors are now stepping into the limelight as the leading gap-fillers of state action. Private enterprises are leading the technology

innovation in renewable energy, and pressure groups and non-governmental organizations are calling for bolder climate policy. [16] note that global legal orders need to bring such actors into decision-making so that they can access their resources and knowledge in an effective manner.

Climate litigation is ever more a vehicle for holding leaders to account. Courts everywhere now are holding corporations and governments responsible for their actions contributing to climate change. [18], for instance, illustrates the way in which litigation has pressured governments to create more ambitious climate change reduction goals and put adaptation for climate first. This is an indicator of increased consciousness towards moral and legal accountability in acting when it comes to climate.

Technological innovation is accompanied with a second significant opportunity in its wake. Emission savings through technological improvements in renewable technology, carbon capture, and simulation can make a transition towards a low-carbon economy at a rapid pace. However, such technology access is not even, and developing nations lack funding for accessing and deploying them. According to such a stance taken in works such as [6], [17], such multilateral accords can contribute vastly in regards to technology transfer and capacity development in vulnerable nations.

4.4 Recommendations for the Strengthening of International Law

To be able to deal with the above challenges, international climate law has to be overhauled fundamentally. To start with, mechanisms for enforcement need to be reinforced so that states can be held accountable for their commitments. The creation of binding targets with default sanctions would improve accountability [4].

Second, the need for intensifying and rationalizing financial instruments. The rich nations have a responsibility to honor their commitments of providing

financial support, and there must be more financial instruments developed in order to deal with rising costs of climate adaptation and mitigation [10].

Third, international law has to become more representative in a manner that it hears more the voice and interest of developing countries. By ensuring fair representation to such countries on the decision-making platform, they will be in a good position to contribute to the formulation of climate policy [5].

Lastly, international law will have to become proactive and not passive in its actions and thinking. Frameworks then must be designed for effective addressing new challenges, i.e., migration for climate and impact of artificial intelligence in its environment [12].

5. CONCLUSION

Climate change raises a survival issue, and a shared and immediate action is warranted. In its work, the article has concluded that international law plays a key role in overcoming the challenge of the climate problem; it affords the opportunity for developing global cooperation, formulating compulsory engagements, and opening avenues for financial and technological cooperation. These to date have also included agreements like the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement in providing a platform where nations have come together for a cause of responding to the effects of climate. However, as in this case, long-standing concerns in terms of enforcement, fairness, and representativity have taken root.

Common but differentiated responsibilities (CBDRs) have sat at the focal point in acknowledging greenhouse debts of the developed nations and burden asymmetries between developing countries. Its implementation has, however, been hugely asymmetric, and therefore most vulnerable nations do not have sufficient resources to cope with the effects of climate change. The finance instruments such as the

Green Climate Fund, in spite of its promise, have been marked by poor contributions and slow disbursement of funds. Ignoring the issue of developing nations erodes not only confidence but undercuts collective actions towards stemming concerns about climate, according to such scholar researchers such as [6], [18].

Second, inadequate provisions for compliance with such international agreements disempowers most of its effectiveness. Lacking default penalties, most nations fall short of its target, and in so doing, destroy worldwide efforts at temperature constraint. Researchers like [4], [19] have suggested the setting up of binding goals and stronger mechanisms of accountability so that nations hold on to their commitments.

At the same time, there are new chances arising that have the potential to propel global climate leadership. The growing presence of non-state actors—defined by corporate and NGO leadership evolution—demonstrates avenues through innovation, advocacy, and popular pressure that supplement and assist state leadership. Climate litigation is becoming a force to be considered, holding governments and companies to account, an indication that there is growing recognition of the legal as well as ethical imperatives to act. There are also technological advances in renewable energy and carbon capture that give further cause to believe that it is possible to make progress, as long as there is fair access to such technologies, as several studies by [16], [17] have elaborated.

Overcoming these challenges and grasping these opportunities requires a change in international law, with reform in the direction of fair access to finance and technology for developing countries. It is required that the enforcement mechanisms be strengthened so as to hold states accountable for their actions, and also non-state actors need to be engaged more meaningfully into the international climate governance regime. Lastly, legal regimes must have adequate flexibility in an effort to address new challenges like climate change migration, as well as the integration of artificial intelligence and nature protection [12]. Though these elements are responsible for the effectiveness of international law in responding to such challenges, its actual application is at the mercy of the states' willingness to act collectively in fully representative forums.

Although all these elements make international law an effective tool for responding to these challenges, its actual implementation hinges on nations' willingness to adopt collective action in fully representative forums. The international community can only build legal institutions that realize sustainable decreases in the prevalence of climate change in this asymmetrical battle by adopting innovation, fairness, and accountability. In addition, this project will render the world a safer and fairer place for all human beings, current and future generations.

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