Climate Diplomacy and Global Governance: A Strategic and Qualitative Analysis of International Politics (1950−2025)

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Abstract
Climate change has become a complex issue at the center of contemporary international relations. This study examines the position of climate diplomacy within global governance structures and the evolution of these processes from the 1950s to 2025 through a qualitative approach. The main research question addresses how states and non-state actors shape global governance mechanisms through climate diplomacy and which power relations are determinant in this process. The study reveals that climate negotiations are not limited to environmental protection goals but occur at the intersection of economic interests, technological hegemony, and geopolitical strategies. The theoretical framework, shaped by international regime theory and structuralist approaches, contextualizes the multi-layered nature of climate diplomacy. Based on a qualitative research design, this study evaluates international agreements, diplomatic documents, and policy texts through document analysis methods. Findings indicate that climate diplomacy has transformed over time from a technical negotiation area into a strategic competition arena. While developed countries reject the principle of historical responsibility, developing countries strengthen their demands for justice and equality. As the effectiveness of multilateral agreements declines, regional alliances and bilateral collaborations gain importance. Research results demonstrate that climate diplomacy reproduces traditional international politics patterns and reinforces existing power asymmetries. The study offers recommendations for democratizing climate governance, establishing inclusive negotiation processes, and ensuring equitable resource distribution.
Keywords: Climate Diplomacy, Global Governance, International Regimes, Multilateralism, Climate Justice

Introduction
Climate change, one of the most complex political, social, and ecological issues of the twenty-first century, has become one of the fundamental dynamics shaping the agenda of international politics. The massive greenhouse gas emissions that have occurred since the Industrial Revolution have led to irreversible increases in global average temperatures; this situation has profoundly affected the balance of ecosystems, the sustainability of social life, and the functioning of economic structures (Pande et al., 2023; Intergovernmental Panel on

Climate Change, 2023; Adger et al., 2009). The threats posed by climate change emerge not merely as an environmental problem but as a strategic issue that redefines states' domains of sovereignty, security perceptions, and forms of international cooperation (Busby, 2022; Clack et al., 2024; Okereke et al., 2009). In this context, climate diplomacy has gained significance as a multilayered diplomatic domain encompassing the negotiation processes, policy instruments, and cooperation mechanisms that states and non-state actors develop in response to the global climate problem (Morgan, 2024; Dikaios, 2024; Bodansky, 2010).

The historical development of climate diplomacy has followed a trajectory parallel to the structural transformations of international politics throughout the period extending from the 1950s to the present. The environmental issue, which was largely neglected during the Cold War era, began to become part of the global agenda with the 1972 Stockholm Conference; this process became institutionalized with the signing of the United Nations Framework Convention on Climate Change at the 1992 Rio Summit, gained binding force with the 1997 Kyoto Protocol, evolved into a new phase based on the principle of universal participation with the 2015 Paris Agreement, and intensified with discussions on phasing out coal at the 2021 Glasgow Summit (Asadnabizadeh, 2025; Morgan, 2024; Falkner, 2016; Bäckstrand and Lövbrand, 2019). However, this process is not merely a series of conferences and agreements; it simultaneously reflects a multidimensional negotiation arena where states' understandings of sovereignty, power balances, and the functionality of international law are called into question (Bodansky et al., 2017). The concept of global governance possesses central importance at this juncture for understanding the functioning of climate diplomacy (Biermann and Pattberg, 2008). This is because the resolution of the climate problem requires multi-actor and multi-level cooperation that exceeds the capacity of a single state or a narrow group of actors.

Global governance refers to a complex coordination process that extends beyond hierarchical state structures in the traditional sense, incorporating horizontal cooperation networks, transnational institutions, and civil society organizations (Harris, 2022; Brechin & Lee, 2025; Bäckstrand et al., 2010). In climate diplomacy, this form of governance encompasses a broad spectrum of actors, including not only interstate agreements but also the roles of regional organizations, global-scale civil initiatives, and the private sector (Heubaum, 2022; Kirton et al., 2024; Gupta, 2014). However, this multi-actor structure simultaneously brings with it ambiguities of authority, conflicts of interest, and problems of effectiveness in decision-making processes (Rajamani & Peel, 2021; Segger & Voigt, 2025; Haas, 2004). Consequently, climate diplomacy must be addressed not merely as a technical negotiation process but as a strategic domain where political power, social demand, and economic interest intersect (Sunstein, 2025; Fiorino et al., 2024; Paterson, 1996).

From the perspective of liberal institutionalism, climate diplomacy is viewed as a domain where international institutions facilitate cooperation among states, enhance information sharing, and reduce transaction costs (Heubaum, 2022; Intergovernmental Panel on Climate Change, 2022; Keohane, 1984; Haas, 1992). This approach emphasizes the norm-setting and policy coordination functions of multilateral institutions such as the United Nations Framework Convention on Climate Change. However, critical international relations approaches argue that behind this apparently cooperative structure, hegemonic power relations, North-South inequalities, and economic interests based on capital accumulation are

determinant (Harris, 2022; Fiorino et al., 2024; Paterson, 2001; Okereke et al., 2009). For this reason, the theoretical framework to be employed throughout the study has been constructed to encompass both the cooperation emphasis of liberal institutionalism and the power and hegemony analyses of critical approaches.

The structural contradictions of climate diplomacy manifest themselves particularly in the debates over historical responsibility and financial obligations between developed and developing countries. The principle of "common but differentiated responsibilities" of the Kyoto Protocol was an attempt to manage this tension, but in practice it remained limited due to the insufficient financial support of developed countries and their reluctance in technology transfer (Rajamani & Peel, 2021; Doelle & Seck, 2021; Gupta, 2014; Okereke, 2007). The Paris Agreement attempted to overcome this problem with the system of "nationally determined contributions," but this time the weakness of bindingness and the inadequacy of monitoring mechanisms became subjects of criticism (Segger & Voigt, 2025; Wewerinke-Singh & Mead, 2025; Falkner, 2016; Bodansky et al., 2017). At the Glasgow Summit, the failure to take concrete steps regarding developing countries' demands for "loss and damage" once again revealed the structural injustice of global governance (Doelle & Seck, 2021; Fiorino et al., 2024).

When the literature is examined, it is observed that studies addressing the relationship between climate diplomacy and global governance generally focus on specific periods, specific agreements, or specific theoretical perspectives (Andonova et al., 2020; Brechin & Lee, 2025; Biermann and Pattberg, 2008; Bäckstrand and Lövbrand, 2019; Roger et al., 2017). However, comprehensive studies that address the seventy-five-year period extending from the 1950s to 2025 with a holistic perspective, employ both liberal and critical theoretical frameworks in a balanced manner, and systematically apply qualitative analysis methods remain limited. This study possesses the potential to fill this gap.

The fundamental problematic of this study has been formulated as follows: Through which historical stages have climate diplomacy passed during the period from 1950 to 2025, what structural transformations have occurred in global governance processes, and what have been the effects of these processes on the power relations, cooperation mechanisms, and normative structures of international politics? The study's hypothesis is that although climate diplomacy has undergone an apparent transformation from the traditional understanding of sovereignty toward multi-actor governance structures throughout the historical process, this transformation has not eliminated states' strategic interests, power balances, and economic priorities but has instead reproduced these elements in new forms. To test this hypothesis, the study will examine the key diplomatic processes, institutional structures, and actor behaviors during the 1950-2025 period through qualitative methods.

The expected contributions of the study can be addressed at three fundamental levels. At the theoretical level, it presents an original analytical framework that integrates liberal institutionalism and critical international relations approaches in the context of climate diplomacy, thereby revealing the explanatory capacity and limitations of both perspectives. At the empirical level, it documents the seventy-five-year historical process systematically, detailing the turning points, continuities, and ruptures of climate diplomacy. At the policy level, it develops concrete recommendations regarding which structural reforms are

necessary for grounding future climate negotiations on a more effective and just basis. These contributions are also significant in demonstrating that climate diplomacy is not merely an environmental issue but a central dynamic shaping strategic domains of global politics such as security, development, migration, and energy.

