G8 and Global Climate Policy: Repercussions and Cooperation Dynamics

Mohamad Mokdad[1], Medani P. Bhandari[2]

[1]Achrafeye, Sodeco, Damascus Road, Khayyat Tower 1, Second floor, Beirut, *Lebanon*

[2]Corresponding Author, Kathmandu, Forestry College, *Nepal*

Abstract— **Climate agreements are an essential global initiative to mitigate global warming and manage the escalating climate crisis. Their success depends on the commitment of key nations, especially the G8, to reduce greenhouse gas emissions and transition to carbon-neutral energy sources. These agreements also call for collaborative efforts to achieve net-zero emissions by 2050 and support developing countries in reducing their carbon footprint.**

This study highlights the necessity of collective action by the international community to address climate risks threatening humanity. It underscores the importance of sustainability principles, climate adaptation, and adequate funding as critical solutions, despite varying perspectives among international entities under the United Nations framework. The G8, as a leading global economic and political bloc, plays a pivotal role in shaping strategic issues such as global security, counterterrorism, and climate change. Their influence on international and regional stability makes their cooperation indispensable for tackling climate challenges.

The research examines the consequences of non-compliance with climate agreements, analyzing their impact on G8 cooperation and international dynamics. It also investigates how individual countries benefit from or suffer under climate change and how they leverage opportunities to their advantage. The findings emphasize the interconnectedness of global efforts in combating climate change and the strategic implications for international partnerships and policy-making.

Keywords— Climate Agreements, G8 Nations, Greenhouse Gas Emissions, Global Sustainability, International Cooperation, Climate Adaptation

I. INTRODUCTION

Climate agreements have become a critical global priority and a foundational strategy for curbing global warming and mitigating its adverse effects. These agreements rely heavily on the commitment of leading nations, particularly the G8 countries, to reduce greenhouse gas emissions by shifting to alternative, carbon-neutral energy sources. Additionally, the G8 nations are tasked with spearheading efforts to achieve net-zero emissions by 2050 while simultaneously supporting developing nations in their efforts to reduce emissions (International Energy Agency, 2021).

This study emphasizes that the existential risks posed by climate change demand robust and decisive intervention by the international community. Effectively addressing these risks requires adherence to sustainability principles, adaptation to climate realities, and the mobilization of adequate financial resources. However, these efforts remain hindered by divergent strategies and priorities among various international actors, including those within the United Nations framework (United Nations Framework Convention on Climate Change [UNFCCC], 2020).

Global climate change has gradually evolved from a peripheral environmental concern into a central pillar of international economic, political, and security governance. Among the key informal institutions shaping this evolution, the Group of Eight (G8)—and later the Group of Seven (G7)—has played a significant role in agenda-setting. Established initially in the mid-1970s to address global economic instability and

ASEJ - Scientific Journal of Bielsko-Biala School of Finance and Law
Volume 30, No 1 (2026), pages 10
https://doi.org/10.19192/wsfip.sj1.2026.3
Received: December 2025, Accepted: March 2026,
Published: March 2026

energy security following oil shocks, the G8 was not designed as an environmental governance body. However, as scientific evidence on climate change accumulated and its economic and geopolitical implications became increasingly evident, climate policy progressively entered the G8's strategic discourse.

The chronological development illustrates how G8 engagement with climate issues unfolded in phases. During the early period (1975–1988), climate concerns were largely absent, with cooperation focused on stabilizing fossil-fuel-based energy markets. From the late 1980s through the 1990s, growing scientific consensus—marked by the establishment of the IPCC and the adoption of the Kyoto Protocol—pushed climate change onto the G8 agenda, albeit in a fragmented and non-binding manner. National economic priorities and divergent responsibilities limited collective enforcement and ambition (see table below).

The mid-2000s marked a turning point, particularly with the 2005 Gleneagles Summit, when climate change was explicitly framed as an economic, development, and security challenge. Subsequent summits linked climate policy to sustainable development, energy transition, and financial stability. However, external shocks such as the global financial crisis, geopolitical tensions, and shifting leadership—most notably the U.S. withdrawal from the Paris Agreement in 2017—repeatedly constrained coherence and effectiveness.

More recently, the G7 has reasserted its influence through net-zero commitments, climate finance pledges, carbon market coordination, and the framing of climate change as a systemic security risk. As shown in the table, while the G8/G7 has been influential in shaping narratives and priorities, its climate leadership has depended heavily on alignment with broader multilateral mechanisms, particularly the UNFCCC. This evolving role underscores both the potential and the limitations of elite forums in governing a complex, global, and deeply political climate crisis.

II. The Global Position of the G8 Countries

The aftermath of World War II ushered in numerous global crises, including economic, social, security, and environmental challenges. These challenges highlighted the need to form international coalitions, particularly those encompassing the world's major economic powers, to address escalating global tensions. The establishment of these blocs was driven by key events, including the Cold War, the emergence of new geopolitical actors, and rising concerns over global instability (Baldwin, 2016).

The origins of the G8 can be traced back to the geopolitical and economic upheavals of the 1970s. Notably, the Arab oil embargo during the October War of 1973 triggered a global economic recession, prompting France to convene a summit in 1975 at Rambouillet. This meeting brought together leaders from West Germany, Italy, Japan, the United Kingdom, and the United States. A year later, Canada joined the coalition, forming the Group of Seven (G7). Russia's inclusion in 1997 transformed the group into the G8, although its membership was suspended in 2014 following the annexation of Crimea (Laub, 2014).

