INTERNATIONAL COOPERATION FOR CLIMATE-CHANGE GOVERNANCE: AN ANALYSIS OF ARTICLE 6 OF THE PARIS AGREEMENT 2015

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Abstract
Climate change, the quintessential global commons dilemma, demands an unprecedented level of international cooperation. This study interrogates Article 6 of the Paris Agreement 2015 as a juridical apparatus for enabling transboundary climate governance through market and non-market approaches. The research problem lies in the ambiguity, operational deficits, and equity challenges inherent in the implementation of cooperative mechanisms-specifically, Internationally Transferred Mitigation Outcomes (ITMOs), the Sustainable Development Mechanism, and non-market frameworks. Employing a doctrinal legal methodology, the study critically analyses treaty provisions, COP decisions and comparative legal regimes to distil the normative scope and functional performance of Article 6. The findings reveal that while Article 6 embodies significant promise for enhancing ambition and cost-effectiveness in climate mitigation, its efficacy is impeded by legal uncertainties, governance fragilities, and asymmetries in technological and institutional capacities among parties. The study therefore recommends the urgent operationalisation of a robust Article 6 rulebook with precise accounting standards, enhanced transparency frameworks, and equitable benefit-sharing models. It further advocates for increased climate finance, technology transfer, and South-South cooperation to facilitate the participation of developing countries in emerging carbon markets. In conclusion, the study affirms that the success of Article 6 is not merely contingent on legal sophistication but on political will, institutional coherence, and global solidarity. If well harnessed, Article 6 could become the linchpin of climate multilateralism-transforming ambition into action and fostering a just transition to a low-carbon global economy.

Keywords: Climate Change Mitigation; International Cooperation; Paris Agreement; Article 6; Sustainable Development

1. Introduction

Climate change is the most urgent and complicated challenge we face today,[3] affecting the environment, economy, and society on a broad scale.[4] The increasing concentration of greenhouse gasses (GHGs) in the atmosphere, largely due to human activities[5] such as fossil fuel combustion,[6] deforestation, and industrial processes has led to significant changes in global climate patterns.[7] These changes include rising average temperatures, shifting precipitation patterns, more frequent and severe weather events, and sea-level rise,[8]

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[3] BA Iqbal and FN Ghauri, 'Climate Change: The Biggest Challenge in 21st Century' [2011] 2 (6) *Mediterranean Journal of Social Science*s 41-51, 41.; See also: G Moiceanu and MN Dinca, 'Climate Change-Greenhouse Gas Emissions Analysis and Forecast in Romania' [2021] 13 (21) Sustainability 12186;<https://doi.org/10.3390/su132112186>accessed on uly 1 2024.

[4] OU Okoroafor and others, 'Effect of Climate Change on Nigerian Economic Sustainability' [2024] 14 (5) IJECC 67-78, 67; *See* also, T Dietz and R Shwom and CT Whitley, 'Climate Change and Society' [2020] 46 (1) *Annual Review of Sociology* <DOI:10.1146/annurev-soc-121919-054614>accessed on July 14 2024.

[5] Y Wang and B Zhou, 'Exploring the Impact of International Cooperation on Climate Change' [2022] 670 *Advances in Social Science, Education and Humanities Research* 1409.

[6] ibid 1409.

[7] EPA, 'Climate Change Indicators: Greenhouse Gases' <https://www.epa.gov/climate-indicators/greenhouse-gases> accessed July 15 2024.

[8] Available at <https://www.epa.gov/report-environment/greenhouse-gases?>accessed on July 1 2024.

flash floods here and there[9]. The Intergovernmental Panel on Climate Change (IPCC) reports that the global average temperature has already increased by approximately 1.1°C above pre-industrial levels, with profound impacts on ecosystems, economies, and human health.[10] The need for international cooperation in addressing climate change is paramount.[11] This is on account of the fact that no single nation can effectively combat climate change in isolation, as GHG emissions know no borders.[12] Coordinated global action is essential to mitigate the adverse effects of climate change and to adapt to its unavoidable impacts.[13] This necessity for collective effort is underscored by the universal nature of the problem and the shared benefits of sustainable solutions.[14]

Over the decades, there has been a lot of efforts, particularly the adoption of international legal instruments, at different levels-International, regional and national levels-to combat the scourge of climate change.[15] The Paris Agreement, is the current pinnacle of international climate law,[16] adopted in 2015 under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC). This Agreement marks a significant milestone in the global response to climate change. Unlike its predecessor, the Kyoto Protocol, which imposed binding emissions reduction targets on developed countries and economies in transition,[17] the Paris Agreement adopts a more inclusive and flexible approach. It encourages all nations to contribute to the global climate effort according to their respective capacities and circumstances.[18] The historical significance of the Paris Agreement lies in its universal acceptance[19] and its innovative framework, which emphasises transparency, accountability, and enhanced ambition over time. Key objectives of the Paris Agreement include limiting global temperature rise to well below 2°C above pre-industrial levels, with efforts to limit the increase to 1.5°C[20]; enhancing adaptive capacity[21]; and fostering climate resilience and low GHG emissions development,[22] and this is to be pursued in a manner that does not threaten food production.[23]

In the circumstance, this paper aims to critically examine Article 6 of the Paris Agreement, which provides mechanisms for voluntary international cooperation in achieving climate mitigation and adaptation goals. Article 6 is particularly significant because it outlines the frameworks through which countries can collaborate to meet their Nationally Determined Contributions (NDCs) more effectively and efficiently. The focus will be on the mechanisms established under Article 6, namely cooperative approaches,[24] the sustainable development mechanism,[25] and non-market approaches.[26] By exploring these mechanisms, this paper will assess their potential to enhance global climate action, identify challenges in their implementation, and propose recommendations for strengthening international cooperation in climate change mitigation and adaptation.