Literature Review

The literature examining the relationship between climate diplomacy and global governance has accumulated a multi-layered body of knowledge spanning the historical trajectory from the 1950s to the present. The fundamental characteristic of this literature is its concentration on the politicization of scientific knowledge, the evolution of institutional governance architectures, and the grounding of power relations on epistemic foundations. The conceptual roots of climate diplomacy extend back to the revolutionary developments in atmospheric science in the 1950s. Houghton (2009) and Bolin (2007) define this period as the beginning of meteorological knowledge's transformation into a strategic knowledge category. The initiation of systematic measurements of carbon dioxide accumulation in the atmosphere during the Cold War era constituted the first instances of scientific knowledge assuming an instrumental role in international policymaking. With the establishment of the United Nations Environment Programme in the 1970s, the concept of climate diplomacy gained visibility in the literature; however, during that period, climate change was framed not as a global threat in its contemporary sense, but rather as a matter of regional pollution (Adger et al., 2009).

The integration of scientific knowledge into foreign policy processes was placed on an analytical foundation through Haas's (1992) conceptualization of epistemic communities. Epistemic communities are institutional networks capable of influencing state behavior through data standardization and expert knowledge. The roles played by the World Meteorological Organization, the International Council for Science, and the Intergovernmental Panel on Climate Change validate this conceptual framework. Beck (2009) and Biermann (2014), by approaching climate change as a managed global risk, posit that knowledge is transformed into strategic capital in diplomatic decision-making processes. The role of epistemic communities in the production of climate models, the determination of data-sharing protocols, and the definition of risk has given rise to a new governance logic that indirectly constrains states' sovereignty domains. Edwards (2010) conceptualized the data infrastructures of atmospheric science as vast machines, emphasizing that these infrastructures are fundamental elements determining knowledge asymmetry in international politics.

The global governance literature began evaluating the climate issue from the perspective of regime complexes starting in the 1990s. Keohane and Victor's (2011) regime complex approach revealed that institutional structures in the climate domain are not based on a single central authority but represent a multi-layered, network-based architecture. The Kyoto Protocol, the Paris Agreement, the United Nations Framework Convention on Climate Change, and the Intergovernmental Panel on Climate Change constitute institutional networks with complementary yet sometimes contradictory normative frameworks. Young (1999) and Biermann (2007) emphasized that this structure entails risks of institutional pluralism and political fragmentation, and that the effectiveness of climate diplomacy depends on the coordination capacity among institutions. Bulkeley and Newell (2010) noted that climate governance has evolved from a state-centric negotiation model toward a

networked and multi-level governance form, and this transformation has rendered the traditional Westphalian understanding of sovereignty more flexible.

Within the framework of regime theory, Krasner (1983) and Keohane (1984) emphasized the normative foundations of international environmental regimes, arguing that the success of climate diplomacy depends not only on technical capacity but also on shared norms. The normative textual structure of the 1992 United Nations Framework Convention on Climate Change institutionalized the principle of common but differentiated responsibilities at the institutional level. Bodansky (2010) and Bodansky, Brunnée, and Rajamani (2017) demonstrated that legitimacy in climate regimes is nourished not only by states' consent but also by the participation of civil society and scientific institutions. Barrett (2003), addressing environmental diplomacy along the axes of theory and practice, argued that the weakness of binding force in climate agreements stems from states' sovereignty sensitivities, and consequently, effective sanction mechanisms cannot be established.

Strategic governance approaches examine climate diplomacy through the balance of power, interest, and rationality. Nye's (1990, 2004) theories of soft power and smart power conceptualized environmental knowledge and climate discourse as instruments of geopolitical strategies. Falkner (2013, 2016) demonstrated that climate diplomacy has risen as a non-military strategic capacity, playing a fundamental role particularly in the European Union's construction of green normative power. China's ecological civilization discourse and the United States' energy security-oriented climate strategies are indicators that climate diplomacy has become a new dimension of geopolitical competition. Dalby (2002, 2009) emphasized that climate has become institutionalized in national defense strategies, and the securitization process has integrated climate diplomacy into military planning and national security policies.

The concept of climate services rapidly proliferated in the literature following the Third World Climate Conference in Geneva in 2009. Hewitt et al. (2012) defined climate services as the systematic integration of scientific knowledge into decision-making processes, and this perspective combined classical diplomatic understanding with knowledge-based governance. Zillman (2007) characterized the network established by the World Meteorological Organization through the Global Climate Observing System and the World Climate Research Programme as the diplomatic institutionalization of scientific infrastructure. The opening of climate knowledge to operational use has enabled the development of decision support mechanisms in sectors such as agriculture, water resource management, health, and energy, channeling scientific knowledge directly toward economic and social applications.

The regime complex approach defined by Keohane and Victor (2011) examines how the fragmentation in climate governance reduces or enhances diplomatic effectiveness. The overlapping authorities and norms emerging among the Intergovernmental Panel on Climate Change, the United Nations Framework Convention on Climate Change, the Green Climate Fund, and Conference of the Parties processes create governance complexity. Biermann and Pattberg (2012), re-evaluating global environmental governance, demonstrated that institutional pluralism provides flexibility on one hand while creating problems in terms of coherence and accountability on the other.

A significant portion of the literature on climate diplomacy focuses on North-South injustices. Roberts and Parks (2007) demonstrated that the climate justice discourse constitutes a normative axis in climate negotiations, emphasizing the imbalance between the historical responsibility of developed countries and the vulnerability of developing countries. Dubash (2019), examining the tension between climate change and development in the Indian case, showed that the climate policies of developing countries conflict with poverty alleviation and economic growth objectives. The Kyoto Protocol's principle of common but differentiated responsibilities was a normative initiative aimed at managing this tension, yet remained limited due to inadequate financial support from developed countries and resistance in technology transfer. The Paris Agreement attempted to overcome this problem through the nationally determined contributions system; however, the weakness of binding force and the inadequacy of monitoring mechanisms have been subjects of criticism (Dimitrov, 2016; Cullenward & Victor, 2020).

The security dimension of climate diplomacy is increasingly finding more space in the literature as a strategic issue. Dalby (2020) demonstrated that climate is an integral part of security discourse and that climate security has become institutionalized in national defense strategies. The threats climate change poses in areas such as migration, food security, and access to water resources reveal that the security-climate relationship requires multi-dimensional analysis. Dryzek (2013) and Dryzek and Pickering (2019), addressing the transformation of climate politics in the Anthropocene era, drew attention to the risk that the securitization process carries for limiting democratic participation.

The literature on epistemic and ontological power addresses climate diplomacy through knowledge production and circulation. Miller and Edwards (2001) demonstrated that the production and circulation processes of climate knowledge have become domains of geopolitical control. Data sharing, the standardization of climate models, and the development of algorithmic prediction systems are creating a new epistemic hegemony, transforming climate diplomacy into a power domain based on knowledge asymmetries. Jasanoff (2010) emphasized that the boundaries between science and politics have become permeable, and that the normative and epistemological dimensions of climate knowledge are intertwined.

Multi-level diplomacy and networked governance constitute one of the fundamental dynamics of the transformation of climate diplomacy. Avant, Finnemore, and Sell (2010) along with Hale, Held, and Young (2013) argued that climate diplomacy has ceased to be state-centric and is conducted by multi-level and multi-actor networks. Bulkeley et al. (2014), addressing transnational climate change governance, examined the diplomatic roles of local governments, technology companies, and international civil society organizations. Twenty-first-century climate diplomacy possesses a new diplomatic morphology based on horizontal networks, enabling the diversification of decision-making processes while creating new challenges in terms of accountability and democratic legitimacy.

Normative power, legitimacy, and perception management constitute the discursive dimension of climate diplomacy. Falkner (2016) positioned the European Union's climate diplomacy as an example of normative power, emphasizing that legitimacy derives not only from emission commitments but also from discursive and normative superiority. Boykoff

(2011) demonstrated that who speaks in climate discourse is critical in terms of media representation and public perception. Dryzek et al. (2013), addressing the discursive dynamics of climate politics, analyzed how different discourse coalitions influence negotiation processes.

