

***Global Warming and Climate Change Effect:
Understanding the Interplay between Environmental Impact
and Geopolitical Conflict***

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ABSTRACT

Climate change emerges as a critical catalyst for international conflicts, intensifying geopolitical tensions and socio-economic instability through environmental degradation. This analysis reveals how escalating greenhouse gases profoundly impact global ecosystems, spotlighting the strategic roles and geopolitical complexities involving major nations, especially China's influence. Employing qualitative methods, the study scrutinizes the effectiveness of international agreements like the UNFCCC, Kyoto Protocol, and Paris Agreement. It exposes gaps in understanding localized impacts and effective mitigation strategies, advocating for an integrated approach that melds environmental science with socio-economic considerations. The research underscores the urgent need to merge environmental sustainability with strategic geopolitical and economic policies, aiming to effectively address the multifaceted challenges of climate change and ensure global stability.

Keywords: Climate Change, Geopolitical, Environmental

INTRODUCTION

In the current global era, environmental health has become a paramount concern (Jaiswal et al., 2022). Our planet's environment, a complex and interdependent system, is vital for sustaining life and ensuring the well-being of all species (Virgolino et al., 2020). The environment's role extends beyond mere habitat provision; it is integral to the air we breathe, the water we drink, and the food we consume. In this context, understanding and

addressing global warming is not just a matter of scientific interest but a necessity for maintaining the health and balance of our global environment. The effects of global warming highlight the fragile interplay between human activities and the natural world, reminding us of our responsibility to protect and preserve our planet for future generations (Biagini et al., 2014).

The urgency of making environmental protection a top priority is underscored by the rapidly escalating impacts of global warming. As we witness increasingly severe weather patterns, rising sea levels, and the displacement of populations, it becomes clear that environmental issues are not just future concerns but present realities (Fang et al., 2021). The health of our environment directly influences economic stability, public health, and social structures. Prioritizing environmental protection is not only an ethical imperative but a practical necessity to ensure sustainable development, peace, and security in an interconnected world. This prioritization demands global cooperation and a unified response to mitigate the adverse effects of environmental degradation and to forge a path towards a sustainable future (Muganyi et al., 2021).

Global warming, a critical aspect of the environmental challenges we face today, is a significant disruptor of Earth's ecological balance. It results from the escalation of greenhouse gases like carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and chlorofluorocarbons (CFCs) in our atmosphere, which trap solar energy and lead to an increase in Earth's temperature (Ahmad et al., 2023). This phenomenon is driving changes in the Earth's atmosphere, oceans, and land, altering climates globally. The scientific community continues to explore the potential magnitude of future warming and its varied impacts across different regions. This ongoing scientific discourse is crucial in informing public debates and shaping global policy decisions aimed at either mitigating the effects of global warming or adapting to its inevitable consequences (Differbaugh & Burke, 2019).

Human activities, particularly those associated with industrial

processes, are the primary contributors to the rise in greenhouse gases, making global warming predominantly an anthropogenic issue. Acknowledging this, many countries have united under frameworks like the National Institute of Statistics and Economic Studies (INSEE) and the UNFCCC to discuss and combat climate change. This global consensus, reflected in the agreements of countries attending these conferences, underscores the serious threat posed by rising global temperatures. The Conference of Parties (COP), as the apex decision-making body within the UNFCCC, plays a pivotal role in shaping international responses and strategies to address global warming (Houghton, Sir John, 2004).

The tangible impacts of global warming are evident in recent climatic changes and natural disasters, particularly in China. Cities across China have been increasingly afflicted by extreme weather events, including storms, floods, smog, urban heat islands, typhoons, and waterlogging. The China Meteorological Administration warns that climate change is likely to amplify the frequency and severity of these climate-related disasters, posing heightened risks, especially in urban areas. China's engagement in global climate discussions, particularly since the early 1990s, highlights its commitment to addressing climate change. During negotiations for the United Nations Framework Convention on Climate Change (UNFCCC), China emphasized the principle of common but differentiated responsibilities, advocating for a collaborative but tailored approach where each country's responsibility in combating climate change is recognized and acted upon (Thew et al., 2021).

