



기후변화에 대한 Global Governance의
현황과 문제점

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The State of Global Governance on Climate Changes: Issues and Prospects.

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ABSTRACT

Preventing climate change requires global collective action but the Paris Agreement revealed only individual parallel actions, thus failing to resolve the collective action problem. In theory, all nations could benefit if they take collective action but in reality they still take individual action of releasing carbon dioxide even though this may put them worse off in the end. This is a classic case of the “tragedy of the commons.”

In the current international system, only the national government can undertake collective action to produce public goods but globally, there is no world government that can provide global public goods. The realities of “global governance” that the UNFCCC have shown so far are too weak and gridlocked and its negotiations too slow to reach consensus. As a result, the Paris Agreement left the world still in anarchy by merely calling on nations to submit their voluntary pledges with neither global emissions limitation nor mandatory national targets. As a substitute to this reality, a benign hegemon could perform the roles of world government but there is no such empire in the 21st century as even the U.S. has become incapable of exercising hegemony. Initially, the UNFCCC did try to facilitate collective action by implementing the top-down approach enshrined in the Kyoto Protocol in 1997 but failed to accomplish its intended mandatory targets for preventing climate change mainly because of the conflicting interests rising between developed countries and developing countries and especially because the Protocol applied only to developed countries while the U.S. and China were outside of it. This is why the U.S. began to reassert some leadership roles to achieve a global deal by taking a bottom-up approach in Copenhagen in 2009 but failed to conclude such agreement mainly because China, India and other

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developing countries refused to accept an intrusive agreement. The U.S. then resorted to fostering cooperation with China and other major emitters by taking parallel, if not collective action through bilateral or regional partnership, thus setting a workable example of emission reduction. In November 2014 the world's largest and second largest emitters, China and the U.S. did reach a historical breathtaking agreement on addressing global climate changes by making such parallel pledges, which in turn produced enormous impact on the negotiations leading to the Paris Agreement in December 2015.

This agreement turned out to be a series of plans for parallel action by reaffirming the UNFCCC principle of “common but differentiated responsibility” for all nations to provide their domestic plans for reducing emissions “in light of different circumstances,” phrases taken straight out of the U.S.-Chinese bilateral agreement. All countries are encouraged to put their own “intended nationally determined contributions.” The agreement provides the only collective goal of “holding the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels” while pursuing efforts to limit the temperature to 1.5 degrees by 2100. But how to achieve this goal is unclear because it has no adequate enforcement mechanism other than peer pressures and periodic transparent reviews in order to prevent free ridings. Its overall message, though, is that a new era of de-carbonization and clean energy is beginning to set in motion but by no means is the agreement's future certain.

This state of weak global climate governance derives from the lack of consensus and leadership both in contemporary international and national politics. It is a reality that only when the U.S, China and other powers exercise leadership by making political compromises for cooperation can they activate the consensus-driven global governance like the UNFCCC. As attempts for solution, we cite several competing ideas: carbon price, technological breakthrough, minilateral approach, and an ad hoc caucus of 10 largest emitters for crisis management. To fight climate change more effectively, we must exert our utmost efforts in mobilizing all the available means including scientific, economic and political methods with a sense of urgency for the common future of humanity as a whole.

Key words: carbon price, climate change, collective action, emission reduction, global warming, global public goods.

I . The Paris Agreement as a Case Study of Global Governance

On December 12, 2015 the Paris Agreement on climate change that will go into effect in 2020 was finally concluded as a “historic turning point” in the world’s efforts for keeping global warming “well below 2 degrees Celsius” above the pre-industrial levels by the turn of this century. This Agreement was widely billed as humanity’s last plan to prevent the most catastrophic effects of climate change. How the U.N. Framework Convention on Climate Change (UNFCCC) could at last accomplish this accord reveals a great deal about the current state of global governance on climate change by exposing its strengths and weaknesses. More than anything else, the Paris Agreement vividly reflects the emerging structure of global governance designed to facilitate global cooperation in the increasingly globalizing world where some 200 sovereign states are still busy defending their national interests more than international cooperation by competing with each other.

