

SEIZING THE OPPORTUNITY: CLIMATE POLITICS
IN THE DEVELOPING WORLD

by

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DISSERTATION ABSTRACT

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My research asks how and why some developing countries have adopted ambitious climate policies, while others have not. As developing countries have no international obligations and little domestic public support for undertaking climate change action, it is puzzling to see them taking substantial steps to counteract global warming. I argue that such policies are due to a strong pro-climate policy group, which arises because of the interaction of international institutions and a shift in domestic politics. Specifically, international institutions helped to cultivate a pro-climate policy group through international socialization and economic incentives between the late 1990s and early 2000s. The changes in domestic politics after the mid-2000s, particularly policy decision makers' rising energy and environmental concerns, strengthened the power of the pro-climate policy group. Due to the interplay of international institutions and the development of domestic actors, the pro-climate policy group was able to advance their interests in climate policymaking process and advocated for a proactive climate policy.

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CHAPTER I

INTRODUCTION

While slow and cumbersome progress is being made in the negotiations for the post-Kyoto period, considerable progress on climate change has been made by some developing countries (Global International, 2013; Pew Charitable Trusts, 2010; UNEP, 2013). From large emitters such as China and India, to small emitters such as Kenya, Vietnam and Colombia, countries have begun to take actions on climate change. Some developing countries, such as China and Brazil, have begun increasing their investment in renewable energy as well as setting up voluntary and quantified targets on emissions reduction based on their pledges in international negotiations. For the first time in the history of international climate negotiations, there are developing countries taking substantial action on climate change (Chandler et al., 2002; Hurrell & Sengupta, 2012).

The transformation of climate actions in developing countries is puzzling, and poses a challenge to both theories of public goods and of environmental politics (Najam, 2005b; Steinberg, 2003; Williams, 2005). In the face of a global public good like climate change, we would expect developing countries to free ride on the efforts of developed countries. As benefits of climate stabilization are non-excludable, developing countries could benefit from climate mitigation without contributing to emissions reduction (Hardin, 1968; Olson, 1965; Ostrom, 1990; Young, 1989). In addition, as developing countries have no binding obligation to reduce carbon emissions,¹ they could use the

¹ Developing countries are listed as non-Annex I countries, and are exempted from mandatory emissions reduction based on the Kyoto Protocol.

institutionalized principle of “Common but Differentiated Responsibilities” (CBDR) to defend their inaction.² However, the last decade has witnessed a shift in some developing countries’ responses to climate change. Some of them have not only announced their voluntary quantified targets on emissions ceiling, but also reduced their emphasis on the norm of CBDR in negotiations.

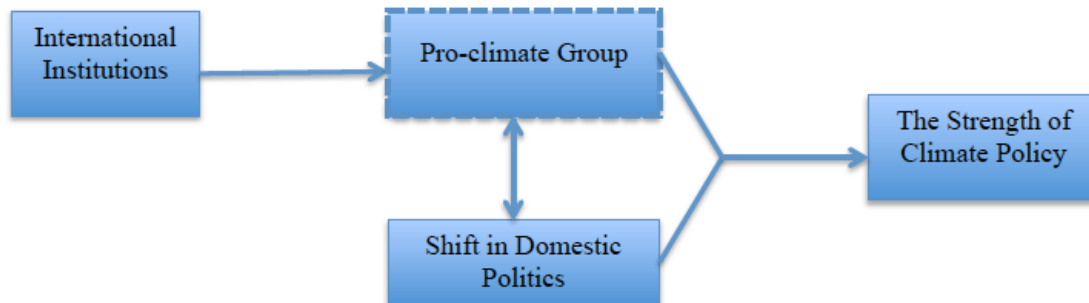
More surprisingly, climate change has little domestic public support in democratic developing countries and is not a priority for policymakers in less-democratic countries. Many developing countries have a large proportion of their population living in poverty, and there is no basis for expecting support for environmental protection out of the “post-materialistic” concerns of high-income citizens (Inglehart, 1995). Also, in the developing world, people of a variety of backgrounds and income levels share the view that development requires macroeconomic growth, and fear that climate stabilization will constrain their access to cheap energy sources which has made their development possible to date (Kartha, 2011). Facing challenges of poverty alleviation and economic growth, policymakers in developing countries tend to prioritize technological and financial advancement over the environment (Grossman & Krueger, 1994; Stern, 2004). Yet, despite these considerations, developing countries have started to make voluntary actions on climate change and to implement a series of climate policies and measures.

² The United Nations Framework Convention on Climate Change (UNFCCC) and its related Kyoto Protocol has established a principle of “common but differentiated responsibilities” (Bernauer, Böhmelt, & Koubi, 2013). Thus, developing countries have insisted that developed countries should take a major responsibility for climate change, and that any measures adopted in negotiations not hinder their development.

Argument in Brief

My explanation for the strength of climate policy lies in a pro-climate domestic policy community, which developed because of the interplay of international institutions and domestic political dynamic. As indicated in Figure 1, one of the factors that helped to cultivate this pro-climate policy community were international institutions, working through international scientific and environmental discourses and economic incentives at an early stage of a country's engagement in international negotiations. It facilitated the emergence of pro-climate domestic actors with roots in scientific, environmental and business communities. Through scientific and environmental discourses, international institutions enabled climate experts to bring scientific concerns of climate change into domestic policy debates. Through economic incentives such as the Clean Development Mechanism (CDM), international institutions stimulated climate mitigation by government officials and business groups. Another factor has been the domestic political dynamic, particularly policy decision makers' rising energy and environmental concerns. It strengthened the power of the pro-climate policy group in the domestic policymaking process. Due to the interaction of international institutions and the development of domestic actors, the pro-climate policy group was able to advance their interests in climate policymaking process and advocated for a proactive climate policy.

Figure 1. Causal Model.



The statistical analysis provides a preliminary confirmation of the significant effect of international institutions and regime type on the strength of a country’s climate policy. I use case studies to trace the causal mechanisms of interactions between international and domestic actors, and to capture variation in the efforts made by local actors to put climate change on the policy agenda. Based on my statistical analysis, I selected an “on-the-line” case, India, to examine how the causal mechanism works in a general cross-case relationship. Evidence from India reveals how domestic climate advocates reframed climate change in India’s domestic policy debates. These domestic pro-climate actors, such as the epistemic and business communities, empowered by global environmental governance, along with bureaucrats who see linkages between climate change and India’s international aspirations and domestic energy concerns, are working together to persuade the government of India to pursue an ambitious climate policy.

I also selected an “off-the-line” case, China, to explore why an authoritarian developing country would have a more ambitious climate policy than what the statistical model predicts. Drawing on my fieldwork in China, I find that, while the pro-climate

actors are increasing due to China's engagement with international institutions, it is only when they gain support from the highest levels of the party-state that they can change the outcome of bureaucratic bargaining to one favoring an aggressive climate policy. The change in the top leadership's attitude towards climate change is largely due to their concern with maintaining high rates of economic growth, something which is becoming increasingly difficult in part because of China's vulnerable resource-intensive economy and fragile ecological environment. Since the legitimacy of the Chinese Communist party depends crucially on its ability to deliver high rates of economic growth, the party leadership seeks to develop a "Low-Carbon Economy," which requires economic transformation and higher energy efficiency. The development of a low carbon economy coincides with the objectives of climate change mitigation. Thus, the party leadership's focus on economic transformation and greater energy efficiency empowered groups and government agencies that pushed for policies designed to reduce carbon emissions at the expense of groups and agencies pushing the interests of the oil, power, steel and cement industries. Both India and China countries have begun to take significant steps to address climate change, but contrary to what one might expect, it is authoritarian China and not democratic India that appears to be taking the strongest action to reduce climate change. I argue that China is facing less pressure from groups that favor conservative climate policies compared to India because of the intervention of the top party leadership.

My case studies in India and China provide further confirmation of the results of the statistical model by tracing causal processes in the interactions between international and domestic politics. They demonstrate how participation in international institutions is influencing the strategies and positions of domestic actors on climate change. In addition,

they further illuminate the relationship between regime type and the strength of climate policy. As the case of India illustrates, democracies foster deliberations on climate change among different interest groups and allow them to compete for their favored climate policies. Climate policy is the result of a compromise between those favoring policies that alleviate climate change and those who oppose such policies. One of the lessons we can draw from the Chinese experience, on the other hand, is that regime type may be less important than regime legitimacy in shaping climate policy. It is the top leadership's focus on strengthening the legitimacy of the regime that has given those actors advocating an ambitious climate policy the ability to prevail in the bureaucratic struggles over climate policy.

Scholarship on Global Climate Politics

Scholarship on global environmental politics has given much attention to climate change, seeking to understand states' response to climate change and to engage them with climate mitigation and adaptation (Betsill, 2010; Cass, 2006; D. Fisher, 2004; Harrison & Sundstrom, 2010; Keohane & Victor, 2011; Okereke, Bulkeley, & Schroeder, 2009; Purdon, 2015; Victor, 2006). Some scholars have analyzed obstacles and opportunities of international cooperation on climate change (Falkner, Stephan, & Vogler, 2010; Hovi, Sprinz, & Underdal, 2009; Keohane & Victor, 2011; Parker, Karlsson, Hjerpe, & Linnér, 2012; Victor, 2006). Some has concerned with national government's response to climate change by examining domestic institutions, interests and ideas (Bailey & Compston, 2012; Cass, 2006; Hale, 2010; Harrison & Sundstrom, 2010; Hochstetler & Viola, 2012). Others have explored the participation of subnational governments in climate mitigation

with a range of climate initiatives (Bulkeley & Betsill, 2005; Schreurs, 2010; Sugiyama & Takeuchi, 2008; Urpelainen, 2009). This study contributes to the existing literature by casting light on the question of the emergence of proactive climate policies in developing countries. It focuses in particular on how the interaction of international and domestic politics has shaped climate policies. By doing so, the study also adds to our understanding of when and how international relations and domestic politics matter in influencing a country's environmental policy decisions.

In addition, much of the literature on global climate politics has analyzed factors that shape developing countries' international negotiating stance and domestic climate actions (Bailey & Compston, 2012; Chandler et al., 2002; Coetzee & Winkler, 2014; Dimitrov, 2010; Dolšak, 2009; Hallding et al., 2011; Najam, Huq, & Sokona, 2003; Never, 2015; Torney, 2015; Williams, 2005). Some has looked at the impact of international context and institutions (Coetzee & Winkler, 2014; Torney, 2015). Some has explored the impact of domestic factors, including economic development, energy structure and climate vulnerability (S. Fisher, 2012 ; Rong, 2010; Tyler, 2010; Viola & Franchini, 2012). Perhaps one important trend of this area has been a move to analyze the rise of emerging powers such as India, Brazil, China and South Africa in global climate governance, in particular their climate policy changes in international negotiations and domestic action (Bailey & Compston, 2012; Hallding et al., 2011; Hurrell & Sengupta, 2012; Never, 2015; Torney, 2015). But much attention was given to the role of state, and less was paid to domestic non-state actors, and their interaction with state power and international institutions. This study extends existing literature in this direction by taking

a closer look at how a pro-climate domestic group shaped climate policies in India and China.

Methodological Approach

This study adopts a mixed-method approach, seeking to reveal the causal mechanisms by combining quantitative analysis with case studies (Gerring, 2007; Lieberman, 2005; Seawright & Gerring, 2008). Data analysis is useful to assess whether the possible explanatory variables are associated with the dependent variable. It provides a preliminary confirmation of some core hypotheses and dismisses several rival explanations. Case studies in individual countries are useful to identify why and how these explanatory variables are correlated with the dependent variable by investigating a narrowed ranged of hypotheses and tracing the causal process within countries (George & Bennett, 2005; King, Keohane, & Verba, 1994; Mahoney & Goertz, 2006).

I used statistical analysis to examine general patterns in the strength of climate policy across developing countries. I gathered data on the effect of international institutions (i.e. international socialization and international financial support level), regime type, the influence of domestic interest groups (i.e. environmental NGOs and fossil fuel industries), economic development level and air quality level of a large sample of developing countries. The data analysis provides preliminary confirmation of the significant effect of international institutions and regime type on the strength of a country's climate policy. But it is less useful to determine whether the effects of international institutions and regime types are causal or spurious, and to evaluate which mechanisms work and when they work.

I used case studies to understand how international institutions and regime type are correlated with the strength of climate policy. The case selections are based on two considerations. First, I chose one typical case that can exemplify the cross-national relationship. I selected an “on-the-line” case, India, to examine how the causal mechanism works in a general cross-case relationship. Second, I chose one deviant case to develop new explanations for the strength of climate policy. I selected an “off-the-line” case, China, to explore why an authoritarian developing country would have a more ambitious climate policy than what the statistical model predicts.

The case studies draw on three principal sources of data. First, a number of secondary sources were examined, including journal articles and relevant books, research reports of NGOs and think tanks and newspaper articles. They cover the evolution of India and China’s participation in international climate negotiations, the domestic development of climate politics in India and China, and the involvement of major climate actors in the two countries.³ The secondary sources provide valuable support to my case studies with detailed account of climate policy evolution in China and India. Second, the case studies rely on an analysis of a wide range of primary sources. Government documents and speeches of government officials were collected and analyzed, covering India and China’s national communications with the UNFCCC, domestic Five-Year

³ In the case study of India, it draws on information from India’s important policy journal *Economic and Political Weekly*, and influential environmental magazine *Down To Earth*. Four major English-language newspapers were analyzed in the case study, including *the Hindu*, *the Indian Express*, *Times of India* and *Livemint*. Research reports from leading non-government think tanks, such as The Energy and Resource Institute (TERI), Centre for Science and Environment (CSE) and Centre for Policy Research (CPR), were examined to corroborate the analysis of climate policy in India. With regards to the case study of China, it draws heavily on Chinese-language sources, including information from state-run media, *Xinhua Net*, *People’s Daily* and *Guangming Daily*, as well as Chinese journal articles at CNKI database. Research reports from government-backed research institutions were also incorporated to the case study, such as Energy and Research Institute (ERI), the Chinese Academy of Social Science (CASS) and China’s National Climate Center.

Plans, national climate change action plans, and public speeches of their relevant climate policymakers.⁴ Third, the case studies draw on interviews conducted during fieldwork in Beijing in 2014. Interviews were conducted with governmental officials, climate experts, and representatives of environmental NGOs. The interviews serve to facilitate deeper understanding of climate politics in the off-the-line case, China. These different sources are triangulated in order to strengthen the data's validity.

The Outline of the Research

My dissertation is organized in five chapters. Chapter 1 provides a brief overview of my research. Chapter 2 looks at possible explanations for the strength of climate policy and generates major hypotheses from different theoretical perspectives. Chapter 3 presents the findings from data analysis. Due to data availability, I used a cross-sectional dataset to test correlations between independent and dependent variables. The results suggest that a developing country's engagement with international institutions and its political system have significant effects on the strength of its climate policy. The statistical analysis provides preliminary confirmation of correlations, but less useful to identify when and how these explanatory variables affect the strength of climate policy. Hence, I selected two cases to trace causal mechanisms in the interactions of international domestic dynamics.

⁴ The case of India looked at speeches of bureaucrats that have worked at Ministry of Environment and Forests (MoEF), Ministry of External Affairs (MEA), served as members of PM's Council on Climate Change. The case of China focused on speeches of high-ranking party members and government officials from the National Development and Reform Commission (NDRC).

The following two chapters focus on the qualitative case studies. Chapter 4 features an “on-the-line” case: India, to examine how causal mechanisms work in a general cross-case relationship. I have found that India’s strong climate policy is due to the evolution of a pro-climate policy community as a result of interaction between international and domestic political dynamics. International institutions facilitated the emergence of this pro-climate group with roots in scientific and business groups through international socialization and economic incentives. However, national politics have divided this community regarding the extent of their commitment to climate mitigation. The gradual shift in climate policy illustrates the compromise between international pressure and domestic interests.

Chapter 5 focuses on an “off-the-line” case: China, and seeks to explain why an authoritarian country would have a more ambitious climate policy than what the previous statistical model predicts. I have found that the emergence of China’s climate policy is also due to a strong pro-climate policy community, which developed because of international interaction and a shift in Chinese domestic politics. Specifically, international institutions helped cultivate a pro-climate policy community through international socialization and economic incentives. China’s domestic political dynamic, particularly the party-state leadership’s rising energy and environmental concerns, which strengthened the power of the pro-climate policy community. Due to the interplay of the international community and the development of domestic actors, the pro-climate policy group was able to advance their interests in climate policymaking process, and prompt China to adopt a proactive climate policy.

My study is concluded with summarizing the main findings in both statistical analysis and case studies and discussing the implications of these results for climate politics in the developing world. I suggest that scholarship on climate politics would benefit by paying more attention to domestic interests and institutions and the state-society dynamics.

CHAPTER II

THEORY AND HYPOTHESES

My research seeks to understand why and how ambitious climate policies have adopted in some developing countries. Drawing on the existing literature, this chapter first examines the conceptual definitions of climate policies. Second, it discusses possible explanations for the strength of these climate policies and generates major hypotheses of the research.

The Dependent Variable and Conceptual Definitions

I measure cross-national variation of climate actions (my dependent variable) by the strength of developing countries' climate policies. Climate policies include a series of laws, regulations and policy instruments that address climate change. Building on different scholars' research works, the strength of climate policies in my study is assessed on two levels:

- The international level: focusing on international commitments to UNFCCC, including the ratification and implementation of the Kyoto Protocol, and the participation of the Copenhagen Accord.
- The domestic level: focusing on the adoption of domestic policies by a national government to mitigate climate change, including a set of domestic regulations and measures listed in the IPCC report.

International Commitments

At the international level, the strength of climate policies can be reflected in countries' positions in international negotiations. In the case of developing countries, I measure their international commitments based on their participation in the Kyoto Protocol and the Copenhagen Accord. As the Kyoto Protocol is the first international binding agreement to cut greenhouse gas emissions, many studies take the ratification and the implementation of the Kyoto protocol as an important indicator of a country's global commitments to climate change (Bernauer & Böhmelt, 2013; Burck, Bals, & Ackermann, 2009; Bättig & Bernauer, 2009; Dolšak, 2009; Harrison & Sundstrom, 2007). For instance, one way to measure this is through: 1) the ratification of the UNFCCC and the speed with which a country did so; 2) the ratification of the Kyoto Protocol and how quickly each country did so; 3) the submission of the latest national climate report, as well as its timeliness; and 4) the frequency and punctuality of financial contributions to the UNFCCC secretariat (Bernauer & Böhmelt, 2013; Bättig & Bernauer, 2009). A similar way examines 1) how quickly each country ratified the Kyoto Protocol, and 2) whether it has developed an institutional capacity to participate in flexible mechanisms under the Kyoto Protocol (i.e., a carbon trading scheme, the Clean Development Mechanism (CDM) and Joint Implement (JI)) (EBRD, 2011). Yet another approach to measure a country's international commitments is based on how politically challenging their commitments are (Dolšak, 2009; Harrison & Sundstrom, 2007). As Dolšak, Harrison and Sundstrom indicate, the ratification of the Kyoto Protocol would be less politically challenging than the implementation of mitigation projects, such as

hosting the CDM, as the latter requires domestic capacity building and public expenditures (Dolšak, 2009; Harrison & Sundstrom, 2007).

However, as members of non-Annex I countries, developing countries have no mandatory emission targets and assume no obligations under the Kyoto Protocol. In other words, the political demands on them are smaller than those facing Annex I countries. Therefore, examining the Kyoto Protocol alone cannot explain how strong developing countries' global commitments are. Therefore, my study also discusses the participation of developing countries in the Copenhagen Accord, as it signals that developing countries are taking significant steps on climate change with quantified targets for the first time in the history of international negotiations (Hallding et al., 2011; Hurrell & Sengupta, 2012).

Domestic Climate Progress

While focusing on developing countries' commitments to international negotiations can provide the most systematic information about actions on climate change, it cannot fully explain the strength of climate policies without consideration of domestic climate policies, as global interactions take place in the context of forces partly driven by domestic political decisions. In the following paragraph, I enumerate how to measure the domestic actions of a national government.

At domestic level, my study focuses on national climate targets, regulations and instruments employed by different sectors that could contribute to greenhouse gas emissions. To make domestic climate actions comparable across countries, I follow most scholars' research works on climate policy comparison, and have selected a manageable

set of policy instruments based on the list of the IPCC report (Compston & Bailey, 2013 ; Dolšak, 2009; EBRD, 2011; Harrison & Sundstrom, 2007; Kunkel, Jacob, & Busch, 2006; Lachapelle & Paterson, 2013).⁵

The strength of domestic climate policies first examines whether there are climate regulations and targets, such as a set of standards for emissions quotas and reduction in some sectors (Compston & Bailey, 2013 ; EBRD, 2011; Kunkel et al., 2006). For instance, Compston and Bailey (2013) in their analysis of the strength of climate policy, focuses on “a ban on fossil fuel power stations unless equipped with Carbon Capture and Storage (CCS), or emission standards that have the same effect, and emissions standards and/or fuel economy standards for motor cars” (Compston & Bailey, 2013). As a large proportion of greenhouse gas emissions are concentrated on energy and industry sectors, particularly in developing countries, my study focuses on climate regulations and targets adopted by national governments in these two areas.⁶

Second, it discusses the adoption of market-based mechanisms across countries, including carbon-trading permits, carbon tax and feed-in tariff. As these mechanisms are widely employed by a growing number of countries, they become an important indicator to measure and compare the strength of domestic climate policies (Compston & Bailey, 2013 ; Dolšak, 2009; Harrison & Sundstrom, 2007).

Third, the strength of domestic policy is evaluated by governmental financial support for climate change, particularly public expenditure on research and development

⁵ The IPCC report categorizes climate policy instruments into seven groups: 1) regulations and standards for emission levels; 2) taxes and charges; 3) tradable permits; 4) voluntary agreements; 5) subsidies and incentives; 6) research and development (R&D); and 7) information instruments (S. Gupta et al., 2007).

