Asia's Response to Climate Change and Natural Disasters

Implications for an Evolving Regional Architecture

A Report of the CSIS Asian Regionalism Initiative

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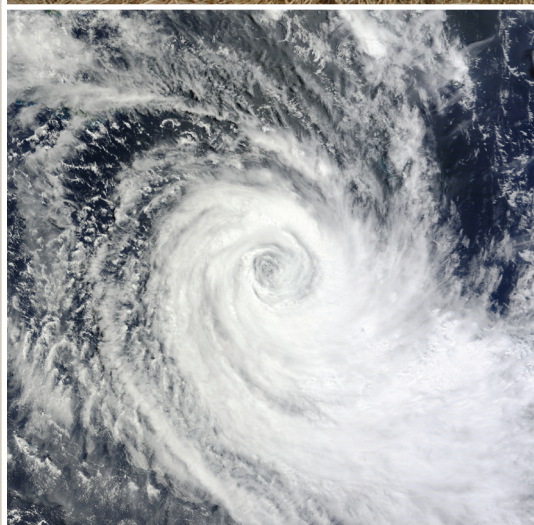Charles W. Freeman III
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Cover photo credits: (Top) Indonesian NGO workers offload supplies from a U.S. Navy helicopter on Sumatra in Operation Unified Assistance on January 18, 2005, during international relief efforts following the Indian Ocean tsunami. DoD photo by Petty Officer 1st Class Alan D. Monyelle, U.S. Navy, U.S. Department of Defense, http://osd.dtic.mil/photos/Jan2005/050113-N-9885M-296.html. (Bottom left) NASA satellite photo of Tropical Cyclone Ului in the South Pacific Ocean, on March 18, 2010, http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=43180. (Bottom right) Wind farm at Bangui Bay on the Ilocos Norte, Philippines, http://www.flickr.com/photos/adrcataylo/3146364197/.

CONTENTS

EXECUTIVE SUMMARY

In this volume, we examine how Asia as a region has responded to the nontraditional and transboundary security threats of climate change and natural disasters. We discuss its implications for the evolution of regional institutions to meet future challenges.

While climate change is generally acknowledged as a threat to the region, Asia as a whole has not responded forcefully or in unity to this challenge. Many governments do not see this threat as urgent or of high priority, given pressing and often competing demands for sustaining livelihood and economic growth, especially among the more populous developing countries. They look to the United States and other advanced industrial countries to take on greater responsibility for meeting this global challenge. At the same time, however, there is increasing awareness of the potentially catastrophic risks associated with climate change, particularly among those affected or likely to be affected. A number of countries have set their own targets and, often with external assistance and within regional organizations, have undertaken measures to increase energy efficiency and reduce carbon emissions to curb pollution while enhancing energy security. Indonesia and some of its neighbors in the Association of Southeast Asian Nations (ASEAN) have begun to address the effects of transborder haze. Moreover, some governments aspire to take the lead in global climate change negotiations to enhance their prestige, while others seek economic gains from emerging "green industries."

In contrast to climate change, Asia's response to natural disasters has been more vigorous. A series of major disasters that started with the Indian Ocean tsunami in 2004 has generated an outpouring of international assistance and proliferation of regional initiatives. In 2005, ASEAN members signed the first legally binding treaty in the world for comprehensive interstate disaster management. In 2010, the Asia-Pacific Economic Cooperation forum decided to elevate its task force on emergency preparedness to a permanent working group.

Governments and regional institutions are also looking beyond immediate humanitarian relief missions to developmental issues of mitigation and adaptation to reduce disaster risk. There is increasing focus on slow-onset disasters related to climate change that may affect critical water sources in the Himalayas and along the Mekong River Basin. Our study cautions, however, that these initiatives have not cemented the region's ability to respond to future disasters. We discuss problems related to the lack of coordination at different levels, the uncertain role of the military and continued gaps in resource and expertise in key organizations. We recommend steps be taken to rationalize the multitude of initiatives to improve coherence but, more importantly, to develop greater technical expertise and on-the-ground capability among existing institutions.

Although Asia lacks, and is not likely to develop, a single umbrella organization such as the European Union or the North Atlantic Treaty Organization, our study concludes that the region's patchwork of overlapping institutions can work to address problems in response not only to local environmental hazards and natural disasters but also to other security threats, through arrange-

ments like the Six-Party Talks on the Korean Peninsula. Responses are effective when there is consensus on common threats and interests and when individual governments and institutions are willing to take on responsibility for forging collective action.

These informal arrangements and the pluralistic structure of overlapping regional institutions are often more flexible and able to circumvent the constraints of political rivalries and formal organizations, as in the cases of Cyclone Nargis in Burma or the Sichuan earthquake in China. Moreover, we see strong bilateral ties as complementing rather than undermining these multilateral arrangements. Nonetheless, we also acknowledge that such ad hoc arrangements face issues of duplication and seldom address broader and longer-term regional challenges, such as climate change or other security issues. Current efforts should focus on strengthening and, in some cases, further institutionalizing existing arrangements to increase transparency and accountability and bring sharper focus on Asia's long-term challenges.

Looking further ahead, particularly with respect to U.S. policy, we believe that the U.S. role will continue to be critical in supporting the region's response to many of the natural disasters it will face. At the same time, the United States should seek to focus Asia's attention increasingly on the long-term threat of climate change and other slow-onset disasters. Not only is the region expected to be a major victim of the consequences of climate change, but it is also a major source of the threat itself. We recommend that the United States not only continue its bilateral and multilateral programs to increase energy efficiency and the use of alternative energy and clean coal technology but also begin to explore broad, secure, low-carbon pathways within the Asia-Pacific Partnership on Clean Development and Climate. We recommend that the partnership expand its membership and mission by including other major emitters like Indonesia and countries that expect to be severely affected by climate change to address the related threat of fresh water shortages and flooding along the Mekong River basin and coastal waters. We conclude that U.S. leadership in the partnership can also generate the momentum needed to achieve a global agreement on climate change.

1   INTRODUCTION
Charles W. Freeman III and Michael J. Green

It has become something of an axiom in policy circles to refer to the twenty-first century as the "Asian Century." The numbers certainly bear out that assertion. Asia is home to more than 60 percent of the world's population, produces well over a third of global gross domestic product, has two superpowers in waiting in both China and India, and presents a full range of the world's most challenging traditional and nontraditional security concerns.

As a region, Asia appears to be integrating rapidly in every conceivable sphere. Intra-Asian trade has nearly doubled over the past 25 years, and the region leads all others in the number of free trade and other preferential trade arrangements. Where Asia's institutional architecture was once dominated by a network of American alliances dubbed the "hub and spokes," numerous multilateral forums such as the East Asia Summit, the Asia-Pacific Economic Cooperation forum, and the Regional Forum of the Association of Southeast Asian Nations now contribute to regional cooperation and security.

Yet despite the evidence of increased economic integration and expanding regional cooperation, Asia's diverse geography, culture, and political norms have complicated movement toward a single architectural arrangement comparable to the European Union or the North American Free Trade Agreement. Countries in Asia are divided by the world's tallest mountains, most treacherous seas, and deepest jungles. They are further divided by dramatically different religious, ethnographic, and cultural identities. Politically, they range from democracies—some chaotic, some more stable—to autocracies. And a 3,000-year history of civilizational rivalry continues to cast a shadow over a region marked by jarring shifts in the balance of power.

Unlike Europe, which integrated in the latter half of the twentieth century in common defense against an external threat and in the shared conviction that state rivalry must be replaced by regional cooperation, Asia does not have a natural set of organizing principles that drive it toward political integration. Indeed, with Asian peace and security largely guaranteed by the U.S. forward presence in the Asia-Pacific even after the end of the Cold War, one might argue that neither concerns over internal friction nor those over external challenges are much of a catalyst for integration.

A focus on the European Union as a potential model for Asian integration is probably inappropriate: conditions that would favor such a structure simply are not present at this time. Given the diverse threat perceptions, political norms, and levels of economic development, the process of integration in Asia will likely remain fluid and untidy for some time to come. Indeed, where European integration largely flowed from the top-down design of a handful of prescient German and French leaders who shared a common vision for the future, Asian integration is much more likely to result from a networking of multilateral cooperation from the bottom up—often in spite of rivalry and competition among the region's leaders.

In February 2009, the Center for Strategic and International Studies (CSIS), with the generous support of the MacArthur Foundation, published a survey of Asian strategic elites that mapped the aspirations and expectations across the region with respect to Asia's emerging architecture. That survey demonstrated strong concern in the region over the dynamics of a perceived shift in power to China, as well as broad support for some sort of East Asian Community architecture focused on confidence building, conflict prevention, and economic integration and to a degree on governance norms, although there was no consensus on which countries should be part of such an architecture. In addition, those surveyed, not surprisingly, tended to value tools of national power and global organizations ahead of regional institutions when looking at crisis management and conflict avoidance.

Based in part on the results of that survey, CSIS and the MacArthur Foundation decided to dive deeper into the concept of regional institution building, examining existing frameworks and their operation and questioning how such frameworks will function as real-world challenges begin to guide national behaviors of those nations operating within them. In particular, we have sought to measure means by which regional actors can come together for collective action in response to nontraditional security and transboundary issues in short-term crises (like natural disasters) or longer-term, unfolding catastrophes (like climate change).

One result is the following volume, in which we look broadly at two areas of nontraditional security cooperation in Asia: (1) climate change, including both the domestic political factors in Asia and the regional strategies for securing low-carbon pathways in anticipation of coordinated efforts to ameliorate climate change; and (2) regional approaches to disaster management. The volume concludes with an inventory of the structures for joint action in Asia and draws on the case studies to assess the utility of existing and emerging institutions as the United States and the region seek greater cooperation on traditional and nontraditional security challenges.

If this is an Asian Century, how the United States conducts itself as an Asian power will say much about its status as the critical actor in global affairs. The success of the United States in engaging with regional institutions will say much about how Asian states view the United States and its contribution to regional peace and stability. Overestimating the breadth and reach of the emerging regional architecture would be unwise. Underestimating the role of regional institutions, however, has the potential to unseat the United States in its status as the guarantor of Asia's security. This volume presents at least one effort to estimate the limits and aspirations of Asia's evolving regional architecture in a real-world context.

2 THE POLITICS OF CLIMATE CHANGE IN ASIA
Charles W. Freeman III and Amy Searight

Introduction: The Copenhagen Accord

Negotiations held under the United Nations Framework Convention on Climate Change (UN-FCCC) in Copenhagen in December 2009 fell well short of global expectations. The stormy negotiations became a series of high-stakes political showdowns between major global actors, with an end-game effort to "salvage" a deal made in a closed-door meeting among the leaders of Brazil, China, India, South Africa, and the United States.[1] In the end, the negotiations failed to produce a new international treaty with binding emissions targets, although they did produce a nonbinding political "accord." The Copenhagen Accord lays out an aspirational goal of limiting global warming to two degrees Celsius but does not specify global targets or define national actions that would be needed to achieve this goal. Instead, nations are asked to make voluntary pledges on actions they plan to take to reduce greenhouse-gas (GHG) emissions.

