Cooperation or Competition: US-China Dynamics on Climate Change

https://www.e-ir.info/2024/08/01/cooperation-or-competition-us-china-dynamics-on-climate-change/

JIWON NAM, AUG 1 2024

This article is part of the US-China Dynamics series, edited by Muqtedar Khan, Jiwon Nam and Amara Galileo.

In August 2021, United Nations Secretary General Antonio Guterres declared a “code red” for humanity in the face of human induced climate change (UN News Global perspective Human stories, 2021). Considering how many countries are affected by extreme climate events such as sea level rise and increased number of wildfires, climate change is significantly affecting day to day lives of people on earth. Slow but steady efforts to combat climate change have been facilitated by the United Nations Framework Convention on Climate Change (UNFCCC). Despite continuous effort at the international level, progress toward limiting and reversing harmful effects of climate change has been lacking. One of the reasons that international efforts to combat climate change has been minimal is the inability to draw the collective efforts from key UN member countries. Countries that supposedly are able to bring effective influence to combatting climate change, such as the United States and China, have not been supportive of the global effort. For example, The United States officially became the first nation to withdraw from Paris climate agreement in 2020 three years after then-President Trump announced its withdrawal (McGrath, 2020).

The United States’ uncooperative position on climate change may be changing. When President Biden took office as the president of the United States in January 2021, one of his first actions was to rejoin the Paris Agreement. In the most recent UNFCCC Conference of the Parties (COP 26) meeting in Glasgow, the United States and China agreed to work together in the fight against climate change. This unprecedented movement towards cooperation from the United States and China indicates that the world’s most powerful two countries still have the potential to work together for the greater good despite their historically hostile relationship. Even so, it is important to recognize that there are still obstacles that potentially impede the full cooperation of the United States and China.

To address the global threat of climate change and the potential for the United States and China to undertake joint action to combat climate change, this paper proceeds as follows. I dedicate the first three sections of this paper to issue identification. Here, I first identify the dynamics of climate change in further detail. I then highlight the effects of climate change and provide examples of extreme weather events caused by human-induced climate change. For the second section, I elucidate the complexities of the US-China political and diplomatic relationship. The United States and China have fundamentally different political systems; the US is well known for promoting democracy whereas China has a de facto authoritarian system. In this second issue identification section, I highlight the differences of the US and China and the current political relationship of the two countries. For the third section, I identify the possibilities of US-China cooperation or competition over the shared issue of climate change. In this section, I highlight the fact that the United States and China are both heavy greenhouse gas emitters and note that their joint participation in combating climate change would possibly bring effective measures to the global effort to combat climate change. However, I also highlight the equally important possibilities of US-China competition over the efforts to combat climate change and discuss how this potential competition may evolve. After identifying the three major issues outlined above, I discuss the US national interests in cooperating or competing with China on climate change. In the final section of the paper, I outline five policies for both the United States and China to pursue to address climate change as the two largest global powers.

Issue Identification

The scope of the effects of climate change, especially in relation to climate change-induced natural disasters, is often underestimated. Even so, many now accept that climate change has become the most imminent threat to humanity. According to a NASA report in early 2020, the Esperanza Base weather station in Antarctica recorded the highest temperature in history when it reached 18.3ºC (64.9ºF) (NASA, 2020). It was an unprecedented event that exemplified how the effect of climate change is becoming more and more severe every year, as illustrated by unusual high temperature rise even in Antarctica. Shortly after this incident, the Intergovernmental Panel on Climate Change (IPCC)'s Sixth Assessment Report (AR6) came out in August 2021. The main takeaway from the report was that "it is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred" (IPCC, 2021a). With these trends in place, it has become almost impossible to maintain the internationally-agreed threshold of 1.5 degrees Celsius above pre-industrial levels of global warming which was set by the 2030 Agenda for Sustainable Development (United Nations Department of Economic and Social Affairs, 2015). In sum, and despite climate change deniers' argument that climate change is not happening and the rise of earth temperature is a part of natural cycles (Dunlap and McCright, 2010), it is now clear that global warming is both caused by human activities and is occurring at a faster rate than ever before.

