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The Paris Agreement on Climate Change: Efficiency of Mitigation Obligation

Md. Jahid-Al-Mamun*

Abstract: *The 'Paris Climate Treaty' is the first MEA (Multilateral Environmental Agreement) which imposes mitigation obligations not only on developed countries but also on developing country Parties. The Agreement actually extended the mitigation obligations enshrined under the UNFCCC and the Kyoto Protocol. It has created a universal binding obligation to take domestic actions to achieve the target of reducing emissions of GHG set out by the domestic ("bottom-up") process. PA has recognized the best available science to carry on mitigation actions. It requires the Parties to undertake a continuous planning process to mitigate climate change impacts set out in NDC every five years. This Agreement requires a more ambitious NDC containing progression of mitigation commitment from the previous NDC. Though a 'mandatory enforcement mechanism' or 'penalty for non-compliance with mitigation obligations is absent in the Agreement, the mandatory procedural obligation makes us optimistic that the target will be achieved. The information relating to mitigation actions is subject to technical expert review. For assessing the overall and collective progress towards achieving the PA's long-term mitigation goals, the Agreement requires a "global stocktake" in 2023 and after that time in every five years. There is a "transparent, non-adversarial and non-punitive" expert-based measure to facilitate compliance with provisions containing mitigation obligations. Many Parties are committed to shifting to renewable energy and imposing a carbon tax in their NDCs to achieve their desired mitigation pledges. Many countries have started to invest in cheaper zero-carbon goods and services. When such cheaper zero-carbon goods and services capture the market, then the mitigation target will be fulfilled easily. PA is a universal consensual document. Though it is confronted with many challenges, its strong foundation and efficient mitigation obligation make us optimistic that the overall mitigation targets will be achieved and that mother earth will be safe from being "hell". This paper shall discuss the mitigation goal and nature of the mitigation obligation under the PA and finally analyze the efficiency of the mitigation strategy.*

Keywords: Climate Change, Paris Agreement, Mitigation Obligation, Mitigation Goal.

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* Lecturer Land Management & Law, Jagannath University.

1. Introduction

A big number of 195 countries had negotiated the historic Paris Agreement (hereinafter PA) with a view to address the serious problem caused by climate change which has been termed as a great legal success. But some scholars termed it as a political or executive agreement that can visibly do nothing to mitigate climate change. As they pointed out, the PA, unlike the previously effective Kyoto Protocol, has not imposed mandatory mitigation obligation upon the member countries. Fewer of them are hopeful. They think that countries shall fulfill their self-determined contributions to mitigate climate change more than mandatory obligations. They think uniform participation in the global fight against the problem shall successfully reach the targeted goal. The other group of scholars are not satisfied with their expectation. They are concerned that if countries are allowed to set their own contribution, then they set lower goals than their potential.

Against the backdrop, this paper shall examine the strength of the opinion of the two groups. This paper shall discuss the mitigation goal and nature of the mitigation obligation under the PA and finally analyze the efficiency of the mitigation strategy.

1.1 Climate Change as the Common Concern of Mankind

Climate Change and its adverse consequences on the earth have been acknowledged as the common concern of humankind.[1] The phrase 'common concern of humankind' denotes a framework to address global problems. Those problems which transcend the boundary of one single country and for which a collective response is required are treated as common concerns of humankind.[2] Climate Change is such a concern of mankind as it does not respect national boundaries.

It has been claimed by the archaeologists and scientists that adverse impact of climate change was one of the major causes for the destruction of the major civilizations like *Mohenjo-daro & Harappan Civilization.*[3] Yuval Noah Harari in his book *Sapiens: A Brief History of Humankind*[4] has rightly mentioned the horrific effect of climate change and predicted that climate change shall be one

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[1] United Nations Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 31 ILM 849 (1992) (UNFCCC), preamble; Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016), preamble.

[2] Dinah Shelton, 'Common Concern of Humanity' (2009) 39(2) *Environmental Law and Policy* 83.

[3] William J. Burroughs, *Climate Change in Prehistory The End of Reign of Chaos* (Cambridge University Press, 2005) 254-255.

[4] Yuval N. Harari, *Sapiens: A Brief History of Humankind* (Harper 2015).

of the reasons of extinction of the earth. Human actions may make the world as 'heaven' or 'hell'. Climate Change has been considered in today's world as not only the 'common concern for mankind as a whole', but also concern for all the living and non-living beings.

The fatal consequences of adverse effects of climate change have started to become more apparent only after the mid-20th century, and which raised widespread global voice and awareness on climate issues. New reports from different parts of the world have continuously alarmed us about the adverse impact of climate change. It's the proper time to mitigate and soften the adverse effect of climate change. The *IPCC Report 2018* after discussing the horrific effects of climate change, has emphasized that the acceleration of 'far reaching, multilevel and cross sectoral' actions can mitigate climate related risks.[5] The climate regime is continuously trying to invent new ways which will effectively mitigate climate change. For these reasons, climate change may now be considered with the final examination for mankind as a whole, which is going on. Actually, the existence of this civilization is fully dependent on the outcome of the examination. There is no preparatory time for the exam. The Paris Climate Treaty is like the question paper. The existence of the civilization is fully dependent upon how we follow the provisions of the PA.

1.2 General Mitigation Goal under the PA

Article 2.1.b of PA sets out two goals i.e. 'holding the increase in global average temperature *well below 2°C* above pre industrial levels' (i), and 'pursuing *efforts to* limit the temperature increase to below 1.5°C'[6]. So, it is clear that the PA has aimed at keeping the global temperature below 2°C, though it will try to keep the temperature below 1.5°C.

The objects of setting 2°C-1.5°C mitigation goal are twofold; setting 2°C to make the PA as viable, rather than mere aspirational agreement as it was practically difficult for many countries to achieve (i); and setting 1.5°C efforts with a view to send a message to the countries with capacity to take more ambitious actions (ii).[7]

Article 4 of the Agreement has contained the provisions of how to reach the 'long-term temperature goal' as set out in Article 2. The goal is to be achieved

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[5] Valérie Masson-Delmotte and others (eds), *Global Warming of 1.5°* (IPCC 2018) 7 <https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf> accessed 2 November 2020.

[6] ibid.