[9] IPCC, <https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/>accessed July 1 2024.
[10] R Leal-Arcas and A Filis, 'International Cooperation on Climate Change Mitigation: The Role of Climate Clubs' [2021] 362 *Queen Mary Law Research* 5 and 7.
[11] ibid.
[12] ibid.
[13] M Escapa and A Ansuategi, 'Is International Cooperation on Climate Change Good for the Environment?' [2004] 17 (7) *Economics Bulletin* 1-11.
[14] Planet Energies, 'International Efforts to Combat Climate Change' [2024] <https://www.planete-energies.com/en/media/article/international-efforts-combat-climate-change>accessed on July 15 2024.
[15] Available at <https://www.adb.org/publications/international-climate-change-legal-frameworks>accessed July 1 2024.
[16] Kyoto Protocol. Art. 3 (1)
[17] Paris Agreement. Arts. 2(1); 4 (2) and 4 (3)
[18] BBC, 'What is the Paris Climate Agreement and Why Does 1.5C Matter?' <https://www.bbc.com/news/science-environment-35073297?utm>accessed August 4 2024.
[19] Paris Agreement. Art. 2.1(a)
[20] ibid Art. 7 (1).
[21] ibid Arts. 2.1 (b) and 7.9.
[22] ibid Art. 2.1 (b).
[23] ibid Art. 6.2.
[24] ibid Art. 6.4.
[25] ibid Art. 6.8.
[26] Available at <https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism?utm> accessed July 23 2024.

2. The Anatomy of Article 6 of the Paris Agreement

Article 6 of the Paris Agreement is crafted to facilitate voluntary international cooperation in achieving the mitigation and adaptation goals set forth by the Agreement.[27] It introduces a framework that allows for the use of cooperative approaches to achieve Nationally Determined Contributions (NDCs). The text of Article 6 is divided into three main sections: Articles 6.2, 6.4, and 6.8. Article 6.2 establishes a basis for cooperative approaches that involve the use of Internationally Transferred Mitigation Outcomes (ITMOs). It allows countries to engage in voluntary cooperation in the implementation of their NDCs to enhance the ambition of their climate actions and to promote sustainable development. The key provision here is the emphasis on environmental integrity, transparency, and robust accounting to ensure that ITMOs are real, measurable, and verifiable.[28]

Article 6.4 creates a centralised mechanism to contribute to the mitigation of greenhouse gas emissions while fostering sustainable development. This mechanism, often referred to as the Sustainable Development Mechanism (SDM), is intended to replace the Clean Development Mechanism (CDM) under the Kyoto Protocol[29]. The SDM aims to incentivise and facilitate the participation of both public and private entities in emissions reduction activities. It also includes provisions to ensure that these activities lead to real, measurable, and long-term benefits related to climate change mitigation[30].

Article 6.8 acknowledges the importance of non-market approaches in achieving the goals of the Paris Agreement. It provides a framework for countries to engage in cooperative measures that do not rely on market-based mechanisms. These non-market approaches can include initiatives such as technology transfer, capacity building, and adaptation efforts that enhance climate resilience and support sustainable development without the exchange of ITMOs[31]. Article 6 assumes a critical role in global climate efforts. It encourages transparency, accountability, and environmental integrity. Emission reductions achieved through Article 6 mechanisms are verifiable, contributing to the collective endeavor to limit temperature rise[32]. Additionally, Article 6 mobilises climate finance, supporting investments in low-carbon technologies and sustainable infrastructure. This dual impact accelerates the transition toward a greener economy while addressing socio-economic development and poverty reduction.

Looking ahead, effective implementation of Article 6 remains pivotal for international climate cooperation. Policymakers, stakeholders, and international organisations must fortify regulatory frameworks, enhance technical capacities, and expand financial mechanisms-especially to support developing nations. Inclusive partnerships, including South-South cooperation and knowledge-sharing initiatives, ensure active participation and mutual benefit across all countries. As we navigate the complexities of climate change, unwavering commitment, innovation, and collective action will shape a sustainable and resilient future for generations to come.

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[27]A Marcu, 'Carbon Market Provisions in the Paris Agreement (Article 6)' (CEPS Special Report No. 128 2016). Available at https://www.ceps.eu/ceps-publications/carbon-market-provisions-paris-agreement-article-6/>accessed July 8 2024.

[28]H Deng and others, 'Proposal of Implementation Framework of Cooperative Approaches and Sustainable Development Mechanism' [2022] 14(2) *Sustainability* 655; <https://doi.org/10.3390/su14020655>accessed August 5 2024.

[29]G Chan and others, 'Guidelines for a Sectoral Sustainable Development Mechanism in the Post-2020 Climate Regime' (University Digital Conservancy 2016); <https://hdl.handle.net/11299/190929>accessed August 5 2024.

[30]Available at https://earth.org/explainer-what-is-article-6-of-the-paris-agreement-and-why-is-it-a-key-topic-cop28/?> accessed August 5 2024.

