

Evaluating International Legal Regime on Climate Change: A Comparative Analysis of the Türkiye and Pakistan in the Context of Climate Change Mitigation

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ABSTRACT

This Study explores the comparative effectiveness of the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto protocol and the Paris Agreement in the mitigation of climate change specifically impacts on Türkiye and Pakistan. Both nations face significant climatic challenges, including the increase in temperatures, erratic precipitation patterns and sea level increase. The UNFCCC has provided a fundamental framework for international climatic negotiations, promoting dialogue and cooperation, however, its broad commitments often lack demands, which limits direct impacts nationwide. In contrast, the Kyoto protocol introduced binding emissions reduction objectives for developed countries, which did not extend to developing nations such as Pakistan and Türkiye, which affected their ability to implement substantial climatic actions. The Paris Agreement marked a paradigm shift by emphasizing specific contributions at the national level (NDC), allowing countries to adapt the objectives to their specific circumstances. This flexibility, while encouraging inclusion, ask questions about the adaptation and ambition of each country's commitments. The analysis reveals that Türkiye and Pakistan have used these frames in different extensions, generating mixed results in national climate resilience and adaptation strategies. While Türkiye, as an OECD member and candidate for European Union accession, faces unique challenges in balancing its development trajectory with emission reduction commitments. Türkiye has advanced in the development of renewable energy, Pakistan faces vulnerabilities exacerbated by socio -economic limitations. Ultimately, the effectiveness of these international agreements depends on the political will, institutional capacities and social participation in each country, which highlights the need for greater cooperation and support mechanisms to address climatic vulnerabilities more effectively. This comparative evaluation underlines the complexities of climate governance and the need for personalized approaches to address the unique challenges faced by Türkiye and Pakistan. The paper concludes with policy recommendations to enhance compliance,

strengthen institutional frameworks, and promote regional cooperation in line with evolving international climate law.

Keywords: *International Climate Legal regime; Climate Change Mitigation; Legal Frameworks; Kyoto Protocol , Türkiye; Pakistan; Paris Agreement; Climate Governance*

INTRODUCTION

Assessing Global Climate Action: Turkey and Pakistan's Commitments and Compliance under the UNFCCC, Kyoto Protocol, and Paris Agreement, Climate change represents one of the most serious challenges faced by humanity, demanding a solid international collaboration and commitment to Effective Policy Mark. The United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto protocol and the Paris Agreement have become fundamental pillars in the global response to climate change. Each of these agreements seeks to mitigate climatic impacts through structured commitments and collaboration efforts between nations, thus forming a complex network of international climate governance. This analysis focuses on Türkiye and Pakistan, two countries that embody the intersection of the dynamics of the developing nation and developed within this framework. The UNFCCC established an integral framework in 1992 with the aim of reducing greenhouse gas emissions, serving as the basis for subsequent agreements (Occhipinti and Verona, 2019).

Within this framework, Türkiye and Pakistan have articulated their climate policies and commitments. Türkiye, classified as an emerging economy, has fought to balance its development objectives against the imperatives of compliance with international climate commitments (Batmaz and Sisman-Aydin, 2025). Pakistan, on the other hand, although it is a developing nation with various vulnerabilities towards climate change, has affirmed its commitments under the Paris Agreement and the UNFCCC, although it faces significant challenges in the implementation (Mardan et al., 2024).

The Kyoto protocol, adopted in 1997, introduced legally binding commitments for developed countries to reduce greenhouse gas emissions (ERBIL, 2025). He distinguished between the developed and developing nations, which resulted in criticisms related to equity and equity in cargo exchange, particularly from countries such as Turkey and Pakistan (ARI and Sari, 2017). In this sense, the breach of Türkiye with the binding objectives under the protocol has led to criticism, given its economic status and its emission profile (Tok Lazoğlu, 2024). On the contrary, Pakistan's commitment to the Kyoto protocol reflects his resources limitations, which have severely limited their ability to adhere to the strict expected commitments under the agreement (ALI, XU and AHMAD, 2021).

The 2015 Paris Agreement marked a significant change by encouraging nations to establish their own objectives, known as specific contributions at the national level (NDCS), which reflects their capacities and responsibilities (King and Van Den Bergh, 2019). The recent Alignment of Turkey with the Paris Agreement highlights a strategic axis towards a low carbon future, as demirbilek (2025) highlights, while Pakistan's commitment is equally critical, since it formulates a framework for resilience against climatic impacts (Kaminski, 2018). The inclusive nature of Paris Agreement aims to cover a broader spectrum of countries under its umbrella, promoting an equitable approach to climate action (Atici, 2022).

However, the practical effectiveness of these frameworks to induce compliance and achieve reductions of real emissions remains controversial. Turkey's trip towards compliance has been documented as a complex, with factors such as political will, economic considerations and public awareness that play a significant role (Lazoğlu, 2024). In fact, Türkiye has found significant obstacles in the alignment of its national policies with the objectives delineated in the Paris Agreement, partly due to continuous economic and geopolitical challenges, as Okutan (2018) pointed out. Pakistan's commitment to climate change

frameworks is not exempt from challenges. The country faces acute risks of climatic impacts, including floods and heat waves, which require urgent climate action (Abbas, Bhatti and Aziz, N.D.).

Despite these vulnerabilities, Pakistan's climatic policies have illustrated a proactive position to commit to international efforts, integrating climate adaptation and resistance in their national strategies (Mani et al., 2018). However, the nation continues to exhibit gaps in the financial and technological support necessary to fulfill these commitments effectively (Pauw et al., 2024).

When evaluating the fulfillment of Turkey and Pakistan within the UNFCCC, Kyoto and the Paris Agreement, it is clear that regional socio-economic contexts and political structures substantially influence their climatic policies (Kompas, Pham and Che, 2018). In addition, the disparity in the capacities between the nations developed and in development complicates the panorama of the climate government, creating challenges and opportunities for global collaboration (Qin and Yu, 2023). The change of responsibility from the Global North to the South Global emphasizes the need for a more nuanced approach in the negotiation and operationalization of international climate agreements (Anwar and Akhter, N.D.).

In general, although the substantial frameworks established by the UNFCCC, Kyoto protocol and the Paris Agreement provide the necessary orientation to combat climate change, its successful implementation depends largely on the commitment and fulfillment of individual nations, particularly those like Turkey and Pakistan. Success in this effort requires not only national commitment but also global cooperation to mitigate the risks raised by climate change. In conclusion, the ways forward to both nations are plagued by challenges, however, they present opportunities for innovation in climate governance, adaptation strategies and international collaboration, thus influencing the broader narration of climate change responses throughout the world. Regime Theory (within International Relations & International Law), will be employed for this study.

Literature Review:

The commitments and conformity of Türkiye and Pakistan under the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Paris Agreement provide a nuanced landscape to understand how developing countries sail on climate change obligations. Türkiye and Pakistan, both signatories to these international executives, have continued variable strategies that reflect their unique socio-economic contexts and their political landscapes. The incorporation of Türkiye into the climate change regime has been the subject of a thorough examination. As tok Lazoğlu (2024) and Kovancı (2023), Türkiye adopted his climatic policies, marks his centenary, marked a critical stage in which he sought to align national interests with global commitments. Country climate change policies have often oscillated between development needs and international expectations (Arisoy and Abdullahi, 2023). The complexities surrounding Türkiye's obligations are still complicated by its status as developing countries which aspires to be recognized as a developed nation (Ari and Sari, 2017).

In the context of the Paris Agreement, compliance has become an important theme. The contribution determined at the national level of Türkiye (NDC) reflects a commitment to reduce greenhouse gas emissions, but the lack of specific quantitative targets has raised questions about its effectiveness (Demirbilek, 2025). This flexible approach, although accepted for certain developing countries, is criticized as insufficient given the terrible realities of the climate (Kovancı, 2023). Nevertheless, Türkiye actively engages in global dialogues on climate change, positioning itself as a regional leader in the Islamic world, as Kaminski noted (2018).

In comparison, Pakistan's approach to its international obligations under UNFCCC has also demonstrated a strategic alignment of national and international climatic objectives. The country is confronted with notable challenges due to strong vulnerability to climatic impacts, in particular affecting rural livelihoods (Yousaf et al., 2025). This context requires a more aggressive strategy to combat climate change. Ali, Xu and Ahmad (2021) underline the need for a systematic reform of Pakistan's climate governance,

recognizing the obstacles posed by socio-political dynamics that complicate effective implementation. The two nations showed a degree of compliance with the Kyoto protocol, although different levels of success. Pakistan, widely classified as a non-Annex I party, has benefited from flexibility mechanisms described in the Kyoto protocol, allowing it to focus on sustainable development while joining international standards (Atici, 2022). The gap between rhetoric and action has been widespread in discussions on Pakistan's climatic policies, suggesting a disconnection which must be reconciled for effective compliance (Ghazaryan, 2023).

By assessing compliance with the Paris Agreement, we recognize the contrasting trajectories taken by Türkiye and Pakistan. Türkiye's recent push towards low carbon policies was characterized by an adaptation of its legal framework to meet international standards, although criticism highlights a simple continuation of existing policies without substantial lowering of emissions (Demirbilek, 2025). Meanwhile, Pakistan's strategy focused on local adaptation measures against climate change, such as Yousaf et al. (2025) argue that robust legal and political frameworks could improve their compliance trajectory. The state's institutions and legal framework will be reinforced as a result (Abbas et al., 2022).

