

National Climate Policy Framework and International Obligations

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Abstract:

Governance plays a vital role in formulating climate change policies, especially in countries vulnerable to environmental hazards like Pakistan. Good governance requires a synergy between capable governments, civil society, and the private sector to create policies that improve disaster resilience and climate adaptation. Pakistan, although contributing less than 1% to global greenhouse gas emissions, ranks among the top 10 most affected countries by climate change. The recurrent climate-related disasters, such as the 2022 floods, demonstrate the urgent need for effective governance to mitigate climate risks. While Pakistan has aligned its national policies with international climate frameworks, challenges remain in policy implementation due to institutional, financial, and technical barriers. Strengthening governance, increasing domestic climate finance, and adopting innovative technologies are critical steps toward achieving resilience. Effective climate action requires a coordinated effort among all stakeholders to enhance Pakistan's capacity for climate adaptation and disaster preparedness.

Key words:

Governance, climate change, Pakistan, resilience, adaptation.

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Introduction

Governance is the exercise of political, economic, and administrative authority in the management of a country's affairs at all levels. It comprises formal and informal mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences. While governance encompasses government and civil servants, it also includes all relevant stakeholders in a society, such as the private sector and civil society organizations, from households and local levels to provincial, national, and international levels.

Good governance for building feasible climate change policies that incorporate disaster and climate resilience occurs when capable, accountable, transparent, inclusive, and responsive governments work synergistically with civil society, the private sector, and at-risk populations. The aim is to formulate policies and action plans to create an enabling environment that improves society's ability to prepare for and respond to climate-related hazards, while building capacity to adapt to changes in the climate. However, governance is also affected by informal mechanisms, such as power dynamics, cultural and religious norms, and political ideologies, which can be powerful drivers in planning, formulating, and implementing policies.

Pakistan is among the top 10 countries most affected by climate change, despite contributing less than 1% to global greenhouse gas emissions. According to the Notre Dame-Global Adaptation Index (ND-GAIN), Pakistan is the 39th most vulnerable and the 27th least prepared nation globally to cope with the impacts of climate change. This is evident as the country has been intermittently hit by floods and other climate-related catastrophes in the past. A recent case is the June 2022 floods that caused an unprecedented disaster as heavy rains, combined with river, urban, and flash flooding, caused widespread devastation. The National Disaster Management Authority (NDMA) reported that around 33 million people, or one in seven Pakistanis, were affected by the floods. This situation presented a significant challenge for the Government of Pakistan, not only in resettling displaced populations but also in helping them adapt to drastically altered environments. Nearly 8 million people were forced to leave their homes, and over 1,700 lives were lost, with one-third of the victims being children. The unpredictable and volatile nature of climate-induced disasters was further highlighted by the fact that these floods came on the heels of a severe heatwave and drought. What was previously considered a once-in-1,000-year event was exacerbated by prolonged temperatures above 45°C, leading to crop failures, power outages, and wildfires (Hashmat et al., 2024). The following figure illustrates the categories of climate-related disasters Pakistan encountered over a fifteen-year period, with floods proving to be the most catastrophic, affecting 24.3 million people so far.

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Disaster Events Reported (2008 - 2023)

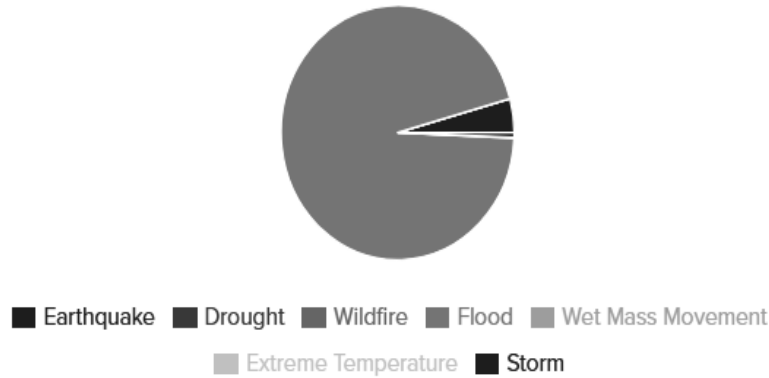


Figure 1. Affected population due to climate disasters (Pakistan)

Source: Internal Displacement Monitoring Centre (Pakistan)2023

In his book *How to Avoid a Climate Disaster* (2022), Bill Gates mentions that approximately 52 billion tons of greenhouse gases are emitted every year, contributing significantly to the degradation of the Earth’s environment. In this context, Pakistan contributes only a minuscule percentage of 0.9% to global greenhouse gas (GHG) emissions, yet is one of the most susceptible countries (UNFCCC 2021).

To curtail the adverse effects of climate change and decarbonize the environment, a myriad of top international frameworks has been formulated, including the United Nations Framework Convention on Climate Change (UNFCCC) - 1992, the Kyoto Protocol - 1997, the Paris Agreement - 2015, the Conference of the Parties (COP, 26, 27 & 28), and the Sustainable Development Goals (SDGs). Pakistan has also developed several key policies and frameworks to address the growing challenges of climate change, including the Environmental Protection Act 1997, the National Climate Change Policy (NCCP) - 2012 (Revised in 2021), the National Disaster Risk Reduction Policy (NDRRP) - 2013, the Framework for Implementation of Climate Change Policy (2014-2030), the National Energy Efficiency & Conservation Act 2016, the Pakistan Climate Change Act - 2017, the Clean Green Pakistan Movement (CGPM) - 2018, the Ten Billion Tree Tsunami Programme (TBTTP) - 2019, and the National Adaptation Plan (NAP).

Problem Statement

Although Pakistan has devised several climate change-related policies and frameworks, significant challenges persist due to discrepancies between the country's national climate policies and international frameworks. These gaps, which include policy incoherence, inadequate institutional capacities, and limited financial resources, hinder Pakistan's ability to effectively meet global climate commitments.