[31]S Bolan and others, 'Impacts of Climate Change on the Fate of Contaminants Through Extreme Weather Events' [2024] 909 *Science of The Total Environmen*t 168388 <https://doi.org/10.1016/j.scitotenv.2023.168388. <https://www.sciencedirect.com/science/article/pii/S004896972307016X>accessed August 5 2024. Available at

[32]A Michaelowa and I Shishlov and D Brescia, 'Evolution of International Carbon Markets: Lessons for the Paris Agreement' [2019] 10 (6) *Wiley Interdisciplinary Reviews*: *Climate Chang*e e613. <doi:10.1002/wcc.613.>accessed July 12 2024.

The overarching objective of Article 6 is to enhance voluntary international cooperation to achieve greater climate ambition. By allowing countries to collaborate on mitigation efforts, Article 6 seeks to leverage the strengths and capabilities of each participating nation, fostering a more efficient and effective global response to climate change. One of the fundamental principles of Article 6 is the support for sustainable development.[33] The mechanisms established under this article are designed to ensure that climate actions contribute not only to the reduction of greenhouse gas emissions but also to broader developmental goals.[34] This dual focus on climate and development underscores the interconnected nature of environmental and socio-economic objectives in the global sustainability agenda.[35]

Another critical principle enshrined in Article 6 is the maintenance of environmental integrity.[36] This principle ensures that cooperative approaches do not compromise the environmental goals of the Paris Agreement. The mechanisms must adhere to robust accounting standards to prevent double counting of emissions reductions and to ensure that ITMOs represent actual, additional, and verifiable emissions reductions. Furthermore, Article 6 underscores transparency in the implementation of cooperative approaches. Transparent reporting and verification processes are essential to build trust among participating countries and to ensure that the claimed emissions reductions are credible and meet the agreed-upon standards.[37] This transparency is crucial for the overall credibility and effectiveness of the Paris Agreement.[38]

3. Mechanisms under Article 6

3.1. Cooperative Approaches

Article 6 of the Paris Agreement introduces multiple options for cooperation towards achieving the NDCs and higher ambition.[39] Specifically, article 6.2 facilitates cooperative approaches among parties by allowing the use of what is known as internationally transferred mitigation outcomes (ITMOs) to meet their nationally determined contributions (NDCs).[40] These approaches can take the form of bilateral or multilateral agreements, where countries collaborate to achieve their emission reduction targets more cost-effectively and efficiently.[41] Bilateral agreements involve direct cooperation between two countries. For instance, a country with advanced technological capabilities may assist another country in implementing renewable energy projects, thereby generating ITMOs that can be transferred and counted towards the NDCs of both nations. This form of collaboration leverages the unique strengths and resources of each country, fostering mutual benefits and enhancing overall climate ambition.[42] Of course, multilateral agreements, on the other hand, involve multiple countries engaging in collective efforts to reduce emissions. These agreements can be facilitated through regional organisations or international consortia that coordinate and oversee joint

[33]N Kreibich and W Obergassel, 'The Voluntary Carbon Market: What May be its Future Role and Potential Contribution to Ambition Raising under the Paris Agreement?' [2019] 19 (6) *Climate Policy* 686-702.

[34]KH Olsen and J Fenhann, 'Sustainable Development Benefits of Clean Development Mechanism Projects: A New Methodology for Sustainability Assessment Based on Text Analysis of the Project Design Documents Submitted for Validation' [2008] 36 (8) *Energy Policy* 2819-2830. <doi:10.1016/j.enpol.2008.02.039> accessed July 12 2024.

[35]The Climate Warehouse, 'Ensuring Environmental Integrity under Article 6 Mechanisms' [2022]. Available at https://www.theclimatewarehouse.org/knowledge/papers/ensuring-environmental-integrity-under-article-6-mechanisms> accessed July 11 2024.

[36]World Bank, 'What You Need to Know About Article 6 of the Paris Agreement' [2022]. Available at <https://www.worldbank.org/en/news/feature/2022/05/17/what-you-need-to-know-about-article-6-of-the-paris-agreement> accessed July 11 2024.

[37] UNFCCC, 'Article 6 – Cooperative Implementation' [2022]. <https://unfccc.int/process/the-paris-agreement/cooperative-implementation>accessed July 11 2024.

[38] Nigeria's Article 6 Framework – National Council on Climate Change' (Capacity-Building Workshop January 30th – 31st 2024); <https://natccc.gov.ng/publications/Capacity%20Building%20Workshop_Day%201.pdf>accessed July 23 2024.

[39] UNFCCC, 'Article 6.2 Manual for the Accounting, Reporting and Review of Cooperative Approaches' [2019] <https://unfccc.int/sites/default/files/resource/Article_6.2_Reference_Manual.pdf

[40] Learning for Nature, 'Operationalizing Article 6.2 of the Paris Agreement - Achieving Ambitious Climate Action through Cooperative Approaches'.[2023] <https://www.learningfornature.org/en/courses/operationalizing-article-6-2-of-the-paris-agreement-achieving-ambitious-climate-action-through-cooperative-approaches/> accessed July 10 2024.

[41] Available at <https://unepccc.org/article-6-pipeline/>accessed July 10 2024.

[42] L Schneider and S La Hoz Theuer, 'Environmental Integrity of International Carbon Market Mechanisms under the Paris Agreement. [2018] 19 (3) Climate Policy 386. <https://doi.org/10.1080/14693062.2018.1521332>accessed July 12 2024.

mitigation activities. Such collaborative frameworks can amplify the impact of individual efforts by pooling resources, sharing expertise, and promoting innovative solutions across borders.