Digitalization, data regime, and new-era literature reflect the transformation of post-2015 climate diplomacy. The digital climate governance literature examines the impact of algorithmic prediction systems, remote sensing technologies, and artificial intelligence-based modeling on diplomatic negotiations. Digital climate diplomacy, particularly in the post-2020 period, has caused the global information infrastructure to assume a strategic dimension, bringing issues of data sovereignty and digital capacity disparities to the governance agenda (Oyenuga et al., 2025; Cordonier Segger & Voigt, 2024). Buck (2019), addressing the post-climate engineering era, discussed how technological interventions can transform governance dynamics.

Although the current literature possesses a broad scope, studies that holistically examine the seventy-five-year period extending from 1950 to 2025, integrating historical-institutional continuity with strategic analyses, remain limited. While most research focuses on specific periods, integrated models addressing the evolution of climate diplomacy along the axes of knowledge, institutions, and strategy are insufficient. This study offers a qualitative and strategic framework encompassing both historical and contemporary layers to fill this gap in the literature. Thus, the relationship between climate diplomacy and global governance is redefined not merely as environmental but as an epistemic, institutional, and strategic capacity.

Theoretical Framework

Climate diplomacy constitutes a multi-layered arena of international politics wherein power, knowledge, and legitimacy are mutually constituted. This section presents an original analytical model that integrates liberal institutionalism, critical international relations theories, the epistemic community's approach, and security studies to establish the theoretical architecture of climate diplomacy. The theoretical framework is not confined to conceptual definitions but is configured as a dynamic structure that explicates how these concepts have materialized throughout the historical process spanning from 1950 to 2025 and how they have shaped actor behaviors.

Climate diplomacy transcends traditional diplomatic understanding and represents a strategic arena where power, knowledge, and normative legitimacy intersect. While Nye's conceptualization of soft power partially explains the normative dimension of climate diplomacy, it fails to fully capture the hegemony established through knowledge production (Nye, 1990, 2004). Climate diplomacy constitutes both a normative power game and an epistemic negotiation arena (Hulme, 2010). States compete not only over greenhouse gas mitigation or the governance of financial mechanisms but also over determining which knowledge is scientifically acceptable and which risks should be defined as threats requiring urgent intervention. In this context, knowledge is not a neutral resource but strategic capital through which power relations are produced (Haas, 1992; Beck, 2009). Data sharing, the standardization of climate models, and the development of algorithmic prediction systems create new epistemic hegemony, transforming climate diplomacy into a power arena based

on knowledge asymmetries. Jasanoff (2010) emphasizes that the boundaries between science and politics have become permeable, with the normative and epistemological dimensions of climate knowledge intertwined. Climate diplomacy is shaped not only by agreements among states but also by epistemic struggles over what knowledge counts as truth. Control over knowledge regimes constitutes one of the fundamental mechanisms through which asymmetric power relations are reproduced in climate diplomacy.

Multi-level diplomacy and network governance approaches address the transformation of climate diplomacy from a state-centric structure to a multi-actor configuration. Avant, Finnemore, and Sell (2010), along with Hale, Held, and Young (2013), have advanced the proposition that climate diplomacy is conducted through multi-level and multi-actor networks. Bulkeley et al.'s (2014) study on transnational climate change governance has rendered visible new actor categories that transcend classical diplomacy by examining the diplomatic roles of local governments, technology corporations, and international civil society organizations. Twenty-first-century climate diplomacy possesses a new diplomatic formation based on horizontal networks, which while diversifying decision-making processes, creates new challenges in terms of accountability and democratic legitimacy. This multi-actor structure, while enhancing participatory governance possibilities, simultaneously brings forth problems of authority ambiguities and responsibility distribution.

Normative power, legitimacy, and perception management constitute the discursive dimension of climate diplomacy. Falkner (2016) has positioned the European Union's climate diplomacy as an exemplar of normative power, emphasizing that legitimacy derives not solely from emission commitments but from discursive and normative superiority. Boykoff's (2011) media representation studies demonstrate that who speaks in climate discourse is critical for public perception. Dryzek et al. (2013) have analyzed how different discourse coalitions influence negotiation processes by addressing the discursive dynamics of climate politics. Normative power operates as a form of power functioning through language, symbols, and narratives beyond material resources, playing a central role in climate diplomacy.

This theoretical framework, rather than confining climate diplomacy to a single theoretical perspective, integrates the cooperation emphasis of liberal institutionalism, the power and hegemony analyses of critical approaches, the knowledge-politics nexus of epistemic communities' literature, and the threat perception perspectives of security studies. This integrative approach enables simultaneous assessment of both the institutional structure and power dynamics of climate diplomacy, both the role of scientific knowledge and the impact of normative discourses. Consequently, climate diplomacy must be addressed not merely as a technical negotiation process but as a strategic arena where political power, social demand, and economic interest intersect (Sunstein, 2025; Fiorino et al., 2024; Paterson, 1996).

From a liberal institutionalist perspective, climate diplomacy is viewed as an arena wherein international institutions facilitate cooperation among states, enhance information sharing, and reduce transaction costs (Heubaum, 2022; Intergovernmental Panel on Climate Change, 2022; Keohane, 1984; Haas, 1992). This approach emphasizes the norm-forming and policy coordination functions of multilateral institutions such as the United Nations Framework Convention on Climate Change. However, critical international relations approaches contend that behind this ostensibly cooperative structure lie determining factors of hegemonic power

relations, North-South inequalities, and economic interests based on capital accumulation (Harris, 2022; Fiorino et al., 2024; Paterson, 2001; Okereke et al., 2009). Therefore, the theoretical framework employed throughout this study has been constructed to encompass both the cooperation emphasis of liberal institutionalism and the power and hegemony analyses of critical approaches.

The structural contradictions of climate diplomacy manifest themselves particularly in debates over historical responsibility and financial obligations between developed and developing countries. The Kyoto Protocol's principle of "common but differentiated responsibilities" constituted an initiative to manage this tension but remained limited in practice due to inadequate financial support from developed countries and their reluctance in technology transfer (Rajamani & Peel, 2021; Doelle & Seck, 2021; Gupta, 2014; Okereke, 2007). The Paris Agreement attempted to overcome this problem through a system of "nationally determined contributions," yet this time it has been subject to criticism for weak bindingness and inadequate monitoring mechanisms (Segger & Voigt, 2025; Wewerinke-Singh & Mead, 2025; Falkner, 2016; Bodansky et al., 2017). The failure to take concrete steps regarding developing countries' demands for "loss and damage" at the Glasgow Summit once again exposed the structural injustice of global governance (Doelle & Seck, 2021; Fiorino et al., 2024).

When the literature is examined, studies addressing the relationship between climate diplomacy and global governance are generally observed to focus on specific periods, specific agreements, or specific theoretical perspectives (Andonova et al., 2020; Brechin & Lee, 2025; Biermann and Pattberg, 2008; Bäckstrand and Lövbrand, 2019; Roger et al., 2017). However, comprehensive studies that address the seventy-five-year period spanning from the 1950s to 2025 with a holistic perspective, employ both liberal and critical theoretical frameworks in a balanced manner, and systematically apply qualitative analysis methods remain limited. This study possesses the potential to fill this lacuna.

Global governance theories demonstrate that international order is not solely state-based but is also produced by multiple actors and network structures (Rosenau and Czempiel, 1992; Held and McGrew, 2002). Climate change constitutes the most fertile experimental field of governance theories. Institutional networks such as the World Meteorological Organization, the United Nations Environment Programme, the International Council for Science, the Intergovernmental Panel on Climate Change, and the United Nations Framework Convention on Climate Change represent concrete examples of the fragmented sovereignty structures articulated by Keohane and Victor (2011). These institutions generate governance capacity through knowledge standardization and normative frameworks without relying on hierarchical authority in the classical sense. The Intergovernmental Panel on Climate Change has established a bridge between epistemic authority and political legitimacy by rendering scientific knowledge the fundamental input of international negotiations (Biermann, 2014). The regime complex approach reveals that institutional pluralism in the climate arena both provides flexibility and creates coordination problems. Norm overlaps and authority ambiguities among different institutions constitute structural factors weakening the effectiveness of global climate governance (Young, 1999; Biermann, 2020).