⁶ Details regarding climate policy instruments across sectors can be found: http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg3_report_mitigation_of_climate_change.htm

(Kunkel et al., 2006; Lachapelle & Paterson, 2013). Due to the close relationship between energy consumption and climate change, here my study also focuses on subsidies for renewable energy development and deployment.

In general, the strength of a developing country's climate actions is compared on two levels. Investigating only one of them will not enable us to fully understand the strength of climate policy across countries. As noted earlier, the comparison of global commitments to climate change alone cannot fully capture the strength of climate policy in the developing world, because their commitments in the Kyoto Protocol do not come with large political costs, given that these countries assume no obligations. However, only looking at domestic policies adopted by the developing world cannot illustrate the strength of climate policies either, as the adoption of some policy instruments and institutional capacity building in developing countries is based on their communication with international climate change regimes.

In addition, my study of the strength of climate actions focuses on policy outputs, such as the adoption of legislation, laws and policy instruments, rather than on policy outcomes, such as the change of emission level and emissions trend. First, policy outcomes alone cannot provide detailed accounts of the process and efforts made by national government on climate change. Also, it is not clear whether the outcome is policy-induced or just coincidental. Specific circumstances such as economic development, technological innovations and demographic factors, can affect the variation in emission trends and levels. For instance, part of the reduction in emissions in Germany was directly attributed to unification, while in the UK, the liberalization and privatization of the energy market were the primary causes, rather than being policy-driven

(Eichhammer et al., 2001; Hammons, 2006; A. Michaelowa, 2003). Also, as some climate policies and instruments have been implemented only recently, it will take several years for their effects to show up in emissions levels and trends.

Hypotheses: Variables Influencing Climate Actions

There is a considerable amount of work that addresses the question of why strong climate policies arise in some countries rather than others. Some focus on a cross-national comparison of countries' overall actions on climate change, ranging from OECD members to emerging economies, and some focus on aggressive climate actions in a specific country (Bailey & Compston, 2012; Cass, 2006; Hallding et al., 2011; Harrison & Sundstrom, 2010; Hochstetler & Viola, 2012; Lachapelle & Paterson, 2013; Weidner & Mez, 2008). Drawing on these studies, my study examines three types of explanations, political, economic, and environmental, for understanding how these factors are shaping climate policy-making processes in developing countries.

Political Explanations

International Institutions

The international institutions in which countries are nested largely shape their responses to international environmental issues, such as climate change. Through participation in international institutions, states are able to interact and address specific environmental issues while exchanging knowledge and ideas, sharing financial resource and building patterns of rules and principles (Finnemore, 1996; Jacobson, Reisinger, & Mathers, 1986; Keohane & Nye, 1987; Krasner, 1982; March & Olsen, 1998; Schreurs &

Economy, 1997; Young, 1994). Socialization in international institutions is changing states interests and behaviors in different ways. It shapes states' perception of environmental problems by influencing domestic scientific discourse with the transfer of scientific knowledge, as new scientific information about causes and consequences of environmental issues emerged (Haas, 1992). International institutions also influence countries' actions on environmental issues by changing the calculation of costs and benefits analyses with economic incentives and technical expertise (Brown Weiss & Jacobson, 2000). This effect is prominent in the case of developing countries, as they may have relatively weak scientific capacity and financial support for environmental research and protection. With an inflow of technology and financial resources, engagement with international institutions can enhance the willingness of developing countries to improve their environmental performance (Spilker, 2012). In addition, international institutions affect countries' behaviors on environmental issues with the diffusion of internationally held environmental norms and principles, such as sustainable development, and thus encourage states to behave as a environmental-friendly citizen in the international community (Ward, 2006). The following section takes a closer look at how international institutions influence states on climate change through scientific knowledge, financial resources and environmental norms and principles.

Scientific and Environmental Discourses

International institutions are able to change a country's national environmental policy through international socialization with scientific knowledge and environmental principles (Haas, 1992; Litfin, 1994; Mitchell, 2007; Young, 1994). Scientific findings

and deliberation play a crucial role in addressing global environmental issues as they can reduce uncertainty by identifying causes and consequences of environmental problems. International institutions facilitate the spread of this scientific knowledge with efforts of epistemic communities, reframe scientific discourse about environmental issues and introduce environmental problems into policy debates (Grundmann, 2007; Haas, 1992; Jasanoff, 1998; Litfin, 1994; Meyer, Frank, Hironaka, Schofer, & Tuma, 1997; Paterson, 1996; Peterson, 1992). One example of this is epistemic communities' contribution to ozone layer protection. A growing shared understanding of the causal knowledge on the relationship between CFC emissions and ozone layer depletion has brought bureaucrats, environmentalists and scientists together, and enhances the salience of ozone depletion in policy agendas (Haas, 1992; Litfin, 1994).

Likewise, in the case of climate change, countries that integrate into international institutions have received a large amount of scientific information about the causes and consequences of global warming, which in turn could influence their climate actions through epistemic communities. Over the last three decades, international organizations, such as the World Meteorological Organization (WMO) and the United Nations Environmental Program (UNEP) have been involved in research projects on climate change, including a series of international scientific and political meetings on this subject (Paterson, 1996). They established the well-known scientific community for climate change, the Intergovernmental Panel on Climate Change (IPCC) in 1988, which aims to review and evaluate published scientific literatures on climate change, and to disseminate scientific views of climate change (Grundmann, 2007). By 2014, it has published five scientific assessment reports on climate change, and built a strong scientific consensus on

human-induced climate change around the world (Grundmann, 2007; J. Gupta, 2010). Engaging with these organizations increases exposure to scientific knowledge and awareness of the impact of human-environment interaction. This can alter the perception and decisions of actors on the domestic landscape, including policymakers, scientists, journalists, environmental NGOs and other participants (Biermann, 2001; Economy, 1997). In essence, under the international institutions, countries are able to access much information about climate change and increase their understanding of this environmental issue, which can shape their interests in climate change and lead them to pursue proactive climate policy.

International institutions not only shape countries' national climate policy through scientific knowledge, but also through institutionalized environmental norms and principles (Grundmann, 2007; Meyer et al., 1997; Pettenger, 2007). Within international institutions, a country's attitudes and actions toward global warming could be affected through the process of social learning (Finnemore, 1996; Mitchell, 2007; Wendt, 1999; Young, 1994). Through socialization, countries are exposed to different environmental ideas and theories, and some of them may internalize these ideas and principled norms, and then change their environmental policies. In the last two decades, the international community has convened a number of conferences on environmental protection and set up a series of principles for countries to deal with climate change. One is the precautionary principle, which was promoted the UN Economic Commission for Europe (ECE) and the Second World Climate Conference Declarations(J. Gupta, 2010). It encourages countries to take proactive action on climate change in order to prevent future

regret regarding the negative impacts of climate change (J. Gupta, 2010). Most OECD countries value this principle and take it seriously.

Another principle is the common but differentiated responsibilities (CBDRs), which was established under UNFCCC (J. Gupta, 2010). It implies that, while climate change is a common concern of mankind, responsibilities differs based on a country's contribution to the problem and their capability to address it (Betsill, 2010; J. Gupta, 1997). By this principle, the Global North should take more responsibility for climate change than the Global South. Industrialized countries not only need to take proactive actions on climate change, but also provide financial assistance for developing countries. This principle has been widely accepted by developing countries and helps them defend their position in climate negotiations (Najam, 2005a; Williams, 2005).

With the change of the geopolitical and economic landscape, new principles are set up and disseminated in the socialization. A new principle that is guiding climate policy is the Nationally Appropriate Mitigation Actions (NAMAs) (Coetzee & Winkler, 2014; J. Gupta, 2010). The idea of NAMAs is related to the concept of Sustainable Development Policy and Measures (SP-PAMs). It appeared for the first time in the Bali Action Plan, and it encourages developing countries to link sustainable development with climate change, to ensure that they can realize their development goals in a low carbon path (Coetzee & Winkler, 2014). Therefore, the extent to which a country internalizes these principled norms and scientific ideas determines the strength of its climate policies.

- *Hypothesis 1A: Among developing countries, more exposure to scientific knowledge and environmental principles under international regimes makes a country more likely to adopt a stronger climate policy.*

Economic Incentives

Aside from scientific knowledge, the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol provide a set of flexible mechanisms to promote international cooperation and enhance state capacity building, such as carbon trading, joint implementation and Clean Development Mechanism (CDM) (Betsill, 2010). The experience of the European Union Emissions Trading Scheme (EU ETS) is one example. It allows countries that are over their emission targets to purchase emission credits from other countries that have an excess (Clapp & Dauvergne, 2011). Another mechanism that provides large economic benefits for different countries is the CDM. It enables developed countries to make investments in projects in developing countries in order to obtain credits to meet the requirement for GHGs reduction, and it helps developing countries reduce emissions by providing advanced technology and improving energy efficiency (Dinar, Rahman, Larson, & Ambrosi, 2011; Fuhr & Lederer, 2009). This mechanism has been widely accepted by developing countries, some of which have obtained high economic benefits, such as China and India (Dubash, 2012; Schröder, 2011). Additionally, there are a variety of environmental aid programs that are organized by different international regimes, which aim to help developing countries build the capacity to tackle climate change (Clapp & Dauvergne, 2011; Purdon, 2014). For instance, the World Bank, UNDP and UNEP jointly established the Global Environmental Facility (GEF) to provide funding to developing countries in environmental protection projects, such as global warming (Clapp & Dauvergne, 2011; J. Gupta, 1997; Keohane & Levy, 1996). With financial support, the recipient governments

are able to engage more in climate change than they were before. Another example of climate finance is the Clean Technology Fund. As the largest multilateral climate investment fund, it is organized by multiple development banks and the UNFCCC, and has directed billions of financial support to developing countries with climate change (Purdon, 2014). Against this background, my study predicts that international regimes can influence national climate policy with increased financial resources. The more engagement countries have in international institutions, the more countries are able to access to these resources, and the more likely they will be to reconsider the costs and benefits of their climate actions.

- *Hypothesis 1B: Among developing countries, more access to financial resources under international regimes makes a country more likely to adopt a stronger climate policy.*

Political System

A country's political system is another crucial influence on the strength of climate policies. An amount of literature has examined how a political system can shape national environmental policies, and explored the relationship between democracy and environmental degradation. Most of this literature finds that democracy has a positive effect on environmental protection, and democracies are more willing to provide public services to deal with environmental problems than non-democracies (Axelrod, 2004; Bueno De Mesquita, Morrow, Siverson, & Smith, 1999; Bättig & Bernauer, 2009; Congleton, 1992; Q. Li & Reuveny, 2006; Neumayer, 2002; Olson, 1982; Payne, 1995).

This effect of political system on environmental policies is due to decision-making procedures under different regimes. Democratic states make decisions based on the interests of the median voters, who also have the median income share and time horizon, yet authoritarian governments have greater income share from tax revenues and gratuities, as well as a shorter time horizon given the high possibility of regime overturn (Congleton, 1992). Thus, the increasing marginal costs of environmental protection can discourage authoritarian states to provide this public good. Likewise, democracies have a great “encompassing interest” than non-democracies to satisfy, so they need to make sure the distribution of national income can benefit the majority (McGuire & Olson, 1996; Olson, 1982). Even if authoritarian regimes can provide a certain level of public good for collecting more revenues in the future, they are facing less pressure for public good provision, such as environmental protection, due to smaller “encompassing interest” (McGuire & Olson, 1996; Olson, 1982). This viewpoint has been developed by Bueno de Mesquita, who argues that the winning coalitions are smaller than the selectorate in authoritarian states in contrast to they are in democracies, so political leaders are more likely to provide private good for a small elite groups rather than public good for ordinary citizens (Bueno De Mesquita et al., 1999). Another advantage democracies enjoy is the freedom of individual rights and the free information flow. It allows their citizens are better informed about environmental problems and free to express their concern and demand change (Payne, 1995). On balance, democracy is more likely to take care of environmental problems, such as climate change, than non-democracy, as it has a large size of winning coalition and allows for a high degree of information flow. In addition, empirical evidence also indicates that democracies can significantly decrease human-

induced environmental degradation in carbon dioxide and nitrogen dioxide emissions, as well as be more willing to join and ratify international environmental agreements (Q. Li & Reuveny, 2006; Neumayer, 2002).

In contrast to the argument that democracy is positively related to environmental quality and strict environmental policy, some scholars argue that authoritarian regime may become more capable of dealing with the complex political and environmental pressure (Beeson, 2010; Heilbroner, 1974). Authoritarian regimes may benefit the environment by limiting environmentally destructive behaviors with strict policies, as they don't pay much attention to individual liberty (Heilbroner, 1974). This viewpoint is also resonates with the coercive regulations on individual rights proposed by Hardin in dealing with the tragedy of the commons (Hardin, 1968). In addition, for countries with a tradition of strong state intervention, authoritarian regimes can be more efficient to deal with environmental problems (Beeson, 2010). Even so, however, authoritarian regimes remain less effective in produce policy outcomes than democratic regimes because the former lack public participation in the policy making process and policy implementation (Gilley, 2012).

- *Hypothesis 2: Among developing countries, democratic regime makes a country more likely to adopt a stronger climate policy.*

Domestic Interest Groups

Domestic interest groups can exert an influence on environmental policy in favor of their concerns (DeSombre, 2000; Falkner, 2008; Hochstetler & Viola, 2012; Kelly, 2010; Olson, 1965; Pulver, 2012; Stigler, 1971; Yandle & Buck, 2002). If countries are

abundant with fossil fuels, such as coal, oil and natural gas, they will be able to develop carbon-intensive industries and resources-exporting industries due to relatively cheap energy price. The adoption and implementation of climate policies in these countries will be costly due to obstacles from entrenched interest groups in fossil fuel sectors. As the costs of emissions reduction are concentrated on carbon-intensive industries, these industries will have a powerful incentive to join together to lobby the government for weak climate policies. Their influence will be increased if they have good access to policy makers (Ehrlich, 2007; Tsebelis, 2002). Thus, the development of climate policies in these countries may be slow and less ambitious. On the other hand, if countries have large geographic resources to develop renewable energies, such as hydroelectricity, biofuel, wind and solar power, they are likely to formulate relatively strong climate policies, especially if these countries enjoy a comparative edge in renewable energy technologies and products.

Since environmental regulations will benefit some firms and industries but harm others, corporations that have a high stake will be actively involved in lobbying policy makers (Olson, 1965; Stigler, 1971). Regarding climate policy, there will be a competition of interest groups between the fossil fuel sector and the alternative energy sector. Progressive climate policies will harm emissions-intensive sectors and fossil fuel producers, but benefit low-carbon sectors and renewable energy producers. Thus, the two interest groups will lobby for opposite climate policies. For instance, in the case of the United States climate policy, the Global Climate Coalition, which consists of major oil producers and other firms, strongly opposed to the Kyoto Protocol, and attempted to undermine scientific findings of climate change (Falkner, 2008; Yandle & Buck, 2002).

Similarly, interest groups also play an important role in formulating climate policy in New Zealand. Since a major source for carbon emissions is coming from the agriculture sector, the farmers' lobby Federated Farmers sought legislation that will protect agriculture industries (Kelly, 2010). The influence of interest groups on climate policy can also be found in developing countries such as Brazil and India. Under the Clean Development Mechanism (CDM), corporations that are working on emission reduction programs, such as energy efficiency or renewable energy generation, can increase their revenues from CDM credits, so they are highly supportive for progressive climate policy (Pulver, 2012; Viola & Franchini, 2012). Although interest groups compete for different climate policies, their influence on the policy agenda is based on how they can overcome the problem of collective action. Since costs of climate policy will be concentrated in energy/emission-intensive sectors, but benefits will be widely dispersed, the coalition within the fossil fuel sectors may have higher stakes than low-carbon sectors, and push further for their preferred climate policy.

Hypothesis 3: Among developing countries, the presence of a greater number of influential interest groups from emission-related sector makes a country less likely to adopt a stronger climate policy.

Environmental NGOs

A growing number of non-governmental organizations (NGOs) have begun to assume increasing responsibilities to deal with environmental problems within borders and across countries over the last two decades, ranging from ozone layer protection to climate change (Corell & Betsill, 2001; Doyle & Simpson, 2006; Keck & Sikkink, 1998;

Raustiala, 1997; Risse-Kappen, 1995; Rootes, Zito, & Barry, 2012; Saunders, 2008; Wapner, 1996). These active environmental groups connect through shared ideas, common discourse and the exchange of information and services, and have been trying to shape environmental policies with principled ideas and different political strategies (Keck & Sikkink, 1998; Raustiala, 1997). At the international level, their technical knowledge and influence on public opinion can increase their leverage in international environmental negotiations, such as the participation of NGOs in the UN Convention to combat desertification and the Kyoto Protocol (Corell & Betsill, 2001). At the domestic level, they can shape national environmental policies as well as public life (Raustiala, 1997; Wapner, 1996). Environmental NGOs can provide information about policy opinions and frame environmental issues due to the complexity and uncertainty of environmental problems, as well as monitor a government's commitment and keep the public informed (Raustiala, 1997). In addition, they can increase public awareness and shape individual behaviors with economic, social and cultural practices (Wapner, 1996). For instance, in dealing with climate change, a coalition named Stop Climate Chaos, consisting of numerous environmental NGOs, has framed climate change issue as a global climate justice issue and highlighted the negative effect of climate change on poor countries, to call attention from the North (Saunders, 2008). While conventional literature has always linked NGOs to industrialized democracies, it is noteworthy that the presence and development of environmental NGOs have increased in developing countries under authoritarian regime, such as China, Iran and Burma (Doyle & Simpson, 2006; Schwartz, 2004). While environmental NGOs choose not to challenge the state and avoid confrontational strategy, their development is tolerated and even encouraged by the state

in dealing with environmental issues. These groups have also started to exert influence on environmental policy and, by extension, climate policies in these countries. Overall, as mentioned, my study hypothesizes that countries with a large number of environmental NGOs are likely to be more active regarding their climate policies.

- *Hypothesis 4: Among developing countries, stronger environmental NGOs make a country more likely to adopt a stronger climate policy.*

Economic Explanations

Whether countries can capture emissions mitigation opportunities depends on their economic growth. With economic development, countries are able to invest in advanced technologies that pollute less, while bearing relatively high mitigation costs. A number of studies have discussed the linkage between economic growth and environmental quality. Grossman and Krueger, among others, indicate that there is an invert U-shaped relation between environmental quality and per capita income, which is termed as the Environmental Kuznets Curve (EKC) (Grossman & Krueger, 1994; Stern, 2004; Torras & Boyce, 1998). They state that economic activities will inevitably cause environmental degradation, but the demand for improving environmental quality will increase with rising per capita income. This shift is due to strict environmental regulations, advanced technologies and the effect of industrial composition (Grossman & Krueger, 1994). Therefore, even if economic growth is associated initially with worsening environmental conditions, environmental quality will rise in the long term when a country's per capital income reaches a critical level. Aside from this, these countries are also able to assume high costs to deal with environmental problems (Brown

Weiss & Jacobson, 2000; Sprinz & Vaahitoranta, 1994). By following this curve, countries tend to engage more with addressing environmental problems when there has been a rise in their economic development.

In the case of developing countries, economic growth has always been regarded as a top priority and important for poverty alleviation. By the logic of the EKC, at an early stage of economic development, we should expect these countries to pay less attention to environmental quality. A number of case studies in developing countries, such as Thailand, Mexico and Indonesia, show that the environment always loses in the conflict between economic growth and environmental protection (Desai, 1998). With increasing per capita income, environmental protection is no longer a luxury good, and countries are able to actively engage more in environmental issues than they were before. An empirical analysis of environmental research and development in OECD countries indicates that public research and development expenditures on environmental problems are increasing with income (Komen, Gerking, & Folmer, 1997). Other research also shows that economic and financial development can decrease environmental degradation in emerging economies, such as the BRIC (Brazil, Russia, India, China) countries (Tamazian, Chousa, & Vadlamannati, 2009). Moreover, economic development will bring a change in industrial composition. Service sectors are replacing manufacturing sectors and produce less pollution with economic growth, which will do less harm to the environment (Torras & Boyce, 1998). Another change that comes with economic development is environmental awareness. People's values and goals shift from prioritizing economic growth to the quality of life, and they become more concerned about environmental degradation (Inglehart, 1995).

However, the way to link economic development and environmental quality differs between developed countries and developing countries. With a worsening global environment, it has become difficult for developing countries to replicate the path of developed countries given the limitations of natural resources and rapidly increasing population (Castro, 1995). Additionally, as the exporting of pollution-intensive production becomes less likely for developing countries, they may not have the positive effect of industrial composition on their environmental quality (Cole & Neumayer, 2005). Accordingly, in order to maintain their economic growth, these countries are seeking a way for sustainable development. Against this background, environmental policies that can benefit the domestic economy are welcomed in developing countries. For example, developing countries that suffer from power shortages are willing to use policies that can improve energy efficiency and relieve the shortage of power in their economies. In addition, by adopting strict environmental policies, developing countries that have major markets in developed countries can avoid potential border tax adjustment or carbon tariff, so that their exporting products can stay in competitive prices (Hochstetler & Viola, 2012; Z. Zhang, 2010). In a word, economic development plays an important role in promoting proactive environmental policies.

