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ARTICLE

Dilemma of choice: China's response to climate change[1]

Dilema de escolha: a resposta chinesa à mudança climática

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Introduction: climate change and national security

Since the end of the industrial revolution in the end of the 18th century, human activity, especially the great consumption of energy resources by developed countries in the process of industrialization, has caused the density of greenhouse gases in the stratosphere to increase and bring about the effect of global climate warming (Stern 2006, 2). Climate change has not only produced negative influences on the global environmental system, it has also brought serious challenges to the survival and development of human society, which has not only affected the daily lives of human beings but has also caused major natural catastrophes and damage around the world. In a report released by the World Wildlife Fund in 2009, global sea level is predicted to rise by more than one meter before 2100. The rise in sea level is expected to produce inundation in coastal areas and island countries, influencing about one-fourth of global population. In the Stern Review published by the British Royal Society in 2006, former chief economist of the World Bank, Sir Nicholas Stern, warned that global warming would produce negative consequences for the world economy. If effective action is not adopted within the next decade, the expected economic cost may surpass the sum of the total cost of the great wars and the Great Depression. The same report further points out that the total cost and risk of climate change is equal to the annual loss of at least 5% GDP in the global economy (ibid., vi).

Redefining national security

In fact, since the release of *Silent Spring* brought the world's attention to the issue of environmental protection and sustainable development (Carson 1962),

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in *The Limits to Growth*, Donella Meadows et al. (2004) further point out that limitations to the global biosphere will have major consequences on global development. Meadows et al. think that governments and citizens around the world should adopt the approach of sustainable development towards the limits to growth and bring about ways for the global society to move towards sustainability. Coincidentally, around the same time, the United Nations held the Conference on Human and Environment (UNCHE) and the first oil crisis broke out in the Middle East, which exposed the effects and influences of energy shortage and environmental degradation on national security. These developments have guided more international attention to issues of non-traditional security.

Due to its comprehensive, permeating and potentially uncorrectable effects (IPCC 2007, 3), climate change is considered to be one of the most challenging global issues facing human beings today. In addition, the exploration of the effects of climate change on international and national security became a new popular research topic.[2] In 1983, Richard Ullman openly criticized US definition of national security during the Cold War period to be "very narrow" and "extremely militarized," which resulted in the over-militarization of US foreign policy and Washington's ignorance of threats to other countries' national security. Ullman (1983) points out that resource competition and transnational migration that comes with population increase in developing countries may give rise to severe conflicts. In 1993, Mahbub ul-Haq (1999, 79) attempted to describe a new concept of human security, which is not only homeland security but people's security; not only security realized through military power but security realized through development; not only national security but individual security; not only the home, street, work, society and environment but the security of people anywhere.

Accordingly, the Human Development Report released by the United Nations Development Programme (UNDP) in 1994 clearly established the definition of "human security," which covers political, economic, food, health, environmental, personal and collective security (UNDP 1994). The report "A More Secure World: Our Shared Responsibility" proposed by the High-Level Panel on Threats, Challenges and Change to the UN Secretary General in 2004 also points out environmental degradation as an important challenge to international security (UN 2004). It is apparent that global climate change has become an important factor that influences national security today.

2 For related research on the relationship between climate change and national security, see: Joshua Busby, *Climate Change and National Security: An Agenda for Action* (New York: Council on Foreign Relations, 2007); Kurt Campbell et al., *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change* (Washington D.C.: CSIS, 2007); German Advisory Council on Global, *Climate Change as a Security Risk* (London: German Advisory Council on Global Change, 2007); Chris Abbott et al., *Global Responses to Global Threats: Sustainable Security for the 21st Century* (Oxford: Oxford Research Group, 2006).

Challenges and responses

In 2006, the Oxford Research Group released the report *Global Responses to Global Threats: Sustainable Security for the 21st Century*, which analyzes the security impact of climate change and proposes corresponding response measures. The report points out that: (1) climate change may cause serious natural challenges and food crises while forcing human beings to move away from coastal and delta regions – these challenges would bring about harm, social instability and changes in lifestyle; (2) the severity, sustainability and destructiveness of climate change challenges will far surpass international terrorism; and (3) the increasing use of nuclear energy should not be the strategy adopted in response to climate change, as the action would only exacerbate the spread of nuclear technology in an unstable world and increase the potential of rogue states or extremist groups acquiring such technology (Abbott, Rogers and Sloboda 2006, 7).