One of the key strengths of these collaborative frameworks under article 6.2 is that the provision fosters cost-effectiveness. By allowing countries to purchase cheaper emissions reductions abroad, the mechanism can lower the overall cost of achieving global emissions targets.[43] Another area of strength is the provision for flexibility.[44] The mechanism provides flexibility for countries to achieve their NDCs through international cooperation.[45] Greater international collaboration in technology is essential. Presently, about 80% of patent applications in clean energy technology are held by Japan, the United States, the European Union (notably Germany and France), South Korea, and the United Kingdom. Many of these green technology patents remain unused, either because they cannot be commercialised or due to patent suppression practices. Although the latter has been upheld as legal by US courts,[46] it raises significant concerns. Countries like Brazil and South Africa have tied their progress under nationally determined contributions to the transfer and support of technology.[47]

Finally, there is room for innovation and technology transfer between countries, this, enhancing overall global capacity to mitigate climate change. The core principle underlying ITMOs is to ensure that the environmental integrity of the Paris Agreement is maintained. This necessitates robust accounting systems to track the generation, transfer, and use of ITMOs, thereby preventing double counting and ensuring that each ton of reduced emissions is only claimed once. Transparency in reporting and verification processes is crucial to build trust among parties and to validate the authenticity of the claimed mitigation outcomes.

3.2. Sustainable Development Mechanism

Article 6.4 establishes the Sustainable Development Mechanism (SDM), which is designed to facilitate the generation of emissions reduction projects that contribute to sustainable development.[48] This article is structured as follows: a firm based in Country C funds a reforestation project in Country D, which results in the creation of carbon credits. These credits are then sold on the global market to other companies or nations seeking to mitigate their emissions.[49] This mechanism builds on the experiences of the Clean Development Mechanism (CDM) under the Kyoto Protocol, with enhanced features to address previous shortcomings and to align with the broader goals of the Paris Agreement.[50] The SDM aims to incentivise and mobilise investments in projects that reduce greenhouse gas emissions while supporting sustainable development objectives. These projects can include a wide range of activities, such as renewable energy installations, energy efficiency improvements, reforestation efforts, and methane capture initiatives. By linking emissions reductions to sustainable development benefits, the SDM promotes an integrated approach to climate action that addresses both environmental and socio-economic challenges. A critical component of the SDM is the

[43] N Kreibich and L Hermwille, 'Caught in between: Credibility and Feasibility of the Voluntary Carbon Market Post-2020' [2021] 21 (7) Climate *Policy 939–957; <https://doi.org/10.1080/14693062.2021.1948384>accessed July 13 2024.*

[44] JF Green, 'Does Carbon Pricing Reduce Emissions? A Review of Ex-post Analyses. [2021] 16 (4) *Environmental Research Letters* 043004.

[45] *Continental Paper Bag Co v Eastern Paper Bag Co., 210 US 405 (1908)).*

[46] R Leal-Arcas and A Filis, 'International Cooperation on Climate Change Mitigation: The Role of Climate Clubs' [2021] 362 *Queen Mary Law Research 28.*

[47] UNFCCC, 'Development of a Sustainable Development Tool for Article 6.4 of the Paris Agreement' [2023] <https://unfccc.int/sites/default/files/resource/a64-sb007-aa-a07.pdf>accessed July 5 2024.

[48] Available at <https://www.smithschool.ox.ac.uk/news/article-6-focus-outcomes-cop28?utm>accessed July 8 2024.

[49] Smith School of Enterprise and the Environment, 'Article 6 in Focus: Outcomes from COP28 [2023] <https://www.smithschool.ox.ac.uk/news/article-6-focus-outcomes-cop28> accessed July 8 2024.; Also <https://www.iisd.org/articles/paris-agreement-article-6-rules?>accessed July 9 2024.

[50] R Webb and J Wentz, 'Human Rights and Article 6 of the Paris Agreement' (Sabin Center for Climate Change Law, Columbia Law School 3018) <https://climate.law.columbia.edu/sites/default/files/content/docs/Webb-Wentz-2018-05-Human-Rights-and-Article-6-of-the-Paris-Agreement_0.pdf>accessed July 13 2024. See also, R Anderson, 'Non-Market Mechanisms under Article 6.8 of the Paris Agreement: A Transnational Perspective' [2022] 13 (2-3) *Transnational Legal Theory* 321–351; also available at <https://doi.org/10.1080/20414005.2023.2174718>accessed July 13 2025.

establishment of stringent accounting rules to ensure the integrity of the emissions reductions achieved. These rules require accurate Measurement, Reporting, and Verification (MRV) of the emissions reductions, ensuring that they are real, additional, and permanent. Additionally, the SDM incorporates safeguards to prevent double counting, ensuring that emissions reductions are not claimed by more than one party or mechanism. It is germane to note that the centralised nature of the SDM also facilitates the participation of a wide range of stakeholders, including private sector entities, non-governmental organisations, and local communities. This inclusive approach enhances the diversity and scalability of the projects, promoting innovation and broadening the impact of climate action efforts.