A comprehensive examination of these policy mismatches is essential to ensure that national frameworks are robust enough to address the growing climate risks and are aligned with global standards for climate resilience and sustainability. Addressing this challenge is critical not only for enhancing Pakistan's climate adaptation and mitigation strategies but also for securing international support and maintaining credibility in global climate forums.

Scope

The study analyzes the workings of the Prime Minister's Task Force on the National Climate Policy Framework and International Obligations, established in 2008 by the Planning Commission of Pakistan, with the aim of aligning Pakistan's climate policies with global frameworks, including the Paris Agreement and Sustainable Development Goals (SDGs). The task force ensures that Pakistan meets its international climate obligations, as outlined in its Nationally Determined Contributions (NDC) under the Paris Agreement, and oversees the implementation of important national policies such as the National Climate Change Policy (2021) and the Climate Change Action Plan 2021-2025.

This study aims to evaluate Pakistan's current climate policy landscape, focusing on national and international regulatory frameworks, institutional structures, and their alignment with global best practices.

The study will analyze climate-related acts, laws, policies, and agreements of both Pakistan and international counterparts. It will also assess the effectiveness of Pakistan's national climate action, examine gaps in current policy implementation, and offer recommendations to strengthen institutional resilience and climate adaptation. The scope covers the Pakistan Climate Change Act 2017, the National Climate Change Policy 2021, and other key legislative frameworks, including the Pakistan Environmental Protection Act 1997 and the Nationally Determined Contributions (NDC).

Research Methodology

This research employs a qualitative methodology, rooted in an extensive review of secondary sources and data analysis. It includes a detailed examination of academic literature, government reports, interviews, social media analytics, and publications from international organizations pertinent to climate change. The following officials were interviewed:

1. Mr. Sami Ullah Wazir, DG Environmental Protection Agency, KP (KP Climate Change Policy and details of accomplishments of EPA, along with HR details, were obtained).
2. Mr. Zeeshan Abdullah, Additional Secretary, Climate Change, Forestry, Environment, and Wildlife Department (A brief prepared by the department for COP28 was obtained).
3. Mr. Adnan Farid, Additional Secretary P&D, and Mr. Sher Azam, Senior Chief of the Environment Section were interviewed, and documents such as the Supporting Climate Change concept note, a brief about the Climate Change Cell, P&D, and details of projects executed for achieving NDCs were obtained.

Analysis

Critical Analysis of National Policy Framework

Pakistan's national climate change policy framework, including the National Climate Change Policy (NCCP) 2012 and the Framework for Implementation (2014-2030), highlights the country's recognition of climate change's severe impacts, particularly on key sectors like agriculture, water, and energy. The policy framework emphasizes adaptation strategies such as building climate-resilient infrastructure, improving water resource management, and enhancing disaster preparedness. However, significant challenges hinder its effectiveness. Weak implementation mechanisms, limited financial resources, and institutional fragmentation, particularly between federal and provincial governments, have slowed progress. Pakistan's climate goals, as outlined in its Nationally Determined Contributions (NDCs), are heavily reliant on international financial assistance, which has been insufficient. Furthermore, the country's infrastructure remains vulnerable to climate risks, as evidenced by recent devastating floods. To improve, Pakistan needs to strengthen institutional capacities, mobilize both domestic and international climate financing, and encourage public-private partnerships to promote green technologies. Establishing robust monitoring and evaluation mechanisms is also essential to ensure policy effectiveness and accountability. Despite the challenges, Pakistan's engagement in global climate efforts, particularly under the Paris Agreement, reflects its commitment to addressing climate change, although significant improvements are needed to translate policies into action.

Evaluation of Federal-Level Policy Implementation Framework

The federal-level policy implementation framework in Pakistan plays a crucial role in translating national policies into actionable programs, particularly in areas such as climate change, development, and economic reform. However, despite strong policy frameworks, challenges in governance, resource allocation, and institutional coordination have hindered effective implementation. This evaluation explores the strengths and weaknesses of the federal-level policy implementation framework in Pakistan, focusing on key areas such as administrative capacity, resource mobilization, and coordination between federal and provincial governments.

Strengths of the Federal-Level Policy Implementation Framework

a. Comprehensive Policy Frameworks:

At the federal level, Pakistan has developed numerous comprehensive policies to address key national issues. For example, policies related to climate change, economic reform, education, and healthcare reflect clear objectives and strategic plans. These policies are often aligned with international agreements and standards, demonstrating Pakistan's commitment to global efforts such as the Sustainable Development Goals (SDGs).

b. Centralized Oversight and Coordination:

Federal institutions like the Ministry of Planning, Development, and Reform, and the Ministry of Climate Change provide centralized oversight and play a pivotal role in ensuring that national policies are harmonized and aligned with broader goals. These ministries are responsible for allocating resources, setting national priorities, and monitoring the progress of policy implementation.

c. International Cooperation and Funding:

The federal government has successfully engaged in international partnerships and secured funding from global financial institutions and development organizations, particularly in sectors such as energy, infrastructure, and climate change adaptation. This external support provides critical financial and technical resources that are often unavailable at the provincial level.

Issues and Challenges in Policy Implementation

a. Institutional Fragmentation and Governance Issues:

A major challenge in federal-level policy implementation is institutional fragmentation. Different ministries and departments often work in silos, resulting in inefficiencies and overlapping mandates. Coordination between federal ministries and provincial authorities remains weak, especially after the 18th Constitutional Amendment, which devolved several policy responsibilities to the provinces. This decentralization has led to governance issues, with provinces sometimes lacking the capacity or resources to implement federal policies effectively.

b. Limited Administrative Capacity and Technical Expertise:

Federal agencies often face capacity constraints, particularly in terms of human resources and technical expertise. In key sectors such as healthcare, education, and climate change, the federal government struggles to recruit and retain skilled personnel who can ensure effective policy execution. Moreover, bureaucratic inefficiencies and delays are common, further hindering implementation.

c. Inadequate Resource Mobilization:

While the federal government often formulates ambitious policies, their implementation is constrained by inadequate financial resources. National policies often depend on substantial domestic and international funding, which can be inconsistent or delayed. The federal budget allocates limited resources to development and social sectors, making it difficult to achieve policy targets in areas such as poverty reduction, infrastructure development, and environmental sustainability.

d. Monitoring and Accountability Mechanisms:

Pakistan's federal policy framework lacks robust monitoring and evaluation mechanisms to track the progress and effectiveness of policy implementation. This gap often leads to delays in identifying and addressing challenges, which reduces policy responsiveness and accountability. Although oversight agencies exist, their capacity to enforce compliance or address underperformance is limited.