What's more, the effects of climate change are already affecting people and communities globally. Currently, the most affected societies and countries include small island developing countries (SIDs), the most fragile countries in the Caribbean, and countries in South Asia and Africa (Dunlap and McCright, 2010; Eckstein et al., 2019; UN Chronicle, n.d.). Problematically, the countries that are most vulnerable to climate change's effects are also disproportionately the poorest and most fragile states. Because of inadequate responses for the disasters and general instability, these countries face increasing challenges in recovering from repeated extreme weather events caused by climate change. However, in the future, the effect of climate change and its associated extreme weather events will be limited to only these regions and countries. It will eventually spread to additional countries that are not currently experiencing climate change as the earth's temperatures rise.

The most prevalent contributor to global climate change is greenhouse gas. The most widespread industries that are responsible for greenhouse gas emission include electricity and heat production, agriculture, forestry and other land usage, industry, transportation, and buildings. CO2 is one of the greenhouse gases that is responsible for about two-thirds of the global heating influence from the total amount of human induced greenhouse gases (NOAA, 2022). Global CO2 emission from burning fossil fuel and industrial processes is predominantly led by China and the United States; these two countries make up to about 45 percent of total emission (EPA, n.d.). This is why the United States and China, as the top two global emitters, must contribute more to slow down and reverse the effect of climate change to benefit the larger global population. While to some it may appear that climate change is affecting only a limited number of people in the most vulnerable regions of the world at this time, its effects will continue to spread by way of extreme weather events to broader populations as the global temperature continues to increase. Taking the initiative to combat climate change would lead the US and China to leading global efforts to save humanity from climate change-induced extreme weather events.

United States and China Political and Diplomatic Relations

Historically, the United States and China have exhibited political ideological differences on issues such as humanitarian practices, domestic freedoms, democracy, and the handling of territorial disputes in the South China Sea. Recent decades of rapid economic growth in China have threatened to unseat the United States from its global hegemonic status, exacerbating the tense relationship between the two countries. This section delves into the political relationship between the United States and China to explain the potential obstacles to climate change cooperation for the two countries.

The US-China relationship is primarily known as a political adversarial relationship that has intensified in terms of these countries' efforts to maintain or threaten the United State's positions as global hegemon. This often hostile relationship between the US and China has been exacerbated over the past 30 years since China's rapid increase in

its gross domestic product (GDP), manufacturing output, and the amount of trade (Hamnett, 2018; The World Bank, n.d.). Since the end of the second World War, the United States maintained its hegemon status in world politics. Major international systems such as the League of Nations (which was succeeded by the United Nations), the World Bank, and the IMF were each built under supervision of the United States, oftentimes with an interest in providing aid to war torn countries (Foot et al., 2003; Puchala, 2005). However, this does not mean that the United States controls these international multilateral institutions. This is evidenced by the fact that these major institutions now boast a majority of the world's countries as member states. To varying degrees, this global community participates and at times dominates the decision-making processes within these institutions. What is important to note, however, is that when a powerful country creates institutions, it tends to create sets of rules which serves its overall interests. For example, not all the countries get the same representational share in decision-making; and richer countries often fund those institutions more, given them more weight in institution-wide decision-making processes.

Historically, the United States was not an exception. By creating the most prominent international institutions, the United States set the rules and it showed "itself willing to subject itself to those rules even when they do not further its interests if the institution is to retain legitimacy and usefulness" (Foot et al., 2003). Therefore, by building institutions with a purpose of reconstruction after the devastation of World War II, the United States sought to depict itself as a generous world hegemon that was willing to help other countries when they were in need, in addition to the broader goals of some of these institutions in promoting global cooperation. At the same time, the United States enjoyed a disproportionate share of power over decision making processes within these institutions. One contemporary example is that of the Executive Board of IMF, which requires 85 percent majority votes on any increase in quotas in their funding. The major amount of funds comes from the United States, so ultimately the seemingly international institution needs US approval to increase its own finances (Foot et al., 2003).