Despite extensive research on global warming, there remain significant gaps in the literature, particularly in understanding localized impacts and effective mitigation strategies. Current studies often provide a broad overview but lack detailed analysis of how global warming affects different ecosystems and communities, especially in developing countries (Diffenbaugh & Burke, 2019). There is also a noticeable deficit in interdisciplinary research that

combines environmental science with socio-economic factors, crucial for developing comprehensive climate action plans (Virgolino et al., 2020). Additionally, the effectiveness of current policies and their implementation at both national and international levels requires further scrutiny (Fang et al., 2021). Addressing these gaps is vital for a nuanced understanding of global warming's multifaceted impacts and for devising more targeted and effective mitigation and adaptation strategies.

The primary objective of this study is to address these identified gaps by providing a detailed analysis of the localized impacts of global warming, with a focus on vulnerable ecosystems and communities. The study aims to integrate environmental science with socio-economic considerations, offering a holistic view of the challenges and potential solutions. By evaluating the effectiveness of existing policies and their implementation, this research seeks to propose enhanced and more practical climate action plans. The ultimate goal is to contribute to the global effort in combating climate change through targeted strategies that are both scientifically sound and socio-economically viable.

This study's significance lies in its comprehensive approach, bridging the gap between theoretical research and practical application. By focusing on the localized effects of global warming and integrating socio-economic aspects, the study offers valuable insights into the real-world implications of climate change. The interdisciplinary nature of the research contributes to a more holistic understanding of the issue, enabling the development of more effective and inclusive climate policies. Additionally, the study's emphasis on policy evaluation and implementation provides a roadmap for more effective governance and action at both the national and international levels. The findings and recommendations from this study are expected to benefit policymakers, environmental scientists, and communities directly affected by global warming, ultimately contributing to the global fight against climate change.

RESEARCH METHOD

This research employs a qualitative method, which means it explains existing phenomena using research analysis and employs a qualitative approach (critical reasoning). The data sources for this study include journals, articles, documents, and mass media related to the research focus. The data analysis uses a content analysis model that focuses on Climate Change and Global Warming in the World. The analysis technique is carried out through procedures such as preparing and organizing data for analysis, reading all data to gain a general understanding of the information, considering all meanings, coding or organizing data, creating descriptions of controls or individuals, and analyzing themes from the coding, to interpret and elaborate further in line with the research objectives. Data collection techniques involve a step-by-step process, including identifying sources of reading material like books and journals. The technique for collecting data involves observing and gathering information based on the realities to be researched. Once the data is compiled, it eases the process of identifying and analyzing the data (Creswell, 2019).

In the context of this research on climate change and global warming, the qualitative approach allows for an in-depth understanding of these global issues. By analyzing various sources, including scientific journals and media reports, the research aims to offer insights into the complexities of climate change and global warming. The methodology, involving careful data collection and thematic analysis, seeks to uncover the nuances of how these environmental challenges are evolving and impacting the world. Creswell's framework guides the research, ensuring a systematic and rigorous analysis of the data to contribute meaningful findings to the field of environmental studies.

RESULT AND DISCUSSION

Climate change first became a political issue in the 1970s. Mitigation of climate change has been prominent on the international political agenda since

the 1990s and has increasingly gained attention at both international and local levels. Climate change is a complex global issue. Greenhouse gases contribute to global warming regardless of where their emissions originate. However, the effects of global warming vary greatly depending on how vulnerable a place or economy is to its impacts. Global warming has an overall negative effect that is expected to worsen with increasing warming. The ability to use fossil fuels and renewable energy sources varies greatly from one country to another (Binus.ac.id, 2020).

Countries around the world participated in the first conference on climate change, which only resulted in a general intention to resolve the issue and non-binding commitments from developed countries to reduce emissions. In the 21st century, increasing attention has been given to mechanisms such as climate funding to enable vulnerable countries to adapt to climate change. In some countries and local jurisdictions, climate-friendly policies have been adopted far beyond international commitments. However, local greenhouse gas reductions achieved through these policies will not slow global warming unless greenhouse gases are reduced globally (Hariyadi, 2017).

Managing climate change issues will continue to potentially be a political battleground and a matter of interests among nations, particularly developed countries. Efficiency is inevitably linked to scenarios of the constellation of the international political system that cannot be accurately mapped. National conditions thus also affect how each country should respond amid their complex national development challenges. This partly drives the strengthening of such constellations in developing countries, implementing the principle of the "right to development" and the principle of common but differentiated responsibilities. This naturally happens with as much pressure as possible from developed versus developing countries growing to participate (share the burden) in climate change. As a developing country, Indonesia is politically and legally bound (Hariyadi, 2017).