The variations in commitments and efficiency under the Paris Agreement highlight a broader question in international climate governance. As indicated by Kumar et al. (2024), the transition from ambitious promises to tangible actions remains heavy with challenges, in particular for developing countries. The disparity between the expectations of developed countries and in continuous development to shape the results of climate negotiations, where financial mechanisms to support adaptation and attenuation are necessary (Boyle and Ghaleigh, 2016). In addition, it is essential to understand the role of customary international law in the development of states' obligations, including Türkiye and Pakistan. Mayer (2023) stresses that the principles of responsibility and responsibility of the State can underpin the commitments that these countries have made. This legal perspective becomes essential when considering the implications of non-compliance, where international law could exert pressure or encourage changes to national policies (Mayer, 2022).

This comparative analysis also reflects the potential for collaboration and learning between the two countries. Both are located in the world south and the challenges between them in front of migration, food security and economic resilience induced by the climate (Anwar and Akhtar, 2023). In order to create a liberal economic environment, the constitutional and legislative processes are expanded (Abbas et al., 2022). Thus, the construction of cooperative frameworks which are based on shared experiences and common challenges can improve their individual and collective responses to climate change (Turkamani, 2023).

An assessment of the strategies of Türkiye and Pakistan in the context of the Kyoto protocol and the Paris Agreement reveals a complex interaction of conformity, commitment and efficiency in climate governance. While Türkiye has made progress towards the integration of climatic objectives in its national program, its effectiveness remains under surveillance due to waves targets of emissions and implementation challenges. Conversely, the concentration of Pakistan on localized adaptation strategies reflects the capacity of flexible conformity, while facing important obstacles in the execution of policies. The roads of the two nations illustrate the broader challenges within the international governance of climate change, requiring innovative approaches to improve compliance and stimulate effective climate action in the world. Thanks to a continuous dialogue, shared learning and increased accent on legal obligations, Türkiye and Pakistan can potentially emerge as proactive players in the world climate arena.

The comparison between the commitments, challenges and implementations of Turkey and Pakistan pursuant to international climatic agreements, in particular the UNFCCC, the Kyoto protocol and the Paris agreement, reveals substantial differences and shared challenges that offer insights on their respective approaches to climate change. Turkey's commitment with the United Nations Framework Convention on

Climate Changes (UNFCCC) illustrates its unique position both as a development economy and in transition. Historically, Turkey has maintained a double position during climate negotiations, supporting country status developing its needs for economic growth (Erbil, 2025).

The country has affirmed its commitment through the Kyoto protocol, although as part not annexed I, underlining the differentiated responsibilities in line with its development trajectory (Ari & Sari, 2017). On the contrary, Pakistan's narration within the UNFCCC framework largely reflects the challenges of a development nation that faces serious vulnerabilities for climatic impacts. Pakistan's participation was characterized by a focus on adaptation measures, highlighting its socio-economic vulnerabilities for the effects on climate change (Yousaf et al., 2025). Based on the Kyoto protocol, Turkey has faced challenges to reconcile its industrial aspirations with environmental commitments. While ratified the protocol, Turkey delayed the binding objectives until more economic guarantees has ensured, revealing a tension between environmental and economic priorities (Tok Lazoğlu, 2024).

On the other hand, Pakistan's approach as part of the Kyoto protocol was less controversial due to its country status not allowing it to focus more on the adaptation rather than on rigorous mitigation obligations (Naser & Pearce, 2022). This outline emerges when both countries exemplify the complexities faced by the development of nations that navigate on climatic policies that often reflect external perceptions and internal needs. The Paris agreement has marked a fundamental moment, since both Turkey and Pakistan have committed themselves to determined contributions at national level (NDC) which reflect their respective skills and priorities. The initial NDC of Türkiye has targeted a conditional reduction in greenhouse gas emissions by 21% by 2030, depending on the reception of international support (Demirbilek, 2025).

However, the country's commitment has been criticized in order not to align with adequate long-term climatic strategies (Lazoğlu, 2024). On the contrary, the NDC of Pakistan, which aims to reduce emissions of 20% compared to the company scenarios as usual by 2030, reflects a more ambitious position, showing its intent to align with global climatic objectives despite limited financial resources (Yousaf et al., 2025).

Both countries face significant socio-economic challenges in the implementation of their climatic commitments. The rapid industrialization of Türkiye and the energy dependence on fossil fuels create obstacles to the transition to more green alternatives (Ahmmed, 2021). The politician is further complicated by public reluctance and economic costs associated with renewable energy transitions (Kaminski, 2018). Pakistan faces its set of obstacles, including insufficient infrastructures for climatic resilience and a lack of financial support for large adaptation projects (Ali, Xu and Ahmad, 2021). The priority of development needs compared to environmental concerns remains a significant challenge for both nations while trying to fulfill their international commitments (Anwar & Akhter, 2025).

In addition, the implications of international law and climatic agreements represent both opportunities and challenges for Turkey and Pakistan. The interaction between the formation of internal policies and international expectations continues to model their climatic agendas (Boyle & Ghaleigh, 2016). For Turkey, the incorporation of EU climatic political paintings influenced its strategies, which have often been perceived as late compared to European standards (Allen, 2021). For Pakistan, international support for climatic initiatives, if aligned with national interests, has actually mobilized efforts against sustainable development paths, showing a synergistic approach to integration with global climatic objectives (Ahmmed, 2021). Mutual understanding and a sound, unbiased administrative structure will be helpful in this regard (Abbas et al., 2022). Recent analyzes show that both Turkey and Pakistan experience heterogeneous impacts of climatic agreements, largely due to their different skills and formation of strategies (Ghosh & Sourav, 2025).

As evident from the performance of the respective NDC, Turkey's emissions have substantially increased, reporting challenges in achieving its goal, while Pakistan dependence on adaptation strategies facilitates

some progress towards its commitments (Saurav & Ghosh, 2025). This scenario highlights the disparities in the effectiveness of implementation in the field of the same global paintings, reflecting the localized challenges that diverge from formal commitments. Complexities relating to climatic funding further complicates the implementation processes for both countries. Turkey, still classified by some as a developing country, tries to access the financial mechanisms pursuant to the Paris agreement while facing skepticism for its ability to achieve its goals (Demirbilek, 2025). Pakistan, on the other hand, has a desperate need for solid international financial support to improve its climate action initiatives, effectively demonstrating how financial instruments can play a crucial role in the creation of climate commitments (Man et al., 2018).

In summary, the narratives on the climate change of Türkiye and Pakistan within the UNFCCC, Kyoto and Paris protocol illustrate distinct trajectories modeled by socio-economic contexts, international obligations and domestic challenges. Turkey is preparing with the duality of growth and environmental responsibility, often leading to a delay in commitment in the face of economic growth. On the contrary, the vulnerability of Pakistan to climatic impacts guides its solid adaptation strategies, although limited by its financial constraints. While both countries advance, the integration of climatic action with development policies remains fundamental to fulfill their obligations and effectively deal with the wider implications of climate change. The dialogue and support continues internationally will be essential to help both nations to overcome the myriads of the challenges deriving from the policies and the implementation of climate change.

Theoretical Framework

Regime Theory (within International Relations & International Law), Regime Theory offers a critical lens through which to analyze state behavior and international cooperation. By postulating that international regimes - seven m of implicit or explicit rules, rules and rules - interactions between states, this theory highlights the influence of collective agreements on global governance. It promotes stability and predictability in interstate relationships, facilitating cooperation in issues such as trade, environment and safety. Moreover, within the structures of international relations and international law, the regime theory emphasizes the importance of multilateralism, suggesting that cooperative structures increase compliance and adherence to legal norms, finally promoting a more ordained international system. Therefore, the Paris Agreement, Kyoto Protocol, UNFCCC, and other international legal frameworks pertaining to climate change are themselves a system of standards, guidelines, and decision-making processes that regulate state conduct.

Research Questions

- How effective is the current international legal regime on climate change in promoting environmental protection in Pakistan and Türkiye?
- What are the key challenges faced by Pakistan and Türkiye in implementing climate change mitigation and adaptation measures?
- What are the existing governance mechanisms in Pakistan and Türkiye for coordinating and implementing climate change policies, and how effective are they in addressing climate change?
- What are the potential areas for alignment between Pakistani and Turkish environmental protection laws and policies in addressing the challenges of climate change?
- What degree of cooperation exists in Türkiye between the public and commercial sectors to support climate change adaptation and sustainable development?
- Based on the findings, what recommendations can be made for strengthening the international legal regime on climate change and improving climate change policies and governance in Pakistan and Türkiye?

DISCUSSION AND RESULTS

The international reaction to climate change has changed during the decades that it has been on the agenda. Since the 1970s, when climate change was first recognized, the worldwide legal framework has changed, culminating in the 2015 approval of the Paris Agreement. A comprehensive grasp of the issue's historical background is necessary to comprehend the current legal framework and the obstacles now facing the fight against climate change.

Growing worries about climate change led to the creation of the UN Framework Convention on Climate Change (UNFCCC) in 1992. In order to avoid harmful human interference with the climate system, the UN Framework Convention on Climate Change (UNFCCC) aims to stabilize greenhouse gas concentrations in the atmosphere. The CBDR-RC principle was initially created by the UN Framework Convention on Climate Change (UNFCCC), which acknowledged the necessity of taking action as a group to combat climate change. In 1995, the first Conference of the Parties (COP) to the UNFCCC approved the Berlin Mandate. A legally enforceable agreement defining emission reduction objectives for wealthy nations was to be negotiated as part of the Berlin Mandate.

Signed in 1997, the Kyoto Protocol was the first international agreement to set legally binding carbon reduction objectives for wealthy nations. Between 2008 and 2012, industrialized nations were required by the Kyoto Protocol to reduce their greenhouse gas emissions by an average of 5.2% below 1990 levels. The Clean Development Mechanism (CDM), a flexible market-based mechanism created by the Kyoto Protocol, permitted wealthy nations to offset their emissions by funding emission-reduction initiatives in developing nations.