The eventual impact of the Copenhagen Accord's voluntary mechanism depends on whether governments stick to their pledges, which is in the end a political question. Some analysts suggest that if countries follow through on their pledges and ratchet up midterm actions, the two degrees Celsius goal is within reach.[2] However, meeting this goal is ultimately dependent on domestic politics in each country that may sustain or hinder fulfilling these pledges and may push or restrain governments in pursuing more ambitious targets in the future.

The inability of countries to resolve the most contentious issues surrounding global action on climate change raises the question of whether the UNFCCC framework will work as the main negotiating forum for achieving further progress on global climate change. Achieving ultimate consensus among such a diverse group with divergent interests may be a bridge too far. Alternatively, other frameworks at the regional or global level may be better suited to forging consensus on key issues, such as emissions targets and an equitable distribution of obligations among countries. One such framework is the Asia-Pacific Partnership on Clean Development and Climate (APP), which includes Australia, Canada, China, India, Japan, the Republic of Korea (ROK), and the United States. Collectively, these countries account for over 50 percent of the world's energy use and greenhouse-gas emissions. Other potentially useful frameworks include the Major Economies Forum on Energy and Climate Change (MEF) and the G20.

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1. Sarah O. Ladislaw, "Post-Copenhagen Pathways," *CSIS Commentary*, January 11, 2010, http://csis.org/publication/post-copenhagen-pathways.

2. Trevor Houser, "Evaluating Copenhagen: Does the Accord Meet the Challenge?" Commentary posted on Realtime Economic Issues Watch, Peterson Institute for International Economics, February 4, 2010, http://www.iie.com/realtime/?p=1173.

In the final analysis, the success of any of these frameworks depends less on what happens at the multilateral negotiating table and more on domestic political factors in key participating countries. Our project mapped out the terrain of the climate change debates in seven key Asia-Pacific countries: Australia, China, India, Indonesia, Japan, the Republic of Korea, and the United States. This chapter draws insights from case studies of the politics of climate change by scholars in each country from our study, *Green Dragons: The Politics of Climate Change in Asia,* a component of the overall CSIS Asian Regionalism Initiative.[3] These countries are members of APP (except Indonesia), the MEF, and the G20. Therefore, reaching a consensus among these countries will be crucial to achieving progress on climate change action at the global or the regional level. Yet these players have taken strikingly different positions on international climate change issues.

The first section of this chapter describes in broad terms the pattern of variation in Asia-Pacific responses to global efforts on climate change by examining the interplay of international and domestic variables that shape country behavior. Next, 12 key factors are identified that frame this variation in domestic politics and are critical to understanding the obstacles and incentives to cooperation. The concluding section considers common ground for building cooperation going forward on the basis of their widely divergent domestic political landscapes.

Variation in Asia-Pacific Responses

The politics of climate change vary dramatically across the Asia-Pacific region. At first glance, this variation is not surprising, given the striking economic and political diversity of the region. The countries involved in our study—Australia, China, India, Indonesia, Japan, the ROK, and the United States—have widely varying levels of economic development, political systems, geographic vulnerabilities, and population size. Yet interestingly, the variation in country behavior in global climate change negotiations does not entirely correspond to these traditional divides.

These seven Asia-Pacific countries can be assessed on their positions and defined interests. Some have actively supported international efforts to mitigate climate change, and others are hesitant to make firm commitments in international talks due to domestic economic or political factors. The primary reasons for these differences exist in each country's characterization and delineation of its interests. In one group of countries—Indonesia, Japan, the ROK, and, to some extent Australia under the Labor government—governments have taken a forward-leaning stance on climate change policies. China, India, and the United States, in contrast, have defined their interests in different ways: all three of these states have taken positions that emphasize the high costs of mitigation or that indicate reluctance to commit to binding standards because of concerns about economic disadvantage or lack of common measuring sticks and evaluation standards.

Interestingly, these states do not fall neatly along lines of advanced versus emerging economies. On the one hand, China and India exemplify the traditional cleavage between developed and developing countries. Along with Brazil and South Africa, they have led a bloc of developing countries that resist efforts to impose binding commitments and shared obligations for emissions reductions on emerging economies, emphasizing that most of the existing emissions are the result

3. Michael J. Green and Charles W. Freeman III, eds., *Green Dragons: The Politics of Climate Change in Asia* (Washington, D.C.: CSIS, forthcoming). The authors of the country cases are Kiyoaki Aburaki (on Japan); Malcolm Cook (on Australia); Prem Shankar Jha (on India); Sarah Ladislaw (on the United States); Wonhyuk Lim (on Korea); Agus P. Sari (on Indonesia); and Zhu Feng (on China).

of industrial growth by Western states, particularly the United States and Europe. On the other hand, Indonesia, an emerging economy, has set ambitious targets in the interest of pursuing international leadership goals. The ROK, a member of the Organization for Economic Cooperation and Development (OECD) for over a decade, has also set ambitious goals as a matter of domestic economic policy. Other advanced economies in the Asia-Pacific region have taken vastly different approaches in climate change negotiations, with Japan resuming its legacy of leadership from the negotiation of the Kyoto Protocol in the 1990s by announcing ambitious targets under the newly elected Democratic Party of Japan government, while the reduction targets and policies of the United States are behind those of the European Union and Japan.

Common Strategic Dilemma, Differentiated Responses

One common strategic constraint facing all these countries in international collaboration on climate change is the collective action dilemma. No country wants to assume an unfair burden by contributing more than its "fair share" of carbon emissions reductions. All countries want to avoid a "sucker's payoff" in the strategic game of climate change cooperation. This is a classic collective action dilemma, one that countries face in many other areas of international cooperation, from international trade to arms control and nonproliferation regimes. Yet in climate change negotiations, the collective action problem is made more acute by concerns over competitiveness and carbon leakage. In terms of competitiveness, countries face the risk that self-imposed limits on carbon emissions will drive up local industrial costs higher than those of countries (notably China) that insist on less stringent restrictions. In terms of effectiveness, countries are concerned that the impact of collective action will be mitigated or nullified if major GHG emitters like China, India, and the United States do not fully participate. Not only will they continue to grow GHG emissions, but also industrial production could shift even more rapidly to these developing countries, wiping out any gains from cooperation. These factors make climate change even more difficult than traditional areas of cooperation like international trade, where the underlying conflict is typically more about the distribution of benefits than the distribution of costs. In climate change, the sucker's payoff is very high.

Despite this common strategic dilemma, the politics of climate change policy are playing out quite differently across these countries. Several Asian governments have sought to use climate change to their domestic and international advantage. Rather than focusing on costs and constraints, these governments are framing the issue as one of opportunities. Japan and the ROK, for example, are both seeking to take leading roles in global efforts to mitigate climate change. The current governments in both countries see several advantages to positioning themselves as "green leaders." First, playing a lead and constructive role in global talks on climate change is an opportunity to boost international stature and augment their "soft power" by being seen as "green powers." Second, both countries see first-mover advantages in restructuring their economies to promote green technologies. Despite substantial opposition from industry in both countries, the governments of President Lee in the ROK and of former prime minister Hatoyama in Japan were able to frame their ambitious environmental agendas in ways that are sustaining broad public support.

Another country that has defined reductions as in its immediate interest is Indonesia. President Yudhoyono has proposed ambitious unilateral reduction targets for emissions and has offered even higher reductions with international support. Like the ROK, Indonesia sees an opportunity to play a leading role in international climate change discussions as a "bridge" between diverse

countries—as a developing country, an oil producer, and an archipelago highly vulnerable to the impacts of climate change. The government is also motivated by the prospect of gaining international financial support, as well as the comparatively low cost of mitigation policies that would come from tackling the problems of deforestation, forest fires, and peatland degradation, which contribute more than half of Indonesia's greenhouse gas emissions.

By contrast, China and India have defined their interests in different ways, based on their economic priorities, strategic calculations, and the way they have defined their international roles. As emerging economies, both countries have sought to defend their industrial prerogatives by framing their commitments in nonbinding terms. Moreover, both countries have carved out roles as leaders of the bloc of developing countries in North-South negotiations on economic issues and climate change discussions. India in particular has a long diplomatic tradition of leading the developing world in demanding more equitable treatment—or indeed more favorable, "special and differential" treatment[4]—in North-South discussions on trade, finance, and climate change. China has joined India in this defensive leadership of developing countries on climate change, demanding that the norms of flexibility (nonbinding-ness) and favorable treatment (lower expected contributions) be maintained. Further, China's very strong attachment to the principle of sovereignty and noninterference, which has long influenced its foreign policy priorities and traditions, has also strongly shaped its stance on climate change negotiations. China's focus on sovereignty concerns led it to oppose strongly any international monitoring system in the Copenhagen negotiations, which was a mechanism deemed essential by the European Union and the United States.

As a result, both China and India have tended to view negotiations within the UNFCCC framework as starkly zero-sum. Their position has been to avoid, as much as possible, taking on the burdens of mitigating climate change, demanding instead that advanced economies that have been historical emitters should assume the lion's share of the burden of reducing global emissions. China and India have insisted that the Kyoto Protocol framework, which does not place any obligations on developing countries, be maintained as the legitimate multilateral instrument for climate change negotiations. They underscore that the Copenhagen Accord is nonbinding.

Different considerations have framed the policies and interests of the United States and Australia. The United States chose not to ratify the Kyoto Protocol, due in large part to objections that large developing emitters did not have shared obligations under the treaty. For most of the past decade, the United States has not actively engaged in the UNFCCC process, but the arrival of the Obama administration in 2009 led to a renewed commitment to seek multilateral progress, as well as an effort to pass significant climate change legislation. In the lead-up to the Copenhagen summit, the United States came forth with its first-ever numerical target for reductions, pledging a 17 percent reduction from 2005 emissions, amounting to a 4 percent reduction from 1990 levels. Australia, despite negotiating a very generous reduction commitment in the Kyoto Protocol, did not ratify the treaty under Prime Minister John Howard on the grounds that the United States had refused to do so and that major developing emitters were omitted. The election of the Labor government under Prime Minister Kevin Rudd in 2007 brought a swift ratification of the Kyoto treaty and a strong domestic focus on climate change legislation. But Australia continues to hedge

4. *Special and differential treatment* is a term devised in agreements emanating from the Tokyo Round of trade negotiations in the GATT and subsequently adopted in various legal provisions in the World Trade Organization. The S&D provisions refer to differential and more favorable treatment afforded to developing countries on a range of trade issues. See http://www.wto.org/english/tratop_e/devel_e/dev_special _differential_provisions_e.htm.