In terms of climate change, Indonesia is not exempt from this issue. The constellation of the international political system will approach several scenarios. Van Prancis Kappen, for example, made his concept with a four-quadrant scenario script, any of which is valid for different policies in each country in solving global issues. In all, there are several variables in those quadrants that also color when tied to each scenario, namely the potential for cooperation, a tendency for weak cooperation, and related actors, both state and non-state actors (Hariyadi, 2017).

THE MAJOR ROLE OF LEADING COUNTRIES IN GLOBAL CLIMATE NEGOTIATIONS

The energy sector is particularly important in Indonesia, not only as a driver of domestic economic growth but also as an export commodity. However, this economic growth can have negative impacts on natural resources such as water, air, and soil. These negative impacts may include pollution as a result of energy use. Energy use can pollute the environment due to solid waste, liquid waste, and pollutants from the emissions of burning fossil fuels like particles, SO₂, NO_x, and Carbon Dioxide (CO₂) (Haseeb et al., 2021).

A study presented in Poland stated that the world's climate is changing rapidly, exceeding previous expectations. The Intergovernmental Panel on Climate Change (IPCC) reported in February that the acceleration of climate change is not only triggered by human activities like the use of fossil fuels and deforestation (Singh et al., 2023).

Forests are an important component in the world's carbon and hydrological cycles. Approximately 18-20% of the world's anthropogenic GHG emissions come from land use changes, particularly deforestation, contributing more to climate change than all forms of and types of transportation combined. In recent years, forest looting or illegal logging in forest areas has become increasingly rampant and seemingly uncontrollable. This threat of forest damage will undoubtedly have an incredibly large negative impact due to the El Niño effect from the loss of forests, especially in

areas with significant ecological functions and biodiversity. The Planning Agency of the Department of Forestry through satellite imagery showed that the area still forested or still covered by trees in Java in 1999/2000 was only four percent. This area is largely a watershed in river basins.

Even without additional triggers, the IPCC indicates that if no serious efforts are made, disasters such as droughts, floods, and various other disasters threatening human life will still occur until the end of this century (Obersteiner et al., 2009). The issue of global warming gained world attention after the High-Level Conference (Summit) held by the UN in June 1992 in Rio de Janeiro, better known as the Earth Summit. Since the Earth Summit, several international meetings have been held, and a significant outcome is the Annual COP (Conference Of the Party) III meeting in Kyoto in 1997 organized by the UNFCCC (United Nation Framework Convention on Climate Change) (Trines, 2007).

Most debates that arise in the REDD mechanism are about how a REDD scheme can be funded. In recent years, the flow of multilateral funds intended to respond to climate change mitigation has begun to grow. Civil society organizations are concerned about the World Bank's ability to manage climate change funds effectively (Shin et al., 2022). In its current form, this World Bank fund is intended to provide both grants and loans. There is a possibility that we will face a situation where developing countries increase their debt to deal with problems caused by the north. Even if this fund is not used to provide loans, it can place recipient countries in a donor-recipient relationship that does not reflect the main country's obligations to developing countries.

Major countries around the world are actively participating and contributing significantly to global efforts in combating climate change. This participation is crucial as climate change is a complex global issue, transcending national boundaries and requiring a collective response. The active involvement of these countries often reflects their recognition of the urgency of the climate crisis and their commitment to reducing greenhouse

gas emissions, promoting sustainable development, and implementing adaptation strategies.

Among these active countries, many are key players on the global stage, either due to their economic strength, their significant contributions to global emissions, or their vulnerability to the effects of climate change. Their actions, policies, and commitments play a pivotal role in shaping the international response to climate change. This includes setting ambitious targets for reducing emissions, investing in renewable energy technologies, and providing financial and technical support to less developed countries in their climate change initiatives. Additionally, these nations often lead and participate in international forums and negotiations, such as the United Nations Framework Convention on Climate Change (UNFCCC) and its Conference of Parties (COP), to forge global agreements and collaborations (Kuyper et al., 2018).

The active participation of these countries is not only crucial for the global fight against climate change but also serves as a model for others. Their leadership and commitment can inspire and pressure other nations to intensify their efforts in addressing climate change, ultimately contributing to a coordinated and effective global response.