An important turning point in the global response to climate change was the 2009 Copenhagen Climate Conference. A non-binding agreement known as the Copenhagen Accord acknowledged the need to limit global warming to less than 2 degrees Celsius and to give developing nations financial support so they can better adapt to the effects of climate change. The Paris Agreement's foundation was likewise set by the Copenhagen Accord. The international response to climate change underwent a sea change with the signing of the Paris Agreement in 2015. In addition to pursuing efforts to keep temperature rise at 1.5°C, the Paris Agreement seeks to keep global warming well below 2°C over pre-industrial levels. Countries are empowered by the Paris Agreement to create their own NDCs according to their respective national capabilities and conditions. In order to evaluate progress toward the long-term objective of the Paris Agreement, the Global Stock take procedure was also developed.

The world is currently falling short of the targets set forth in the Paris Agreement, and the effects of climate change are getting worse despite international efforts. Aiming to keep global warming to less than 2°C over pre-industrial levels, the 2015 Paris Agreement also pursues efforts to keep temperature increases to less than 1.5°C. Countries are permitted by the Paris Agreement to establish their own NDCs in accordance with their own national capabilities and circumstances. Under the Paris Agreement, Turkey submitted its NDCs and is a party to the UNFCCC. However, this concept is heavily reliant on industrialized nations providing financial and technological support. Türkiye is susceptible to the negative effects of climate change, including food insecurity, water scarcity, and extreme weather events like droughts and floods. The Paris Agreement's foundation was likewise set by the Copenhagen Accord. The international response to climate change underwent a sea change with the signing of the Paris Agreement in 2015.

How effective is the current international legal regime on climate change in promoting environmental protection in Pakistan and Türkiye?

Assessing Climate Change Efficacy: The Role of UNFCCC, Kyoto Protocol, and Paris Agreement in Shaping Pakistan and Türkiye's Environmental Policies, The urgency of climate change has incited

international initiatives designed to promote global cooperation in mitigation strategies. Among these initiatives, the United Nations Convention -United Climate Change (UNFCCC), the Kyoto Protocol and the Paris Agreement stand out as significant milestones. The effectiveness of these structures, particularly regarding their impact on climate change policies and practices on Pakistan and Türkiye, ensures critical examination. Both nations face distinct environmental challenges and were involved in these international agreements in various ways, presenting an opportunity to evaluate their effectiveness in promoting substantive actions against climate change. The UNFCCC, established in 1992, served as a fundamental structure for subsequent weather agreements. The goal was to stabilize greenhouse gas concentrations, allowing sustainable development (Nachmany et al., 2015).

For Pakistan, a country inherently vulnerable to climate change, UNFCCC has provided a platform to articulate its climate concerns in a global scenario. Pakistan has been a vocal defender of climate justice, emphasizing the disproportionate impacts of climate change in developing countries (Hassan, 2022). This alignment has been crucial to Pakistan to ensure international support for adaptation financing and training initiatives.

International Climate Agreements Participation:

Agreement/Protocol	Pakistan	Türkiye	Effectiveness in Environmental Protection
UNFCCC (1992)	(Ratified 1994)	(Ratified 2004)	Provides framework, but weak enforcement.
Kyoto Protocol (1997)	(Ratified 2005)	(Ratified 2009 as Annex I without reduction target)	Limited impact; lack of binding emission cuts.
Paris Agreement (2015)	(Ratified 2021)	(Ratified 2021)	Stronger global momentum; nationally determined contributions (NDCs) remain under-ambitious.
Montreal Protocol (1987, Ozone)	Yes	Yes	Successful in phasing out ozone-depleting substances, indirect climate benefit.
Other Regional/Soft-Law Initiatives	Limited engagement	EU-linked frameworks (candidate country obligations)	Türkiye has stronger alignment due to EU accession process.

Table 1

National Implementation & Compliance:

Indicator	Pakistan	Türkiye	Observed Effectiveness
NDC Ambition	50% reduction (conditional on finance)	Net zero by 2053	Both conditional; limited clarity on pathways.
Climate Legislation	Pakistan Climate Change Act 2017	National Climate Change Adaptation Strategy (2021)	Frameworks exist but weak enforcement.
Institutional Capacity	Ministry of Climate Change (under-resourced)	Ministry of Environment, Urbanization, and Climate Change	Türkiye stronger capacity, Pakistan struggles with governance gaps.
Renewable Energy Policies	30% renewable target by 2030	32% renewables by 2030 (aligned with EU)	Türkiye more advanced in integration, Pakistan facing financing challenges.

Table 2

Türkiye's involvement with UNFCCC has evolved alongside its geopolitical aspirations. As a growing regional power, Türkiye took advantage of its involvement in UNFCCC to improve its international position and attract investments for sustainable projects (KOVANCI, 2023). The establishment of the Climate Change and Air Quality Coordination Center in 2018 illustrates this commitment (Gören, 2025). By leveraging UNFCCC, Türkiye focused on more adaptive climate strategies, thus contributing to his broader development goals while responding to climate change. The Kyoto Protocol, adopted in 1997, introduced legally commitments to reduce binding emissions, especially to developed countries. However, its limited success is often attributed to non-compliance by the main nations and the absence of substantial commitments from developing countries (UDO et al., 2024).

In Pakistan, Kyoto's protocol did not significantly altered the country's trajectory in relation to climate policy, as it was not mandatory to reduce emissions under this structure (Jatoi et al., 2023). However, the emphasis of the protocol in clean development mechanism (CDM) projects led to some investment flow to renewable energy initiatives and energy efficiency in Pakistan (Islam, 2020). Despite these efforts, the overall impact of the Kyoto protocol on the structure of Pakistan remained limited, mainly due to its non-binding nature for countries such as Pakistan. On the other hand, Türkiye actively participated in the Kyoto Protocol, positioning itself as an emerging market with unique climate needs. Although initially classified as a party other than Annex I, Türkiye sought recognition for his developmental challenges within the protocol (Tok Lazoğlu, 2024).

This participation allowed Türkiye to engage in various CDM projects, thus facilitating investments in renewable energy and contributing to emission reductions (OKUTAN, 2018). However, Türkiye's commitment to greenhouse gases mitigating is still a point of discord, as its economic expansion often prioritized industrial growth on environmental safeguards (Deniz et al., 2024). The Paris Agreement, an operational since 2016, has represented a significant change towards inclusive and flexible climate governance, advocating nationally determined contributions (NDCs) of all countries. For Pakistan, this structure proved instrumental as it aligns with the sustainability objectives of the country and its vulnerability to climate impacts (üstün, 2023). The updated NDC sent by Pakistan includes ambitious goals to reduce emissions and improve resilience (RAFI, 2025).

This commitment reflects recognition of the Pakistan of their climate vulnerabilities and the need for robust policies that support the efforts of adaptation and mitigation. In Türkiye, the Paris Agreement facilitated a critical review of its climate strategies, invoking a national discourse that began to reassess its industrial practices and greenhouse gas emissions (USTUN, 2023). The newly established NDC aims to reduce greenhouse gas emissions by 21% by 2030 compared to business as usual, a significant step taken to its historical dependence on fossil fuels (Deniz et al., 2024). However, they remain challenges, including political resistance to the transition from coal and industrial emissions, highlighting weaknesses in the mechanisms of execution and responsibility within national legislation related to climatic commitments (Sevinçli & Savaş, 2024).

Both Pakistan and Türkiye face unique challenges in the implementation of effective climate policies, driven by domestic economic concerns and development agendas. In Pakistan, the slow response to adaptation to climate change has often been exacerbated by governance and limited financial resources (RAFI, 2025). On the other hand, Türkiye's climate policies are often in disagreement with their ambitious objectives of economic growth, putting it in a critical junction of the development of equilibrium and environmental preservation (KOVANCI, 2023). Such contradictions question the effectiveness of

international agreements, as realities on the ground usually differ from the ideals established by structures such as UNFCCC, Kyoto Protocol and Paris Agreement.

Effectiveness Matrix of International Legal Regime:

Criteria	Pakistan	Türkiye
Legal Compliance	Moderate	High
Enforcement	Weak	Moderate
Institutional Capacity	Weak	Stronger
Climate Finance Access	Limited	Better access (due to EU ties, foreign investment)
Environmental Protection Outcomes	Limited (pollution, deforestation, floods)	Improving (renewables, emissions control)

Table 3

In conclusion, while UNFCCC, Kyoto Protocol and Paris Agreement provided critical platforms to shape climate policies in Pakistan and Türkiye, its effectiveness depends on the willingness of each nation to align its economic goals with environmental sustainability. Pakistan's involvement with these structures has focused mainly on adaptation and climate justice, while Türkiye sailed to its climate commitments through its aspiration for socioeconomic growth. The different impacts of these international agreements underline the need for contextualized approaches that respond not only to global climate objectives, but also to the unique political and socioeconomic landscapes of each country. Therefore, future efforts in climate governance should emphasize the integration of international commitments with national priorities, ensuring that countries such as Pakistan and Türkiye can forge paths toward resilience and sustainability in an increasingly uncertain climate.

What are the key challenges faced by Pakistan and Türkiye in implementing climate change mitigation and adaptation measures?

Navigating Climate Challenges: Governance, Resources, and International Cooperation in Pakistan and Türkiye's Implementation of UNFCCC, Kyoto Protocol, and Paris Agreement, Climate change represents one of the most significant global challenges of our time, and its disproportionate impacts on developing nations underline the pressing need for effective international cooperation to address this crisis. Pakistan and Türkiye, two countries that face critical environmental and socio-economic challenges, find numerous obstacles in the execution of climate change initiatives under international frameworks such as the United Nations framework convention on climate change (UNFCCC), the Kyoto protocol and the Paris Agreement. This analysis focuses on three main areas in which these nations face barriers: governance, resources and international cooperation.