In 2008, the Oxford Research Group released the report *An Uncertain Future: Law Enforcement, National Security and Climate Change*, which points out that climate change would become a threat against the United Kingdom within the next decade. According to the report, as the issue of climate change continues to worsen, increasing temperature would cause an increase in sea level and changes in global climate, which would in turn lead to the damage of public facilities, shortage of resources and large-scale migration of human beings. The world would then face the pressure of several million environmental refugees. Peoples forced away from their homes due to natural disaster would inevitably contribute to social and international instability and regional and ethnic conflicts. The country is advised to carry out tighter border security controls to reduce the production of carbon dioxide (Abbott 2008).

In short, the impact of climate change is global. Besides an understanding of the potential impacts of climate change, a proposal of effective response to the consequences is critical. Moreover, in the sudden outbreak of negative events caused by climate change, limitations on the supply of food, water and energy may be first expressed through economic, political and diplomatic means such as the negotiation of treaties and sanction on trade. In the entire process, conflict over territory and water may become even more severe. As states threatened by such crises become ever desperate for scarce resources, the level of conflict can be expected to rise as well (Schwartz and Randall 2003, 14–15). This is the reason that national security is ever becoming the main concern of discussions on climate change.

The influence of climate change on China's national security

In recent years, oddities in global climate have caused China to be swamped by natural disasters. As a country with great population, relatively low economic development, vulnerable regional biosphere and complicated climate conditions,

China is particularly susceptible to the influences of climate change. Not only has China surpassed the US to become the biggest energy (coal) consuming state in the world, it has also become the biggest producer of carbon dioxide and sulfur dioxide (Hu and Yan 2010, 29). According to a report by the International Atomic Energy Agency (IAEA), if effective measures are not adopted soon, by 2030, the amount of pollutants produced by China will be twice the total amount of pollutants produced by OECD countries (Bustelo 2007).

China's leadership is concerned about climate change because of the potential influences of climate change on national development (Marks 2010, 972). Zeng et al. (2008, 730–731) predict that as a result of climate change, China will face various challenges including melting glacier, especially in Tibet and Tianshan; loss in agricultural production, which may decrease as much as 10% by 2030 (Bustelo 2007); increasing number of droughts, storms, floods and natural disasters caused by extreme climate; rising sea level that will affect as many as 67 million people (Heggelund 2007, 167); and the exposure of another 40% of the world's population to the threat of natural disaster (The Economist 2008). Taking into account that China harbors a massive population of 1.3 billion people, decreasing resources, severe pollution problems and a fast-growing economy – factors of a typical development dilemma –, the potential cost of climate change for China is exceedingly high (Heggelund 2007, 158, 165).

Vulnerability and potential conflict

Regarding the influence of climate change on China's national security, one of the earliest studies can be traced to the report *An Abrupt Climate Change Scenario and Its Implications for United States National Security* released by the US Pentagon in 2003. Unreleased to the public until 2004, the report points out that in the period 2010–2020, as China's food production needs to respond to a fast-growing population, reduced reliability of stable rain conditions will have major consequences. Reduced occurrence of the cycle of evaporation and cooling of water vapor will result in the extension of cold winters and increasingly warm summers. As rainfall decreases, problems of water and energy supply can be expected to become worse. A hungry China will covet the resources of Russia and other countries to its western border while large-scale famine may cause chaos and international conflict (Schwartz and Randall 2003, 13). Accordingly, the report predicts that before 2030, China will become involved in many international conflicts as a result of negative consequences brought on by global climate transformations (ibid., 15–19).

Following the Pentagon report, the *Climate Change as a Security Risk* report issued by the German Advisory Council on Global Change in 2007 succeeded the analysis of the influences of climate change on China's national security. The report considers China as a country deeply influenced by climate change. Climate change will result in melting glacier, land degradation, reduction in agricultural

land, fresh-water shortage, extreme weather events, prolongation of drought and increased sea level in China. Although these issues have different degrees of impact on different regions, existent biospheric and social problems can be expected to intensify, with the final consequence of negative impacts on China's economic vitality and political stability.

The report further points out that an important characteristic of contemporary Chinese society is the developmental gap among regions, with ethnic minority communities established in the least developed areas of China, making up approximately 60% of the country's territory. Inhabitants of these areas mainly rely on agriculture; these regions are particularly susceptible to the influences of melting glacier, desertification and deforestation. Such environmental issues have become the main factors contributing to conflicts among different ethnic groups in recent years. Furthermore, the migration of Chinese nationals to neighboring countries such as Russia and Mongolia and environmental issues that have arisen as a result of resource development activities have both contributed to diplomatic friction between China and its neighbors (German Advisory Council on Global Change 2007, 146–149).