By “global governance” I mean the process through which the nation states, markets, international institutions like the U.N., and civil society groups make collective decisions and cooperate to solve global problems. “Governance” here is not government per se as the U.N. Commission on Global Governance defined the concept in 1995: “Governance is the sum of the many ways individuals and institutions, public and private, manage their common affairs.... At the global level, governance has been viewed primarily as intergovernmental relationship but it must now be understood as also involving non-governmental organizations, citizens’ movements, multinational corporations, and the global capital market.” By “climate change” I mean a change in average weather conditions and “global warming” means warm temperature caused by climate change. Climate change is regarded as “slow violence” that “occurs gradually and out of sight, a violence of destruction that is dispersed across space and time, an attritional violence that is typically not viewed as violence at all” (Rob Nixon).

The central theme of this essay is that climate change is the greatest collective action problem in human history. Preventing climate change requires taking global **collective action** but the Paris Agreement turned out to be a series of **individual parallel actions** that the nation states take voluntarily rather than mandatorily. Initially, the UNFCCC did try to facilitate collective action by implementing the top-down approach enshrined in the Kyoto Protocol but failed to accomplish its intended mandatory targets for preventing climate change mainly because of the conflicting interests rising between developed and developing countries and specifically because most of developing countries as well as the U.S. and China were outside of the treaty. It is why the Paris Agreement adopted a bottom-up approach by allowing all the parties including both developed and developing countries to

take parallel action by making only voluntary contributions. As a result, now they are groping for more feasible solutions necessary to realize a carbon-free planet. Such efforts are bound to evolve from the complex interactions involving science, economy, diplomacy and politics as far as doable action is concerned, given the nature of the contemporary international system.

II . The Logic of Global Governance and the “Tragedy of the Commons.”

The logic of global governance is to take a global collective action to produce global public good like stable climate that has no national border. In theory, such “governing without government” is necessary to take collective action so that all nations could benefit from protecting the global commons called the atmosphere. In reality, however, each nation tries to “free ride” by receiving the benefits of such public good and expects others to assume the costs of reducing greenhouse gas even though doing so may well put all of them worse off and the entire atmosphere in danger of being squandered in the end. This is a classic case of the “**tragedy of the commons.**” This tragedy seems to roughly illustrate how the contemporary international system is working in the world where no sovereign nation is willing to sacrifice its own national interests for the sake of global public good.

In the current international system, only the national government can undertake collective action to produce public goods but globally, there is no world government that can provide global public goods. The realities of global governance on climate change are well illustrated by the consensus-driven UNFCCC which is too weak and gridlocked and its negotiation too slow to decisively prevent climate change. As a result, the Paris Agreement has left the world still in an almost anarchy by merely calling on nations to make only voluntary pledges with neither global emission reduction targets nor effective enforcement. As a substitute for a world government, a benign empire or hegemonic power could perform the roles of world government. In fact, the U.S. did attempt to play this role by helping launch the Kyoto Protocol in 1997 that included some elements of collective action. But faced with opposition of the Senate the U.S. itself was unable to ratify the Protocol and hence incapable of exercising hegemony. It was against this background that the Paris Agreement in 2015 resorted to instituting voluntary individual and national action and not collective action, thus still leaving the free-rider problem unresolved but it better fits the realities of contemporary international relations evolving in the 21st century in which such new powers like China, India, Brazil and others are rising rapidly while the U.S. is set in a process of relative decline.

Ⅲ. Climate Governance from the Kyoto Protocol to the Paris Agreement.

Global governance on climate change evolved from the international treaties or agreements that the nation states reached under the UNFCCC. Among these the Kyoto Protocol and the Paris Agreement stand out most important. The former mandated its parties to implement their assigned amounts of greenhouse gas reductions but the latter merely encouraged its parties to make their own pure voluntary pledges. The Kyoto Protocol was a binding treaty which was negotiated at the international level and then required its parties to implement it domestically but this top-down approach failed to make any significant progress for 25 years mainly because the UNFCCC found it almost impossible to enforce. By contrast, the Paris Agreement is a mostly non-binding accord that allowed its parties to first deliberate what they could do domestically and then make their voluntary international commitments. This flexible bottom-up approach is a new mode of concluding a universal agreement by involving both developed and developing countries but still lacks effective enforcement mechanism, which is characteristic of all international laws.