[7] Jorge E Viñuales, 'The Paris Climate Agreement: An Initial Examination' (2015) 6 *C-EENRG Working Papers* 2.

through *'global peaking* of GHG emissions as early as possible and speedy reduction thereafter which aims to ensure a balance between the anthropogenic GHG emission by source and their removals by sinks within 2050'.[8] For that purpose, the emission reduction will be in accordance with the 'best available science'.[9] Article 4 has also recognized the 'principle of equity, sustainable development and efforts to eradicate poverty'.[10]

1.3 NDC Approach of Climate Mitigation under the PA

After the journey of PA, INDC may be the most pronouncing phrase in the field of climate change. Sophie Yeo has rightly said that 'the UN is the world of many acronyms, but there is one in particular that is likely to dominate climate policy [for the last eight months:] (is) INDC'.[11] The term 'NDC' stands for 'Nationally Determined Contribution' which is the fundamental element for the implementation of PA. It is the heart of PA and the achievement of its long term mitigation target. It embodied the member's will to reduce national emissions and take adaptation measures for the impact of climate change.[12] It is the national climate plan highlighting national climate actions which includes climate related goals, policies, measures undertaken by a government in response to climate change 'as a contribution to global climate action'.[13] The mitigation obligation in PA is based on the soft principle of bottom up submission of NDC by the parties.[14]

The PA has imposed an obligation on all States to submit NDC as it is a common responsibility.[15] It does not exclude developing countries like Kyoto Protocol.[16] But the PA has recognized the developing parties' necessity of support for the implementation.[17] Like Montreal Protocol[18], PA has embodied

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[8] Paris Agreement (n 1) art 4.1.

[9] ibid.

[10] ibid.

[11] Sophie Yeo, 'Explainer: What are 'Intended Nationally Determined Contributions'?' (*CarbonBrief,* 31 March 2015) <https://www.carbonbrief.org/explainer-what-are-intended-nationally-determined-contributions> accessed 2 November 2020.

[12] UNCCCC, 'Nationally Determined Contributions (NDCs)' <https://unfccc.int/process/the-paris-agreement/nationally-determined-contributions/ndc-registry> accessed 2 November 2020.

[13] UNFCCC, 'NDC Spotlight' <https://unfccc.int/process/the-paris-agreement/nationally-determined-contributions/ndc-spotlight> accessed 2 November 2020.

[14] Paris Agreement (n 1) art 4.2.

[15] ibid, art 3.

[16] According to their non-inclusion in Annex B of the Kyoto Protocol and Annex I of the UNFCCC.

[17] Paris Agreement (n 1) art 3.

[18] Montreal Protocol on Substances that Deplete the Ozone Layer (adopted 16 September1987,

the 'principle of equity' and the 'common but differentiated responsibilities and respective capabilities' in the implementation of the agreement.[19] The PA has potentially a review mechanism for inclusion of parties in a category who will be entitled to the benefit of CBDR.[20] PA has not determined the developing and developed status of member countries. This agreement has asked its member parties to act according to its capabilities. It has cast more discretion to the parties to take mitigation actions in accordance with its capabilities. This new system will be good when the parties mentioned as 'developing countries' takes more burden. But this system has a great risk to be exploited. The Parties may rank themselves down to avoid extreme burden.[21]

The provision of 'self-determination' of mitigation goals has great value in the climate change regime. It is the concerned country who may know better about their capability. It allows them to set a target to which they are capable of reaching. This system will be more compilable as the parties cannot blow hot and cold from the same mouth. The self-assessed mitigation target will play a role of estoppel. They will be stopped from non-compliance. The PA has introduced a reputational mechanism of 'naming and shaming' in the place of mandatory financial mechanism. No country wants to lose the confidence of other states and to be seen as international laggards.

Article 4.3 of the PA requires that the successive NDC of each party has to represent progression from the current NDC. For example, if Country 'X' has pledged to mitigate 20% emission reductions in its first NDC, it will have to pledge to reduce more than 20% in its successive NDCs. The risk behind this provision is that the Party may avoid the extreme burden by initially lowering its goal. As PA requires that Party's NDC will reflect 'highest possible ambition'[22], it could be and should be subject to scrutiny for avoiding the misuse. The INDC submitted before PA shall be NDC when the member states ratify it and no regression is allowed from the first NDC.[23] The State Parties are bound to provide information

entered into force 1 January 1989) 26 ILM 1550 (hereinafter Montreal Protocol), art 5.

[19] Paris Agreement (n 1) art 2.2.

[20] Rachel Boyte, 'Common but Differentiated Responsibilities: Adjusting the "Developing" / "Developed" Dichotomy in International Environmental Law' (2010) 14 *New Zealand Journal of International Law* 65, 87.

[21] Michaela Danneman, 'The Paris Agreement's Compliance Mechanism' (Graduate Thesis, Stockholm University 2016) 32 <https://su.diva-portal.org/smash/get/diva2:1049560/FULLTEXT01.pdf> accessed 2 November 2020.

[22] Paris Agreement (n 1) art 4.3.

[23] Decision 1/CP.19, Further advancing the Durban Platform, UN Doc FCCC/CP/2013/10/Add.1 (31 January 2014), para 2(b) <https://unfccc.int/sites/default/files/resource/docs/2013/cop19/eng/10a01.pdf> accessed 2 November 2020.

necessary for clarity, transparency and understanding in communicating their NDCs.[24] The APA[25] is duty bound to provide guidance for it to be ensured and the CMA[26] will adopt it.[27]

The parties to PA are duty bound to submit their NDCs in every five years until the mitigation target is achieved. Each and every NDC will not be regressive in mitigation target from its previous one meaning the NDC is to be updated in every five years.[28] PA requires NDCs to be recorded in a public registry with a view to provide information necessary for clarity, transparency and understanding.[29] This mandatory obligation has given an opportunity for other states or civil society to evaluate the implementation of it as it ensures transparency and openness.

It is the obligation of the CMA to take the implementation of the Agreement periodically with a view to assess the collective endeavour to achieve the overall mitigation goal which is called 'global stock take'.[30] The global stock take is to be held every five years and the first global stocktake will be held in 2023.[31]

2. Challenges of Mitigation Obligation under PA

2.1 The Temperature Limit of 2°C-1.5°C is Not Sufficient to Avoid Climate Anomalies

The PA is aimed to reduce the global average temperature 'well below' 2°C and to pursue efforts to limit it to 1.5°C. The word 'well below' is a vague term. There should be a clarification whether it is 1.9°C, or 1.8°C, or 1.7°C, or 1.6°C. Scientists have expressed great concern that even if the goal is achieved, the result will be devastating.[32]

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[24] Paris Agreement (n 1) art 4.8.

[25] Ad-hoc Working Group on the Paris Agreement.

[26] Conference of the Parties serving as the meeting of the Parties on the Paris Agreement.

[27] UNFCCC Decision 1/CP.21, Adoption of the Paris Agreement, UN Doc FCCC/CP/2015/10/Add.1 (29 January 2016), paras 26-28.

[28] Paris Agreement (n 1) arts 4.3, 4.9.

[29] ibid, arts 4.12, 4.8.

[30] ibid, art 14.1.

[31] ibid art 14.2.