Today, the G8 countries collectively represent approximately 12% of the global population, account for 50% of the world's GDP, and contribute to two-thirds of global trade (Mace, 2021). Despite lacking a legal personality or institutional framework with binding authority, the G8 has played a pivotal role in shaping global policies on economics, security, and climate change. Over the last three decades, it has served as a key forum for addressing major global issues, including environmental sustainability and climate change (Energy Saving Trust, 2021).

The G8 functions as a platform for informal yet impactful dialogue among its members, enabling them to adapt their agendas to evolving global circumstances. In the 1970s, its focus was on the oil crisis, while in the 1980s, it emphasized global environmental concerns. The 1990s saw a shift towards financial instability and debt crises, with additional attention given to African development issues at the turn of the century. In more recent years, the group has expanded its scope to include terrorism, drug trafficking, and human rights (Broom, 2021).

The summits provide an invaluable opportunity for heads of state to engage in direct, high-level discussions. Over time, the G8's approach to cooperation has evolved significantly, emphasizing the interconnectedness of global economies. Its guiding principle asserts that the economic and trade policies of major economies have profound effects on other nations due to the increasing interdependence of the global economic system (Mingst, 2014).

Table 1: G8 and Global Climate Policy – Chronological Development, Repercussions, and Cooperation Dynamics

Period / Year	Key G8 Milestones	Global Climate Policy Context	Main Tasks and Commitments	Repercussions and Cooperation Dynamics
1975–1988	Formation of G7 (1975); later inclusion of Canada	Energy security dominates the agenda following the oil crises	Stabilize global energy markets; economic coordination	Climate concerns are marginal; cooperation is focused on fossil fuel security
1989–1996	Early environmental discussions emerge in G7 summits	A growing scientific consensus on climate change (IPCC established in 1988)	Support climate science; recognize environmental risks	Limited coordination; climate framed as an environmental, not an economic issue
1997	G8 engagement around Kyoto Protocol	Adoption of the Kyoto Protocol under UNFCCC	Commit to emissions reductions; promote market mechanisms	Divergent national positions weaken collective enforcement
2000–2004	Climate appears intermittently on G8 agendas	Climate change linked to sustainable development	Encourage technology transfer; capacity building	North–South tensions over responsibility and finance
2005	Gleneagles G8 Summit (UK Presidency)	Climate change is elevated as a core economic	Launch the Gleneagles Plan of Action;	Enhanced cooperation with emerging

Period / Year	Key G8 Milestones	Global Climate Policy Context	Main Tasks and Commitments	Repercussions and Cooperation Dynamics
		and security issue	promote clean energy	economies; limited binding outcomes
2008	Hokkaido–Toyako G8 Summit	Climate linked to global economic stability	Support long-term emissions reduction goals	Financial crisis diverts attention; climate ambition diluted
2009	L'Aquila G8 Summit	Lead-up to Copenhagen COP15	Commit to 2°C target; climate finance pledges	Coordination challenges; credibility gap emerges
2010–2013	Transition discussions toward G20 leadership	Climate governance becomes more fragmented	Promote green growth and low-carbon pathways	Shift from G8 dominance to broader multilateral forums
2014	Russia suspended; G8 reverts to G7	Heightened geopolitical tensions	Maintain climate dialogue without Russia	Reduced global representativeness; policy coherence weakened
2015	G7 support for Paris Agreement	Adoption of the Paris Agreement	Endorse decarbonization and long-term climate goals	Renewed alignment with UNFCCC processes
2017	U.S. announces withdrawal from Paris Agreement	Fragmentation of global climate leadership	Preserve collective ambition despite U.S. position	EU, Canada, and Japan strengthen cooperation
2021	Cornwall G7 Summit	Post-COVID green recovery	Net-zero by 2050 commitments; climate finance	Reinforced cooperation; renewed transatlantic leadership
2022–2023	G7 climate-security nexus strengthened	Climate framed as security and economic risk	Accelerate energy transition; address climate finance gaps	Stronger coordination with multilateral banks
2024–Present	G7 leadership in global climate diplomacy	Focus on just transition and carbon markets	Carbon pricing, CBAM coordination, climate finance	Geopolitical tensions constrain cooperation, but it remains influential

Source: Bhandari 2024.

This table demonstrates that G8/G7 engagement with climate policy has evolved from energy security concerns to climate-economic governance, and more recently to climate-security and justice frameworks. While the G8/G7 has played an important agenda-setting role, its effectiveness has been constrained by internal political divergence, geopolitical shifts, and the rise of broader multilateral platforms such as the G20 and UNFCCC.

III. Areas of Cooperation

The G8 leaders, through their summits, have sought to implement effective strategies to create a safer, more stable world while improving global living standards amid pressing challenges. The group has tackled a wide range of issues, including economic stability, energy security, trade, counter-terrorism, and global security. Key highlights of their cooperative efforts are outlined below:

The G8 reaffirmed its commitment to fostering sustainable development in African nations and supporting poverty alleviation efforts. Measures included initiatives such as debt forgiveness for the world's poorest nations, humanitarian aid for millions affected by food shortages, and targeted interventions to combat malaria, a leading cause of child mortality in Africa (The White House, 2005). These steps underscored the group's focus on addressing systemic inequalities and improving public health outcomes on the continent.