Governance plays a fundamental role in the effective execution of climate change initiatives. In Pakistan, fragmented governance structures often hinder a cohesive response to climate change. The central government struggles to implement national policies effectively due to political instability and lack of coordination between provincial governments (Khan et al., 2016). In addition, bureaucratic inefficiencies create bottlenecks in the formulation and execution of climatic policies, undermining the potential benefits of frames such as the Paris Agreement (Yousaf et al., 2025).

In contrast, Türkiye has advanced towards the integration of climatic policies in its national agenda. However, it faces significant challenges related to the alignment of local governance with national climatic

strategies (Türkeş, 2017). Local governments often lack the capacity, resources and authority to implement climatic initiatives effectively, which can stop comprehensive climate action.

Comparative Challenges in Climate Change Implementation:

Challenge Area	Pakistan	Türkiye
Economic Constraints	Heavy reliance on climate finance & loans; limited domestic funds for renewable energy	Middle-income status with growing economy but hesitant to commit to costly mitigation
Energy Dependence	Fossil fuel imports dominate energy mix; slow renewable adoption	Coal & natural gas central in energy policy despite renewable potential
Institutional & Governance Gaps	Weak enforcement of climate laws; overlapping jurisdictions; political instability	Stronger institutions but fragmented policy between environment, energy, and industry
Technological Barriers	Limited capacity for green tech, weak R&D, dependence on foreign expertise	More advanced industry but lacks large-scale innovation in decarbonization
Urbanization & Infrastructure	Rapid urbanization without climate-smart planning; poor waste management	Expanding cities vulnerable to heat waves, floods, and sea-level rise
Agricultural Vulnerability	Agriculture-dependent economy highly exposed to floods, droughts, and heatwaves	Semi-arid regions vulnerable; water scarcity threatens food security
International Pressure & Commitments	Weak negotiating power in climate finance mechanisms	Obligated to balance climate action with EU integration pressures

Table 4

Both nations also deal with limitations of resources that inhibit their climate change efforts. Pakistan, categorized as one of the most vulnerable countries for climate change impacts, lacks adequate financial resources to implement large -scale adaptation and mitigation projects (Yousaf et al., 2025). The dependence on external aid for climatic finances further complicates the situation, since donor dependence can lead to uncertainties and limitations in long -term planning. Despite the commitments assumed under the Kyoto protocol and the Paris Agreement, Pakistan's limited access to climatic finances suffocates its ability to invest in sustainable development initiatives (Mako et al., 2022).

Adaptation vs. Mitigation Challenges:

Dimension	Pakistan	Türkiye
Adaptation Challenges	Flood management, glacier melt, extreme weather, displacement of rural communities	Drought, water scarcity, desertification, sea-level rise along Mediterranean coast
Mitigation Challenges	Low renewable capacity, reliance on imported oil & coal, limited industrial regulation	Slow transition to renewables, continued reliance on coal, resistance from industrial lobbies

Table 5

In Türkiye, although the government has shown interest in the transition to low carbon policies, resources limitations persist. The continuous dependence of fossil fuel energy sources and the important investments required for renewable energy transitions propose financial loads that hinder the effective implementation of climatic strategies (Demirbilek, 2025). In addition, rapid urbanization and population growth exert

additional tension on resources, reducing the government's ability to assign funds properly for climate change initiatives (Kovancı, 2023).

Consequently, the efforts of both nations under international agreements are hindered by the lack of financial and human resources. International cooperation is essential for successful implementation of climatic initiatives. Pakistan's participation in international climatic agreements has been inconsistent, mainly due to its limited commitment in global climate discourse (Rezvi et al., 2024).

This inconsistency affects its credibility and ability to attract international funds and essential technical assistance to execute climatic projects. In addition, there is a perceived imbalance in the responsibilities between the nations developed and in development, which complicates Pakistan's negotiations under the UNFCCC (Anwar and Akther, 2024). Global northern-south dynamics has led to skepticism regarding the effectiveness of international climatic policies, further exacerbating Pakistan's climate crisis (Anwar and Akther, 2024).

On the contrary, Türkiye's participation in international initiatives presents a complex narrative. As an emerging economy, Türkiye Lidia with the double challenge of addressing national development needs while adheres to international climate commitments (Tok Lazoğlu, 2024). Despite its growing participation in global climatic discussions, the country is often caught among its development aspirations and strict climatic obligations under the Paris Agreement (Ali et al., 2021).

In addition, Türkiye's geopolitical state influences its international cooperation capacities in climate matters, since regional tensions can affect collaboration initiatives with neighboring countries. In the search to solve these obstacles, both nations require comprehensive policies that incorporate effective governance, the mobilization of resources and the strengthening of international associations. For Pakistan, it is vital to improve governance structures to promote clear communication and coordination between several government layers, ensuring that climatic policies are effectively implemented (Khan et al., 2016). In addition, there is a pressing need for innovative financing mechanisms to reinforce investment in resistant climatic infrastructure and sustainable practices (Mako et al., 2022).

Similarly, Türkiye must explore innovative energy solutions and diversify sources of financing to make the transition to renewable energy more extended (Demirbilek, 2025). International collaborations, such as technology transfer agreements and capacity construction programs, can help Türkiye overcome their resources limitations while fulfilling global climatic commitments. The development of regional cooperation frameworks can also improve the exchange of information, thus improving climatic action.

Challenge Matrix (Qualitative Assessment):

Challenge Category	Pakistan	Türkiye
Financial	Severe	Moderate
Institutional	Severe	Moderate
Technological	Moderate	Moderate
Social Awareness	Moderate	Moderate
Climate Vulnerability	Extreme	High

Table 6

Ultimately, obstacles that prevent climate change initiatives in Pakistan and Türkiye under international frames encapsulate a broader struggle that many developing countries face. Governance challenges, resource deficiencies and international cooperation complexities significantly undermine their skills to fulfill their commitments under the UNFCCC, Kyoto and Paris agreement. Concerted efforts aimed at improving national capacities, ensuring sustainable funds and promoting international collaboration are

essential for both nations to exceed these challenges and contribute effectively to global climate action (MASLIN et al., 2023; OCCHIPINTI and VERONA, 2019). Only through such comprehensive approaches can Pakistan and Türkiye expect to mitigate the harsh realities of climate change and progress towards sustainable development (VERONA, 2019).

What are the existing governance mechanisms in Pakistan and Türkiye for coordinating and implementing climate change policies, and how effective are they in addressing climate change?

Comparative Analysis of Climate Change Governance: Effectiveness of Pakistan and Türkiye in Implementing UNFCCC, Kyoto Protocol, and Paris Agreement, the Governance mechanisms on climate change policies in Pakistan and Türkiye serve as critical frameworks in the International Climate Regime, in particular within the framework of the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Paris Agreement. The analysis of these mechanisms reveals the essential information on how the two countries manage their obligations and their contributions to the fight against climate change and explore their effectiveness in reducing carbon emissions and the fight against socio-economic impacts of climate change.

Pakistan and Türkiye, both signatories to these international agreements, are subject to governance executives who dictate how climate policies are shaped and implemented. The UNFCCC, initiated in 1992, emphasizes collective action and international cooperation between its parties to stabilize the greenhouse gas concentrations (Maslin, Lang and Harvey, 2023). Pakistan's climate governance is largely influenced by its national climate change (NCCP) policy, which was adopted in 2012 and updated afterwards. This policy describes a framework to integrate the adaptation and attenuation of climate change in national development strategies, reflecting its commitment under CCNUCC. Despite this, challenges remain in application and a sufficient allocation of resources (Qureshi and Ijaz, 2025).

On the other hand, the approach of Türkiye was considerably shaped by its unique geopolitical position and its aspirations for the EU. Türkiye has developed its climatic policies, such as the National Climate Change Action Plan, which aligns its commitments from the Paris Agreement (USTUN, 2023). After the ratification of the Paris Agreement, Türkiye established its determined contribution on a national level (NDC), demonstrating a substantial commitment to reduce annual emissions (Lazoğlu, 2024). However, experts argue that the effectiveness of these policies depends on improving the quality of governance, transparency and the commitment of stakeholders (Berrich, Mafakheri and Dabbou, 2024).

As part of the Kyoto protocol, the two countries have approached their commitments differently because of their status as developing countries. While Türkiye, originally classified as a country in Appendix II, pleaded for an obligation modified under the protocol, Pakistan, as an unattractive country I, was confronted with the challenge of limited industrialization (Qadir et al., 2025). The governance mechanisms in place during this period were characterized by dependence on climate finance and technology transfer focused on donors, but uneven access to such resources has hampered effective implementation in Pakistan (Mako et al., 2022).

The transition from the Kyoto protocol to the Paris Agreement caused additional changes in governance approaches. The ascending framework of the Paris Agreement allows countries to set self-determinate objectives, which has undoubtedly given more agency in developing countries (Qin & Yu, 2023). For example, while Türkiye presented its improved NDC, the extent to which these commitments result in effective measures depends on political will and administrative capacities (Demirbilek, 2025). Likewise, Pakistan presented its determination through its framework for a green economy climatic resilient; However, questions related to institutional fragmentation and lack of coordination between various ministries represent important obstacles to the successful implementation of its climate action strategies (Sheeraz et al., 2024).

