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MITIGATING THE GLOBAL WARMING CONUNDRUM

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Abstract

Attempting to keep global warming well below 2º Celsius is an aggressive goal set by the Paris Climate Agreement. Nation-state pledges to decrease greenhouse gas emissions have been made as to the first step through nearly all countries, in the form of nationally determined assistance (NDCs) for the year 2030. This research goes away from the NDCs to look at regional participation and ambition in reductions after 2030. Internalizing the human value of cooperation is critical for mitigating the unfavorable effects of climate change and adapting to a changing situation. Greenhouse gas (GHG) emission inventories serve as a bridge between national and international climate policy, as well as the climate and environmental science. With this research paper, the authors hope that they will be able to assist researchers in understanding better present and future reporting necessities (under UNFCCC and the Paris Agreement) and identify key issues and topics to keep in mind when working to improve the GHG inventory. As an outcome of the Paris Climate Agreement, this paper shows how global warming affects climate change, which leads to further displacement.

Keywords: Climate change, global warming, Paris Agreement, Mitigation

1. INTRODUCTION

The pace of global warming is picking up steam. Global temperatures have risen by about 1°C since the industrial revolution, which is expected to accelerate. Each century since the 1980s has been warmer than the one before it. According to scientists, the last 5 years (2015–19) have been the warmest on record, with 2019 likely ranking second. Weather-related natural disasters are becoming more common, indicating that Earth's systems are already under strain. More and more evidence of abrupt and permanent changes (so-called "tipping points") caused by rising sea levels shows that the world is much closer than was thought before (Lenton and others, 2019).

In Paris in 2015, policymakers worldwide agreed to keep global temperatures between 1.5°C and 2°C higher by the year 2100. To meet this goal, carbon emissions must be drastically reduced, and they must be cut to zero by the middle of the century (IPCC 2014, 2018a). As a result, carbon emissions must be cut to zero or removed from the atmosphere using natural or man-made sinks (forests and oceans, for example). Even with such drastic reductions in carbon emissions, the stock of accumulated carbon in the atmosphere must be reduced via absorption with carbon sinks for temperatures to remain within the target range.

There have been insufficient efforts to decrease greenhouse gas emissions thus far. Emissions have reduced temporarily as a result of the COVID-19 crisis. There will be physical and economic damage on a scale that has not been seen in millions of years if current policies are not changed with the end of the century, raising the probability of catastrophic results worldwide through 2–5°C. Reduced agricultural crop and fish farming yields and hotter conditions for those who work outside have been linked to climate change-induced productivity loss. Enhanced incidence and harshness of natural disasters and rising sea levels (coastal areas)

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have additional consequences, including increased economic disruptions and physical destruction of productive capital, infrastructure, & buildings (Batten, 2018). Existing damage forecasts, including those for the natural world and catastrophic risk, do not adequately account for small historical temperature variations that are subject to uncertainty because of the temperature response to accumulated carbon dioxide emissions ("climate sensitivity"). Recent studies (such as Burke, Hsiang, and Migueln 2015) that consider the possibility of nonlinear effects and long-term declines in economic growth recommend that the harm will be much higher than previously anticipated, even though the losses are expected to be important. Changes brought on by global warmings, such as ice melting, rising sea levels, and ocean acidification, could amplify the phenomenon's effects and make it extremely difficult to reverse in the short term (IPCC 2014, 2018a).

Climate change mitigation efforts face both challenges and opportunities as a result of the COVID-19 crisis. However, mitigation is probable to boost earnings by limiting damages and serious health and safety risks in the long run. Nonetheless, the economic conversion it necessitates may slow development during the change, particularly in countries deeply dependent on fossil fuel exports and have high population and economic growth rates. The global recession makes it more complex to implement mitigation policy, increasing the urgency of figuring out how to promote employment and growth while also protecting the vulnerable. On the other hand, the current situation presents opportunities to move the economy in a more environmentally friendly direction. There has been an important drop in investment since the financial crisis. By sending the right price signals and offering other financial incentives, policies can ensure that capital spending recovers in line with decarbonization. The pandemic may necessitate fiscal stimulus, which offers the chance to boost environmentally friendly and resilient public infrastructure through tax incentives.

The macro economy's potential impact on various climate change mitigation policy required to achieve net carbon emissions zero by 2050 is examined in this paper. Because mitigation policies influence the economy in a variety of ways and have both negative and positive impacts on production, simulation using a general equilibrium model is necessary. Because the relative strength of the various channels involved in the interaction determines the overall impact, it is impossible to predict.

2. Climate change &Global Warming

The rise in greenhouse gases in the atmosphere, which raises the earth's average temperature, causes global warming or climate change. Global warming is caused through a variety of things, including forest fires, volcanic eruptions, methane released from thawing ocean-floor permafrost, livestock methane emissions, wetlands, and forest destruction. Preexisting weather patterns will rapidly change as the earth's temperature rises. NOAA, the National Oceanic & Atmospheric Administration, monitor several climate change indicators.