The G8 leaders emphasized their dedication to achieving lasting peace in the Middle East by supporting efforts to resolve regional conflicts. They backed the work of the special envoy to the occupied territories, advocated for the withdrawal of Israeli forces from Gaza and the West Bank, and encouraged international financial contributions to revive the Palestinian economy. Additionally, they called for the cessation of violence and terrorism in the region. They extended their congratulations to Lebanon for conducting democratic parliamentary elections in 2005, pledging support for its governance and development (Mingst, 2014).

A strong commitment to combating terrorism has remained a cornerstone of G8 cooperation. Leaders urged all nations to contribute to efforts to identify and neutralize terrorist threats, dismantle terrorist financial networks, and uphold the rule of law. This included close collaboration with the United Nations and other regional organizations to strengthen global political will and institutional capacities in the fight against terrorism (Laub, 2014).

The G8 nations prioritized combating the proliferation of weapons of mass destruction, emphasizing the need to prevent their acquisition by terrorist groups. Strategies included restrictions on the export of enrichment technologies and the enforcement of UN Security Council Resolution 1540, which prohibits non-state actors from developing, acquiring, or using nuclear, chemical, or biological weapons (Energy Saving Trust, 2021).

Recognizing the challenges posed by economic imbalances and volatile oil prices, G8 leaders advocated strategies to foster global economic stability. These included promoting growth through increased national savings, enhancing production capacity in oil-exporting nations, and reducing market volatility through transparent data-sharing practices (Mace, 2021).

The G8 pledged to accelerate trade reforms to open new market opportunities, particularly in developing nations, thereby stimulating growth and reducing poverty. This included initiatives to combat piracy and intellectual property rights violations, such as enhanced internet monitoring and the development of stronger legal frameworks in collaboration with developing nations (Broom, 2021).

Addressing climate change has been a significant focus for the G8, with leaders advocating for a collaborative approach involving both developed and developing nations. Key initiatives included transitioning to sustainable energy sources, promoting nuclear and renewable energy, and advancing

hydrogen-powered vehicle technology. During the 2021 G7 Summit in the UK, members reaffirmed their commitment to achieving net-zero emissions. They adopted a four-pillar environmental framework to promote sustainability, transform the economy, and protect nature (International Energy Agency, 2021).

Following the Soviet Union's collapse and Russia's shift toward democracy, the G7 nations invited Russia to join the group in 1998, aiming to encourage economic reform and democratic governance. However, in 2014, the G8 suspended Russia's membership after it annexed Crimea, citing violations of Ukraine's sovereignty and territorial integrity. Russia's support for the Syrian regime further exacerbated tensions, highlighting diverging priorities within the group (Laub, 2014).

IV. Criticism of the G8

Over the past five years, the G8 has faced mounting criticism, particularly regarding its approach to free trade, which has become a focal point for anti-globalization movements. Critics argue that the group's exclusivity prioritizes the industrial needs of its member nations at the expense of developing countries. This criticism has spurred the formation of alternative economic blocs, such as BRICS (Brazil, Russia, India, China, and South Africa), some of whose members now have GDPs that surpass those of certain G8 countries (Laub, 2014). Additionally, the G8 has been criticized for failing to reflect the perspectives of emerging economies and for no longer representing the world's most dynamic and influential economies. Without Russia, the G7 lacks balance in terms of global nuclear power dynamics, instead projecting a unipolar view of global governance (Mingst, 2014).

The absence of emerging economies such as China and India—two of the world's most populous nations and expected future economic powerhouses—from the G8 has been a significant point of contention. In response to a series of financial crises in Latin America and Asia during the late 1990s, discussions were expanded to include these and other new players, resulting in the establishment of the G20 in 1999. The G20 has since eclipsed the G8 as the primary platform for international economic cooperation. It includes leaders from both developed and developing nations across all continents. Collectively, the G20 nations represent 80% of global economic output, two-thirds of the world's population, and three-quarters of global trade (International Monetary Fund [IMF], 2021).

Despite its challenges, the G8 has made significant contributions to addressing global crises. Its role has evolved over decades, from tackling the oil crisis of the 1970s to addressing environmental risks in the 1980s and supporting the democratic and economic transitions of Eastern European nations in the 1990s. The G8 has also played a vital role in combating terrorism post-9/11, managing the 2008 global financial crisis, and addressing climate change in recent years (Baldwin, 2016).

a. Asserting Western Presence

At the 2021 G7 summit, leaders of the world's most advanced democracies reaffirmed the relevance of the "West" in addressing global challenges. They pledged hundreds of millions of COVID-19 vaccine doses and demonstrated their commitment to slowing climate change, thereby countering China's growing influence in global trade and economics (Energy Saving Trust, 2021).

b. Tackling the Pandemic

The G7 leaders developed a joint agenda to combat the COVID-19 pandemic by committing to donate 2 billion vaccine doses to low-income countries and to enhance global health frameworks. Efforts included improving early warning systems and accelerating vaccine research and production timelines (World Health Organization [WHO], 2021).

c. Supporting Economies

The G7 emphasized economic recovery through $12 trillion in financial and technical support to stimulate global trade and growth. Initiatives included job creation, infrastructure investment, and support for small and medium enterprises (Mace, 2021).