Analysis of International Climate Obligations and Its Alignment with National Policy

International Climate Obligation	Alignment with National Policy
<p>i. Kyoto Protocol (1997) In 2005, Pakistan signed the Kyoto Protocol but was not required to have binding emission reduction targets as it was considered a developing country. However, Pakistan has benefited from climate finance through mechanisms such as the Clean Development Mechanism (CDM) to support low-carbon development projects. Between 2005 and 2020, Pakistan hosted 74 CDM projects, potentially leading to a reduction of over 13 million tons of CO₂ equivalent per year (GoP, 2021).</p>	<p>The revised National Climate Change Policy (NCCP) in 2021 places a strong emphasis on building climate resilience, particularly through adaptation measures. However, there is limited focus on long-term mitigation, which is in line with Pakistan's status under the Kyoto Protocol. The Clean Development Mechanism (CDM) projects in Pakistan have supported green initiatives in renewable energy, such as small hydropower projects, aligning with national efforts to reduce dependency on fossil fuels (Ilyas et al., 2023).</p>
<p>ii. Paris Agreement (2015) Pakistan ratified the Paris Agreement in 2016 submitting its Nationally Determined Contributions (NDCs), which highlight a target of reducing GHG emission by 50% by 2030, conditional on international finance support. Recent studies show that Pakistan's emissions have increased over time, reaching approximately 490 million tons of CO₂ equivalent in 2021, with energy, agriculture, and industry being the largest contributors (GoP, 2021).</p>	<p>Aligned with National Policy The 2021 Updated NDCs reflect Pakistan's dual focus on adaptation and mitigation. Pakistan's Alternative and Renewable Energy Policy (AREP 2019) sets a goal to produce 30% of electricity from renewables by 2030. However, according to a 2022 review, the country still faces significant barriers to renewable energy adoption, such as financial constraints, political instability, and outdated infrastructure, slowing its transition to low-carbon energy production. Pakistan's energy sector contributed over 40% of total GHG emissions, highlighting the urgent need for decarbonizing energy. Despite the progress, achieving the 50% emission reduction target is contingent on securing around \$100 billion in climate finance and capacity-building support by 2030 (Malik & Ullah, 2023).</p>
<p>iii. COP 27 (Sharm El Sheikh, 2022) At COP 27, Pakistan led efforts to establish a Loss and Damage Fund, aimed at compensating vulnerable countries for climate-induced damages. In the aftermath of the 2022 floods, which caused damages</p>	<p>Aligned with National Policy Pakistan's national policies are increasingly focused on disaster risk reduction and resilience-building, especially in agriculture and water management. The National Climate</p>

<p>of over \$30 billion, Pakistan's advocacy for climate finance gained substantial international support. Pakistan's loss from climate change was estimated at 9.1% of GDP between 2000-2020, according to the Global Climate Risk Index 2021 (Eckstein et al., 2023).</p>	<p>Change Policy (NCCP) and National Disaster Risk Reduction Policy (2013) prioritize mitigation of extreme weather events (UNFCCC, COP 27).</p>
<p>iv. COP 28 (Dubai, 2023) At COP 28, Pakistan advocated for more robust climate financing and technical support. Recent research indicates that Pakistan requires an estimated \$348 billion by 2030 to transition towards sustainable energy, adapt to climate change, and protect against future climate disasters.</p>	<p>Aligned with National Policy Pakistan's Alternative and Renewable Energy Policy (AREP 2019), which aims to generate 30% of energy from renewable sources by 2030, reflects the country's commitment to clean energy. However, a 2023 study found that Pakistan currently generates less than 5% of its electricity from renewables, which highlights a significant gap in policy implementation that needs addressing.</p>
<p>COP 29 (to be held at Baku, Azerbaijan from 11th to 22nd Nov, 2024) It has two pillars; namely Enhance Ambition and Enable Action. It will prioritise to focus on policies to lower temperature by 1.5 degrees, national adaptation plans, NDCs from all stakeholders, New Collective Qualified Goal and finalise Article 6 of Paris Agreement.</p>	<p>Aligned with National Policy. Since the COP will be focusing more on implementation and evaluation so the policies already aligned will be discussed and further progress will be ensure after evaluating the challenges in its achievement.</p>
<p>Sustainable Development Goals (SDGs) Pakistan has made progress toward the SDG 13: Climate Action, SDG14: Life Below Water Land, SDG:15 Life on Land with key areas including adaptation, disaster risk reduction, and early warning systems. The government's 2023 Voluntary National Review highlighted that 70% of Pakistan's SDG indicators are linked to climate and environmental outcomes, with over \$7 billion allocated for SDG projects since 2016.</p>	<p>Aligned with National Policy Pakistan's integration of the SDGs into its Vision 2025 reflects alignment with international development goals. However, a 2022 study on SDG implementation noted that funding gaps and weak institutional coordination remain critical barriers to achieving the SDGs, particularly in rural areas affected by climate change. Achieving SDG 13 requires a significant increase in investment in climate-resilient infrastructure, particularly in water management and agriculture. The study indicated that Pakistan needs to close a \$12.5 billion annual gap in SDG-related funding to stay on track by 2030 (Khan et al., 2023).</p>