Haas's (1992) conceptualization of epistemic communities forms the theoretical core of climate diplomacy. Networks based on shared expert knowledge determine how problems are defined in international politics, how policy preferences are framed, and which solutions are deemed legitimate. The World Meteorological Organization, the Intergovernmental Panel on Climate Change, and the Global Climate Observing System not only produce scientific knowledge but also define which knowledge becomes policy (Litfin, 1994; Miller, 2001). The concept of knowledge regime provides a normative framework regarding which data shall be collected, which models shall be employed, and which scenarios shall be considered valid in climate diplomacy (Edwards, 2010). The power of epistemic communities derives from their capacity to translate scientific knowledge into political discourse, rendering them the invisible architects of climate diplomacy. The analysis of climate diplomacy must encompass not only political processes but also the circulation modes, production mechanisms, and legitimacy foundations of knowledge.

Strategic diplomacy theory explicates state-level power construction in the climate arena at both discourse and capacity levels (Berridge, 2015). Developed countries maintain the power to define the global climate agenda through scientific capacity and data infrastructure, while developing countries develop normative balancing strategies through the principles of climate justice and common but differentiated responsibilities (Okereke, 2010). Knowledge has been transformed into strategic capital rather than military or economic power; possessing climate knowledge determines position in negotiations (Beck, 2009). Falkner's (2016) normative power analysis demonstrates that the European Union gained legitimacy in climate diplomacy by transforming green norms into international standards. China's ecological civilization discourse and the United States' energy security-oriented climate strategies reveal that climate diplomacy has become a new dimension of geopolitical competition (Falkner, 2013). Strategic diplomacy encompasses not only diplomatic negotiation techniques but also questions of how climate knowledge is produced, by whom it is shared, and under what conditions it is utilized.

Climate justice and North-South tensions constitute the theoretical axis questioning the normative and ethical foundations of climate diplomacy. Roberts and Parks's (2007) conceptualization of climate justice foregrounds the imbalance between historical responsibility and current obligations. The history of greenhouse gas accumulation in the atmosphere by developed countries during their industrialization processes contradicts the development rights of developing countries (Dubash, 2019). The Kyoto Protocol's principle of common but differentiated responsibilities constituted a normative initiative to address this structural injustice, but it produced limited impact due to inadequate financial support from developed countries and resistance in technology transfer (Okereke, 2007). The Paris Agreement introduced flexibility to obligations through the system of nationally determined contributions; this flexibility has led to criticisms of weak bindingness (Bodansky, Brunnée, and Rajamani, 2017; Dimitrov, 2016). Climate justice is not merely an ethical discourse but a structural factor determining the success and legitimacy of climate diplomacy.

The conceptualization of climate services refers to the transformation of scientific knowledge into operational use and gained a central position in global climate governance following the Third World Climate Conference in Geneva in 2009. Hewitt et al. (2012) defined climate services as the systematic integration of scientific knowledge into decision-making processes;

this perspective integrated the classical understanding of diplomacy with knowledge-based governance. Zillman (2007) characterized the network established by the World Meteorological Organization through the Global Climate Observing System and the World Climate Research Programme as the diplomatic institutionalization of scientific infrastructure. The opening of climate knowledge to operational use enabled the development of decision support mechanisms in sectors such as agriculture, water resource management, health, and energy, directing scientific knowledge toward economic and social applications. This process demonstrates that climate knowledge does not remain merely as academic knowledge accumulation but is transformed into a resource generating political and economic value.

The climate security perspective addresses climate change as an element of national and international security. Dalby's (2009, 2020) studies reveal that climate has become an integral part of security discourse and has been institutionalized in national defense strategies. The threats created by climate change in areas such as migration, food insecurity, pressure on water resources, and conflict risk demonstrate that the security-climate nexus requires multi-dimensional analysis (Dalby, 2002). However, as Dryzek (2013) and Dryzek and Pickering (2019) warn, the securitization of climate carries the risk of constraining democratic participation. Security language can accelerate climate policies by strengthening urgency and threat perception, but it also brings the danger of transferring decision-making processes into the hands of technical elites and military institutions. Climate security constitutes the theoretical arena requiring a delicate balance between the effectiveness of climate diplomacy and democratic legitimacy.

Epistemic and ontological power literature examines climate diplomacy through knowledge production and circulation, investigating how knowledge is transformed into political resource. Miller and Edwards (2001) have demonstrated that the production and circulation processes of climate knowledge have become arenas of geopolitical control. Data sharing, the standardization of climate models, and the development of algorithmic prediction systems create new epistemic hegemony, transforming climate diplomacy into a power arena based on knowledge asymmetries. Jasanoff (2010) emphasizes that the boundaries between science and politics have become permeable, with the normative and epistemological dimensions of climate knowledge intertwined. Climate diplomacy is shaped not only by agreements among states but also by epistemic struggles over which knowledge counts as truth. Control over knowledge regimes constitutes one of the fundamental mechanisms through which asymmetric power relations are reproduced in climate diplomacy.

This theoretical framework, rather than confining climate diplomacy to a single theoretical perspective, integrates the cooperation emphasis of liberal institutionalism, the power and hegemony analyses of critical approaches, the knowledge-politics nexus of epistemic communities' literature, and the threat perception perspectives of security studies. This integrative approach enables simultaneous assessment of both the institutional structure and power dynamics of climate diplomacy, both the role of scientific knowledge and the impact of normative discourses. The analysis of the historical process spanning from 1950 to 2025 will demonstrate how these theoretical concepts manifest in concrete diplomatic processes, establishing a solid bridge between theory and practice. This theoretical framework not only provides a conceptual map but also supplies the analytical tools to be employed in the empirical sections of the study.

Research Methodology

This study subjects the relationship between climate diplomacy and global governance to strategic and qualitative analysis across a historical process extending from 1950 to 2025. The methodological design of the research presents an original framework that integrates the interpretive depth of the qualitative research tradition (Creswell & Poth, 2024; Denzin & Lincoln, 2023), the causal logic of the process-tracing approach, and the critical power of discourse analysis. In this section, the epistemological foundation, design, data sources, analytical processes, and validity mechanisms of the research are systematically explicated.

The epistemological stance of the research is positioned between the interpretive paradigm and critical realism (Denzin & Lincoln, 2023; Maisuria & Banfield, 2022). Understanding a complex political domain such as climate diplomacy necessitates accounting not only for actors' subjective meaning-making practices but also for structural power relations and institutional dynamics. While the interpretive approach provides the capacity to understand how state representatives, international organizations, and epistemic communities frame the climate issue (Bevir & Rhodes, 2015), critical realism renders visible the material interests, hegemonic relations, and structural inequalities underlying these discursive formations (Ciplet et al., 2015). Consequently, the research is reducible neither to a purely positivist cause-and-effect inquiry nor to entirely subjective interpretations; it is grounded in an integrative analytical logic that systematically dissects the interaction of both levels.

The research design consists of a qualitative framework in which the process-tracing method converges with discourse and content analysis. Process-tracing aims to reveal the logical connections between events by chronologically tracking the causal mechanisms that lead to a particular outcome. This method examines the seventy-five-year evolution of climate diplomacy through three historical phases. The first phase encompasses the 1950-1979 period, investigating the transformation of atmospheric science into a global knowledge infrastructure and the process of scientific capacity building through the World Meteorological Organization's World Weather Watch Programme and Global Atmospheric Research Programme. The second phase covers the 1979-1992 period, addressing the First World Climate Conference, the Villach Conference, the establishment of the Intergovernmental Panel on Climate Change, and the signing of the United Nations Framework Convention on Climate Change. The third phase spans the 1992-2025 period, analyzing the multilateral negotiation dynamics, institutional transformations, and structural tensions that emerged through the Kyoto Protocol, the Paris Agreement, and the Glasgow Summit.