As we come to understand in the relationship between the United States and multilateral institutions, we can recognize that the United States has had advantages in controlling and indirectly influencing the world as a global hegemon for the time since the end of the World War II in 1945 until the present. For the United States, the very country that has been influencing and pressuring other countries as a de facto global hegemon for over half a century, the rise of China in the recent years could be perceived as a threat. China is not a global hegemon yet, and there is little chance that China will become a powerful enough global hegemon to influence international, multilateral organizations to the same extent as the US. However, China's current size, GDP, and military expenditure, when viewed alongside the reality that China is a country that is growing rapidly on these dimensions, could impose a security threat to the United States from a realist point of view. According to Mearsheimer, great powers always search for opportunities to gain power over their rivals and achieving hegemony is their ultimate goal. This argument is based upon five assumptions: First, the international system is anarchic; second, great powers possess offensive military powers which indicates that states are dangerous to each other; Third, other party's intentions are never clear; Fourth, survival is a primary goal of a states; and fifth, great powers are rational actors (Mearsheimer, 2001). If these assumptions hold true, then the United States, as a global hegemon, should resonate with fear of China, given its rising power status. To make the matter potentially worse for the United States, China has been increasing in its influence in Asia alongside its broader rise, which has resulted in more influential power in a geographic region that is both a key priority for the US and one that China calls home (Ikenberry, John G., 2008). It is thus understandable that the United States would perceive China as a country that threatens its hegemonic status quo, and the global world order that currently rests upon that status quo.

One example of the expansion of China's influence in the Asia-Pacific region can be seen in China's Belt and Road Initiative (BRI). The BRI connects the geographic region of Asia and expands those connections to Central Asia, Europe, and even Africa with a series of terrestrial and maritime routes. Although seemingly focused on the economic benefits of expanding trade routes in land and sea, China has nevertheless extended its political influence to the greater region through policy coordination, facilities connectivity, unimpeded trade, financial integration and people-to-people bonds (Mitchell, 2020). Scholars consider this to thereby be China's steppingstone for regional integration under Chinese influence and China's corresponding efforts to promote regional cooperation and enhanced economic collaboration under its own sphere of influence. China is accordingly achieving its goal of regional hegemony by building infrastructure that is based on both bilateralism and multilateralism through the Belt and Road Initiative (Kaczmarski, 2017). Another dimension of this strategy of Chinese expansion can be seen in

Chinese interests in oil imports from Africa. Africa has become point of contention for geopolitical competition over oil and natural gas in recent years. The United States has long imported oil from Africa while ensuring security for some of the politically unstable African countries since the end of the World War II (Klare & Volman, 2006). However, China began to be interested in Africa in the 1960s and 1970s and currently is expanding its presence through infrastructure and investments in the mining sector, so as to strengthen its ties with oil rich countries in the region such as Nigeria (Klare & Volman, 2006). China has become a direct competitor to the United States for natural resources in Africa, and for the provision of aid and foreign direct investment (and hence influence) to African countries.

The second way that China poses a potential threat to the United States is China's rapid economic growth. From World Bank, IMF, and other existing data, the Chinese rate of GDP growth has been significantly higher over past few decades than that of the United States, as well as in relation to most of the European countries whose GDP have been declining (The World Bank, n.d.). For the United States, China is the only rising power that threatens its status as not only a security guarantor but also as a global economic power. Even during the Cold War, the United States' hegemonic aspirations had to concern themselves only with the Soviet Union's military strength which their rivalry was based on (Ikenberry, 2008). However, in more recent years, and because China is increasing both its military and economic power, the United States has to be aware of, and be prepared for, the reality of a power transition in the mid-to-long term.

According to the power transition theory, it is clear that China is well on the way to challenging the status of the United States as a global hegemon. Power transition theory "posits that stability and maintenance of the global system comes with hegemonic dominance through power preponderance (Kim and Gates, 2015)." It is also implied that a rise of powerful state and its challenges to a global system that was put in place by the current hegemon will lead to global instability (Chan, 2005; Kim and Gates, 2015; Lemke, Douglas, 1997). According to scholars, China has been following the paths of the challenger to the current hegemon. Chan (2005) compares the Composite Index of National Capability (CINC) between the United States and China. Since the end of World War II in 1946, the United States had commanded about 36.4% of the global total composite national capability but it decreased to only 15% in 2011 (Chan, 2005).