Legal and Institutional Framework Assessment

Legal Framework

Pakistan's existing legal and institutional framework for climate policy is a patchwork of policies and regulations aimed at addressing the multifaceted challenges of climate change, but it faces several significant challenges related to coherence, coordination, and implementation. The country's key climate strategy is the National Climate Change Policy (NCCP) 2012, which provides a broad framework for tackling climate change. However, the policy has struggled to achieve its goals due to weak institutional capacity, lack of inter-sectoral coordination, and inadequate financial resources. Additionally, the Framework for Implementation of Climate Change Policy (2014–2030) was introduced to prioritize actions, but tangible outcomes have been limited due to weak governance and political will (Mumtaz, M., 2018). At the institutional level, the Ministry of Climate Change is tasked with leading the implementation of national climate policies. Still, there are significant gaps in coordination between federal, provincial, and local authorities. Pakistan's devolution of powers under the 18th Amendment has further complicated the execution of climate policies across different governance levels, often leading to fragmented efforts (Iqbal et al., 2022). Furthermore, Pakistan has committed to international frameworks, such as the Paris Agreement, submitting its Nationally Determined Contributions (NDCs), which pledge to reduce greenhouse gas emissions. However, inadequate legal frameworks and a lack of integration between climate policy and broader economic development strategies have hindered progress (Mumtaz, M., 2018). The Kyoto Protocol also shaped Pakistan's approach to climate finance through the Clean Development Mechanism (CDM), but institutional inefficiencies have constrained the full realization of CDM benefits (Ahmad & Salman, 2012). In summary, while Pakistan has made strides in developing a legal and policy framework for climate action, significant barriers remain in ensuring these policies are effectively integrated into national development plans and implemented across all sectors.

A brief of the Pakistan Legal Framework is elaborated here as follows:

Important Features of Legal Framework
<p>i. Pakistan Climate Change Act 2017</p> <ul style="list-style-type: none"> • Established the Pakistan Climate Change Council and the Pakistan Climate Change Authority to oversee the implementation of climate-related policies, coordinate across governmental levels, and manage international climate finance (Mumtaz.M, 2018). • Aims to integrate climate adaptation and mitigation strategies into national development planning.

<p>ii. National Climate Change Policy (NCCP) 2012</p> <ul style="list-style-type: none"> • Provides a comprehensive framework to address climate change impacts on water, agriculture, health, and energy sectors. • Focuses on disaster preparedness, biodiversity, and the transition to renewable energy, but its implementation has been slow due to lack of coordination and resources. 	
<p>iii. Environmental Protection Act 1997</p> <ul style="list-style-type: none"> • Primarily focuses on pollution control but includes provisions for addressing climate-related environmental degradation, air and water quality. However, it doesn't provide a comprehensive mechanism for dealing with Climate Change. (Iqbal et al., 2022). • Forms the legal basis for environmental impact assessments (EIAs), which are essential in climate-sensitive projects like infrastructure and energy development. 	
<p>iv. Kyoto Protocol and Clean Development Mechanism (CDM)</p> <ul style="list-style-type: none"> • Pakistan has been involved in the CDM under the Kyoto Protocol, which facilitated projects to reduce greenhouse gas emissions and allowed for carbon credits trading (Iqbal et al., 2022). 	
<p>v. Paris Agreement 2016</p> <ul style="list-style-type: none"> • Pakistan committed to reducing its emissions by 50% by 2030, conditional on international climate finance support (Mako et al., 2022). • The country's Nationally Determined Contributions (NDCs) outline its strategies for achieving these targets, though progress remains limited due to institutional and financial constraints (GoP, 2017). 	
<p>vi. National Disaster Risk Reduction Policy 2013</p> <ul style="list-style-type: none"> • Focuses on disaster risk management in the context of increasing climate change impacts such as floods and droughts • Aligns with broader climate adaptation strategies, especially in vulnerable areas. 	
<p>vii. 18th Constitutional Amendment (2010)</p> <ul style="list-style-type: none"> • Devolved environmental governance to the provincial level, complicating the coordination of national climate policies. • Provinces now hold significant responsibility for implementing climate actions, which has led to uneven progress. 	
<p>viii. National Energy Efficiency & Conservation Act 2016</p> <ul style="list-style-type: none"> • It aims to promote energy efficiency and reduce greenhouse gas emissions from the energy sector, a major source of Pakistan's emissions. • Part of the broader effort to achieve sustainable energy targets under SDG-7 and SDG-13. 	

This framework, while extensive, faces challenges of coherence, coordination, and financial limitations, particularly in translating policies into actionable programs across provincial governments. Despite these legislative efforts, these laws do not fully integrate climate change as a priority within key economic sectors like energy, agriculture, and infrastructure. The fragmentation of laws across different sectors often results in a lack of cohesive implementation strategies at the national level (Khan et al., 2023).

Institutional Framework

The Ministry of Climate Change (MoCC) is the primary federal institution responsible for formulating and overseeing the implementation of climate policy. However, other ministries, such as the Ministry of Energy, the Ministry of Water Resources, and the Ministry of Planning, Development, and Reform, are also responsible for key economic sectors. The MoCC often lacks the authority to enforce climate-related policies across these ministries, leading to institutional fragmentation. For example, while the MoCC has designed comprehensive policies such as the National Climate Change Policy (2021) and the National Adaptation Plan (NAP), implementation is hindered by misalignments with economic planning documents such as Pakistan's Vision 2025 and Five-Year Development Plans. Additionally, an authority envisaged in the Climate Change Act of 2017, known as the Climate Change Authority, has yet to be established even after a lapse of seven years.

i. Integration with Economic and Multi-Sectoral Development Plans:

- Vision 2025 and Five-Year Development Plans: Pakistan's broader economic and development plans emphasize economic growth, poverty reduction, and industrial development. However, these plans have historically prioritized short-term economic growth over long-term sustainability, and the integration of climate policies is limited.
- A 2023 report by Hussain and Ahmed points out that while Vision 2025 mentions climate change, the goals are not aligned with actionable targets for carbon emissions reduction or adaptation. For instance, the energy sector's expansion plan within the Five-Year Plan focuses predominantly on coal and natural gas, with minimal inclusion of renewable energy targets, in contrast to the commitments made in Pakistan's Nationally Determined Contributions (NDCs) under the Paris Agreement.