Finally, the joint study report *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change* sponsored by the Center for a New American Security (CNAS) and the Center for Strategic and International Studies (CSIS) also analyzes the potential influences of climate change on China's national security. The joint study points out that the fast increase of greenhouse gases can be traced to China's coal-based energy structure (Zhang 2008, 81; Lewis 2007/2008, 157). The use of coal not only serves as a long-term threat against the global environment but also exacerbates existent environmental problems in China such as desertification, water shortage and deterioration of air quality (Campbell et al. 2007, 61–62). The report notes that a source of conflict originates from migration that is stimulated due to environmental issues. In China, this type of migration is usually demonstrated as the movement from rural to urban areas and adds to the pressure of population overload in cities. Also, the migration of people to regions of more rainfall in China is also consequential. For example, the movement of Han people in China's interior to Xinjiang to look for work has engendered national conflict and inter-ethnic competition over resources and work between Han workers and local Uyghurs (Campbell et al. 2007, 62–63).

China's climate risk

Climate change brings about serious challenges against national security. In terms of China, one can notice the following challenges:[3]

3 For research on the influence of climate change on China, see: Joanna Lewis, "Climate Change and Security: Examining China's Challenge in a Warming World," *International Affairs*, Vol. 85, No. 6 (2009), pp. 1196–1213; National Development and Reform Commission, *China's Policies and Actions for Addressing Climate Change* –

A. Territorial size and soil quality: climate change has caused rising sea level and retreating coastline, causing parts of China's land territory to be under water, with coastal areas facing stronger potential threats. Furthermore, climate change has increased the speed of soil degradation in China. For example, desertification has decreased the living space of Chinese people, which entails threats against the security of China's biosphere, sustainable development of the Chinese economy and survival of the Chinese ethnicity (Zhang 2010, 21–27).
B. Fresh water:[4] in terms of China's water resource, not only does the country incur shortage, but the distribution among regions is unequal. Increased economic development has made the issue of water security stand out. Increased temperature level or reduced rainfall has caused changes in the flow and route of rivers. At the same time, climate change has also caused glacial retreat. In the short run, increasing glacial retreat can cause river runoff to increase. However, with the large-scale shrinking of glaciers, both glacial and river runoff are bound to decrease, which not only reduces the supply of water resource but also undermine the balancing function provided by runoff. The consequence of such event is the chain reaction of deteriorating water resource, biosphere and the environment. In short, climate change further exacerbates China's existent vulnerability in water resource.
C. Food production: climate change increases instability in agricultural production and causes disturbances to agricultural development. Major adjustments in agricultural production structure and planning, including plantation period and crop species, can be expected to incur as a result of climate change. At the same time, negative effects of drought and high temperature may intensify as well, incurring additional agricultural losses. These are all factors that may greatly increase agricultural cost.
D. Increased frequency and strength of extreme climate events: climate change increases the water cycle and alters the regional distribution and strength of rainfall, which may in turn give rise to extreme climate events such as flood, drought, snow storm and typhoon. Increased frequency and strength of climate events may incur great losses for human property and living conditions (IPCC 2007).
E. Governmental challenges: climate change has caused China to face ever-increasing international and domestic pressures; self-autonomy of the government is reduced and Beijing's governing ability is further

the Progress Report 2009 (Beijing: National Development and Reform Commission, 2009), pp. 7–10. National Development and Reform Commission, *China's National Climate Change Programme* (Beijing: National Development and Reform Commission, 2007).

4 See: Scott Moore, *Climate Change, Water and China's National Interest*. *China Security*, Vol. 5, No. 3 (2009), pp. 25–39.

challenged. Even though China has adopted a series of measures towards energy conservation, high-speed economic development and an energy consumption structure based on coal have caused China to obtain a high level of carbon dioxide emission and face growing international pressure on the reduction of emission. In addition, the great increase in China's comprehensive power has lowered the global recognition of China as a developing country while increasing the expectation and demand for Beijing to take a more active role in the international community. More importantly, climate change has already caused major challenges to Beijing's governing ability and stability of the Chinese regime. For example, regarding a big snow storm in Southern China in 2008, both the central and local governments' capability and authority were put under suspicion, as local authorities failed to predict and react to the disaster effectively.