The data sources of the research are structured into two fundamental categories. Primary data sources consist of United Nations Framework Convention on Climate Change Conference of the Parties decisions (COP1-COP26), Intergovernmental Panel on Climate Change assessment reports (AR1-AR6), World Meteorological Organization congress proceedings, World Climate Conference outcome documents (WCC-1, WCC-2, WCC-3), and Global Climate Observing System strategic plans (GCOS, 2004). These documents constitute foundational texts that directly reflect the normative architecture and institutional logics of climate diplomacy. Secondary data sources encompass academic monographs, peer-reviewed articles, and historical assessment studies. This dual data structure enables a triangulation approach, thereby enhancing the reliability of findings.

The data analysis process is conducted through conceptual coding and thematic analysis techniques. Qualitative content analysis has been applied to primary documents, with texts being coded within the framework of predetermined conceptual axes. During the coding process, both inductive and deductive approaches have been synthesized (Saldaña, 2021; Miles et al., 2020). While inductive coding aims to identify themes emerging directly from texts, deductive coding seeks to apply concepts derived from the theoretical framework to the text. The main thematic axes have been determined as science-policy interface, institutional capacity building, epistemic authority, normative legitimacy, and strategic negotiation dynamics. These axes are designed to reflect both Keohane's (1984) emphasis on liberal institutionalism and the power analysis perspective of critical approaches.

The analytical levels are structured across three layers. At the institutional level, the functional specializations, institutional logics, and positions within the regime complex of organizations such as the World Meteorological Organization, International Council for Science, United Nations Environment Programme, Intergovernmental Panel on Climate Change, and United Nations Framework Convention on Climate Change are examined. At the diplomatic level, the discursive strategies of state representatives in negotiation forums, the functioning of normative decision-making processes, and Conference of the Parties dynamics are analyzed. At the knowledge-political level, the interaction between scientific knowledge production and political demands, the role of epistemic communities (Haas, 1992), and the strategic utilization of data regimes (Edwards, 2010) are dissected. The intersection of these three planes provides a systematic analysis of the multi-layered structure of global climate governance.

In the conceptual operationalization process, the concepts of climate diplomacy and global governance are concretized through three indicators. The institutional depth indicator is assessed through the number and quality of joint sponsorships, breadth of legal authority, and institutional resilience (Biermann, 2014). The scientific-technical capacity indicator is measured through the geographical scope of data observation systems (GCOS, 2004), the systematicity of Intergovernmental Panel on Climate Change assessment cycles (IPCC AR1-AR6), and the level of advancement in modeling tools. The political-strategic impact indicator is evaluated through the binding level of normative texts guiding state behavior (Bodansky, 2010), the implementability of Conference of the Parties decisions, and the diplomatic projections of adaptation-mitigation strategies (Falkner, 2013).

The process-tracing phases are implemented across three successive periods. In the first phase, the 1950-1979 period is treated as scientific capacity building, examining the epistemic foundations of World Meteorological Organization and International Council for Science cooperation. In the second phase, the 1979-1992 period is analyzed as the institutional codification process, tracking the First World Climate Conference, the Villach Conference, and the establishment of the Intergovernmental Panel on Climate Change within the framework of causal mechanisms. In the third phase, the 1992-2025 period is evaluated as the policy-science integration process, addressing Conference of the Parties processes, the Global Climate Observing System, and the post-Paris Agreement era. In each phase, causal mechanisms are traced in the form of "scientific awareness → institutional design → policy framework → governance implementation," with evidence for each mechanism being

confirmed through direct quotation from historical documents and comparative content analysis.

The application of discourse analysis is employed to dissect the normative structure of climate diplomacy. Key concepts used in Conference of the Parties decisions, Intergovernmental Panel on Climate Change summaries, and World Climate Conference outcome documents are systematically analyzed. For instance, the institutionalization of the concept of "common but differentiated responsibilities" through the Kyoto Protocol, its transformation into the discourse of "nationally determined contributions" in the Paris Agreement, and its sharpening through "loss and damage" debates at the Glasgow Summit are addressed as discursive transformation. This analysis reveals how hegemonic discourses are constructed and how normative structures are legitimized.

The validity and reliability mechanisms of the research are grounded in a multi-faceted verification logic. Internal validity is ensured through a data triangulation approach. Primary documents, secondary academic literature, and historical assessment reports are compared to test the consistency of findings. External validity is assessed through the theoretical generalizability of findings. While the research focuses on a specific case, the findings are formulated in a manner that offers theoretical contribution to the global governance literature. Reliability is secured through the transparency and replicability of the data analysis process. The coding scheme, thematic categories, and analytical processes are documented in detail, thereby enabling independent researchers to arrive at similar analytical conclusions. The ethical dimension of the research rests on unproblematic ground, as all documents utilized are publicly accessible institutional publications. Primary data sources have been obtained from the official websites of international organizations such as the United Nations, the World Meteorological Organization, and the Intergovernmental Panel on Climate Change, with the authenticity of documents being verified. Secondary sources have been selected from peer-reviewed academic publications, with full compliance to citation standards being maintained.

The limitations of the research converge on three fundamental points. First, access to primary documents covering the entire seventy-five-year historical process is constrained by the availability of specific institutional sources. The conduct of certain diplomatic negotiation processes behind closed doors complicates their detailed analysis. Second, the generalizability of findings is inherently limited by the interpretive framework characteristic of qualitative research. However, this limitation does not diminish the theoretical contribution of the research; on the contrary, it enhances analytical depth. Third, the assessment of the process up to 2025 does not reflect the definitive outcomes of ongoing negotiation dynamics. Nevertheless, the analysis of current trends provides a valuable foundation for predicting future orientations.

In conclusion, the methodological design of this research presents an original architecture capable of addressing the relationship between climate diplomacy and global governance within an integrity of historical depth, conceptual sensitivity, and strategic analysis. By bringing together the interpretive power of the qualitative research tradition, the causal clarity of process-tracing, and the critical capacity of discourse analysis, the research aims to

redefine climate diplomacy not merely as an environmental concern but as an epistemic, institutional, and strategic capacity.

Findings

The findings obtained through document analysis and content interpretation reveal three fundamental transformations in the seventy-five-year evolution of climate diplomacy. The first transformation is the process by which scientific knowledge has been converted into strategic capital. The second transformation is the replacement of state-centric traditional diplomacy by multilayered governance architecture. The third transformation is the grounding of power relations on epistemic foundations.

The period 1950-1979 represents the foundational phase in which atmospheric science was transformed into global knowledge infrastructure. The establishment of the World Meteorological Organization in 1951 marked the beginning of the standardization of climate data according to international standards (Zillman, 2007). With the Global Atmospheric Research Programme initiated in 1957, the systematic measurement of carbon dioxide concentration in the atmosphere was established as a scientific infrastructure. According to Bolin (2007), the measurements initiated by Charles Keeling at the Mauna Loa Observatory laid the foundation for the acceptance of climate knowledge as an instrument bearing evidentiary value in diplomatic negotiations. During this period, although epistemic communities did not yet play a determinant role in political decision-making processes, the collection and standardization of scientific data acquired an institutional character.

The period 1979-1992 encompasses the process through which the climate issue was elevated from a technical problem to the global political agenda. The First World Climate Conference of 1979 constituted a turning point in the definition of climate change as an issue requiring international cooperation (Houghton, 2009). The establishment of the Intergovernmental Panel on Climate Change in 1988 symbolizes the emergence of the institutional structure serving as a bridge in the transformation of scientific knowledge into political decisions. Haas's (1992) conceptualization of epistemic communities was concretized during this period. Expert knowledge became a normative power shaping the preferences of states. The 1992 Rio Summit and the signing of the United Nations Framework Convention on Climate Change represent the historical moment when the legal framework of climate diplomacy was established. As Bodansky (2010) emphasizes, this convention established a delicate balance between the principle of sovereignty and global responsibility.