- *Hypothesis 5: Among developing countries, high economic development makes a country more likely to adopt a stronger climate policy.*

Environmental Explanations

Local Air Pollution

A country's response to climate change is dependent on its domestic air pollution (Dolšak, 2009). At first glance, people may argue that a country's reaction to a specific global environmental problem is related to their domestic ecological vulnerability to this problem, as observed in areas of ozone layer protection and acid rain control (Barrett, 2003; Sprinz & Vaahtoranta, 1994). Countries with a high likelihood of skin cancer tend to be more supportive of protection for the ozone layer than those with a low likelihood (Sprinz & Vaahtoranta, 1994). Also, countries that suffer the most from acid rain problem are even willing to reduce emissions unilaterally, such as Scandinavian countries, the Netherlands, Germany and Austria (Barrett, 2003). By this logic, we would expect that countries with a low sea level and high reliance on their agricultural sector are willing to engage more in climate action than countries that are not. However, unlike ozone layer and acid rain problems, there is little evident that climate vulnerability can affect national climate policy, even controlling for economic development (S. Dasgupta, Laplante, Meisner, Wheeler, & Jianping Yan, 2007; Rowlands, 1995; Tubi, Fischhendler, & Feitelson, 2012). However, as indicate below, some scholars point out that local air pollution can provide incentives for countries to make a proactive climate policy (Betsill, 2001; Chandler et al., 2002; Dolšak, 2009; Sandler, 1997).

While countries will suffer from sea level rise, water scarcity, agricultural output reduction and natural disasters in different ways and to a different extent, it is not easy for people to have direct experience with the consequences of climate change within a short period of time, this is particularly true with issues such as sea level rise and glacier

meltdown. It will take years for people to observe these long-term changes. However, unlike climate change, people can breathe and observe air quality in their daily life. For countries with severe air pollution, people are more concerned about air pollution than climate change. Interestingly, there are some common pollution sources for both air pollution and climate change, such as power production and transportation. It is likely to have synergies to link air pollution to climate change (Kok & De Coninck, 2005; Sandler, 1997; Swart, Amann, Raes, & Tuinstra, 2004). Also, since the effect of climate policies takes a long time to become apparent, but the costs of them are concentrated in a short time, policy makers will favor profitable short-term concern rather than a long-term goal such as climate change (Hovi et al., 2009). By this logic, climate change can be reframed as a local air pollution issue that is already on a country's local agenda, which can reduce obstacles to adopt a proactive climate policy (Betsill, 2001; Chandler et al., 2002). Thus, we should expect countries that encounter severe air pollution to obtain more private benefits by making stronger climate policies.

- *Hypothesis 6: Among developing countries, lower local air quality makes a country more likely to adopt a stronger climate policy.*

In conclusion, there are six major explanations for the strength of climate policy in developing countries. To test whether they can shape climate politics in the developing world, and when and how they can help us understand climate policymaking processes in these countries, the following chapters will use data analysis and case studies to examine these explanations in great detail.

CHAPTER III

METHODS AND ANALYSIS

This chapter presents the empirical analysis used to assess the dependent variable, the strength of climate policy. The study combines statistical analysis and detailed case studies to evaluate the hypotheses developed above. The goal of the quantitative analysis is to establish a correlation between explanatory variables and the dependent variable. The case studies investigate whether the statistical association is in fact causal, and provide a more nuanced look at why the explanatory variables are correlated with the dependent variable. By combining these cross-national quantitative and case study methodologies, the analysis seeks to better understand why some developing countries have taken more proactive climate policies than others.

The first part of the chapter presents the main large N quantitative analysis. It analyzes a cross-sectional dataset that covers a large number of developing countries in 2007. Due to limited data availability, the analysis begins with a multivariate OLS regression to test these hypotheses. After running a series of specification tests, it also examines the robustness of the findings by using alternative indicators for the independent variables and multiple data imputations for missing values (Honaker, King, & Blackwell, 2011). The results suggest that a developing country's participation in international institutions and its regime type are significantly correlated with the strength of climate policy.

The second part of the chapter explains the rationale behind case selection. It looks at one on-the-line case, India, to examine how international institutions and democratic system account for the strength of climate policy. It also selects one off-the-

line case, China, to examine why an authoritarian country may adopt a more proactive climate policy than the statistical analysis would expect. Another consideration for India and China case studies is that both countries are significant and influential players in the global climate change discourse due to their large population, high carbon emissions and rapid industrialization.

Empirical Analysis

The goal of the statistical analysis in this section is to examine the correlations between the explanatory variables and dependent variable for evidence of possible causal relationship. It begins by analyzing key hypotheses with a basic bivariate regression. Next, I turn to a multivariate regression analysis to control for potential confounding factors and test the robustness of the results. In particular, I show that the conclusions of the simple analysis are robust after using alternative indicators for the explanatory variables and multiple data imputation for missing values. Data availability restricts the sample to 60 developing countries, which are categorized as such by the IMF's World Economic Outlook Database.

Variables

As noted above, the motivation behind my study is to identify the driving forces for the variation in climate policies in the developing world. The dependent variable is the strength of climate policy, which is operationalized based on the CLIM Index (Climate Laws, Institutions and Measures Index). This index has the virtue of providing both international and domestic-level indices (EBRD, 2011). There are a number of

indicators to assess the strength of climate policies, but most of them focus on the climate change cooperation (Baettig, Brander, & Imboden, 2008; Bernauer & Böhmelt, 2013; Dolšák, 2009). Less attention is given to comparing domestic policies due to data availability.

The index quantifies policy in four dimensions: international cooperation, domestic climate framework, sectorial measures or targets, and cross-sectorial fiscal or regulatory measures (EBRD, 2011). Every country receives a score in each of the four policy areas, which may take one of three values. That is, in each policy area p , every country c has a score $S_{cp} \in \{0, 0.5, 1\}$. The index of climate policy is simply measured by the total value each country obtains. It ranges from 0 to 1, the higher the index is, and the stronger a country's policy is.⁷ The index covers 95 countries that submitted their national communications to the UNFCCC between 1 January 2005 and 15 January 2011 (EBRD, 2011; Steves & Teytelboym, 2013). As my study focuses on developing countries, the sample excludes all developed countries.

The first explanatory variable pertains to developing countries' exposure to scientific information and their exposure to environmental norms transmitted via international institutions. Hypothesis 1A posits that among developing countries, more exposure to scientific knowledge and environmental principles under international institutions makes a country more likely to adopt a proactive climate policy. Following previous research, I employ membership in international organizations to measure a

⁷ The international cooperation covers from Kyoto Protocol to ambitious targets for post-Kyoto period. The adoption of domestic policies covers domestic climate measures between 2008 and 2011 (Steves & Teytelboym, 2013). As developing countries have no mandatory emissions reduction target under the Kyoto Protocol, their international cooperation cannot truly reflect the strength of their climate policies. The study focuses more on national climate measures adopted after 2007. Therefore, data collection for all independent variables is from 2007.

country's involvement in international institutions (Bernauer, Kalbhenn, Koubi, & Spilker, 2010; Spilker, 2012). Specifically, this study uses the number of international environmental treaties when a country is member as an indicator. The data are taken from Mitchell's International Environmental Agreement Dataset Project (2002-2015, Version 2007).⁸

The second explanatory variable is a measure of developing countries' access to economic incentives under international institutions. Hypothesis 1B indicates that among developing countries, more access to financial resource under international regimes makes a country more likely to adopt a stronger climate policy. The study focuses on climate finance these countries can obtain from international organizations. Because Global Environmental Facility (GEF) serves as the major financial mechanism of the UN Framework Convention on Climate Change, the approved spending from GEF on global warming in a given developing country and year will be used as an indicator of economic incentives for developing countries.

The third explanatory variable pertains to the political system in the developing countries. Hypothesis 2 posits that among developing countries, democratic regime makes a country more likely to adopt a stronger climate policy. To test this, I utilize the Freedom House political right index 2007.⁹ This index is a widely used indicator for democracy, and has a broad coverage (Bättig & Bernauer, 2009; Dolšak, 2009; Neumayer, 2002). The index ranges from 1 – most democratic – to 7 – most autocratic. I

⁸ Data focuses on the number of environmental treaties that enter into force.

⁹ Data retrieved from Freedom House.

have inverted the original data to create the variable *political system* so that a country is judged to more democratic the higher its score.

Hypothesis 3 predicts that more influential interest groups from emission-related sector make a developing country less likely to adopt a proactive climate policy. To test the leverage of emissions-intensive interest groups, the study uses carbon emissions from fossil fuel per GDP available in data from the World Bank 2007, because country data on interest groups is sparse. To measure the effect of environmental NGOs (Hypothesis 4), my study follows Bernauer et al (2013), and takes the number of ENGOs membership in the International Union for Conservation of Nature (IUCN) as a proxy for ENGOs political leverage.

To assess the effect of economic development (Hypothesis 5) on the strength of climate policy, this study uses the log of GDP per capita as an indicator. Though the square logged GDP per capita is often included for a non-linear effect between a country's environmental performance and its national income, it is not included in the present study because the analysis is restricted to developing countries (Spilker, 2012). My expectation is that all developing countries stay in the left side of the inverted U curve in the Environmental Kuznets Curve (EKC). GDP per capita data was obtained from the World Bank (2007).

To account for the effect of local air quality in the strength of climate policy adopted by a developing country (Hypothesis 6), the study takes the log of sulfur dioxide emissions per capita as a proxy for air pollution. Sulfur dioxide emission is widely regarded as an important indicator for air quality in previous research (Bernauer et al., 2010; Grossman & Krueger, 1994; Selden, Forrest, & Lockhart, 1999). Data are taken

from Emission Database for Global Atmosphere Research (EDGAR) (2007) because it has data up to the present. My hypotheses are summarized in Table 1.

Table 1. The Operationalization and Data Sources for Independent Variables.

Independent Variables	Indicator	Sources
H_{1A} : Exposure to scientific information and environmental norms	The number of membership a developing country has in environmental treaties (choose the number of treaties that enter into force).	International Environmental Agreement Dataset Project (2002-2015, version 2007) by Mitchell
H_{1B} : Access to economic incentives	Whether countries are recipient of climate funds or not, 1 indicates yes, 0 indicates no.	Website: Climate Fund Update
H_2 : Political system	Political rights index, scale of original data inverted, high values indicate more democracy	Freedom of House 2007
H_3 : Emission-related interest group pressure	The percentage of emissions-related sectors' contribution in GDP	The World Bank: world development indicator 2007
H_4 : ENGOS political leverage	The number of ENGOS membership in IUCN per capita	(Bernauer et al., 2013)
H_5 : Economic development	Log of GDP per capita, since the data analysis is restricted in developing countries, the square term of loggdp per capita is not used here.	The World Bank: world development indicator 2007
H_6 : Environmental quality	Log of sulfur dioxide emission per capita	Emission Database for Global Atmosphere Research (EDGAR) 2007

Research Design

This section presents my estimation strategy. My basic regression equation is for estimating the relationship between the dependent variable and explanatory variables in my study. Let S_{cp} denote country c 's score in policy area p as quantified by the CLIM.

Recall that there are four policy areas and higher values of the index are indicative of more pro-climate policy.

$$y = \beta_0 + \beta_1 H_1 + \beta_2 H_2 + \beta_3 H_3 \dots + \beta_6 H_6 + \beta_7 H_7 + \varepsilon$$

Before proceeding, three research design issues merit some discussion. The first design issue concerns the possibility of multicollinearity. This potential problem arises when two or more explanatory variables are highly correlated. To deal with the risk of multicollinearity, I used the variance inflation factor (VIF) diagnostic.¹⁰ The results show that all explanatory variables have high tolerance value to keep their independent effect on the dependent variable, indicating that they are not highly correlated.

Second, consider the risk of heteroscedasticity. When the variance of the residuals is not constant, the standard errors of the estimated regression coefficients will be inefficient and biased. To test for this potential inferential threat I utilized the standard Breusch-Pagan test, results of which suggest heteroscedasticity is not a significant concern.

Third, the research design considers the possibility of endogeneity. One potential source of endogeneity arises from reverse causality. My empirical analysis treats all explanatory variables as exogenous variables, including international socialization (H_{1A}) and economic incentives (H_{1B}) under international institutions. One may argue that international socialization and economic incentives might affect the strength of a country's climate policy, or that the strength of a developing country's climate policy could also affect its dedication to international institutions and its ability to secure

¹⁰ The average VIF is 1.56, so multicollinearity is not a concern.

financial support. To mitigate the potential risk of reverse causation, following previous studies, all independent variables have been lagged one year (Q. Li & Reuveny, 2006).

The analysis begins with a simple bivariate regression, found in Table 2, to examine the first-order correlation between the dependent and explanatory variables. This first-cut indicates that most explanatory variables are highly correlated with the dependent variable. For instance, a developing country's exposure to scientific information and environmental norms is positively correlated with the strength of its climate policy. As indicated in the table, a unit change in the membership can increase the strength of climate policy by 0.001.

A similar relationship is also found in other explanatory variables, including developing countries' access to economic incentives, their economic development, regime type and local air quality. One interesting finding is that GDP per capita is positively correlated with the strength of climate policy in the developing countries. This finding differs from the prediction of the Environmental Kuznets Curve, in which most developing countries should stay in the left side of the curve and favor economic growth over environmental protection.

Table 2 also shows that two independent variables do not indicate statistically significant effect on the strength of climate policy. One is the political influence of interest group, and the other is the effect of ENGOs. These findings contradict with the literature on explaining domestic institutions for environmental policies. One likely reason for this result is that the indicators for both variables cannot fully capture the dynamics of domestic politics in these countries. Accordingly, the following multivariate analysis and case studies still take these two hypotheses into consideration.

Table 2. Bivariate Correlation Coefficients.

	Correlation coefficient
Membership	.0012355 ***
Climate fund	.0887861 **
Political system	.0375348 ***
Interest group political leverage	.0906332
ENGO political leverage	-.0097896
Log GDP per cap	.0507461 ***
Air quality	.0474887 ***

Standard errors in parentheses. Significance indicated as follows: *** p<0.01, ** p<0.05, * p<0.1

Table 3. Multivariate Regression Analysis.

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6
Membership	0.000670** (0.000292)	0.000657** (0.000289)	0.000677** (0.000265)	0.000586** (0.000279)	0.000631** (0.000262)	0.000899*** (0.000243)
Climate fund	0.0820** (0.0350)	0.0858** (0.0341)	0.0861** (0.0338)	0.0961*** (0.0322)	0.0986*** (0.0316)	0.0892*** (0.0325)
Political system	0.0287*** (0.00895)	0.0289*** (0.00888)	0.0289*** (0.00880)	0.0275*** (0.00874)	0.0271*** (0.00865)	0.0257*** (0.00896)
Log GDP per cap	0.0252 (0.0161)	0.0241 (0.0159)	0.0250* (0.0149)	0.0282* (0.0152)	0.0315** (0.0136)	
Air quality	-0.000148 (0.0168)	0.00296 (0.0158)		0.00735 (0.0150)		
Interest group	0.0644 (0.0657)	0.0601 (0.0649)	0.0638 (0.0613)			
ENGOS	-0.00366 (0.00660)					
Constant	-0.289 (0.184)	-0.267 (0.178)	-0.294*** (0.102)	-0.242 (0.176)	-0.312*** (0.101)	-0.110** (0.0521)
Observations	60	60	60	60	60	60
R-squared	0.511	0.508	0.508	0.500	0.498	0.449

Standard errors in parentheses. Significance indicated as follows: *** p<0.01, ** p<0.05, * p<0.1

Table 3 presents results for multivariate regression analyses between all explanatory variables and the dependent variable. The first model (m1) is the full model that includes all original potential explanatory variables. Another five models (m2-m6) have regression analysis by selecting different independent variables based on their statistical significance. Among the explanatory variables, three of them display significant effect on the strength of climate policies across all models, including membership, climate fund and political system, which indicates that one unit change of each variable can affect the strength of climate policies to different extents in terms of estimated coefficients of explanatory variables.

First, the effect of a developing country's membership in international environmental treaties is statistically significant and positive, reflecting that a developing country's growing integration into international institutions could make the country more likely to have a strong climate policy. However, it is worth noting that the effect of membership is relatively small, as a unit change in the membership only increases the strength of climate policy by 0.00067. Second, the effect of climate fund from international institutions is also statistically significant and positive. As climate fund is a dummy variable in the analysis, the result suggests that a developing country with economic incentives from international institutions has stronger climate policy than one without economic incentives. Third, the effect of political system on the strength of climate policy is statistical significant and positive across all models, indicating that the more democratic a developing country is, the more likely the country will take strong climate policy.

Among the six models, it is worth noting that four explanatory variables do not indicate statistically significant correlation with the strength of climate policy, including economic development (Log gdp_pc), air quality (Log so2_pc), political leverage of energy-intensive industries (interest group) and environmental NGOs (ENGOS). Hence, it seems that these findings may not support my previous assumptions. However, the insignificant effects of these explanatory variables could result from the data quality and sample size. To fully understand the potential role these explanatory played in a developing country's climate policy, case studies will take them into consideration.

My findings are robust to alternative indicators for political system in the data analyses, particularly different measurements for democracy (Boix, Miller, & Rosato, 2012; Cheibub, Gandhi, & Vreeland, 2010). The effect of political system on the strength of climate policy remains statistically significant and positive. In addition, since the model has a small data set with missing values, I used the multiple data imputations for missing values across all developing countries (Honaker et al., 2011; Imai, King, & Lau, 2009). The results support previous data analyses, suggesting that the strength of climate policy is significantly affected by a developing country's exposure to scientific information and environmental ideas, its access to climate finance and domestic political system.

The preliminary data analysis helps to build general causal mechanisms between explanatory variables and dependent variable. It illustrates that both international institutions and domestic political system are correlated with the strength of a developing country's climate policy. However, the statistical analysis cannot answer whether the correlations are causal, and explain when and how these explanatory variables are

correlated. Particularly, it cannot tell under what conditions and in what ways international institutions and political system have shaped the strength of climate policy. It also fails to capture the potential interaction of international and domestic dynamics.

In addition, due to data availability, the data analysis cannot fully capture political dynamics in developing countries' climate policy. First, the data sample is a cross-sectional data instead of panel data, which makes it difficult to capture temporal dynamics across countries. Hence, the limitation of data collection reduces explanatory power of the statistical analysis. Second, the difficulties in measuring explanatory variables also make it hard to truly reflect the causal effect of explanatory variables on dependent variable. Particularly, in the statistical analysis, it is very difficult to measure the effect of political leverage of energy-intensive industries and environmental NGOs in developing countries because precise data is scarce. Measuring a developing country's international socialization faces the same challenge. While I used the membership in environmental treaties as a proxy for international socialization, one could argue that international institutions can influence a country's climate policy through multiple channels, and this proxy cannot distinguish the role of international socialization from other possible channels. Therefore, in light of limitation in the data quality and small sample, all results in the data analysis need to be interpreted with caution.

Case Selection

Further research on case studies is an essential part of my study. First, it helps to include some explanatory factors that are not included in the original hypotheses, as some countries might have specific settings that facilitate their climate actions. Second, case

studies allow us to capture some factors that are too difficult to be examined by a data analysis, such as the contextual factor.

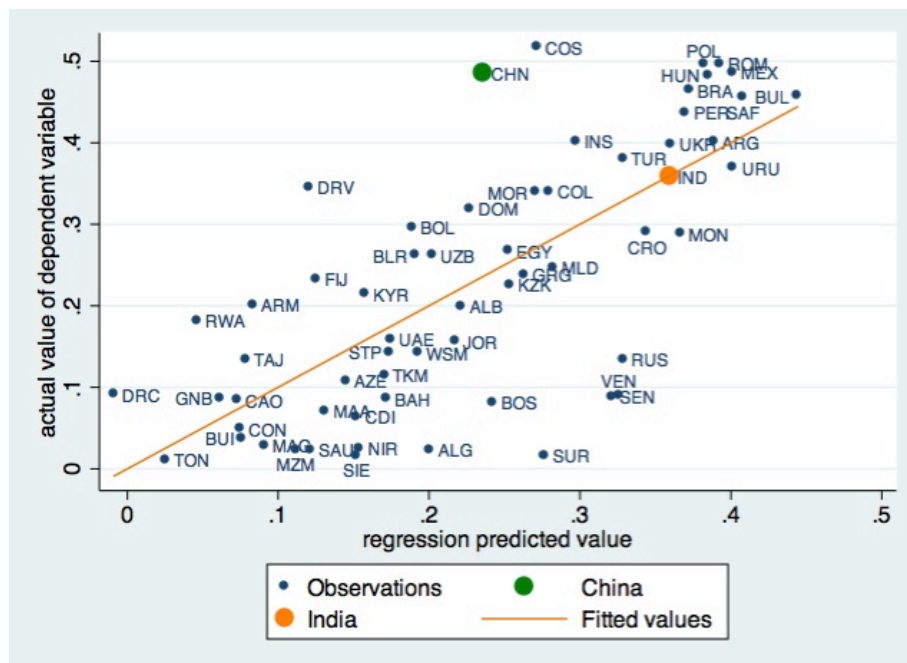
I selected cases based on the outcomes of statistical studies and on the significance of specific countries in climate change mitigation. As the preliminary data analysis suggests, the following three factors from political explanations have a statistically significant effect on the strength of climate policies adopted by developing countries: 1) a developing country's exposure to scientific information and environmental ideas in international institutions (Hypothesis 1A); 2) a developing country's access to economic incentives from international institutions (Hypothesis 1B); and 3) the political system of a developing country (Hypothesis 2). To explore linkages between international actors and different domestic groups and to capture the nuances and better understand causal mechanisms, my study selected the following two cases.

In order to examine how the causal mechanisms work in a general cross-cases relationship, I selected one typical case that is on the regression line (Seawright & Gerring, 2008). Figure 1 shows that the fitted line with predicted values from regression analysis and data observations with actual values of the dependent variable. In this figure, most data observations are clustered around the regression line. Among them, one observation (IND, which refers to India) is right on the line, which also indicates that it has the smallest residual between its actual value and the predicted value from the regression model. Therefore, I selected India as a representative case.

My study will also consider "off-the-line" cases, which are not well explained by the regression model. Focusing on these cases can help us to examine some independent variables that are not considered in the regression model due to lack of theory or data

(Lieberman, 2005). Among the “off-the-line” cases in the model, my study will investigate the case of China. First, China is a “substantively important” case in that it has special normative interest due to its major role in domestic and international politics (Mahoney & Goertz, 2006). As an emerging power among developing countries and the largest greenhouse gases emitter in the world, China’s participation in combating climate change will have a crucial impact on climate stabilization (Parker et al., 2012; Saul & Seidel, 2011). Second, studying China in particular is theoretically important as it remains an authoritarian regime with a high degree of political centralization and a traditional top-down policy making process; investigating the dynamics of its domestic politics can provide another perspective to understand policy formulation in non-democratic countries.