3.3 Non-Market Approaches

Article 6 of the Paris Agreement recognises the right of Parties to cooperate in the implementation of their Nationally Determined Contributions (NDCs) through both market- and non-market-based approaches.[51] While market-based forms of cooperation are enshrined in Articles 6.2–6.7, Article 6.8 of the Paris Agreement recognises the importance of non-market approaches (NMAs) in international cooperation on climate change mitigation and adaptation in a variety of fields.[52] Market-based approaches entail both the cooperative approaches' and the SDM. On the other hand, Non-Market Approaches (NMAs) under the Paris Agreement refer to voluntary cooperation mechanisms that are not market-based.[53] Article 6.8 recognises the importance of non-market approaches in achieving the objectives of the Paris Agreement. NMAs are defined in Article 6, paragraph 8, of the Paris Agreement as integrated, holistic, and balanced approaches that enhance public and private sector participation in the implementation of NDCs and enable coordination across instruments and institutional arrangements[54]. Unlike market-based mechanisms that rely on the exchange of ITMOs, non-market approaches focus on broader forms of cooperation that do not involve tradable emissions reductions.

The framework for non-market approaches under Article 6.8 encompasses a wide array of activities, such as technology transfer, capacity building, adaptation planning, and policy coordination. These approaches are designed to complement market-based mechanisms by addressing areas where market solutions may not be sufficient or appropriate. One example of a non-market approach is the establishment of technology transfer initiatives that facilitate the sharing of advanced climate technologies between countries. These initiatives can enhance the capacity of developing countries to implement effective mitigation and adaptation measures, thereby strengthening their resilience to climate change impacts. Another potential application of non-market approaches is in the realm of capacity building. This involves providing technical assistance, training, and resources to countries to enhance their ability to design and implement effective climate policies. By building local capacities, non-market approaches can empower countries to take ownership of their climate actions and to integrate climate considerations into their broader development strategies.

4. Implementation and Challenges

4.1 Legal and Regulatory Frameworks

Implementing Article 6 of the Paris Agreement necessitates a robust legal and regulatory framework, both at the national and international levels. Countries must develop and enforce national legal requirements that align with the obligations under the Paris Agreement. This includes the establishment of laws and regulations that facilitate the creation, transfer, and use of internationally transferred mitigation outcomes (ITMOs),

[51] A Michaelowa and others, 'Operationalizing the Non-Market Approaches under Article 6.8 of the Paris Agreement' [2021] 30 (5) *Environmental Policy and Governance* 261-275, 261.

[52] Available at <https://www.cgiar.org/news-events/news/non-market-approaches-what-are-they-exactly/> accessed July 14 2024.

[53] L Peterson and others, 'Non-Market Mechanisms under Article 6.8 of the Paris Agreement: A Transnational Perspective. [2022] 13(2-3) *Transnational Legal Theory* 321-351. Available at <https://doi.org/10.1080/20414005.2023.2174718> accessed July 24 2024.

[54] C Voigt, 'The Compliance and Implementation Mechanism of the Paris Agreement. [2016] 25 (2) *Review of European, Comparative & International Environmental Law* 161-173.

ensuring compliance with the standards of transparency, environmental integrity, and sustainability.[55] At the international level, the regulatory framework must ensure that cooperative approaches, sustainable development mechanisms, and non-market approaches are governed by clear, consistent, and enforceable rules. These rules must be designed to promote fairness and accountability among participating countries. For instance, the detailed guidelines for the operationalisation of Article 6 were agreed upon at the COP26 summit in Glasgow, where parties adopted the Article 6 rulebook, setting forth the necessary accounting and reporting requirements

Harmonisation of domestic laws with international obligations is a critical component of effective implementation.[56] Countries need to adapt their existing legal systems to incorporate the provisions of Article 6, which often involves significant legal reforms. This process requires extensive coordination among various national authorities, including environmental agencies, energy regulators, and financial institutions.[57] By aligning national laws with international standards, countries can ensure that their climate actions are consistent, credible, and capable of contributing to the global effort to combat climate change.[58]

4.2 Technical and Operational Issues

The successful implementation of Article 6 mechanisms also depends on overcoming numerous technical and operational challenges. One of the foremost issues is the establishment of robust monitoring, reporting, and verification (MRV) systems. These systems are essential to ensure the accuracy and integrity of emissions reductions and to prevent double counting.[59] MRV systems must proficiently track the generation, transfer, and utilisation of ITMOs in real-time. This necessitates the deployment of sophisticated technologies and methodologies for emissions measurement and data management. For instance, satellite monitoring and blockchain technology have been proposed as potential tools to enhance transparency and traceability in carbon markets[60]. However, it must be pointed out that implementation and compliance pose multifaceted challenges. Countries often encounter technical difficulties in developing the requisite infrastructure and expertise to effectively implement MRV systems[61]. Additionally, operational challenges arise from the need to coordinate activities across various sectors and jurisdictions[62]. Ensuring that all relevant stakeholders, including private sector entities and local communities, are engaged in the process is crucial for the successful deployment of Article 6 mechanisms. Furthermore, compliance with the established rules and standards is essential to maintain the credibility of the cooperative approaches. This calls for continuous capacity-building efforts and the establishment of enforcement mechanisms to address non-compliance issues. International cooperation and support, particularly for developing countries, play a vital role in addressing these challenges and ensuring that all parties can meet their commitments under Article 6.

4.3 Political and Economic Considerations

The implementation of Article 6 mechanisms is deeply intertwined with political and economic considerations. One of the key challenges is balancing economic growth with environmental protection. While climate action can drive sustainable development and create new economic opportunities, it can also

[55] Available at <https://www.linkedin.com/pulse/legal-regulatory-considerations-utilizing-article-6-jcizf?trk=public_post_main-feed-card_feed-article-content>accessed August 4 2024.