The period 1992-2025 simultaneously harbors the maturity phase and structural contradictions of climate diplomacy. The Kyoto Protocol (1997) institutionalized the international climate regime by introducing binding emission reduction targets. However, when analyzed through Keohane and Victor's (2011) regime complex approach, Kyoto's rigid top-down model produced limited impact due to the non-inclusion of major emitting countries in the protocol. The Paris Agreement (2015) provided flexibility by introducing the system of nationally determined contributions, yet has been criticized for its lack of bindingness (Bodansky et al., 2017). As Falkner (2016) demonstrates, the European Union emerged as a normative power during the Paris process, transforming climate leadership into an instrument of soft power.

Epistemic power and knowledge asymmetries constitute the first fundamental dimension of the findings. The knowledge infrastructures conceptualized by Edwards (2010) have become sources of strategic superiority in climate diplomacy. Countries possessing satellite observation systems, climate modeling capacity, and supercomputer technologies have established epistemic hegemony in climate negotiations. The assessment reports of the Intergovernmental Panel on Climate Change have mediated in the transformation of scientific knowledge into political decisions (Bolin, 2007). However, the predominance of scientists from developed countries in this process has created structural inequality in the shaping of the global climate agenda. As Biermann (2014) emphasizes, control over data production and circulation has emerged as a new source of geopolitical power.

The emergence of multilayered governance structures constitutes the second fundamental finding. In Bulkeley et al.'s (2014) analysis, local governments have become independent actors in climate diplomacy. Transnational networks such as the C40 Cities Climate Leadership Group have added a new governance layer alongside state-centric diplomacy (Harris, 2022). The rise of the private sector constitutes another dimension of this transformation. The net-zero emission commitments of multinational corporations demonstrate that voluntary market mechanisms influence diplomatic processes (Sjåfjell et al., 2024). However, as Avant et al. (2010) caution, the increase in actor diversity has created problems in terms of accountability and democratic legitimacy.

The issue of global justice and inequality represents the third critical finding area. In Roberts and Parks's (2007) analysis, climate diplomacy emerges as an arena in which North-South asymmetries are reproduced. The principle of common but differentiated responsibilities has enabled developing countries to bring historical injustice onto the agenda. As Dubash (2019) demonstrates in the case of India, developing countries experience structural tension between climate action and development objectives. The establishment of the Green Climate Fund demonstrates that resource transfer has been transformed into a normative obligation (Schalatek, 2023). However, the reluctance of developed countries to fulfill their annual hundred-billion-dollar commitment has revealed the fragility of global solidarity mechanisms.

The rise of climate security discourse constitutes the fourth fundamental finding category. As Dalby (2020) reports, climate change has become institutionalized in national security strategies. The reports of the United States Department of Defense have defined climate as a threat multiplier. The securitization process has framed climate diplomacy with urgency discourse, yet, as Dryzek and Pickering's (2019) critique indicates, it carries the risk of limiting democratic participation. Climate migration is a concrete indicator of the security-climate intersection. The threat of territorial loss faced by small island states has forced the questioning of the concept of sovereignty (Goodman, S., 2024; Swain, A., 2025).

The tension between technology transfer and intellectual property rights represents the fifth finding area. In Dimitrov's (2016) explanation of the failure of the Copenhagen Summit, the restriction of clean technologies by developed countries through protectionist policies emerged as the primary obstacle. The demand of developing countries for access to technology demonstrates that climate diplomacy is not merely an area of cooperation but also of conflict (Eritja & Fernández Pons, 2025). The costs of energy transition lead developing countries to postpone climate action in the absence of technology transfer.

The transformation of financial mechanisms is the sixth critical finding (Lehner et al., 2023). The expansion of green bond markets has enabled the articulation of private sector financing into climate diplomacy. However, this financialization process is criticized for reducing climate action to market logic. Bernstein's (2001) conceptualization of the compromise of liberal environmentalism explains this tension. Climate finance functions both as a solidarity mechanism and as an instrument of capitalist accumulation.

The rise of intergenerational justice discourse constitutes the seventh fundamental finding (Luzzatto, 2022). The legitimation of youth organizations such as the Fridays for Future movement as new actors in climate diplomacy demonstrates a bottom-up norm formation process (Springer Nature, 2025). The participation of young activists in United Nations forums has led to the questioning of traditional diplomatic norms. Intergenerational justice has deepened the debate on historical emission responsibility (Gardiner et al., 2023).

The rise of digitalization and artificial intelligence-supported climate modeling represents the eighth finding area (Haugen & Orbie, 2024). Algorithmic prediction systems have been transformed into decision support mechanisms in climate diplomacy. However, this process has deepened digital capacity disparities, leading to a new epistemic divide. Edwards's (2010) concept of knowledge infrastructures explains the strategic dimension of digital transformation. Data sovereignty has become a new agenda item of climate diplomacy.

Climate engineering debates constitute the ninth fundamental finding. In Buck's (2019) analysis, technological intervention proposals have carried climate diplomacy into a risky domain. Proposals such as solar radiation management have forced the questioning of the ethical boundaries of global governance (Tienhaara & Robinson, 2022). Climate engineering carries the risk of shifting from emission reduction to technological solutions.

Regional differentiation and multiple regimes constitute the tenth critical finding. When analyzed within Bernstein and Cashore's (2015) triangle of regulation, innovation, and governance, regional climate regimes produce fragmenting rather than complementary effects on global governance. The European Union's emissions trading system, the Asia-Pacific region's development-oriented approach, and Africa's adaptation priority create structural contradictions in the global climate regime. Keohane and Victor's (2011) conceptualization of regime complex explains this fragmentation.

The rise of post-pandemic green recovery discourse is the eleventh finding (Korpar et al., 2023). The European Union's Green Deal framework has integrated climate diplomacy with economic recovery. However, whether this process constitutes genuine structural transformation or discursive renewal remains debatable (Goodman, 2024). The proliferation of digital diplomacy has transformed traditional negotiation formats based on physical meetings.

Carbon border adjustment mechanisms constitute the twelfth critical finding (WIPO, 2023). The European Union's carbon border tax proposal represents a new domain where climate policies intersect with trade law. This mechanism, while aiming to prevent carbon leakage on one hand, possesses the potential to adversely affect the competitive capacity of developing

countries on the other. Climate diplomacy is becoming increasingly intertwined with trade and security policies.

When the findings are evaluated holistically, it is observed that climate diplomacy has transformed from atmospheric science to global governance, from a technical issue to strategic capacity during the 1950-2025 period. Epistemic power, multilayered governance, and global inequality constitute the three fundamental dynamics of climate diplomacy. This transformation represents the rise of knowledge-based strategic capacity in international politics.

Discussion

The systematic examination of the seventy-five-year historical process reveals that climate diplomacy has been shaped by three fundamental structural tensions. First, the reproduction of hegemonic power relations behind the discourse of universal participation. Second, the transformation of scientific knowledge into a strategic instrument by epistemic communities, despite its presentation as a neutral resource. Third, the expansion of accountability gaps despite the multi-actor governance architecture being advanced with the promise of democratization. These tensions demonstrate that climate diplomacy is not merely environmental negotiation but a strategic arena where power, knowledge, and normative legitimacy intersect.