Figure 2: Case selection.



Moreover, taking India and China as case studies offers several advantages for analyzing the interaction between international and domestic actors in the evolution of

climate policies in the developing world. In the face of global environmental problems such as climate change, China and India share many common features, which are expected to lead them to a similar level in the strength of climate policies. In the arena of international climate negotiations, both countries have taken similar positions to defend developing countries' right to develop, and both reject quantitative mandatory emission cuts targets. As large carbon emitters, both are under growing pressure on climate mitigation. Meanwhile, both countries have drawn a number of financial resources for their carbon emission and clean energy programs due to host CDM projects under the Kyoto Protocol (Fuhr & Lederer, 2009). In the arena of domestic policy debates, India and China face a set of similar economic and environmental constraints in addressing climate change. As two of the fastest growing economies and the most populous countries, both countries take economic development and poverty alleviation as top priorities. Also, both have suffered from worsening air pollution in recent years. Therefore, climate change is neither a policy priority nor has high public support. Against this background, we should expect India and China to pursue similar climate actions. However, statistical analysis based on the aforementioned hypotheses predicts India's performance, but not China. Taking intensive investigations on these two countries enables us to explore factors that cannot be reflected in the model. One of these factors is the interaction between international and domestic actors. By tracing the process of how a global environmental problem is interpreted and structured by the dynamics of domestic politics in each country, case studies will provide another angle to examine the relationship between my independent variables and dependent variable. Another advantage for investigating these two cases is to seek possible factors that may have been

missed in previous theoretical setting but may have a decisive influence on the strength of climate policy in India and China.

As this chapter indicates, in the study to address the strength of climate policies across developing countries, data analysis is useful in examining the effects of both international institutions and domestic politics. However, it is difficult to explore the interplay between international actors and different domestic groups and to capture efforts made by local actors to put climate change on the policy agenda. To capture the nuances and better understand causal mechanisms, cases in chapter 4 and chapter 5 will be examined by using a) interviews with governmental officials, climate experts, representatives from environmental NGOs and business groups, and b) materials collected from government documents, research reports and public speeches by senior officials.

CHAPTER IV

CLIMATE POLITICS IN INDIA

As previous data analysis has indicated, a developing country's participation in international institutions and its regime type significantly affect on the strength of its climate policy. To further understand when and how the international institutions and regime type shaped a developing country's climate policy, this chapter focuses on an "on-the-line" case, India, and explores how the interaction between international and domestic actors have shaped the emergence of proactive climate policy in India.¹¹ In particular, it examines how India's integration into international environmental governance has facilitated the rise of a pro-climate policy community through international socialization and economic incentives. This pro-climate community includes societal groups from the bureaucracy as well as the scientific and business communities. It then explores how economic opportunities and changes in domestic energy governance and climate bureaucracy prompted these groups to advance their interests in climate change and push the Indian government for a proactive climate mitigation policy.

The evolution of India's climate policy also offers an interesting case in which to examine climate politics in the developing world. At first glance, India is an unlikely place to see proactive climate action. India has a fast-growing economy, and it is facing pressing challenges such as poverty alleviation and energy access. In 2004, 38.4% of

¹¹ Pervious data analysis has predicted India's climate actions, given that the observation of India is right on the regression line.

India's population still lived less than \$1.90 a day.¹² The number dropped to 31.4% in 2009, but this percentage still accounts for a large proportion of the population.¹³ Additionally, India was still ranked 134th on the Human Development Index in 2009,¹⁴ which suggests that India's overriding concern is and should be human and economic development. Aside from poverty alleviation, another challenge facing the Indian government is rural electrification. By the mid-2000s, India still had 78 million households with no access to electricity (Dubash & Bradley, 2005, p. 73). This has limited poverty reduction given the important role of electricity in accessing better economic opportunities, health care and education in rural areas. Against this background, poverty mitigation and economic development still dominate the domestic policy agenda and are viewed as the priorities for the Indian government.

Upon closer examination, India has become an active player on climate change since the late-2000s. It softened its stance on climate change in the international climate negotiations and developed a series of domestic climate actions (Atteridge, Shrivastava, Pahuja, & Upadhyay, 2012; Dubash, 2009b; K. Michaelowa & Michaelowa, 2011; Rastogi, 2011; Thaker & Leiserowitz, 2014). This chapter seeks to explain why such a strong climate policy has emerged in India.

The first section of this chapter will present an overview of the evolution of India's climate policy, including changes in India's international negotiations and domestic climate actions. The next two sections will take a closer look at the impacts of

¹² Data is from the World Bank: <http://povertydata.worldbank.org/poverty/country/IND> (Accessed by 02/04/2016).

¹³ Ibid.

¹⁴ Data is from the UNDP.

international institutions and domestic politics on the transformation of India's climate policy through the development of a pro-climate policy community. Specifically, it examines how India's participation in international environmental governance led to the emergence of a pro-climate policy community through international socialization and economic incentives. It then explores how domestic changes in energy governance and climate bureaucracy encouraged this community to advance their interests in climate mitigation. As the interplay of international institutions domestic politics, a pro-climate policy community was able to prompt India to take a proactive climate policy.

Shift in India's climate policy

India has undergone a transformation over the last two decades, gradually evolving from a strong opponent to a relatively active proponent of climate policies. Table 4 illustrates the development of India's climate policy. At international climate negotiations, India has departed from its traditional position as a southern hardliner that were at the front against climate change since the late-2000s (Dubash, 2009b; Rajamani, 2009; Vihma, 2011). At the domestic level, India has adopted a set of climate measures across different sectors, as well as at different levels of governments. This section examines the evolution of India's climate policy in greater detail.

Table 4. Timeline of India’s climate policy.

International Commitment	No International obligation	No quantified target	No quantified target	No quantified target	No quantified target; Soften rhetoric on per-capita emissions	No quantified target	Yes Voluntary quantified target pledged: 20-25% cut	Yes	Yes	Yes	Yes	Yes	Yes INDC target 33-35% cut by 2030 below 2005
Domestic Action	No climate policies	No climate policies	Energy saving and conservation	Integrated Energy Policy adopted; National Environmental Policy adopted	PM's council on climate change established; Energy Intensity reduction target launched	India's National Action Plan on Climate Change released	State Action on Climate Change (SPACC) developed		Renewable Energy Certificate (REC) trading system commenced	Perform Achieve and Trade (PAT) Scheme started		Smart cities program launched	Renewable energy target enhanced
Time	1991-1995	1996-2000	2001-2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015

Changes in International Stance

At the international level, after being a long-time opponent of strong climate action between the early 1990s and the mid-2000s, India has emerged to be an active player in the international climate negotiations in recent years.

From the 1990s to the mid-2000s, India had been strongly against making any international commitment to limit its GHGs emission, and insisted that developed countries should take major responsibility for climate change due to concerns of burden-sharing equity and economic development (Atteridge et al., 2012; Dubash, 2013; Vihma, 2011). For example, in a paper prepared for the New Delhi Conference of Select Developing Countries on Global Environmental Issues in 1990, the Indian government emphasized that “it is the developed countries which have created and continue to add the threats of climate change and it is primarily their responsibility to reverse the situation by setting limits on their emissions of greenhouse gases” (Rajan, 1997, p. 103). The Indian government also indicated that “developing countries would accept particular responses only if they do not impede their economic development or reduce the resources currently available for such development” (Rajan, 1997, p. 104). Additionally, the government showed little interest in climate change given its low per-capita emission. In the early 1990s, India emitted only 2-4% of the world total GHGs emission (Jacobsen, 1998, p. 4). If the emissions are measured on a per-capita basis, India’s per-capita emission in 1993 were five times below the world average at the time (Jacobsen, 1998, p. 4). One of India’s influential environmental think tanks, the Centre for Science and Environment (CSE), stated that it was not fair to equate the luxury consumption of the rich with the

survival emissions of the poor, and suggested a “per-capita entitlement” position for the Indian government.¹⁵ Then-Indian chief negotiator Chandrashekhar Dasgupta even presented the CSE’s original case of the “per capita” argument and took it as India’s formal position in the climate negotiations of in the early 1990s (Stevenson, 2011, p. 1012). Therefore, in India’s national report for United Nations Conference on Environment and Development (UNCED), the Indian government “listed population, poverty, agriculture and community waste as highly priorities, but climate change and sea-level rise were hardly considered” (Jacobsen, 1998, p. 7). During negotiations in the 1990s, the government also stressed that India’s development tasks cannot be compromised by climate actions, and that emissions will grow to meet its social and development needs (Jacobsen, 1998, p. 8).

The Indian government maintained this negotiating stance for a long time. During the 1997 Kyoto climate meeting, Minister of Environment and Forest (MoEF) Saifuddin Soz argued that “India categorically rejects ideas suggesting any new commitments for developing countries...India’s first and overriding priority is poverty eradication and provision of basic human needs. The Convention acknowledges that the share of global emissions originating in developing countries will grow to meet their social and development needs”.¹⁶ In 2002, India hosted the Eighth Session of the Conference of Parties (COP-8) to the UNFCCC in New Delhi, in which all parties adopted the Delhi

¹⁵ See Anil Agarwal and Sunita Narain, *Global Warming in An Unequal World* (Center For Science And Environment, 1991). The great influence of this report on shaping the Indian government’s position in the early climate negotiations can be seen in a set of scholars research (Isaksen & Stokke, 2014; Never, 2012).

¹⁶ Soz, Saifuddin. *India Rejects Incorporation Of New Environmental Commitments for Developing Countries*. (Text of speech presented at the COP-3 to the UNFCCC at Kyoto, 1997). <http://www.m2.com/m2/web/story.php/1997852568440080DDE88025683A0025702A> (Accessed by 07/08/2015).

Declaration on Climate Change and Sustainable Development. During the session, India reaffirmed its stance that development and poverty alleviation are priorities for developing countries (Government of India, 2004, p. 162). India's firm stance on climate change can also be found in its government documents. As the 2006 National Environmental Policy showed the essential elements of India's response to climate change have been "adherence to the principle of common but differentiated responsibilities", "equal per-capita entitlements of global environmental resources to all countries" and "over-riding priority of the right to development" (Government of India, 2006b, p. 43).

However, India began to change its position at international forums from the 2007 onwards (Atteridge et al., 2012; Dubash, 2013; K. Michaelowa & Michaelowa, 2012; Thaker & Leiserowitz, 2014; Vihma, 2011). Between 2007 and 2010, India began to soften its rhetoric in international climate negotiations. At a G8+5 Summit in Heiligendamm in 2007, Prime Minister Manmohan Singh pledged that India's per capita emissions would never exceed those of the developed world (Government of India, 2014). This pledge was reiterated by the Prime Minister in his address on the release of the Indian national climate change program in 2008 (Government of India, 2008b). The announcement signaled a change of India's climate policy, introducing of the notion of caps for the first time (Atteridge et al., 2012, p. 70). In 2009, before the Copenhagen climate talk, India pledged a voluntary carbon intensity reduction plan, and aimed to reduce the emissions intensity of its GDP by 20-25% by 2020. Like China, for the first time in the history of the climate negotiations, India proposed a quantified emissions reduction target (Hurrell & Sengupta, 2012, p. 471). In 2010, at the COP-16 Cancun

climate talk, Minister of the MoEF Jaiam Ramesh went a step on climate policy, and stated that “all nations must take on binding commitment in an appropriate legal form” (Ramesh, 2014). In 2015, in its submitted report to the UNFCCC regarding the Intended Nationally Determined Contribution (INDC), India included a target to reduce the emissions intensity of its GDP from 2005 levels by 33% to 35% by 2030 (Government of India, 2015, p. 34).

Changes in Domestic Climate Action

The transformation of climate governance also took place at the domestic level from the 2007 onwards, with Indian government adopting a proactive climate policy at national and subnational levels (Dubash & Jogesh, 2014; Fujiwara, 2010; Mathur & Varughese, 2009; K. Michaelowa & Michaelowa, 2011; Rastogi, 2011).

As discussed earlier, throughout the 1990s, India was strongly against making a commitment to climate change mitigation in international negotiations. The government instead focused on how to avoid such obligations while also obtaining financial support from developed countries (Rajan, 1997, p. 150). Meanwhile, it did not provide sufficient financial support to control growing emissions (Jacobsen, 1998, p. 13). There were few policies and measures that directly addressed climate change at the time (Jacobsen, 1998). India’s 8th Five-Year Plan (FYP: 1992-1997) emphasized that “it is essential that these negotiations recognize the aspirations of large masses of poor people and do not impose any burden on developing countries, respecting their sovereign right over their resources. Transfer of technology, flow of new and additional resources to developing countries to fully meet any additional cost are pre-requisites to international cooperation in the

environment sector” (Government of India, 1992, p. 4.16.17). The 9th Five-Year Plan (FYP: 1997-2002) also indicated that “global environmental issues, such as ozone depletion, climate change due to accumulation of GHGs, bio-diversity loss etc. are largely due to the rapid industrialization of the developed nations. India is an insignificant contributor to the GHG emissions” (Government of India, 1997, p. 8.2). While India’s 10th FYP plan (2002-2007) started to mention the implications of climate change nationally, it asked for further research instead of actions (Government of India, 2002b, p. 221). Although India tried to keep its domestic climate actions consistent with international negotiations, the 10th FYP showed that “developing countries are not required to take any commitment during this phase, however, under the Protocol all countries have to reduce emission of GHGs by making mitigation efforts like improving efficiency of energy conversion and utilization, afforestation, stabilizing population growth, limiting methane emissions through proper waste management and phasing out subsidies on power utilization” (Government of India, 2002a, p. 1076).

While few climate-oriented actions were adopted in India between the 1990s and early 2000s, India has begun to initiate policies that target carbon emissions. As indicated in India’s Integrated Energy Policy 2006 and its first National Environmental Policy of 2006, India’s sustainable development plans, ranging from renewable energy advancement to energy efficiency enhancement will lead to GHG emissions reduction (Government of India, 2006a, p. 135, 2006b, p. 42). In 2007, the Prime Minister (PM) instituted a Council on Climate Change (PMCCC), which is a special office with a high-level advisory group on climate change within the Prime Minister’s Office. It is designed to advise the government on mitigating climate change and to coordinate national actions

(The Hindu, 2007). India's 11th FYP (2007-2012) also detailed domestic climate actions “to reduce the energy intensity per unit of GHG by 20% from the period 2007-08 to 2016-17” (Government of India, 2007b, p. 207). In early 2008, the PM's office set up a Special Envoy on Climate Change to better engage in both international negotiations and domestic planning. During the same year, the PMCCC released the National Action Plan on Climate Change (NAPCC), which outlines eight national missions for combating climate change, ranging from renewable energy development to water mission and sustainable habitats protection (Dubash & Joseph, 2015, p. 15). In 2009, the Indian government also requested all states to develop a State Action on Climate Change (SPACC) under the framework of the NAPCC (The DNA, 2009). These SPACCs were expected to develop specific and necessary institutional and policy infrastructures to support the implementation of climate actions (TERI, 2011, p. 5). By 2013, 22 states and Union Territories had completed drafts of their SPACCs, nine of which had been approved by the MoEF (Dubash & Jogesh, 2014, p. 1). Additionally, in 2010, an Expert Group on Low Carbon Strategies for Inclusive Growth was set up to support the formulation of India's 12th Five Year Plan (FYP: 2012-2017), and to analyze sectoral mitigation opportunities and develop low-carbon strategies (Shakti, 2015, p. 1). In 2015, India also created a new plan for renewable energy that pledged to increase the share of non-fossil fuels to 40% in the total energy consumption by 2030 (The Hindu, 2015).

In addition to policy support for climate mitigation, the central government has begun to offer financial support to deal with climate change. First, India increased investment in renewable energy, particularly after 2009. By 2011, India had become the

second-largest country in renewable energy investment among developing countries.¹⁷ In November 2010, India initiated a market-based mechanism to encourage the use of renewable energy, the Renewable Energy Certificate (REC) trading system (EDF, 2015, p. 4). This market mechanism aims to promote power companies to increase renewable sources in their power generations by setting up specific targets (EDF, 2015, p. 4). Additionally, in 2010, the government launched another market-based mechanism targeting energy efficiency enhancement, the Perform Achieve and Trade (PAT) initiative, which is a cap-and-trade scheme for energy efficiency (EDF, 2015, p. 2). The system resembles the Emissions Trading Scheme (ETS), but it employs a cap on energy intensity rather than on absolute carbon emissions. It sets mandatory energy efficiency targets on 473 facilities from energy-intensive industries and the electricity sector, which accounted for 60% of India's 2007 GHG emissions (EDF, 2015, p. 2).

As discussed above, India's climate policy has undergone an important evolution since 2007. On the international front, India has played a more constructive role in international climate negotiations. It relaxed its attitude towards climate action in 2007 and proposed a voluntary quantified emissions target in 2009. Domestically, India has formulated proactive climate measures to improve energy efficiency and the development of renewable energy, such as the creation of the two market-based mechanisms, the PAT and the REC in 2010, and a new renewable energy advancement plan in 2015. These changes are in contrast with the initial inaction and rejection to climate mitigation schemes between the 1990s and early 2000s. This chapter seeks to answer why and how a

¹⁷ Data from Global Trends in Renewable Energy Investment 2013. India's renewable energy investment faltered between 2012 and 2013, but started to rise in 2014. According to the same report in 2015, it was the third-largest country in renewable energy investment among developing countries.

developing country such as India, which has an unfinished development agenda, low-capita carbon emissions and a strong concern for equitable burden sharing, has adopted a proactive climate policy. Below, I argue that the transformation is due to the evolution of a pro-climate policy community as a result of interaction between international and domestic political dynamics. International institutions facilitated the emergence of this pro-climate group with roots in scientific and business groups through international socialization and economic incentives. However, national politics have divided this community regarding the extent of their commitment to climate mitigation. The gradual shift in policy illustrates the compromise between international pressure and domestic interests.

The Impact of International Dynamic

This section explores the impact of India's participation in global environmental governance on domestic actors' attitudes towards climate change. Specifically, it examines how the international institutions helped to create a pro-climate community with international socialization and economic incentives. This community comprises climate experts, private entrepreneurs and government bureaucrats. Between the late 1990s and mid-2000s, India's growing political and economic integration globally created an atmosphere in which domestic actors could exchange scientific knowledge and ideas about the environment. The increased access to information particularly shaped climate experts' perception of climate change and its implications for India. In addition, economic incentives created an opportunity for stimulus and growth in the business sector. By cultivating a group of pro-active climate actors, international institutions have

played an important and constructive role in shaping the transition of India's climate policy from 2007 until the present day.

Scientific and Environmental Discourses

Between the late 1990s and mid-2000s, India's growing participation in the international institutions has influenced the salience of climate change in the domestic policy agenda. In particular, the interaction of international environmental research institutions and India's scientific and bureaucratic communities has promoted the emergence of pro-climate advocates within the two communities, which has brought the scientific perspective on the implications of climate change for India into the climate policy debate.

While India has engaged in discussion of climate change internationally since the early 1990s, both the government and the scientific community remained skeptical of global scientific assessments on climate change due to their limited involvement in the international scientific research (Biermann, 2002; Kandlikar & Sagar, 1999; Siebenhüner, 2003). This distrust was evident in the assessment reports from the Intergovernmental Panel on Climate Change (IPCC). The first chairman of the IPCC, Bert Bolin had pointed out that "many countries, especially developing countries, simply do not trust assessments in which their scientists and policymakers have not participated" (Siebenhüner, 2003, p. 113). Therefore, throughout the 1990s, the IPCC had been criticized for skewed reports with insufficient information and communication by developing countries such as India. Even if this organization is the foremost scientific authority on climate change with broad research and assessment capabilities on climate

change and detailed information on causes and consequences of climate change. Some Indian experts viewed the IPCC as a “political-scientific institution with little transparency and inherent Northern intellectual supremacy” (Biermann, 2001, p. 299). They also argued that the IPCC did not take developing countries’ interests into sufficient consideration, including a lack of concern for monsoon variability and equitable sharing for climate change (Biermann, 2001, pp. 300-301).

Against this background, beginning in the later 1990s, the IPCC has made efforts to increase the participation of researchers and analysts from the developing world so as to facilitate the interaction of experts and knowledge transfer. This interaction helped the IPCC place more emphasis on issues that concerns developing countries, such as the socio-economic effects of climate change and a climate vulnerability assessment, and also stimulated India’s scientific capacity on climate change research (Biermann, 2001). In addition, between the late 1990s and the mid-2000s, there was growing scientific collaboration between the international institutions and India’s environmental and scientific communities on the implications of climate change for India (K. Michaelowa & Michaelowa, 2011; Never, 2012; Rajamani, 2009; Sathaye, Shukla, & Ravindranath, 2006). One notable example of international cooperation is India’s first national communication report for the UNFCCC in 2004, which was based on a collaborative effort between India’s scientific community and the Global Environmental Facility (GEF) (Sathaye et al., 2006, p. 323). It involved a number of domestic research teams and educational institutions for research in climate modeling, climate impacts and mitigation (Sathaye et al., 2006, p. 323). During this time period, the election of Rajendra K. Pachauri as the head of the IPCC in 2002 also facilitated interaction between

international institutions and India's scientific community to some extent (K. Michaelowa & Michaelowa, 2011, pp. 7-8). One of India's leading scientists, Pachauri, also served as the director of the Energy and Resource Institute (TERI: its former body is Tata Energy Research Institute), an influential research institution for India's climate and energy issues and active participant in national policy making (Jacobsen, 1998, p. 18). TERI has a close relationship with the government, particularly because many climate experts and bureaucrats have worked previously at the TERI (Never, 2012, p. 380). This link between international institutions and domestic scientific and bureaucratic communities could also increase scientific information exchange on climate change and allowed it to gain more attention at home.

