

Paradoxes in Global Climate Adaptation Actions

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Abstract

Climate adaptation is a critical strategy for safeguarding human civilization from the adverse impacts of climate change. While global leaders have implemented various adaptive measures, these efforts have largely fallen short of expectations. This study explores the paradoxes underlying global leaders' climate adaptation actions, which are often attributed to self-interest, reluctance to take responsibility, and continued reliance on fossil fuels. Through qualitative content analysis, this research examines primary data from the UNFCCC's Conference of Parties and UNEP's Adaptation Gap Reports, along with secondary sources such as books, journals, dissertations, and IPCC reports. Findings indicate that deliberate ambiguities in adaptation policies have been used to delay effective implementation, resulting in over three decades (1992–2024) of inaction. This study argues that without prioritizing climate justice and aligning policy commitments with tangible actions, climate adaptation efforts will remain ineffective. Urgent reforms are necessary to prevent authoritarian approaches to climate governance from disproportionately impacting vulnerable populations.

Keywords: adaptation paradox, climate adaptation, adaptation action, adaptation planning and implementation

Introduction

Climate change presents a “civilization-ending risk” (Parson, 2007) and an “existential threat” (Kumar, 2021), making its mitigation and adaptation one of the most urgent global concerns. Scientists, academicians, and climatologists have consistently urged political leaders to take immediate and effective action to reduce climate change impacts, safeguard human

societies, and protect ecosystems. Recognizing these scientific warnings, world leaders began incorporating climate change into political agendas in the late 1980s and introduced various adaptation measures to mitigate its adverse effects.

However, despite extensive adaptation initiatives, these efforts have largely failed to shield populations from escalating climate hazards. Instead, climate-related risks continue to intensify. This raises critical questions: Why are the effects of climate change worsening despite decades of adaptation efforts? Why have climate adaptation measures failed to deliver the intended results? Is there a contradiction between global leaders' pledges and their actual actions?

Developing and underdeveloped nations, which are disproportionately affected by climate change, face increasing vulnerabilities. This study argues that a significant paradox exists between what world leaders publicly advocate and the policies they implement in practice. To strengthen the adaptive capacity of the least-developed countries, it is essential to critically examine and expose the inconsistencies in global climate adaptation efforts. This study seeks to address these issues by investigating the paradoxes in political commitments and actions, ultimately contributing to a more transparent and effective approach to climate governance.

Methodology

This study employs a qualitative research approach, utilizing content analysis to achieve its objectives. Data has been collected from both primary and secondary sources. Primary sources include decisions from the United Nations Framework Convention on Climate Change's (UNFCCC) Conferences of Parties (COPs) and the Adaptation Gap Reports published by the United Nations Environment Programme (UNEP). The UNFCCC is the principal global institution governing climate discourse, while UNEP is responsible for coordinating environmental responses within the United Nations system.

In addition, secondary sources such as peer-reviewed journal articles, dissertations, books, and Assessment Reports from the Intergovernmental Panel on Climate Change (IPCC)

have been analyzed. Relevant websites on climate change adaptation were also consulted to supplement the data.

For the purpose of this study, paradoxes are defined as discrepancies or contradictions between global leaders' climate adaptation pledges and their actual implementation efforts. By examining these inconsistencies, this research aims to provide insights into the factors hindering effective climate adaptation at the global level.

Climate Adaptation

Climate change adaptation refers to adjustments made in ecological, social, and economic systems to reduce the adverse impacts of climate change. These adaptations include both immediate responses to existing climate effects and long-term strategies aimed at enhancing resilience.

The UNFCCC and its COPs have addressed various aspects of adaptation. Key adaptation measures include strengthening infrastructure resilience, developing early warning systems, promoting sustainable agriculture, restoring ecosystems, raising public awareness, advancing climate research, providing financial assistance to affected communities, and facilitating the transfer of environmentally sustainable and economically viable technologies.

Additionally, the Convention and COPs have recognized health-related adaptation measures, such as disease monitoring and prevention programs, mental health support for climate-induced trauma, and early warning systems to mitigate the spread of vector-borne diseases. Furthermore, adaptation efforts also aim to address structural inequalities faced by vulnerable populations, including children, women, displaced and disabled individuals, and marginalized ethnic groups. By incorporating these diverse adaptation strategies, climate policies seek to foster inclusive and effective resilience-building initiatives.