First, The United States plays a significant role and has a considerable influence on global climate negotiations, particularly in formulating global climate agreements related to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. The United States can be regarded as a superpower and also one of the largest greenhouse gas emitters in the world (van Asselt & Kulovesi, 2017). As such, the actions taken by the United States have a significant impact on global efforts to tackle climate change and reduce greenhouse gas emissions. Additionally, the United States is highly advanced in technology industries, which is crucial for creating environmentally friendly technologies and solutions for reducing greenhouse gas emissions, such as renewable energy, electric vehicles, and efforts to make

energy use more efficient. Furthermore, the United States supports financially or technically assisting developing countries in addressing climate change, such as through the transfer of technology and financial aid for development. Therefore, the role of the United States in global climate negotiations can vary, depending on the policies of its leadership (Bumpus & Liverman, 2008).

Second, The European Union plays a significant role in reducing greenhouse gas emissions. Based on the 2030 Climate Action Plan, the EU is committed to reducing emissions by 55% by 2030 compared to 1990 levels. In December 2020, the EU set a target to achieve carbon neutrality by 2050, an effort aimed at balancing emissions and absorption in that year. Furthermore, the EU is working to create renewable energy sources and reduce the use of fossil fuels. It has set a target of 32% renewable energy by 2030 and has implemented several programs to develop renewable energy in its member states (Romanak et al., 2021). The EU plays a role in global climate diplomacy and international cooperation, particularly in the Paris Agreement, which aims to reduce climate change. The EU also participates in international climate negotiations and supports developing countries in reducing emissions. In addition, the EU is working towards green development with the goal of becoming a carbon-neutral region by 2050. This is to be achieved through investments in green technology, renewable energy, and the allocation of European recovery and resilience funds to support financial development in the green economy (European Commission, 2020).

Third, China has a significant influence on climate change in the global market. As a major emitter of greenhouse gases, China has invested in renewable energy development, such as solar and wind power, and has promoted policies to reduce greenhouse gas emissions. China has also innovated in forestry to preserve biodiversity, creating the "Green Silk Road" to expand the use of renewable energy along this route. In addition, China plays a role in diplomatic cooperation and international collaboration, including financial assistance and technology transfer from developed to

developing countries, and is committed to addressing global climate change (BBC.com, 2021).

Fourth, Japan plays a role in global climate negotiations, having set targets for reducing greenhouse gas emissions and aiming for carbon neutrality by 2050. Japan has a target to reduce emissions by 46% by 2030 compared to 2013. Japan has also developed green technologies, including renewable energy sources like solar and wind power, batteries, electric vehicles, and environmentally friendly energy storage. Japan has been a major player in international climate diplomacy, hosting the UN Climate Change Conference (COP 3) in Kyoto in 1997 and participating in the UN Climate Conference (COP 21) in Paris in 2015, contributing to the establishment of the Kyoto Protocol and the Paris Agreement. Japan has also donated funds and efforts to help developing countries reduce emissions, contributing 1.3 trillion yen (11.9 billion US dollars) between 2016-2020. Japan is actively involved in global initiatives like the Coalitions of Finance Ministers for Climate Action and the Blue Carbon Initiative to preserve coastal ecosystems (Kyodo News, 2021).

Fifth, Canada is involved in global climate negotiations, particularly in the Paris Climate Agreement. Canada has actions aimed at reducing greenhouse gas emissions, with a target to reduce emissions by 30% by 2023 from 2005 levels. Canada has invested in renewable energy sources and clean technology. On November 17, 2021, Canada discussed an ASEAN-Canada free trade agreement, which involves creating sustainable trade cooperations in Southeast Asia. In 2019, Canada, the United States, and Mexico revised the North American Free Trade Agreement, now called USMCA (United States-Mexico-Canada Agreement), focusing on environmental protection, addressing plastic waste, and cooperating to reduce greenhouse gas emissions. Canada also participates in the Trans-Pacific Partnership (TPP), a multilateral agreement promoting free trade and environmental protection (Aisyah, 2018).

Sixth, Australia contributes to global climate negotiations and the Paris Agreement. It has agreed to reduce greenhouse gas emissions by 26-28% by 2023 compared to 2005. Australia collaborates regionally with Pacific nations to promote efforts to address climate change, providing financial and technical support. Australia has innovated in developing clean technologies in solar and wind energy and long-lasting energy storage. In international cooperation, Australia contributes to the United Nations Framework Convention on Climate Change (UNFCCC) and meetings with the Conference of Parties (COP) to address global climate change (Hovi et al., 2009).

Seventh, Brazil plays a significant role in global climate negotiations and contributed to the United Nations Framework Convention on Climate Change (UNFCCC) through international cooperation to address climate change and limit greenhouse gas emissions under the Paris Agreement. Brazil, home to the world's largest tropical rainforest, such as the Amazon, greatly impacts the global climate. These forests function as natural carbon sinks, helping reduce atmospheric carbon and maintain global climate balance. Therefore, protecting these forests is crucial for reducing greenhouse gas emissions and slowing global warming (Bumpus & Liverman, 2008).