From the mid-2000s, increased interaction with international institutions has promoted climate change on the domestic policy agenda and cultivated a group of pro-climate actors in the scientific and environmental communities, especially after the IPCC released its fourth assessment report and won a Nobel Prize for its work on climate change in 2007. This group has called for proactive climate actions from the Government of India (Bharadwaj, 2007; Dubash, 2007; Mehra, 2007; Rajamani, 2007). Interviews by Isaksen and Stokke (2014) showed that "increased knowledge and awareness about India's vulnerability has been an important driver for India's climate policy... the IPCC, its chairman [Rajendra K. Pachauri] and other Indian climate researchers acted as knowledge brokers that brought attention to climate change impacts in India" (Isaksen & Stokke, 2014, p. 114). For instance, one climate expert, referring to the Stern Review and the fourth IPCC report, argued that India's focus on the rhetoric of equity in climate change negotiation "is legitimate but not sagacious" due to adverse effects of climate

change on India's economy, and the lack of domestic action would undermine international efforts to combat climate change (Rajamani, 2007, pp. 1-3). Another climate policy expert from an environmental nongovernmental organization, the Center for Social Market, stated that "India may not be the biggest global emitter, but it is time we were pro-active in addressing its impacts on our people", given that India's has a large population depending on climate-sensitive sectors (Mehra, 2007, p. 11).

One of the most prestigious and influential policy journals in India, *Economic and Political Weekly (EPW)*, also published a number of articles featuring climate change in 2007 than it was before. An editorial in the EPW about the IPCC's fourth report indicated that "the planet earth has reached an ecological turning point, and we need to think and act radically if we are to survive" (Editorial, 2007, p. 900). Climate expert, Nagraj Adve, whose article "*Implication of Climate Panel Report*" featured in the EPW, pointed out that "there is no doubt that the first world and capitalism are primarily responsible for the plight we are in... but given the little time to act and given that all scientific studies indicate that South Asian and Indian water sources, forests, biodiversity, shorelines and agriculture are already getting hit and going to get worse hit, the Indian government needs to move fast" (Adve, 2007, p. 1002).

Anshu Bharadwaj, the director of the Center for Study of Science, Technology and Policy, also published his article "*Carbon Counting*" in the EPW, regarded the fourth IPCC report as "a stern warning", indicated that "India may reject proposals for mandatory cuts in carbon dioxide emissions, but it has to consider meeting a reasonable proportion of its growing energy supply from carbon-free technologies" (Bharadwaj, 2007, p. 13). Discussing India's negotiation position in the 2007 Bali climate meeting

after the release of the IPCC report, climate policy scholar Navroz Dubash argued that “India needs to now ask itself if it should hold on to a defensive national stance on climate or if the time is right to develop and implement creative national policies...India has sought to occupy the moral high ground on climate change. But in a warming world, simply occupying the moral high ground will provide us little defense against climate devastation” (Dubash, 2007, p. 37). The impact of substantive scientific knowledge of the fourth IPCC report not only reaches out to the Indian scientists, but also bureaucrats. As noted by Rajamani (2009), in his address to the Indian Science Congress in January 2007, the Prime Minister said that “the science of climate change is still nascent and somewhat uncertain” (Government of India, 2007c). However, in his 2008 address, he acknowledged that “the recent global concern about climate change and global warming is in fact based on painstaking statistical work” (Government of India, 2008c).

By fostering interaction between international institutions and India’s domestic scientific and bureaucratic communities, the credibility and legitimacy of global environmental assessments on climate change have increased since the mid-2000s. The diffusion of scientific knowledge and the building of national scientific capacity have facilitated the emergence of advocates who are conscious of the negative effects of climate change on India and the urgency needed in addressing it.

Economic Incentives

Between the late 1990s and the early 2000s, international institutions have also facilitated the emergence of pro-climate actors with roots in the business community through economic incentives, especially the Clean Development Mechanism (CDM). As

a market-based mechanism under the Kyoto Protocol, the CDM is designed to encourage developed countries to make investment in climate mitigation projects in developing countries, while also potentially providing access to advanced technologies. Since the 2000s, the CDM has gained considerable interests from India's industrial sector due to the interaction of the international community and India's climate research and business groups (Bhushan, 2009; Parikh & Parikh, 2004; Shukla, Balasubramaniam, & Yajnik, 2004).

During India's early participation in international climate negotiations in the 1990s, its industries showed little interests in climate change due to scientific uncertainties and business competitiveness risks (Das, 2012; Jacobsen, 1998; Never, 2012; Pulver, 2012; Rajamani, 2009). At that time, they were neither invited to the discussion of India's negotiating stance nor involved in the views exchange with the major government institution for climate change, the Ministry of Environment and Forests (MoEF) (Jacobsen, 1998, p. 29). Also, the Indian industry doubted the scientific certainty of climate change, and regarded it as a kind of non-tariff restrictions used by developed countries to impede India's economic growth (Das, 2012, p. 247).

However, starting in the early 2000s, India's exposure to information about the CDM and other profitable opportunities began to draw the attention of India's business sector, which became enthusiastic about this and more interested in climate mitigation (Das, 2012; Deodhar, Michaelowa, & Krey, 2003; Pulver, 2012; Stevenson, 2011). There were different international organizations that involved in India's CDM capacity building programs, such as the United Nations Development Programme (UNDP), the Asia Development Bank (ADB) and the German Technical Cooperation (GTZ, now GIZ)

(Phillips & Newell, 2013, p. 656). One example of the interaction between India's industries and international institutions is the Indo-US Dialogue regarding the CDM between 1999 and 2000 (Stevenson, 2011, p. 1016). This dialogue was due in part to efforts of two U.S. climate policy officials, Kathleen McGinty and Karl Hausker, who had been visiting TERI as senior fellows at that time (Stevenson, 2011, p. 1016). It brought business leaders from the U.S. and India together to discuss opportunities presented by the CDM. They also held ministerial meeting to talk about "working closely together with other countries to develop... international rules and procedures for the Kyoto mechanisms, including the CDM" (Stevenson, 2011, p. 1016). This kind of interaction has promoted the awareness of the CDM among India's industries. Later, between 2001 and 2002, when the Netherland government initiated a program, the Certified Emission Reduction Unit Procurement Tender (CERUPT), to buy Certified Emission Reduction Units (CERs) generated by CDM projects, the Indian project developers quickly seized the opportunity with "the entrepreneurial spirit of the Indian industry" (Rajamani, 2009, p. 349). These private entrepreneurs began to seek advice from research institutions such as TERI on CDM project proposals and approval from the MoEF to participate in the Dutch and Finnish carbon tenders in the early 2000s (Deodhar et al., 2003, p. 6; TERI, 2005, p. 3).

Additionally, some large business associations, such as the Confederation of Indian Industry (CII) and the Federation of Indian Chamber of Commerce and Industries (FICCI), being aware of economic opportunities beyond the CDM, also began to promote an consensus climate change mechanisms within the Indian industry (TERI, 2001, p. 6). The CII even developed a detailed handbook aimed at raising awareness of the CDM-

related investment opportunities for its members (Pulver, 2012, p. 259). Attracted by additional investments from the CDM, the Indian industry pressured the government to set up authorities and regulations to manage CDM projects development (K. Michaelowa & Michaelowa, 2011, p. 7). By late 2005, India had surpassed Brazil to become the largest CDM projects holder (Pulver, 2012, p. 256). The business group also became more involved with India's climate negotiations. The FICCI sent its first delegation to the 2004 climate talk, and the CII became a registered participant observer in the climate negotiations after 2005 (Pulver, 2012, p. 259). Since the mid-2000s, the business sector's increased interests in market-based mechanisms aimed at economic support for climate change mitigation have prompted more attention on the domestic political agenda.

International Pressure

As a participant in international institutions, India is not only exposed to scientific knowledge and economic incentives, but also to growing pressure from the international community, particularly from other developing countries (Atteridge et al., 2012; Hallding et al., 2011; K. Michaelowa & Michaelowa, 2011; Rastogi, 2011; Vihma, 2011). This pressure has rose with India's growing economy and international aspirations in the mid-2000s.

While India was continuously under international pressure for its stance on climate change throughout the 1990s, it was able to resist this influence with other developing countries by defending its right to develop. However, after rapid economic development began in the early 2000s, India has found it more difficult to use "the right to develop" as a defense for climate inaction. This is particularly true when it pursues a

leadership position in the international community, such as its bid for permanent membership in the UN Security Council since the mid-2000s (Atteridge et al., 2012; Hallding et al., 2011; Rastogi, 2011). As some Indian scholars have pointed out, the country's aspiration to be seen as an emerging great power means that it also needs to take a leadership role in important global issues, such as climate change (Kapur, Khosla, & Mehta, 2009, p. 34).

During the 2007 Bali climate meeting, India refused to commit any further action on climate change without imposing more ambitious targets on developed countries. This attitude created an image of India as being “obdurate” and gained bad reputation on tackling climate change (The Economist, 2008). This perception of India made India puzzled and disappointed (Dubash, 2009a; Mathur & Varughese, 2009). In a speech regarding India's challenges in climate change negotiations, Shyam Saran, a senior climate negotiator and who was later appointed as Special Envoy of climate change in 2009, said that “I found a deliberate and systematic diplomatic offensive to put India on the defensive, characterize it as a naysayer, as the Economist once said, acquire the reputation of being obstinate and recalcitrant” (Saran, 2010). He acknowledged that “it is also important to appreciate that in branding India as ‘obdurate’ or as a naysayer, there was also psychological pressure being brought upon us” (Saran, 2010). Aside from this, India's traditional defensive approach to climate change faced criticism from other developing countries, such as Granada, Bangladesh and the Maldives (Thaker & Leiserowitz, 2014, p. 112; Vihma, 2011, p. 84). In his explanation of the shift of India's negotiating stance in 2009, the Minister of the MoEF, Jairam Ramesh, indicated that India's traditional stance was “disfavored by the developed countries, small island states

and vulnerable countries. It takes away from India's aspiration for permanent membership of the Security Council" (Times of India, 2009a).

India was also facing pressure from another large emitter in the developing world, China. As India's rival for international status, China's performance on climate change also had an impact on India's climate policy making (Hallding et al., 2011, p. 63). In contrast to being portrayed as "obdurate", China was "praised as flexible and forward-looking" by the international community following the Bali 2007 meeting (Walsh, 2009). This pressure might partially explain why India released its first climate action program in 2008, which "in its form and structure, showed considerable similarity to the Chinese plan, which had been released a year earlier", as noted by Dubash and Joseph's research (Dubash & Joseph, 2015, p. 13). The government of India also used this domestic climate plan to signal that India was a "global citizen" that wanted to take further action on climate change (Livemint, 2007). The pressure from China became prominent after India and China signed an agreement on climate change cooperation in 2009 (Government of India, 2009). By aligning with China, India tried to safeguard its interests in climate negotiations, so as to resist the pressure from the international community on committing to legally binding emissions cuts. However, China's increasing proactive climate action, coupled with President Obama's pledge for emissions cut has put unexpected pressure on India prior to the 2009 Copenhagen climate meeting (Lakshimi, 2009). R.K Pachauri, a top Indian climate scientist as well as the ex-chairman of IPCC, pointed out that "India was at the crossroads after the recent U.S. and Chinese move" (Lakshimi, 2009). Thus, in late 2009, India followed China's example in announcing its voluntary carbon intensity target at the Copenhagen meeting. The Minister of MoEF, Jairam Ramesh, indicated that

India's pledge was stimulated by international pressure, and its specific form and contents were influenced in particular by China (Dubash & Joseph, 2015, p. 14).

As noted above, between the late 1990s and the mid-2000s, India's growing integration into the international institutions facilitated the rise of pro-climate actors with roots in scientific, business and political communities, which began to advance climate change mitigation in the domestic political agenda. Through international socialization with India's climate experts regarding the scientific knowledge of climate change, international institutions helped to raise awareness of India's vulnerability to climate change in both the government bureaucracy and civil society, which began to pay attention to the negative effects of climate change. Additionally, through economic incentives, international institutions promoted the participation of the Indian industrial sector on climate change, and stimulated their interest in climate mitigation. Growing international pressure also played an important role in the adoption of a proactive climate policy by cultivating pro-climate actors in the bureaucracy, within which some bureaucrats saw a link between India's international aspiration and proactive climate actions.

The Impact of Domestic Dynamic

The transformation of Indian climate policy is due to a strong climate-oriented policy community created from the interaction of international and domestic dynamics. The previous section examined the impact of international institutions on India's climate policy shift. This section focuses on how domestic political dynamics have shaped India's climate politics by expanding the pro-climate policy group since the mid-2000s.

Specifically, it examines changes in energy governance and climate bureaucracy and their effects on India's climate policy.

Change in Energy Governance

Between the early 2000s and mid-2000s, India's energy governance went through a major shift. Due to insufficient supply and limited access, the focus moved from conventional energies to clean energies. This change provided an opportunity for the pro-climate policy community to advance their own interests in domestic climate policy debates. Specifically, this change enabled a broad coalition with pro-clean energy government institutions and renewable energy sectors to be built. This was accomplished, in part, by linking climate change to energy security.

Since the early 2000s, there had been a widening gap between energy supply and energy demand due to India's higher economic development. Benefiting from economic liberalization in the early 1990s, India's economy grew rapidly in the 2000s. From the 9th Five-Year Plan (FYP) period (1997-2002) to the 10th FYP (2002-2007), the average of India's economic growth rate increased from 5.35% to 9.15% (Balachandra, Ravindranath, & Ravindranath, 2010, p. 6432). This higher economic growth drove a rapid increase in energy consumption. Starting in the early-2000s, the widening gap between energy supply and demand led to a severe energy shortage. Between 2003 and 2004, India suffered an estimated shortage of 7.1% in energy terms and 11.2 % in terms of peak demand, and the number goes up to 10% and 17% respectively between 2007 and 2008 (TERI, 2009, p. 5). According to the Indian government's integrated energy policy report, if India wants to keep its economic growth rate of 8% over the next 20 years, it

will need to increase its primary energy supply by three to four times its 2003-04 levels (Government of India, 2006a, p. xiii). India's heavy reliance on fossil fuel imports exacerbates the insufficient supply. India's primary energy sources, coal and oil, which accounts for two thirds of India's total energy consumption, are overwhelmingly dependent on imports.¹⁸ This leaves India vulnerable to the fluctuation of energy prices on the international market, as well as to domestic social instability (Varigonda, 2013, p. 1113). In addition, the insufficient energy supply has been exacerbated by the increased political and economic risks of conventional energy access, which have suffered setbacks domestically and internationally since the early 2000s. While India has abundant coal reserves, its current coal production not only fails to keep pace with coal consumption, but also faces debates on banning coal mining in forest areas (Noronha, 2009; Sant & Gambhir, 2012). The Indian government also has realized that its assumption about India's access to primary energy sources such as coal has been over-optimistic, as the estimates of 200 years of domestic coal reserves now might run out in around 45 years (Dubash, 2011, p. 71). Aside from this, India's oil imports are also facing competition from other emerging economies, such as China, in the global market. This has increased India's concerns regarding the limitations of conventional energies (Noronha, 2009; Rastogi, 2011).

Acknowledging the constraints of conventional energies development on economic growth and energy security, the Indian government has become more interested in renewable energy development (Chaudhary, Krishna, & Sagar, 2015; Dubash, 2011; Sant & Gambhir, 2012). Between the early 2000s and mid-2000s, India developed a set

¹⁸ Data is from the EIA.

of energy policies to further renewable energy development, particularly in wind and solar power sectors. In 2003, the Indian government enacted the Electricity Act of 2003, which provided a new institutional and legal framework for electricity generation and distribution, including promoting the generation of electricity from renewable energy (Chaudhary, Narain, Krishna, & Sagar, 2014; Dubash, 2011; Fujiwara, 2010). Following this was the passing of the National Electricity Policy 2005 and the National Tariff Policy 2006, which require all state-level energy regulatory commissions to set up the share of electricity generated from renewable energy and a minimum percentage for power purchase from renewable sources (Chaudhary et al., 2015, p. 65). For instance, Karnataka's Energy Commission set up a minimum of 5% and a maximum of 10% of electricity from renewables, and Madhya Pradesh's Energy Commission stipulated 0.5% of electricity from wind power by 2007 (Lewis, 2007, pp. 217-218). In addition, the government launched a rural electrification scheme, Rajeev Gandhi Grameen Vidyutikaran Yojana (RGGVY) in 2005, under which solar energy was regarded as an off-grid solution for electrification in remote regions (Harish & Raghavan, 2011). With policy support, wind and solar power sectors have started to flourish since the mid-2000s. Between 2003 and 2008, India's wind power industry developed rapidly, with an average growth rate of 35%, which generated a number of wind power firms (Chaudhary et al., 2015, p. 66). The most influential one, Suzlon, has become a leading wind turbine manufacturing firm both internationally and domestically with 8% market share in the global market and 52% of India's market by 2006 (Lewis, 2007, p. 219). Aside from this, the government's rural electrification also created space for solar power development.

Some Indian firms such as Moser Baer and Tata BP Solar started to develop manufacturing plants in India (Chaudhary et al., 2015, p. 72).

Since the mid-2000s, India's burgeoning renewable energy sectors, coupled with growing international concern on climate change, have created a new narrative that suggest linking energy security to climate change has emerged in India since the mid-2000s (Dubash, 2011; Mehra, 2008). India's 2006 Integrated Energy Policy report indicated that "for us the imperative is to push energy efficiency, promote modern renewables, develop new technologies that augment our energy supply such as in-situ coal gasification that also provide scope for carbon capture, and emphasize nuclear power. All of these will automatically help reduce the GHG emissions" (Government of India, 2006a, p. 136). In 2007, the MoEF released a report titled "Addressing energy security and climate change". It emphasized the significance of energy supply and access in India's national development strategy, and identified clean energy access and energy efficiency enhancement as ways to build energy security and cut carbon emissions (Government of India, 2007a, p. xiii). Therefore, it is not surprising that India's 2008 national climate action plan, the NAPCC, focused on renewable energy policies that also mitigate carbon emissions. One example is the Solar Mission that outlined in the NAPCC. This plan aimed to deploy 20,000 MW of solar power by 2022. To achieve this target, it required further development of solar technology, as well as the capacity of grid-connected solar power and off-grid solar applications (Government of India, 2008a). The growing connection between energy policies and climate change policy during the transition of India's energy governance also brought the MoEF and the Ministry of New and Renewable Energy (MNRE) together for climate mitigation (Chaudhary et al., 2014).

This nexus of climate change and energy security had growing support from other senior climate policymakers after 2007. In his speech at Asia Society in 2008, The Minister of External Affairs, Pranab Mukherjee, highlighted the close linkage between climate change and energy security and the challenges both pose to India (Mukherjee, 2008). Additionally, in his 2009 speech titled with India's climate change initiatives, the Special Envoy on Climate Change, Shyam Saran, indicated that "for India, the climate change argument and the energy security argument have come together in compelling fashion...India must overcome the energy constraints on its growth and must do so in a global environment of increasing finite and depleting source of energy" (Saran, 2009). He also called for a shift in strategy from reliance on fossil fuels to a pattern of growth based on clean energy to deal with India's energy security as well as climate change. During this shift to further renewable energy development, India is preparing itself for stable economic development with sufficient and safer energy supply and proactive climate actions.

Change in Climate Change Bureaucracy

The shift in India's climate policy not only benefits from the change in India's energy governance, but also from a transformation within India's bureaucracy on climate change between 2007 and 2009. A change in staff on India's climate policy institutions provided an opportunity for the pro-climate actors to advance their interests on the domestic policy agenda, and enabled them to have a greater say in India's climate policymaking process (Never, 2012; Vihma, 2011).

Over the last two decades, India's climate policy has been dominated by senior bureaucrats who favored a traditional defensive approach towards climate change, such as Chandrashekhar Dasgupta, Prodipto Ghosh and Shyam Saran (Dubash, 2009b; Never, 2012; Vihma, 2011). Due to concerns for India's unfinished development plans and the need for emissions space, these senior bureaucrats have been hesitant to promote strong climate policy. Chandrashekhar Dasgupta, then-chief climate negotiator from the MEA, emphasized the equitable burden sharing for climate change in terms of per-capita in the climate negotiations in the 1990s (Stevenson, 2011). While he was retired from the MEA in 2000, he was still an influential figure in India's climate policy given his continued participation in the Indian delegation until 2009 (Vihma, 2011, p. 81). Another veteran climate negotiator, Prodipto Ghosh, who joined India's delegation in 2001 as a top bureaucrat from the MoEF, had also been cautious about an ambitious climate policy, fearing that climate change would limit India's development space (Vihma, 2011, p. 81). As he emphasized, "India's concerns about economic growth and poverty eradication are legitimate and must be fully respected in any global climate regime" (Ghosh, 2009, p. 35).

Starting with the appointment of Jairam Ramesh as the Minister in mid-2009, the MoEF under Ramesh has been pushing for ambitious climate policy domestically and internationally (Atteridge et al., 2012; K. Michaelowa & Michaelowa, 2011; Never, 2012). The takeover of Ramesh and his new team of young advisers in the climate policy process broke "the longstanding influence of several bureaucrats and advisers who stood for India's old, reactive position in the international negotiations and a preference for growth over environment in all cases" (Never, 2015, p. 96). During Ramesh's tenure as the Minister of the MoEF between 2009 and 2011, India initiated a number of domestic

climate measures, such as developing State Action Plans on Climate Change (SAPCC) to promote state-level climate action, and building the Indian Institutions on Climate Change Assessment with climate scientists to further India's climate research (Dubash & Joseph, 2015). Ramesh also sought to reframe India's stance in the international climate negotiations. In Ramesh's leaked letter to the Prime Minister before the Copenhagen climate meeting in 2009, he argues that "India need to be seen as a deal-breaker and should try to curb emissions in its own interests", in addition, he suggested that India should "not stick with G77 but be embedded in G20. We should be pragmatic and constructive, not argumentative and polemical" (Times of India, 2009a). As explained by Ramesh, he sought to "drive the domestic agenda and use that agenda for building a leadership position internationally" (Dubash & Joseph, 2015, p. 13). Meanwhile, the MoEF also consolidated its power in the climate policy process under the leadership of Ramesh (Dubash & Joseph, 2015). Its powerful position led to the disbanding of the Prime Minister's Special Envoy on Climate Change, a climate coordination organization led by a senior conservative climate bureaucrat, Shyam Saran (The Hindu, 2010).