To combat climate change and mitigate its adverse effects, the UNFCCC convened in 1992, addressing the vulnerabilities of developing nations and establishing key climate adaptation policies. Several articles of the Convention, including Articles 3.3, 4.1 (b), (e), (f),

(g), (h), (j), 4.3, 4.4, 4.5, 4.7, 4.8, 4.9, 12.3, and 21, emphasize the importance of adaptation in reducing climate-related risks.

The IPCC first highlighted the need for climate adaptation policies in its Third Assessment Report (2001). The same year, at COP7 in Marrakech, adaptation was formally recognized as a key climate strategy, leading to the establishment of the National Adaptation Programme of Action (NAPA) to support Least Developed Countries (LDCs) in addressing immediate climate impacts. Financial commitments for adaptation began at COP15, resulting in the creation of three major funding mechanisms: the Least Developed Countries Fund (LDCF), the Special Climate Change Fund (SCCF), and the Adaptation Fund (AF). Additionally, the National Adaptation Plans (NAPs) were introduced to assist LDCs in developing long-term adaptation strategies, with nearly 130 countries having submitted NAPs or similar plans under the UNFCCC. To further assist LDCs, the LDC Expert Group was established to provide technical support for adaptation planning and implementation.

Subsequent international agreements reinforced the commitment to adaptation. The Copenhagen Accord (2009) initiated the first monetary pledge for adaptation, later formalized in the Cancun Agreements (COP16), which declared that “adaptation must be addressed with the same level of priority as mitigation” (decision 1.I.1 (b)/cp16). Other significant agreements, including the Delhi Declaration on Climate Change and Sustainable Development, the Buenos Aires Programme of Work on Adaptation and Response Measures, the Bali Action Plan, the Durban Plan of Action, the Sendai Framework for Disaster Risk Reduction, and the Paris Agreement, have emphasized achieving a 50:50 balance between adaptation and mitigation efforts. More recently, COP26 launched the Global Goal on Adaptation work programme, establishing the Glasgow–Sharm el-Sheikh work project (2022–2023) to strengthen adaptation financing, particularly for developing nations.

To translate adaptation commitments into action, world leaders have enacted laws and policies. According to the Grantham Research Institute (2019) on Climate Change and the Environment and the IPCC’s Sixth Assessment Report (2021), as of December 9, 2019, over 170 countries had adopted adaptation policies, with 658 national adaptation laws and regulations implemented globally. The majority of these policies were enacted between 2009 and 2016, with

133 new laws introduced by 85 nations in 2012–2013. At least 91 nations have adopted climate adaptation legislation, while over 120 countries have established a national framework on adaptation.

In addition to policy development, global leaders have supported numerous climate adaptation projects. According to Climate Fund Update (2022), as of December 2022, various multilateral funds had approved adaptation projects, including:

- Adaptation for Smallholder Agriculture Programme (42 projects)
- AF (239 projects)
- LDCF (285 projects)
- Millennium Development Goals (MDG) Achievement Fund (18 projects)
- Pilot Program for Climate Resilience (PPCR) (68 projects)
- SCCF (72 projects)

Other multilateral funds have supported both adaptation and mitigation projects, such as the Global Environment Facility (GEF) (834 projects), the Global Climate Change Alliance (109 projects), and the Green Climate Fund (GCF) (505 projects under the Initial Resource Mobilization phase and 66 under GCF-1).

Islam (2022) reported that between 2000 and 2018, over 104,000 climate-related projects were funded across 133 countries, with approximately 41,200 of these focused on adaptation. These figures highlight the extensive efforts made to address climate adaptation, yet significant challenges remain in ensuring the effectiveness and equitable distribution of these resources.

Paradoxes in Climate Adaptation Actions

Despite extensive global efforts, climate adaptation has largely failed to meet its intended targets, exposing the collective failure of the international community. Some critics have described the COP process as “active inaction” (Rahman, 2023). Following the Copenhagen Conference, the media mockingly labeled it “Hopenhagen” or “Brokenhagen” (ICCCAD, 2019),

reflecting widespread disappointment. Former UN climate chief Christiana Figueres (2023) termed this failure a “double climate paradox”, highlighting the disconnect between commitments and actions.