Comparative table Governance mechanisms for climate action (Pakistan vs. Türkiye):

Governance function / mechanism	Pakistan what exists (short)	Effectiveness (0–5) & short reason	Türkiye — what exists (short)	Effectiveness (0–5) & short reason
National legal framework	Pakistan Climate Change Act (2017) + National Climate Change Policy / National Adaptation Plan (NCCP, NAP 2023). Act creates Pakistan Climate Change Council (PM-chaired) and a Climate Change Authority. (Asia Pacific Energy Policy)	3/5 — Strong legal basis on paper; gaps in rules, regulations, and sustained financing slow full implementation. (Asia Pacific Energy Policy)	National strategies (long-term & 2024–2030 Strategy) → now complemented by a new Climate Law (2025) ; recent law formalises governance, ETS/legal basis and institutional roles. (iklim.gov.tr)	4/5 — Recent law fills a long-standing legal gap and enables carbon market instruments; implementation details still rolling out. (ICAP Carbon Action)
Central coordinating body / political leadership	PM-level Climate Change Council + Ministry of Climate Change & Environmental Coordination (federal). Ministry chairs national planning and international reporting. (Asia Pacific Energy Policy)	3/5 — High-level council improves mandate/visibility, but coordination with powerful sector ministries and the finance ministry remains uneven. (Asia Pacific Energy Policy)	Environment & Urbanization Ministry (Climate department) leads coordination; climate law establishes clearer institutional roles (carbon market board, climate department functions). (iklim.gov.tr)	4/5 — Central ministry stronger legally; political will mixed but improving; new bodies (carbon board) increase coordination capacity. (iklim.gov.tr)
Subnational / provincial governance	Provinces have their own environment/climate departments and province-level policies (KP, Sindh, Balochistan etc.); devolution means provinces hold many implementation levers.	2.5/5 — Provincial engagement exists, but uneven capacity, funding, and policy alignment across provinces	Strong role for municipalities and regional authorities in adaptation/urban planning; central law seeks to harmonise national and local roles but practical coordination across ministries and local governments remains	3/5 — Local actors engaged, but alignment & resourcing differ by region. (webdosya.csb.gov.tr)

Governance function / mechanism	Pakistan what exists (short)	Effectiveness (0–5) & short reason	Türkiye — what exists (short)	Effectiveness (0–5) & short reason
	(few.kp.gov.pk)	hinder consistent delivery. (UNDP)	challenging. (webdosya.csb.gov.tr)	
Sectoral agencies & MRV (energy, water, agriculture)	Multiple agencies (EPA-Pak, WAPDA, PMD, NDMA, PCRET, GCISC) play sector roles; MRV/data systems improving but uneven. Pakistan submits UNFCCC communications and NDC updates. (environment.gov.pk)	2.5/5 — Institutional multiplicity helps reach sectors but creates fragmentation; MRV and routine data gaps reduce performance measurement. (Asian Development Bank)	Sector frameworks (energy, transport, urban planning) increasingly aligned with climate goals; climate law introduces requirements for permits, MRV and emissions permitting tied to ETS design. (unfccc.int)	3.5/5 — Better integration expected once law/ETS operational; needs capacity to run MRV and permit systems. (unfccc.int)
Finance & investment (public & market instruments)	Reliance on donor/IFIs, some national climate finance units; limited domestic green finance instruments; public budgets constrained especially after disasters (e.g., 2022 floods). (unfccc.int)	2/5 — Finance remains the biggest bottleneck; programmes exist but scale and predictability are low. (unfccc.int)	New legal basis for carbon market / ETS and potential green finance mechanisms under the 2025 law; government pushing Green Deal alignment and green finance steps since 2021. (Climate Governance Hub)	3.5/5 — The legally enabled carbon market/ETS could mobilise funds; success depends on design, market credibility and revenue allocation. (ICAP Carbon Action)
Planning & monitoring (NDCs, action plans)	NDC updates, National Adaptation Plan (2023), Framework for implementation exist. Reporting to UNFCCC (TNC, BURs). Implementation tracking limited by institutional capacity. (unfccc.int)	3/5 — Plans comprehensive, but progress tracking and enforcement are weak; disasters often divert resources. (unfccc.int)	2024–2030 Mitigation & Adaptation Strategy + earlier national plans; climate law requires clearer reporting and coordination; EU Green Deal alignment initiatives. (iklim.gov.tr)	3.5/5 — Stronger planning framework now; monitoring effectiveness will depend on institutionalization under the new law. (iklim.gov.tr)

Governance function / mechanism	Pakistan what exists (short)	Effectiveness (0–5) & short reason	Türkiye — what exists (short)	Effectiveness (0–5) & short reason
Civil society / stakeholder participation	Active NGOs, CSOs, and community initiatives (esp. post-2022 floods). Consultation mechanisms exist in policymaking but inclusion and grievance mechanisms vary. (AP News)	3/5 — Engagement is strong at grassroots but meaningful influence on big policy/finance decisions is uneven. (AP News)	Civil society & research institutions engaged in policy dialogue; industry chambers engaged on ETS/design. Public consultations form part of strategy design. (Climate Governance Hub)	3.5/5 — Consultation culture improving, especially around EU alignment and ETS— but implementation feedback loops need strengthening. (Climate Governance Hub)

Table 7

A comparative analysis of governance mechanisms reveals nuanced differences in institutional capacities. Türkiye has established a more centralized climate governance structure, which includes various ministries working in collaboration between the sectors. This level of integration is congratulated to promote a holistic approach to climate policy (Tok Lazoğlu, 2024). On the other hand, the multi-institutional governance of Pakistan is struggling with fragmentation, where different agencies may not align in their climatic objectives, leading to inflectors and gaps in the execution of policies (Ahmmad, 2021).

In addition, financial mechanisms play a vital role in highlighting the effectiveness of governance structures in both countries. Türkiye has increasingly sought to improve climate funding through international partnerships and green bonds, targeting investments in renewable energies (Kayral et al., 2025). Pakistan, on the other hand, continues to feel difficulties in mobilizing adequate climate funding, which is exacerbated by a lack of internal capacity to be taken from international funding (Kumar et al., 2024). The development of policies in the two countries is therefore complex linked to their ability to effectively exploit financial flows, which is essential for the implementation of ambitious climate policies. Despite major challenges like Indo-Pak relations (Bilal et al., 2022), the progress of public awareness and participation in climate action have experienced slight improvements in the two countries. Citizens' commitment to climate issues is essential to hold responsible governments and guarantee that policies have a robust public basis (Triarchi, Koliass and Kyriotelis, 2023). In Pakistan, increased dialogue and basic movements emphasize climate change as a national concern, reflecting increasing recognition of the problem (Zakaria et al., 2021). Conversely, Türkiye witnessed an increase in non-governmental organizations pleading for stronger climate action, thus influencing government awareness and transparency (Bhauacharya, Kharas and Mcarthur, s.d.).

The effectiveness of governance mechanisms can be measured by the real results of reduction in emissions and the construction of resilience in the vulnerable sectors. Although the two countries have made commitments, their achievements remain sufficiently demonstrated in the measurable results. Pakistan always faces a growing vulnerability to the effects of climate change such as floods and droughts, requiring robust adaptive measures (Qadir et al., 2025). Türkiye, faced with similar climatic challenges, has launched a transition to renewable energies, but the current outbuildings on fossil fuels pose an important challenge to achieve its emission objectives (USTUN, 2023).

In conclusion, although Pakistan and Türkiye have developed governance mechanisms sensitive to international climatic policies within the framework of the UNFCCC, the Kyoto Protocol and the Paris Agreement, the effectiveness of these mechanisms varies considerably due to structural, financial and administrative differences. Increased institutional consistency, better access to climate financing and increased public participation are essential for the two countries to carry out their potential in the fight against climate change and the realization of their international commitments. While they sail in the complexities of global climate governance, the evaluation and continuous adaptation of their approaches will be essential to approach the evolving climate landscape.

What are the potential areas for alignment between Pakistani and Turkish environmental protection laws and policies in addressing the challenges of climate change?

United for the Planet: Synergizing Pakistan and Turkey's Environmental Laws for Collaborative Climate Action and Sustainable Development, The environmental laws of Pakistan and Turkey have a fertile field for collaborative strategies aimed at combating climate change and improving sustainability. The two countries, located in regions vulnerable to ecological degradation and climatic impacts, have articulated a range of environmental policies and legal frameworks. Synergies between these frameworks can be used to create complete responses to shared environmental challenges, including water rarity, energy consumption and climate resilience.

Pakistan faces important environmental challenges, manifesting itself in the scarcity of severe water, energy ineffectiveness and recurrent natural disasters attributable to climate change. The country's decision-makers have recognized the urgent need for coherent strategies on climate change that align with sustainable development objectives (Baloch, Rehman and Ali, 2025). In particular, policies such as the national climate change policy and the framework for adapting climate change illustrate the government's commitment to integrate environmental considerations in economic and social planning (Waheed, Fischer and Khan, 2021). Meanwhile, Turkey has developed its own solid set of environmental laws, including environmental law n ° 2872, which focuses on environmental prevention and protection, and the climate change action plan, which aims to considerably reduce greenhouse gas emissions by 2030 (Sarker, Rahman and Giessen, 2019).

Potential Areas for Alignment between Pakistan & Türkiye on Environmental Protection & Climate Change:

Policy / Legal Area	Pakistan (Current Status)	Türkiye (Current Status)	Potential Alignment / Synergy
Climate Change Legislation	<i>Pakistan Climate Change Act 2017</i> — establishes Climate Change Council & Authority; provides framework for adaptation/mitigation.	<i>Türkiye Climate Law 2025</i> — sets legal framework for ETS, permits, MRV, carbon markets.	Harmonization of legal frameworks: Exchange best practices on law enforcement, institutional design, and integration with sectoral policies.
National Climate Policies & Plans	National Climate Change Policy (2021 update), National Adaptation Plan (2023).	National Climate Change Strategy 2024–2030, Long-Term Strategy (2053 net-zero target).	Joint strategy development: Share methodologies for long-term mitigation pathways, integrate sectoral targets (energy, transport, agriculture).
Emission Reduction Mechanisms	NDC commitment: 50% GHG reduction by 2030 (conditional on finance); limited domestic carbon	New ETS framework; preparing to link with EU carbon border adjustment mechanism.	Carbon market cooperation: Knowledge exchange on ETS design, MRV, and potential future cross-border crediting.