While Ramesh's bold statements on international negotiations were under harsh criticism from domestic actors in both the bureaucracy and civil society, his ambitious domestic climate measures faced little opposition as both sides share concerns on India's energy problems and unfinished development tasks. For instance, after the release of the leaked letter Ramesh sent to the PM in 2009, senior climate negotiators such as Chandrasekhar Dasgupta and Prodipto Ghosh, had even threatened to pull out of the Copenhagen talks as they feared that the shift of India's position on climate change would put constraints on economic growth (Times of India, 2009b). This concern was also

shared by the business community. President of the Federation of Indian Chambers of Commerce and Industry (FICCI), Harsh Pati Singhania, who wrote to the PM and emphasized that "per capita emissions should remain the basis for greenhouse gas emissions reduction, as reiterated by you at the inauguration of the Delhi High Level Conference on Climate Change Technology Development and Transfer" (Times of India, 2009b). In addition, a number of environmental NGOs petitioned the Prime Minister that India's climate policy must take India's development into consideration and that the government not commit to any mandatory emissions cuts without financial and technological support from developed countries (Livemint, 2009).

In response to the criticism, Ramesh made a speech in the Parliament right before the 2009 Copenhagen climate meeting. He argued that, "I separate domestic responsibility from international obligation. I want to be aggressive on domestic obligation and I want to be pro-active on international obligation because in international obligation there is only one thing that counts...it is India's interest that counts".¹⁹ While Ramesh's progressive approach to international negotiations faced large opposition, his ambitious plan for domestic climate actions gained support from the conservatives. The senior climate negotiator Chandrasekhar Dasgupta, who initially expressed his opposition to Jairam Ramesh's approach to international climate negotiations in 2009, also agreed on the importance of domestic climate actions. In his interview with the Indian Foreign Affairs Journal, he pointed out that "capping our low emissions would make very little difference to global warming but would seriously impede our development programs and

¹⁹ See excerpts from Lok Sabha and Rajya Sabha debates from *Handbook Of Climate Change And India* (edited by Dubash), p. 239.

nullify efforts to build up our coping capacity against climate change... this does not mean that we should do nothing to moderate the inevitable increase in our emissions. They are major opportunities for adopting cost-effective energy efficiency and energy conservation measures. These promote our development objectives, while also yielding import co-benefits for climate change mitigation” (C. Dasgupta, 2011, pp. 226-227).

Conclusion

The last decade witnessed the shift of India’s response to climate change, from inaction to proactive action. After 2007, India not only began to relax its rhetoric on international climate negotiations and pledge a voluntary quantified emissions reduction target, but also to adopt a set of strong domestic climate measures. After examining both international and domestic factors, this chapter finds that the transformation of India’s climate policy resulted from the creation of a strong pro-climate group because of interaction of international and domestic dynamics. Between the late 1990s and the mid-2000s, India’s participation in the international environmental institutions helped further climate change mitigation on the domestic policy agenda by developing a diverse group of pro-climate actors. Growing international socialization with scientific knowledge of climate change drew attention to Indian climate experts, and prompted them to bring scientific aspects of climate change into climate policy debates. Also, because of economic opportunities provided by the CDM, business entrepreneurs also started to lobby for proactive climate policies. Another important international factor is increased international pressure on India, particularly because of the role that India desires to play on the world stage. In addition, changes in domestic dynamics enabled the pro-climate

group to increase its influence on climate policy. In particular, changes in India's energy governance and climate bureaucracy expanded the pro-climate group with renewable industries and pro-climate bureaucrats. The shift of energy governance in the mid-2000s created a new link between energy security and climate change by developing renewable energies, and cultivating pro-climate actors in renewable industries. Meanwhile, the changes in the climate bureaucracy from 2008-2009 enabled the pro-climate bureaucrats to exert more influence to steer India's climate policy development.

It is worth noting that political opposition to a strong climate policy remained in India, especially regarding a legally binding international commitment, given India's unfinished development tasks. This concern is reflected in the widespread opposition to Ramesh's ambitious international commitments in 2009. Also, due to this strong domestic concern on the right to develop, while India has softened its rhetoric in climate negotiations, it has pledged a voluntary target rather than a legally binding one. Therefore, to reconcile economic development and climate change, India's climate policy focuses on a co-benefits approach, aimed at linking climate action to domestic development plans, such as energy security and poverty eradication but to disconnect proactive domestic action from international commitment (Atteridge et al., 2012; Dubash, 2013; Thaker & Leiserowitz, 2014). This approach became evident after the end of Ramesh's tenure as the Minister of the MoEF, the new Minister, Jayanthi Natarajan took a more traditional position at international climate negotiations than his predecessor (Isaksen & Stokke, 2014; Never, 2012).

The development of India's response to climate change also presents a case study to look at environmental politics in the developing world, and offers insights into how to

engage developing countries with global climate governance. Like most developing countries, India is facing challenges from economic development and environmental protection, and has endeavored to keep a balance in between. If building a link between economic development and climate change control, India is able to ensure its development prospects are not compromised by climate change. Instead, these agendas could facilitate climate mitigation and adaptation.

CHAPTER V

CLIMATE POLITICS IN CHINA

Climate governance in China presents a case study to understand why an authoritarian country would have a more ambitious climate policy than what the previous statistical model predicts. As an authoritarian regime that prioritizes economic development over environmental protection, it is surprising that China has begun to take substantial actions on climate change mitigation over the last decade. The Chinese government has proposed its own voluntary quantified emissions reduction target in international climate negotiations, and is starting to adopt a carbon-trading scheme, to increase investment on the development of green technology and renewable energy, and to set up domestic mandatory emissions cut target. China's ambitious climate policies and plans are in sharp contrast to its previous conservative stance on climate change between the 1990s and the early 2000s, when the Chinese government was not only strongly opposed to binding conventions on climate change and skeptical of the IPCC findings, but also had few domestic climate actions (Chayes & Kim, 1998; Davenport, 2012; Economy, 1997).

The transformation of Chinese climate governance is puzzling. First, China is largely insusceptible to international pressure than countries that have accepted obligation to cut emissions based on the Kyoto Protocol. Second, as climate change is a public good, China is incentivized to rely on the efforts of other countries rather than taking any actions itself. Third, until 2009 China still had little domestic public support for climate change action. A national survey in 2007, for instance, found that the Chinese public did not see climate change as the most pressing environmental problem (Lo, 2010, p. 1015).

Also, a 2009 Pew Research Global Attitudes Project survey indicated that the Chinese public did not view climate change as the most serious problem and was less concerned about it than any of the public in the 24 other countries surveyed (Pew Research Center, 2009).

This chapter seeks to explain the transformation of China's climate policy and to answer why China has changed its position on climate change since the mid-2000s. By examining the impacts of international institutions and China's domestic politics on the shift in China's climate policy, I argue that it is the interaction of these two dynamics that contributes to the development of a strong pro-climate policy community, thus, the emergence of a stronger climate policy. More specifically, international institutions helped to cultivate a pro-climate policy community through international socialization and economic incentives between the late 1990s and early 2000s. China's domestic political dynamic, particularly the party-state leadership's rising energy and environmental concerns between the early 2000s and mid-2000s, which strengthened the power of the pro-climate policy community. As these two dynamics work together, the pro-climate policy group, a diverse collection of domestic actors from the bureaucratic, scientific, and business communities, was able to advance their interests in the climate policymaking process, and then promoted China to adopt a proactive climate policy from the mid-2000s onwards.

This chapter proceeds in three sections. The first section discusses changes of China's climate policy at both the international and domestic levels. The second section focuses on how China's integration into global environmental governance helped to develop a pro-climate policy group of Chinese experts, bureaucrats and businesses

through scientific and environmental discourses and economic incentives. The third section explores how the energy and environmental concerns of China's top leadership provided an opportunity to strengthen domestic pro-climate support, transforming the country's climate policy after the mid-2000s.

Shift in China's Climate Policy

China's climate policy has undergone a profound transformation over the last two decades, transforming from an aggressive opponent of carbon emissions reduction to an active proponent. In international climate negotiations, China's attitude towards climate change has shifted from questioning the validity of climate change to proposing its own voluntary quantified target of climate mitigation (See Table 5). At the national level, China has made great progress by providing legislative and financial support for carbon reductions, ranging from renewable energy development to carbon pricing initiatives. From the mid-2000s onwards, China began adopting a range of policies that encourage carbon emissions reduction, including increasing energy efficiency, developing renewable energy and setting up authorities to manage CDM projects. This shift towards a proactive climate policy was further expanded after 2009 when, for the first time in a decade, the Chinese government made a pledge for a quantified emissions reduction target at the Copenhagen climate meeting. In 2010, it adopted a mandatory carbon reduction target in its 12th Five-Year Plan. In 2011, China initiated a pilot program of carbon trading. More recently, China proclaimed that it would adopt a national carbon-trading scheme in 2017, and pledged to cap its carbon emissions by 2030. In the following section, the change in China's climate policy is examined in more detail.

Table 5. Timeline of China’s climate policy.

International Commitment	No International obligation	No quantified target	No quantified target	No quantified target	No quantified target	No quantified target	Yes Voluntary quantified target pledged: 40-45% cut	Yes	Yes	Yes	Yes	Yes	Yes INDC target 60-65% cut by 2030 below 2005
Domestic Action	No climate policies; No mandatory energy intensity reduction goal	No climate policies; No mandatory energy intensity reduction goal	No climate policies; No mandatory energy intensity reduction goal	Renewable Energy Law adopted. Mandatory energy efficiency target launched;	China’s National Climate Change Program released; New Renewable energy development plan released	Provincial Leading Groups on Climate Change constituted	Golden Sun Program initiated; Renewable Energy law amended	Low-carbon cities program launched	Pilot ETS scheme started; National FIT scheme introduced; Mandatory carbon emissions intensity target launched				National ETS scheme announced; Renewable energy plan enhanced
Time	1991-1995	1996-2000	2001-2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015

Changes in International Stance

On the international front, China's position in international climate negotiations has changed significantly over the last two decades. At an early stage of international negotiations in the 1990s, China was not only strongly opposed to any quantified mandatory emissions reduction imposed on developing countries, but also questioned the IPCC findings. At the Ministerial Conference of Developing Countries on Environment and Development in Beijing in 1991, China joined with other developing countries to adopt the Beijing Declaration, which indicated that "developed countries should be responsible for historical and current greenhouse gases emission... the ongoing negotiations cannot expect developing countries to accept any obligations in the near future" (Beijing Declaration, 1997). Meanwhile, China continued to be skeptical regarding the results of the IPCC findings and climate change science in general. During the 1995 intergovernmental negotiating committee for climate change, the Chinese delegation casted doubts on the data, arguing that "government could not base policy decisions on such scientific uncertainties" (Chayes & Kim, 1998, p. 524). While the Chinese government signed the Kyoto Protocol in 1997, "its resistance was crucial for the deletion of a draft Kyoto Protocol paragraph that allowed Non-Annex-I developing countries to set voluntary emissions targets" (A. Michaelowa, Shouchuan, Krause, Grimm, & Koch, 2003, p. 117). At the 1997 Kyoto climate meeting, China also expressed its objection to carbon trading, stating that "emissions trading may not contribute to actual reductions in emissions but shift reductions overseas" (Earth Negotiations bulletin, 1997).

Meanwhile, China also had reservations regarding another flexible mechanism, the Clean Development Mechanism (CDM), and was worried that these mechanisms would allow developed countries to shirk their responsibilities (Hatch, 2003, p. 54). Some Chinese climate experts had expressed similar concerns about it and posited that this mechanism would harm the developing countries' interests in the near future (H. Xu, 1998; S. Xu, 2001). A senior climate expert from the SPC (former body of the National Development and Reform Commission (NDRC)), Xu Huaqing, pointed out that, "on the surface the so-called 'Clean Development Mechanism' seems to help developing countries deal with climate change, but in reality it allows developed countries and developing countries to implement the treaty together, and helps developed countries achieve the target of their emissions reduction" (H. Xu, 1998, p. 40). Thus, although China's ratification of the Kyoto Protocol in 2002 made it eligible for the CDM, it did not express great interest in developing CDM projects in the early 2000s (W. Lin, Heggelund, Tangen, & Li, 2004, p. 6).

In contrast to its hesitation and reluctance to address climate change in the 1990s, China has become a more active proponent for climate mitigation since the mid-2000s. In 2005, China adopted a set of guidelines and regulations for the CDM development and set up a national authority to manage CDM projects. With policy support, between 2005 and 2007, there was a rapid development in CDM projects. By 2007, China had become the largest CDM host country (Schröder, 2011, p. 2). In 2009, at the Copenhagen climate meeting, China made a pledge of voluntary quantified emissions reduction. For the first time in the history of international climate negotiations, a developing nation had taken significant steps regarding climate mitigation (Hurrell & Sengupta, 2012, p. 471). This

move also suggested a partial break with China's long-term objection to quantified targets.

Changes in Domestic Climate Action

In addition to the transformation of China's policy in international climate negotiations, there has been a shift domestically since the mid-2000s. This change is in contrast to its previous actions between the 1990s and early 2000s, when few domestic climate actions and policies were enacted due to China's strong reservation on carbon emissions reduction.

Throughout the 1990s, few domestic climate actions can be found in China. China's Five-Year Plan (FYP), one of the most important government documents that guide state economic development, barely mentioned climate change or global warming in its 8th FYP (1991-1995) and 9th FYP (1996-2000) (Government of People's Republic of China, 1991, 1996). Instead, special attention was given to the coal development and the ways to increase coal production and transportation. For instance, the 8th FYP aimed at building a set of power plants around coal production centers in coal-abundant provinces, such as Shanxi Province. In addition, the FYPs of the 1990s also paid less attention to renewable energy development. While they began to include new energy technology development in paper, they did not set up specific targets for it. Only until the 10th FYP (2001-2005), contents on climate change mitigation had begun to appear in the FYPs (Government of People's Republic of China, 2001).

From the mid-2000s onwards, China adopted a range of domestic climate policies and measures, including energy efficiency enhancement, renewable energy development

and carbon trading initiatives. Beginning in 2005, China began to set mandatory energy efficiency targets in its Five-Year Plan (FYP), a general economic and social development plan made by China's top leadership every five years. In the 11th FYP (2006-2010), China set a target of 20% energy intensity reduction of the 2005 level by the year of 2010 (Government of People's Republic of China, 2006). It disaggregated this target into quotas for local governments as a “legally binding mandatory target” (法律效力的约束性指标), and took the achievements of the target as an indicator for local governmental performance evaluation (政府绩效考核) and local cadre performance evaluation (干部政绩考核) (The State Council, 2006). During the 11th FYP, the central government also launched a “Top 1000 Energy-Consuming Enterprises Program” (千家企业节能减排行动) for energy efficiency improvements in the industrial sector, which accounts for 33% of China's energy consumption and a similar share of energy-related carbon emissions.²⁰ This program was estimated to reduce 250 million tons of carbon dioxide by 2010.²¹ In 2007, China released its first National Climate Change Program, which targets energy efficiency and renewable energy development for carbon emissions reduction (Xinhua, 2007b). In 2010, the National Development and Reform Commission (NDRC) launched a pilot program to create “low-carbon cities” in five provinces and eight cities. Those participating provinces and cities were encouraged to develop low-carbon local industries and build capacity for greenhouse gases reduction and energy efficiency (China's Energy News, 2010). In 2011, China's 12th FYP (2011-2015) took

²⁰ Detailed information can be seen: <http://www.chinafaqs.org/library/chinafaqs-efficiency-thousand-companies-time> (Accessed in 10/13/2015).

²¹ Ibid.

another considerable step toward energy efficiency improvement by proclaiming that by 2015 the carbon emissions intensity would decrease by 17%, as compared to 2010 (Government of People's Republic of China, 2011). To facilitate the implementation of this plan at local levels, quotas were assigned to the local government and linked to the promotion of local governmental officials (Xinhua, 2014). In 2016, China launched its 13th FYP (2016-2020). The plan followed its previous path on mitigate climate change, and set up a mandatory target of 18% reduction in carbon intensity reduction by 2020 (Government of People's Republic of China, 2016).

Additionally, China's growing proactive climate policy can be found in its ambitious plan for the renewable energy development. After the mid-2000s, China increased its legislative and financial support for renewable and low carbon energies. In 2005, China passed the National Renewable Energy Law, which provides a principal framework for the development of renewable energy and offers a set of financial incentives and tax preferences for renewable energy projects (Academy of Macroeconomic Research, 2014, pp. 12-13). In 2007, China set up the Medium- and Long-Term Development Plan for Renewable Energy, which aimed to increase the share of renewable energy consumption to 15% by 2020 with investments of 2000 billion RMB (around 333 billion USD) (The NDRC, 2007). With government support, China quickly emerged as the global leader in renewable energy finance and investment, as well as in renewable energy installation and production. By 2009, China had become the world's biggest investor in renewable energy with a commitment of 34.6 billion, and the second in the world for renewable energy installed capacity (The Pew Charitable Trusts, 2010, p. 7). By 2010, China has also taken the top spot in wind turbine and solar cell production

(Bradsher, 2010). The shift of China's policy was further promoted in 2011 when China initiated a pilot carbon-trading scheme in two provinces and five cities (The NDRC, 2012). In 2015, China also announced plans to adopt a national carbon-trading scheme in 2017, which signals China's new ambition in limiting carbon emissions (Davis & Davenport, 2015). Meanwhile, in its latest submitted report on its Intended Nationally Determined Contribution (INDC), China aimed to increase the share of non-fossil energy in the total primary energy supply to 20% by 2030 (Government of People's Republic of China, 2015).

As this brief overview suggested, China's climate policy has undergone an important transformation since the mid-2000s. The following sections seek to explain this policy shift and explore under what conditions and in what ways factors from both international institutions and domestic politics have been able to shape China's climate policy change. In particular, it takes a closer look at how international socialization and economic incentives helped generate a pro-climate policy community, and at how domestic political interests deriving from energy and environment concerns stimulated the development of this pro-climate group. When factors from the two levels work together and reinforce each other, they are able to strengthen the power of the pro-climate group, and then transform China's climate policy.

The Impact of International Dynamic

The last three decades have witnessed China's growing participation in the international environmental regimes. China has signed on to a range of international environmental treaties and committed itself to international norms and rules, as well as

developed extensive links with the scientific and environmental communities (Economy, 2001; Falkner, 2006; Johnston, 1998; Kent, 2002; Schroeder, 2008). In the field of climate change, China has engaged in international climate negotiations since the early 1990s. It signed on to the Kyoto Protocol in 1997 and ratified it in 2002. China's growing integration into global climate governance has provided domestic actors with access to scientific and environmental ideas about climate change, as well as to foreign investments and advanced technologies for addressing climate change. In this section, I examine how China's participation in the international environmental regimes has had a profound impact on promoting a domestic climate change agenda and developing a pro-climate policy community through international socialization and economic incentives during the late 1990s and the early 2000s.

Scientific and Environmental Discourses

Between the late 1990s and the early 2000s, growing socialization with the international scientific and environmental communities exposed China's climate and energy experts to climate change concerns and impacts. With a wide range of bilateral and multilateral scientific and environmental activities, by the mid-2000s, China's natural and social scientists had reached a consensus on the destructive effects of global warming on China, and began to bring scientific concerns of climate change into climate policy debates.

International scientific cooperation regarding the environment and climate change has been ongoing since the 1990s, and contributed to developing an understanding of climate change among scientific and political elites (Economy, 1997). Like other

developing nations, China did not have a significant history of climate change research during international climate negotiations in the early 1990s. A number of international organizations and transnational NGOs, such as the United Nations Environment and Development (UNEP), the Asian Development Bank (ADB) and the World Resource Institute (WRI), provided support for Chinese scientists to develop climate change research while sharing scientific information and offering environmental training (Economy, 1997, pp. 24-25). For instance, one of China's most influential research institutions on climate change, the Energy Research Institute (ERI), has obtained substantial scientific and financial support from scientific and environmental communities of the United States, Germany and the UK.²² As a senior climate expert from the ERI indicated, "The international exchange has gradually increased the Chinese experts' understanding of climate change".²³

However, China's scientific and environmental communities did not forge a consensus on the impacts of climate change on China in the 1990s. In spite of extensive access to western scientific climate models, many researchers from the China Meteorological Administration (CMA) argued that the effects of climate change on China were uncertain and asked for further research before taking climate action (Economy, 1997, p. 25). In contrast, experts from the State Environment Protection Administration (SEPA), emphasized the destructive impacts of global warming on every aspect of China's society, and also credited international assistance in developing the research that led to the conclusion on the impacts of climate change (Economy, 1997, p. 26). Despite

²² Interview with a senior researcher of the ERI. Beijing, August 6, 2014. Evidence can also be found in (Economy, 2001), p. 244; (Wübbeke, 2013), p. 723.

²³ Ibid.

gradual acceptance of the validity of climate change by scientific and political elites with environmental and scientific training from the international community, concern regarding the uncertainty of human effect remained (Luo, 1997; Zhao, 1999). A 1996 report titled “Studies on Climate Change and Its Effects” from the Chinese Academy of Sciences called for further research to reduce the uncertainties in climate change (Economy, 2001, pp. 248-250).