1. The Intergovernmental Panel on Climate Change (IPCC).

This global governance organization was established by the World Meteorological Organization and the UN Environment Program in 1988 to assess the causes and impacts of climate change on human life. Since then the IPCC has produced five scientific and influential assessment reports. Its fifth report released in 2014 confirmed “beyond doubt that human activity is the primary cause of global warming” and therefore, full de-carbonization is necessary to prevent it. By so doing the IPCC prompted the UN to conclude a global treaty called the UNFCCC so that this new treaty could take up the climate change issue perhaps as the most urgent task of global collective action to save the planet. For these contributions, the IPCC and former U.S. vice president Al Gore were awarded the Nobel Peace Prize in 2007.

2. The UNFCCC.

The UN launched this treaty at the Earth Summit in Rio de Janeiro in 1992. The UNFCCC consists of 196 parties and its Secretariat convenes annual conferences called “Conference of Parties” (COP) to produce global agreement on preventing drastic climate change.

3. The Kyoto Protocol.

This protocol is an international treaty that the UNFCCC first reached in Kyoto in 1997 and went into force in 2005. It committed the parties to implement binding emission reduction targets. From this time on the Kyoto Protocol called upon developed countries to shoulder more responsibilities, for they had caused the bulk of greenhouse gas emissions that resulted from their industrialization of some 150 years. This was the beginning of the principle: “**common but differentiated responsibilities and respective capabilities**” that was codified in the treaty. The protocol assigned maximum carbon emission levels to its parties and allowed them to participate in carbon credit trading. Emitting more than the assigned limit would result in a penalty for the violating country in the form of a lower limit in the following period.

The Kyoto Protocol separated countries into two groups. *Annex I* included developed countries including 37 countries plus EU while *Non-Annex I* referred to developing countries; emission limitations were only placed on Annex I countries so that they could cut emissions by an average of 5 percent against 1990 levels for the 2008-2012 period which was to be extended around 2009. *Non-Annex I* countries participated in projects that lowered emissions in their own countries; for this they earned carbon credits. The credits could be traded or sold to Annex I countries, which allowed them a higher level of maximum carbon emission for that period. The Kyoto Protocol was to expire in 2012 and eventually failed to accomplish its original goals since it covered only 14 percent of global emissions, for the largest emitter at the moment, the U.S. failed to ratify it because of the Senate’s objection and China was outside it as a developing country but replaced the U.S. as the largest emitter in 2006. Thus, the U.S. took a hand-off stance and China began to assert itself as a champion of the developing world as “the largest developing country” even while alarming signs of global warming became apparent every day. To break out of this deadlock, U.S. President Barak Obama began to assert some leadership at the climate summit (COP15) in Copenhagen in 2009 by trying to strike a new post-Kyoto deal.

4. The Copenhagen Accord.

The Copenhagen conference turned out once again to be a deadlock between the developed and developing country groups over the issues of who should make more mitigations and pay for the costs of so doing. Such small countries as Bolivia, Cuba, Peru and Venezuela went so far as to refuse adoption of a final climate deal itself. By this time, however, the total amount of greenhouse gas emissions by developing countries including

such emerging countries as Brazil, Russia, India, China and South Africa began to exceed the total amount released by developed countries. Yet the developing group looked backward by calling upon developed countries and especially the U.S. to assume primary responsibilities for causing global warming in the past and therefore to provide more costs for adapting to climate change while developed countries looked forward by asking developing countries to share the burden, for they themselves still had to rely on fossil fuels to achieve economic growth as their first priority in order to lift their people out of poverty more than anything else. In India, for example, over 300 million people lived without electricity; India strongly advocated the need to use coal and oil to generate economic growth more than fighting climate change. The struggle between the developing and the developed world remained deadlocked until the end of the negotiations behind closed doors particularly between the two lead protagonists, China who championed the cause of the developing block and the U.S. who consistently advocated the importance of transparency and inclusiveness in emission cuts. When a small group of leaders from Brazil, China, India and South Africa gathered to have a coordination meeting, President Obama was uninvited but nevertheless he burst himself into this room and eventually hashed out an interim last minute political deal with them to salvage the summit from total collapse.