2.1 Greenhouse Impact

The strength of the sun's light affects Earth's climate. The Earth's surface is heated through solar radiation, which is radiated back into space. As an outcome, gases in the atmosphere trap

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some of the heat emitted. As a result, global temperatures are rising, and weather patterns are shifting. The greenhouse gases catch heat energy; they are all positive radiative forcing agents that disrupt the atmosphere's energy balance. The greenhouse gases trap heat energy. When scientists calculate gas in global warming potential (GWP), they compare it to carbon dioxide (CO2), the most powerful known gas. If CO2 has a global warming potential (GWP) of one, methane has a GWP of 34. Table 1 shows the results.

Table 1: GWP values and lifetimes

Greenhouse Gas	Lifetime (years)	GWP time Horizon 100 years
Methane	12.4	34
HFC-134 (hydro fluorocarbon)	13.4	1550
CFC-11 (chlorofluorocarbon)	45.0	5350
Nitrous oxide (N_2O)	121.0	298
Carbon tetra fluoride (CF_4)	50000	7350

(Source: Myhreet al., 2013)

3. The Paris Agreement

When it comes to addressing climate change, the Paris Agreement is a document that looks to the future. When pursuing the UNFCCC's objectives, the Agreement is guided via principles of equity & shared but distinguished obligations & abilities (CBDR-RC). According to the Agreement, global average temperature rises should be incomplete to 1.5°C over pre-industrial levels, with the overarching goals of sustainable development and poverty abolition. The international community also agreed to keep working to maintain global warming to 1.5 degrees Celsius. The goal's final section, which calls for international cooperation to maintain global warming to 1.5^o Celsius or less, demonstrates how serious the international community takes the issue and how genuine the concern is.

Unlike the earlier Kyoto Protocol, the Agreement does not set exact emission decrease targets for a group of countries. As a result, it is much more inclusive because it establishes a broader objective for all State Parties, requiring them to develop, communicate, and implement measures to further the Agreement's purpose all the way through their nationally determined contributions. Another notable achievement of this Agreement is that it included major carbon-emitting economies such as the United States and China, which did not have binding commitments to cut carbon emissions under the existing Kyoto Protocol framework. After signing the Agreement, both of these countries ratified it.

When it comes to implementation, the Agreement takes a bottom-up method that prioritizes national policies. The international climate change regime is a prod to get things moving in the right direction. In legal terms, the countries must develop national policies to achieve the Agreement's quantified goals. Every five years, nationally determined contributions (NDCs) must be reviewed and provided, and they must be progressive compared to previous

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contributions. The Agreement also establishes a more open and transparent framework for implementing it.

3.1 Climate Change: The Paris agreement

In 2015, the Paris Climate Change Agreement was signed with all countries. This is the first time that all countries have policy responsibilities. Because of this, domestic policy content will remain in the hands of governments while international legal responsibilities to build up, implement, and strengthen actions regularly are created. The international freedom of information systems and global reviews apply to national policies, and each new policy proposal must be better than the one that came before it. There are several flaws in the policy agreement, and it's too early to determine if it will work. Despite this, the negotiations have resulted in a political victory. Surprisingly, all major players, including countries with opposing interests, backed the agreement. It demonstrates how difficult it was to reach an agreement on one of history's most contentious issues.

3.2 The Long-term Goal

To attain net-zero global emissions with 2060–2080, the Alliance of Small Island States (AOSIS) chose to reduce emissions by 80–95 percent before that date, based on scientific evidence. The Like-Minded Developing Countries (LMDCs) objected to Quantification, which included countries like India, China, Saudi Arabia, Malaysia, and the United States. The United States preferred decarbonization in this century to denote a worldwide shift away from fossil fuels without committing to a defined timeline. The increasing number of countries that want to stay global warming to 1.5^{o} above pre-industrial levels was one of the most notable political developments to emerge from Paris this year. One hundred six states have joined together to call for action to remain global warming below 1.5 degrees Celsius for the first time. Nations in the north preferred a temperature increase of 2 degrees. According to US negotiators, the term "two degrees" will only appear in the treaty's preamble. They fought against the commissioning of an IPCC report that specifically examined the consequences of a 1.5-degree Celsius rise.

3.3 Finance

The Paris Conference had a dramatic and obscure financial episode. A tense meeting of ministers from wealthy countries took place behind closed doors with less than 24 hours left until the summit's conclusion. Numerous Northern countries argued against making financial commitments & even recommended reversing earlier climate finance pledges. Because finance was a no-go area for G77 and China, the entire outcome was in jeopardy. According to a few European diplomats, "any change in our position on finance will have seismic effects on negotiations & will wreck the entire agreement." Whatever transpires in Paris will go down in the past as a watershed moment. Do not give historians a cause to write that the worldwideanswer to climate change has been ruined" (personal notes). A more recent argument succeeded in convincing developed countries that a goal of $100 billion per year should be established by 2025.