F. Challenges against national defense and military construction: climate change has increasing negative impacts on many of China's major national defense projects such as the Three Gorges, the Green Wall of China, water rechanneling from the south to the north, and natural gas transfer from the west to the east. The increase in extreme climate events has also hindered the development of the Chinese troops fighting ability while increasing the burden of disaster relief. In 2008, China's Defense Whitepaper listed natural disaster as a threat to national security for the first time and pointed out that troops should retain the ability to carry out a variety of military missions (State Council Information Office of the People's Republic of China 2009). Besides the threat of natural disaster, many of China's missile bases are established on tundra regions in the northwest. Both the freezing and thawing of ice would affect the missile sites. Lastly, on a strategic level, energy competition due to climate change may generate tension between China and other neighboring countries, increasing the chances for local military conflicts.

China's response to climate change

Basic principles and policy guidelines

Regarding the issue of global climate change, Beijing has publicly expressed that China would adhere to the following principles (National Development and Reform Commission of the People's Republic of China 2007, 24–26):

A. Respond to climate change based on China's framework for sustainable development: China will continue its active response towards the issue of climate change based on the national strategy for sustainable development.

B. Abide by the principle of "common but differentiated responsibilities" as stated in the United Nations Framework Convention on Climate Change (UNFCCC): developed states should take the lead in reducing greenhouse gas emission and provide capital and technical support for developing states. Economic development and poverty reduction is the priority of developing countries. The extent to which developing states abide by the obligations contained in the convention depends on the effective fulfillment of basic promises by developed states.
C. Balance between a reduction in emission and adaptation to climate change: China will continue to strengthen its policies on energy conservation and structural adjustment. The ability to adapt to climate change should be improved through a combination of projects on environmental protection and disaster prevention.
D. Retain flexibility in complementing climate change policies with other related policies: As the reduction of greenhouse emission concerns many aspects of society, China concludes that only a response that takes into consideration different aspects of the problem can be effective.
E. Rely on technological advancement and innovation: China seeks to fully exploit technological advancement as a mean in responding to climate change. Accordingly, China should provide strong support towards the search for an active response regarding climate change.
F. Active participation and wide cooperation: China should actively participate in the UNFCCC negotiations and related activities undertaken by the Intergovernmental Panel on Climate Change (IPCC). China seeks to further strengthen international cooperation on climate change and actively push forward cooperation in technological transfer and clean development mechanism (CDM).

Based on the forgoing principles, China is set to pursue the following goals (ibid., 26–29):

A. Control greenhouse gas emission: China seeks to improve social awareness of energy conservation; advance towards the establishment of a green society; adopt related measures on energy conservation; and reduce the emission of greenhouse gases.
B. Strengthen adaptability towards climate change: China seeks to adopt measures such as the strengthening of agricultural infrastructure, adjustment in plantation period, select development of resistant varieties and development of biotechnology.
C. Strengthen scientific research and technological innovation: China seeks to strengthen fundamental research in climate change in order

to make advancements in alternative energy, energy conservation and adaption level.

D. Increase public awareness and level of management: China seeks to promote the issue of climate change and increase social awareness of environmental protection, which are beneficial for the future establishment of institutions and management systems in response to climate change.

In fact, China has established the National Climate Change Coordination Committee (guojia qihou bianqian xietiao xiaozu) in 1990 and adopted *China's Agenda 21: White Paper on China's Population, Environment and Development in the 21st Century* in 1994, which outlines the country's strategic framework for sustainable development and its main goals in different fields. Based on central institutional reforms, China established the National Climate Change Response and Coordination Committee (guojia qihou bianhua duice xietiao xiaozu) in 1998 and confirmed the goal of energy conservation and reduction in greenhouse emission in the 11th Five Year Plan proposed in 2006 (Xinhua 2009). In the following year, China further established the National Leading Committee on Climate Change and released the National Climate Change Programme (Zhu 2010, i), the first state policy document on climate change that discusses China's comprehensive strategy against climate change before 2010 and mid-term reduction target for greenhouse gas emission (National Development and Reform Commission 2007; Qin 2009, 252).

In 2009, China passed the Environmental Impact Assessment Act. As a responsible developing power, Beijing recognizes the importance of climate change and advocates joint response through effective international cooperation (The Central People's Government of the PRC 2009). In the same year, the progress report on climate change released by China's National Development and Reform Commission (NDRC) points out that the Chinese government is "deeply cognizant of the complexity and extensive influence of [climate change] issues and fully aware of the arduousness and urgency of the task of addressing climate change" and "is determined to address climate change in the process of pursuing sustainable development" (National Development and Reform Commission 2009, 1).

