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FULL LENGTH ARTICLE

Evaluating the Effectiveness of the Paris Agreement and Challenges to International Climate Cooperation: A Political, Economic, and Justice-Based Analysis

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ABSTRACT

The Paris Agreement (2015) marked a significant change in international climate regulation by replacing binding national targets with a flexible, bottom-up system of nationally determined contributions (NDCs). Although this design secured almost universal participation, voluntary commitments and weak implementation mechanisms have constrained its ability to deliver the deep, equitable emissions cuts needed to limit warming to 1.5 °C. This study critically examines the Agreement's institutional structure, ambition cycle, transparency framework, Article 6 market mechanisms, and climate finance. Drawing on scholarly work, global climate assessments, and United Nations documentation, it identifies political self-interest, economic inequality, unresolved differentiation, and finance gaps as major obstacles to international cooperation. These structural challenges are especially consequential for developing countries. A case study of Uzbekistan, a climate-vulnerable lower-middle-income country in Central Asia participating in Article 6, illustrates how global barriers are reflected nationally through conditional NDCs, limited measurement, reporting, and verification (MRV) capacity, and reliance on external support. The analysis concludes that without stronger accountability, predictable climate finance, operationalized equity under CBDRRC, and hybrid governance, the Paris framework risks remaining aspirational rather than transformative. Recommendations focus on Article 6 integrity, domestic monitoring, and just-transition principles to narrow the ambition and equity gaps.

Keywords: Paris Agreement ▪ Nationally Determined Contributions ▪ Economic inequalities ▪ Uzbekistan case study ▪ Hybrid governance

1. INTRODUCTION

Climate change is one of the major global challenges of the twenty-first century and requires coordinated international action. Rising global temperatures, recurring extreme weather, and ongoing environmental degradation underscore the need for cooperation. Adopted in 2015, the Paris Agreement established a landmark international framework for climate action. Despite its ambitious goals, its effectiveness and the ability of countries to cooperate remain contested. This paper assesses the Agreement's effectiveness and the obstacles to international climate cooperation. It argues that while the Agreement has strengthened unity among nations, its impact is constrained by political conflict, economic interests, and climate-justice concerns.

The Paris Agreement marked a multilateral breakthrough. Unlike the Kyoto Protocol's targets-and-timetables framework, it uses a bottom-up structure centered on nationally determined contributions (NDCs). This design enabled near-universal participation and introduced recurring five-year ambition cycles,

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a global stocktake, and an enhanced transparency framework. In principle, it balances national sovereignty with collective action through the principle of common but differentiated responsibilities and respective capabilities (CBDRRC), taking differing national circumstances into account.

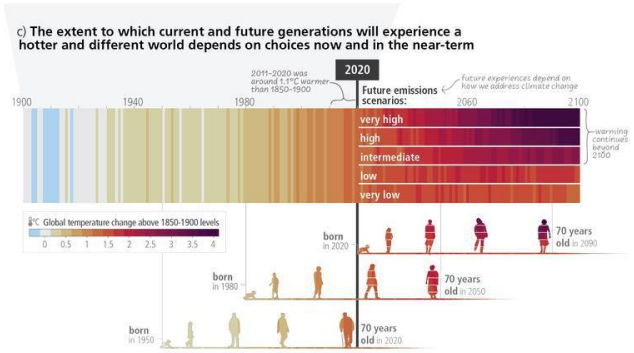


Figure 1. Observed and projected global temperature changes and the lived experience of generations under different emissions scenarios (IPCC AR6 Synthesis Report, SPM.1).

Nearly a decade after adoption, however, the Agreement's ability to foster profound cooperation and transformative emissions cuts remains disputed. Political self-interest can override long-term common interests; economic and developmental inequalities fuel disagreements over responsibility; and unresolved questions of differentiation, transparency, finance, and enforcement weaken trust. The flexibility that enabled broad participation may also permit free-riding and insufficient ambition as pathways consistent with 1.5 °C narrow. Figure 1 illustrates the diverging climate futures associated with different emissions scenarios.

The central research question is: How effective is the Paris Agreement, and what challenges constrain international climate action? The paper analyzes the Agreement's institutional design, ambition mechanisms, transparency provisions, Article 6 market mechanisms, and climate-finance architecture, with particular attention to differentiation and equity under CBDRRC. It brings scholarship from the Harvard Project on Climate Agreements together with IPCC assessments, UNEP Emissions Gap Reports, and UNFCCC documentation. An in-depth case study of Uzbekistan, a landlocked, climate-vulnerable developing country in Central Asia, shows how systemic barriers and opportunities appear at the national level.