[32] 'What would a Global Warming Increase of 1.5C be Like?' *The Guardian* (International Edition, 16 June 2016) <https://www.theguardian.com/environment/2016/jun/16/what-would-a-global-warming-increase-of-15c-be-like> accessed 26 November 2020; Matt McGrath, 'What does 1.5C Mean in a Warming World?' *BBC* (2 October 2018) <https://www.bbc.com/news/science-environment-45678338> accessed 26 November 2020.

Even if the global climate goal '2°C-1.5°C' is met, some types of extreme weather events which are specially related to extreme heat shall be more severe and frequent.[33] *The IPCC Report 2018* has shown that the climate related risks are higher for the global warming of 1.5°C-2°C.[34] This level of temperature will certainly increase floods, droughts and wildfires.[35] It will cause rising of sea levels. Sea levels rising will be responsible for coastal flooding, salinization of water supplies. It will badly affect tourism, fisheries and coastal erosion.[36] It will also impose an adverse impact on food security.[37]

A recent report by ICIMOD[38] has alarmed that even if the global temperature is kept below 1.5°C, the one third glacier of Himalaya shall be melted. It will be two thirds if the temperature will be 2°C. It will cause the increase of glacier mass.[39] It will cause extreme weather which will threaten 200 crore people of Bangladesh, India, Pakistan, Nepal, Bhutan, Tibet and adjacent regions.[40]

2.2 The Mitigation Pledges in the INDCs are Insufficient

There is a gap between the overall goal of PA and the mitigation pledges of INDCs. Even if the mitigation pledges under the INDCs are fulfilled, it will not be able to stop the temperature from increasing between 2.2°C- 3.4°C by 2100 from the pre-industrial levels.[41] The Draft Decision of the PA itself notes that pledges submitted so far by the countries will not be enough to reverse the upward trend of global emissions.[42]

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[33] Christopher B. Field and others (eds), 'Climate Change 2014: Impacts, Adaptation, and Vulnerability' (Cambridge University Press 2014) 12 <https://www.ipcc.ch/site/assets/uploads/2018/03/ar5 _wgII_spm_en-1.pdf> accessed 2 November 2020.

[34] Masson-Delmotte and others (n 5) 7.

[35] OECD, The Implementing The Paris Agreement: Remaining Challenges and The Role of the OECD (Meeting of the OECD Council at Ministerial Level: Paris, 30-31 May 2018) 5 <https://www.oecd.org/mcm-2018/documents/C-MIN-2018-12-EN.pdf> accessed 26 November 2020.

[36] Christopher B. Field and others (eds) (n 33) 1-32.

[37] T Wheeler and Von Braun, 'Climate Change Impacts on Global Food Security' (2013) 341 (6145) *Science* 508-513 <https://pubmed.ncbi.nlm.nih.gov/23908229/> accessed 2 November 2020.

[38] International Center for Integrated Mountain Development.

[39] Philippus Wester and others (eds), *The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People* (Springer 2019) 58.

[40] ibid 60.

[41] See, the Climate Action Tracker Website <http://climateactiontracker.org/global.html> accessed 2 November 2020.

[42] UNFCCC, Aggregate effect of the intended nationally determined contributions: an update, UN Doc FCCC/CP/2016/2 (2 May 2016) <https://unfccc.int/resource/docs/2016/cop22/eng/02.pdf> accessed 26 November 2020.

2.3 Ambiguity of Principle of CBDR Leads Lowering Mitigation Pledge

The mitigation obligation under the PA is based on the principle of common but differentiated responsibilities (CBDR) and respective capabilities. The term 'respective capabilities' is not clear. The Kyoto Protocol (KP) grouped the country parties into Annex I and Annex II according to their capabilities, but the PA has not done so. It leads to ambiguity. As to determine the national circumstances and capabilities, there is a room for different interpretation.[43] Parties are allowed to interpret their capabilities. There is a great risk of lowering mitigation pledges by the parties than their real situation.

2.4 Non-binding Nature of Obligation

The more binding and centralized obligation of an agreement compel states to implement domestic policies to meet international commitment.[44] Greater abidingness implies serious pledges to comply with, greater the cost of non-compliance (loss of reputation in global community, loss of co-operation by other states, sanctions etc.), triggering domestic policies to comply with international obligation, and engaging domestic institutions with international agreement.[45] The greater abidingness ensures greater implementation.

PA does not impose a penalty for non-compliance with the mitigation obligation which is a very daunting issue.[46] Though there is some procedural abidingness, the PA is a non-binding instrument. It makes it meaningless.[47] Some scholars claim that only uniform participation will not really contribute to diminish the antagonistic effect of climate change. The symptom has already been seen. From the claim of the LDC, specially the SIDS LDC, the mitigation obligation should have and must have binding effect. The economy which is built up by the cost of climate must bear the cost of mitigation. They should take the burden for their 'culpability', not according to 'capacity'.

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[43] Lavanya Rajamani, 'Ambition and Differentiation in the 2015 Paris Agreement: Interpretative Possibilities and Underlying Politics' (2016) 65(2) International and Comparative Law Quarterly 511.

[44] Kal Raustiala, 'Form and substance in international agreements' (2005) 99 AJIL 581, 592.

[45] Ian Brownlie, *Principles of Public International Law* (7th edn OUP 2008) 45-49.

[46] 'Climate Action Tracker Statement: Paris Agreement: Near-Term Actions Do Not Match Long Term Purpose but Stage Is Set to Ramp up Climate Action' Climate Action Tracker (12 December 2015) <http://climateactiontracker.org/assets/publications/briefing-papers/CAT_COP21_ParisAgreement-statement.pdf> accessed 2 November 2020.

[47] Marc Morano,'UN Paris Climate Pact Remains Non-Binding, Meaningless' Climate Depot (1 September 2016) <https://www.climatedepot.com/2016/09/01/un-paris-climate-pact-remains-non-binding-meaningless> accessed 26 November 2020.

The absence of any authoritative compliance mechanism renders the implementation of mitigation obligation under PA confusing. There is no sanction or penalty for non-compliance by any State. Article 15 talks only about facilitation and promotion of implementation.[48]The textual framework of the PA also makes the specific obligation weak, as the soft nature of words used in the treaty such as 'may', 'should' or 'encouraged' do not constitute any positive obligation.[49] Though the Parties are bound to prepare, communicate and update their NDCs, there is no strict mandate to implement the exact contents of the NDCs.[50]According to Article 4.2 of PA, parties are only obliged to 'pursue' measures 'with the aim of achieving the objectives of their NDCs'. This implies that they don't have to fulfill the NDCs but only to make efforts towards achieving their respective targets. The flexibility mechanism of the PA is paving the opportunity for countries to adopt an evasive National Mitigation Plan.[51] Due to such problems, a serious question of efficiency of mitigation obligations, which are non-binding and voluntary in practice, has arisen.