Table 2.1. The Impact of Copenhagen Accord Pledges

	Emissions				Reduction from BAU			
		2020			Billion tons		Percent	
	2005	BAU	Low	High	Low	High	Low	High
Annex I	20.06	19.90	17.92	17.10	1.98	2.64	10	14
United States	7.45	7.29	6.40	6.40	0.89	0.89	12	12
Japan	1.44	1.30	1.00	1.00	0.31	0.31	24	24
Australia	0.65	0.71	0.57	0.47	0.14	0.24	20	34
European Union	5.14	4.79	4.39	3.84	0.41	0.95	9	20
Russia[a]	2.90	3.24	3.24	3.07	0.00	0.17	0	5
Canada	0.81	0.90	0.70	0.70	0.20	0.20	22	22
Other	1.67	1.66	1.63	1.62	0.03	0.04	2	2
Non-Annex I	24.71	35.74	33.55	32.61	2.19	3.12	6	9
China	6.74	12.63	12.31	11.59	0.31	1.03	2	8
India[a]	2.11	3.74	3.74	3.74	0.00	0.00	0	0
ROK	0.59	0.72	0.51	0.51	0.21	0.21	29	29
Indonesia	1.95	2.34	1.75	1.75	0.59	0.59	25	25
Brazil	2.23	2.39	1.60	1.56	0.80	0.83	33	35
South Africa	0.51	0.53	0.35	0.35	0.18	0.18	34	34
Mexico	0.75	0.85	0.80	0.62	0.05	0.23	6	27
Other	9.84	12.53	12.49	12.49	0.04	0.04	0	0
SUBTOTAL	44.78	55.64	51.47	49.71	4.17	5.76	7	11
Potential mitigation from international finance			0.00	−1.53	0.00	1.53		
TOTAL	44.78	55.64	51.47	48.18	4.17	7.29	7	13

Source: Trevor Houser, "Evaluating Copenhagen: Does the Accord Meet the Challenge?" commentary posted on Realtime Economic Issues Watch, Peterson Institute for International Economics, February 4, 2010.

Note: Measures of CO_2 include land-use change. BAU = business as usual. Annex I countries were industrial economies in OECD or economies in transition as of 1992 during the UNFCC negotiation. Non-Annex I countries are mostly developing countries.

[a] For India and Russia, the pledges listed in the accord do not result in a reduction below the business-as-usual pathway used for this analysis.

heavily on the full participation of others in international efforts on climate change, as reflected in its wide-ranging offer in the lead-up to the Copenhagen summit of 25 percent cuts in emissions below 2000 levels but only 5 percent reductions in the absence of a global binding agreement.

Table 2.1 lays out the calculations by Trevor Houser, an economist at the Peterson Institute for International Economics, of the impact of pledged actions under the Copenhagen Accord as compared to business-as-usual (BAU) scenarios. As evident in the table, the willingness of key Asia-Pacific countries to take on ambitious pledges varies widely. Australia (pledging action that would produce 20–35 percent reductions from BAU), the ROK (29 percent), Indonesia (25 percent), and Japan (24 percent) rank among the leading countries in pledged commitments. Moreover, some of these countries have offered higher reductions if matched by others or if financed by international assistance. Japan, for example, has offered a midterm target of reducing emissions by 25 percent below 1990 levels, but only if the other major economies make similarly ambitious targets. Indonesia has offered to expand its target to a 41 percent reduction below business-as-usual by 2020, if it receives international financial assistance.

For fast-growing China and India, the governments have defined reductions in terms of cuts in carbon intensity, meaning the amount of carbon dioxide emitted per unit of economic output or gross domestic product (GDP). As their economies grow, so will their emissions, but a reduction in carbon intensity will mean that the rate of growth of emissions will slow. China has pledged to reduce its carbon intensity by between 40 and 45 percent by 2020, which will reduce emissions below a "business as usual" scenario. India set a voluntary target of reducing carbon intensity by as much as 25 percent by 2025 and committed never to exceed the average per capita emissions of the OECD countries. The United States is squarely in the middle of these groups, offering to reduce emissions by 17 percent from 2005 levels by 2020, which amounts to 12 percent below BAU. This pledge is contingent on the passage of climate change legislation in the U.S. Congress, which will be a difficult political battle that requires bipartisan support.

This raises the question: "What domestic political and economic features in each country constrain the interests and positions of these states in international negotiation?"

Factors of National Variation

A standard starting point for explaining differences in state preferences for international cooperation is to consider variation in domestic political and economic interests. These interest-based explanations have been used to explain international environmental cooperation by focusing on two key domestic interests: the ecological vulnerability of the country to climate change and the cost of abatement measures called for in the regime under negotiation. Countries that face higher risks of ecological damage under climate change will be more motivated to negotiate an international regime to control emissions. Likewise, countries that face lower costs of mitigating emissions will have a higher preference for taking collective action than those facing higher costs. This is just one example of the interest-based explanations formed by domestic considerations revealed in our study.

Understanding these factors, both negative and positive, will be crucial to reaching consensus. Our analysis provided 12 framing points, which are discussed below:

- *Developed versus developing economies.* The most-discussed variation among the Asian countries assessed involves whether developing countries should mitigate GHG emissions on the same scale as developed countries that have been the historical source of most atmospheric carbon.

- *Large scale versus lesser GHG emitters.* The ability of smaller countries or those that have already significantly reduced overall emissions to dramatically affect overall global emissions by reducing their own output is limited. Therefore, political support for domestic emissions reduction is somewhat captive to the commitment to reduce GHG output by larger-scale emitters.

- *Strength of political leadership.* The personal involvement and commitment of top political leaders have been a driving force in shaping forward-leaning policies on climate change. Leaders in Indonesia, Japan, and the ROK have each played a central role in shaping domestic debates by defining the issue in particular ways and placing climate change policies and ambitious targets at the top of their political agenda. Newly elected leaders in Australia and the United States since 2008 have also given a push to climate change issues and moved the agenda forward.

- *Strength of domestic public support for action on climate change.* Cross-national polls have shown strong global support for action on climate change, with surprisingly low variation across developing and developed countries. Asia-Pacific nations poll the highest level of support for climate change actions. The significance of these polls should be somewhat reduced when considered against the relative unwillingness of the domestic public in these countries to pay more for reduced GHG emissions.[5]

- *Skepticism over the science of climate change.* Outside the United States and India, skepticism over the science of climate change has not been a significant factor in shaping climate change policy. In the wake of "climate gate," in which e-mails from leading climate change researchers suggested an effort to exaggerate the dangers of climate change, however, public skepticism of scientific consensus spiked, particularly in Australia.[6]

- *Economic linkages: "green growth" versus costs.* The way climate change policies are framed, by both advocates and opponents, can have a decisive impact on the way domestic publics view them. Framing the issue in purely environmental terms often fails to resonate with broader publics, aside from those people already committed to environmental causes. Activist governments and other proponents have thus sought to create links between climate change and economic growth, including through the promotion of green-technology development as a national economic strategy, while opponents have sought to define the issue in terms of the economic costs and the negative impact on growth.

- *Opportunities for international prestige as a domestic political priority.* The Asia-Pacific cases in our *Green Dragons* study offer some striking examples of the way that international considerations can outweigh purely domestic concerns in shaping climate change debates and policy choices. Two countries in particular, Indonesia and the ROK, defined their interests to a large degree in response to international opportunities.

- *Impact of business community.* The business communities in these Asia-Pacific countries are active participants in debates over climate change policy. In many cases, they are the most active and vocal opponents of legislation to curb emissions, although a growing number of green-

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5. See annex table 2.A.1.
6. See annex table 2.A.2.

technology industries and financial sector interests in some countries balance other industrial interests in support of aggressive climate change policies and carbon-trading schemes. The impact of the business community thus varies depending on how well organized and unified it is in defining business interests.

- *Role of civil society and environmental nongovernmental organizations (NGOs).* Environmental NGOs are active participants in the climate change debate in most of the key Asia-Pacific countries. They are an especially influential and media-savvy presence in Australia and the United States, but they also have a strong voice in Indonesia, Japan, and the ROK. In the United States, environmental groups play varying roles in support of climate mitigation policies, with some focusing on clean energy technology and energy efficiency, while others focus on conservation of natural lands and deforestation.

- *Ecological and strategic factors.* The Asia-Pacific region as a whole is highly vulnerable to the ecological effects of climate change and is second only to Africa in the predicted negative impact. Some countries like Australia are already experiencing significant ecological effects, increasing the urgency in these countries for near-term solutions to the challenges.

- *Stable energy supply.* Countries with stable supplies of fossil-based energy are less likely to push for aggressive climate change actions. By contrast, energy disruptions and price spikes help push governments toward energy conservation and developing renewable energy resources.

- *Central-local government relations.* The relationship between the central and the state or local governments often creates political obstacles to enacting or implementing effective climate change policies.

Adding Up the Differences: Common Ground, Pathways Forward?

The politics of climate change in Asia are as wide ranging and varied as the economic, political, and social diversity of the region. These political differences raise significant obstacles to serious collaboration on climate protection. And yet there are some areas of commonalities and shared approaches—and a few underappreciated and particularly important positive factors—that shape the political dynamics of climate change in the region.

Strong Public Support for Climate Change Policy in Asia

Publics in all seven countries are highly concerned about the impact of global warming and would like their governments to take stronger measures to address the issue. This response may be due in part to the shared ecological vulnerability of these Pacific states to climate change. Public support is especially high in Australia, China, Japan, and the ROK. Public opinion in the United States and India lags behind support shown in other countries, with lower levels of acceptance of the scientific consensus on climate change and smaller majorities in support of costly actions. But even in these two countries, sizable majorities support their governments' adoption of greater measures to curb emissions. Public opinion in India appears to diverge from the more cautious approach taken by the Indian government, and the gap appears even wider in China.

Of course, polls may not capture the full dynamics of public opinion in the face of rapidly rising energy costs. Moreover, polling on climate change is very sensitive to the framing of the issue

and thus may shift rapidly in response to actual policy proposals and their estimated (or disputed) costs.[7] In other words, government behavior in some Asia-Pacific states may be overly cautious, or it may reflect a more accurate calculation of the true *political* costs of moving forward. Asia-Pacific governments that have succeeded in boosting public support for environmental policies have framed the issue as opportunities for green growth and jobs.

Importance of Leadership and of Opportunities on the International Stage for Leaders to Shine

Dynamic political leadership committed to a climate change agenda is the single most important ingredient for achieving policies for reducing carbon emissions. The cases in our study suggest that providing an opportunity for these leaders to shine on the international stage is also important. Leaders supporting ambitious climate change policies benefit from the opportunities to demonstrate international leadership on the issue by hosting summits and receiving widespread international recognition. The rise in international prestige in turn boosts public support for policies that mitigate climate change. Designing international frameworks for enhancing prestige and leadership opportunities may augment this effect.

In addition to the UN process, the G20 may also hold significant value for promoting climate change cooperation. It also raises the possibility that regional groupings may play a valuable role, especially those with summit-level meetings like APEC and the East Asian Summit.

Importance of Technology and Recognition of Early-Mover Advantages

Many countries in the region are vying for technology leadership in environmental industries. China, Japan, the ROK, and the United States are all in the forefront of climate change technology, and India would very much like to join their ranks. These countries recognize the early-mover advantages of developing environmental technologies and gaining a competitive edge on their rivals in what is likely to be a rapidly expanding global market. This shared focus on technology may provide motivation for collaboration, but it could also create competitive dynamics that inhibit the diffusion of technology.