Although this group of key players failed to produce a comprehensive post-Kyoto protocol, they did manage to agree on a few important principles. Among these perhaps the most important was the newly emphasized principle that unlike in the Kyoto Protocol, both developing and developed countries should make voluntary greenhouse gas mitigations. Another was the recognition that “deep cuts in global emissions are required according to science” as the IPCC’s fourth assessment report called for. Consequently, most of the parties came to share a keen awareness that no global agreement could possibly achieve its intended goals without an active participation of the U.S. and China as the world’s two leading emitting superpowers. To accommodate the developing countries’ demands that developed countries should assume more responsibilities, U.S. Secretary of State Hilary Clinton proposed the idea of establishing the Green Climate Funds that could mobilize \$100 billion annually by 2020 to help developing countries to better adapt to climate change. Only then did China agree to accommodate some international scrutiny in reporting emissions reductions. They also promised to take some concrete action to keep global temperature increase below 2 degrees Celsius. And yet the summit ended acrimoniously without a formal global accord by leaving most parties unhappy. This was why the UNFCCC declared only “to make note” of these non-binding measures but eventually 114 parties came out to support the accord. The Durban conference (COP-17) in 2011 agreed to extend the Kyoto Protocol until 2017 and potentially 2020, and decided to make a final break from the Kyoto

Protocol by signing a new legal structure in Paris by 2015.

5. The Paris Agreement.

In order not to repeat the failure of the Copenhagen conference, the U.S. began to take serious leadership this time to accomplish some bilateral cooperation first with China, India and the EU before laying a ground work for reaching a new global climate accord. In 2014 the UNFCCC convened the COP20 in Lima, Peru that produced a draft accord containing 5-pages of some general outlines calling upon all parties to submit their domestic plans for reducing carbon emissions under the principle of “common but differentiated responsibility” and “in light of different circumstances.” The Lima conference mandated the COP21 to convene in Paris in 2015 and to complete a final agreement on climate change by taking a bottom-up approach.

IV. The Paris Agreement: Partnership for Parallel, not Collective, Action.

Preventing climate change requires all countries to take a global collective action but the Paris Agreement presented only individual parallel actions that resulted from some bilateral and regional partnership between the U.S and China, India and the EU, and from a series of compromises made by shifting coalitions among rich and poor countries. Yet it failed again to resolve the free-rider problem. Key to achieving this breakthrough, if it is one, was the advent of Sino-American partnership that set an example of taking joint leadership for a bold action and left enormous impact on the subsequent negotiations leading to the Lima and Paris Agreement. This global agreement is significant in that it was truly a universal one involving 193 UN member plus Niue, Cook Islands and the EU by blurring for the first time the perennial divide between developed and developing countries for sharing responsibility. It is possibly a best deal that could actually work in the contemporary international system of sovereign nation states but was fuzzy on detail. Its weakness, however, lies in its insufficient commitments and financing necessary to achieve the only globally reached consensus of keeping global warming below 2 degrees and in its weak enforcement mechanism that still allows rooms for free riding or cheating by certain parties, for there is no punishment mechanism for free riders or underperformers.

1. Sino–American Partnership for Parallel Action as an Example of Leadership.

In November 2014 the world’s largest and second largest emitters, China and the U.S. reached a historic breathtaking agreement on addressing global climate challenges by making two parallel pledges when President Xi Jinping and Obama had a summit in Beijing. Before he went to Beijing President Obama had unilaterally initiated the domestic Clean Power Plan of curtailing emissions from coal-fired power plants and significantly advanced the global agenda for climate change by pledging to cut greenhouse gas emissions to 26-28 percent below 2005 levels by 2025. He then got China on board for this task by urging it to cooperate. For the first time President Xi agreed to cap China’s carbon emissions “around 2030” and to increase its non-fossil fuel to 20 percent by 2030. For him, this was an inevitable choice perhaps, given the stark reality that pollution caused 1.6 million deaths every year and 4 thousand per day (*Time*, August 14, 2015) in China. The two superpowers emitting about 23.43 and 14.69 percent of global missions respectively also agreed to cooperate on carbon capture technology and energy efficiency, demonstrating an example of cooperation to be achieved by taking parallel action.