[56] M Mehling and E Haites, 'Mechanisms for Linking Emissions Trading Schemes' [2009] 9 (2) *Climate Policy* 169-184.

[57] L Rajamani, 'The 2015 Paris Agreement: Interplay Between Hard, Soft and Non-Obligations' [2016] 28 (2) *Journal of Environmental Law* 337–58;<https://www.jstor.org/stable/26168923>accessed July 13 2024.

[58] Available at <https://www.worldbank.org/en/news/feature/2022/05/17/what-you-need-to-know-about-article-6-of-the-paris-agreement?utm> accessed July 14 2924.

[59] Available at <https://www.worldbank.org/en/news/feature/2022/05/17/what-you-need-to-know-about-article-6-of-the-paris-agreement?utm> accessed July 14 2024.

[60] R Tang and others, 'Key Challenges for the Establishment of the Monitoring, Reporting and Verification (MRV) system in China's National Carbon Emissions Trading Market' [2018] 18 (1) *Climate Policy* 106-121; <DOI: 10.1080/14693062.2018.1454882>accessed July 14 2924.

[61] E Rivera and D Bonomo (eds), 'Typical Challenges for Vertically Integrated Measurement, Reporting and Verification Systems of Greenhouse Gas Emissions' (ICLEI 2021) 8.

[62] Available at <https://www.iisd.org/articles/paris-agreement-article-6-rules?>accessed July 14 2024.

pose short-term economic challenges, particularly for countries heavily reliant on fossil fuels.[63] Political will and leadership are crucial in navigating these challenges. Governments must demonstrate a commitment to integrating climate objectives into their broader economic and development strategies. This involves making difficult policy decisions and investing in low-carbon technologies and infrastructure. Moreover, it requires addressing potential economic dislocations and ensuring a just transition for affected workers and communities.

Addressing the concerns of developing countries is another critical aspect of the implementation of Article 6. Many developing nations face unique challenges, including limited financial resources, technical capacity, and institutional frameworks.[64] International support in the form of financial assistance, technology transfer, and capacity-building is essential to enable these countries to participate effectively in Article 6 mechanisms and to achieve their NDCs.[65] The principle of common but differentiated responsibilities and respective capabilities (CBDR-RC) is fundamental in this context. It recognises the differing capacities and responsibilities of countries in addressing climate change and calls for tailored support to developing countries. By fostering equitable and inclusive participation, the implementation of Article 6 can contribute to a more balanced and effective global climate response.[66]

5. Case Studies and Examples

5.1 Successful Implementations

Several countries and regions have demonstrated successful implementations of Article 6 mechanisms, showcasing the potential for international cooperation in climate change mitigation and adaptation. One notable example is the European Union (EU), which has utilised bilateral and multilateral agreements under Article 6.2 to enhance its climate action efforts. Through partnerships with countries like Norway and Switzerland, the EU has effectively leveraged ITMOs to achieve its emission reduction targets while promoting sustainable development initiatives.[67] Similarly, Costa Rica has pioneered the use of the SDM under Article 6.4 to support its ambitious forest conservation and reforestation programs. By generating carbon credits through these activities, Costa Rica has not only contributed to global emissions reductions but has also strengthened its environmental resilience and biodiversity conservation efforts.[68] In addition to national efforts, regional initiatives have also emerged as successful models of Article 6 implementation. For instance, the African Union has established collaborative frameworks under Article 6.8 to promote technology transfer and capacity-building initiatives among African countries. These efforts aim to enhance the continent's climate resilience and support sustainable development goals across the region.[69]

Consequently, a-2025 comparative review highlights six countries, Africa inclusive-Cambodia, Ghana, Rwanda, Tanzania, Zambia, and Zimbabwe-as early leaders in operationalising Article 6 frameworks[70]. This means that in addition to the European Union and Costa Rica, several countries have emerged as frontrunners in putting these frameworks into practice. Cambodia, for example, has developed a comprehensive operational manual to guide its implementation of Article 6.2, focusing on sectors identified in its NDC and long-term carbon neutrality goals. The country's Ministry of Environment oversees the process, which features rigorous authorisation procedures and a system of fees and benefit-sharing designed to ensure both

[63] UNECA, 'Regulating Carbon Markets: Building Capacity for the Implementation of Article 6 of the Paris Agreement' [2023] <https://www.uneca.org/eca-events/regulating-carbon-markets-building-capacity-implementation-article-6-paris-agreement>accessed July 14 2024.
[64] UNEP-CCC, 'Article 6 Pipeline' [2024] <https://unepccc.org/article-6-pipeline/>accessed July 14 2024.
[65] ibid.
[66] European Commission, "EU Climate Action: International Carbon Market Cooperation' [2020] Available at <https://ec.europa.eu/clima/policies/ets/international_en>accessed August 4 2024.
[67] UNDP, 'Costa Rica's National Climate Change Policy' [2021]<https://www.cr.undp.org/content/costarica/en/home/presscenter/articles/2021/politica-nacional-cambio-climatico-costa-rica.html>accessed August 4 2024.
[68] African Union. 'AU Climate Change Strategy' [2020] https://au.int/en/agenda2063/climate
[69] UNECA (n 62).
[70] ibid.

environmental integrity and support for domestic climate goals. Cambodia has adopted a phased approach, continually updating its policies beyond 2025[71]. Ghana stands out with a detailed national policy blueprint that covers nearly 90% of its emissions under the NDC[72]. The Ministry of Environment, Science, Technology and Innovation, alongside a dedicated Carbon Market Office, manages Ghana's carbon market activities[73]. The country has established a whitelist of approved technologies and applies adaptation and opportunity cost fees, ensuring that proceeds benefit local communities. Through these mechanisms, Ghana has attracted carbon finance and green investments, particularly for renewable energy and waste management projects.