However, it is worth noting Beijing seems to take an ambiguous approach towards the issue of climate change. In the 12th Five Year Plan released in 2010, China openly commits itself to the goals of reducing energy use and carbon dioxide emission as active responses to global climate change.[5] Despite the commitment,

5 Related measures include: effectively control greenhouse gas emission; reasonably control total energy consumption and increase the efficiency of energy use; strengthen the evaluation and assessment over the achievement of energy-saving targets and advance related regulations and standards; adjust energy consumption structure and increase the ratio for the use of non-fossil fuels; strengthen the capability of establishments that respond to extreme climate events; establish and improve institutions for measuring greenhouse gas emission

in the climate change conference in Cancún in 2010, the Chinese government expressed its hope that developed and developing countries should shoulder their respective duties and obligations and actively respond to climate change based on the principle of "common but differentiated responsibilities." China will make its greatest effort in realizing the dual objectives of economic growth and reduced energy consumption (Xinhua 2010).

Overall, China seeks to attain a balance: under the condition that economic development is not suffered, reduce the negative impacts of climate change on the domestic economy. On the world stage, China holds to the principle of "common but differentiated responsibilities," and advocates that states should carry out their duties and obligations. For example, international cooperation is critical in the carbon collection and exploitation and the development of relevant storage technology. As developing states cannot rely on their own strength to perform such tasks, support from developed states in this case is particularly important. Accordingly, China has made the following suggestions: (1) further exploit the Carbon Sequestration Leadership Forum (CSLF) as an interface for multilateral collection; (2) investigate into the development of a global funding mechanism for carbon sequestration; and (3) developed countries should take the lead in making contributions to the initiative based on its advantages.[6]

Domestically, in order to achieve the important goal of reduced emission without impairing economic growth, China has adopted the development model so-called "low-carbon economy." Such aspirations can be garnered from official documents and talks by China's political elites. On various occasions, Chinese elites have proposed energy conservation, reduction in greenhouse emission and low-carbon economy as important goals in state development. China seeks to realize the "scientific development concept" (kexue fazhanguan), establish a resource-conserving, environmental-friendly society and promote the so-called "cycling investment."[7]

In short, it is clear that China's main objective is to reduce the serious challenges of climate change while maintaining the country's economic development. Beijing holds steadfastly to the principle that China is a developing state and, as such,

and supervising reduced emission and saved energy; strengthen scientific research on climate change; increase the pace of research into low-carbon technology and its application; hold on to the principle of common but differentiated responsibilities; actively engage in international cooperation regarding global climate change. See: "shouquan fabu: zhonggong zhongyang guanyu zhiding guomin jingji han shehui fazhan di shier ge wunian guihua de jianyi" (The CCP central government's suggestion regarding the establishment of the 12th Five Year Plan), available at <http://news.sina.com.cn/c/2010-10-27/204721364515.shtml>.

6 "zai tan shouji lingdaoren luntan disijie buzhangji huiyi kaimushi shang de jianghua" (speech at Opening Ceremony of the Fourth Ministerial Level Meeting of the Carbon Sequestration Leadership Forum, available at <http://www.ccchina.gov.cn/cn/NewsInfo.asp?NewsId=29621>).

7 "Cycling investment" refers to the economy as an organic form that should exploit organic and not mechanic principles to guide the economic activities of human society. The characteristic of the concept is low extraction, high efficiency and reduced emission. All materials and energies are reasonably exploited in a cycling economy, with the effects of economic activities on the environment reduced to a minimum level.

should be differentiated from developed states; developing and developed states should have different responsibilities. Although China is the biggest producer of carbon dioxide and sulfur dioxide, Beijing's political elites have expressed that the country will take care of its duties and obligations in the fight against climate change, and make great efforts towards the realization of economic growth and reduced greenhouse gas emission.

China's actions against climate change

In order to mitigate the impact of global climate change on national security, China has adopted a variety of policies to accomplish the priority of combating climate change while maintaining economic development. China's adoption of low carbon economy is a typical example of such moves.