Policy / Legal Area	Pakistan (Current Status)	Türkiye (Current Status)	Potential Alignment / Synergy
Adaptation & Disaster Risk Reduction	pricing. Strong focus on adaptation due to high vulnerability (2022 floods). NDMA + provincial DRR authority's active.	Urban climate resilience, disaster preparedness (e.g., earthquakes + floods).	Shared adaptation toolkit: Joint capacity building on early warning, resilient infrastructure, water management, and disaster governance.
Renewable Energy & Green Transition	Renewable energy targets (60% by 2030, conditional); solar, wind expansion ongoing but underfinanced.	Part of EU Green Deal alignment; renewables expansion, green hydrogen strategies emerging.	Green energy cooperation: Joint projects on renewables, technology transfer, and R&D in solar/wind/hydrogen.
Environmental Impact Assessment (EIA) & Enforcement	EIA mandatory under Environmental Protection Act; implementation uneven across provinces.	Stronger EIA and Strategic Environmental Assessment (SEA) requirements (aligned with EU standards).	Policy alignment: Pakistan could adapt Türkiye's EU-aligned EIA/SEA practices; scope for shared training and monitoring systems.
Institutional Coordination	Federal Ministry of Climate Change & provincial environment departments.	Ministry of Environment, Urbanization and Climate Change; centralized under new law.	Institutional learning: Exchange models on balancing federal/provincial vs. central governance structures.
Climate Finance	Heavy reliance on international climate finance; nascent green bonds.	ETS revenues + EU-linked green finance opportunities emerging.	Joint climate finance mechanisms: Explore blended finance, bilateral funds, and regional green investment vehicles.
Civil Society & Public Engagement	Strong grassroots activism post-2022 floods; uneven policy influence.	NGOs, research institutes, and business chambers engaged in ETS/policy consultations.	Public participation models: Exchange best practices for inclusive policy design, community-driven adaptation, and industry consultation.

Table 8

In regional context, the role of South Asian countries is also important when considering any strategy to improve the security situation (Rashid et al., 2022). The mutual interests of the two nations in the fight against climate change can lead to collaborative strategies in the regional context. Pakistan and Turkey are both part of various regional organizations, such as the Economic Cooperation Organization (ECO), which can serve as cooperation platforms (Mujahid et al., Ali, 2015). Joint initiatives could include the sharing of cross -border data on environmental indicators and climate impact assessments, similar to approaches promoted to regional water safety frameworks (Ali and ZIA, 2016).

The sharing of data in real time would improve the resilience of the two nations by allowing more enlightened decision -making processes, in particular in the management of resources and preparation for disasters. In addition, the creation of joint working groups focused on specific environmental problems, such as water management and energy efficiency, could give significant advantages. In Pakistan, the water

link of water is increasingly recognized as a critical intersection field which requires collaborative governance strategies (Bacocheng et al., 2024). This resonates with the recognition by Turkey of the integrated management of water resources as a means of meeting its own challenges linked to the shortage of water and ecological balance (Albatayneh, 2023).

Collaborative research initiatives aimed at exploring best practices and innovative technologies for effective use of resources would not only help to respond to demands from the two countries, but would also be used as a model for other nations in the region. Tackling environmental problems is also crucial. Pakistan's geographic challenges, mainly from its river basin systems, can be attenuated by collaboration agreements with Turkey. Similar to the collaborative principles of environmental governance discussed by Ali, XU and Ahmad (2021), Pakistan and Turkey could establish joint protocols for sustainable cross - border river management. This would guarantee an equitable allocation of resources and to underline the importance of maintaining ecological integrity in shared bodies of water. These executives have proven to be effective in many contexts around the world and could significantly contribute to relieving the challenges linked to the water facing the two countries.

The roles of the coherence of policies and legal frameworks cannot be underestimated in the efforts of each nation for sustainability. Furthermore, lot of legal guidelines has been made to relaxed humans (Abbas et al., 2022). As Khan and Chang (2021) have argued, the integration of environmental policies with broader economic frameworks is essential for the effective implementation of climate change initiatives. To this end, Turkey's adaptation strategies, which integrate financial incentives for green technologies, could inspire similar initiatives in Pakistan (Kumar et al., 2022). In addition, learning Turkey's approach to finance green development could shed light on Pakistan strategies to mobilize climate funding from international sources, as Mako et al. (2022).

Climate change has no borders; thus, regional cooperation is essential to solve this cross -crossed problem. The interactions between Turkey and Pakistan indicate the potential for collaborative strategies to combat climate change and promote sustainable development. In the context of globalization, the main concern lies in the integration of environmental regulation in economic growth trajectories. Nathaniel, Mursrshed and Bassim (2021) justify that the role of environmental regulations is essential to balance growth with ecological management, a principle that the two nations could internalize more.

The emphasis on Turkey on renewable energies technologies can also be a learning point for Pakistan. The latter launched various projects to promote solar and wind energy in accordance with its national electricity policy. Turkey's commitment to technology transfer and capacity building initiatives could strengthen Pakistan's ambitions for the adoption of renewable energies (Granit et al., 2016).

In addition, the additional measures taken by the two countries to align their respective green financing mechanisms - in particular by responding to the commitments of the Paris Agreement - indicate a promising path for cooperative companies (Dikau and Volz, 2019). Finally, the rule of law remains an essential factor in the success of the implementation of environmental policies. Atta and Sharifi (2024) emphasize the intrinsic link between the rule of law and environmental sustainability, highlighting the need for robust legal frameworks to support effective application. The strengthening of legal frameworks of the two nations will not only stimulate compliance with international environmental agreements, but will also create an environment conducive to investment in sustainable projects.

In conclusion, the synergy between the environmental laws and policies of Pakistan and Turkey presents many collaboration opportunities in the face of climate change. By focusing on data sharing, cross -border resources management and the integration of sustainable practices in their economic frameworks, the two countries can build a resilient and sustainable future. Taking advantage of their unique forces and

experiences will not only improve the coherence of environmental policy, but will also promote a more sustainable regional landscape in the midst of increasing threats posed by climate change.

What degree of cooperation exists in Türkiye between the public and commercial sectors to support climate change adaptation and sustainable development?

Bridging Sectors: a comparative analysis of public-commercial collaboration in climate change adaptation and sustainable development in Türkiye and Pakistan, The collaboration between the public and commercial sectors is crucial for effective adaptation to climate change and sustainable development initiatives, especially in countries such as Türkiye and Pakistan. Both nations face significant challenges due to climate change, including extreme climatic events, resources shortage and environmental degradation. Analyzing existing levels of collaboration and identification of gaps between these sectors can provide inspire implications for the formulation of policies and implementation of adaptation strategies.

In Pakistan, the water sector has been recognized as particularly vulnerable to climatic impacts. The implementation of effective adaptation strategies requires the collaboration of public institutions and private entities (Khan, 2018). The Government has established Marcos, such as the National Climate Change Policy, to guide both sectors towards common objectives for sustainability (Ahmed et al., 2020). The prioritization of the objectives of the climate change policy has emerged as a focal point in recent discussions within Pakistan, which reflects a growing recognition of the need for integrated approaches for sustainable development (Ahmed et al., 2020). This alignment of government policies and corporate strategies can significantly improve the resilience of communities to climate -related interruptions.

In addition, the role of corporate governance in adapting climate change has been highlighted by several academics. Peker, Kan and Nadeem (2019) argue that effective corporate governance is essential to boost systemic changes in the light of climatic risks. Companies can incorporate sustainability into their operational models, and when public policies support these initiatives, a robust framework for adaptation arises. The initiatives directed privately, together with the government regulations, form a vital component of Pakistan's response to climatic challenges (Qadir et al., 2025).

Similarly, Türkiye has made significant advances in the integration of sustainable development initiatives in their climate change strategies. According to the analysis of the incorporation of Türkiye in the global regimes of climate change, it is evident that cooperation between the public and private sectors is increasingly emphasized (Tok Lazoğlu, 2024). For example, the Turkish government has established public-private associations aimed at addressing energy sustainability and resource management, key areas affected by climate change (Yıkmaz, 2025).

The participation of private entities not only increases financial resources, but also brings innovative approaches to environmental management, leading to better adaptation results. When exploring the renewable energy perspectives of both countries, Uddin et al. (2021) illustrate the potential of intersectoral collaboration in the advancement of sustainable energy solutions. This collaboration is particularly relevant since both Türkiye and Pakistan seek to reduce their dependence on fossil fuels while improving their renewable energy capabilities. The transformation of energy systems through joint companies is fundamental in the implementation of long -term adaptation strategies that contribute to climate resilience.

When evaluating public-private partnerships (PPP), Guoyan et al. (2023) emphasize the need for a synergistic approach to address environmental degradation and achieve sustainable development. In Türkiye & Pakistan, alignment of interests between government agencies and commercial sectors can promote significant improvements in reducing environmental impacts. These associations can facilitate innovative financing mechanisms & an efficient allocation of resources essential for climate adaptation measures. In addition, the integration of green finances within the public and commercial sectors has become an outstanding strategy for sustainability.

Financial institutions increasingly recognize the importance of aligning their investments with sustainable development objectives. Kumar et al. (2022) underline the potential of green finances in supporting small and medium enterprises, which often strive to innovate in sustainable practices. By working closely with the government to develop favorable policies, interested parties can amplify their collective impact on climatic adaptation.