Rwanda focuses on aligning mitigation efforts with broader sustainable development objectives and has invested in a clear institutional framework that accelerates project approval. Tanzania is actively drafting its national guidelines, led by the Vice President's Office, emphasising transparency and sustainable outcomes. Zambia is developing digital platforms to track mitigation projects and ITMOs, while Zimbabwe has centralised leadership within its Ministry of Environment, establishing rigorous administrative and reporting standards and benefit-sharing systems[74]. Across these countries, diverse approaches reflect each nation's unique circumstances, institutional strengths, and policy priorities. Fees and proceeds from carbon market activities are commonly used to support adaptation and social benefits, demonstrating how climate action can align with broader development goals. The broader impact of operationalising Article 6 mechanisms is significant. At COP29, the full deployment of these frameworks was finalised, unlocking opportunities for countries and companies to engage in international carbon markets. This is expected to generate billions of dollars in savings and investment by supporting cleaner technologies, phasing out polluting industries, and accelerating renewable energy projects, particularly in developing economies[75]. Ultimately, these early implementations show the importance of strong institutions, transparent governance, and alignment with national climate strategies for successful and sustainable participation in the evolving carbon market landscape. By fostering green investments, job creation, and technology transfer, Article 6 is proving to be a critical tool for achieving the ambitions of the Paris Agreement and driving sustainable development worldwide.

5.2. Lessons Learned

The implementation of Article 6 has provided valuable lessons for policymakers and stakeholders alike, highlighting both successes and challenges in leveraging international cooperation for climate action. Analysis of successes reveals that effective governance structures and clear regulatory frameworks are essential for the successful implementation of Article 6 mechanisms. Countries that have established robust legal frameworks and institutional capacities, such as the EU and Costa Rica, have been able to navigate complex international climate markets and maximise the benefits of cooperative approaches.[76] Conversely, failures often stem from inadequate institutional capacity, limited financial resources, and political barriers. Developing countries, in particular, face challenges in accessing climate finance and technology transfer, which are crucial for participating in Article 6 mechanisms effectively. Addressing these barriers requires

[71] UNDP, 'Creating Transparent System for Monitoring, Reporting and Verification (MRV) in the Area of Climate Change' [2023]<https://www.undp.org/montenegro/projects/creating-transparent-system-monitoring-reporting-and-verification-mrv-area-climate-change>accessed July 14 2024.

[72] UNDP., 'What Does Transparency Mean When It Comes to Climate Change?' [2023] Available at <https://climatepromise.undp.org/news-and-stories/what-does-transparency-mean-when-it-comes-climate-change> accessed July 14 2024.

[73] J Todun, 'Addressing Climate Change Through Climate Action' [2022] 1 (1) Climate Action' 2; <https://doi.org/10.1007/s44168-022-00003-8>accessed July 14 2024.

[74] ibid.

[75]Climate Action Network (CAN), 'Global Climate Action Agenda' [2021] Available at <https://climateactionnetwork.ca/> accessed July 14 2024.

[76]UNFCCC (2021). "Enhancing Ambition: The Paris Agreement." Available at: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

international support and capacity-building initiatives tailored to the specific needs of vulnerable countries.[77] Best practices identified through successful implementations include transparent reporting and verification processes, stakeholder engagement, and the integration of climate considerations into broader development strategies. These practices enhance accountability, build trust among parties, and ensure that emission reductions achieved through Article 6 mechanisms are credible and contribute to global climate goals.[78] In order to seriously enhance the future implementations of Article 6, we recommend measures such as strengthening international cooperation, expanding financial and technical assistance to developing countries, and promoting knowledge-sharing among stakeholders. By learning from past experiences and adopting best practices, countries can maximise the potential of Article 6 to accelerate global climate action and achieve sustainable development objectives.[79]

6. Future Prospects and Recommendations

6.1. Enhancing International Cooperation

The future of global climate action hinges on enhancing international cooperation through strategic initiatives and collaborative frameworks.[80] One key strategy involves strengthening existing partnerships and fostering new alliances among countries, international organisations, and non-state actors.[81] By leveraging shared expertise and resources, countries can amplify their collective impact in addressing climate change challenges. Initiatives such as the Climate Action Network (CAN) and the Global Climate Action Agenda (GCAA) serve as platforms for coordinating efforts and mobilising support for ambitious climate goals[82]. Moreover, promoting transparency and accountability in international climate negotiations is crucial for building trust and ensuring the effectiveness of cooperative mechanisms. Countries should prioritise the development of robust monitoring, reporting, and verification (MRV) systems to track progress towards their climate commitments accurately. These systems play a pivotal role in verifying emission reductions and enhancing the credibility of cooperative approaches under Article 6 of the Paris Agreement[83].