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4. India's INDCs: A way ahead for developing countries

The UNFCCC or the Paris Agreement did not spur India's resolve to contract with climate change. This country's long traditions and customs have ingrained in its people a desire to develop and prosper in harmony with nature and an appreciation for all that nature offers. As a result, despite the Convention's lack of mandatory mitigation obligations, India set a voluntary goal of dropping GDP's emission intensity by 20-25 percent by 2020-21. Between 2005 and 2010, the government reduced the emission intensity of its GDP by 12 percent through a variety of administrative, regulatory, and policy measures. 22 This is why the UN Environment Program (UNEP) acknowledged India as one of the countries doing a great job in achieving its voluntary climate change mitigation goals in its 2014 Emission Gap Report.

4.1 India existing structure of law &guidelines for climate change

Because of its physical location and the variety of its ecological systems, India is particularly vulnerable to the negative effects of climate change. To address environmental concerns, India has enacted national legislation, rules, plans, & regulatory frameworks. To begin, as part of its Directive Principles of State Policy, the Indian Constitution requires the government to "improve and protect India's environment, forests, and wildlife." This is a critical point. The United States Constitution requires all citizens to practice environmental stewardship.

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The National Climate Change Action Plan (NCAP) 2008 and other state climate action plans aim to reduce greenhouse gas emissions by implementing appropriate adaptation and mitigation technologies and promoting the new and innovative market and voluntary mechanisms for climate change mitigation. Because of these environmental policies and laws, the country will be able to meet its INDC.

6. A Comprehensive Mitigation Package

For drastic global reductions in emissions, mitigation efforts cannot be distinguished significantly across countries or regions because each country or region must reduce emissions by 80%. Oil exporting and other economies are the only ones exempt from this rule. Due to the decline in global oil demand, it is anticipated that their current emission levels will be maintained. The macroeconomic policy package was created with political feasibility and macroeconomic policy goals in mind, and it includes the following items:

There should be a green fiscal stimulus to help the economy recover from the COVID-19 crisis and bring carbon prices down to where they need to be to meet the emission target.It includes the following items in particular:

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6.1 Green supply policies: Renewable energy production should be subsidized by 80%. Implementing a 10-year public investment plan in renewable energy is required (opening at 1% of GDP & decreasing linearly to zero over 10 years; after that, additional public investment will keep the new green capital stock growing). Renewable & other low-carbon energy sectors, transportation infrastructure, & services are anticipated to see increased investment, with the latter helping to take advantage of buildings' increased efficiency.

6.2 Compensatory transfers: One-fourth of carbon tax revenue is distributed to households as compensation, protecting the purchasing power of low-income families through targeted cash transfers.

6.3 Climate resilient technology transfers & access to renewable energy sources: National governments should follow through on international climate agreements and interpretations under the Paris Framework with multiple countries to make sure climate-resilient & environmentally friendly technology transfers & equitable access to renewable energy sources around the globe. The Turkmenistan-India TAPI Pipeline project, initially signed, exemplifies this. Turkmenistan and India have decided to build a natural gas pipeline to connect Turkmenistan's natural gas reserves in the other three countries. Turkmenistan has a large natural gas reserve. The country's future energy requirements will necessitate similar measures. To become self-sufficient and share or transfer indigenous green technologies in the future, the government must allocate financial resources for scientific research.

CONCLUSION

The 2015 Paris Climate Change Agreement requires all countries to put in place specific policies. This hybrid approach to global climate governance combines bottom-up and top-down elements. Nations around the world have agreed to defer to their governments on domestic policy. Despite this, the new climate agreement has imposed legal obligations on countries worldwide to continuously develop, implement, and strengthen climate action. While the agreement has some flaws, it is still too early to tell whether it will be effective. Despite this, the negotiations resulted in a political victory. Surprisingly, all major players, including countries with opposed interests, backed the agreement. This demonstrates how difficult it was to agree on the one of modern history's most contentious issues.

Taking action by a few states won't be enough to fix the problem. The Paris Agreement identifies this correctly & calls for cooperation among all countries & peoples, regardless of their development status. The global community still has a long way to go before fully embracing its responsibilities, however. CBDR should be viewed in a cross-country background and at an 'individual level,' be understood and implemented. People of all nationalities, races, and genders need to envision and propagate a new concept of shared but differentiated responsibilities & respective abilities. In the end, everyone has a role to play in resolving this global issue and must do their part. Educated, aware, and well-off citizens bear a greater share of the responsibility for protecting the weak, which are at risk due to no fault of

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their own. Awareness of the problem's urgency and personal attitudinal changes are essential for current and future generations to live in safety.

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