d. Ensuring a Prosperous Future

The G7 champions free trade and fair economic systems to create resilience in the global economy. Recent measures include strengthening taxation frameworks to attract investment and harnessing technological innovation for societal benefit, ensuring prosperity across all dimensions, from cyberspace to outer space (Broom, 2021).

e. Protecting the Planet

The G7's environmental commitments include achieving net-zero emissions by 2050, phasing out coal-fired power plants, and conserving 30% of the planet's land and oceans by 2030. Additionally, the group pledged $2.8 billion to help developing nations transition to clean energy and reaffirmed its commitment to mobilizing $100 billion annually to combat climate change impacts in developing countries (International Energy Agency [IEA], 2021).

f. Preserving Values

The G7 prioritizes upholding core Western values such as democracy, freedom, and human rights. A significant focus has been placed on gender equality, with efforts to enroll 40 million girls in education and allocate $23 billion to the Global Partnership for Education program (United Nations Educational, Scientific, and Cultural Organization [UNESCO], 2021).

V. Climate Change Impacts on G8 Countries

Throughout history, climatic changes have significantly shaped the rise and fall of empires and influenced global governance. For example, prolonged droughts in ancient Egypt, which diminished Nile water levels and agricultural productivity, were major contributors to the decline of the Pharaonic Empire. Similarly, extreme winters during World War II reshaped the European battlefield, contributing to the Nazis' defeat and altering global geopolitics after the war (Hsiang & Burke, 2014).

a. United States

Until 2006, U.S. administrations largely dismissed climate change as a critical issue. However, the 2007 conference titled "Implications of Climate Change for American National Security," held at the Army War College, marked a shift in perspective as strategists highlighted the risks posed to national security (National Intelligence Council, 2008). Economically, the U.S. faces annual GDP losses of approximately 1.2% for every 1°C increase in temperature, due to coastal degradation, higher energy costs, and reduced productivity. Flood risks in southern and midwestern states threaten to displace hundreds of thousands of people, deepening economic inequalities and social divides (EPA, 2021).

Hurricane Katrina in 2005 serves as a stark example of climate-induced displacement, with over one million residents displaced, a quarter resettling in Houston. The relocation of Alaskan communities, such as Newtok, further illustrates the high costs of climate adaptation, with federal relocation expenses exceeding $15 million for a population of just 350 people (U.S. Government Accountability Office, 2020). Additionally, worsening droughts in Mexico could exacerbate illegal migration to the U.S., threatening food and national security (Cisneros et al., 2014).

Strategic considerations, such as former President Donald Trump's 2019 proposal to purchase Greenland, reflect the geopolitical implications of climate change. Melting ice caps offer new trade routes and resource opportunities, while Greenland itself could become a potential settlement for climate refugees (Brauch, 2019).

b. United Kingdom

The UK benefits from its insular geography, which provides some protection against large-scale migrations. However, rising global temperatures may prompt populations from southern regions to view Britain as a "lifeboat" due to its livable conditions. Despite this, post-Brexit immigration policies have tightened, restricting access for climate refugees and prioritizing national security over humanitarian concerns (Broom, 2021).

Domestically, the UK faces increasing flood risks and rising sea levels. Emma Howard Boyd, chair of the Environment Agency, emphasized the urgency of adaptation, famously stating, "Britain must adapt or die" (Environment Agency, 2021). The UK has demonstrated leadership in addressing climate change through its 2008 binding legislation to reduce greenhouse gas emissions, amended in 2019 to target net-zero emissions by 2050 (Committee on Climate Change, 2020).

c. France

France has positioned itself as a global leader in addressing climate change, with 83% of its population identifying it as the most significant challenge of the 21st century. French lawmakers are working to embed climate commitments into the constitution, reflecting the nation's dedication to environmental preservation (Poumadère et al., 2005).

Climate change is already affecting France's economy and society, with extreme heat waves, such as the deadly 2003 event, causing nearly 15,000 deaths. Agricultural yields are declining due to hotter, drier summers, driving up production costs (European Investment Bank, 2021). France has also been at the forefront of international efforts, playing a pivotal role in the Paris Climate Agreement and promoting the transition to a green economy through initiatives to phase out fossil fuels and adopt a "zero carbon" approach (UNFCCC, 2020).

d. Germany

Germany, Europe's largest economy, faces significant climate challenges despite its advanced industries and infrastructure. Rising temperatures, severe floods, and storms threaten public health, food security, and national security (German Federal Foreign Office, 2020).

Germany's approach ties climate change to foreign policy, emphasizing adherence to the Paris Climate Agreement. German officials have highlighted the intersection of climate change, migration, and geopolitical shifts, urging international cooperation to address these intertwined challenges (BMU, 2020).

e. Italy

Among G8 countries, Italy is particularly vulnerable to the impacts of climate change due to its geographical proximity to the Global South, where the effects of global warming are projected to be severe. This proximity makes it a likely destination for large numbers of African migrants seeking refuge in resource-rich northern regions (Di Maio, 2020).

Italy's economic sectors, especially agriculture and tourism, are heavily affected by rising temperatures, making adaptation increasingly challenging. For instance, prolonged droughts have led to declining crop yields and higher production costs. Luigi Di Maio, Italy's foreign minister, has warned of the growing link between climate change and security in the Mediterranean, emphasizing how desertification is intensifying competition for scarce resources such as water and arable land (European Environment Agency, 2021).