This was a living example showcasing a case that even rival powers could share some measure of leadership for taking parallel action when their national interests were well aligned with cooperating with the other rival. By so doing they did set the global agenda for multilateral negotiations in Lima in 2014 and in Paris in 2015 and created further momentum by acting as a catalyst for others to follow suit. Their bilateral partnership exhibited a most feasible way of sharing leadership and facilitating top-down cooperation, if not coordination, for overlapping interests that are necessary for triggering bottom-up cooperation to make tangible progress.

2. The 2 Degrees Celsius Benchmark as the Only Collective Goal.

The Paris Agreement provides the only collective goal of “holding the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels as a tipping point and to pursue efforts to limit the temperature to 1.5 degrees” by 2100. The addition of the 1.5degrees benchmark is not binding but a positive long-term ambition to urge both rich and poor countries to peak emissions “as soon as possible,” for most scientists point out that the 2degrees benchmark is insufficient to limit global warming. Actually, the EU had consistently advocated the 1.5degrees benchmark since the 1990s but China who used to claim a member of the G77 group of 134 developing countries, India

and other developing countries like Saudi Arabia were objecting to this lower benchmark. Interestingly enough, many small countries and especially island countries that were in danger of being submerged by rising sea levels formed a loose “Climate Vulnerable Forum” along with African countries. Eventually this group joined the Coalition for High-Ambition that Marshall Island had led and the EU and the U.S. later joined came out to advocate the 1.5degrees aspiration in the negotiations. Then China and India were compelled reluctantly to acquiesce to this idea. Despite these high ambitions, however, there are no concrete measures in place to achieve such higher ambitions. How this goal could be achieved depends entirely on how the parties actually pledge and review their reduction commitments in the years to come.

3. Intended Nationally Determined Contributions (INDC): Parallel Action.

At the heart of the Paris Agreement are the **INDCs** that all parties are obligated to submit voluntarily by taking individual parallel, not collective action, for there are no common plans with measurable timetables, leaving the future of climate mitigations squarely in the hands of national governments. This was necessary to bring all parties to the negotiating table where everybody has one vote respectfully to China that emits almost one-thirds and to Gambia that omits only 0.02 percent of global emissions. Unfortunately, many scientists point out that the total pledges made by all parties as of 2015 could lead to a 2.7 degrees rise or higher by 2100! President Obama personally met with delegates of the Alliance of Small States (AOSIS) to persuade them to come on board for making voluntary pledges. Since these developing countries will have to bear the brunt of the effect of severe climate change, they eventually gave ground to come along to sign a universal agreement. It was a major victory for the U.S., for it deviated from the “common and differentiated responsibilities” that had forced only developed countries to shoulder responsibilities for global warming under the Kyoto Protocol. Thus, **the INDCs** fit the interests of key players like the U.S. and China as well as poor countries. India, for example, offered no peak year but only promised to cut emissions intensity by 33 to 35 percent some time. These measures left the future timetable for emission reductions in the hand of the largest polluters with no collective system in place to enforce that individual countries meet their own targets.

The text of the Paris Agreement walks a fine line, binding in some procedures like reporting **INDCs** but setting emissions targets for individual country is non-binding. This was what the U.S. had consistently sought, for a binding treaty has no chance of being ratified by the Senate. There are no common standards or formula for each party to determine the scope and content of its **INDC**. Hence, each has to decide and implement its

plan through its domestic political processes. Globally, however, the UNFCCC aims to produce a peak in emissions as soon as possible and eventually to net zero emissions in the second half of the century. Developed countries will have to take the lead but developing countries also are expected to gradually move on to emission peaking and reduction, for the IPCC is saying that net zero emissions must be achieved by 2070 to avoid really dangerous global warming. Despite these high hopes, there is little guarantee that they will be implemented as planned because the mechanism to facilitate implementation and compliance is very weak indeed as the text specifically call for “non-adversarial and non-punitive” methods.