2.5 Undue Privilege to the Emerging Economy

The world has seen drastic changes in the GHG emission scenario within the few decades contrary to 1990s, when the UNFCCC adopted it. The world has witnessed that some developing countries like China, India and Brazil are now being the largest global GHG emitter countries.[52] Some of them have emerged as the world's biggest economy in terms of GDP. They are now more capable to shoulder the burden of highly expensive initiative. In this scenario, it is not fair to impose the whole burden of mobilizing the GCF ($100 billion annually) only on the developed country parties excluding the emerging economic giant.[53]

It is true that the developing countries can claim contribution from the developed countries for their historical culpability for climate change. Since

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[48] Paris Agreement (n 1) art 15.

[49] Lavanya Rajamani, 'The 2015 Paris Agreement: Interplay Between Hard, Soft and Non-Obligations' (2016) 28 *Oxford Journal of Environmental Law* 337–358.

[50] Ralph Bodle, Lena Donat, and Matthias Duwe, *The Paris Agreement: Analysis, Assessment and Outlook* (Berlin, Ecologic Institute 2016) <https://www.ecologic.eu/sites/files/event/2016/ecologic_institute_2016_paris_agreement_assessment.pdf> accessed 2 November 2020.

[51] John Gibbons, 'Ireland's staggering hypocrisy on climate change' *The Guardian* (International Edition Online, 26 Jul 2017) <https://www.theguardian.com/environment/2017/jul/26/irelands-staggering-hypocrisy-on-climate-change> accessed 2 November 2020.

[52] 'Global Greenhouse Gas Emissions Data' (US Environmental Protection Agency Website) <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data> accessed 2 November 2020.

[53] Paris Agreement (n 1) art 9.

the beginning of industrial revolution, the developed countries have emitted huge GHG for development. For this reason, they should shoulder the burden in accordance with the principle of 'common but differentiated responsibilities and respective capabilities'. But the complex global politics should also be considered. It is also true that the developed country may renounce shouldering the burden. The US's withdrawal from PA is a glaring example in this respect. It is also true that the economy of many developed countries has shrunk. For these reasons, the traditional 'Developed vs Developing' burden sharing model should be redefined to make it more balanced and rational.

2.6 Inadequate Financing

Financing is the blood and flesh to carry on a projected activity. It lies in the heart of implementation of mitigation actions. Funds by developed countries enhance the capacity to run mitigation actions. Article 9 of the PA read with the Paris Decision requires the developed members to contribute only $100 billion annually. It is very insufficient to carry on mitigation action worldwide. GCF has been proved to be inadequate to mitigate total global mitigation costs.[54] Even, it is not sufficient to fulfill the needs of India to carry on its mitigation pledges which is estimated to exceed $2.5 trillion.[55] Whole world will get nothing after giving it to India. The small amount which is not even binding has been proved to be very insufficient.

The developed parties make delays to provide the insufficient funds which hamper the overall mitigation goal of PA. The US's withdrawal from PA has worsened the situation. The US has contributed to GCF only 1 billion dollar, the other 2 billion pledged amount is now practically not achievable.[56]

The task of approval of funds to developing countries is more challengeable. The most challenging part is to disburse them. Only 150 million dollar has been released up to December 2017.[57] Corruption by the government of most

[54] 'Paris pledges not enough, additional action needed to slow climate change: top scientists' Climate Policy Observer (30 September 2016) <http://climateobserver.org/the-truth-about-climate-change-report-paris-indcs/> accessed 2 November 2020.

[55] 'Here are India's INDC Objectives and How Much It Will Cost' Indian Express (2 October 2015) <http://indianexpress.com/article/india/india-news-india/here-are-indias-indc-objectives-and-how-much-it-willcost/> accessed 2 November 2020.

[56] Michael Slezak, 'Barack Obama transfers $500m to Green Climate Fund in attempt to protect Paris deal' The Guardian (18 January 2017) <https://www.theguardian.com/us-news/2017/jan/18/barack-obama-transfers-500m-to-green-climate-fund-in-attempt-to-protect-paris-deal> accessed 2 November 2020.

[57] Fatima Arkin, 'The Green Climate Fund commits billions, but falls short on disbursements' *Devex* (9 May 2018) <https://www.devex.com/news/the-green-climate-fund-commits-billions-but-falls-short-ondisbursements-92648> accessed 2 November 2020.

developing and LDCs are one of the biggest challenges ahead in the pathway of using the fund. The engagement of all stakeholders in the process may eradicate this problem and get a good result. On the other hand, GCF did not impose a clear ban on fossil fuel funding being confronted by Japan, China and Saudi Arabia.[58] This failure to ban climate funds on fossil fuel may lead the funding to be used in a wrong gateway. It has caused major hindrance in achieving mitigation goals.

2.7 Lack of Technology and Resource is an Impediment for Developing Countries

It has been evident that most developing country Parties have faced serious technical and resource problems in preparing INDCs. A recent report shows that about 79% of the countries have faced minor or major problems in preparing their INDCs and it caused delays.[59] Among them, 29% countries have delayed in submitting their INDCs.[60] Two third countries have faced serious problems in the assessment of technical options, impacts of climate change and necessary financial support.[61] To enhance the capacity of the developing countries for the implementation of their mitigation pledges, proper technical assistance and financial support should be provided with. There should be specific guidelines how the support shall be provided with. As all Parties are not in a uniform situation, they need 'tailor made assistance' instead of a fixed 'one-size-fits-all' approach.[62]

2.8 Hindrance to Fulfill Commitment in Domestic Level

The implementation of mitigation obligations depends on many things. The government of a country has to balance between its mitigation commitments with the interests of its citizens. Sometimes, the domestic circumstances hinder a government from fulfilling its mitigation pledges. *Lucas Bergkamp*[63] has argued that the fulfillment of individual mitigation pledges depends largely on the

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[58] 'UN green climate fund can be spent on coal-fired power generation' *The Guardian* (29 March 2015) <https://www.theguardian.com/environment/2015/mar/29/un-green-climate-fund-can-bespent-on-coal-fired-power-generation> accessed 2 November 2020.

[59] Marie Kurdziel, Thomas Day, Frauke Roeser, Heiner von Lüpke, Lisa Herrmann and Inga Zachow, *Challenges and lessons learned in the preparation of Intended Nationally Determined Contributions* (INDCs) (New Climate Institute 2016) 3.

[60] Mengpin Ge and Kelly Levin, 'What's Changing As Countries Turn INDCs into NDCs?' Inter Press Service (23 April 2018) <http://www.ipsnews.net/2018/04/whats-changing-countries-turn-indcs-ndcs/> accessed 2 November 2020.

[61] ibid.

[62] 'Intended Nationally Determined Contributions (INDCS): sharing lessons and resources' <https://cdkn.org/indc/?loclang=en_gb> accessed 2 November 2020.