Between the early 2000s and the mid-2000s, the international socialization regarding climate change concern was further deepened with China’s increasing participation in the IPCC activities. The exchange of scientific ideas enabled the expert community within China to reach a consensus on the implications of climate change for the country, which promoted the issue on the domestic policy agenda. The Chinese government began to send increasing numbers of scientists to participate in the IPCC activities, particularly after its report had such an effect on international climate negotiations. As an influential climate expert stated, “the IPCC’s scientific assessment has become an international political arrangement. It shows the significant role of science in the international political decision-making process” (Pan, 2001). While only a few experts participated in the IPCC working progress throughout the 1990s, the number of participants has been increasing since the early 2000s (Chen, 2002). As the senior climate scientist Qin Dahe (秦大河) observed during his participation in the IPCC, “Chinese scientists’ achievements in climate change have benefited from their work in the IPCC ” (Technology Daily, 2013).

China’s scientists’ active participation in IPCC activities transmitted climate change scientific knowledge and concerns into the domestic political arena. With the

release of the third IPCC assessment report in 2001, there was more and stronger evidence for a link between human activities and climate change. Based on this increase in the certainty of global warming, the Chinese scientists that participated in the working process of this report expressed their concerns on the effects of climate change on China and called for actions on further research on it (Qin, 2003). Ding Yihui (丁一汇), a senior Chinese climate expert and the co-chair of the Working Group I in the third IPCC report, stated that “climate change will have a lot of influence on our natural ecosystem and national economy. Some of the effects may be irreversible and catastrophic. Take early research and timely measures could reduce the adverse effects of climate change” (Ding, 2002).

Therefore, between the early 2000s and the mid-2000s, China organized its first national research program regarding the assessment of climate change on China. This program encompassed a number of leading climate and energy experts who also participated in the IPCC activities, such as Pan Jiahua (潘家华), Xu Huaqing (徐华清), Qin Dahe (秦大河), Jiang Kejun (姜克隽), Ding Yihui (丁一汇) and Zhou Dadi (周大地). In this report, scientists combined the models of emissions scenarios from the IPCC with China’s own model to predict the effects of climate change on China (Ding et al., 2006; E. Lin et al., 2006). They agreed that global warming would have substantial negative impacts on different aspects of China, such as agriculture, water resources and the ecological system (Ding et al., 2006; E. Lin et al., 2006). Given China’s vulnerability to climate change, these experts called for China’s active response to climate change and provided policy recommendations with a focus on a co-benefit approach. They suggested that “China’s current economic development is constrained by the limitation of natural

resources and environmental pollution, energy conservation and energy structure improvement will constitute the core of China's energy strategy, which is also consistent with China's climate change strategy" (He et al., 2006).

Economic Incentives

China's integration into the international environmental governance has not only shaped domestic climate and energy experts' attitudes towards climate change through socialization with scientific knowledge and environmental ideas, but also changed some bureaucrats and business groups' interests in climate change through economic incentives from the early 2000s to mid-2000s. The potential opportunities of new investment and technology transfer from the international community motivated these domestic actors to pursue proactive climate policy.

China's ratification of the Kyoto Protocol in 2002 made it eligible for the Clean Development Mechanism (CDM) –a market-based mechanism that could bring investments and technologies to developing countries. However, the Chinese government still hesitated in developing CDM projects, this was, in part because of uncertainty in the CDM market caused by the U.S., Australia and Russia not ratifying Kyoto Protocol at the time (W. Lin et al., 2004, p. 6). However, between 2002 and 2005, the growing international cooperation on CDM projects generated significant benefits in China, which caused more support for them and a proactive climate mitigation policy by both government officials and business corporations.

In 2002, government of the Netherlands planned to develop China's first CDM project, the Inner Mongolia huitengxile wind farm development project (First Financial

Daily, 2005). The hosting company was expected to receive EUR 27 millions by developing this project. Later, in 2004, the Chinese State Forestry Administration and the Italian Ministry of the Environment, Land and Sea also decided to start investing in CDM projects in China (First Financial Daily, 2005). In early 2005, another CDM project, the Xiaogushan hydropower project, obtained an investment of \$13.5 millions from the World Bank's Prototype Carbon Fund (First Financial Daily, 2005). Against this background, China's influential state-run newspapers cited the World Bank's report on the CDM market, and showed that developing the CDM could bring billions of investment to China's hosting companies, in addition to being a great opportunity for China's renewable energy development (Guangming Daily, 2005; People's Daily online, 2005a). Meanwhile, research reports from climate and energy experts also demonstrated the potential benefits China would gain from the CDM. A 2005 collaborative international research report involving experts from the ERI and Qinghua University also discussed opportunities and benefits from CDM projects. It emphasized that the CDM could benefit China with technology transfer, carbon emissions reduction and renewable energy development.²⁴ In an interview with the People's Daily, Liu Deshun (刘德顺), a co-author of the report and senior climate expert at Qinghua University, suggested that China should be proactive and take the opportunity to obtain funding and technology from developed countries (People's Daily online, 2005b). Another co-author and senior Chinese governmental official from the Ministry of Science and Technology (MOST), Lu

²⁴ The research is supported by the MOST, the World Bank, Federal Ministry for Economic Cooperation and Development (Germany) and Swiss State Secretariat for Economic Affairs. See Lu Xuedu and Liu Deshun (2005). Clean Development Mechanism in China: taking a proactive and sustainable approach, p. 72.

Xuedu (吕学都), also viewed the CDM as a huge opportunity for China's business groups and indicated that it would help to upgrade China's energy industry as well as transform its energy structure (Southern Weekly, 2005). Lu also called for wide media coverage of the CDM to increase the participation of China's business community (Southern Weekly, 2005).

As a result of success during the early development of the CDM in China and the potential economic benefits behind this mechanism between 2002 and 2005, it helped develop a set of domestic actors that supported climate change mitigation with this market-based approach. Within the central government, there was even an institutional competition among government agencies for influence on the CDM (W. Lin et al., 2004, p. 6; Schröder, 2011, p. 67). The long-time pro-climate agency, the MOST, and the powerful agency responsible for climate policy, the NDRC, competed for political influence on the CDM market (Schröder, 2011, p. 67). The NDRC took over major responsibility for the CDM from the MOST in 2004, and became actively involved in the development of CDM projects. To strengthen management of the CDM domestically, China established a national authority in 2004 to oversee the projects. The NDRC, MFA and the MOST as core members (Government of People's Republic of China, 2004). Furthermore, following the enactment of the Kyoto Protocol in 2005, China's highest-level climate policy coordination center, the Chinese National Coordination Committee on Climate Change, set up detailed measures to guide the development of the CDM (Government of People's Republic of China, 2005).

In addition to the change of government agencies' attitude toward climate change in the central government, the CDM also motivated the participation of China's local

governments and business community in climate change mitigation, especially in renewable energy development to some extent (Lewis, 2010; Qi, Ma, Zhang, & Li, 2008). In the face of large economic benefits generated from the CDM, a number of provinces not only set up regulations and guidelines for CDM projects development, but also established provincial CDM centers for training and capacity development (Qi et al., 2008, p. 389; Schröder, 2011, p. 8). For instance, by realizing benefits from the CDM, a local government official from Ningxia Autonomous Region spoke with the MOST regarding establishing a specific organization for CDM development, which later developed into China's first CDM center in 2003 (Schröder, 2011, p. 69). By 2007, China had already set up 27 provincial CDM centers at the local level (Xinhua, 2007). In addition, provinces such as Shanxi and Gansu set up a leading government group to manage CDM projects and issued detailed guidelines for the CDM respectively (Qi et al., 2008, p. 389). Provinces with large CDM potential, including high carbon emissions or geographic advantages in renewable energies, are more enthusiastic about the CDM than others. It is not surprising that Shanxi Province –China's biggest coal-producing region, and the Inner Mongolia Autonomous Region, China's largest wind power potential region, became active participants in the CDM (Schröder, 2011, p. 55). At the same time, the CDM also influenced the business community's attitudes toward climate change. The renewable energy industries, particularly the wind energy industry, had been enthusiastic about applying for CDM projects, given potential economic benefits from the CDM and policy support from the central and local governments. For instance, the state-owned power company, the China Huaneng Group, began to develop wind power CDM projects with a Spanish power company in 2005 (Xinhua, 2006a). China's largest wind power

producer, Longyuan Power Group, also became an active participant in the CDM, and had developed 36 CDM projects by 2007 (Guangming Daily, 2007). China's wind power report from 2007 indicated that "90% of non-concession wind projects have applied to be registered under the Kyoto Protocol's CDM since 2005" (J. Li et al., 2007, p. 49).

As discussed above, China's participation in international institutions cultivated a pro-climate policy community. Between the late 1990s and the early 2000s, through socialization with international scientific and environmental groups, international institutions enabled China's climate and energy experts to develop a consensus on the urgency of climate change in China and to bring these scientific concerns into climate policy debate. Through economic incentives such as the CDM, international institutions also stimulated climate mitigation by government officials and business groups.

However, the strength of this international forces-induced pro-climate policy community remained relatively weak in the early 2000s. First, while climate and energy experts promoted the rise of climate change on political agenda in China, their influence on climate policy decision-making was limited in the context of China's political system. As a top-down, centralized and authoritarian country, China's policymaking process is centered on a bureaucratic bargaining among different government agencies, and its policy decisions are outcomes of deliberations between bureaucratic institutions (Lampton, 2001; Lieberthal & Oksenberg, 1988). It is the government agencies that have played the most important role in the climate policymaking. For this reason, a developing pro-climate actor in the business community, the renewable energy industry, also played a marginalized role in climate policymaking. It was at an early stage of development in the early 2000s, and was too weak to impact the political agenda.

Second, as noted earlier, bureaucrats from the MOST and the NDRC all expressed interest in the CDM. However, the multiple roles and responsibilities the NDRC had assumed made it difficult to move beyond a moderate climate policy. The NDRC is the primary government agency responsible for climate policy, as well as the top policy center for China's economic and energy policies (Heggelund, 2007, p. 171). The Chinese leadership has prioritized economic growth over environmental problems so the NDRC, a government agency responsible for economic growth, stable energy supply and national climate policy, must also prioritize economic development and energy security when formulating policies on climate change. Besides the NDRC, the MOST has been a pro-climate actor and enthusiastic supporter for the CDM, but its weak administrative power has made it unable to change bureaucratic deliberation in favor of strong climate policy.

On balance, the international dynamics with international socialization and economic incentives developed a pro-climate policy community in China between the late 1990s and the early 2000s. However, this newly developed group was not politically influential in changing climate policy deliberations at the time. The next section examines how the domestic dynamics worked with the international dynamics to strengthen the pro-climate policy group in China, which made China become a proactive actor in climate change policy.

The Impact of Domestic Dynamic

Due to international dynamics, a pro-climate policy community was able to develop and promote climate change concerns in the domestic political agenda between the late 1990s and the early 2000s. At the same time, changes in the domestic political

dynamics reinforced the impact of the international dynamics, and contributed to strengthening the power of the pro-climate group. This section examines the impact of China's domestic politics, and focuses on how domestic political concerns worked with the international dynamics to increase the influence of the pro-climate group, which turned China into an ambitious actor on climate change. Particularly, this section first discusses growing legitimacy challenges China faced between the early 2000s and the mid-2000s, and explores how the Chinese top leadership's growing environmental and energy concerns for regime legitimacy influenced domestic actors' approaches and attitudes towards climate change since the mid-2000s. It then looks at how these challenges gave a boost to the pro-climate group and shifted the results of bureaucratic bargaining to one favoring a proactive climate policy.

Challenges to China's Legitimacy

After the decline of the revolutionary and charismatic authority in the post-Mao period, the Chinese party-state leadership sought legitimacy elsewhere to assert its authority (Laliberté & Lanteigne, 2007; Lampton, 2001). The introduction of performance legitimacy with a focus on high rates of economic growth allowed the CCP to maintain its political power (Burns, 1999; Gilley & Holbig, 2009; Laliberté & Lanteigne, 2007). The party-state leadership has emphasized the significance of economic growth ever since the start of China's reform and opening up policy in the early 1980s, and has made a set of guidelines and rules to ensure stable economic

development.²⁵ However, since the early 2000s, this major source of legitimacy, strong and positive economic performance, has been challenged by energy demand and environment degradation.

There is no denying that China's rapid economic growth has driven a sharp increase in its energy consumption. However, between 1980 and 2002, China's leadership had been able to manage an energy-efficient economic growth with a set of governmental policies and financial incentives (Zhou, Levine, & Price, 2010, p. 2439). During this time period, there was an average annual decline of 5% in energy intensity, which allowed China to quadruple its GDP, but merely doubled the amount of its energy consumption (Lewis, 2013, p. 8). However, this situation began to change in 2002. Energy intensity increased an average of 3.8% per year between 2002 and 2005 (Lewis, 2013, p. 8). For the first time in decades, China's energy consumption began to rise more quickly than its economic growth (Aden & Sinton, 2006, p. 253; Lewis, 2013, p. 8). The surging energy demand and limited energy supply began to affect China's economic development and people's daily life. Since 2002, China has confronted power shortages in almost every year, which have led to power cuts or blackouts in a lot of areas, particularly the coastal provinces where China's economic boom is concentrated (China Daily, 2003). To ease the power crunch, some local authorities have rationed electricity distribution and encouraged people and the industries to limit energy use (Lim, 2004). This energy shortage situation became worse in 2004. Most coal power plants were running on a very low coal stock of less than 15 days, and 24 provinces suffered power

²⁵ The reports of the CCP Party Congress have centered on policies and rules regarding economic development since the 11th CCP Party Congress. Details can be found in the archive of the CCP's National Congress: <http://cpc.people.com.cn/GB/64162/64168/64563/index.html> (Accessed by 11/1/2015).

cuts during peak hours (China Business, 2004; People's Daily Online, 2004). It was estimated that increasing power shortages would even reduce the growth rate of China's GDP by 0.5% in 2004 (China Business, 2004). The salience of the energy issue and its adverse impact on the economy started to worry China's senior leadership. In 2005, the central committee of the CCP had a collective study session about the issue of China's energy resources, then-president Hu Jintao indicated that "the energy issue is a major strategic issue for China's economic and social development" (Xinhua, 2004). Later that same year, in the first conference for the establishment of the National Energy Leading Group, Premier Wen Jiabao, pointed out that the "energy problem is an important strategic issue that matters to China's economic development, social stability and national security" (Xinhua, 2005c).

In addition to the energy issue, another challenge to China's performance legitimacy is the fragile ecological environment (Hsu, 2014; A. Wang, 2013). China's unprecedented economic growth has taken a heavy toll on the environment, especially on its air and water quality. As energy consumption surged between 2000 and 2005, China's coal consumption increased by 75%, which made China the world's largest source of sulfur dioxide emissions (World Bank, 2007, p. xi). Additionally, about 54% of the seven main rivers in China contained water deemed unsafe for human consumption (World Bank, 2007, p. xi). The worsening condition of the environment has also caused significant public health and economic damages. The concentration of particles in the air has caused an increasing rate of respiratory illnesses in urban China, and the frequency of acid rain has caused large economic losses by destroying agriculture and building structures (World Bank, 2007, pp. xiii-xvi). Aside from this, there has been growing

public dissatisfaction with environmental pollutions since the early 2000s. In 2005, the number of environmental appeals and letters received by the Chinese Environmental Protection Bureaus reached to 608, 245, which is ten times higher than those received in 1995 (Jing, 2010, p. 197; Tong, 2013, p. 237). Nearly half of these letters and complaints were about air pollution (Van Rooij, 2010, p. 62). Meanwhile, an increasing number of people have used demonstrations and protests to express their discontents with environmental deterioration. Environmental mass incidents (环境群体性事件) have increased at an annual rate of 29% since 1996 (Tong, 2013, p. 236). These violent demonstrations have become a new source of social instability. One typical example is a pollution protest in Dongyang, Zhejiang province in 2005, which received much attention from the media and government officials (Xinhua, 2005a; Yardley, 2005). In his discussion of environmental mass incidents, then-chief director of provincial environmental protection bureau in Zhejiang indicated that “environmental disputes have become the new cause of social instability...if being used by a small bunch of ill-willed individuals, could seriously damage the Party-Mass relationship and the Party’s image” (Ma, 2008/2009, p. 46). During a speech in 2005, then-governor of Zhejiang Province and current president of China, Xi Jinping, emphasized that “environmental mass incidents could destroy the fruit of reform and opening up” (Ma, 2008/2009, p. 47).

Climate Governance under Legitimacy Consolidation

Between the early 2000s and mid-2000s, as noted above, the soaring energy demand and worsening environment posed new challenges to China’s economic growth and worried China’s party-state leadership. At the same time, these new challenges also

provided opportunities for the pro-climate policy community to obtain support from China's leadership. This section explores how the response of the Chinese authorities to the energy demand and environment degradation strengthened the power of the pro-climate group in bureaucratic bargaining by shaping government agencies' interests in climate change, and causing China to develop a more proactive climate policy.

Maintaining Legitimacy

The traditional pattern of China's economic growth is usually characterized as "high-volume of investment and consumption of energy and natural resources, heavy pollution, and low efficiency" (People's Daily Online, 2005). As discussed previously, this model of economic development put tremendous pressure on China's top leadership. In response, starting in 2004-2005, the party-state leadership began to stipulate a set of policies and measures to transform the traditional pattern of economic growth, so as to ease China's energy shortage and environment deterioration. In its 5th plenary session of the 16th CCP Central Committee in October 2005, the CCP issued their proposal for China's 11th Five-Year Plan, and emphasized that "[we] must increase the transformation of economic growth. The capacity of our land, water, energy, raw materials and environment has constrained economic development."²⁶ Later that year, an editorial from the Xinhua News also indicated that "it is time to end the 'coarse form (粗放型) of economic growth... economic development should be based on high efficiency of energy use and low environmental pollution with focusing on quality and efficiency" (Xinhua,

²⁶ The CCP Party Congress report. (October 11, 2005). The CCP's proposal on the eleventh Five-Year Plan. <http://cpc.people.com.cn/GB/64162/64168/64569/65414/4429220.html> (Accessed by 11/06/2015).

2005d). Another influential official journal run by the CCP, Ban Yue Tan (半月谈), also showed that “it is urgent to transform the economy...the way to sacrifice environment and destroy resources for economic growth is costly” (Xinhua, 2005e). In early 2006, the CCP emphasized the significance of transforming the pattern of economic growth by holding a collective study session for the CCP Politburo members. Then-president Hu Jintao pointed out that “only by accelerating the transformation of the form of economic growth can we promote economic development to be harmonious with population, resources and environment, and ensure the sustainable development of our economy and society” (Xinhua, 2006b).

In addition to transforming the pattern of economic growth, China’s party-state leadership also sought a new ideology that focused on the environment in guiding economic development. The CCP started to develop the idea of “ecological civilization (生态文明)” between 2002 and 2005, when China’s economy was facing pressure from energy shortages and environmental degradation (People's Daily Online, 2012b). President Hu Jintao mentioned the significance of eco-civilization on China’s economic development at the 2004 Population Resource and Environment Work Conference (Xinhua, 2004). Later, in his speech to the provincial leaders regarding how to strengthen the CCP governing capacity in 2005, Hu emphasized the significance of ecological environment construction, and he pointed out “our current ecological situation is grim, and local environmental pollution problems are very serious. As population increases and people’s standards of living improve, the contraction between economic and social development and the resources and the environment will be more prominent” (Xinhua, 2005b). In the CCP’s 17th Party Congress in 2007, the CCP officially introduced the

concept of “ecological civilization” and put it in the party’s political report for the first time. This is widely regarded as a response to China’s traditional form of economic growth, and a strong signal for a shift in China’s economic and environmental policies (Xinhua, 2007a). In a speech to party delegates in the 17th party congress in 2007, Hu Jintao stated, “To build the ecological civilization, [we] need to form a pattern of economic structure, growth and consumption with energy saving and environmental protection, and to establish a large-scale circular economy and increase the proportion of renewable energy sources. Also, [we need to] control the discharge of major pollutants effectively and improve environmental quality significantly” (Xinhua, 2007c). This inclusion of “ecological civilization” in the CCP’s political report shows the party-state leadership’s plan to depart from the long-term one-sided pursuit of GDP growth.

Strengthening the Power of the Pro-Climate Group

As discussed above, after the mid-2000s, China’s leadership developed a new pattern of economic growth with energy saving and environmental protection, in part because of legitimacy consolidation. They began to set up a series of policies to encourage the transition to a new economic model. This change enabled the pro-climate policy community to develop and exert greater influence on climate policy debate. First, within the Chinese bureaucracy, perhaps the most important change was that the powerful NDRC joined the pro-climate group after the mid-2000s. As the major government agency responsible for China’s economic, energy and climate change policies, the NDRC began to emphasize energy efficiency and conservation and renewable energy development, which made the institution a leading actor in domestic

climate action. In addition, China's growing environmental concern has also strengthened the power of pro-environmental officials in the inter-agency bargaining on climate change. Second, working outside of the governmental bureaucracy, climate experts and renewable energy industry also gained more power to influence climate policy decisions. The increasing energy and environmental concerns of the Chinese leadership gave them an opportunity to advance their interests, including objectives in line with a proactive climate policy.