4. Peer Pressure and Periodic Reviews for Enforcement.

The Paris Agreement had no legal enforcement mechanism. In efforts to ensure that parties implement their pronounced **INDCs**, the Paris Agreement relies mainly on “peer pressure” and resorts to enshrining regular five-year reviews of **INDCs** to make sure that future pledges are better and no backsliding made. Generating peer pressure by “**naming and shaming**” potential violators, it is still vulnerable to free-riding, creating incentives for states to make minimum contributions while benefiting from the contribution of others. Thus, it is still difficult to know what others are doing and to hold all parties accountable to their action.

To complement this method, the Paris Agreement introduced a review mechanism to aggregate “stock-takings” of collective emissions by outside expert-groups every five years. Under this new system, parties are called upon to make future commitments by increasing pledges as “a progression” and “as ambitious as possible.” Facilitative dialogues will begin in 2018 to probe these pledges. Countries that have submitted their pledges for 2025 are urged to come back in 2020 with new more ambitious ones; those with pledges for 2030 are encouraged to “communicate or update” them. This ratcheting up process will be repeated every five years, with the first global stocktaking occurring in 2023. Yet there is no way of punishing those countries that miss their emissions pledges.

What it can do is to hold every country accountable to the same standards of transparency in publically monitoring, verifying and reporting as the U.S. consistently called upon China and India in particular to accept. But these sunlight provisions must be “facilitative, non-intransitive and non-punitive” accommodating most of China’s strong opposition to any “intrusive” measures. It is important to note that parties must report their pledges openly and regularly to avoid “carbon leakage.” Thus, the agreement essentially substitutes transparency for compliance, for it fails to provide the UNFCCC Secretariat with more effective means of enforcing climate governance for the sake of global public goods.

5. Finance and “Loss and Damage.”

Developed countries are obligated to continuously provide financial help to developing countries so that the latter could better adapt to climate change and transition to clean energy. The previous pledge of \$100 billion a year will continue beyond 2020 and is expected to increase beyond that later on. These funds will be managed by the Green Climate Funds that the Cancun conference agreed to establish in 2012 and its Secretariat began operation in Incheon, Korea in 2013. Over 30 countries including the U.S. who pledged \$3 billion and Japan 1.5 billion have raised some \$10 billion thus far. At the behest of the U.S. there is also the clause that finance can be mobilized from a wide variety of sources including the private sector. China, however, went its own way by pledging \$3.1 billion of aid to help developing countries while continuing to claim itself as the “largest developing country.”

Another article acknowledged the “importance of averting and addressing loss and damage associated with the adverse effects of climate change.” Since the U.S. long opposed the idea of compensation demands that developing countries had made, a footnote clause was introduced to state that loss and damage “does not involve or provide basis for liability or compensation.” When the draft article on this issue turned out to state: “developed country Parties **shall** continue taking the lead by undertaking economic-wide absolute emissions reduction targets” (emphasis added), the U.S. adamantly objected to this wording of “shall” and demanded immediate change. Then, French diplomats abruptly substituted the word “shall” for “should” in order to rescue the agreement from derailing at its final moment. It should be clear from these illustrations that the Paris Agreement resulted from a series of compromises not only between rich and poor countries but also among constantly shifting coalitions depending on diverse issues that involved really difficult and arduous negotiations spanning the 23 years from 1992 up to 2015.

6. Open Door for Carbon Price and Reduction of Emissions from Deforestation and Forest Degradation.

The Paris Agreement stealthily opened the door for market forces to start driving change in the world when it briefly mentioned “internationally transferred mitigation outcome.” It also mentioned the needs for reducing emissions from deforestation and forest degradation in consideration for concerns of many environmental leaders working in this field.

7. An Overall Message.

If there is an overall message underlying these articles, it is this: a new era of

de-carbonization and clean energy is beginning to set in motion. Some characterize this as a paradigm shift in human history signaling a fundamental shift from investments in coal, oil and gas as primary energy bases to a framework for investments in non-fossil fuels and cooperation on climate change. But by no means is the deal's future is certain, for battles between climate change movements and the political forces that are determined to fight tooth and nail to maintain the status quo will continue while there is emerging a big hurdle like the availability of cheap oil, gas and coal that resulted from the plunging commodities price begun in 2015. Thus, the common task facing all countries is how to achieve some appropriate harmonies between economic growth and emission reduction in different circumstances.