[63] Lucas Bergkamp, 'The Paris Agreement on Climate Change: A Risk Regulation Perspective' (2016) 7 *European Journal of Risk Regulation* 35.

democracy of a country. The change in government may have impact on fulfillment of pledges since 'a sustained and credible commitment to PA's long term goals is incompatible with the vagaries of national politics driven by short term economic and other interests'.[64] The mitigation commitment by the Obama Administration and withdrawal from PA by the Trump Administration is the recent example of this argument. A group of US citizens has support for the withdrawal.

John Schellnhuber[65] has rightly observed that 'by 2025 we will have to have closed down all coal-fired power stations across the planet. That decarburization will not guarantee a rise of no more than 1.5°C but it will give us a chance. But even that is a tremendous task'.[66] It will be very difficult for many countries to comply with John Schellnhuber.

2.9. US's Withdrawal from PA: A Great Challenge

US President Donald Trump has declared his intention to withdraw from the PA on June 1, 2017. He claimed that the PA has posed draconian financial burden over US citizens.[67] Despite the withdrawal by the US, the second largest emitter country, from PA, whether this Agreement will be successful to mitigate climate change is a serious question to be considered. If the practice of withdrawal from PA spreads to other larger emitter countries, the result will be devastating. It is anticipated that the US withdrawal will impact adversely on flourishing the global climate regime.[68] The Obama administration has pledged to contribute $3 billion to GCF of which it paid only $1 billion. After withdrawal, the Trump administration has cancelled the remaining fund. The small size climate fund will certainly fail to fulfill the needs of developing countries and the scientific research community. The US's withdrawal will impose more mitigation obligations upon the other countries to reach the targets. When the US fails or refuses to fulfil its mitigation pledges, the other countries might follow its step and reverse their position. The disease is contagious, health is not. This practice has a great risk of destroying the 'principle of cooperation' which is the basement of PA. Sunstein[69]

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[64] ibid 36.

[65] John Schellnhuber is the Director of Potsdam Institute for Climate Impact Research.

[66] Robin McKie, 'Scientists warn world will miss key climate target' *The Guardian* (6 August 2016) <https://www.theguardian.com/science/2016/aug/06/global-warming-target-miss-scientists-warn> accessed 2 November 2020.

[67] See Kevin Liptak & Jim Acosta, 'Trump on Paris Accord: "We're Getting Out" *Cable News Network* (2 June 2017) <https://perma.cc/CX93-J226> accessed 2 November 2020.

[68] Yong-Xianga Zhang, and others, 'The Withdrawal of the U.S. from the Paris Agreement and its Impact on Global Climate Change Governance' (2017) 8 *Advances in Climate Change Research* 213, 215.

[69] Cass Sunstein, 'Of Montreal and Kyoto: A Tale of Two Protocols', (2007) 31 *Harvard Environmental Law Review* 1, 4.

has rightly stated that 'the behaviour of the nations is interdependent, and whether nations are willing to make significant reductions in greenhouse gas emissions might be endogenous to the behaviour of the United States in particular. If the world's leading emitter is unwilling to make reductions, other nations might be reluctant to do so'.[70]

3. Strengths of PA to Kick-out the Above Challenges with Some Recommendations

Against all the challenges, this part will critically explain the possibilities of PA to achieve its long term goal, the strength of mitigation obligation under PA to fight against the challenges discussed above.

3.1 The Uniform Acceptance Leads to Psychological Norms of Conformity

The PA has been accepted unanimously. 197 countries have signed the agreement among whom 188 countries have ratified it. Universal acceptance is a strong psychological norm which will influence the Parties to comply with their commitment. The fulfillment of their mitigation pledge will be their 'win' and failing to do so will be their 'lose'. The 'win' and 'lose' situation will have a strong impact on their mitigation actions. Arden Rowel and Josephine van Jaben[71] has touched the issue that 'Paris Agreement, incorporates virtually universal political buy-in--presents the opportunity of setting psychologically powerful norms'.[72] Uniform actions create a psychological impact which compels a person to comply with the community-set rules.[73]

3.2 The Power of Bottom-up Mitigation Obligation

The Climate Change issue is not purely a legal issue but a hybrid issue of law, science and politics and political economy. It has been said that the Party's emission reduction target depends on political aim rather than legal obligation.[74] In international relations, all parties are sovereign. They have every right to, and not to, enter into international treaty as well as to withdraw from a treaty. So, it is quite difficult to impose binding mitigation obligations on a party. Wolfgang[75]

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[70] ibid.

[71] Arden Rowell and Josephine van Zeben, 'A New Status Quo: The Psychological Impact of the Paris Agreement on Climate Change' (2016) 7 *European Journal of Risk Regulation* 49.

[72] ibid 52.

[73] ibid.

[74] Charlotte Streck, Moritz von Unger and Paul Keenlyside, 'The Paris Agreement: A New Beginning' (2016) 13 *Journal for European Environmental & Planning Law* 5.

[75] Wolfgang Obergassel (né Sterk), Christof Arens, Lukas Hermwille, Nico Kreibich, Florian Mersmann, Hermann E. Ott, and Hanna Wang-Helmreich, *Phoenix from the Ashes — An Analysis*

has supported the soft law nature of climate change agreement like PA. He has said that:

> International agreement can go as far as the countries are prepared to do. The national determination of contributions opens space for policy-makers to better marry their climate change efforts with their national development discourse and planning.[76]

The PA has reflected these realities. The larger emitter China did not want to enter into a legally binding agreement. The US did not sign the KP and Canada has withdrawn from it due to it's top-down mitigation approach. It hampers the overall object of KP and makes it somewhat inactive. Due to the bottom-up mitigation approach, the PA has been accepted universally. Parties are allowed to set their own mitigation commitment which they will try to attain. This approach has been seen to be very effective. The mitigation pledges in the NDCs play a role of 'name-and-shame' mechanism.[77] To lead the mitigation governance and for the fear of admonition, the parties are undertaking vigilant actions to achieve the goal. The 'transparent, non-adversarial and non- punitive measures' shall have great success.[78]

More importantly, though the 'top-down' approach in any climate accord sounds good but in reality, it doesn't work in the complex political sphere of the present world. *Gwynne Taraska*[79] has nicely stated that '[i]n an ideal world, we might want a top-down style with legally binding commitments, but realistically that doesn't bring parties to the table'.[80]

3.3 The Procedural Part is Binding

The inadequacy of NDCs and mitigation goals, the insufficiency of funds and resources fall within the purview of procedural obligation. A review of the PA shows that the procedural part of PA is binding.[81] Parties are bound to sit for

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of the Paris Agreement to the United Nations Framework Convention on Climate Change (Germany, Wuppertal Institute 2016) 39, 43.

[76] ibid.

[77] Jennifer Jacquet and Dale Jamieson, 'Soft but Significant Power in the Paris Agreement' (2016) 6 *Nature Climate Change* 643, 645.