Degree of Public Commercial Sector Cooperation in Türkiye on Climate Change Adaptation & Sustainable Development:

Area of Cooperation	Public Sector Role	Commercial / Private Sector Role	Degree of Cooperation	Effectiveness & Gaps
Policy & Strategy Development	Ministry of Environment, Urbanization & Climate Change leads strategy (e.g., 2024–2030 Climate Strategy, National Adaptation Plan).	Business chambers (TOBB, TÜSİAD) and sector associations provide input during consultations.	Moderate–High	Businesses are increasingly involved in policy dialogues (esp. linked to EU Green Deal); still limited influence outside large corporates.
Renewable Energy Transition	Government incentives, renewable targets, feed-in tariffs, and tenders (e.g., YEKA projects).	Private sector investment in wind, solar, and hydro; growing interest in green hydrogen.	High	Strong PPP cooperation in energy, but project finance and bureaucratic hurdles slow uptake.
Carbon Market & ETS Development	2025 Climate Law enables national ETS and MRV system; government sets rules.	Private sector engaged in pilot ETS simulations; industry chambers involved in ETS design.	Moderate	Early-stage cooperation; companies preparing for EU Carbon Border Adjustment Mechanism (CBAM).
Adaptation & Resilience (Urban, Agriculture, Water)	Municipality’s lead local adaptation (urban planning, water efficiency); public disaster agencies (AFAD).	Agribusinesses investing in drought-resilient crops; construction/real estate sectors exploring green building certifications.	Moderate	Cooperation exists but fragmented; adaptation is less attractive commercially compared to mitigation/energy.
Sustainable Finance & Investment	State-owned banks offer green credit lines; government developing green taxonomy aligned with EU.	Turkish banks issue green bonds; corporations integrate ESG into finance.	High	Strong momentum in green finance; coordination improving under EU-aligned frameworks.
Technology & Innovation	Government R&D programs (TÜBİTAK, KOSGEB) support clean tech.	Start-ups and corporates invest in solar tech, battery storage, digital monitoring.	Moderate	Cooperation exists but scale is smaller than in EU; need stronger incentives.
Public Awareness & CSR	Ministries run awareness campaigns; municipalities promote eco-living.	Companies invest in CSR (waste reduction, tree planting, climate awareness).	Moderate	Engagement visible but often one-off or branding-driven; needs integration into national campaigns.

Table 9

The intricate dynamic of how public policies can effectively take advantage of corporate capacities both in Türkiye and Pakistan illustrates in the work of Lewis et al. (2021). The synergy created by the policies that cover the collaborative spirit between the public and commercial sectors can improve the capacity to respond to the impacts of climate change. As countries align their agendas with global frameworks, such as the UN Sustainable Development Goals, the need for a cohesive action between the different sectors becomes critical. Despite the positive advances made, there are still gaps in the collaboration efforts between the public and commercial sectors in Türkiye and Pakistan. The challenge of climate change requires urgent and coordinated responses, however, barriers such as regulatory discrepancies and communication decompositions can hinder effective cooperation (al-Jayyousi et al., 2023).

Moreover, sometime as far as legal framework, it's inactive and incapable and the violation of the regulation is an ordinary thing (Bilal et al., 2022). The identification of these obstacles is essential to create an enabling environment that fosters collaboration and allows sustained efforts against climatic adversity. In addition, an empirical investigation on the impact of climate change and adaptation strategies in South Asia supports this notion, demonstrating the value of collaborative frames (Qadir et al., 2025). The challenge of climate change requires a multifaceted response by which the adaptive learning of past collaborations can inform future initiatives (Arslan et al., 2021).

A continuous dialogue is required for political leaders and business leaders to collectively navigate complex environmental challenges. In conclusion, the levels of collaboration between the public and commercial sectors in Türkiye and Pakistan with respect to the strategies for adapting to climate change and sustainable development initiatives indicate both progress and improvement areas. While frames and policies are being established to expand associations, continuous evaluation and improvement of these collaboration efforts will be fundamental. By promoting a culture of cooperation and shared responsibility keeping in view of the native culture, traditions as well as its compatibility (Bilal et al., 2022) both countries can be better positioned to address the pressing climate challenges they face and work to achieve sustainable development. However. The interaction of governance, innovative financing and public-private associations will remain at the forefront of these efforts as the imperative for sustainability gains urgency in the context of global climate change.

Based on the findings, what recommendations can be made for strengthening the international legal regime on climate change and improving climate change policies and governance in Pakistan and Türkiye?

Strengthening Global Climate Governance: Strategies for Enhancing the UNFCCC, Kyoto Protocol, and Paris Agreement with a Focus on Pakistan and Türkiye, the international climate governance framework, which includes the UNFCCC, the Kyoto protocol and the Paris Agreement, is essential to address the growing climate crisis. However, recent findings indicate gaps and limitations that require an evaluation and reflexive improvements. For Pakistan and Türkiye, effective climate governance policies must be formulated to navigate to navigate their unique challenges while aligning with international frames.

UNFCCC serves as a basis for global climatic negotiations, but its effectiveness has been compromised by insufficient responsibility mechanisms and a lack of binding commitments for developing countries. The strengthening of demanding execution through lighter and stricter responsibility measures is essential. As Shafi (2025) suggests, promoting transparent communication between nations with respect to their climatic policies could improve collective responsibility and promote trust. In addition, improve the reporting

framework for emissions and adaptation efforts, as indicated by Casado-Osensio et al. (2022), will facilitate a more precise evaluation of national contributions and help identify best practices.

From the framework of the Kyoto protocol, it is crucial to recognize the importance of flexibility mechanisms while guaranteeing that they do not lead to lagoons that allow excessive emissions. Atici (2022) argues the reconciliation of these mechanisms in a way that include the circumstances of developing nations. For Pakistan and Türkiye, the incorporation of localized carbon trade systems could encourage emission reductions while supporting economic growth (ARI and Sari, 2017). This location of flexibility mechanisms requires robust institutional frameworks that allow effective management and supervision, such as Khan et al. (2016) prominent.

The Paris Agreement presents a turning point in climate governance, advocating for the nationwide contributions (NDC). However, a more nuanced approach is necessary to explain the different abilities of nations to promulgate change. Pakistan NDC should capitalize their strengths inherent in sustainable agriculture and renewable energy, since these sectors have a significant potential for decarbonization (Ahmed et al., 2020). On the other hand, Türkiye strategies must include significant investments in green technology to ensure that it can effectively transition towards a neutral carbon economy (Deniz, Ulutürk and Başkara, 2024).

To improve climate governance policies in Pakistan and Türkiye, both countries need to adopt innovative financial mechanisms that support climate resistance investment. The recent work of Mako et al. (2022) describes the urgency to improve climatic finance strategies. Establishing a green fund, particularly to finance research and implement sustainable technologies, could mitigate the impacts of climate change. Local interested parties, including the private sector, must actively participate in this process (Kumar et al., 2022), ensuring that financing is aimed at sustainable and inclusive projects. In addition, it is imperative to close the gap between science and politics. The integration of scientific research in policy formulation processes can be improved significantly. Institutions in both countries must collaborate with research organizations to ensure that climatic policies are informed by the latest scientific findings (Qadir et al., 2025). This collaboration could manifest on joint platforms to share data, best practices and emerging technologies, which finally leads to more effective climate governance.

Commitment of the local community also plays a fundamental role in improving the effectiveness of climate policy. Research has shown that incorporating local knowledge and practices can reinforce adaptation efforts. Khan et al. (2022) emphasize the importance of public awareness and community initiatives in the cultivation of resilient agricultural practices. Those responsible for formulating policies must prioritize investments in grassroots movements that enhance local communities in Pakistan & Türkiye to develop personalized solutions that address climate vulnerabilities while guaranteeing food security.

In addition, gender considerations in climate governance are essential, particularly in both countries, where the participation of women in agriculture is significant. Shafi (2025) postulates that women included in decision -making processes related to climatic projects can result in more equitable and sustainable results. Policy formulators must develop programs that improve women's agency and participation in climate action, promoting community resilience against climatic impacts.

Finally, regional cooperation between Pakistan and Türkiye can amplify their climate governance efforts. Both nations face similar challenges related to climate change, and a collaborative approach could allow them to share resources, knowledge and experiences effectively. Initiatives such as joint climate action projects and research collaborations can strengthen bilateral ties while improving regional resilience to climate change impacts (Siddikogu and Sagirogu, 2023). Regular dialogues and knowledge exchange platforms can cultivate a collaborative approach to environmental challenges.