Promoting technological innovation and its early adoption is extremely important to combating climate change. China's and India's rapid growth will result in massive investments in industrial and energy infrastructure, which will "lock in" carbon-intensive technologies for a long time unless new low-carbon technologies can be quickly developed and diffused.

Energy Efficiency Meets Everyone's Interests

Whether the motive has been sustainability, economic growth, or mitigation, significant energy efficiency programs have received domestic political support and have been implemented in all the countries we assessed. Chapter 3 on securing low-carbon pathways will expand on this area.

In sum, these key Asia-Pacific countries define their interests differently—often in ways that defy standard expectations and depend on international opportunities as well as most importantly

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7. See annex table 2.A.1.

on the domestic political factors. Reaching some consensus on the solution to the challenge of climate change will require political leaders in these countries to present effectively the collective benefits of ameliorating climate change, while persuading their publics to accept the pain that such amelioration will almost certainly entail.

Annex

Table 2.A.1. Willingness to Pay More to Fight Climate Change (in percent)

Question: Would you be willing to pay [fixed amount in local currency equal to 1 percent per capita GDP, prorated per month] more for energy and other products as part of taking steps against climate change? [Those not willing were then asked the same question about an amount equivalent to 0.5 percent per capita GDP.]

Willing to Pay	1% More	0.5% More	Not Willing
China	68	14	16
Vietnam	59	26	13
Japan	53	12	35
United States	48	14	38
Indonesia	44	16	35
India	44	11	29
Average	46	17	33

Source: World Bank, "Public Attitudes toward Climate Change: Findings from a Multi-Country Poll," *World Development Report 2010: Development and Climate Change,* December 3, 2009, http://siteresources .worldbank.org/INTWDR2010/Resources/Background-report.pdf.

Table 2.A.2. Views of Human Activity as Significant Cause of Climate Change (in percent)

	Human Activity Is Significant Cause	Human Activity Is NOT Significant Cause	Don't Know
ROK	91	7	2
China	87	11	2
Australia	81	16	3
Indonesia	71	17	12
United States	71	24	5
India	47	21	33
Average	79	14	7

Source: BBC World Service Poll, "All Countries Need to Take Major Steps on Climate Change: Global Poll," poll of 21 countries (only 6 Asia-Pacific countries shown in table), September 24, 2007.

3 SECURE, LOW-CARBON PATHWAYS IN ASIA

David Pumphrey and Sarah O. Ladislaw

Climate change, energy security, and economic development are key issues facing governments around the world. Stabilizing the level of greenhouse gases (GHG) in the earth's atmosphere to avoid the most dangerous impacts of global climate change will require participation of all major sources of GHG emissions. The political reality of many of the world's major economies (and major emitters) is that emissions reduction cannot come at the undue expense of energy security and economic growth. The key to global action, therefore, is to identify policy and technology solutions that reduce emissions while providing enough energy to maintain economic growth and development: that is, to find secure, low-carbon pathways.

Advantages of Secure, Low-Carbon Pathways

Secure, low-carbon pathways offer strategic guidance for policymakers, companies, financiers, and the community of nongovernmental organizations (NGOs). Each of these communities recognizes that reaching the emissions reduction goals outlined by the international community will be extremely difficult. Questions abound about the technological, economic, political, and commercial feasibility of moving low-carbon technology to market at scale and in time to meet those goals. These low-carbon pathways are designed to answer some of the key questions about the policy frameworks (laws, regulations, and incentives), technological investments, and commercial activity that are necessary not only to reach lower emissions without jeopardizing economic growth and energy security but also to create economic opportunity and improve overall security.

Low-carbon pathways can be tailored to different time frames, geographic locations, economic sectors, technology and fuel options, and other key assumptions and inputs. For the purposes of this chapter, we focus on low-carbon pathways that explore emissions reductions from an energy sector in a given economy over time horizons of 20 to 40 years (out to 2030 or 2050). According to the International Energy Agency's *World Energy Outlook 2009*, the energy sector accounts for 84 percent of global carbon dioxide (CO_2) emissions and 64 percent of global GHG emissions and is therefore critically important to any efforts to reduce emissions.[1]

Low-carbon pathways illustrate how society can transition from its current energy system to one that limits the amount of greenhouse gases that cause climate change. The pathways use a

1. International Energy Agency (IEA), *World Energy Outlook 2009* (hereafter *WEO 2009)* (Paris: OECD/IEA, 2009), 168.

combination of economic, social, technological, policy, and commercial assumptions to provide an outlook, or a series of outlooks, on how different technologies and fuels contribute to future energy use, at what cost, and under what time horizons. Most of this analysis is done through complex modeling processes and does not speak directly to the policies or investments that will bring about any given scenario. Other pathways approach the problem from a policy standpoint, modeling instead the expected outcome of certain energy and climate policies to judge the potential effectiveness of those policies. Both types of pathway offer useful insights into the economic and technological potential for decarbonizing energy systems. Most of these models do not incorporate the impact on emissions outside the energy sector (land use and forestry) and do not, therefore, provide an economy-wide view of emissions reductions. For countries with significant land-use and forestry-related emissions, such as Indonesia, these energy-related low-carbon pathways are not sufficient for making determinations about the least-cost method of reducing emissions.

These studies have been instrumental in helping educate policymakers about the options, costs, and limitations of technologies, fuels, and policies being promoted to drive the transition to a low-carbon economy. As countries commit to reducing emissions as part of a global effort to combat climate change, low-carbon pathways have emerged as an important tool for exploring various technology and policy options as well as serving as the foundation for the goals each nation will set for midterm and long-term emissions reduction.

These pledges and targets serve an important purpose in the context of international climate negotiations. At the UN Conference of Parties (COP) meeting under the UN Framework Convention on Climate Change (UNFCCC) in December 2009, countries agreed to pledge targets and actions for emissions reduction out to the year 2020. To date, nearly 100 countries have submitted targets or pledges. For certain countries, these targets are already a matter of domestic policy and codified in domestic law; for others, the targets are still being debated; and for a great many countries, these targets are voluntary in nature and contingent on the availability of international financing and technology. Many countries arrived at their given pledge after careful analysis and study using low-carbon pathways. These pathways served as confidence-building measures for policymakers and industry because they illustrated a specific path for achieving given emissions reductions at a given cost. Other countries based their pledges on political grounds or made slight adjustments to emissions trajectories already expected to result from policies in place.

Low-carbon pathways also can highlight uncertainties. To manage uncertainty, the pathways must include assumptions about future fuel costs and availability, the pace and timing of technology innovation and capital stock turnover, social and commercial response to changing technologies, prices, and practices, and the overall effectiveness of any given set of public policies. The best low-carbon pathways provide a range of potential outcomes that test some of the variability that comes with so much inherent uncertainty, and many of them use the uncertainty to drive policy mechanisms that can try to manage a variety of outcomes and protect society against unintended consequences.

Secure, Low-Carbon Pathways in Asia

Asia is particularly important in global efforts to reduce emissions and energy use. It is home to some of the largest current and future emitters of global greenhouse gases as well as the most vulnerable to the impacts of a changing climate. The region is host to several densely populated countries and major centers of urban growth and development. Many of the rapidly developing

economies in Asia will be the major source of the world's growth in energy demand in the next several decades and are therefore critically important to patterns of energy consumption, production, and use as well as drivers for investment and technology development and deployment.

Countries in the region are at different stages of development and have a variety of governance structures and approaches to economic and social development. The United States, as part of the Asia-Pacific region, is an important contributor to GHG emissions, global energy consumption and production, and the global effort to transition to low-carbon economies. Asian countries are heavily engaged in efforts to reduce emissions and provide for future energy security and are engaged in efforts, both on a regional and on a bilateral basis, to cooperate where possible to drive the kind of policies, investments, and technological research and development that will ease the transition to sources of lower-carbon energy and ensure greater energy security.

While all countries in the region have an important role to play in combating global climate change and all countries share a concern for their own economic, environmental, and energy security, some countries' emissions reductions are more important than others, given the sheer magnitude and expected trajectory of growth (see table 3.1). China and the United States are the largest emitters of greenhouse gases. Any global action to reduce emissions that fails to include them will not be effective. India, while a much smaller source of emissions than China or the United States today, is projected to be a major source of emissions in the coming decades as it continues to develop. Japan and the Republic of Korea (ROK) are both important economies and regional leaders. Japan, a major developed economy with high levels of efficiency, will face the unique challenge of reducing emissions when the cost of abatement is extremely high, economic growth is relatively low, and dependence on energy imports is already a major concern. The ROK has taken a very active role in promoting low-carbon, green growth in the wake of the recent global recession. Taiwan, like other emerging economies, has seen its GHG emissions grow dramatically as it seeks to balance economic growth with emissions reduction targets.

Although countries like Indonesia will have an important impact on global emissions reduction, their greatest source of emissions abatement will come from changes in forestry and land-use practices more than energy consumption. Even with the participation of the major emitters, there are several reasons to find ways for smaller economies and smaller emitters to develop and follow a low-carbon pathway: reduce emissions further, provide markets for low-carbon energy technologies, and help prevent carbon leakage.

This chapter discusses secure, low-carbon pathways for China, India, Japan, the ROK, Taiwan, and the United States, which together represent 53 percent of total global CO_2 emissions. To better understand each pathway under development, the Center for Strategic and International Studies (CSIS) convened a small workshop in February 2010 in Tokyo to discuss the methodology and assumptions used in developing each respective pathway, to address the various barriers faced to achieving targets, and to compare the success, challenges, and implementation strategies of each pathway. The analysis draws heavily on the presentations made and discussions that followed.

Table 3.1. Actual and Predicted Energy-Related CO_2 Emissions in Selected Asian Economies, the United States, and the World, 2007 and 2030

Economy	2007 Emissions (millions of metric tons)	2007 Global Ranking	% of Global Emissions	Projected Emissions, 2030
China	6,071	1	21	11,615
India	1,327	4	5	3,362
Japan	1,232	5	4	984
ROK	481	9	2	346
Taiwan	276	22	1	407[a]
United States	5,741	2	20	5,535
World	28,826	n.a.	n.a.	40,226

Source: International Energy Agency, *World Energy Outlook 2009*, Annex A: Tables for Reference Scenario Projections, 621–657.

Note: n.a. = not applicable.

[a] Projected for 2025; Environmental Protection Administration, Taiwan.

The pathways include important information about the targets for emission reduction, advances in technology, changes in energy fuels and technology, and economic and security impacts of the transition to a low-carbon economy. The pathways attempt to place the targets in context, reviewing their overall ambition and feasibility. When transitioning to low-carbon energy sources, however, each economy will face its own set of challenges. These differences result from factors as varied as their industrial makeup and political economy, domestic natural resource base, energy profile, demographic and socioeconomic trends, political landscape, and views and priorities relating to energy security and climate change.