V. Conclusion: In Search for Solutions.

The current state of global governance is indeed weak, gridlocked and ineffective mainly because it has been shaped by international and domestic politics in which sciences, economics, diplomacy and politics are working in complex interaction. Sciences discover truths about climate change; economics tends to constrain what global governance can do in terms of costs and benefits; diplomacy seeks to reach agreements through consensus or compromise; and politics makes authoritative choices and take concrete action on the basis of presently feasible ends and affordable means. In reality, however, such choices also result from compromises between scientific and economic requirements and political feasibilities. In the end, politics determines the choices. This is why politics must change first in order to prevent climate change. Global governance evolves within these **political constraints** of an anarchic international system or a world without government. To fight climate change more effectively, it would be better for the states to take unilateral actions and try to build bilateral or regional partnership before negotiating a global agreement. With this realistic perspective one can cautiously make several concluding observations as following.

1. The Weak State of Global Governance.

The state of consensus-driven global governance on climate change as the UNFCCC has shown so far is too weak to take collective action for the purpose of providing global public goods. Challenges of global warming are truly global in scope but the Paris Agreement reflects the aggregation of national actions amounting to the lowest common denominator. This is why some call it just a “fraud” or “fake,” for it provides only words but little action (James Hansen) and express serious doubts if it could stave off the most destructive effects

of global warming. In this sense It is only a political statement of good will like other international laws that are based on the principle that *pacta sunt servanda* (agreement must be kept). The task of implementing the agreement is left to vagaries of national domestic politics.

2. A G-0 World without Global Leadership.

This state of global governance closely mirrors the current situation of a “G-0 World” in which global leadership is absent and the nation states are alive and fiercely vying with each other for power and autonomy. It is neither a unipolar world under U.S hegemony nor a G-2 world, for China is still passive on the idea of global governance and reluctant to share leadership with the U.S. for taking global collective action. And yet when it finds that what it could do globally is well aligned with its own national interests, China does partner with the U.S. for common interests, if not global public good. If the U.S. and other key players like India and Brazil should cooperate, if not coordinate, in this manner they could find some common ground and reach political compromises for themselves and for the good of the globe in activating even consensus-driven global governance. In this G-0 world, the U.S. remains *primus inter pares* and is capable of assuming some leadership. It is a hard reality that still without an active American involvement few important global issues can get addressed, let alone resolved, for the world still looks to the U.S. for leadership whenever the chips are down. It is a matter of course that small states cannot compel big states to do what they do not want. The international politics through which 196 parties managed to complete the Paris Agreement quite tellingly attests to this fact.

3. Carbon Price and “Climate Club.”

Another way of undertaking collective action is to let markets determine the price of carbon as most economists suggest so that states and corporations could trade carbon emissions. If a globally determined carbon price system is hard to materialize, it is still possible for some countries to foster “climate clubs” in “coalitions of the willing” as it is in the EU so that the participating states or corporations could “cap and trade” carbon through markets. A somewhat different variety of this idea is to institute “carbon tax” like tariff on exports from polluting countries. Prominent economists like Paul Krugman and Joseph Stiglitz advocate some versions of carbon tax. Others suggest voluntary climate clubs like FTA for trade that penalize non-members through uniform tariff on their exports. Complementing these ideas is the “cap and trade” system in which emitters can buy and sell carbon credits so that markets can adapt to the added cost burden. The EU’s Emission

Trading System is a good example and California has other versions. China is to undertake a nationwide carbon trade system in 2017. Some forms of carbon price are being implemented in 40 countries and 23 cities. But these systems will face substantial difficulties in determining carbon prices in different countries and regions unless a worldwide universal price system is instituted.