Despite being Europe's second-largest industrial economy, Italy has taken proactive steps to combat climate change. It is a leader in renewable energy consumption and boasts the lowest per capita carbon emissions among major European economies. Since 1990, Italy has reduced its emissions by 17%, a testament to its commitment to sustainability. These efforts also aim to safeguard its cultural and tourism assets, including Venice, which faces existential threats from rising sea levels (World Resources Institute, 2022).

f. Japan

Japan's island location in the Far East makes it highly susceptible to climate-related challenges. Rising sea levels and intensified typhoons threaten millions of residents, displace communities, and damage vital industries such as rice farming and fishing. Floods have already submerged thousands of homes, highlighting the urgent need for comprehensive adaptation strategies (Japan Meteorological Agency, 2021).

Despite being the world's fifth-largest carbon emitter, Japan is striving to transition toward sustainable energy sources. However, the 2011 Fukushima nuclear disaster forced the country to temporarily rely on fossil fuels, setting back its green energy goals (World Nuclear Association, 2020). To address these challenges, Japan has launched a "green growth strategy" under Prime Minister Yoshihide Suga. This plan includes transitioning gasoline-powered vehicles to electric, generating

60% of electricity from hydrogen and nuclear power, and leveraging offshore wind energy, signaling Japan's commitment to reestablishing its leadership in environmental innovation (Ministry of Economy, Trade and Industry, 2021).

VI. Countries Benefiting from Climate Change

a. Russia

While climate change is primarily viewed as a global catastrophe, Russia is uniquely positioned to benefit from specific climate-driven opportunities. Agriculture stands to gain significantly, with Russia expected to strengthen its position as the world's largest wheat exporter. Melting Arctic ice could also open up new shipping routes, including a direct sea route to China and the United States, bypassing the Suez Canal (U.S. Geological Survey, 2020).

In a bold geopolitical move, Russian explorer Artur Chilingarov planted a flag under the Arctic Ocean in 2007, symbolizing Russia's claim to the region, which is believed to hold nearly one-third of the world's undiscovered natural gas reserves. This potential wealth underpins Russia's investments in developing the Northern Sea Route, a project expected to enhance its global influence (Arctic Institute, 2021).

However, Russia's domestic climate change policies remain inconsistent. Although President Vladimir Putin pledged carbon neutrality by 2060, the country vetoed a 2021 UN Security Council resolution linking climate change to global security, citing insufficient evidence to establish such a connection (United Nations, 2021).

b. Canada

Canada has emerged as a strong advocate for global climate agreements, with Prime Minister Justin Trudeau committing to ambitious emissions reduction goals. For instance, Canada doubled its funding for climate initiatives during the 2021 G20 summit, earning praise for its bold decision to implement a national carbon tax (Government of Canada, 2021).

Canada is experiencing the effects of climate change at nearly twice the global average rate. Coastal communities on the Atlantic face rising sea levels and stronger storms, while western regions contend with wildfires, landslides, and snowstorms that threaten infrastructure and ecosystems (Moody's Analytics, 2021).

Despite these challenges, Canada could also benefit economically from warmer temperatures. Opportunities include expanded agricultural potential, increased oil and gas exploration in the Arctic, and the opening of new shipping routes. However, Canada's environmental policies often create tension, as they aim to mitigate climate change while acknowledging that some changes could improve its citizens' quality of life (Natural Resources Canada, 2021).

Competition over the Arctic has intensified, with Canada asserting its sovereignty amid Russia's Arctic claims. Initiatives under former Prime Minister Stephen Harper included building icebreaker warships and developing Arctic ports, reinforcing Canada's strategic presence in the region (Canadian Department of National Defense, 2020).

VII. Strategic Climate Cooperation Among G8 Countries

The G8 nations are at the forefront of global strategic cooperation, particularly in addressing climate change, which has become a central focus in their discussions. As economic and climate policies are closely intertwined, these nations recognize that climate commitments inevitably impact their economic structures. Consequently, G8 resolutions attract significant attention from international climate organizations and developing nations grappling with the adverse effects of climate change (International Energy Agency [IEA], 2021).

The 2021 G8 Summit, held on June 13 in Cornwall, UK, placed climate change and the COVID-19 pandemic at the top of its agenda. Acting as a prelude to the 26th UN Climate Change Conference (COP26) in Scotland later that year, the summit reaffirmed the goals of the Paris Agreement, particularly limiting global warming to 1.5°C and achieving carbon neutrality by 2050. Leaders are also committed to halving emissions by 2030 compared to 2010 levels, with some nations, like the UK, pledging even greater reductions of up to 68% compared to 1990 levels (Climate Action Tracker, 2021).

The summit emphasized the need for innovation in green technologies to enhance the efficiency of vehicles, appliances, and heating systems. Although the G8 welcomed initiatives such as doubling the efficiency of lighting and cooling systems, the lack of clear timelines raised skepticism about their feasibility. The final report highlighted the importance of recovering climate resilience, investing in green infrastructure, and employing those affected by reduced fossil fuel investments (G7 Research Group, 2021).

During the 2009 Copenhagen Conference, the G8 pledged to mobilize $100 billion annually to help developing nations mitigate the impacts of climate change. However, this target has consistently been underachieved, exacerbated by funding diversions during the COVID-19 pandemic. At the 2021 Cornwall Summit, only Canada and Germany announced specific contributions, pledging $4.4 billion and $7.24 billion annually through 2025, respectively (Oxfam, 2021).