Each economy will face barriers to transition, including barriers to technology deployment, social change, investment, or political consensus. Some of these barriers can be overcome by policy changes, while others are a bit more difficult to influence and will require unpredictable technological advancements or gradual changes in society. In addition, the domestic and international stakeholders—especially politicians, businesses, nongovernmental organizations, and international financial institutions that play a key role in determining the future course of energy- and emissions-related decisions in each country—can act as barriers.

The final section offers some broad views on the important role that regional cooperation can play in advancing secure, low-carbon pathways among the countries in Asia. Technology cooperation, information sharing, financing, and many other strategies may play an important part in helping each country in the region maintain energy security while transitioning to lower-carbon sources of energy.

As long as energy security, economic growth, and a healthier environment continue to be top priorities for Asia and the rest of the world, low-carbon pathways will be an important tool for providing policymakers, businesses, and the general public with critical information on crafting and adjusting policies to decarbonize their energy sectors. The analyses that follow are not necessarily the best or only pathways to achieving a secure, low-carbon energy future, but they are intended to provide insights into the challenges and opportunities that await many of the world's most important sources of emissions and energy use.

Case Studies

China

China has become the world's largest emitter of energy-related greenhouse gasses, having now surpassed the United States. In 2007, China's energy sector accounted for nearly 6.1 billion tons of CO_2, representing about 21 percent of total global energy-related CO_2 emissions.[2] China's historical emissions, however, are still well below those of the United States, and per capita emissions are about a quarter of those of the United States and about half those of Europe. China's emissions have been driven by a period of strong economic growth based on energy-intensive industries and by a heavy reliance on coal as the major energy source. The rapid growth of energy consumption has required major expansion of the energy production, transport, and consumption infrastructure. As a result of the challenges associated with this expansion, Chinese decisionmakers have become greatly concerned about the country's energy security, that is, its ability to deliver reliable and affordable energy services to support economic growth. The rapid growth in energy use has created environmental concerns as well, primarily over the degradation of air and water quality but more recently over climate change. The Chinese government has put forth a number of policies to improve the efficiency of energy use, encourage other energy sources, especially nonfossil fuel sources, and establish a trajectory for carbon emissions.

Background on China's Greenhouse Gas Emissions

China's GHG emissions more than doubled between 1990 and 2007, from 2.2 billion tons of energy-related CO_2 emission to 6.1 billion tons. As figure 3.1 shows, China's energy consumption is dominated by the industrial sector, which has been the main engine of economic growth. In 2006, energy consumption by industry accounted for over 50 percent of total final energy consumption (see figure 3.1a), in contrast to the United States, which consumes less than 30 percent of total delivered energy in the industrial sector. Growth in China has been especially strong in energy-intensive industries such as iron and steel, concrete, glass, and chemicals. China is now the world's leading producer of steel, cement, glass, and ammonia.
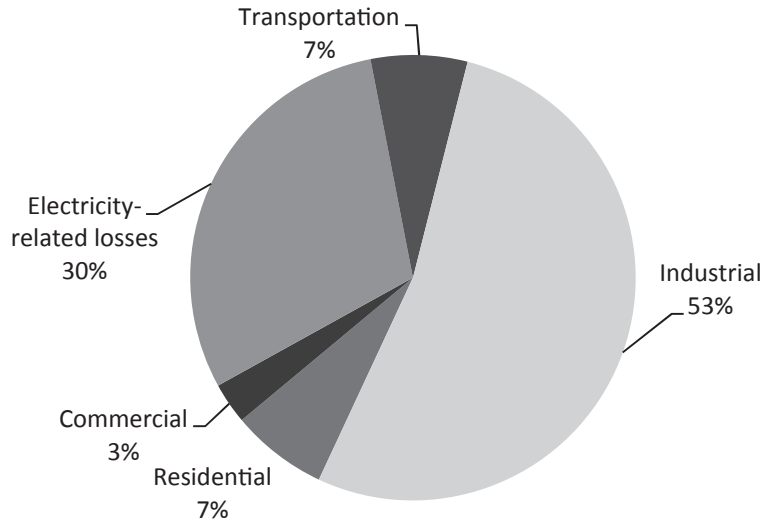

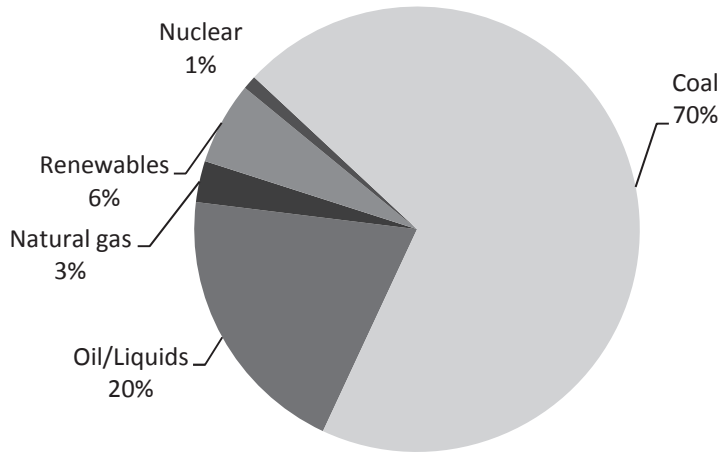2. *WEO 2009,* Annex A: Tables for Reference Scenario Projections, 647.

Figure 3.1. Energy Consumption in China by Sector and Fuel, 2006

a. Consumption by sector

Transportation
7%

Electricity-
related losses
30%

Industrial
53%

Commercial
3%

Residential
7%

b. Consumption by fuel

Nuclear
1%

Renewables
6%

Natural gas
3%

Oil/Liquids
20%

Coal
70%
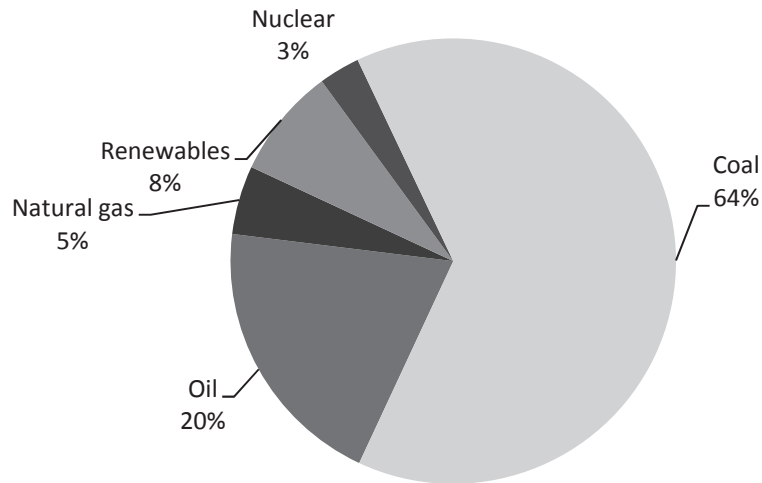
Source: Energy Information Administration, *International Energy Outlook 2009* (Washington, D.C.: EIA, May 2009), 215.

Note: Electricity-related losses represent energy lost through generation, transmission and distribution of electric power and may include heat production.

Figure 3.2. China's Projected Energy Demand by Fuel, 2030

Source: *WEO 2009, 646.*

China's energy mix has been dominated by domestically produced coal. As figure 3.1b shows, about 70 percent of China's total primary energy demand in 2006 was in the form of coal. Coal dominates electric power production, representing about 80 percent of total power generation. Coal also plays an important role in the industrial sector, representing about one-third of final consumption. Petroleum has played a smaller role in China than in the United States, reflecting the differences in the number of automobiles in operation. As China's wealth has increased however, the auto fleet has expanded rapidly to the point that China became the largest producer of automobiles in the world in 2009.

China's demand for energy is expected to continue to increase as long as policies strive to promote high economic growth. The International Energy Agency (IEA) forecasts that China's demand for energy will be the most important component of world energy growth through 2030. Despite continued improvement in energy efficiency, the IEA estimates that China's demand for energy could increase by nearly 95 percent from 2007 to 2030.[3] China's increase would represent about 40 percent of total growth in world energy demand. Since the expected mix of fuels will remain about the same, this growth will be dominated by the growth in the principal energy sources of coal and oil. While renewables and nuclear power are both growing at faster rates than fossil fuels, they are not growing rapidly enough to change the relative balance among energy sources significantly. These estimates imply that China's consumption of coal will grow from current levels of about 3.0 billion tons to more than 4.5 billion tons by 2030. For oil, consumption could grow from about 7.7 million barrels per day in 2008 to 16.3 million barrels per day in 2030 (see figure 3.2). GHG emissions under this scenario would grow from 6.1 billion tons of CO_2 equivalent in

3. *WEO 2009*, 76.

2007 to 11.6 billion tons in 2030. At that point, China alone would account for 28 percent of global emissions.

These trends in the growth of energy consumption—driven largely by energy-intensive industry and based primarily on coal—have caused the Chinese government to take a number of policy measures to deal with the potential energy security and environmental problems. For energy security, the prospect of continuing growth in demand for coal raises concerns about the country's continuing ability to increase the scale of the infrastructure necessary to produce and transport the coal. Bottlenecks in the mining and transportation of coal have led to increasing coal imports by coastal provinces. For oil, the increased consumption will be met mostly through higher imports from the Middle East. Both of these situations raise concern about maintaining a reliable and reasonably priced flow of energy. The heavy reliance on coal has been a major contributor to poor air quality in China, but the leadership has become more and more worried about climate change–related impacts and recognizes China's role as a major contributor of future GHG emissions.

To address concerns over energy security, the environment, and climate change, the Chinese government has adopted policies addressing energy demand and the mix of fuels that will be consumed. On the demand side, the Eleventh Five Year Plan covering 2006–10 called for reducing the overall intensity of energy in the economy by 20 percent through a number of programs that target the largest industries, shut down small industries, and improve energy efficiency for buildings. Although nonfossil fuels represented only about 7 percent of total energy consumption in 2006, China hopes to derive 15 percent of its energy from nonfossil fuels by 2020 by increasing generation of wind, solar, nuclear, and hydro power. China has also put in place aggressive automobile fuel efficiency standards to limit the growth in oil demand. Before the COP 15 meeting in Copenhagen last year, China announced GHG emission objectives for the first time. China has set a goal of lowering the GHG intensity of its economy by 35–45 percent by 2020. This objective was reiterated in the Copenhagen Accord emission reductions that were compiled at the end of January 2010.