1.1 Objectives

The objectives of this study are to:

1. critically evaluate the institutional effectiveness of the Paris Agreement and its capacity to raise collective ambition;
2. identify and discuss the principal political, economic, and equity-related obstacles to closer international cooperation;
3. examine how these global challenges manifest in a developing-country context, using Uzbekistan as a case study; and
4. develop conceptually grounded, policy-relevant recommendations for making the climate regime more effective and equitable.

2. LITERATURE REVIEW

The literature identifies a tension between the diplomatic reach of the Paris Agreement and its limited practical effectiveness. Victor argues that NDC flexibility requires stronger quality criteria that reflect countries' capacities; without them, bottom-up cooperation may remain superficial. Rajamani highlights unresolved differentiation, including the treatment of developed and developing countries and conditional NDCs, as a threat to long-term legitimacy. Bodansky notes that the transparency and Article 6 rules leave substantial discretion to parties, creating risks of inconsistent implementation. Research on ambition emphasizes the need for stronger drivers, longer-term pathways, and more credible successive commitments (Zou; Harstad).

Transparency has both narrow and broad dimensions, and domestic policy monitoring is necessary to build trust and reduce information asymmetries (Conte Grand; Aldy). Stavins and Marcu describe the two Article 6 tracks as potentially complementary, provided that environmental integrity, accounting, and fungibility are secured. Barrett and Gallagher and Paterson point to mini-multilateral and network-based approaches as ways to accelerate cooperation. Finance and adaptation gaps remain central concerns (Thompson; Heal and Lee; Murray). The IPCC estimates that well-regulated Article 6 cooperation could reduce mitigation costs, while the UNEP Emissions Gap Report warns that current NDCs leave a substantial gap relative to the 1.5 °C goal. Uzbekistan illustrates several of these challenges, including conditional NDCs, reliance on Article 6 cooperation, and large mitigation and adaptation finance needs by 2030 [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17].

3. MAIN ANALYSIS

3.1 Institutional Design and Ambition Dynamics

The Paris Agreement's bottom-up design was a diplomatic innovation that helped break the political deadlock associated with Kyoto by allowing countries to determine their own NDCs. It shifted climate governance from command-and-control targets toward iterative pledging and review. Yet flexibility without robust accountability can sustain low ambition and free-riding. The IPCC's Sixth Assessment Report projects warming of approximately 2.5–2.9 °C by 2100 under current policies and NDCs, well above the Paris temperature goals. Five-year cycles may also be too short to secure credible, long-term transitions in capital-intensive sectors [1, 5, 15].

3.2 Differentiation and Equity under CBDRRC

Differentiation remains one of the Agreement's most contested foundations. The move toward a more flexible interpretation of CBDRRC was politically necessary, but the Agreement does not fully specify how equity should shape conditional NDCs or the global stocktake. This creates persistent tensions between developed and developing countries: developing countries regard finance and technology transfer as essential corollaries of differentiation, while developed countries emphasize universal climate action. A fair distribu-

tion of burdens is important to sustaining long-term cooperation [2, 18].

3.3 Transparency and Domestic Monitoring

The pledge-and-review system depends on transparency and domestic monitoring. Without clear metrics and reliable policy surveillance, asymmetric information can undermine trust and mutual learning. Credible measurement, reporting, and verification (MRV) systems are essential, but many developing countries have limited capacity for data collection and institutional coordination [6, 7, 19].

3.4 Article 6 Mechanisms: Opportunities, Governance Challenges, and Implications for Cooperation

Article 6 is intended to increase ambition through cost-effective international cooperation and to direct finance and technology to developing countries. It provides for decentralized cooperative approaches under Articles 6.2 and 6.3, including internationally transferred mitigation outcomes (ITMOs), and a more centralized mechanism under Articles 6.4 and 6.7. Article 6.2 can accommodate heterogeneous, bottom-up links between systems, while the two tracks need compatible quality metrics and accounting rules to support environmental integrity and market liquidity [8, 9].

The IPCC estimates that well-managed Article 6 mechanisms could reduce global mitigation costs by as much as 50 percent and enable greater ambition, particularly with standardized methodologies and international oversight under the Article 6.4 mechanism. Risks include weak additionality rules, inadequate baselines, and missing corresponding adjustments, which may create low-quality credits, delay domestic decarbonization, and erode trust. UNEP likewise notes that Article 6 could mobilize finance for developing countries, but current implementation does not adequately guard against low-integrity credits and greenwashing [15, 16].