[78] Ezgi Ediboglu, 'The Paris Agreement: Effectiveness Analysis of the New UN Climate Change Regime' (2017) 17 UC *Dublin Law Review* 180.

[79] Gwynne Taraska is the Associate Director of Energy Policy at the Center for American Progress.

[80] Jack Fitzpatrick, 'Is Paris Climate Accord "Kyoto 2.0"?' *Morning Consult* (April 21, 2016) <https://morningconsult.com/2016/04/21/paris-climate-agreement-kyoto-2-0/> accessed 2 November 2020.

[81] Tess Bridgeman, 'Paris Is a Binding Agreement: Here's Why That Matters' *Just Security* (June 4, 2017) <https://www.justsecurity.org/41705/paris-binding-agreement-matters> accessed 2 November 2020.

meetings, update PA, make rules etc. These will be able to remove the problem regarding the mitigation goals, insufficiency of NDCs and will ensure transfer of technology, capacity building, and financing for carrying on mitigation obligations. As discussed earlier, most of the provisions of PA containing mitigation obligations use 'shall' and thus is binding. Parties are bound to take mitigation actions though the result is not binding.\

3.4 Overambitious NDCs and More Effective Outcomes

The PA requires the members to submit NDCs in every five years which will present progressive mitigation pledges with highest possible targets. It intends to avoid locking in insufficient ambition.[82] For example, if Bangladesh pledges to reduce 5% of emissions from 1990 levels in its first NDC, it will have to express its pledge of reducing more than 5% emission in its next NDC. If every country increases their mitigation pledge, that will have substantial contribution and make the regime effective.

3.5 'Listen and Learn' and 'Collective Responsibility'

The INDCs are public documents. Any party can review the data and progress of other Parties. The overambitious targets of one party may encourage another party to set a more ambitious pledge. The transparency mechanism can highlight the problems in each party's mitigation action. Any feedback by another party can assist the party in problem to correct it. It can establish a 'listen and learn' or 'self-correction' system. The developed parties may assist a developing party by finance, capacity building or technology transfer; if they find any defect which compels the party not to comply with the target. Climate change is a global problem which requires joint endeavor to reach the target. The bottom up and transparency approach of PA can establish 'collective responsibility' which will be more efficient to fight against climate change. The 'self-correction' and 'collective responsibility' concept has a great possibility of making mitigation obligation efficient.

3.6 Parties are Required to Justify Publicly Their Mitigation Commitment

The agreement is bottom-up, the Party to PA determines their mitigation contribution which is to be reflected in their highest possible contribution and the mitigation efforts are required to be informed in the global stock take.[83] In

[82] Mary J. Mace, 'Mitigation Commitment under Paris Agreement and the Way Forward' (2016) 6 *Climate Law* 21, 22.

[83] Paris Agreement (n 1) art 4.3, 4.9. Some have already begun to make assertions regarding the consistency of their efforts with 2 or 1.5°C targets.

practice, Parties cannot determine their mitigation commitment arbitrarily. They are required to justify that their mitigation pledge is sufficient to achieve the 2°C-1.5°C mitigation target. They are expected to provide sufficient information in respect of how they consider their pledge would align with global mitigation goals.[84] The requirement of public justification may influence them to set their highest possible mitigation pledge.

3.7 Domestic Pressure to Take Rationale Mitigation Actions

In 2016, Rabab Ali, a 7 years old Pakistani girl, approached the Supreme Court of Pakistan and asserted that the mitigation pledges by Pakistan in its INDC are insufficient and lack mitigation action. It is violating her right to life. The young girl has cast the eye of the world on the relation between climate change mitigation and intergenerational equity, right to life, dignity, property and equal protection of law. She prayed to court for asking the federal government to rewrite the INDC including comprehensive mitigation pledges.[85] The case is pending before the Pakistani Supreme Court.

In another lawsuit, Thompson, a New Zealand law graduate has approached the High Court of Wellington challenging the legality and reasonableness of mitigation pledges in the INDC of NZ. Though the Court dismissed it on the ground that the INDC contained reasonable mitigation pledge, they observed that the Environment Minister of NZ should consider the latest IPCC report in setting 2050 goal.[86] Thompson has planned to appeal.[87]

The cases have a great sign in compelling the government for setting reasonable mitigation pledges in their NDCs and complying with them which is rightly echoed in the voice of *Professor Tracy Bach*, who noted that 'a potentially potent route for assuring national accountability for the NDCs pledged under international law'.[88]

The world has witnessed that the promises to take enthusiastic action on

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[84] UNFCCC Decision 1/CP.21 (n 27) para. 27 <https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf> accessed 2 November 2020; Paris Agreement, article 4.8.

[85] *Ali v Federation of Pakistan* (Supreme Court of Pakistan, 2016) 1 <https://www.elaw.org/ system/files/Pakistan%20Climate%20Case-FINAL.pdf> accessed 2 November 2020.

[86] *Thomson v Minister for Climate Change Issues* (High Court of NZ, 2017) <http://www.courtsofnz. govt.nz/cases/thomson-v-the-minister-forclimate-change-issues/@@images/fileDecision?r=642.38115004> accessed 2 November 2020.

[87] 'Law Student Loses Case Against Gout's Climate Policy' *Radio New Zealand* (2 November 2017) <https://www.radionz.co.nz/news/national/342953/law-studentloses-case-against -govt -s-climate-policy> accessed 2 November 2020.

[88] Tracy Bach, 'Human Rights in a Climate Changed World: The Impact of COP 21, Nationally Determined Contributions, and National Courts' (2016) 40 Vermont Law Review 561, 595.

climate change by Canada's new Liberal Party had partially contributed to their victory in the last national election. Many voters were aggrieved with the previous Conservative government's environmental policies, which appeared to them like cheating and evasive foot-dragging. Due to massive environmental awareness, public opinion in much of the developed world is genuinely concerned about climate change and stronger than ever.[89]

3.8 Greater Transparency and Regular Updating of Obligation will Pave the Way to Reach Mitigation Targets

The NDCs submitted by the Parties are to be recorded in the public registry of the secretariat.[90] Parties are required to account for their NDCs.[91] Parties are required to provide a national inventory report which will contain anthropogenic emission reduction by sources and removals by sinks of GHGs.[92] The Parties are also required to provide information necessary for evaluating progress of achieving NDCs.[93] The Parties are required to submit these information at least biennially.[94] A 'technical expert review' of submitted information and 'multilateral consideration of progress and achievement' of NDCs will enhance Party's mitigation capability.[95] A compliance body under the PA will ensure compliance with the provisions of the PA.[96] In addition to these mechanisms, the periodic stock taking starting from 2023 will review the collective mitigation efforts of the members and call them to update and enhance their actions.[97] The whole framework of PA will make the mitigation obligation more effective to achieve its goal.