Transition Policies and Outlook

Numerous analyses have attempted to provide insight into the future path for energy demand and supply as well as GHG emissions in China. This chapter will draw primarily on work done by the Energy Research Institute (ERI) of the National Development and Reform Commission. The ERI has developed substantial information on the energy sector in China as well as extensive computer models to help understand the evolution of the energy market.
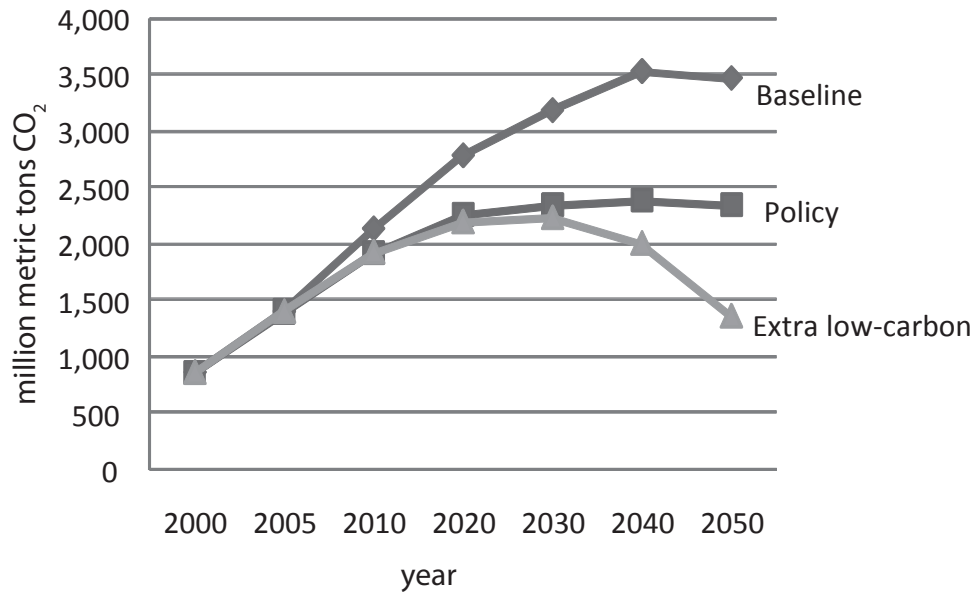
The ERI report, "Low-Carbon Economy Scenario Studies up to 2050," develops four emission scenarios: a business-as-usual case, a low-carbon path with high economic growth, an enhanced low-carbon pathway that can be pursued with international cooperation, and a low-carbon pathway with low economic growth. The high economic growth rate averages 6.4 percent year through 2050 with higher growth in the period to 2030 and lower growth after that time. The lower growth rate in gross domestic product (GDP) averages 5.7 percent through 2050.[4]

The key factors in determining a low-carbon pathway are the evolution of industrial structure, the efficiency of the technologies employed across the economy, and the rate of adoption of more efficient and low-carbon energy production technologies. The study expects that the Chinese

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4. Kejun Jiang, Xiulian Hu, Qiang Liu, and Xing Zhuang, *Low-Carbon Economy Scenario Studies Up to 2050,* Energy Research Institute, National Development and Reform Commission (NDRC), Beijing, 2009.

Figure 3.3. Three Scenarios for China's CO$_2$ Emission Trends, 2000–2050

economy will evolve from an export market–focused manufacturing one to a developed-country model focused increasingly on serving domestic demand. With this shift and the maturation of the internal infrastructure, industrial structure will see a decline in the share accounted for by industry and construction and an increase in the share of light manufacturing and service industries over this time period. This evolution implies that the output of energy-intensive industries will peak between 2020 and 2030 and decline through 2050. For example, iron and steel output is assumed to grow from 355 million tons in 2005 to 610 million tons in 2020 and then decline to 360 million tons in 2050.

How quickly the highest-efficiency production technologies are introduced into the energy-intensive sectors is also a key factor. For each major industry, the study makes explicit assumptions about the penetration rates of new technologies. Similarly, the scenarios make assumptions about the pace of introducing more efficient appliances, building technologies, and automobiles. The scenarios make assumptions about the pace of introducing new, low-carbon energy technologies such as offshore wind, photovoltaics, nuclear power, and carbon capture and storage (CCS). The distinguishing difference between the low-carbon scenario and the extra low-carbon scenario is how quickly energy-efficient and low-carbon technologies are introduced.

Figure 3.3 shows emission trends of the three main scenarios, where the *baseline* illustrates business as usual, *policy* illustrates the low-carbon scenario, and *ELC* tracks the extra low–carbon case. Both the baseline case and the policy case show carbon emissions peaking about 2040; however, the peak in the policy case is more than 30 percent lower than the business-as-usual case. For the extra low-carbon case, the peak is reached around 2030, and by 2050 emissions are about 60 percent lower than in the baseline and 40 percent lower than in the policy case.

Energy Security Considerations

The policies that will put China on a low-carbon pathway should have benefits for overall energy security concerns. As noted above, two major concerns for China are the rising imports of Middle Eastern oil and the ability to increase domestic coal production in a reliable and cost-effective manner. The strategies described in these scenarios—which place heavy emphasis on sharply lowering the energy intensity of the economy through structural change and greater energy efficiency—will also lower the amount of oil and coal that will need to be supplied to the market. In addition, the shift to low-carbon energy sources will reinforce the effects of these efficiency measures.

The impact of these policy changes on economic growth, however, is a key policy question for the Chinese government. The low-carbon policy case could result in GDP losses of just over 1 percent by 2030, while the enhanced low-carbon case could cause GDP to be nearly 2 percent lower. This economic effect will need to be evaluated against the benefits to energy security and climate.

Competitiveness and Clean Energy

China's clean energy polices have led to a rapid expansion in manufacturing capacity for low-carbon energy technologies. China's investment in clean energy in 2009 exceeded all other countries at $34.6 billion.[5] This level of investment was driven by aggressive targets for renewable energy generation as well as by a feed-in tariff for wind power, subsidies for photovoltaics, and readily available financing for clean energy projects. China is also taking steps to encourage domestic innovation by issuing guidelines on the use of domestically developed technology.

India

Driven by economic development and policies that extend access to energy to a wider segment of the population, the Indian energy sector is one of the fastest growing in the world. While often linked with China in terms of importance in global energy markets and GHG emissions, India's energy economy and its policy environment are very different. India has recognized that it must begin to implement policies that address GHG emissions.

Background on India's Energy Sector

A key characteristic of India's energy sector is the low per capita consumption of energy. In 2006, India's per capita consumption was about 0.5 tons of oil equivalent (toe), while per capita consumption in China was 1.4 toe, the OECD average was 4.7, and the U.S. average was 7.7.[6] Over 400 million people in India, about one -third of the population, do not have access to electricity, and about 90 percent of the rural population depends on traditional biomass sources for fuels for cooking. India's energy consumption is dominated by the industrial and electric power sectors. The household and commercial sectors have relatively low use of appliances and automobiles. Figure 3.4a shows the sectoral breakdown of final energy consumption in 2006.
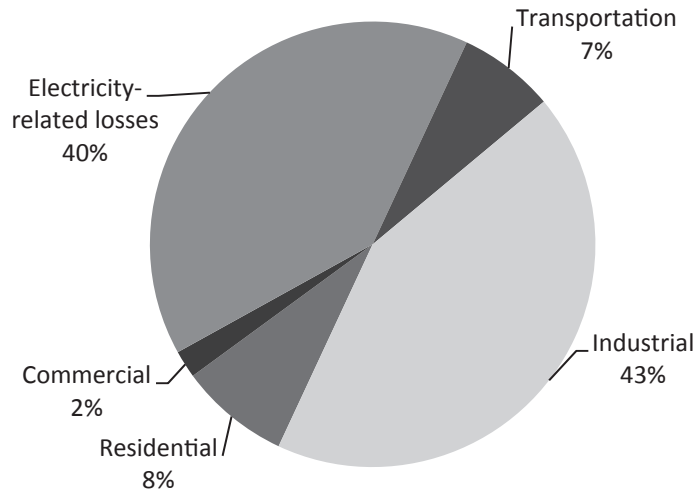
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5. PEW Charitable Trusts, *Who's Winning the Clean Energy Race? Growth, Competition and Opportunity in the World's Largest Economies* (Washington, D.C.: PEW Charitable Trusts, March 2010), 26.

6. IEA, "Selected Indicators for 2006," *Key World Energy Statistics 2008* (Paris: OECD/IEA), beginning at p. 50.
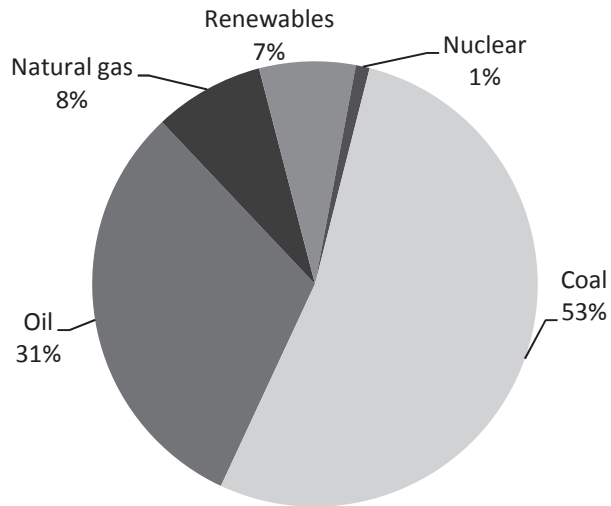
Figure 3.4. Energy Consumption in India by Sector and Fuel, 2006

a. Consumption by sector

Transportation
7%

Electricity-
related losses
40%

Industrial
43%

Commercial
2%

Residential
8%

b. Consumption by fuel

Renewables
7%

Nuclear
1%

Natural gas
8%

Coal
53%

Oil
31%

Source: EIA, *International Energy Outlook 2009* (Washington, D.C.: EIA, May 2009), 216.

Note: Electricity-related losses represent energy lost through generation, transmission and distribution of electric
power and may include heat production.

On the supply side, India's energy sector is dominated by coal. About 53 percent of total consumption in 2006 was from coal, most of which was produced in India (see figure 3.4b). The expansion of domestic coal production will be challenged by the need for additional infrastructure to mine and transport the coal. In addition, India's coal is of a low quality. Because of these two factors, coal imports have been rising and are expected to continue to capture a larger share of India's power generation, especially in coastal areas. For its oil, India depends heavily on international markets, importing about 68 percent of its total consumption. Renewables, almost totally hydropower, represented about 7 percent of the overall energy mix in 2006.

India was the fourth-largest emitter of energy sector–related greenhouse gases in 2006 (behind China, the United States, and Russia) and fifth when the European Union is included. India's emissions have risen by about 125 percent since 1990. The heavy dependence on coal to produce electricity is the key factor in India's emission profile. According to a study by the Energy and Resources Institute (TERI), nearly 50 percent of GHG emissions came from the electric power and other transformative energy industries.[7]

Secure Low-Carbon Pathway

India's major economic policy objective is to alleviate poverty through economic development. This goal includes making progress on bringing commercial energy services to all Indians. Maintaining access to reliable and affordable energy supplies is critical and is seen as a central element in maintaining high GDP growth rates that will create adequate jobs to support the poverty alleviation efforts. The Indian government has increasingly recognized the risks posed by climate change but only recently announced the voluntary goal of reducing the emission intensity of GDP by 20–25 percent by 2020 compared to 2005 levels.