COMPARATIVE ANALYSIS OF GLOBAL BEST PRACTICES

Overview of Pakistan's Climate Change Policy and Mitigation Strategies

Pakistan's climate change policy and mitigation strategies are articulated in several key documents, such as the National Climate Change Policy (2012), Nationally Determined Contributions (NDCs) under the Paris Agreement, and the National Adaptation Plan (NAP). However, there remain significant gaps in effective implementation, resource mobilization, and coordination with economic growth strategies. The National Climate Change Policy outlines objectives for reducing greenhouse gas (GHG) emissions, transitioning to renewable energy, and enhancing resilience to climate impacts. However, its Nationally Determined Contributions (NDCs) are relatively modest, aiming to reduce GHG emissions by 50% by 2030, conditional on receiving international financial support (GoP, 2021).

International Best Practices	Best Practice adoption for Pakistan
<p>i. Renewable Energy Transition</p> <p>Germany's Energiewende (Energy Transition) is often cited as a model for decarbonizing energy systems. The country has rapidly expanded its renewable energy portfolio, with 47% of its energy coming from renewables as of 2021. Germany's success lies in robust policy frameworks like feed-in tariffs, incentives for solar and wind installations, and substantial public-private investments (Helm. D, 2021).</p>	<ul style="list-style-type: none"> • Pakistan could adopt feed-in tariffs and offer more attractive incentives for private sector investments in solar and wind energy. Germany's decentralized energy model can be replicated, especially in regions like Khyber Pakhtunkhwa, which have substantial hydroelectric potential.

<p>ii. Climate Adaptation and Resilience Building</p> <p>The Netherlands' Delta Programme offers an excellent model for flood risk management and climate adaptation. By combining engineering solutions (dykes, levees, flood barriers) with nature-based solutions, the country has effectively protected itself from sea-level rise while enhancing ecological resilience. The program is anchored in a long-term, well-funded strategy and engages local communities (Aerts, J. et al., 2021).</p>	<ul style="list-style-type: none"> • Pakistan, especially regions like Sindh and Punjab prone to flooding, can learn from the Netherlands by combining hard infrastructure (dams, levees) with nature-based solutions (mangrove restoration, wetlands creation). Long-term financing for adaptation should be prioritized through both national budgets and international funds like the Green Climate Fund (GCF).
<p>iii. Climate Governance and Institutional Capacity</p> <p>The UK Climate Change Act (2008) established legally binding carbon budgets and created the Committee on Climate Change, an independent body that advises the government on climate actions. The UK's success is rooted in strong legal frameworks, cross-ministerial coordination, and a centralized climate monitoring body that ensures accountability (CCC, 2021).</p>	<ul style="list-style-type: none"> • Pakistan could benefit from establishing an independent Climate Change Commission that reports directly to the Prime Minister's Office. This body could oversee cross-sectoral coordination, track progress on NDC targets, and ensure accountability across ministries.

<p>iv. Carbon Pricing and Market Mechanism</p> <p>Sweden’s carbon tax has been hailed as one of the most effective tools in reducing emissions. Introduced in 1991, the carbon tax has helped Sweden reduce GHG emissions by 25% while growing its economy by 75%. Sweden’s model also integrates financial incentives for companies that switch to low-carbon technologies (Hammar, H. et al. (2021).</p>	<ul style="list-style-type: none"> • Introducing a carbon pricing mechanism could help Pakistan meet its emission reduction targets. A phased introduction of a carbon tax for high emission sectors such as cement and brick manufacturing could help generate revenue for green investments and provide incentives for emission reductions.
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Institutional Framework Swot Analysis

SWOT Analysis	Details
<p>Strengths</p>	<ul style="list-style-type: none"> • Existence of Dedicated Institutions: Institutions like MoCC and PCCA with clear mandates for climate policies. • Strong Policy Framework: Key documents such as NCCP and NAP provide strategic roadmaps for climate action. • International Support and Funding: Success in securing international funding for climate projects. • Climate Vulnerability Awareness: Growing awareness among governments regarding climate vulnerability and integration into policies.
<p>Weaknesses</p>	<ul style="list-style-type: none"> • Fragmented Institutional Coordination: Lack of coordination among climate related bodies leading to inefficiencies. • Inadequate Financial Resources for Implementation: Limited budget for climate action affecting comprehensive programs • Lack of Enforcement Mechanisms: Weak enforcement of environmental regulations. • Dependency on International Donors: Reliance on donor support affects long-term sustainability of climate projects.

Opportunities	<ul style="list-style-type: none"> • Green Economic Growth and Job Creation: Potential to shift towards renewable energy and eco-tourism. • Capacity Building and Institutional Strengthening: International partnerships can enhance disaster management and climate adaptation. • Leveraging International Climate Finance: Increased focus on GCF and MDBs can enhance funding for climate initiatives. • Technological Innovations in Climate Adaptation: Potential to use advanced technologies for planning and response.
Threats	<ul style="list-style-type: none"> • Political Instability and Policy Continuity: Frequent political changes threaten climate policy sustainability. • Rising Climate Risks and Disasters: Increasing frequency of extreme weather events challenges institutional capacity. • Economic Constraints and Competing Priorities: Limited domestic funding due to economic challenges. • Lack of Public Awareness and Community Engagement: Low public awareness can hinder policy implementation.

Stakeholder Analysis

1. Positively Affecting

Key stakeholders responsible for shaping and implementing Pakistan’s climate policies include the Ministry of Climate Change, the Pakistan Climate Change Authority, and international organizations like the UNFCCC. The Ministry of Climate Change plays a central role in setting the national climate agenda, drafting policies such as the National Climate Change Policy (2021), and overseeing their implementation. The Pakistan Climate Change Authority, established under the Pakistan Climate Change Act (2017), is tasked with ensuring that climate strategies are enacted across sectors and aligned with international obligations, such as the Paris Agreement (2015). Additionally, global bodies like the UNFCCC provide both financial and technical support, which is crucial for Pakistan’s climate initiatives, particularly through mechanisms like the Green Climate Fund and the Adaptation Fund (Pakistan Climate Change Act, 2017).