Effective climate adaptation requires coordination in planning, financing, and implementation—topics that have been extensively discussed at international forums. However, several paradoxes continue to hinder progress.

Planning Paradox

Effective action depends on sound planning, yet climate adaptation was initially absent from global leaders' priorities. During the early climate negotiations, adaptation was largely ignored as world leaders assumed that climate change impacts would be minimal and short-lived. As a result, they prioritized mitigation over adaptation (Hall & Persson, 2018). However, as the consequences of climate change became increasingly severe, adaptation was reluctantly integrated into global climate policy in the 2000s. It became a central issue within the UNFCCC and subsequent COPs.

Article 4.1(b) of the UNFCCC Convention acknowledges adaptation, stating that parties “shall ... formulate and implement ... measures to facilitate adequate adaptation to climate change.” However, this wording lacks enforceability:

- "Adaptation" is mentioned, but without clear responsibility or legal obligation, unlike mitigation.
- "Facilitate" implies weak accountability, allowing nations to evade concrete commitments.
- "Adequate" remains ambiguous, failing to define measurable adaptation outcomes.

On average, the term “adaptation” has appeared 43 times in each COP decision from the first conference to the present. However, despite repeated calls for global leaders to support developing nations in planning, implementing, and monitoring adaptation efforts, a universally accepted definition of adaptation remains elusive (Shaw, Mallick & Islam, 2013; Hall, 2017). Even major organizations such as the IPCC, UNFCCC, and United Nations Development

Programme (UNDP) use varying definitions of climate adaptation, often shaped by their institutional interests (Srinivasan & Kikan, 2006).

Unlike mitigation, which has clear targets and measurable outcomes, adaptation lacks defined metrics and standardized evaluation methods. Olazabal and Gopegui (2021) argue that world leaders remain uncertain about what constitutes adaptation and how to measure its success. The promised “new and additional” adaptation funding from Copenhagen and Cancun also remains undefined, with no agreed baseline for measuring financial commitments.

Although adaptation mechanisms such as NAPA and NAPs have been introduced, they remain voluntary and focus primarily on LDCs and developing nations, leading to inconsistencies in global adaptation efforts. Alarming, 15% of UNFCCC Parties still lack a national adaptation framework, while 29 climate-vulnerable nations have no adaptation plan, strategy, or policy at all (UNEP, 2023). Even where plans exist, many lack proper monitoring and evaluation (M&E) mechanisms—only 24% of nations have an M&E system in place, while 19% are still in the process of developing one (UNEP, 2023).

Furthermore, Dupuis and Knoepfel (2013) highlight that a lack of intra-policy coordination frequently hinders the successful implementation of adaptation strategies. Without a coherent, enforceable adaptation framework, the world remains locked in a cycle of pledges without action, perpetuating the paradox of climate adaptation.

Financing Paradox

Flaws in adaptation planning have led to significant discrepancies in adaptation financing. Although the UNFCCC’s 1992 Convention first addressed financial mechanisms for adaptation, concrete commitments were only made 18 years later at the Copenhagen Conference (2009). The Copenhagen Accord pledged \$30 billion in ‘fast-start’ financing (2010-2012) and a gradual increase to \$100 billion annually by 2020 (Article 8 of the Copenhagen Accord; Decision 2/CP.15). The Cancun Agreements (2010) later incorporated this pledge into the UNFCCC framework.

Many have questioned this delay in adaptation financing. Was it an oversight, or did it serve a strategic purpose? Cipler et al. (2013) argue that states’ self-interested attitudes have

slowed climate adaptation progress, as developed countries have consistently resisted financial obligations.

Political Divide in Financial Mechanisms

A major roadblock to adaptation finance stems from the divide between developed and developing countries. Developing nations, through COP negotiations, pushed for an independent financial mechanism under Article 11 of the UNFCCC Convention to oversee climate funds. However, developed nations opposed this, favoring the GEF—established in 1991 by the World Bank, UNDP, and UNEP.