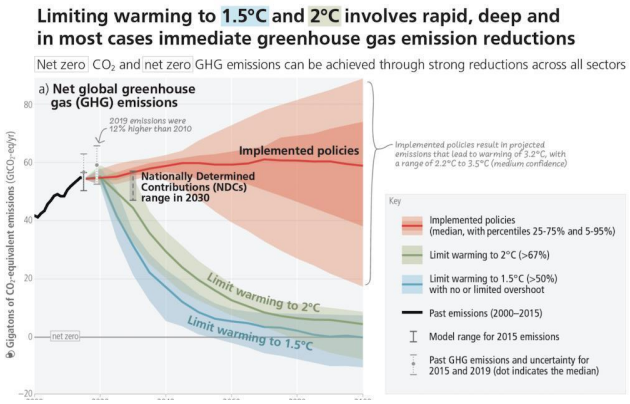


Figure 2. Global greenhouse-gas emissions pathways under implemented policies and NDCs compared with pathways limiting warming to 1.5 °C and 2 °C (IPCC AR6 WGIII).

As Figure 2 illustrates, even conditional NDCs do not deliver the deep emissions cuts required by 2030. This ambition gap helps explain why voluntary pledges have not produced sufficient progress. Article 6 may offer an interim avenue through ITMOs and the centralized mechanism, provided that robust integrity and accounting rules are in place [9, 8].

3.5 Finance and Adaptation Gaps

The adaptation-finance gap remains substantial. The needs of developing countries far exceed current finance flows, as documented by UNEP and the IPCC [16, 15].

3.6 Case Study: Uzbekistan—Global Challenges at the National Level

Uzbekistan illustrates the dynamics of the Paris Agreement in a developing-country context. It is a landlocked, lower-middle-income country in a climate hotspot, facing acute water scarcity, desertification, degradation of the Aral Sea, and heavy reliance on climate-sensitive agriculture. The World Bank's Country Climate and Development Report estimates that unmitigated climate change could reduce GDP by up to 10 percent by 2050; climate-related disasters already cost about 5 percent of GDP each year and disproportionately affect vulnerable populations [20].

Uzbekistan's NDC trajectory demonstrates both the iterative potential and the limitations of the Agreement. The first NDC, submitted in 2018, targeted a 10 percent reduction in greenhouse-gas emissions intensity per unit of GDP by 2030 relative to 2010. The target rose to 35 percent in the 2021 update. In November 2025, Uzbekistan submitted its third NDC (NDC 3.0), aiming to reduce emissions intensity per unit of GDP by 50 percent between 2010 and 2035 and setting a net-zero target for 2055. UNDP facilitated an inclusive, interdepartmental development process, illustrating the value of domestic ownership and successive ambition increases [21, 17].

The country submitted its first Biennial Transparency Report (BTR1) in late 2024 and is developing an integrated national MRV system through the RISQ platform [22, 21]. Uzbekistan is pursuing bilateral cooperative approaches under Article 6.2 with Japan through the Joint Crediting Mechanism and with the Republic of Korea [21, 23]. It prioritizes renewable energy, energy efficiency, and methane capture to attract investment, generate ITMOs toward its NDC, and support technology transfer [21].

Implementation nevertheless faces systemic barriers. Uzbekistan's NDC remains substantially conditional on international assistance, raising equity concerns and highlighting the unresolved differentiation gap. By 2030, the country needs approximately 33.7 billion for mitigation and 15.7 billion for adaptation. Without scaled, predictable climate finance and technology transfer, conditional commitments may not be fulfilled. Baseline-setting capacity, corresponding adjustments, and institutional coordination also remain challenges identified in national reporting and in broader assessments of developing countries [2, 17, 21, 19, 16].

Figure 3 places Uzbekistan's mitigation challenge within the broader relationship between cumulative emissions and warming. Increased warming heightens regional risks, including water scarcity and agricultural losses, reinforcing the equity and finance gaps identified in the literature [2, 18].

Uzbekistan also encourages mini-multilateral cooperation across the water–energy–food nexus and joint adaptation. The success of such initiatives nevertheless depends on global mechanisms that deliver equitable outcomes under CBDRRC. The country's experience captures the two-sided reality of

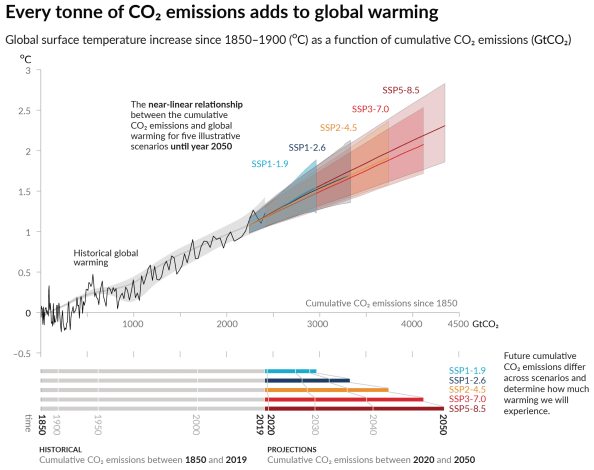


Figure 3. Global surface-temperature change as a function of cumulative carbon dioxide emissions under illustrative pathways.

the Paris Agreement: voluntary NDCs enable broad participation and progressive ambition increases, even in resource-constrained settings, but weak accountability, insufficient finance, unresolved equity, and limited MRV capacity constrain deeper cooperation. Article 6 could help close the finance and technology gap for vulnerable countries, but only if global rules ensure additionality, integrity, and sustainable-development co-benefits [11, 24].