2. Positively Being Affected

The primary beneficiaries of Pakistan’s climate resilience strategies are vulnerable communities, particularly those in flood-prone areas, as well as sectors critical to the country's economy, such as agriculture and water management. Flood-prone communities along the Indus

River Basin benefit from initiatives like the Recharge Pakistan Program, which aims to restore wetlands and mitigate flood risks through nature-based solutions (National Climate Change Policy, 2021). In addition, Pakistan's Ten Billion Tree Tsunami initiative not only enhances forest cover but also improves local communities' resilience to climate-induced deforestation and desertification, contributing to better livelihood opportunities in rural areas. The agricultural sector, which accounts for around 22% of Pakistan's GDP, is also a direct beneficiary of climate adaptation programs focused on water conservation and sustainable farming practices (National Climate Change Policy, 2021).

3. Negatively Affecting

Despite positive intentions, inconsistent policy enforcement by provincial governments poses a significant challenge to climate action. Under the 18th Amendment (2010), provincial governments gained autonomy over environmental regulations, which has led to fragmented and uneven policy implementation across the country. While federal initiatives, such as the Pakistan Climate Change Authority, provide the legislative framework, provincial governments often lack the capacity, resources, or political will to fully enforce these policies. This inconsistency weakens national climate strategies and hampers the realization of Pakistan's commitments under international agreements like the Paris Agreement (2015) (Pakistan Climate Change Act, 2017).

4. Negatively Being Affected

Rural communities, particularly those in high-risk areas like Gilgit-Baltistan and Khyber Pakhtunkhwa, face increasing climate-related hazards such as Glacial Lake Outburst Floods (GLOFs) and droughts. These regions, already vulnerable due to geographic isolation and limited infrastructure, are further disadvantaged by inadequate disaster preparedness and a lack of resource allocation from both federal and provincial authorities (Pakistan Climate Change Act, 2017). Additionally, climate change exacerbates water scarcity in these regions, threatening both livelihoods and food security. The National Climate Change Policy (2021) recognizes these vulnerabilities, yet the lack of on-the-ground implementation, especially in rural areas, leaves these communities disproportionately affected by climate impacts (National Climate Change Policy, 2021).

PESTLE ANALYSIS OF THE ALIGNMENT FRAMEWORK

Political

The political landscape in Pakistan presents significant challenges to the effective coordination of climate policies, particularly due to provincial autonomy following the 18th Amendment (2010). This amendment transferred environmental governance powers to the provincial governments, leading to inconsistencies in policy enforcement and a fragmented approach to climate action. While the Pakistan Climate Change Act (2017) establishes the federal framework, its effectiveness is often hampered by provinces' limited capacity to implement climate initiatives uniformly (Pakistan Climate Change Act, 2017). This lack of coordination between federal and provincial authorities has slowed the execution of critical climate adaptation and mitigation projects, particularly in vulnerable regions such as Balochistan and Khyber Pakhtunkhwa.

Economic

Pakistan's climate actions are heavily dependent on international financial support. The Nationally Determined Contributions (2021) highlight the country's commitment to reducing greenhouse gas emissions by 50% by 2030, but this is contingent upon securing international funding (Nationally Determined Contributions, 2021). The economic strain of climate adaptation measures is particularly acute in sectors such as agriculture and energy, where the transition to sustainable practices requires significant investment. Pakistan has struggled to develop robust domestic financing mechanisms, such as carbon pricing or green bonds, which have proven effective in other countries like Sweden and Germany (National Climate Change Policy, 2021).

Social

Public awareness of climate change remains relatively low in Pakistan, especially in rural areas where communities are often directly impacted by climate-induced disasters such as floods and droughts. The National Climate Change Policy (2021) emphasizes the need for greater community participation and awareness, particularly in disaster-prone regions. However, the lack of comprehensive education and awareness programs has limited the public's engagement in climate action. Programs such as the Ten Billion Tree Tsunami have made some progress in involving local communities in afforestation efforts, but much more is needed to build a nationwide movement for climate resilience (National Climate Change Policy, 2021).

Technological

Pakistan faces significant technological gaps, particularly in the development and deployment of Monitoring, Reporting, and Verification (MRV) systems. These systems are critical for tracking emissions reductions and ensuring compliance with international climate commitments, such as the Paris Agreement (2015). The Pakistan Climate Change Act (2017) mandates the establishment of MRV systems, but inadequate data collection infrastructure and the lack of technological capacity at the provincial level hinder the effectiveness of these systems (Pakistan Climate Change Act, 2017). In contrast, countries like Norway and Germany have successfully implemented advanced MRV systems that enable real-time data collection and reporting, allowing them to meet their climate targets more efficiently.

Legal

The legal framework for climate action in Pakistan, primarily governed by the Pakistan Climate Change Act (2017) and the Pakistan Environmental Protection Act (1997), provides a strong foundation for addressing climate change. However, enforcement remains inconsistent across provinces. Provincial governments often lack the regulatory capacity or resources to enforce environmental laws effectively, resulting in gaps in compliance with national climate policies (Pakistan Environmental Protection Act, 1997). For example, environmental impact assessments, which are required for large infrastructure projects, are not always rigorously enforced, particularly in regions with limited governance infrastructure.

Environmental

Pakistan is highly vulnerable to climate-induced natural disasters, including floods, droughts, and Glacial Lake Outburst Floods (GLOFs) in the northern regions. The Pakistan Climate Change Action Plan (2021-2025) identifies increasing climate vulnerabilities as a significant challenge, particularly in rural and mountainous regions where communities lack access to disaster preparedness resources (Pakistan Climate Change Action Plan, 2021-2025). These environmental challenges are further compounded by deforestation, water scarcity, and soil degradation, which threaten the livelihoods of millions of Pakistanis.