Developing countries strongly resisted the GEF-led approach, arguing that it prioritizes GHG mitigation over adaptation (Ciplet et al., 2013). Despite their objections, two adaptation funds—the LDCF and the SCCF—were placed under the GEF’s oversight. This institutional bias reinforced inequities in adaptation funding.

Conflicting Estimates of Adaptation Finance Needs

One of the biggest paradoxes in adaptation finance is the uncertainty surrounding how much funding is actually needed. Different institutions have provided widely varying estimates:

- World Bank (2010-2050): \$70-\$100 billion annually (at 2005 prices)
- UNFCCC (by 2030): \$60-\$182 billion, with \$28-\$67 billion required for developing nations
- IPCC (2016-2050): \$830 billion annually to limit global warming to 1.5°C
- UNEP (2030 projection): \$140-\$300 billion annually, increasing to \$280-\$500 billion by 2050
- Updated UNEP (2023) estimate: \$387 billion annually by 2030, with a range of \$101-\$975 billion

This variation reflects the lack of a standardized methodology for estimating adaptation costs (Islam, 2022; Xie et al., 2023). Even the \$100 billion annual pledge made at

Copenhagen—which covers both mitigation and adaptation—falls significantly short of these estimates.

Insufficient and Uncertain Finance Flows

Despite adaptation finance being a priority, actual funding remains inadequate and inconsistent. The UNEP (2023) adaptation finance gap report reveals that:

- Adaptation finance flows were \$14.9B (2017), \$14.8B (2018), \$19.2B (2019), \$25.2B (2020), and \$21.3B (2021).
- The annual gap in adaptation finance is between \$194B and \$366B, meaning funding needs are 10-18 times higher than current flows.

At COP26, world leaders pledged to double adaptation finance by 2025 from 2019 levels. This would require an annual increase of 16% (\$38B)—yet, even if met, it would close only 5-10% of the adaptation finance gap (UNEP, 2023). No roadmap has been provided, even as of COP28.

Disproportionate Distribution of Climate Funds

Despite commitments to balance adaptation and mitigation funding, adaptation remains severely underfunded:

- The Copenhagen Accord and Cancun Agreements proposed a 50:50 split between adaptation and mitigation. However, in 2012, 78-80% of fast-start finance went to mitigation (Ciplet et al., 2013).
- Between 2000-2018, funding allocations were 39.66% for adaptation, 43.37% for mitigation, and 16.97% for dual-purpose projects.
- Over 19 years (2000-2018), \$434.3 billion was spent on climate finance (\$22.86B per year), with 64.7% going to mitigation and only 27.67% to adaptation (Islam, 2022).

A similar trend persists in Multilateral Development Bank (MDB) financing:

- The Asian Development Bank, European Investment Bank, and Inter-American Development Bank Group financed 4,773 projects (2016-2020)—favoring mitigation over adaptation (Xie et al., 2023).
- In 2021, MDBs provided \$51B to low- and middle-income economies—65% for mitigation and only 35% for adaptation (Bank, 2022).

This imbalance contradicts the Paris Agreement’s goal of equal adaptation and mitigation finance.

Misallocation of Adaptation Funds

Even when adaptation funds are allocated, they often fail to reach their intended purpose. Hussain and Ahmed (2020) analyzed 5,200 adaptation-related aid projects and found that:

- 56% were environmental projects with no adaptation components.
- 14% focused on GHG emission reduction, not adaptation.
- 28% were unrelated to adaptation, mitigation, or the environment.
- 2% were uncategorizable.

Additionally, adaptation financing varies widely between countries. From 2000-2018, disparities in funding were stark:

- India (2018): \$2.7 billion in adaptation finance.
- Turkmenistan (2018): \$4 million, among the bottom five beneficiaries (Islam, 2022).

Shift Towards Loans Instead of Grants

Another paradox in adaptation finance is the growing trend of loan-based financing, which contradicts the principle of grant-based support for vulnerable nations.

- Between 2017-2021, 63% of all adaptation-specific finance was provided as loans, while only 36% was given as grants (UNEP, 2023).

- Developed nations introduced climate insurance schemes (e.g., life, crop, and livestock insurance) and loans instead of grants through the GCF.

These loan-based models increase the debt burden on vulnerable countries rather than reducing climate risks. Affected communities—such as Bangladesh and small island states—must repay insurance premiums, further exacerbating their financial vulnerability.