The first transformation identified by the research—the conversion of scientific knowledge into strategic capital—constitutes the concrete historical validation of Haas's (1992, 2004) conceptualization of epistemic communities. The process extending from the establishment of the World Meteorological Organization in 1951 to the assessment reports of the Intergovernmental Panel on Climate Change demonstrates that scientific knowledge functions not as a neutral arbiter in diplomatic decisions but as a normative instrument legitimizing particular interest. Edwards's (2010) conceptualization of atmospheric science's data infrastructures as vast machines had shown how these infrastructures determine states' strategic choices; the research findings go beyond this observation, substantiating how data standardization processes institutionally consolidate the scientific hegemony of developed countries. In the post-1988 period, the assessment reports of the Intergovernmental Panel on Climate Change became the fundamental reference for global climate policies, yet the marginal level of scientific contributions from developing countries in the preparation of these reports has made epistemic injustice structural. While Beck's (2009) conceptualization of risk society addresses climate change as a managed global risk, this research reveals the power asymmetry in the processes of defining and managing risk. Information asymmetry is related not only to data production capacity but also to the determination of which knowledge is considered valid.

The second transformation—the transition from state-centric diplomacy to multi-layered governance architecture—validates the analytical power of Keohane and Victor's (2011) regime complex approach. The findings demonstrate how overlapping mandates and norm conflicts among the United Nations Framework Convention on Climate Change, the Kyoto Protocol, the Paris Agreement, and the Green Climate Fund undermine governance effectiveness. As emphasized by Biermann and Pattberg (2012), institutional plurality provides flexibility while creating coherence and coordination dilemmas; the failure of the

2009 Copenhagen Summit is the concrete manifestation of this structural weakness. Bäckstrand and Lövbrand's (2019) emphasis on the democratization potential of multi-actor governance contradicts this research's findings. While the participation of local governments, private sector actors, and civil society organizations in governance processes appears to increase democratic pluralism on the surface, the fact that strategic decisions remain under the control of hegemonic states creates accountability gaps. Multinational corporations' net-zero emission commitments lack binding force due to their reliance on the principle of voluntarism; actor diversity conceals structural power asymmetry.

The global justice issue constitutes the most critical structural tension of climate diplomacy. The transition from Kyoto's common but differentiated responsibilities principle to Paris's nationally determined contributions system has led to the weakening of the historical responsibility norm (Bodansky, Brunnée, and Rajamani, 2017; Dimitrov, 2016). The emission accumulation of developed countries during industrialization processes creates a structural contradiction with the development rights of developing countries (Roberts and Parks, 2007; Dubash, 2019). The failure to systematically fulfill the annual one hundred-billion-dollar climate finance commitment proves that solidarity mechanisms become dysfunctional in the absence of political will. The failure to institutionalize the loss and damage mechanism at the 2021 Glasgow Summit is a concrete indicator of the deepening of North-South inequalities.
The rise of the climate security perspective has initiated a process of securitization of the issue, yet this process carries the risk of limiting democratic participation. The United States' definition of climate change as a threat multiplier in defense strategies, China's normative power construction through the discourse of ecological civilization, and the European Union's claim to green leadership demonstrate that climate diplomacy has been transformed into an instrument of geopolitical competition. Security language can accelerate policy formation by creating a sense of urgency, but it carries the danger of transferring decision-making processes into the hands of technical elites and military institutions. Climate migration and the threat of land loss faced by small island states compel the questioning of the concept of sovereignty.

The tension surrounding technology transfer and intellectual property rights constitutes the conflict dimension of climate diplomacy. Developed countries' limitation of clean technologies through protectionist policies structurally weakens the emission reduction capacities of developing countries. The failure of the 2009 Copenhagen Summit demonstrated that the lack of will regarding technology transfer can stalemate global negotiations. The high costs of energy transition lead developing countries to postpone climate action in the absence of access to technology.

The process of marketization of climate finance, the expansion of green bond markets, and the integration of private sector actors into financing mechanisms have transformed climate action into a domain of capital accumulation (Bernstein, 2001; Newell and Paterson, 2010). The resource inadequacy of the Green Climate Fund demonstrates that this financialization process is far from ensuring global justice. Climate finance reproduces structural inequalities rather than resolving them.

The research's limitations must be considered in interpreting the findings. Access to primary documents covering the entire seventy-five-year historical process is constrained by the

openness of certain institutional sources. The closed-door nature of some diplomatic negotiation processes complicates detailed analysis of these processes. Due to the nature of qualitative research, the generalizability of findings is limited by an interpretive framework; however, this limitation does not diminish the theoretical contribution but rather enhances analytical depth. The evaluation of the process up to 2025 does not reflect the definitive outcomes of ongoing negotiation dynamics; nevertheless, the analysis of current trends provides valuable ground for predicting future orientations.

At the policy level, recommendations are directed toward addressing the structural tensions revealed by the research. First, binding mechanisms for scientific capacity building in developing countries must be established to overcome epistemic injustice. The representation of scientists from developing countries in Intergovernmental Panel on Climate Change processes should be secured through quotas, and the North-South imbalance in scientific knowledge production must be corrected. Second, technology transfer mechanisms should be restructured to provide exemptions from intellectual property rights. Access to clean technologies should be based on the principle of global public interest, independent of commercial profit logic. Third, the traceability and accountability of climate finance commitments should be strengthened through independent audit mechanisms. The annual one hundred-billion-dollar target should be transformed into binding legal regulation, and unfulfilled commitments should be subject to sanctions. Fourth, the loss and damage mechanism must be urgently institutionalized, and funds providing direct support to small island states and climate-vulnerable regions should be established. Fifth, the accountability of multi-actor governance architecture should be increased through transparent reporting systems that ensure monitoring of commitments by private sector and civil society actors. Sixth, digital capacity disparities should be included in the agenda of global climate negotiations, ensuring equal access for developing countries in digital climate governance processes.

Recommendations for future research are shaped toward deepening and expanding the tensions revealed by this study. First, concrete policy examples regarding how epistemic injustice can be addressed should be developed through comparative case studies. Second, new forms of hegemony created by digital climate governance should be addressed with critical perspectives in the context of data sovereignty and algorithmic decision-making processes. Third, accountability and democratic legitimacy issues of multi-actor governance architecture should be discussed in depth within the framework of normative political theory. Fourth, regional dynamics of climate diplomacy, particularly the roles and strategies of local actors in Africa, Latin America, and Southeast Asia regions, should be investigated through detailed ethnographic studies.

In conclusion, the discussion presented by this research demonstrates that climate diplomacy is not merely an environmental issue but a strategic arena where power, knowledge, and normative legitimacy intersect. The seventy-five-year historical process reveals how hegemonic power relations are reproduced behind the discourse of universal participation in climate diplomacy, how scientific knowledge functions as a strategic instrument rather than as a neutral resource, and how the multi-actor governance architecture, despite being advanced with the promise of democratization, deepens structural inequalities. These

findings demonstrate that global climate governance requires fundamental structural reforms.

Conclusion and Recommendations

This research has elucidated the strategic and qualitative dynamics of international politics by analyzing the transformation of climate diplomacy from atmospheric science to a global governance architecture during the period 1950-2025. The systematic examination of the seventy-five-year historical trajectory demonstrates that the climate issue has evolved from being merely an environmental problem into a multilayered geopolitical arena where knowledge, power, and legitimacy relations intersect.

The findings accentuate three fundamental structural transformations. First is the transformation of scientific knowledge from a neutral resource to strategic capital during the process extending from the establishment of the World Meteorological Organization in 1951 to the formation of the Intergovernmental Panel on Climate Change in 1988. Second is the transition from state-centric diplomacy to multi-actor networked governance during the process extending from the 1992 Rio Summit to the 2015 Paris Agreement. Third is the reproduction of hegemonic power asymmetries behind the discourse of universal participation in the transition from the Kyoto Protocol's principle of common but differentiated responsibilities to the Paris system's nationally determined contributions regime. These transformations demonstrate that climate diplomacy has emerged as a new type of strategic capacity in international politics.

The theoretical contribution of the research lies in presenting an original analytical framework that integrates liberal institutionalism with critical international relations perspectives in the context of climate diplomacy. The capacity of international institutions to produce cooperation as articulated by Keohane (1984) and the function of this cooperation in legitimizing hegemonic interests emphasized by critical approaches operate simultaneously in climate diplomacy. The World Meteorological Organization, the Intergovernmental Panel on Climate Change, and the United Nations Framework Convention on Climate Change, while facilitating knowledge sharing and enabling global cooperation on one hand, institutionalize the scientific and financial superiority of developed countries on the other.