In the more recent years, the United States and the West in general are facing more pressure from the rise of China as one of the world's newly industrialized countries (Hamnett, 2018). Scholars have warned that the rise of China and relative decline of the United States and the Western countries poses questions pertaining to whether economic and possibly political dominance will be replaced by China. As previously mentioned, China's GDP at purchasing power parity sharply increased since 2011, and China's manufacturing output continuously increased since 1970 and 2003 covering about from 21% to 28% of world manufacturing output (Hamnett, 2018). China is also doing well and increasing world merchandise exports increasing from 15% of world exports in 1973 to 35% in 2015 (Hamnett, 2018). Compared to China's achievements in this economic area, the United States decreased its world merchandise exports from 21.7% in 1948 to about 9% in 1993 and stayed constant thereafter. Comparing manufacturing output of the United States to China, the US is now far behind of China at 18.5% in 2015 whereas China stayed at about 25% (Hamnett, 2018).

As mentioned previously, the Belt and Road Initiative and China's increased interests in Africa are two clear examples of China's concerted efforts to pose a stronger challenge to the United States, in particular as Chinese economic and political influences via these efforts increase its footprint in a wider range of countries that have traditionally lied outside of its sphere of influence. Both historically and in recent years, the United States and China have had a competitive relationship. Since World War II, the United States has occupied the role of the well-established democratic capitalist global hegemon and China has increasingly assumed the role of a fast-growing competitor that is situated to challenge the United States' unipolar status. However, this competitive relationship aside, both the United States and China are facing a common enemy, climate change. Both countries have been experiencing extreme weather events caused by climate change and monetary damages have been increasing for these events. The next section discusses potential possibilities for Sino-US cooperation on combating climate change.

Potential US-China Agreement on Climate Change Actions

In recent years, China has been emphasizing the importance of climate change and has been a leader of global climate change mitigation. In the context of climate change leadership, they primarily address energy security and health crises that are caused by extreme weather events (Engels, 2018). Health issues are likely to be the result of China's high number of coal-fired power plants and low environmental standards which have led to numerous air quality problems in China's urban areas especially in the East. China recognizes that it needs to build innovative capacity and acquire new green technologies, such as renewable energy technologies, to overcome these climate change induced health issues (Engels, 2018). Furthermore, Chinese leaders speak openly about significant risks China faces from the impacts of climate change including flooding, significant droughts, damages from extraordinarily frequent typhoons, and unusual high temperature inducing drought sin the West (Seligsohn et al., 2009). In becoming the leader of countries that take actions to combat climate change, Chinese leaders also seek to win domestic support and protect its global reputation (Seligsohn et al., 2009). Compared to China's recent actions to address climate change issues domestically and internationally, the United States has consistently proven to be a latecomer in joining the group of countries that seriously address climate change as an issue that they need to address. Among most US politicians, climate change has not achieved a status of national priority. Several recent trends in this regard are notable. The failure of Congress in ratifying the Kyoto Protocol led the US to never join the agreement. Obama's effort to join the Paris Agreement were severely undercut after Trump announced its withdrawal in 2017. Yet this US-based climate change inaction may be slowly improving. In 2021, President Biden finally rejoined the Paris Climate Agreement and set systematic policies to reach net zero emissions by 2050. Biden also established new 2030 emission target which is the nationally determined contribution (NDC) to the UNFCCC (The White House, 2021a).

Despite the hostility caused by great power politics, the recent trends outlined above suggest that the United States and China share enough commonalities in climate change policy priorities to achieve mutual benefits in cooperating over this issue. Indeed, both the US and China have experienced unusual flooding and elongated drought seasons which stand exacerbate national security issues (Brzoska, 2012; Fountain, 2021; Gan and Wang, 2021; Ranjan, 2021; Vigdor, 2021). Combating climate change is thus a common security interest for the two nation-states. Perhaps in part as a result, the United States and China agreed upon the Joint Glasgow Declaration on Enhancing Climate Action in the 2020s at the UNFCCC's most recent COP 26 held in late 2021. As much as it was surprising to witness the United States and China's movement towards cooperation in handling climate change issues, it was a notable positive step towards the possibilities of the global community coming together to effectively address climate change. At COP 26, the United States and China specifically committed to the effective implementation of actions to hold the global average temperature rise to below 2 degrees Celsius and to pursue efforts to limit this temperature 1.5 degrees Celsius (Seligsohn et al., 2009; U.S. Department of State, 2021). After the alarming announcement of the code red from the IPCC Sixth Assessment Report released in August 2021, the United States and China likewise recognized the seriousness of human-induced climate change and committed to accelerate their respective actions in the 2020s through cooperation in multilateral processes (Cole, 2015; U.S. Department of State, 2021).