Despite agreements on transparent climate financing, progress remains inadequate. Oxfam estimates that actual contributions may only reach $36 billion by 2025, far below the $100 billion target. This shortfall underscores the broader reluctance of the international community to shoulder financial responsibilities amidst economic slowdowns (G7 Research Group, 2021).

VIII. Challenges in Strategic Climate Cooperation

The G8's strategic climate cooperation often struggles to translate rhetoric into action. Summit reports frequently use noncommittal language, such as "striving to" or "working on," which frustrates international organizations advocating for decisive climate policies. Critics argue that meaningful integration of climate issues into global governance remains elusive, with national interests often taking precedence over collective well-being (UNFCCC, 2021).

The concept of carbon trading originated at the 1992 Earth Summit and gained prominence under the Kyoto Protocol in 1997. Despite initial setbacks, carbon markets were revived following the 2015 Paris Agreement, establishing trading systems for greenhouse gases. These systems, such as the Cap-and-Trade model, allow countries and companies to trade unused emissions allowances, incentivizing efficiency and renewable energy investments (World Bank, 2020).

At the 2015 G8 Summit in Berlin, members established a platform for strategic dialogue on carbon markets, coordinated by the World Bank and the OECD. This platform seeks to regulate global carbon trading, harmonize pricing, and ensure emissions reductions align with national commitments. Since 2016, the platform has hosted regular meetings in Tokyo, Rome, and Halifax, rotating leadership among member countries to foster international cooperation (OECD, 2021).

The revival of carbon markets has yielded significant results. By 2021, global carbon market profits reached $53 billion, with prices rising to $68.5 per ton, the highest since inception. However, price disparities across nations persist, reflecting differences in government policies and the entry of major emitters such as China into the market (Carbon Tracker Initiative, 2021).

IX. Carbon Leakage and Countermeasures in the G8

With rising carbon prices in G8 nations, the phenomenon of "carbon leakage" has emerged, where companies relocate their operations to countries with less stringent climate policies. This relocation undermines the effectiveness of climate policies, as emissions continue to rise in countries with lenient regulations. To address this, the G8 has prioritized cooperation to combat carbon leakage and maintain the integrity of global climate goals (World Bank, 2020).

Carbon leakage poses significant challenges not only to global climate objectives outlined in the 2015 Paris Agreement but also to the economic competitiveness of G8 countries. Relocations increase production costs due to additional shipping and customs fees, while also leading to job losses and reduced domestic investments. Furthermore, taxing imported goods from relocated companies raises product prices, intensifying competition from countries with fewer climate regulations (Carbon Market Watch, 2021).

The G8 recognized the risks of carbon leakage at its 2021 Cornwall Summit, emphasizing the need for robust economic policies to mitigate them. A significant step toward addressing this issue has been the introduction of the European Union's Carbon Border Adjustment Mechanism (CBAM), which charges companies that relocate to countries with lower carbon costs for the difference in the savings they achieve. This mechanism is set to be fully implemented by 2026 and initially targets sectors with high greenhouse gas emissions, such as steel, cement, and fertilizers (European Commission, 2021).

Under CBAM, importers must purchase carbon permits equivalent to local production costs. By aligning the carbon costs of imported goods with domestic pricing, CBAM aims to level the playing field, reduce emissions, and discourage companies from relocating (OECD, 2021).

The CBAM mechanism has sparked significant debate, particularly concerning its compatibility with international trade norms. Critics argue that calculating emissions from imports can be complex and that the mechanism overlooks carbon taxes already imposed in the country of origin. The United States, while supporting efforts to address carbon leakage, expressed concerns about CBAM's potential for trade disputes (WTO, 2020).

There is apprehension that CBAM could provoke retaliatory measures, with countries imposing restrictions on European goods. In response, discussions in the U.S. have included proposals for climate tariffs on European imports, while Canada is considering similar measures. Former U.S. Secretary of State John Kerry emphasized that CBAM should remain a last resort to address carbon leakage and must align with WTO regulations to avoid escalating trade conflicts (Kerry, 2021).

Achieving meaningful climate solutions requires strategic cooperation within the G8 to align global efforts with the ambitions of the Paris Agreement. A proposed initiative involves forming a global climate coalition, including major emitters such as China, to exempt member nations from carbon tariffs in trade relations. This approach could address carbon leakage without compromising global climate objectives (IEA, 2021). However, balancing global climate concerns with national interests remains a challenge, as major powers often use climate change as a strategic tool in their geopolitical agendas.

In 2017, former U.S. President Donald Trump announced the country's withdrawal from the Paris Agreement, citing potential economic drawbacks, including job losses and reduced GDP growth. Trump argued that the agreement disproportionately affected the U.S. while favoring developing nations, and he questioned the transparency of climate funds distributed to these countries (Trump Administration, 2017).

This decision drew widespread criticism from G8 members. German Chancellor Angela Merkel described the outcomes of the subsequent G8 summit in Italy as unsatisfactory, emphasizing the need for continued commitment from the remaining nations. France, Germany, and Italy issued a joint statement reaffirming that the Paris Agreement was non-negotiable and essential for achieving the 2030 Sustainable Development Goals (UNFCCC, 2020).

Trump's withdrawal raised concerns about potential setbacks to global climate efforts. However, European nations and other G8 members reaffirmed their commitments, ensuring progress continued. The situation improved significantly with President Joe Biden's administration, which rejoined the Paris Agreement on his first day in office and emphasized renewed U.S. leadership in climate collaboration (Biden Administration, 2021).