Gap Analysis of Policies and Their Implementation

There is a significant gap between the formulation of climate policies and their effective implementation in Pakistan. This gap is particularly pronounced at the provincial level due to the decentralization of environmental governance brought about by the 18th Amendment (2010). While the National Climate Change Policy (2021) and the Pakistan Climate Change Act (2017) provide a robust framework for addressing climate challenges, the lack of coordination and capacity at the provincial level hinders consistent implementation across the country (Pakistan Climate Change Act, 2017). Provinces such as Balochistan and Khyber Pakhtunkhwa, which are most vulnerable to climate impacts, often lack the financial resources and technical expertise needed to implement climate adaptation and mitigation strategies.

Another critical gap lies in Pakistan's heavy reliance on international financial support. The Nationally Determined Contributions (2021) set ambitious targets for reducing greenhouse gas emissions by 50% by 2030, but these targets are contingent on receiving international funding. This financial dependency creates uncertainty and limits the sustainability of Pakistan's climate actions, as continued progress is subject to the availability of external aid (Nationally Determined Contributions, 2021). The reliance on global funds, such as the Green Climate Fund, while essential, exposes Pakistan to the volatility of international financial commitments, making long-term planning and project implementation challenging.

Furthermore, gaps in data collection and Monitoring, Reporting, and Verification (MRV) systems significantly hinder Pakistan's ability to accurately track emissions reductions and progress in climate adaptation. Although the Pakistan Climate Change Act (2017) mandates the establishment of MRV systems, these mechanisms are either underdeveloped or poorly coordinated at the provincial level. This lack of robust MRV systems not only impacts emissions tracking but also hampers Pakistan's ability to meet its international obligations under the Paris Agreement (2015). Provinces often lack the infrastructure needed for real-time data collection, making it difficult to compile accurate reports on climate action progress (Pakistan Climate Change Act, 2017).

Moreover, the Pakistan Environmental Protection Act (1997) mandates environmental assessments for projects that could potentially harm the environment. However, there are gaps in enforcement, particularly at the provincial level, where capacity constraints and a lack of regulatory oversight undermine the effectiveness of these assessments (Pakistan Environmental Protection Act, 1997). The inability to enforce these

regulations consistently across provinces adds another layer of complexity to the climate governance framework in Pakistan.

The gaps in policy implementation, financial dependency, and data collection systems pose significant challenges to Pakistan’s climate goals. Addressing these gaps will require enhanced federal-provincial coordination, the development of domestic financial mechanisms, and the strengthening of MRV systems to ensure that climate actions are both sustainable and effective.

Figure: GAP ANALYSIS

Objective	Current State	Desired State	Gap identified	Gap Description
Provincial Implementation of Climate Policies	Inconsistent implementation due to decentralization post- 18th Amendment (2010) . Provinces lack capacity and resources.	Coordinated federal and provincial climate action, with strong capacity in all provinces.	Lack of coordination between federal and provincial governments, resource limitations in vulnerable provinces.	Provinces such as Balochistan and Khyber Pakhtunkhwa are unable to implement climate strategies effectively.
Financial Dependency on International Aid	Heavy reliance on international funding for climate initiatives, NDC (2021) targets contingent on external support.	Sustainable, domestically-funded climate actions with reduced dependence on international aid.	Reliance on global funds such as the Green Climate Fund creates uncertainty in long-term climate planning.	Financial dependency limits sustainability. making progress vulnerable to shifts in international financing commitments
Data Collection and MRV Systems	Inadequate Monitoring. Reporting, and Verification (MRV) systems. Provinces lack infrastructure for real-time data.	Robust, province-wide MRV systems capable of real-time data collection and emissions tracking	Lack of coordination and technological infrastructure at the provincial level.	Without accurate MRV systems, emissions tracking and progress on climate adaptation cannot be effectively monitored.
Enforcement of Environmental Regulations	The Pakistan Environmental Protection Act (1997) mandates assessments, but enforcement is inconsistent across provinces.	Consistent enforcement of environmental laws with strong regulatory oversight at the provincial level.	Capacity constraints and lack of regulatory oversight hinder effective enforcement of environmental regulations.	The provincial authorities lack the resources and capacity to enforce environmental assessments uniformly across projects.

Conclusion

Pakistan's climate obligations under international treaties such as the Paris Agreement, Kyoto Protocol, and the COP conferences align with its national climate policy framework. The National Climate Change Policy (NCCP) and Nationally Determined Contributions (NDCs) are evidence of this alignment, particularly in terms of focusing on adaptation, disaster risk reduction, and sustainable energy transition.

However, the gap between policy and implementation remains a challenge. Research indicates that while Pakistan is making strides in aligning its national strategies with international commitments, significant financial, technical, and institutional barriers persist. Political instability, limited financial resources, weak technological infrastructure, and fragmented legal frameworks pose significant barriers to effective climate action. Achieving Pakistan's climate goals will require a substantial increase in international climate finance, robust governance mechanisms, stronger institutional frameworks, and greater investment in renewable energy and climate-resilient infrastructure. By learning from international best practices and leveraging both domestic and international resources, Pakistan can strengthen its resilience against climate change and achieve its climate-related targets.

To address these issues, there needs to be:

- Stronger coordination mechanisms between the MoCC and key economic ministries.
- An integrated financial strategy, increasing domestic funding to mobilize and allocate climate finance more efficiently.
- Enhanced capacity-building at the provincial level to ensure that national climate policies are effectively translated into local action.

With actionable and pragmatic strategies, the country can enhance its capacity to mitigate the impacts of climate change while promoting sustainable development.