The concept of "low-carbon economy" was first introduced by Gareth Thomas and Stewart Boyle in their work *At the Energy Crossroads: Policies for a Low Carbon Economy*. Thomas and Boyle (2001) point out that the gradual move away from fossil fuels and onto the path towards a low-carbon economy is the only answer towards the development of renewable energy. Since then, the concept was further recognized in the Bali Action Plan of 2007 and established as the theme of the World Environment Day in 2008 – Kick the Habit! Towards a Low Carbon Economy (United Nations Environment Programme 2008). The main objective of low-carbon economy is the mitigation of climate change effects and promotion of sustainable development through technological and institutional innovations. Low-carbon economy is an economic development model that aims to facilitate the transition from a high-energy to a low-energy era by improving energy efficiency, promoting the innovation of low-carbon products and maintaining global environmental balance.[8]

According to the policy suggestions of low-carbon economy, China adopted the following actions with the goal of reducing the influence of climate change on national security. First, in terms of mitigating the effects of climate change, China took the issues of structural adjustment and mode of development into account, and adopted actions such as the advancement of industrial structure, promotion of cycling investment, increase in energy efficiency, promotion of energy-conserving products, reduction of greenhouse gas emission by the agricultural industry and promotion of green plantation (National Development and Reform Commission of the People's Republic of China 2009, 9–27). Specifically, in terms of increasing forest carbon sinks, China carried out the "san-Bei" (xibei, huabei, dongbei, or literally the northwest, north and northeast regions) Green Wall project, with the

8 "ditan jingji: zhongguo jingji fazhang fangshi de xin biange zong xuyan" (Low Carbon Economy: New Revolution in China's Way for Economic Development – Main Preface), available at <http://218.246.21.135:81/gate/big5/misc.drcnet.com.cn/Subject/SubjectIndex.aspx?chnId=4616>.

goal of establishing a series of human-planted forest strips to prevent desertification of the region from worsening (National Development and Reform Commission of the People's Republic of China 2010, 23; The Central People's Government of the PRC 2010). In addition, China has also actively promoted the growing of trees in urban areas in order to facilitate the establishment of natural obstacles for environmental protection (National Development and Reform Commission of the People's Republic of China 2010, 26).

Second, in terms of adjustment actions towards climate change, China actively seeks to strengthen the adjustment ability of the agricultural industry, forest and other natural systems and coastal and other vulnerable regions. China responds to the following issues:

A. Unstable food production: in response to the effects of climate change on agriculture such as instability in food production, changes in agricultural planning and production structure and increased cost, China has established a series of policies catered towards adjustment of the agricultural industry towards climate change, including Drought Control Regulation of the People's Republic of China, Conservation Tillage Plan (2009–2015) and Regulations on Safety of Agricultural Genetically Modified Organisms (National Development and Reform Commission of the People's Republic of China 2009, 20–21; 2010, 31–32; 2011, 8). Currently, the coverage of improved strains of farm crops has exceeded 95 percent nationwide in China and accounts for approximately 40 percent of increased food production in the country (National Development and Reform Commission of the People's Republic of China 2011, 8).
B. Water shortage and uneven distribution: in order to reduce the shortage of water and imbalanced supply among regions, China has enacted a series of policies to strengthen the management and protection of water resource. The Regulation on Management of Water Abstraction Licenses enacted in 2008 strengthens the management of water resource and establishes a water-conserving society conducive to energy conservation and reduced carbon emissions (Republic of China 2009, 23). In February 2009, the State Department issued the Drought Control Regulation of the PRC, which emphasizes the strengthening of river-basin management and water-resource planning. At the same time, China has also strengthened its hydraulic establishments. Since 2009, China has established a series of projects on flood prevention and strengthened the ability to manage water and soil degradation, and spent three years to complete the repair of faulty dams (National Development and Reform Commission of the People's Republic of China 2010, 33).
C. Rising sea level and retreating coast line: in 2008, China established the maritime working institution responsible for climate change tasks

(National Development and Reform Commission of the People's Republic of China 2009, 24). In 2009, China further issued a series of laws and policies to strengthen the government's ability to use and manage the sea. In addition, the State Oceanic Administration (SOA) makes an active effort in monitoring changes in sea level and scale of land reclamation while commencing restoration projects such as the planting of mangrove, protection of coral reef and restoration of coastal wetland. At the same time, the SOA carries out the monitoring, investigation and evaluation of rising sea level, coastal erosion, seawater intrusion and soil salinization (National Development and Reform Commission of the People's Republic of China 2011, 9).

D. Frequent extreme climate events: in order to reduce the level of damages to the life, property and lifestyle of the people caused by extreme climate events, China's Meteorological Administration (CMA) has initiated a series of research projects that strengthens the monitoring, expectation and evaluation of climate change effects. The CMA has also established the first generation system for making short term climate predictions, developed new global climate models and begun evaluation work on the influences of climate change on various aspects of national security including food, water, environment and human health. China seeks to reduce the damage by natural disasters such as snow storm and typhoon through its efforts.
E. Military defense and strategic projects: in response to the threat of climate change, the People's Liberation Army (PLA) established the climate change expert council in 2008 and strengthened the military's research on climate change. The council has investigated into the effect of climate change on military conflict and troop establishment and provided advice and technical support for the PLA (Xinhua 2008).