On February 19, 2021, President Joe Biden officially reentered the United States into the Paris Agreement, reversing the Trump administration's climate policies. Biden's executive order, signed hours after his inauguration, emphasized the urgency of addressing the climate crisis, describing it as a

global, existential threat that requires immediate action to prevent collective harm to humanity (Biden Administration, 2021).

Under Biden's leadership, the U.S. adopted a comprehensive long-term climate strategy, spearheaded by Special Presidential Envoy for Climate John Kerry. This plan targets achieving carbon neutrality by 2050, focusing on energy system transitions and reductions in non-carbon emissions such as methane and nitrous oxide (U.S. Department of State, 2021).

The strategy acknowledges that the efforts of G8 nations alone are insufficient to meet the Paris Agreement goals. Collaboration with G20 countries, particularly China and India, which account for a substantial share of global emissions due to their rapid industrialization, is essential for meaningful progress (Climate Action Tracker, 2021). To enhance domestic efforts, Biden established the National Climate Task Force, integrating officials from various sectors to reestablish U.S. leadership in global climate action. This marked a transformative shift in U.S. policy, fostering international optimism and signaling renewed dedication to combating climate change.

The U.S. return to the Paris Agreement was welcomed by European Union nations and other G8 members, who emphasized the pivotal role of U.S. participation in resolving the climate crisis. This renewed partnership was underscored by the approval of the Build Back Better World (B3W) Initiative during the 2021 G8 Summit in Cornwall, which was seen as a strategic climate victory and a counterweight to China's expanding global influence (G7 Research Group, 2021).

Biden's climate-focused agenda is expected to generate groundbreaking initiatives in financing and clean energy investments, ease trade restrictions tied to carbon leakage, and advance global action aligned with Paris Agreement goals. These developments are poised to accelerate progress toward net-zero emissions (International Energy Agency [IEA], 2021).

X. The Path Forward for Global Climate Policy

The urgency of the climate crisis demands a collaborative approach that prioritizes humanity's future. While national interests often dominate global relations, addressing climate change demands solutions that balance planetary health with economic and social needs.

Transitioning to renewable energy sources is essential to mitigate the catastrophic impacts of climate change. Viewing green energy as a catalyst for economic growth and international trade can help overcome resistance from powerful oil and energy sectors (Renewable Energy Institute, 2021).

Despite controversies, nuclear energy is a significant low-carbon alternative. All G8 nations except Italy have incorporated nuclear power into their energy strategies. Italy, which halted its nuclear program after the Chernobyl disaster, remains cautious. However, nuclear energy faces challenges due to complex regulations and safety concerns (World Nuclear Association, 2020).

Addressing carbon leakage and preventing climate-related trade disputes requires cooperative agreements among major economies. These agreements should aim to exempt nations from punitive carbon border taxes while ensuring compliance with global emissions reduction targets (OECD, 2021).

G8 nations have been proactive in integrating climate education into school curricula and fostering public awareness. Grassroots initiatives that encourage low-emission lifestyles align with governmental sustainability goals and emphasize the collective responsibility to address climate change (UNESCO, 2021).

The circular economy model, which emphasizes resource efficiency, recycling, and waste reduction, represents a sustainable approach for achieving emissions targets. G8 nations exemplify leadership in this area, striving to balance economic growth with environmental stewardship (European Environment Agency, 2021).

XI. Conclusion

The G8, representing the world's largest and most prosperous economies, holds a pivotal role in global governance, particularly in addressing climate change. Comprising nations that share common "Western values," the group's primary focus has traditionally been economic and foreign policy discussions. However, as the economic implications of climate change have grown more pronounced, climate action has become a central topic of G8 deliberations. This shift also reflects the group's strategic response to China's growing economic influence and its relatively lenient climate policies, which contrast sharply with the G8's more ambitious climate goals. A key aspect of the G8's climate strategy is linking climate performance to economic growth. Investments in clean energy, the phasing out of coal, and advancements in green technologies have become critical components of the group's efforts to reduce greenhouse gas emissions. These initiatives are not just environmentally driven but are also seen as opportunities to stimulate economic growth, create jobs, and enhance energy security.

Despite these efforts, the G8's reliance on oil and gas investments remains a significant challenge. Fossil fuels continue to play a substantial role in the energy strategies of several member nations, undermining the group's ability to meet the Paris Agreement targets. This reliance reflects not only the entrenched influence of the oil and gas industry but also the difficulty of balancing short-term economic priorities with long-term environmental goals. Without a decisive shift away from fossil fuels, the G8 risks falling short of its climate commitments, perpetuating global warming and exacerbating its effects. The emergence of carbon markets has significantly shaped the economic relations among G8 countries. These markets, designed to reduce emissions by assigning a price to carbon and creating incentives for greener practices, have introduced a market-based mechanism to combat climate change. However, they have also led to unintended consequences, such as carbon leakage, where companies relocate their operations to countries with less stringent climate regulations to avoid high carbon costs.