The strategy for achieving this goal will rely on continuing improvements in energy efficiency in industrial sector processes, especially in energy-intensive ones, increasing electric power plant efficiencies, and raising the share of low-carbon energy sources, particularly nuclear and solar. India's energy intensity has been improving continuously for more than 20 years, and this trend is expected to continue. The introduction of low-carbon fuels, however, has been not been as rapid and will require significant policy support.
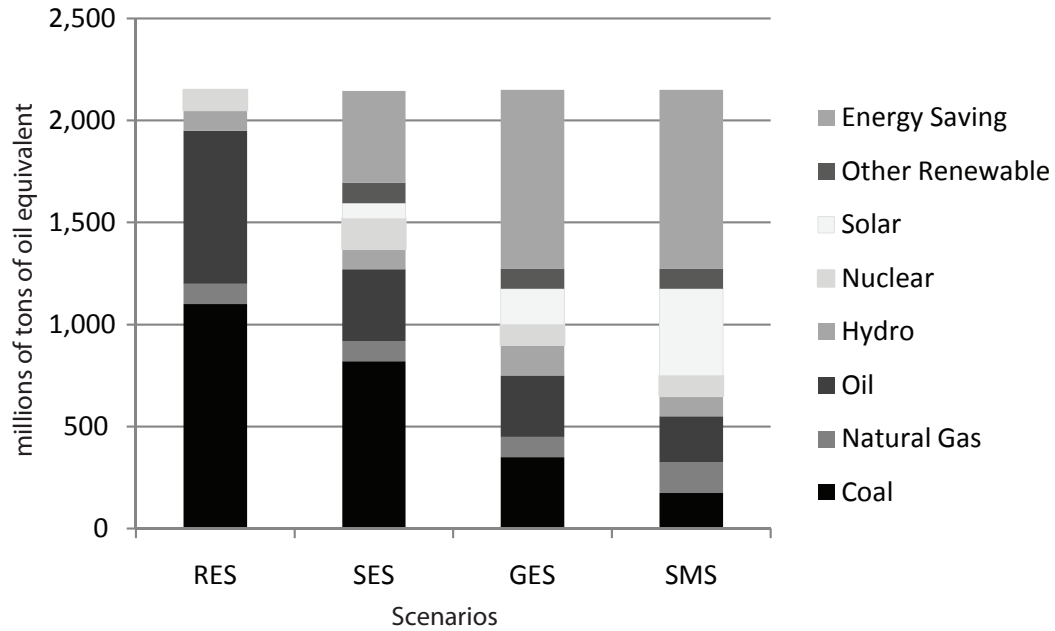
TERI has modeled the outlook for India's energy sector under a number of assumptions. The four cases assessed were a reference case (RES), which assumed continuation of current trends and policies; a sustainable energy scenario (SES), which assumes a greater push for energy efficiency improvements and greater renewable and nuclear power; a global equity scenario (GES), which would fulfill the prime minister's commitment not to permit India's per capita emissions to rise above the global average and assumes that the developed world will reduce its per capita emissions; and a stringent mitigation scenario (SMS), which assumes that India will be extremely aggressive in pushing for energy self-sufficiency. The cases assume that GDP growth will average 8 percent per year through 2031, the rate of growth the government has targeted to meet its poverty reduction goals.

Figure 3.5 shows the results of this analysis. Going from a base of around 600 million tons of oil equivalent (mtoe), Indian energy demand would rise to about 2,100 mtoe by 2031 in the reference case. The reference case shows that the dominant role of coal and oil will persist in 2031,

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7. Ritu Mathur, "Secure, Low-Carbon Pathways for India," presentation, CSIS Secure, Low-Carbon Pathways Workshop, February 26, 2010, Tokyo.

Figure 3.5. Indian Primary Commercial Energy Supply for 2031 under Four Scenarios

Source: TERI Analysis, "Secure, Low-Carbon Pathways for India" presentation, CSIS Secure, Low-Carbon Pathways Workshop, February 26, 2010, Tokyo.

Note: RES = reference case; SES = sustainable energy scenario; GES = global equity scenario; SMS = stringent mitigation scenario.

implying significant increases in imports of both fuels. The sustainable case reflects the impact of major improvements in energy efficiency as well as the introduction of some low-carbon energy sources; however, imports would still be significant in this case. The GES and SMS scenarios include greater energy efficiency but require significant increases in the use of renewable, especially solar, energy.

The estimates in the TERI analysis differ from those of the IEA and the U.S. Energy Information Administration (EIA). The IEA estimates total 2030 energy consumption in India at about 1,300 mtoes.[8] Two major assumptions explain these differences. The first is that the TERI analysis assumes a much higher average GDP growth rate over the period (8 percent versus 6.3 percent). The second is that the IEA assumed that the efficiency of coal-fired power plants would increase at a more rapid rate than the TERI analysis, resulting in significant energy savings.

A key concern for the Indian government is how to extend energy services to the rest of the population in a cost-effective way. Solar power is hoped to provide an option, but new technologies, including efficient light bulbs, are seen as potentially too expensive. Another concern is how to provide transport mobility to individuals as their wealth increases without putting significant pressure on the demand for oil.

From an energy security perspective, these low-carbon pathways could greatly improve India's energy security by lowering the demand for imported oil and coal in the future. The overall impact on GDP, however, is uncertain and needs much greater evaluation.

8. *WEO 2009*, 648.

Japan

Japan is the second-largest economy as well as a world leader in clean energy technology. However, Japan is also highly dependent on imported energy and natural resources. Despite its efforts since the oil crises of the 1970s to move its energy system away from fossil fuel sources, Japan is only 16 percent energy self-sufficient and is the second-largest net importer of crude oil and largest net importer of liquefied natural gas in the world.[9] Meanwhile, Japan has improved its energy efficiency by a third since the 1970s.[10] With its strong clean energy technology research and development (R&D) program, combined with its lowest emission intensity profile, Japan has much to offer as the world transitions to a secure, low-carbon future.

Assumptions and Framing

The annual CO_2 emissions of 1,232 million metric tons placed Japan fifth among the greenhouse gas–emitting countries in 2007.[11] The power sector accounted for more than 40 percent of CO_2 emissions in Japan in 2007 (see figure 3.6a).[12] Meanwhile, its CO_2 emission intensity of nearly 0.3[13] makes Japan among the lowest energy consumers per GDP in the world. Since the mid-1980s, Japan has succeeded in decoupling its growth in energy demand from its growth in GDP.[14] Also, the increased use of low-carbon energy sources slowed its CO_2 emissions growth relative to the growth of energy demand (see figure 3.6b).[15] Between 2005 and 2008, Japanese energy demand grew slowly at 1.8 percent, due in part to the country's energy efficiency efforts but also to its negative population growth.[16] Total energy consumption from 2003 to 2030 is forecast to grow by 0.3 percent per year on average.[17]

Under the Kyoto Protocol, Japan made a legally binding commitment to reducing its GHG emissions below the 1990 baseline by 6 percent by 2012. The midterm target under the Fukuda cabinet, announced in June 2009, was an 8 percent reduction below the 1990 baseline by 2020 (not including emission trading). The target has since become 25 percent by 2020 and 80 percent by 2050 under the cabinet of former prime minister Hatoyama, which came into power in September 2009. The 25 percent reduction target was also formalized under the Japanese commitment under the Copenhagen Accord in December 2009.

Transition Policies and Outlook

The "low-carbon revolution" proposed by former prime minister Aso in April 2009 aims both to support economic growth and to address climate change challenges through a variety of incentives, policies, and regulations. If Japan is to achieve the 60–80 percent GHG emissions reduction by 2050, technology will have to play a key role. Specifically, half the demand for electricity must be met by zero-emission sources; the installed capacity of solar power needs to

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9. EIA, "Country Analysis—Japan," September 2008, http://www.eia.doe.gov/cabs/Japan/Background.html.

10. *WEO 2009.*

11. Ibid.*,* Annex A: Tables for Reference Scenario Projections, 637.

12. Ibid.

13. Ibid., 179.

14. Naoko Doi, presentation, CSIS Secure, Low-Carbon Pathways Workshop, February 26, 2010, Tokyo.
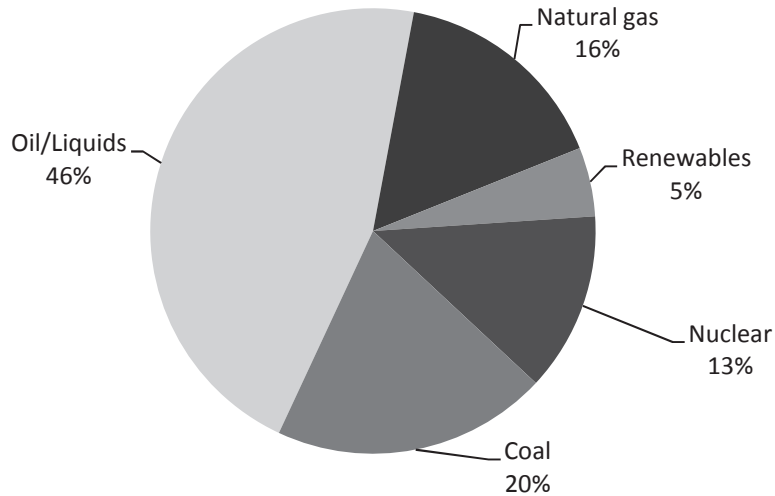
15. Ibid.

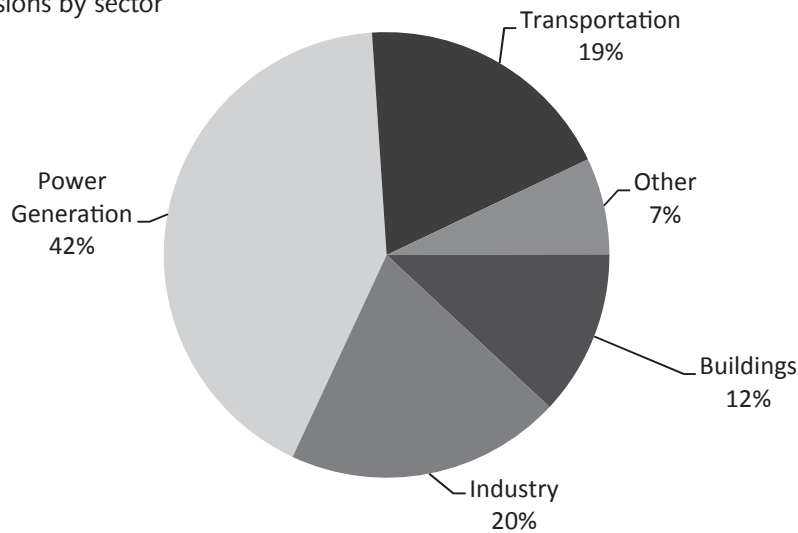16. Ibid.