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[89] 'The Paris climate deal is flawed – but an improvement on Kyoto' *The Globe and Mail* (14 December 2015) <https://www.theglobeandmail.com/opinion/editorials/the-paris-climate-deal-is-flawed-but-an-improvement-onkyoto/article27752355/> accessed 2 November 2020.

[90] Paris Agreement (n 1) art 4.12.

[91] ibid, art 4.13.

[92] ibid, art 13.7.

[93] ibid, art13.7.

[94] ibid, art 9.7; but see Decision 1/CP.21, Adoption of the Paris Agreement, UN Doc FCCC/CP/2015/10/Add.1 (29 January 2016) para 90 <https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf#page=2> accessed 26 November 2020 (providing flexibility to LDCs and SIDS).

[95] Mace (n 82) 37.

[96] Paris Agreement (n 1) art 15.

[97] COP Decision 1/CP.21 (n 94) paras 20, 25; Paris Agreement, art 14.

3.9 PA Has Recognized Science to Facilitate Implementation of Mitigation Obligation

Climate change is more scientific than a legal issue. Without science, we cannot even be introduced with climate change. The COPs faced enormous resistance in recognizing science. PA has recognized the role of IPCC and best available science. PA requires parties to prepare national inventory reports by good practice of methodologies accepted by IPCC.[98] This reliance on best available science has been reflected in Article 14 to assess collective progress of implementation, to set save temperature goal,[99] in the invitation of IPCC to make a special report on the impact of global temperature 1.5°C goal and GHG emission pathways.[100] The special report which has been published by the IPCC based on the best available science.[101] Reliance on science makes the whole mitigation strategy under the PA more efficient.

3.10 US's Obligation under CIL

Climate Change is a transboundary environmental issue and the concern of the whole mankind which requires mitigation actions by all the countries. The earth is 'one globe' and any derogatory actions by one state may cause damages to other states. The US must control and mitigate their emissions which are a threat to the global environment. Protection of the global environment has been considered as customary international law (CIL) by the decision of many celebrated cases.

The ICJ has recognized in *Legality of the Threats or Use of Nuclear Weapon Case* that '[t]he existence of general obligation of states to ensure that the activities within their own jurisdiction and control respect the environment of other states beyond national control'.[102]

Judge Weeramantry had decided in the *Gabcikovo Nagymaros case*[103] that '[t]here is substantial evidence to suggest that the general protection of the environment beyond national jurisdiction has been received as an obligations *erga omnes*'.[104] In *the Legality of the Threat or Use of Nuclear Weapon Case,*[105] he has observed in his dissenting opinion that:

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[98] Paris Agreement (n 1) art 13.7.

[99] Decision 1/CP.21 (n 94); Paris Agreement (n 1) arts 2, 4.

[100] Decision 1/CP.21 (n 94) para 21; Paris Agreement, arts 2, 4.

[101] Global Warming of 1.5° (n 5).

[102] Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion) 1996 ICJ Reports 241-42.

[103] Gabčíkovo–Nagymaros Project (Hungary v Slovakia) 1997 ICJ Reports 7.

[104] ibid.

[105] Legality of the Threat or Use of Nuclear Weapons (n 102) 241-42.

> the global environment constitutes a huge, intricate, delicate, interconnected web in which a touch there or a palpation there sends tremors throughout the whole system. Obligations *erga omnes*, rules *jus cogens* and international crimes respond to the state of affairs by permitting environmental wrongs to be guarded against by all nations.[106]

Climate change is a trans-boundary environmental issue and it affects mankind as a whole. In light of the arguments and decisions, any state party suffering from climate anomaly can go international court against a climate escapist like US for its failure to prevent emission reductions on the ground of

'International custom' which has evidence of general practice and which is accepted as a law, is one of the sources of international law.[107] To qualify as a CIL, there must be state practice and *opinio juris*.[108] Since the adoption of the UNFCCC, all the countries in the world are trying to shift to vigilant climate governance. No state objected to mitigation. It is the substantive proof that mitigating climate change should be recognized as a CIL. Someone may argue that the period of practice is insufficient. To quote Akehurst[109] 'as regards the quantity of practice needed to create a customary rule, the number of States participating is more important than the frequency or duration of the practice'[110]. It was held in the *North Sea Continental Shelf Case t*hat 'the passage of only a short period of time is not necessarily … a bar to formation of new rule'[111] So, in light of the argument, it may be concluded that the mitigation obligation has fulfilled required qualifications to be a CIL. Thus, the US would not be able to escape mitigation obligations.

3.11 Climate Efficient Strategy in NDCs

By a critical analysis of NDCs submitted by the member Parties of PA, it has been seen that two-third Parties are shifting to renewable energy from fossil energy by providing financial incentives, one third of countries committed to improving

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[106] ibid; Similar observation on no-harm issues was made in earlier cases. Trail Smelter Case has established the principle of good neighborliness. A state cannot do anything in its territory which will cause injury to the territory of other states. In the Island of Palm Case, the PCIJ held that the right of territorial sovereignty has a corollary duty 'the obligation to protect within the territory the rights of other states'. The ICJ held in the Barcelona Traction Case that 'an essential distinction should be drawn between the obligations of state towards the international community as a whole… is the concern of all states….all states can be held to have a legal interest in their protection; they are obligations erga omnes'. See Trail Smelter Case (United States v Canada) (Awards in 1938 and 1941) 3 RIAA 1905; and Islands of Palmas Case (Netherlands v USA) 1928 PCIJ.

[107] Statute of the International Court of Justice (June 26, 1945) 33 UNTS 993 (ICJ Statute) art 38.

[108] Legality of the Threat or Use of Nuclear Weapons (n 102) 253; ibid article 38(1)(b).

[109] Michael Akehurst, 'Custom as a source of international law' (1974–75) 47 BYBIL 1.

[110] ibid 53.

[111] North Sea Continental Shelf (*Germany v Denmark, Germany v Netherlands*) 1969 ICJ Reports 3, 74.

industrial process to reduce GHG emissions, three countries committed to impose a carbon tax, and two countries propose to impose trade restriction on importation of inefficient energy.[112] For example, South Africa has proposed in its NDC to impose carbon tax, company level carbon budget, desired emission reduction outcome from some sectors.[113] Investment in renewable energy and energy efficiency is very important for de-carbonization.[114] In 2008, the renewable energy production was only 12.9% of primary energy, which will increase to 50% by 2050.[115] Renewable energy will be the dominant low carbon energy supply option by 2050.[116] Special report of IPCC on *Renewable Energy Sources and Climate Change Mitigation* shows that RE has large potential for GHG mitigation.[117] One the other hand, carbon pricing or carbon tax has been proved to be a very important tool to mitigate climate change keeping balance with GDP growth.[118] So, the innovative mitigation strategy of members appears to be realistic to attain the expected result.