Carbon leakage poses both environmental and economic challenges for the G8, prompting countermeasures such as the European Union's Carbon Border Adjustment Mechanism (CBAM). CBAM aims to level the playing field by imposing tariffs on carbon-intensive imports, but it has sparked debates within the group and with international trading partners. These differing perspectives have highlighted the complexities of achieving strategic cooperation on climate policy, as G8 nations must navigate competing interests and geopolitical tensions while maintaining economic competitiveness. The G8's climate leadership has been tested by fluctuating U.S. policies. Former President Donald Trump's withdrawal from the Paris Agreement in 2017 was a significant setback for global climate efforts, creating tensions within the group and undermining progress. Trump's decision was driven by concerns over potential economic drawbacks, including job losses and reduced GDP growth, which he argued outweighed the benefits of adhering to the agreement. This move deepened divisions within the G8 and strained its collective efforts to address the climate crisis.

The election of President Joe Biden marked a turning point. His administration's immediate reentry into the Paris Agreement and the establishment of comprehensive climate policies signaled a renewed U.S. commitment to global climate action. Biden's approach has not only restored optimism within the G8 but has also reinvigorated efforts to achieve the group's climate goals. Initiatives like the National Climate Task Force and the Build Back Better World (B3W) framework reflect a shift toward more collaborative and ambitious climate strategies. This renewed alignment underscores the critical role of U.S. leadership in uniting the G8 around common objectives. While the G8's collective influence offers the potential for transformative climate solutions, these efforts often face resistance from powerful economic interests, particularly in the oil and gas sectors. Transitioning to clean energy and exploring alternatives such as nuclear power are central to achieving long-term climate goals. However, they often conflict with the short-term priorities of industries that wield considerable political and economic power. This tension highlights the challenge of reconciling national economic interests with global climate commitments, a dilemma that underscores many of the G8's internal and external negotiations. The G8's role in promoting sustainable energy transitions is further complicated by the varying capacities and priorities of its member nations. While countries like Germany and the United Kingdom have made significant strides in renewable energy adoption, others face more complex energy landscapes and rely heavily on fossil fuels for economic stability. This disparity within the group reflects broader global challenges as countries navigate trade-offs among economic growth, energy security, and climate resilience. The G8's capacity to lead on climate change lies in its ability to balance national interests with collective action. The group must continue to leverage its economic and technological strengths to drive innovation in clean energy and climate adaptation. Strategic initiatives, such as expanding carbon markets, investing in green infrastructure, and fostering international cooperation, will be essential in maintaining the G8's leadership role in global climate governance.

At the same time, the G8 must address criticisms of its perceived exclusivity and the uneven distribution of climate responsibilities. Strengthening partnerships with G20 nations and supporting developing countries in their climate transitions will be crucial to achieving equitable and practical solutions. By fostering greater inclusivity and accountability, the G8 can build the trust and cooperation necessary for meaningful progress.

The G8's role in global climate action remains both vital and fraught with challenges. The group's ability to align its economic policies with its climate ambitions will determine its success in meeting the Paris Agreement goals and shaping a sustainable future. While significant hurdles persist, the G8's collective expertise and resources offer a unique opportunity to lead the world toward a greener, more resilient planet.

Addressing the complex challenges of global sustainability requires a multi-dimensional approach that bridges ecological, social, and technological considerations. Conventional, siloed strategies are insufficient to tackle the interconnected crises of environmental degradation, climate change, and resource inequality, which increasingly pose existential threats to humanity (Bhandari, 2024a; UNFCCC, 2020). Holistic and interdisciplinary frameworks are therefore essential to foster resilient systems capable of adapting to both present and future challenges (Bhandari, 2025c; Baldwin, 2016).

The role of international cooperation, particularly among industrialized nations, is critical in shaping climate and sustainability outcomes. Global forums such as the G7 and G8 have highlighted both the potential and limitations of multilateral approaches to environmental governance (Broom, 2021; Laub, 2021; Mingst, 2021). While initiatives such as net-zero commitments and renewable energy roadmaps provide pathways to reduce emissions and advance energy transitions, their implementation often faces political, economic, and social constraints (IEA, 2021; Energy Saving Trust, 2021). Nevertheless, these agreements underscore the importance of collective action and shared responsibility in addressing global climate challenges (Mace, 2021).

At the societal level, sustainability must be linked with human development and ethical considerations. The Capabilities Approach emphasizes expanding human potential and agency, rather than focusing solely on material resources, thereby ensuring equitable access to opportunities and knowledge (Bhandari, 2025a). Integrating transformative and lifelong learning approaches further equips individuals and communities with the critical skills, awareness, and adaptability required for effective participation in complex socio-ecological systems (Bhandari, 2023c).

Technological innovation, particularly in artificial intelligence and data-driven governance, presents both opportunities and challenges. When applied ethically and inclusively, these tools can enhance monitoring, decision-making, and participatory governance in environmental management (Bhandari, 2024c). However, equitable access, transparency, and social accountability remain vital to prevent the deepening of inequalities and to ensure that technology

contributes positively to sustainability outcomes.

In conclusion, the pursuit of sustainability is inseparable from the pursuit of human and ecological flourishing. A combination of holistic worldviews, ethical frameworks, global cooperation, and knowledge-based strategies is essential to navigate the interlinked crises of the twenty-first century (Bhandari, 2024d; UNFCCC, 2020; Broom, 2021; IEA, 2021). Only through integrative approaches that bridge environmental integrity, social justice, and technological innovation can humanity advance toward resilient, adaptive, and equitable futures (Bhandari, 2025b; Baldwin, 2016; Mace, 2021).

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