Recommendations for Strengthening International Legal Regime & National Climate Governance (Pakistan & Türkiye):

Level	Area	Recommendations	Rationale / Expected Impact
International Legal Regime	Equity & Finance	Reform climate finance mechanisms under UNFCCC/Paris (more accessible, predictable flows for developing/middle-income states).	Ensures countries like Pakistan (highly vulnerable) and Türkiye (transition economy) can implement NDCs and adaptation.
	Compliance & Accountability	Strengthen monitoring & enforcement (clearer reporting, independent review of NDC progress).	Increases credibility of Paris Agreement, reduces “pledge–implementation gap.”
	Loss & Damage Mechanism	Operationalize and capitalize the Loss & Damage Fund (est. COP27).	Critical for countries like Pakistan that face catastrophic climate disasters.
	Technology Transfer	Enhance global tech-sharing platforms (renewables, MRV, adaptation tools).	Supports rapid green transition in emerging economies.
	Regional Cooperation	Encourage regional climate alliances (e.g., Middle East–South Asia cooperation platform).	Enables cross-border adaptation (water, migration, disasters).
Pakistan	Implementation of Climate Change Act 2017	Strengthen Climate Change Authority & Council with resources and clear regulations.	Moves from “law on paper” to effective governance.
	Provincial–Federal Coordination	Develop binding provincial action plans aligned with NCCP & NAP.	Ensures coherence in decentralized governance after 18th Amendment.
	Climate Finance Strategy	Establish domestic green finance instruments (green bonds, climate insurance).	Reduces overreliance on donors, builds resilience post-disasters.
	MRV & Data Systems	Invest in climate data, GHG inventory, monitoring systems.	Improves transparency, reporting, and access to international funds.
	Public–Private Partnerships (PPP)	Expand PPP in renewable energy, climate-smart agriculture, and water management.	Mobilizes private capital for mitigation & adaptation.
Türkiye	Operationalizing Climate Law (2025)	Rapidly implement ETS, MRV, and permitting systems with strong oversight.	Aligns with EU Green Deal, improves compliance & finance access.
	EU Alignment	Deepen policy harmonization with EU (CBAM, green taxonomy, EIA/SEA standards).	Enhances trade resilience and green investment flows.
	Adaptation Governance	Strengthen local government capacity for urban climate resilience.	Helps address water stress, urban heat, and flood risks.
	Green Finance	Channel ETS revenues and green	Ensures sustainable funding streams

Level	Area	Recommendations	Rationale / Expected Impact
	Civil Society Engagement	bonds into climate innovation. Institutionalize stakeholder consultation in policy processes.	for climate projects. Builds legitimacy and broad-based climate action.

Table 10

In conclusion, improving the effectiveness of the UNFCCC, the Kyoto protocol and the Paris Agreement requires a multifaceted approach that addresses local and national circumstances within an international context. For both Pakistan and Türkiye, the adoption of a comprehensive combination of transparency, inclusion, solid financial mechanisms, community participation, and formulation of policies informed in regional science and cooperation will be essential to strengthen climate governance policies. These improvements will allow both nations to navigate the realities of climate change more effectively, ensuring that their adaptation and mitigation strategies are aligned with global efforts. By adopting these recommendations, there is the possibility that both countries not only meet their international obligations, but also serve as leaders in the global struggle against climate change.

CONCLUSION

The effectiveness of the UNFCCC agreement, the Kyoto protocol and Paris in the influence of the climate policies of Turkey and Pakistan presents a nuanced landscape, characterized by various degrees of pragmatic commitment, commitment and adaptation because of distinct national circumstances. The UNFCCC, created in 1992, laid the foundations for global climate policy by promoting collaborative dialogue between developed and developing nations. Turkey and Pakistan, both listed in the category of developing countries, used the UNFCCC framework to articulate their climate commitments, but with various degrees of ambition. The status of Turkey as a country of Annex I within the framework of the Kyoto Protocol, although it is not a legally binding objective, motivated its commitment to international discourse concerning climate change, leading to the development of national climatic strategies which correspond to international expectations.

On the other hand, Pakistan has focused on the use of the UNFCCC to access the financial mechanisms that support adaptation and resilience strengthening measures. The emphasis on adaptation is salient given the vulnerability of Pakistan to the impacts of climate change, such as extreme weather events. However, the effectiveness of the UNFCCC by promoting the deeply rooted commitments of these countries remains a concern, in particular because national interests often overshadow global climatic objectives.

During the examination of the Kyoto protocol, its binding nature imposed specific obligations on the nations developed while offering flexibility for developing countries such as Turkey and Pakistan. Imperfect implementation and lack of application mechanisms have led to criticism of the protocol's ability to arouse significant action. In the case of Turkey, the protocol required a reassessment of its industrial policies to align itself with the international standards of emissions. However, Turkey's reluctance to accept compulsory reductions reflects a broader reluctance among developing countries to assume responsibilities perceived as inequitable. For Pakistan, the protocol mainly used to raise awareness and facilitate international cooperation, but has failed to result in tangible commitments or statutory changes at the national level.

The Paris Agreement represents an important change in the global framework of climate governance, emphasizing determined contributions on a national level (NDC) and facilitating a more inclusive approach which recognizes the various capacities and responsibilities of countries. Turkey and Pakistan have articulated their NDC as part of the Paris framework, describing their climatic actions and their long-term objectives. The forces of this agreement reside in its flexibility and global effort to maintain the

temperature increases well below 2 degrees Celsius. However, the Paris Agreement also faces criticisms concerning the adequacy of commitments and the gap between promises of promises and actual implementation.

Turkey's commitment to its NDC illustrates an attempt to balance international pressures with internal economic considerations, although its recent decline on the binding objectives raises concerns about future ambition. The emphasis placed by Pakistan on adaptation in the context of the Paris Agreement reflects its continuous vulnerability, but can lead to an under-registration on attenuation efforts, thus limiting its contributions to global climate action. Worldwide efforts to combat climate change and promote environmental protection are greatly aided by the international legal framework on the subject. Its success in accomplishing these objectives is still up for debate in the literature, though. The difficulties developing nations encounter in putting into practice efficient mitigation and adaptation strategies for climate change are brought to light by case studies from Pakistan and Turkey. These difficulties include inadequate governance systems, a lack of financial and technological resources, and little cooperation between the public and commercial sectors.

With an emphasis on the application of climate change policies and their efficacy in tackling the issues raised by climate change, this study seeks to critically examine the international legal framework on climate change in the context of Pakistan and Turkey. To obtain a thorough grasp of the problems, the study will use a mixed-methods approach, incorporating qualitative and quantitative data. The anticipated findings of the study will support global efforts to prevent and adapt to climate change by shedding light on the potential and difficulties faced by developing nations in putting effective climate change policies into place. The study's conclusions, which emphasize the possibility of international cooperation in tackling shared issues, will have a big impact on governance procedures and regulations.

In conclusion, while the UNFCCC, the Kyoto protocol and the Paris Agreement have each encouraged Turkey and Pakistan to a certain extent to their climate policy frameworks, the effectiveness of these international agreements is compromised by national interests, unequal responsibilities and variable levels of engagement. The complexities of interior priorities and acute pressures of climatic impacts require a more integrated approach to international climate governance which can respond and support specific requests from Turkey and Pakistan. The continuous evolution of these agreements, in particular within the framework of Paris, is promising for a better alignment of local priorities on the objectives of the global climate, provided that the financial and technological support mechanisms continue to evolve and strengthen.

POLICY RECOMMENDATIONS

Enhancing Climate Resilience: An Analysis of Pakistan and Türkiye's Climate Policies with Strategic Recommendations for Governance Improvement, the analysis of current climatic policies in Pakistan and Türkiye reveals that both nations face significant challenges in facing climate change, requesting a global evaluation of their respective governance paintings. In Pakistan, existing policies tend to suffer from fragmentation and do not have an effective implementation, while Turkey's policies, although progressive in some aspects, require a deeper integration of renewable energy initiatives (Khan et al., 2016; Uddin et al., 2021). Therefore, strategic improvements are essential for both countries to improve the effectiveness of climatic action.

To fortify governance against climate change, both nations should focus on the development of integrated climatic action plans. This includes the establishment of a centralized governance body that coordinates between various ministries and interested parties, thus guaranteeing cohesive and complete climatic strategies. In Pakistan, the current national policy on climate change can be increased by integrating local government entities in decision -making processes, facilitating actions based on the custom -made community for specific regional climates (Ahmed et al., 2020). In Turkey, improve the strategic

coordination between the Ministry of the Environment and urbanization and local municipalities can lead to a more effective implementation of climatic initiatives, ensuring that local conditions and needs are considered (Ergun et al., 2021).

In addition, it is urgent to give priority to sustainable agricultural practices as a strategic initiative in both countries. As highlighted by Shafi (2025), agriculture contributes significantly to greenhouse gas emissions and its ability to adapt to climate change is essential for food safety. Both nations should promote policies that encourage sustainable practices among farmers, including organic agriculture, the rotation of crops and the use of varieties of climatic resilient crops. Financial support mechanisms, such as subsidies and micro-loans for farmers who adopt these practices, could significantly strengthen efforts to combat climate change while improving agricultural productivity.

In addition, the expansion of infrastructure is a good initiatives (Rashid et al., 2022), improving investments in renewable energy infrastructures is crucial, in particular for Pakistan, which is strongly based on fossil fuels for energy production. According to Uddin et al. (2021), the transition to a more sustainable energy matrix can not only mitigate emissions, but also to create economic opportunities in the green energy sector. Both countries should set ambitious but achievable renewable energy objectives, supported by government incentives for private sector investments in solar energy, wind and hydroelectric.

The commitment to education and awareness raising programs also vital is also vital. Both nations suffer from a lack of public understanding regarding the implications of climate change and the importance of collective action in facing. The commitment in the educational campaigns can have a significant impact on public attitudes towards climatic policies (Ergun et al., 2021). Schools, community organizations and social media platforms can be used to disseminate information, promoting a culture of sustainability and proactive commitment among citizens. Finally, the international collaboration must be priority. Both Pakistan and Turkey have unique insights and practices that could benefit from shared experiences and resources in the fight against climate change. Establish bilateral agreements focused on climatic research, the transfer of technology and financing can improve their ability to face common challenges effectively. The efforts to share knowledge and resources can be aligned with international paintings, such as the Paris agreement, thus promoting a stronger international climate action community.

In conclusion, improve the climate governance mechanism, promote sustainable agriculture, advance renewable energy investments, promote public awareness and engage in international collaboration are critical paths for Pakistan and Turkey. By implementing these recommended strategies, both nations can improve their resilience to climate change, while contributing to global efforts aimed at reducing greenhouse gas emissions.

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