POLITICAL PRESSURE AND GEOECONOMIC IMPLICATIONS ARISING FROM ECONOMIC DEPENDENCE ON CHINA

China, as one of the largest economies in the world, holds significant potential to exploit the economic dependencies of its partner nations as a political tool. Through robust trade relations, China can leverage its position to influence the political and economic policies of its partner countries. An example is China's practice of economic diplomacy involving the provision of substantial loans to developing countries, often followed by an increase in China's political influence in these nations. Such political dominance can diminish the independence and sovereignty of partner countries, thereby impeding their domestic policies (Hennida et al., 2020).

Economic dependence on China can also affect the foreign policies of partner countries. Nations reliant on exports to the Chinese market often find themselves compelled to align their foreign policies with China's economic interests. Additionally, China uses economic instruments, such as trade sanctions, as political means to influence partner countries. This can make it challenging for partner nations to pursue independent and sovereign foreign policies (Hutagalung, 2017).

Economic reliance on China carries significant geo-economic implications. As the world's largest producer and exporter, China possesses formidable economic power to influence global economic dynamics. Nations dependent on imports of goods and resources from China are vulnerable to fluctuations in prices and supply availability. Economic instability in China, such as a slowdown in growth or financial crises, can have widespread detrimental impacts on partner countries reliant on trade relations with China (Kennedy et al., 2022).

Economic dependence on China also impacts global economic stability. For instance, economic turmoil in China, such as a devaluation of its currency or a stock market collapse, can have far-reaching effects on global financial markets. Dependence on China's market demand can make partner countries vulnerable to changes in China's economic policies, potentially affecting global market stability. Thus, economic reliance on China poses potential risks to global economic stability that need to be carefully managed (Wilantari et al., 2020).

Economic dependence on China also means that partner countries become vulnerable to economic fluctuations in China. Changes in China's market demand, economic policies, or domestic economic situation can have direct impacts on the economies of partner nations. If partner countries cannot swiftly adjust to these changes, they risk significant economic losses (Wilantari et al., 2020). Therefore, it is crucial for partner countries to have flexible

strategies and sufficient market diversification to mitigate vulnerability to economic fluctuations in China.

THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC), THE KYOTO PROTOCOL, AND THE PARIS AGREEMENT

The issue of climate change and its increasingly severe impacts align with the rising concentration of greenhouse gases in the atmosphere. In response to this, the 1992 Earth Summit in Rio de Janeiro, Brazil, resulted in the creation of the United Nations Framework Convention on Climate Change (UNFCCC). This Convention is a global agreement signed by nearly all countries in the world, aiming primarily to address climate change caused by human activities (Masripatin et al., 2016).

The UNFCCC came into effect in 1994 after being adopted in 1992. This Convention acknowledges that the impacts of climate change are felt worldwide and that all countries must cooperate to limit greenhouse gas emissions and prepare for these impacts. The Climate Change Convention lays out a comprehensive framework for addressing climate change, including detailed guidelines, goals, and legal requirements governing nations' efforts to reduce greenhouse gas emissions and provide developing countries with the resources and knowledge to cope with the impacts of climate change (Thew et al., 2021).

The United Nations Framework Convention on Climate Change (UNFCCC) has had a profound impact on the world by establishing a global platform for addressing the urgent issue of climate change. Through the UNFCCC, nations have acknowledged the seriousness of the climate crisis and the need for collective action. The Convention has been instrumental in raising awareness about the impacts of climate change and the importance of reducing greenhouse gas emissions. It has also facilitated the sharing of scientific knowledge and data, particularly through the assessments of the Intergovernmental Panel on Climate Change (IPCC), which have been crucial in informing policy and decision-making at both national and international

levels. The UNFCCC has encouraged countries to develop national strategies for addressing climate change, including the setting of emissions reduction targets and the implementation of climate-friendly policies.

In response to the UNFCCC, countries have taken various steps to fulfill their commitments. Developed countries, recognizing their historical responsibility for the majority of greenhouse gas emissions, have committed to leading efforts in emissions reduction. This includes investing in renewable energy technologies, implementing carbon pricing mechanisms, and setting ambitious national targets for reducing emissions. These efforts are often part of broader strategies to transition to a low-carbon economy. On the other hand, developing countries have focused on balancing climate action with economic development (Kuyper et al., 2018). They have been encouraged to pursue sustainable development paths, reducing emissions while still prioritizing economic growth and poverty alleviation. This approach has often been supported by technology transfer and financial assistance from developed countries, as outlined in the Convention.