Third, in terms of the establishment of legal institutions, China improved environment-related laws and regulations and refined management and working institutions. In terms of the improvement of laws and regulations, Beijing refined and advanced regulations covering issues such as renewable energy, cycling investment, energy conservation and land and water protection (National Development and Reform Commission of the People's Republic of China 2011, 10–11). Furthermore, in response to the central government's determination to fight climate change, China's 31 provinces have established and fully realized individual plans in response to climate change. At the same time, related departments have subsequently established action plans and projects regarding environmental and maritime protection.

In order to strengthen governance ability, Beijing has established a management and working system that is under centralized leadership that

guides the division of labor among departments and involves the participation of different regions and industries. In 2007, Beijing established the National Leading Committee on Climate Change with the Prime Minister leading the committee while ministers from 20 related departments serving as members. The National Development and Reform Commission is responsible for carrying out the decisions of the leading committee. In 2008, the Climate Change Department was established to provide coordination and management for the realization of actions on climate change. In 2010, coordination and communication offices were established under the framework of the National Leading Committee on Climate Change to advance cooperation among the various departments and parties involved (National Development and Reform Commission of the People's Republic of China 2011, 11).

Onwards, in response to the compression of policy autonomy, China actively participates in multilateral negotiations on climate change supported by the UN such as the Bali, Copenhagen and Cancún meetings, and firmly stands by the principle of "common but differentiated responsibilities." China also engages in international dialogue. For example, at the Opening Plenary Session of the 2009 UN Summit on Climate Change, Hu Jintao made a speech titled *Join Hands to Address Climate Challenge*. Finally, China also participates and promotes cooperation among states. In March 2010, China issued the Interim Measures on the Administration of External Cooperation to Address Climate Change,[9] which further standardized and promoted international cooperation on climate change (National Development and Reform Commission of the People's Republic of China 2011, 15–19).

In sum, domestically, China adheres to the development model of low-carbon economy and actively adopts various actions to reduce the negative effects of climate change while balancing the goal of maintaining steady economic development. Internationally, China actively participates in negotiations on climate change and seeks to strengthen cooperation with other countries. By maintaining its interest on the issue of climate change, not only can China avoid the ever-increasing international pressure calling for the country to take action; it can also avoid contraction of its self-autonomy in the international community.

Conclusion

China's main concern with the effects of climate change is whether economic development can be sustained and competitiveness can be promoted (Ma 2010, 28–29). For China's political elites, economic growth is the only path towards improved living standard and employment rate, and also the only path towards

9 Interim Measures on the Administration of External Cooperation to Address Climate Change, available at <http://www.law-star.com/cacnew/201004/360056478.htm>.

the end of poverty. Unfortunately, China's pursuit of economic growth and modernization is often in conflict with growing social movements demanding action against climate change. It is a well-known fact that the human use of fossil fuels has caused the phenomenon of global warming. The reason that China has become the main target of accusation in terms of pollution lies in the state's use of coal. Coal is the leading source of "dirty" energy in the world, and China leads the world in coal production and exploitation, with as much as 70% of its total energy consumption coming from coal. The burning of coal leads to a large amount of carbon dioxide emission and, in 2007, China surpassed the US to become the leading greenhouse gas emission state in the world (ibid., 29).

Based on China's policies and actions towards climate change, the authors conclude that political elites in Beijing have two main considerations:

A. National security interests: on the one hand, climate change is considered to be an effect of greenhouse gas emission and putting a limit on China's greenhouse gas emission would inevitably hinder the country's economic development (Wiener 2008). On the other hand, climate change also entails potential consequences for China's agricultural, food, water, energy and environmental security. With rising temperature, extreme climate events such as rising sea level, typhoon, flood and drought will also severely damage the conditions for China's economic and social development, and threaten social stability and the life and property of peoples. In order to safeguard its own interests, China has adopted the development model of low-carbon economy and searches for pareto optimality between economic development and energy conservation.
B. The role of responsible state: China must contribute to the global battle against climate change by accepting international responsibility and making an effort towards cooperation with other states and reduction of carbon emission, in order to play the role of a responsible power in the international community and correspond to the concept of harmonious worldview (Hung and Tsai 2009, 66–72; Hung and Yu 2009, 52–54). In other words, as a responsible power, China must initiate effective international cooperation and introduce a new governing framework and model for climate change that seeks compromise among states to adjust their consumption structure and lifestyle. At the same time, China must make an effort towards the re-establishment of international organizations and treaties dealing with the issue of climate change (Tao 2009, 279).