Recommendations

Strengthen Institutional Coordination and Governance

Recommendation

- Establish a Centralized Climate Coordination Body: To address the fragmented approach among federal, provincial, and local institutions, create a National Climate Action Council (NCAC) under the Ministry of Climate Change. This council would oversee coordination between ministries, provincial governments, and local agencies to ensure that climate-related policies are integrated across sectors like agriculture, water energy, and infrastructure Justification.
- Effective coordination ensures streamlined policy implementation and mitigates overlapping responsibilities, which have led to delays and inefficiencies.

Actionable Steps

- Set up regular climate action meetings that bring together key stakeholders from all levels of government.
- Empower the NCAC to create specific cross-sectoral working groups focusing on areas like flood management, agricultural resilience, and renewable energy.

Increase Domestic Climate Finance

Recommendation

- Create a National Climate Fund: To reduce reliance on international donors and make climate financing more sustainable, establish a domestic climate fund. This fund would be fueled by a mix of carbon taxation, environmental levies, and public-private partnerships.

Justification

- Over-reliance on external financing limits Pakistan's capacity for sustained climate action. A domestic fund would provide more control and long-term planning ability.

Actionable Steps

- Introduce a carbon tax on emissions from key industrial sectors like manufacturing and transport.
- Incentivize businesses to invest in climate-friendly projects through tax breaks and subsidies.

- Mobilize contributions from the private sector by introducing green bonds and creating opportunities for climate-focused public-private partnerships (PPPs).

Enhance Technological Innovation and Adoption

Recommendation:

- Invest in Climate-Smart Technology: Allocate funds to enhance technological capacity in key areas such as GIS-based disaster monitoring, early warning systems, and climate-resilient agriculture. Pakistan should collaborate with international tech firms and research institutions to introduce state-of-the-art climate prediction models.

Justification:

- Effective technology use is crucial for managing disasters, especially in flood-prone areas. Real-time monitoring improves decision-making and resource allocation during emergencies.

Actionable Steps:

- Develop an Integrated Early Warning System (IEWS) with real-time flood and drought forecasting, using GIS, drones, and satellite data.
- Establish innovation hubs that focus on climate-smart agriculture, energy efficiency, and renewable energy technologies.
- Build capacity through technical training programs for government agencies and local communities to adopt and implement these technologies.

Strengthen Legal Frameworks and Enforcement Recommendation:

- Improve Enforcement of Climate and Environmental Regulations: Strengthen the capacity of provincial Environmental Protection Agencies (EPAs) to enforce existing environmental laws, including the Pakistan Environmental Protection Act. Provide additional resources and funding to enable them to monitor industrial emissions, deforestation, and pollution effectively.

Justification:

- Weak enforcement has been a critical barrier to effective climate action. Strengthening regulatory bodies will ensure compliance and accountability for climate laws.

Actionable Steps:

- Allocate additional resources and technical expertise to EPAs to carry out inspections, monitor compliance, and enforce penalties.
- Increase the use of environmental fines for non-compliant industries, with funds funneled into the National Climate Fund.
- Standardize environmental assessments and ensure uniform enforcement across provinces to avoid discrepancies in regulatory practices.

Increase Public Engagement and Awareness Recommendation:

- **Launch National Climate Awareness Campaigns:** Develop large-scale awareness campaigns to educate the public on climate change, targeting vulnerable populations such as rural farmers and coastal communities. Emphasize the importance of local-level climate adaptation and mitigation strategies.

Justification:

- Public engagement is vital to the success of climate policies. Raising awareness and providing local communities with the knowledge and tools to act will foster community resilience.

Actionable Steps:

- Use multimedia platforms, including television, radio, social media, and community-based workshops, to disseminate climate information.
- Partner with local NGOs and community groups to mobilize rural and urban populations around adaptation strategies, such as flood management and water conservation.
- Introduce climate education programs in schools and universities to build a climate-conscious future generation.

Foster Research and Development (R&D) Recommendation:

- **Increase Investment in Climate-Specific R&D:** Encourage universities, research institutions, and private sector players to collaborate on developing context-specific climate adaptation solutions. Focus on key areas like water management, drought-resistant crops, and sustainable energy sources.

Justification:

- Pakistan lacks sufficient R&D in climate adaptation strategies tailored to its specific geographical and socio-economic challenges. Developing localized solutions will increase the effectiveness of climate policies.

Actionable Steps:

- Establish a National Climate Research Consortium that connects leading universities, private firms, and international experts to address Pakistan's climate challenges.

- Incentivize R&D by offering grants and scholarships for climate-related research projects in areas like agriculture, water management, and renewable energy.
- Collaborate with international climate research institutions to bring global expertise to Pakistan's unique climate issues.

Promote Renewable Energy Expansion Recommendation:

- Accelerate the Transition to Renewable Energy: Expand investments in solar, wind, and hydropower projects to reduce dependence on fossil fuels and cut greenhouse gas emissions. Prioritize public-private partnerships (PPPs) in the renewable energy sector to attract investment and enhance capacity.

Justification:

- Transitioning to renewable energy is essential for reducing emissions and strengthening energy security. Pakistan's natural resources—especially solar and hydropower—offer significant untapped potential.

Actionable Steps:

- Increase government investment in small-scale solar and wind farms that can be deployed in rural areas with limited access to electricity.
- Streamline the approval process for renewable energy projects, making it easier for businesses to invest in green energy.
- Implement financial incentives for households and businesses to adopt solar and wind energy systems, such as tax exemptions or subsidies for solar panels.

Improve Disaster Preparedness and Climate Resilience

Recommendation:

- Develop Climate-Resilient Infrastructure: Invest in climate-resilient infrastructure such as flood defenses, water storage systems, and disaster-proof housing in vulnerable regions like the Indus River basin and coastal areas.

Justification:

- Pakistan's vulnerability to extreme weather events—such as floods, droughts, and heatwaves—necessitates robust disaster preparedness and resilient infrastructure to protect vulnerable communities.

Actionable Steps:

- Construct flood embankments and improve drainage systems in flood-prone areas.
- Upgrade irrigation systems to conserve water and prevent losses during droughts.
- Create climate-resilient housing in areas prone to extreme weather events, particularly in coastal regions and floodplains.

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