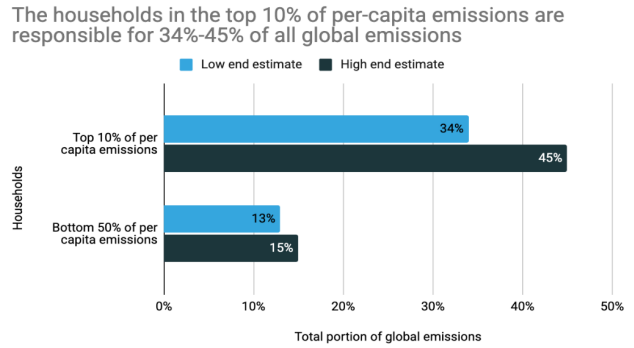


Figure 4. Estimated shares of global emissions attributable to households in the top 10 percent and bottom 50 percent of per-capita emissions.

Figure 4 highlights the unequal distribution of household contributions to global emissions. More broadly, warming beyond 1.5–2 °C increases risks for Uzbekistan, including water shortages and agricultural losses. Its conditional NDC and participation in Article 6 are therefore important but insufficient without scaled-up finance. Voluntary commitments alone have not closed these gaps [16].

4. DISCUSSION

The Paris Agreement has standardized climate discourse and institutionalized iterative ambition cycles, but its effectiveness is inherently constrained by design choices that prioritize national sovereignty over enforceable collective action. Pledging and review enabled broad participation, yet offered limited incentives for deep emissions cuts. Short-term political and economic interests often outweigh long-term global benefits, while economic imbalances and unresolved differentiation under CBDRRC erode trust.

Uzbekistan provides concrete evidence of these dynamics. The country has raised its NDC ambition to a 50 percent emissions-intensity reduction target, yet implementation remains highly dependent on external finance and technology. This reflects a broader pattern: developing countries may increase ambition on paper while lacking finance and capacity to implement conditional commitments. Article 6 can attract investment and facilitate technology transfer, but without agreed integrity standards it risks remaining fragmented rather than becoming a reliable engine of cooperation [15, 16].

Several approaches could strengthen the regime. Hybrid governance—combining multilateral rules with climate clubs, bilateral agreements, and mini-multilateral initiatives—may accelerate action where universal processes stall. Reciprocity linked to trade, security, or other policy areas may be more practical than relying on voluntary commitments alone. Debt-for-climate swaps, Article 6 revenues, green bonds, and stronger domestic monitoring could help build trust and demonstrate good faith [11, 24].

These approaches still require political will. Long-term warming increases the likelihood of crossing dangerous tipping points and disproportionately harms vulnerable countries such as Uzbekistan. Lessons from the Montreal Protocol suggest that effective coordination, credible incentives, and compliance mechanisms can succeed where pledge-and-review alone falls short. The ultimate test is whether the Paris Agreement can evolve from a platform for universal engagement into a regime capable of delivering fair, binding, and transformative cooperation [10].

5. CONCLUSION AND RECOMMENDATIONS

The Paris Agreement is a major diplomatic achievement that has universalized climate action and established dynamic ambition cycles. However, its voluntary character, weak implementation, and unresolved equity concerns limit its capacity to deliver the rapid, profound, and equitable changes needed to restrict warming to 1.5 °C. Uzbekistan's successive NDC increases and active Article 6 engagement demonstrate both the regime's potential and its structural limitations in developing-country settings.

6. RECOMMENDATIONS

1. Strengthen the global stocktake through independent review.
2. Operationalize CBDRRC in Article 6 and ensure adequate financing.
3. Require stringent environmental-integrity standards for Article 6 mechanisms [15].
4. Provide predictable climate finance through innovative instruments.
5. Promote hybrid governance to complement multilateral processes.
6. Codify just-transition principles.

Only stronger accountability, fairer burden-sharing, innovative finance, and genuine collaboration can enable the Paris Agreement to reduce harmful climate change and promote sustainable development across all countries. The stakes are especially high for Uzbekistan, the Global South, and the planet.

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