However, in spite of domestic efforts towards combating climate change, China may continue to face the following difficulties in the near future:

A. Paradox between state interest and international role: with continued deterioration of global warming and threats against human beings caused

by extreme climate events, whether China can continue to hold on to the principle of "common but differentiated responsibilities" remains to be watched. On the one hand, if China remains unwavering and unwilling to undertake international obligations and becomes recognized by the international community as the "culprit of global warming," not only would the benevolent image of "responsible power" that China has worked hard to shape be severely damaged; the country's advancement towards a global power would be challenged as well (Tsai and Hung 2008, 80–82). On the other hand, if China accepts demands for emission reduction due to international pressure, sustainable economic growth becomes in doubt, entailing the further consequence of a setback on the country's rise to power. In short, China needs to find a balance between emission reduction and sustainable growth; otherwise it would be trapped in a growth dilemma.

B. The impact of international pressure on economic development: if China turns away from international obligations on reduced carbon emission, it can expect to receive intensified sanction and pressure from other states, especially from developed states. For example, in 2009, the US Congress adopted the American Clean Energy and Security Act, which stipulates that, until 2020, the US reserves the right to extract carbon tax from the product of states that do not set a limit for carbon emission (The Library of Congress 2009). If the carbon tax is widely adopted around the world, China is bound to face immense pressure in terms of emission reduction, as exported goods would face trade protectionism disguised as environmental barriers (Song 2009). Once again, China is put in a dilemma: on the one hand, if China does not establish a threshold for carbon emission, its exports can be expected to suffer. On the other hand, if China establishes a limit for emission, the challenge may be equally as rigorous, as the state would need to be able to realize emission reduction with sufficient capability and without influencing economic development.

C. Related measures remain loose and ineffective: although the central government has taken the lead to establish many concrete and comprehensive policies, when policies reach the local government, not only is the latter unable to correspond with central policies; pressure from local elites can also undermine the effectiveness of policies. China needs to adopt the following measures in order to produce better results: (1) strengthen judicial ability to supervise environmental law, and (2) establish energy laws with broader scope, more specific demands and stronger legal punishments (Marks 2010, 983–984). In other words, policy is not coordinated between the different levels of government. Although the central government has put in place related measures that seek to respond to the impacts of climate change from

a top-down approach, once the policy reaches the local government, the latter may simply disregard such measures due to local economic considerations. A particular undermining situation emerges when the local government superficially responds to the central government's demands, a phenomenon otherwise known as "the elites decide but the commoners can respond" (shangyouzhengce, xiayouduice) (ibid., 984–985).

D. Realization of low-carbon economy: since China remains a developing state with a large population and low economic development, rapid industrialization and urbanization will continue to exert pressure on China to depend on energy consuming and highly-polluting industries for economic development. Even though China has made an effort towards diversifying its source of energy and reducing its dependence on fossil fuels, in the short run, China's coal-based energy structure remains immovable (Council for Economic Planning and Development 2009). China's current economic structure exacerbates the question of whether low-carbon economy can be fully realized; it remains a difficulty the country must overcome in the future.

China continues to lack sufficient creativity and innovative power while barriers to technological transfer remain. The key to alternative energy and energy efficiency lies in technological innovation and transfer. On the one hand, China currently lacks advanced technology for dealing with carbon emission and faces difficulties in importing such technology from other countries; it is forced to import advanced technology in harnessing wind, solar and nuclear energy through commercial channels. Despite the realization of some technological transfer through trade, restrictions and barriers remain high. On the other hand, if China intends to depend on autonomous research to lift itself out of the situation, the time and effort that needs to be invested by China may generate a new dilemma, as large-scale development and industrialization also require a significant amount of time (ibid.).

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Abstract

In recent years, erratic global climate conditions have generated an incessant series of natural disasters in China. This article seeks to explore China's climate change policies. This article addresses the impacts of climate change on China's environment and China's perception, principle, objective and policy actions in response to climate change.

Keywords: China; global climate change; national security.

Resumo

Em anos recentes, condições climáticas irregulares têm gerado uma incessante série de desastres naturais na China. Este artigo busca explorar as políticas climáticas chinesas, chamando a atenção para os impactos da mudança climática no meio ambiente da China e para a percepção, os princípios, os objetivos e as ações políticas chinesas em resposta à mudança climática.

Palavras-chave: China; mudança climática global; segurança nacional.