Because of preconceived hostile political relations between the United States and China, it is a legitimate concern that the commitment of the two countries at COP 26 will not produce a serious commitment to policy action, in that it may simply represent mere rhetoric from the United States and China. However, a number of factors suggest that these commitments are more than cheap talk. The two biggest greenhouse gas emitters signed a joint commitment to achieve the 1.5 degrees Celsius target which was the goal set by the Paris Climate Agreement. Further, Chinese climate negotiator Xie Zhenhua mentioned that "there is more agreement between China and US than divergence (BBC, 2021)." American counterpart John Kerry also said the similar thing at the COP 26 when he mentioned, "But on climate, cooperation is the only way to get this job done" (Dennis et al., 2021). According to what country representatives mentioned in the COP 26, both countries now recognize the urgency of climate change and the importance of cooperation. For the first time in contemporary history, setting aside the political disagreement, mutual agreements between the two great powers came about on the climate change issue. Now that the United States and China are seemingly willing to cooperate, they need to find out how to build on this momentum, particularly by identifying the aspects that they can collaborate on.

To this end, the U.S. State Department suggests several sectors that the United States and China can collaborate on, including the following: low-cost intermittent renewable energy, balancing electricity supply and demand, integration of solar storage and other clean power solutions, and energy efficiency to reduce electricity waste (U.S. Department of State, 2021). Hence sectors that the United States and China can potentially cooperate exist. That being said, there are two aspects that should be considered. The first one is how to maximize both countries' comparative advantage, and the second is recognizing that climate change is also national security threat for both countries. To maximize comparative advantage, it is important to recognize that the two countries' technical capabilities are not the same. Therefore, standardization of technology is needed, and cooperation is necessary in intelligence sharing. Yang et al. (2014) examine social cognitive factors that influence information sharing related to climate change. Their study found that psychological collectivism fosters information sharing (Yang et al., 2014). This finding brings good news for the US-China relationship because the two countries have now established the common ground that climate change is an important matter, and are willing to cooperate on combating climate change. Further expanding on these agreements between the United States and Chinese governments, scholars recommend encouraging communication campaigns among larger communities of people using norm-based approaches to promote information sharing and climate change urgency (Yang et al., 2014). Recent development on the US-China agreements on climate change leaves more hopeful possibilities than despair about possible US-China cooperation in this area.

United States National Interests

The United States and China have common ground and interest similarities regarding combating climate change at the domestic and international levels. But the question remains as to whether it is within the national interest of the United States, as a global hegemon, to undertake more rigorous collaboration with China. In this regard, I make two clear arguments. First, the United States has incentives to cooperate with China on combating climate change. Second, even though climate change cooperation is the preferred approach for both countries at the moment, competition between the United States and China is also acceptable and likely inevitable. Collaborating with China on combating climate change is in the US government's interests because cooperation can maximize comparative advantages of both the United States and China. China has already started mass production of low-carbon energy technologies (LCETs). Since China joined the World Trade Organization (WTO) in 2001, China has been producing up to about 66% of the world's solar panels and also has become the largest manufacturer of electric vehicles (Helveston and Nahm, 2019; Helveston et al., 2019). However, China is still lacking in developing the newest innovations, and research and development aspects, of technologies in these areas. By comparison, the United States has emphasized the importance of reinventing in American manufacturing and innovation (Abrami, Regina M.; Kirby, William C.; McFarlan, F. Warren, 2014; The White House, 2021b). Therefore, successful collaboration with Chinese manufacturers that utilize relatively cheaper costs of labor combined with strong innovation and technology contributions from the United States is beneficial for both the US and China at least from an economic standpoint. Furthermore, green technology products such as solar panels and electric vehicles will increase the supply of these products in a manner that benefits other countries as they try to become more climate conscious. In this manner, the United States can recover benefits, both economic and reputational, from increased investment in climate mitigation technologies such as those that allow countries to adapt to warmer climate as climate change is expected to progress in the near future (Freeman & Guzman, n.d.).