Moreover, the UNFCCC has catalyzed international cooperation on climate change. Through annual Conference of Parties (COP) meetings, countries negotiate and update their commitments, share best practices, and address challenges in implementing climate action (Gonzales-Iwanciw et al., 2023). These meetings have resulted in significant agreements like the Kyoto Protocol and the Paris Agreement, which have further defined and strengthened global climate action. The responsiveness of countries to the UNFCCC has varied, influenced by national interests, economic capabilities, and political will. However, the overarching impact of the Convention has been to create a unified, though complex, global effort to mitigate climate change and adapt to its impacts, reflecting the shared understanding that climate change is a common concern of humankind requiring a coordinated global response.

Aside from the UNFCCC, the Kyoto Protocol is an international agreement agreed upon as part of the United Nations Framework Convention on Climate Change (UNFCCC) in 1997. The fundamental goal of this protocol is to lower greenhouse gas emissions that contribute to climate change. The Kyoto Protocol endeavors to reduce the amount of greenhouse gases released into the atmosphere globally. Based on national targets set, the parties (countries) in this convention agreed to significantly reduce greenhouse gas emissions. It imposes emission reduction obligations, dividing countries into two groups: developed countries (Annex I) and developing countries (non-Annex I). According to predetermined objectives, developed countries are required to reduce their overall greenhouse gas emissions within a specific timeframe (from 2008 to 2012). Meanwhile, developing countries are encouraged to implement mitigation measures but do not have legally enforceable obligations to reduce their emissions.

The protocol introduces three flexibility mechanisms: the Clean Development Mechanism (CDM), Joint Implementation (JI), and Emissions Trading. These mechanisms allow Annex I countries to achieve their emission reduction targets by undertaking emission reduction projects in other countries or by trading emission quotas. The Kyoto Protocol establishes a monitoring, reporting, and verification system to ensure that Annex I countries fulfill their emission reduction obligations. If a country fails to meet its target, sanctions and corrective measures can be applied. The protocol underwent significant changes in 2012 when the requirements for emission reduction commitments ended. Since then, efforts to combat climate change have shifted to the 2015 Paris Agreement, which involves more countries in reducing greenhouse gas emissions and addressing climate change (Ministry of Environment, 2003).

The Kyoto Protocol had a profound impact on the global approach to climate change. By establishing legally binding emission reduction targets, it marked the first time countries committed to specific, quantified goals for

curbing their greenhouse gas emissions. This was a significant step forward in the international effort to address climate change. The protocol's emphasis on accountability and its innovative mechanisms, such as emissions trading and the Clean Development Mechanism, introduced a new dynamic in environmental diplomacy. These mechanisms encouraged investment in sustainable projects in developing countries and allowed for more flexible ways for industrialized nations to meet their emission targets. The protocol's implementation also stimulated global awareness and action on climate change, leading to increased research and investment in renewable energy and other sustainable technologies.

The response of countries to the Kyoto Protocol varied significantly. Developed countries, particularly those categorized as Annex I countries, faced the challenge of restructuring their industries and energy sectors to meet their emission reduction commitments. This often required significant policy changes and investments in green technologies. While some countries embraced this challenge and became leaders in sustainable technologies, others struggled with the economic implications and political hurdles. Developing countries, on the other hand, had different responses. Many were concerned about the potential impact on their economic development and argued for the principle of "common but differentiated responsibilities" – the idea that while all countries are responsible for addressing climate change, developed countries should take the lead due to their historical emissions and greater financial capacity.

Over time, the Kyoto Protocol's influence evolved as the realities of climate change became more pressing and complex. Although it played a crucial role in setting the stage for global climate action, its limitations became apparent, particularly its inability to include some of the world's largest emitters under binding commitments. This led to the development of the Paris Agreement in 2015, which sought to engage a broader range of countries in climate action efforts. The Paris Agreement built upon the foundation laid by

the Kyoto Protocol but aimed to be more inclusive and flexible, allowing countries to set their own nationally determined contributions towards reducing global greenhouse gas emissions. The shift from Kyoto to Paris marked a significant evolution in the international community's approach to climate change, emphasizing a more collaborative and universally participatory framework.