6.2. Strengthening Article 6 Mechanisms

In order to enhance the effectiveness of Article 6 mechanisms, policymakers should consider several policy recommendations. First, there is a need to streamline and harmonise regulatory frameworks at both national and international levels. Clear and consistent guidelines are essential to facilitate the implementation of cooperative approaches, sustainable development mechanisms, and non-market strategies.[84] Countries should also prioritise capacity-building initiatives to enhance technical expertise and institutional capabilities in managing climate projects and emissions trading schemes.[85] Furthermore, promoting innovation and scalability in climate finance is critical for unlocking new opportunities under Article 6. Enhanced financial mechanisms, such as climate funds and green bonds, can mobilise private sector investments in climate-

[77] Available at <https://www.smithschool.ox.ac.uk/news/article-6-focus-outcomes-cop28?>accessed July 8 2024.; see also, B Müller and A Michaelowa,'How to operationalize accounting under Article 6 market mechanisms of the Paris Agreement' [2019] 19 (7) *Climate Policy* 1-8; <DOI:10.1080/14693062.2019.1599803

[78] A Michaelowa and A Espelage and B Müller, 'Negotiating Cooperation under Article 6 of the Paris Agreement' (Perspectives Climate Research. European Capacity Building Initiative 2019] Available at <https://ecbi.org/sites/default/files /Article%206%202019_1.pdf> accessed August 5 2024.

[79] JC Hourcade and PR Shukla and C Cassen, 'Climate Policy Architecture for the Cancun Paradigm Shift: Building on the Lessons from History' [2015] 15 (4) *International Environmental Agreements: Politics*, *Law and Economics 353-367.*

[80] World Bank, 'Climate Finance.' [2021] <https://www.worldbank.org/en/topic/climatefinance/overview>accessed June 14 2024.

[81] A Atteridge and E Remling, 'Is Adaptation Reducing Vulnerability or Redistributing it?' [2018] 9 (1) *Wiley Interdisciplinary Reviews: Climate Change* e500. <doi:10.1002/wcc.500.>accessed July 13 2024.

[82] ibid.

[83] Massive floods recently (June 2025) in the US States of Texas, Florida and other states with massive destruction of lives and property.

[84] SPAR6C, '*Article 6 Governance Frameworks in Action – A Collection of Case Studies from 6 Host Countries*' (Global Green Growth Institute (GGGI) 2025); Available at <https://www.spar6c.org/sites/default/files/downloads/best-practices/SPAR6C%20%20A%20collection%20of%20case%20studies%20from%C2%A06%C2%A0host%C2%A0countries_28-02-2025.pdf>accessed July 25 2025.

[85] ibid.

resilient infrastructure and low-carbon technologies.[86] These initiatives not only support economic growth but also contribute to achieving sustainable development goals.[87]

6.3. Supporting Developing Nations

Supporting developing nations in their mitigation and adaptation efforts remains a cornerstone of global climate action. Measures to assist vulnerable countries include increasing financial assistance, technology transfer, and capacity-building support. International donors and financial institutions should prioritise investments in renewable energy projects, climate-resilient agriculture, and sustainable urban development to enhance the adaptive capacity of developing nations.[88] Moreover, promoting South-South cooperation and knowledge-sharing initiatives can facilitate the transfer of best practices and innovative solutions among developing countries.[89] By fostering inclusive and equitable partnerships, the international community can ensure that all countries, regardless of their economic status, have the resources and support needed to effectively address climate change challenges.

7. Conclusion

In this paper, we have explored the nuanced mechanisms and implications of Article 6 of the Paris Agreement, by focusing on its targeted and pivotal role in fostering international cooperation for climate change mitigation and adaptation. This study specifically set off by examining the foundational aspects of the Paris Agreement with particular reference to the core objectives outlined in Article 6. The study reveals that there are three main components in Article 6: cooperative approaches, the Sustainable Development Mechanism, and non-market approaches. Under cooperative approaches, countries can engage in bilateral and multilateral agreements to exchange internationally transferred mitigation outcomes (ITMOs), thereby enhancing the ambition and effectiveness of their climate actions. The Sustainable Development Mechanism provides a centralised platform for emissions reduction projects that not only mitigate greenhouse gas emissions but also promote sustainable development goals. Meanwhile, non-market approaches offer flexible frameworks for broader forms of cooperation, such as technology transfer and capacity-building initiatives. Article 6 plays a crucial role in global climate change efforts by facilitating collaborative strategies that transcend national borders. It encourages countries to work together, leveraging their respective strengths and resources to achieve collective climate goals. By promoting transparency, accountability, and environmental integrity, Article 6 mechanisms ensure that emission reductions are verifiable and contribute to global efforts to limit temperature rise and enhance climate resilience. Moreover, Article 6 fosters innovation and scalability in climate finance, mobilising investments in low-carbon technologies and sustainable infrastructure. This not only accelerates the transition towards a greener economy but also supports socio-economic development and poverty reduction initiatives.

Looking ahead, the future of international climate cooperation hinges on advancing the implementation and effectiveness of Article 6 mechanisms. Policymakers, stakeholders, and international organisations must continue to strengthen regulatory frameworks, enhance technical capacities, and expand financial mechanisms to support developing countries. Promoting inclusive and equitable partnerships, particularly through South-South cooperation and knowledge-sharing initiatives, will be essential in ensuring that all countries can actively contribute to and benefit from global climate action. As we navigate the complexities of climate change, the path forward requires steadfast commitment, innovation, and collective action. By building on the successes and lessons learned from Article 6, we can forge a sustainable and resilient future for present and future generations.

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[86] ibid.
[87] ibid.
[88] ibid.
[89] Ghana Carbon Market Office, 'Ghana's Progress Report on the Implementation of Article 6 of the Paris Agreement, 2023'. <https://cmo.epa.gov.gh/reports/>acvessed July 25 2025.