The theoretical framework of this research, rather than confining climate diplomacy to a single theoretical perspective, integrates the cooperation emphasis of liberal institutionalism, the power and hegemony analyses of critical approaches, the knowledge-politics relationship from the epistemic community's literature, and the threat perception perspectives from security studies. This integrative approach enables the concurrent evaluation of both the institutional structure of climate diplomacy and its power dynamics, the role of scientific knowledge, and the impact of normative discourses. The analysis of the historical process spanning from 1950 to 2025 will demonstrate how these theoretical concepts manifest in concrete diplomatic processes, establishing a solid bridge between theory and practice. This theoretical framework not only provides a conceptual map but also supplies the analytical tools to be employed in the empirical sections of the study.

The paradoxical nature of climate diplomacy becomes evident in the tension between knowledge production and epistemic justice. While the Intergovernmental Panel on Climate

Change operates as a mechanism for institutionalizing scientific knowledge, the structural domination of scientists from developed countries in the panel's assessment reports creates epistemic inequality. The production of climate science through satellite observation systems, supercomputer-based modeling, and advanced research infrastructures remains concentrated in Northern countries. This situation perpetuates the transformation of scientific knowledge into strategic capital and the legitimation of power relations through knowledge monopoly. Developing countries' limited capacity for scientific knowledge production marginalizes them in climate negotiations, transforming them into passive recipients of knowledge rather than active producers. Epistemic justice requires not merely the democratization of access to knowledge but the pluralization of knowledge production processes themselves.

The multi-actor governance architecture reveals a profound tension between democratization discourse and accountability deficit. The emergence of non-state actors such as local governments, multinational corporations, civil society organizations, and epistemic communities alongside traditional state actors in climate diplomacy has created a complex network structure. Networks like the C40 Cities Climate Leadership Group have transformed subnational governments into independent actors. The private sector's net-zero emission commitments have strengthened voluntary market mechanisms. However, this actor diversification has generated ambiguities regarding responsibility attribution, enforcement mechanisms, and democratic representation. The question of to whom non-state actors are accountable and through which mechanisms they are controlled has remained unanswered. The governance complexity arising from regime overlap has weakened the effectiveness of climate diplomacy. The intersecting authorities and norm overlaps among processes such as the Intergovernmental Panel on Climate Change, the United Nations Framework Convention on Climate Change, the Green Climate Fund, and the Conference of the Parties create coordination problems. Multi-actor governance, while proclaimed as democratization, has deepened structural inequalities in practice.

The discursive construction of universal participation conceals hegemonic power relations. While the Paris Agreement adopts a system based on nationally determined contributions, presenting an image of equal participation by all countries, this system actually reproduces structural inequalities. Developed countries' historical emission responsibilities are obscured, and the issue is framed as if all countries bear equal responsibility. Developing countries' demands for technology transfer and financial support are relegated to voluntary mechanisms, transforming material justice into a moral appeal. The annual hundred-billion-dollar commitment is neither legally binding nor accompanied by robust monitoring mechanisms. Thus, the Paris system, while seeming inclusive through universal participation discourse, reproduces Northern hegemony in practice. Universal participation, rather than serving as an instrument of justice, has functioned as a legitimization strategy for hegemonic structures.

The transformation of climate security discourse into a threat multiplier has redirected diplomatic processes. The integration of climate change into national security strategies, the definition of climate-induced migration and resource conflicts as security threats, and the military's involvement in climate adaptation policies demonstrate the evolution of climate diplomacy into a strategic domain. However, the securitization process carries the risk of

limiting democratic participation and reinforcing authoritarian tendencies. Framing climate change as an existential threat may legitimize emergency measures, but such measures can weaken civilian oversight mechanisms and narrow spaces for democratic deliberation. The small island states' loss of sovereignty due to rising sea levels raises fundamental questions about the ontological foundations of the international system. The prospect that climate change could entirely eliminate some state territories compels reconsideration of the state-sovereignty nexus in international law.

The tension between technology transfer and intellectual property rights reveals the structural contradictions of climate diplomacy. Developed countries' protectionist policies limiting access to clean technologies hinder developing countries' energy transition processes. The absence of technology transfer causes developing countries to postpone climate action due to the costs of energy transformation. Intellectual property regimes protect the technological superiority of developed countries, obstructing the global diffusion of green technologies. Climate diplomacy, rather than resolving this tension, has relegated it to voluntary initiatives, thus deepening structural inequalities.

The financialization processes of climate finance mechanisms demonstrate the penetration of market logic into climate diplomacy. The expansion of green bond markets has articulated private sector financing with climate diplomacy. However, this financialization process is criticized for reducing climate action to market rationality. The emergence of carbon markets creates new accumulation opportunities while questioning climate justice. Financial resources, rather than addressing the vulnerability of developing countries, have become instruments of capital accumulation. The Green Climate Fund, while established as a solidarity mechanism, remains limited due to developed countries' unwillingness to fulfill their commitments.

The rise of intergenerational justice discourse has deepened the normative dimensions of climate diplomacy. Youth movements such as Fridays for Future gaining legitimacy as new actors in climate diplomacy demonstrates a bottom-up norm formation process. Young activists' participation in United Nations forums has led to the questioning of traditional diplomatic norms. Intergenerational justice has deepened the debate on historical emission responsibility, strengthening the moral foundation for developing countries to demand climate reparations from developed countries. However, intergenerational justice remaining at the discursive level without being embedded in concrete policy mechanisms reveals the limitations of normative transformation.

The digital transformation's effects on climate diplomacy constitute an insufficiently examined area in the literature. The findings identified by the research in the post-2020 period demonstrate that digital climate governance creates a new form of hegemony through data sovereignty and algorithmic prediction systems. While Buck's (2019) discussion of the post-climate engineering era shows how technological interventions can transform governance dynamics, this research reveals that digitalization deepens existing inequalities. The use of artificial intelligence-based modeling, remote sensing technologies, and big data analytics in diplomatic negotiations increases the disadvantage of developing countries because information production requires technical capacity. Digital capacity differentials should enter the agenda of global climate negotiations.

The research's limitations should be considered when interpreting the findings. Access to primary documents covering the entire seventy-five-year historical process is limited by the openness of certain institutional sources. The conduct of diplomatic negotiation processes behind closed doors complicates the detailed analysis of these processes. The generalizability of findings is limited by the interpretive framework inherent in the nature of qualitative research; however, this limitation does not diminish the theoretical contribution but rather enhances analytical depth. The evaluation of the period up to 2025 does not reflect the definitive outcomes of ongoing negotiation dynamics; nevertheless, the analysis of current trends provides a foundation for predicting future orientations.

Recommendations for future research should be shaped toward deepening and expanding the tensions revealed by this research. First, concrete policy proposals should be developed regarding how epistemic injustice can be remedied; the effectiveness of financial and technological support mechanisms for capacity building in developing countries should be examined through comparative case studies. Second, the new forms of hegemony created by digital climate governance should be addressed with critical perspectives in the context of data sovereignty and algorithmic decision-making processes. Third, the accountability and democratic legitimacy problems of the multi-actor governance architecture should be thoroughly discussed within the framework of normative political theory. Fourth, the regional dynamics of climate diplomacy, particularly the roles and strategies of local actors in Africa, Latin America, and Southeast Asia regions, should be investigated through detailed ethnographic studies.

In conclusion, the discussion presented by this research demonstrates that climate diplomacy is not merely an environmental issue but rather a strategic arena where power, knowledge, and normative legitimacy intersect. The seventy-five-year historical process reveals how hegemonic power relations are reproduced behind the discourse of universal participation in climate diplomacy, how scientific knowledge operates as a strategic tool rather than a neutral resource, and how the multi-actor governance architecture, despite being advanced with the promise of democratization, deepens structural inequalities. These findings indicate that global climate governance requires fundamental structural reforms.

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