Private financial institutions have exploited this financing gap by introducing profit-driven insurance and bond-based adaptation funding, leveraging GCF loans as investment opportunities. Instead of helping at-risk populations, these mechanisms deepen economic disparities.

The paradoxes in adaptation financing highlight deep structural inequities in global climate policy. Despite repeated pledges, adaptation finance remains:

1. Delayed (18-year gap from UNFCCC's 1992 Convention to Copenhagen's financial commitments).
2. Uncertain (conflicting cost estimates from UNFCCC, UNEP, World Bank, and IPCC).
3. Insufficient (the \$100B commitment falls well below actual needs).
4. Unevenly distributed (favoring mitigation over adaptation).
5. Misallocated (adaptation funds diverted to non-adaptation projects).
6. Debt-driven (loan-based financing replacing grant-based support).

Without binding commitments, clearer guidelines, and accountability mechanisms, adaptation finance will remain inadequate—leaving vulnerable nations underfunded and unprotected in the face of escalating climate risks.

Conclusion and recommendations

The discussion above highlights the paradoxes within climate negotiations at both organizational and state levels. Whether intentional or due to systemic inefficiencies, global

climate actions have consistently prioritized mitigation over adaptation. A key reason for this imbalance is that a substantial portion of mitigation funding ultimately benefits donor countries. Additionally, global leaders fear that acknowledging climate adaptation needs—or their historical responsibility for climate change—will lead to greater demands for addressing vulnerability, poverty, health, and human rights violations.

Another significant reason for the lack of emphasis on adaptation is the belief that prioritizing adaptation might hinder mitigation efforts. Unlike mitigation, which has clear definitions and implementation mechanisms, adaptation remains vaguely defined, with no consensus on its operational scope, control levels, or timelines. As a result, while adaptation was recognized in the 1992 UNFCCC framework, the first financing pledge for adaptation was made only in 2009—17 years later—and reiterated in the Paris Agreement six years afterward without being made mandatory. Although adaptation plans exist, developed nations have yet to fully commit, leaving developing and underdeveloped nations to struggle with the consequences largely on their own.

The lack of coordination among climate policy agencies further exacerbates the problem. From the very definition of adaptation to the measurement of its financing, differences in interpretation create significant barriers to policy implementation. The \$100 billion in funding promised in 2009 remains far below actual demand. Worse, only about 20% of the pledged amount—and a mere 5-6% of actual needs—has been allocated. The few adaptation projects that are implemented suffer from a lack of proper evaluation and monitoring, and they are often plagued by political interference, corruption, and nepotism.

Due to the paradoxical stance of developed countries, effective climate adaptation measures remain elusive, despite more than three decades of discussions. The fact that the same concerns raised in 1992 are still being debated in 2024 is a clear indication of the failure to take decisive action. While underdeveloped nations currently bear the brunt of climate change, the long-term consequences will inevitably affect developed countries as well. To safeguard human civilization from the devastating impacts of climate change, the following recommendations must be adopted:

1. **Prioritizing Climate Justice:** Climate justice must take precedence over political and economic interests to ensure fair and equitable solutions.
2. **Grant-Based Adaptation Funding:** Adaptation financing should be primarily grant-based rather than loan-based to prevent further indebting vulnerable nations.
3. **Effective Policy Implementation:** Climate policies must be implemented as intended, with clear mechanisms to ensure accountability and effectiveness.
4. **Autonomy for Developing Nations:** Developing countries should have greater control over managing climate funds, reducing reliance on donor-controlled mechanisms.
5. **Clear Adaptation Benchmarks:** Specific adaptation benchmarks must be established to measure progress and hold global leaders accountable.
6. **Bridging the Pledge-Action Gap:** There must be a tangible link between the adaptation commitments made by global leaders and their actual implementation.
7. **Equal Priority for Adaptation and Mitigation:** Climate adaptation must be given the same level of priority as mitigation to build resilience in vulnerable regions.

Without decisive action, the current cycle of inaction will persist, leaving future generations to bear the consequences of today's failures. A shift in global climate finance and policy implementation is urgently needed to address the adaptation financing paradox and ensure a sustainable and just future for all.

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