There is another alternative to protect the climate change issue. The Paris Agreement, an international treaty on climate change, was signed at the 21st United Nations Climate Change Conference, also known as COP21, in December 2015 in Paris, France. This landmark agreement, as highlighted by Marbun (2018), aims to combat global climate change and collectively work towards reducing greenhouse gas emissions and diminishing the negative impacts of climate change.

Central to the Paris Agreement is its ambitious goal of limiting the global temperature rise to "well below" 2 degrees Celsius above pre-industrial levels, ideally targeting a 1.5 degrees Celsius increase. This target is pivotal in reducing the likelihood of severe and potentially catastrophic impacts of climate change. To achieve this, the Paris Agreement introduced the concept of Intended Nationally Determined Contributions (INDCs), where each country voluntarily determines and communicates their own contribution. These contributions encompass the targets for reducing greenhouse gas emissions, tailored to each country's capacity and national policies, thereby allowing a diverse yet unified approach towards a common goal.

The Agreement also emphasizes a robust transparency mechanism to track, report, and verify national contributions and actions. This structure is designed to enhance international trust and accountability, ensuring that countries adhere to their commitments and progress towards their stated goals. Moreover, the Paris Agreement recognizes the importance of financial, technological, and capacity-building support for developing countries in their climate change mitigation and adaptation efforts. Developed countries are

expected to provide financial and technological assistance to help developing nations in their endeavors.

Additionally, the Paris Agreement establishes a five-year global review cycle to evaluate collective progress in achieving the treaty's objectives. This cycle offers opportunities to assess and potentially increase the ambitions for emissions reduction, adapting to the ever-evolving nature of climate science and policy. Almost all countries around the world have embraced the Paris Agreement, regarding it as a crucial milestone in the global effort to combat and address climate change. The treaty acts as a legally enforceable framework for countries to reduce greenhouse gas emissions, enhance resilience to climate change, and collaborate towards forging a sustainable future.

The Paris Agreement has significantly impacted the global approach to climate change, marking a pivotal shift in international climate policy. By establishing a universal commitment to limit global temperature rise, the Agreement has galvanized nations into action, emphasizing the urgency and collective responsibility to address climate change. Its impact is evident in the increased momentum for environmental policies, investments in renewable energy, and the development of national climate action plans aligned with the Agreement's goals. The Paris Agreement's flexible yet ambitious framework allows countries to set their own targets, fostering a sense of ownership and responsibility. This flexibility has been crucial in engaging a wide range of countries, each with different capabilities and circumstances, in the global climate action effort. Additionally, the Agreement's emphasis on transparency and accountability ensures that progress is monitored and encourages continuous improvement in climate strategies.

In response to the Paris Agreement, countries worldwide have shown varying degrees of commitment and action. Many developed countries have stepped up efforts to reduce greenhouse gas emissions, investing heavily in clean energy technologies and implementing policies to phase out fossil fuels. There has been a notable increase in national commitments to achieve net-

zero emissions, signaling a long-term vision for a sustainable future. On the other hand, developing countries have focused on integrating climate action with economic development, often seeking financial and technological support to balance their growth with environmental sustainability. These nations have also been active in advocating for climate justice, emphasizing the need for equitable and fair climate action. The Paris Agreement has thus created a dynamic landscape of climate action, with nations at different stages of development working together towards a common goal, albeit at varying paces and capacities.

International Conflict Potential and Climate Change

According to the UN Intergovernmental Panel on Climate Change (IPCC), climate change disrupts hydrological processes and the supply of water, fish, and other aquatic life, terrestrial biota, agriculture, and forestry (Rosenzweig, 2007). Dupont (2008) argues that climate change makes nations more vulnerable, weakens their geopolitical strategies, and threatens the sustainability of societies. This can lead to conflicts both within and between countries. Climate change, through global temperature rises and changing rainfall patterns, disrupts the availability of natural resources like water and food. As these resources become scarce, competition among countries or different community groups over them can escalate, leading to conflict. A notable instance is the conflict among ethnic groups in Darfur, Sudan, largely fueled by competition over increasingly scarce water and land resources due to climate change.

This scarcity can also lead to mass migrations as climate change alters ecosystems and creates uninhabitable living conditions in some areas. Populations are thus forced to migrate to safer and more sustainable areas. The resulting influx of climate refugees can cause social and economic tensions in the host countries, potentially leading to conflicts with the existing local populations. An illustrative example is the conflict between Rohingya refugees

from Myanmar and the existing population in Bangladesh, a situation tied to mass migration caused by climate change (Uddin, 2019). Moreover, climate change, especially in terms of melting Arctic ice, opens new access to natural resources and previously hidden trade routes. This development can spark competition among nations to claim these territories and resources, as seen in the competition between Russia, Canada, and other countries for the resource-rich Arctic territories.