4. Technological Breakthrough.

Perhaps the most desirable solution is to discover some miraculous technology that could replace fossil energy with renewable energy to the extent that humanity could enjoy a carbon-free society or at least a state of “negative emission,” a situation where the forests and oceans take more carbon dioxide from the air than humanity puts in. Actually, Bill Gate and other corporate leaders joined forces to launch the **Breakthrough Energy Coalition** to generate new “negative emissions technologies” for reducing emissions to zero levels, arguing that only such innovation will prevent climate disasters. This group consisting of 27 large investors is aiming to raise \$350 billion from various sources. Mr. Gate himself pledged \$2 billion, believing that “an energy miracle” is possible within a generation. India in particular promised to increase solar energy by 40 percent by 2030 when it joined the International Solar Alliance which is seeking to build some \$1 trillion funds with France and a number of other countries and major corporations. Despite these bold moves, however, by no means is it certain that an affordable breakthrough technology for renewable solar, wind, wave, tidal, geothermal and biomass energy or any other ways to wean the world off fossil fuel can be discovered any time soon. According to an estimate made by the International Energy Agency(IEA), the two largest contributions to cumulative emissions reduction over the period 2013-50 would come from end-use from fuel and electricity efficiency (38%) and renewables (32%), while carbon capture and storage (12%) and nuclear energy(7%) (CNBC, June 5, 2016).

5. “Minilateral” Approach by Local and Civil Society Groups.

A more realistic way is to take small “minilateral” actions for cooperation at local levels by decentralized localities and civil society groups. Some militant NGOs are very active in pushing for this kind of action. For example, such groups as the Climate Action Network, Greenpeace and the Union of Concerned Scientists are most influential in “ruthlessly telling the truth” to power. Of notice in this regard is an academic contention arguing that decentralized and incremental moves of “polycentric governance” are actually more effective than global and national governance. A typical case was suggested by a political economist,

Elinor Ostrom who shared the Nobel Prize in economics with Oliver E. Williamson in 2009 for her analysis of economic governance arguing that collective action is feasible for the commons at local levels.

This is a good example of voluntary bottom-up environmental movements. To be sure, accumulating these local movements may well lead to more substantive results over long period of time. But it is too slow to prevent imminent climate change where there is preciously little time. To certain degrees, politics and economic growth can accommodate to the business as usual delay of kicking the can down the road but nature and climate do not. We have no luxury of leaving our common future to the vicissitudes of international and domestic politics and wait for their results indefinitely.

6. A Need for an ad-hoc Climate 10 Caucus (C-10) for Crisis Management.

In order to weather imminent crises and to accelerate the implementation of the Paris Agreement, therefore, it is necessary to form an ad-hoc Climate 10 Caucus of the 10 largest CO2 producing countries in 2014: China (23.43%), the US (14.69%), India (5.7%), Russia (4.87%), Britain (4.17%), Japan (3.61%), Indonesia (2.31%), Germany (2.23%), South Korea (1.75%), and Canada (1.57%) (*Statista 2015*); these countries emitting some 70 percent of global carbon should take decisive leadership for pushing for global action. Suppose that some “super-storms” hit the globe and huge tsunami suddenly break out in many critical coasts throughout the world, it would be incumbent upon the U.S. to amass such a crisis management group to take immediate global action as it did in convening the G-20 summit on the brink of coming financial meltdown in 2008. In times of crisis, what counts is action and only those who command power can enforce action. The Caucus could empower the UNFCCC Secretariat to carry out some special inspections on potential signs of violating climate agreements and to enforce effective sanctions as the IAEA does to deter nuclear proliferation throughout the world. Such informal action may well reinvigorate the formal governance of the UN and UNFCCC.

7. South Korea’s Roles of Facilitating Global Public Goods.

Given the present state of global governance analyzed above, what should South Korea do? South Korea as a model of developing countries that has successfully carried out both industrialization and democratization in less than half century needs now to demonstrate another model of “green growth” in transiting to a non-carbon economic development that the UN’s new Sustainable Development Program is calling for. In 2015 South Korea did

launch an emission trading system involving two-thirds of its total emissions; it also submitted **INDCs** aimed to cut greenhouse gases by 37 percent below business as usual levels by 2030 of which 25.7 percent domestically and 11.3 percent reduction by international market mechanism. It is time for Korea to assume a leading role in promoting global public goods in its climate diplomacy as one of ten largest emitters and as a country that hosts the Green Climate Funds Secretariat and has produced three heads of global governance institutions: Ban Ki-moon of the U.N., Kim Yong of the World Bank and Lee Hoesung of the IPCC.

VI. References

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지정토론

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