The shift of the economic growth model for the sake of legitimacy consolidation has influenced government agencies' approach and attitude to climate change since the mid-2000s. In particular, it has strengthened the power of the pro-climate group in the central government. One prominent change lies in the NDRC, which was a hard-liner for conservative climate policy, but which now become an effective actor on the issue. As discussed earlier, the NDRC took over the responsibility of climate change from the SMA in 1998. It is also the agency in charge of China's economic and energy policies. As China's top leadership called for transformation of economic growth pattern, the NDRC has begun to stipulate a set of policies and measures to promote economic development with energy efficiency and pollution reduction, including China's 11th Five-Year Plan with a mandatory target of energy intensity reduction in 2005, the Medium- and Long-Term for Renewable Energy Development Plan in 2007, which also produced benefits for climate mitigation. As the former director of the NDRC, Ma Kai (马凯) has said "China has to manage the relationship between economic development and environmental protection in its process of modernization. We cannot follow the traditional pattern of industrialization with high-volume of resources consumption and

pollution emission, but to take a new path of industrialization with low consumption, low emission, high efficiency and high output, so that we could achieve a ‘win-win objective’ in economic development and environmental protection. [Those efforts] will also contribute to the world’s sustainable development and climate change” (People's Daily Online, 2007). A government official from the NDRC also indicated that “as China’s economy is facing great pressure from rising costs of labor and energy, it has become urgent for China to promote economic transformation so as to avoid ‘the middle income trap’ ...this economic transformation shares the same objectives with climate change mitigation”.²⁷

The NDRC’s approaches to climate change with a focus on economic and energy objectives have become conspicuous after the State Council set up an inter-agency group for climate change in 2007. The full name of this leading group is the National Leading Group on Climate Change, Energy Saving and Pollution Reduction. Its members include ministers or vice-ministers from 27 ministries and commissions, and it focuses on two different objectives. In fact, it is a special inter-agency institution with two different objectives (one agency, two titles: 一个机构，两块牌子) (The State Council, 2007). In other words, it is the same group of officials that deal with two different objectives: the Leading Group has two separate titles, one is the National Leading Group on Climate Change (NLGCC), and the National Leading Group on Energy Saving And Pollution (The State Council, 2007). The general office of the leading group for daily work is in the NDRC. This set-up also signals that China’s climate action is closely linked to energy saving and pollution reduction. In addition to this, in 2007, the NDRC worked with other

²⁷ Interview with a government official of the NDRC in Beijing: August 21, 2014.

government agencies to issue China's first National Climate Change Program. In the report, it showed that China's climate actions are centered on energy and industry sectors, and emphasized the methods China was using to mitigate climate change, including transforming the economic growth pattern, developing renewable energy, improving energy efficiency and increasing forestation (Xinhua, 2007b).

Since climate change mitigation shares similar objectives with energy saving and pollution reduction, the NDRC has become more supportive of climate actions. In 2008, the NDRC established the Department of Climate Change (气候变化司) to set up climate change policies, develop plans and supervise China's climate negotiations. This change increases the NDRC's administrative power in international negotiations, which had been handled by the MFA. Also, this new department is headed by a veteran climate negotiator from the MFA, Su Wei (苏伟).²⁸ Meanwhile, the NDRC appointed a strong environmental proponent – Xie Zhenhua (解振华) as the deputy director of the NDRC in charge of domestic energy saving and pollution reduction as well as international climate negotiations, which was viewed as a positive signal that China had begun to take climate change seriously (Garnaut, 2009). As a former environmental administrator with strong efforts to promote environmental protection, Xie's environmental background made him a rising star, he quickly became the top climate official in China and played an important role in promoting China's national climate actions (Garnaut, 2009). The NDRC also set up another research institution, the National Center for Climate Change Strategy and International Cooperation (NCSC) in 2012, to deal with climate change, especially

²⁸ Interview with a senior climate expert of the ERI in Beijing: August 6, 2014.

research on strategic planning, regulations, carbon markets and information consulting (Xinhua, 2012). This center is headed by Li Junfeng (李俊峰), who served as president of a pro-climate association, the Chinese Renewable Energy Industries Association (CREIA), and is an active official in promoting China's renewable energy development.²⁹

In addition to the changes at the NDRC, the Chinese leadership's concern regarding environment degradation gave a boost to pro-climate actors in the bureaucracy system, such as the SEPA, which has taken a proactive stance on climate change since the beginning of China's climate negotiations.³⁰ In the face of mounting environmental crisis, the central government upgraded the SEPA to the minister-level MEP in 2008 and declared environmental protection as one of China's top national priorities (The Beijing News, 2008a). This arrangement also allows pro-environmental officials to have a say in inter-agency bargaining on climate change. It also ensures that the MEP could play a more important role because the nation's air pollution, especially smog, has worsened since 2010, primarily due to coal. In fact, the MEP has begun to develop collaborative programs to address both air pollution and climate change. It cooperated with the MOST and launched a "blue sky science and technology project" (蓝天科技工程) to promote the research and development of technologies for simultaneously dealing with air pollution and climate change mitigation (People's Daily Online, 2012a). In addition to the MOST, the MEP has a new ally: the Ministry of Finance (MOF). Both of them have been supportive of the adoption of carbon tax since 2008, and they have been developing the details for the carbon taxation in recent years (China Dialogue, 2012; The Beijing News,

²⁹ Interview with a senior climate researcher from an international think tank in Beijing, August 14, 2014 (a).

³⁰ See (Economy, 1997).

2008b). The MOF and the MEP even had some institutional infighting with the NDRC. The MOF and the MEP have had some jurisdictional quarrels with the NDRC over the adoption of a carbon tax. Rather than instituting as an environment-related tax, the NDRC would prefer to establish it as an energy-related tax. This would ensure jurisdiction for the National Energy Administration, which operates under the NDRC (China Economic Weekly, 2013). While governmental institutions have different perspectives on jurisdiction control, it is important to note that they are no longer hesitant to enact measures to mitigate climate change.

As Chinese authorities have shifted their focus on the new low-carbon economic model since the mid-2000s, climate and energy experts are able to push their climate change concerns in climate policymaking. In 2007, China set up the National Experts Committee on Climate Change (国家气候变化专家委员会). This is an official think tank that includes leading Chinese climate and energy experts and serves as a policy advisory organization for China's climate policy (Sina News, 2009). China's influential climate and energy research institutions, such as the Research Center for Sustainable Development (RCSD) under the Chinese Academy of Social Science (CASS), and the Institute of Energy, Environment and Economy (the 3E institute) from the Tsinghua University, and the ERI under the NDRC, all have members who sit on this committee, which allows them to have better access to climate policymaking. As a senior climate expert recalled, "when we started research on China's low-carbon development, 'carbon' remained a sensitive topic ... but this resistance gradually disappeared in 2009"³¹. Another leading climate expert from the ERI also shared a similar experience. When his

³¹ Interview with a senior climate expert from an international think tank in Beijing, August 14, 2014 (b).

research team suggested the adoption of the low-carbon city and carbon trading in 2005 and 2006, it failed to get the support of the leadership.³² However, the plan gained attention in 2007 after then-President Hu Jintao made an announcement to develop low-carbon economy in China.³³ Policy suggestions from climate and energy experts also started to appear in China's climate policy decisions. For instance, the voluntary emissions reduction target China proposed in 2009 Copenhagen meeting is based on the ERI's research work.³⁴

China's top leadership's concerns on economic growth and energy security also provided an opportunity to further the growth of renewable energy industry, and then to strengthen the pro-climate group. After the Renewable Energy Law took effect in 2006, the renewable energy industry obtained a set of policy and financial support from both the central and local governments, such as power purchase mandates and preferential loans (Z. Wang, Qin, & Lewis, 2012). Between 2005 and 2008, there was rapid development in China's renewable energy industry. While it was a newly emerging sector in China, and is highly dependent on state intervention, its interaction with local governments made it become an important player in the transformation of climate policy in China. Driven by local GDP growth and a "green" political image, local governments offered policy support for both wind and solar manufacturing industries, ranging from subsidized land to tax breaks (J. Li et al., 2012; Southern Weekly, 2013). There was even competition among local governments for attracting manufacturing producers (Southern Weekly, 2013). Meanwhile, a growing demand for wind turbines and solar panels from

³² Interview with a senior researcher of the ERI. Beijing, August 6, 2014.

³³ Ibid.

³⁴ Ibid.

the international market also stimulated the development of renewable energy industry. Due to the proliferation of wind and solar manufacturing industries, China quickly took over global leadership in wind turbine and solar panels in terms of production capacity in 2009. These changes within the renewable energy industry allowed it to exert influence on China's climate policy, especially on renewable energy policy. Since China's renewable energy development prioritized production capacity over installation capacity, it found itself in a situation of overinvestment and overcapacity after the global economic downturn, with a shrinking overseas market during 2008 and 2009 (S. Zhang, Andrews-Speed, Zhao, & He, 2013, p. 347). Therefore, renewable energy manufacturers and producers started to lobby governments for incentives and subsidies. This pressure played a crucial role for the Chinese government to develop renewable energy deployment capacity, and then set up China's first FIT (Feed-in-Tariff) scheme in 2011.³⁵

Due to legitimacy consolidation concerns from China's top leadership, the pro-climate group was able to advance their interests in climate mitigation and facilitate the adoption of a proactive climate change policy. In China's bureaucracy, the powerful NDRC shifted from a conservative actor to an active player in climate policy, as it was able to integrate climate change concern into China's economic and energy policies. The marginalized MEP, took advantage of an opportunity to push for climate mitigation, as carbon emissions share similar objectives with air pollution control. Outside China's bureaucracy, China's leadership's concerns also helped climate experts and the renewable energy industry to push climate mitigation onto the domestic policy agenda.

³⁵ Interview with a climate policy analyst from an international think tank in Beijing: August 7, 2014; See also (S. Zhang & He, 2013), p. 397.

Conclusion

Authoritarian China's proactive climate actions is presented as an "off-the-line" case of the statistical model, which predicts that non-democratic countries are less likely to take ambitious climate policies. By examining the impacts of international institutions and domestic political system on the shift in China's climate policy, this chapter finds that the two international and domestic dynamics played different roles in transforming China's climate policy through a pro-climate policy community. International institutions facilitated the emergence of a pro-climate policy group with international socialization and economic incentives between the late 1990s and the early 2000s. However, the domestic political dynamics during the early 2000s and mid-2000s strengthened the power of this pro-climate group, and enabled it to push a proactive climate policy after the mid-2000s. The concerns over legitimacy by the senior leadership played a crucial role in this process. It was these concerns that gave the pro-climate group the ability to prevail in the bureaucratic struggles over climate policy. The change in the leadership's attitude towards climate change is largely due to their concern with maintaining high rates of economic growth, something which is becoming increasingly difficult because of China's vulnerable resource-intensive economy and fragile ecological environment. Since the legitimacy of the Chinese Communist Party depends crucially on its ability to deliver high rates of economic growth, the party leadership seeks to develop a low-carbon economy with economic transformation and higher energy efficiency. The development of a low-carbon economy coincides with the objectives of climate change mitigation. Thus, the party leadership's focus on economic transformation and greater energy

efficiency empowered the pro-climate group that pushed for policies designed to reduce carbon emissions, and transformed China into a proactive actor on climate change.

In addition, the case study of China's climate action offers insight into a debate over authoritarian environmentalism (Beeson, 2010; Gilley, 2012). As an authoritarian country, China is able to formulate and promulgate a wide array of climate policies quickly, and disaggregate targets and goals for climate action into different levels of government with political mandates to push for emission reduction and energy efficiency. However, by developing climate policies around economic performance with limited public participation, it remains to be seen how far China's proactive climate action will go. However, the analysis of climate governance in China presents a case study to see how developing countries address environmental problems while facing pressures from economic development. By establishing a linkage between economic development and climate mitigation, it may be possible for developing countries to keep development sustainable.

CHAPTER VI

CONCLUSION

In this concluding chapter, I review the evidence provided in data analysis and case studies. The quantitative data indicates the significant effects of international institutions and political system on the strength of climate policy. The case studies trace casual processes in the interplay of international and domestic politics. Together, these two pieces of evidence indicates that the emergence of a strong climate policy is due to a strong pro-climate policy group, which developed from the interaction of international institutions and a shift in domestic politics. After summarizing the findings, this chapter ends by considering the implications of my research for theory and practice.

Summary of the Findings

This section examines findings from the quantitative data and qualitative evidence, and discusses whether these results have given support to the hypotheses about factors that influenced the strength of climate policy in developing countries.

Table 6. Results of empirical work.

	Data Analysis	On-the-line Case: India	Off-the-line Case: China
H_{1A} : Scientific and environmental discourses	+	+	+
H_{1B} : Economic incentives	+	+	+
H_2 : Political system	+	+	-
H_3 : Domestic interest groups	-	+	+
H_4 : Environmental NGOs	-	-	-
H_5 : Economic development	-	-	-
H_6 : Local air pollution	-	-	+

Note: “+” indicates “confirms hypothesis”, and “-” indicates “fails to confirm”.

The empirical work of my study is to test the following hypotheses about factors that affect the strength of climate policy in developing countries. The statistical analysis generated a preliminary correlation between these hypotheses and the strength of climate policy, and a confirmation of core hypotheses, including scientific and environmental discourses, economic incentives and political system. The case studies provided further confirmation of the results of the statistical model by tracing causal processes between international and domestic politics. This section discusses how the statistical work and case studies complemented one another, providing different support to understand the adoption of a strong climate policy in developing countries.

The effects of international institutions (H_{1A} and H_{1B}) received strong support in both the statistical work and case studies, as indicated in Table 6. The statistical analysis identified the correlation of international institutions and the adoption of strong climate policy. The case studies of India and China provided further evidence to support the result with detailed investigation in the interaction between international and domestic actors. They suggest that international socialization and economic incentives shaped a developing country's climate policy by cultivating pro-climate actors with roots in the scientific and business communities. In both cases, the country's growing participation in international institutions such as the IPCC, promoted scientific knowledge exchange between domestic experts and the international epistemic community, and allowed the former bringing scientific aspects of climate change on domestic policy agenda. The economic incentives from the CDM under the Kyoto Protocol provided an opportunity for these countries to access to foreign investment and technology transfer, which stimulated the business group's interests in climate mitigation.

The influence of political system (H_2) received strong support in the statistical analysis, but mixed support in the case studies. This discrepancy is due in part to case selection. The case of India is an on-the-line case, but the case of China is an off-the-line case. The statistical work indicated that democratic regimes are positively correlated with the adoption of strong climate policy. The on-the-line case, India, bolstered the finding by tracing the causal mechanism. It suggests that democracies foster deliberation on climate change among different groups and allow them to compete for their favored climate policies. Climate policy is the result of a compromise between those favoring policies that alleviate climate change and those who oppose such policies. However, the investigation of an off-the-line case, China, is trying to understand why a non-democratic regime has strong climate policy than the statistical analysis predicted. This case illustrated that regime type might be less important than regime legitimacy in shaping climate policy, which also offers a new glimpse to understand the effects of political system on national environmental policymaking process.

The effects of domestic interest groups (H_3) received little support from the statistical work, but moderate support from the case studies. This difference is due in part to the limitations of data quality and availability. The proxy used to measure the influence of domestic interest groups did not fully capture the complexity and dynamics of interest groups in the developing world. The case studies of India and China all indicate that the exposure of the businesses to economic incentives from the international community stimulated their interests in climate mitigation. In the two cases, evidence shows that the business group lobbied the government for access to carbon market.

One hypothesis (H_4), the impacts of environmental NGOs, received little support in both the statistical work and case studies. The case studies indicated that the effects of environmental NGOs in shaping climate policy are limited. Part of the reason is, as the case of India indicated, environmental NGOs are focusing more on pressing domestic environmental problems, such as water resources exploitation than global environmental issues, like climate change (Dubash, 2013; Lele, 2012). In addition, the case of China illustrated that domestic environmental NGOs is a latecomer on climate change, so they usually focus more on promoting the implementation of climate policies and increasing public awareness of climate change, and less likely to get directly involved in policymaking.³⁶ Besides, both cases showed that climate change is viewed more as a development issue but less as an environmental issue, which could also discouraged the active participation of environmental NGOs.

A similar situation holds for another hypothesis (H_5). Both the statistical analysis and case studies refute that high economic development affects the adoption of strong climate policy. Instead, the cases of India and China suggest that maintaining economic growth could become an impetus for the adoption of strong climate policy. Both countries chose to develop economic and energy policies with co-benefits for climate change given their growing concern on energy supply and clean energy development competition in the global market.

Another hypothesis (H_6), local air pollution, received little support from the statistical work and on-the-line case of India, but strong support in the off-the-line case of China. Therefore, it is hard to conclude that local air pollution has a generally significant

³⁶ Interview with a representative of an environmental NGO in Beijing: August 13, 2014.

effect on the adoption of strong climate policy in developing countries. However, lessons we can draw from China's experience is that, the salience of air pollution in China's domestic politics played an important role to prompt the government to take a proactive climate policy. The Chinese top leadership's growing concern on fragile ecological environment empowered the pro-climate policy community and allowed them to advance their interests in climate policymaking process.

In general, the qualitative evidence in India and China provide further confirmation of the results of the statistical model by tracing causal processes in the interactions between international and domestic politics. They demonstrate how participation in international institutions is influencing the strategies and positions of domestic actors on climate change. In addition, they further illuminate the relationship between political system and the strength of climate policy. As the case of India illustrates, democracies foster deliberations on climate change among different elite groups and allow them to compete for their favored climate policies. Climate policy is the result of a compromise between those favoring policies that alleviate climate change and those who oppose such policies. One of the lessons we can draw from the Chinese experience, on the other hand, is that regime type may be less important than regime legitimacy in shaping the strength of a country's climate policy. It is the top leadership's focus on strengthening the legitimacy of the regime that has given those pro-climate actors the ability to prevail in the bureaucratic struggles over climate policy.

In addition, the case studies of India and China offer a comparative perspective to look at how different domestic dynamics shaped climate policymaking process and policy output in these two countries. Particularly, the difference of the salience of climate

change in domestic policy agenda has played an important role in both countries' climate politics. The case of India indicates that climate change is a concern shared for different elite groups but not an issue for party politics (Dubash, 2013; Prabhu, 2012; Vihma, 2011). In this sense, climate policy debates center on a deliberative process in which different elite groups compete for their preferred policy, and the policy outputs reflects a compromise of their perspectives. However, the case of China illustrates that climate change has become a concern for Chinese leadership given its negative effects on economic performance. The support of Chinese leadership is a crucial determinant for the success of the pro-climate group in a bureaucratic bargaining. Therefore, the policy outputs reflect state interests instead of a compromise. Different domestic dynamics also help to explain why China's movement to a strong climate policy is faster than India after the mid-2000s, as climate change is a more salient political issue in China than it is in India.

Implications for Theory and Practice

This study is motivated by an interest to understand and explain why some countries adopt ambitious domestic policies to deal with global environmental problems, and have four implications for our understanding of global environmental politics.

First, my research on climate politics in developing countries adds to our understanding of when and how international institutions matter in environmental politics. As explained in the preceding chapters, international institutions helped to encourage the emergence of a pro-climate domestic group at an early stage of developing countries' participation in international negotiations. Through scientific and

environmental discourses and economic incentives, international institutions facilitated the development of this pro-climate group with roots in scientific, business and bureaucratic communities. This internationally induced climate-conscious group has played a significant role in shaping developing countries' response to climate change. Particularly, the group has brought scientific and economic aspects of climate change into domestic policy debates and promoted climate policy agenda. In addition, my research offers insights into long-standing questions in the international relations regarding the interaction of international and domestic politics. It focuses on how this interplay has affected developing countries' adoption of strong climate policies by looking at the role of a domestic pro-climate group. It examines how international institutions influenced domestic climate policy debates through the creation of a pro-climate group, and illuminates how domestic politics facilitated this pro-climate group to advance their interests in climate governance.

Second, my research contributes to our understanding of the nature and extent of domestic politics in global environmental governance, and offers a new lens for exploring domestic interest-group dynamics. The findings of my research demonstrate the importance of domestic politics in shaping national climate policy. Specifically, they suggest that domestic political dynamics promoted the emergence of a strong climate policy by strengthening the political influence of a pro-climate group. Additionally, my research provides a fuller understanding of the "Baptist and bootlegger coalition" in environmental politics (DeSombre, 2000; Hochstetler & Viola, 2012; Yandle & Buck, 2002). By examining the pro-climate group with a diverse set of domestic actors, the study finds that a loose policy coalition with different interests but similar policy

objectives can work together to promote their preferred environmental policy on political agenda, because in so doing can increase their political influence with broad political support.

Third, my research suggests that regime legitimacy may be even more important than regime type. Scholarship on environmental politics posits that democratic countries are more willing to address environmental problems than nondemocratic ones (Congleton, 1992; Neumayer, 2002; Payne, 1995). By contrast, my research finds that authoritarian developing countries will attempt to address environmental issues if the latter begins to challenge their governance legitimacy. As the case of China indicates, China's adoption of a strong climate policy is due in part to Chinese authorities' concern with environmental degradation and its negative effects on high rates of economic growth. As the legitimacy of the Chinese party-state leadership rely heavily on its delivery of good economic performance, China's authorities seek a new economic model that coincides with the objectives of climate mitigation. Therefore, China's leadership's focus on economic transformation provided an opportunity to strengthen the power of a pro-climate group and enabled them to prompt China to adopt a strong climate policy. Additionally, through the case of China, my research adds to our understanding of authoritarian environmentalism (Beeson, 2010; Gilley, 2012; Moore, 2014). Given the important role played by the party-state leadership in China's climate policymaking process, my research suggests that environmental governance in authoritarian regimes with limited public participation still mainly reflects state interests, and an effective bottom-up approach to environmental policymaking has to align their policy objectives with state interests.

Finally, this study shed light on the development of international environmental policies in developing countries. Policies of developing countries have drawn less attention from scholars, with most research focusing on the climate policies of developed countries. By ignoring the role of the Global South in dealing with these pressing global environmental issues, we are ill-prepared to engage with both heavy carbon emitters and rapidly industrializing economies in addressing climate change. My research can mitigate the gap in the existing literature, as well as position us to better understand how developing countries are able to deal with climate change in different ways within their borders. In addition, my study of climate politics in developing countries provides another perspective in how to balance environmental protection and economic growth, as a large amount of literature has focused on how developing countries address environmental issues in the face of pressures from economic development. It suggests that developing countries are more likely to deal with global environmental problems when policy solutions take local economic development and environmental issues into consideration and develop a co-benefit approach that benefits the global environment and local economy.

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