The impacts of climate change can also exacerbate existing tensions between different ethnic or religious groups, affecting the availability of food, water, and environmental stability. Competition over increasingly scarce resources can intensify differences and trigger conflicts between these groups. The conflicts among ethnic groups in Darfur, Sudan, which involve ethnic and religious elements intertwined with competition over scarce resources, are a case in point (Madibbo, 2012).

In the realm of geopolitics, climate change can significantly impact the relationships between countries. Nations severely affected by phenomena such as rising sea levels may seek support or intervention from other countries, leading to conflicts or disputes among nations competing to influence the geopolitical dynamics in the region. The issue extends to border disputes as well. Rising sea levels caused by climate change can shift coastlines and alter national borders, potentially leading to disputes between countries over territorial claims, especially if valuable natural resources are located in the affected areas. The transition to renewable energy, prioritized by many countries to reduce greenhouse gas emissions, can also create competition and conflict. This is particularly evident in the race for access to and control of renewable energy technologies like solar panels, wind turbines, or valuable geothermal deposits (Adrian et al., 2023).

Lastly, climate change can affect regional stability and exacerbate existing tensions. For instance, rising temperatures and droughts can increase the risk of conflict in areas already experiencing border disputes or ethnic

tensions. In situations where conflicts already exist, climate change can complicate and prolong these disputes. Each of these aspects illustrates how climate change, as a multifaceted global issue, can be a catalyst for various forms of international conflict (Evans, 2019). The interconnectedness of these challenges highlights the importance of a comprehensive approach to addressing the impacts of climate change, not only from an environmental perspective but also from a geopolitical and socio-economic standpoint.

CONCLUSION

The extensive analysis of climate change's multifaceted impacts underscores its profound implications for global stability, geopolitics, and socio-economic dynamics. Firstly, the environmental repercussions of climate change, manifested in rising global temperatures, altered rainfall patterns, and melting Arctic ice, pose significant threats to the natural balance. These environmental changes precipitate a cascade of geopolitical and social challenges, ranging from resource scarcity to mass migrations, which in turn exacerbate international conflicts. The situation in Darfur, with conflicts over dwindling water and land resources, and the plight of Rohingya refugees, exemplifies the intricate link between climate change and social unrest. Additionally, the geopolitical race for Arctic resources highlights the strategic dimensions of climate change.

Major nations in global climate negotiations and the geopolitical nuances therein are crucial. Countries like the United States, the European Union, and China, among others, wield considerable influence in shaping international climate policies and strategies. Their commitments to emission reduction, renewable energy development, and support for climate-friendly technologies set the tone for global climate action. However, the varying degrees of commitment and the complex interplay of national interests underscore the challenges in achieving a unified global response to climate change.

Meanwhile, economic dependencies and geo-economic implications of nations, particularly concerning China, reveal another layer of complexity in the climate change discourse. Economic reliance on China's market and resources has significant political and economic ramifications, influencing nations' foreign policies and potentially impacting global economic stability. This highlights the need for strategic diversification and flexibility in global economic relations, especially in the context of climate change mitigation and adaptation efforts.

The international frameworks such as the UNFCCC, the Kyoto Protocol, and the Paris Agreement represent collective efforts to address climate change. These frameworks, while showcasing global recognition of the issue, also reveal the challenges in harmonizing diverse national agendas and capabilities. The transition from the Kyoto Protocol to the more inclusive Paris Agreement marks a significant evolution in international climate policy, emphasizing collaborative and universally participatory efforts. However, the effectiveness of these agreements largely depends on the commitment and actions of individual countries, reflecting the ongoing struggle to balance national interests with global environmental imperatives.

The interplay of environmental, geopolitical, and economic factors in the context of climate change presents a complex and challenging landscape. Effective management of climate change requires not only environmental considerations but also a nuanced understanding of its geopolitical and socio-economic dimensions. The role of major nations, the impact of economic dependencies, and the efficacy of international agreements are pivotal in shaping the global response to this pressing issue. A comprehensive and cooperative approach, integrating environmental sustainability with strategic geopolitical and economic policies, is essential for mitigating the impacts of climate change and fostering global stability and progress.

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