3.12 Efficient Technology Enhances Mitigation

PA advocates for worldwide de-carbonization within the next few decades.[119] The potential harmful effect of climate change imposes an economic cost upon society.[120] This cost should be added with other costs of production. The growth of population, economic activity per capita, energy use per unit of economic activity,

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[112] Charles E Di Leva and Xiaoxin Shi, 'The Paris Agreement and the International Trade Regime: Considerations for Harmonization' (2016) 17 *Sustainable Development Law & Policy* 20.

[113] UNFCCC. 'South Africa's Intended Nationally Determined Contribution', 6 <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa.pdf> accessed 2 November 2020.

[114] *Renewable Energy and Energy Efficiency in Developing Countries: Contributions to Reducing Global Emissions* (UNEP 2017) <https://wedocs.unep.org/bitstream/handle/20.500.11822/22149/1_Gigaton_Third%20Report_EN.pdf> accessed 2 November 2020.

[115] Ottmar Edenhofer, Ramón Pichs Madruga, Youba Sokona, Kristin Seyboth, Patrick Eickemeier. Patrick Matschoss, Gerrit Hansen, Susanne Kadner, Steffen Schlömer, Timm Zwickel, Christoph von Stechow (eds), 'Renewable Energy Sources and Climate Change Mitigation Special Report of the Intergovernmental Panel on Climate Change' (Cambridge University Press 2012) 20 < https://www.ipcc.ch/site/assets/uploads/2018/03/SRREN_Full_Report-1.pdf> accessed 26 November 2020.

[116] ibid 21.

[117] ibid 22.

[118] 'Climate Change Strategy and Carbon Pricing' (Singapore, 20 March 2017) (National Climate Change Secretariat, Strategy Group (NCCS) Website) 10-14 <https://www.nccs.gov.sg/docs/default-source/default-document-library/climate-change-strategy-and-carbon-pricing.pdf> accessed 2 November 2020.

[119] Sebastian Oberthür, 'Where to go from Paris? The European Union in climate geopolitics' (2016) *Global Affairs* 1.

[120] See generally, Adam B Jaffe and others, 'A Tale of Two Market Failures: Technology and Environmental Policy' (2005) 54 *Ecological Economics* 164.

carbon intensity of energy used are the causes of GHG emissions. Improved technology can play a vital role in reducing GHG emissions and the cost of those reductions.[121] Greater technology innovation ensures greater social benefits which reduces the cost of mitigation. Success of a technology depends on innovation and adoption.[122] The success of a technology depends on the number of users. When the users are known to use technology and when it is cheap and available, then it captures the market. Governments can encourage adoption of technology by subsidizing it, adoption in their own operation, or by raising tariffs and nontariff barriers like technology not efficient for mitigation. When one technology is adopted generally, it will replace the existing technology.[123]

The energy efficient technology has been improving rapidly and becoming cheaper.[124] The glaring example of cost effectiveness of de-carbonization technologies is 'solar technology'.[125] By analyzing the NDCs, it has been evident that the Parties to PA are eager to accept efficient technology to achieve goals. For example, Germany is planning to reduce 85%-90% of its GHG emissions by 2050 depending on decarbonized technology.[126] When the technology becomes cheaper and easily available, more efficient than existing technology; then people will be attracted to use those. It is a matter of hope that the improved de-carbonization technology will replace the existing technology and facilitate the achievement of Paris Climate Goal.

4. Conclusion

There are many criticisms and challenges of the mitigation obligation under PA. Nothing in the world is 'perfect'. Then why should we expect 'super perfection' of mitigation obligation under PA? I think, the imperfections in mitigation

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[121] Adam B Jaffe, Richard G Newell and Robert N. Stavins, 'Energy Efficient Technologies and Climate Change Policies: Issues and Evidence' (1999) *Resources for the Future Climate Issue Brief* 19, 1 < https://media.rff.org/documents/RFF-CCIB-19.pdf > accessed 29 November 2020.

[122] Jaffe and others (n 120) 166.

[123] ibid.

[124] Frank Jotzo, 'Decarbonizing the World Economy' (2016) 7(3) *The Solutions Journal* 74-83 <https://www.thesolutionsjournal.com/article/5698/> accessed 2 November 2020; See also, Ying Li and Zofia Lukszo, 'The Cost-effective Pathways for Power Decarbonization: Llow-carbon Generation Technologies' (IEEE PES Asia-Pacific Power and Energy Engineering Conference (APPEEC), 7-10 December 2014.

[125] Cabe Atwell, 'The True Cost of Solar Energy' (*Power Electronics*, 7 February 2018) < https://www.electronicdesign.com/technologies/alternative-energy/article/21199501/the-true-cost-of-solar-energy> accessed 2 November 2020.

[126] 'Decarbonizing the German Transport Sector: The Mobility and Energy Transitions' (*Sustainable Transport in China*, 18 July 2018) <https://www.sustainabletransport.org/archives/6159> accessed 2 November 2020.

obligation compels the world community to rethink which may lead to more efficient solutions. PA is not static one, it is dynamic. As the world's climate has been changing day by day, new targets, principles, rules, systems, and scientific solutions are being evolved. The PA may incorporate those to pave a better way to reach the mitigation goal.

It is a great success of PA that it has brought the whole global community under a single umbrella with a view to march against climate change.[127] The universal acceptance of PA and universal commitment to reduce greenhouse gas emission has built a strong basement of the global climate regime. Previous MEAs dealing with the issue lack universal acceptance and are marked as 'ineffective'. However, the PA has a strong basement, and universal acceptance, it can solve challenges and problems by decision taken in meeting, negotiations and global consensus. The previous discussion has shown that almost all the countries, whether they are developed, developing, LDC or LDC SIDS; have been suffering or are in great threat due to climate change. Even, the US, who has withdrawn from PA, has suffered record colds which caused casualties to its citizens recently.[128] We are optimistic that the worldwide sufferings will compel the whole global community to sit in one table and solve the arising challenges and problems.

The international treaties dealing with climate change before PA have failed due to their binding nature. The approach 'to bind a sovereign' is faulty in international relations. The non-binding nature of mitigation obligation has a great chance to yield more results than the binding instruments. The PA may be compared with 'polling star' or 'shining moon' which is removing the darkness from the sky of the climate change regime. We are optimistic that the night will end, the sun will rise, the climate change regime will be enlightened, and mother earth will be free from the curse of climate change.

[127] Total of 185 countries have ratified the Agreement among 197 signatories State Parties.

[128] 'Death Toll Reaches 11 as US Suffers Record Cold' *VOA News* (31 January 2019) <https://www.voanews.com/a/united-states-record-cold/4767176.html> accessed 2 November 2020.