My second argument is also feasible and might be more realistic. If comprehensive cooperation between the United States and China on climate change proves unachievable despite the advantages outlined above, partial cooperation and partial competition would still be a reasonable option that both countries can choose. Because of ideological differences between the United States and China, and continuous Chinese security threats to the United States by the former's becoming a direct competitor in global markets, comprehensive cooperation might be a too idealistic of an expectation. Indeed, many of the US companies and even the Biden administration itself announced that they are not going to lift tariffs immediately if China does not comply with global trading norms while addressing humanitarian concerning the Uighur peoples of Xinjiang and China's ongoing conflicts in the South China Sea with other Southeast Asian countries (Swanson, Ana; Bradsher, Keith, 2021). Resolving the fundamental ideological differences and humanitarian issues outlined above is likely more appropriate as a long-term goal for the United States and China. Therefore, agreeing on broader cooperative norms such as reducing greenhouse gases in the 2020s, setting up

national action plans and Nationally Determined Contributions (NDCs), and eliminating global illegal deforestation would be easier piecemeal areas of cooperation to achieve in the short-term. In doing so, both countries can agree to have competition on how they would achieve these cooperative norms. The United States and China can compete in providing better solutions, for example innovation and production of solar panels, electric vehicles, or energy efficient buildings. This partial cooperation and partial competition will still lie in the US interest because the US will have achieved its short-term goal of combating climate change with China. Competition could also be beneficial for the United States because partially competing with China could encourage stronger innovation and manufacturing of better products, while maintaining some US technology developments that may otherwise assist China militarily.

Conclusion

In this article, I outlined the current climate change situation, the nature of US-China political relations, and the possible ways that the United States and China could cooperate to combat climate change. I also noted how the United States' national interests could be fulfilled by fully cooperating with China *or* by partially cooperating with China in the areas of climate change norms and regulations while still partially competing in innovation and manufacturing with China. Drawn from this analysis, as both the United States and China established agreements in the US-China Joint Glasgow Declaration on Enhancing Climate Action in the 2020s, prioritizing this mutual agreement on addressing climate change issue and working towards reducing greenhouse gas will be beneficial for combating global climate change crisis. To be more efficient in climate change cooperation, both the United States and China should recognize their political and ideological differences and concede that cooperation and competition are not mutually exclusive.

To maximize both the United States' and China's comparative advantages (wherein the US has better innovation and Research & Development sectors whereas China is the leader of manufacturing), cooperation among the two countries in the area of climate change abatement technologies and related renewable energy technologies is necessary. Manufacturing high-technology products will highlight both countries' comparative advantages. It will be economically beneficial for not only the US and China but will also aid other countries interested in implementing climate conscious policies. It is worth noting that competition between the United States and China is not a form of failure or even a worse outcome than comprehensive cooperation, provided that cooperation in some areas is currently observed. Recognizing the current situation that has been built up over the years and current normative differences is important. Competition on how to achieve the broad agreements such as reducing greenhouse gas can encourage innovation for both the United States and China because both countries would want to make their products better than the others'.

Whether the United States and China end up fully cooperating or simultaneously cooperating and competing, establishing ways to verify and encourage each other's progress on enhancing climate change agreement would be critical. As some scholars have expressed their concerns about current joint US-China agreement being cheap talk rather than actionable cooperation, it will be beneficial to have a means to hold both the United States and China accountable to their commitments. One example of this progress check mechanism would entail establishing direct communication channels with a neutral country or international institution that was willing to serve as a third-party moderator. In this manner, both the United States and China could have an efficient way to communicate with each other and the third-party actor would help to hold each party accountable.

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