17. EIA, "Country Analysis—Japan," September 2008.

Figure 3.6. Japan's Energy Consumption by Fuel and Energy-related CO_2 Emissions by Sector, 2007

a. Consumption by fuel

Natural gas
16%

Renewables
5%

Oil/Liquids
46%

Nuclear
13%

Coal
20%

b. Emissions by sector

Transportation
19%

Other
7%

Power Generation
42%

Buildings
12%

Industry
20%

Source: EIA, "Country Analysis—Japan," September 2008, and *WEO 2009.*
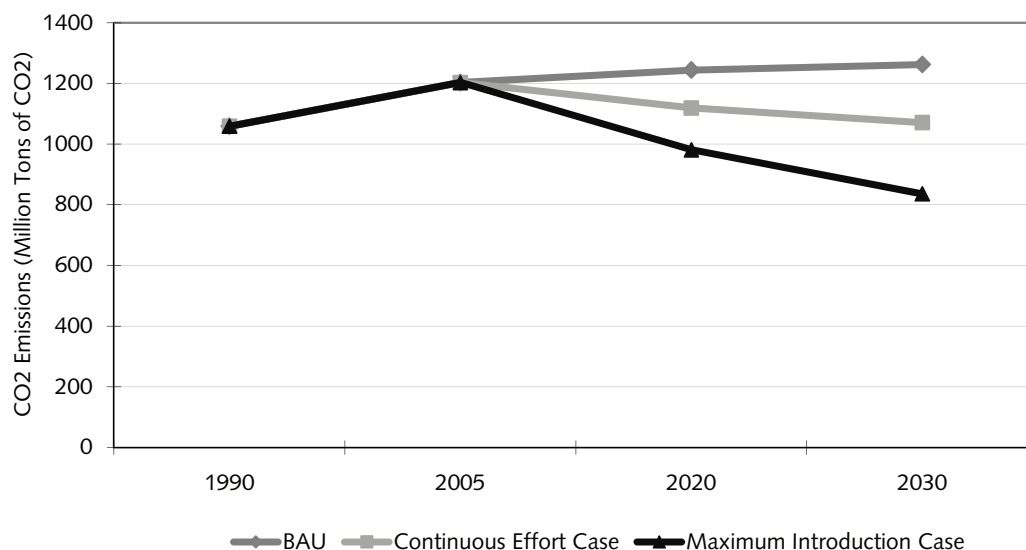
expand by 10 times by 2020 and by 40 times by 2030; and half of new vehicle sales in 2020 must be next-generation vehicles.[18]

The Basic Act on Global Warming Countermeasures, approved by the cabinet in March 2010 and submitted to the Diet for deliberation, proposes a 10-percentage-point increase in the share of

18. Naoko Doi, presentation, CSIS Secure, Low-Carbon Pathways Workshop.

Figure 3.7. Change in Japan's CO$_2$ Emissions under Three Scenarios, 1990–2030

Source: Ministry of Economy, Trade, and Industry (METI)/Doi.

renewable energy in the total primary energy supply by 2020.[19] The bill also proposes an emission trading system, an "anti-global warming tax" (from Japan's 2011 fiscal year), and a feed-in tariff. The bill calls for mitigation efforts in the transportation sector, advanced technology development, energy efficiency in appliances and buildings, and public education. Although no numerical targets are given, the increased use of nuclear energy is also among the proposed measures.

The Ministry of Economy, Trade, and Industry (METI) has released an outlook that reviews the feasibility of the midterm targets, based on three scenarios: *business as usual*, which maintains the 2005 energy efficiency level; *continuous effort*, which assumes improvement in energy efficiency at the current pace; and *maximum introduction,* which assumes the implementation of policies and measures that require a mandatory introduction of commercially available advanced technologies to the maximum possible extent (see figure 3.7). The major findings conclude that the maximum introduction case would reduce the GHG level by 21 percent in 2030, compared to 1990. Under the continuous effort case, emissions would still increase, though at a slower rate, to just over 1 percent increase from 1990 levels, and in the business-as-usual case, CO$_2$ emissions would increase by nearly 20 percent. Meeting the 2020 emissions reduction target of 25 percent will be very difficult and would require committed domestic efforts from policymakers, industry leaders, and the public. The overall energy usage would need to be at or below the 2005 level.

Barriers

The primary barriers to meeting the 25 percent reduction target by 2020 are regulatory and economic. Current regulatory structures are not necessarily in line with long-term energy and climate

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19. Embassy of Japan, Washington, D.C., "Overview of the Bill of the Basic Act on Global Warming Countermeasures (provisional translation)," February 2010.

change goals. High costs associated with the introduction of advanced technologies are one of the economic barriers. The proposed mitigation measures rely heavily on the successful deployment of a range of technology options whose introduction costs are likely to be shouldered by both industry and consumers.[20] In addition, the lack of economic incentives and an effective price-signaling mechanism (e.g., emissions trading system or carbon tax) contributes to the difficulty in facilitating the emissions reduction.[21] More generally, for an energy-efficient society such as Japan, the incremental improvement in efficiency requires greater efforts and resources than in less efficient economies.

Role of Key Stakeholders and the International Community

The business community recognizes that it has an important role to play in the transition to a low-carbon society. It is committed to providing highly efficient goods and services to consumers and improving the energy efficiency of manufacturing, as well as supporting the transfer and deployment of energy-efficient technologies internationally. Meanwhile, businesses are also concerned with further national expenditures for purchasing carbon credits under a global emissions trading mechanism and the loss of the manufacturing base to overseas producers.[22] They also question the viability of capping emissions without proven technologies for deployment, the economic burden of mitigation measures on the public, and fairness from the international perspective— i.e., whether Japan should carry out the mitigation measures at the price of economic growth and employment in the absence of fair and viable commitments by other major economies.

Competitiveness and the Clean Energy Economy

Japan sees a clear economic opportunity in the growing energy technology market and recognizes its vested interest in remaining a leader in clean energy technology. Consequently, the government and industries work closely in this area.

Under the economic stimulus measures passed in 2008 and 2009, Japan allocated $36 billion for investment in clean energy technologies, including $18.3 billion for energy efficiency and $3.7 billion for low-carbon vehicles.[23] From 2011 to 2015, Japan plans on investing approximately $66 billion in clean energy technologies, of which $36 billion will go to support the deployment of clean energy and energy efficiency technologies and $30 billion to undertake clean technology R&D, with a focus on solar energy, low-emission vehicles, and energy-efficient technologies.[24]

To support the successful advance of clean energy technologies from R&D to deployment, the Japanese government has identified 21 innovative energy technologies based on a set of criteria. These include innovative technologies that can deliver substantial reductions in carbon dioxide, technologies that deliver substantial performance improvements and cost reductions, and technologies that Japan can lead the world in developing and thereby gain global market share and boost economic growth.[25] CCS, innovative solar photovoltaics, and advanced nuclear power generation

20. Naoko Doi, presentation, CSIS Secure, Low-Carbon Pathways Workshop.

21. Ibid.

22. Embassy of Japan, "Overview of the Bill of the Basic Act."

23. Ron Atkinson et al., *Rising Tigers, Sleeping Giant: Asian Nations Set to Dominate Clean Energy Race by Out-Investing the United States* (Oakland, Calif.: Breakthrough Institute, 2009), 74.

24. Ibid.

25. Ministry of Economy, Trade, and Industry (METI), *Cool Earth Innovative Energy Technology Program*, March 2008, http://www.meti.go.jp/english/newtopics/data/pdf/031320CoolEarth.pdf.

were among the low-carbon technologies selected.[26] For each technology, the government has developed a road map through 2050, outlining the current level of global economic competitiveness and the prospects for international expansion. The road maps also identified possible technical hurdles in the development of such technologies and suggested the specific areas of research for overcoming them.[27]

The Republic of Korea (ROK)

In recent years, the ROK has put great emphasis on laying the foundation for a competitive economy in a carbon-constrained world. Although the ROK still has comparatively few renewable energy installations and limited capacity for renewable energy manufacturing, the ROK has instituted green growth policies that have the potential for making it a player in the global market for clean technologies. The ROK has also established itself as a potential leader in the global effort to negotiate and tackle climate change. This commitment was apparent in the lead-up to Copenhagen, where the ROK voluntarily pledged to lower its GHG emissions by 30 percent below business as usual, or 4 percent below 2005 levels.

The efforts of the ROK fall in two distinct areas: one objective is to meet a reduction in GHG emissions, specifically focusing on reducing energy intensity and increasing energy efficiency. The other objective, more central and ambitious, is to become one of the world's leading countries in the area of clean technology manufacturing and development.

Assumptions and Framing

Today, the ROK's economy is 97 percent dependent on imported fuel, and oil constitutes more than half its energy imports. In 2006, it generated less than 1 percent of its electricity from renewables (see figure 3.8a). The ROK is the ninth-largest emitter of GHG in the world.[28] Since the 1990s, its emissions have nearly doubled, in large part because of its impressive economic growth, which is focused primarily on manufacturing. GHG emissions from energy-related activities account for 84.3 percent of total emissions.[29] Absent transformational climate change and energy policies, GHG emissions are slated to increase by 180 percent by 2030 (compared to the 1990 level).[30]

Transition Outlook

In his August 2008 speech marking the 60th anniversary of the Republic of Korea, President Lee Myung-Bak announced a new vision for the future economic development of the country, focused on low-carbon energy technologies. In July 2009, the ROK government announced a Five Year Green Growth Plan.

The plan is by far the most publicized and well known of all the low-carbon pathways under discussion in the country. While extensive modeling will need to be carried out in the future to test the ability of this pathway to reach the government's stated climate and energy objectives, this section highlights the key areas of this pathway as well as potential barriers and challenges.

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26. Atkinson et al., 25.

27. Government of Japan Cabinet Office, *Environment & Energy Technology Roadmap and Diffusion Scenario*, http://www8.cao.go.jp/cstp/english/doc/low_carbon_tec_plan/ref_roadmap1.pdf.

28. *WEO 2009*.

29. Yonghun Jung, "Secure, Low-Carbon Pathways: Korean Perspective," presentation, CSIS Secure, Low-Carbon Pathways Workshop, February 26, 2010, Tokyo.

30. Ibid.

This low-carbon pathway has three main strategies. The first strategy is focused on adaptation to climate change and reduction of energy imports. The second strategy is aimed at "greening" the economy and harnessing the clean technology pathway as an economic and industrial policy to promote growth. The government is determined that, through these steps, the ROK will gain a global green technology market share of 10 percent by 2020 and 18 percent by 2050.[31] Under this strategy, the government would focus on developing green technologies, greening the existing industrial sector, and promoting the deployment of clean energy technology. The third and final strategy is aimed at greening the Korean lifestyle. This category is quite broad, spanning green transportation to bicycle paths to cleaning the nation's rivers.

The ROK hopes to see significant reductions in its use of fossil fuels and energy imports, with the goal of 100 percent energy independence by 2050.[32] The plan to do this includes reducing the amount of oil and coal imported and increasing the amount of nuclear and renewable energy produced (see figure 3.8b). Other targets under the five-year plan also include significant increases in energy efficiency—28 percent by 2020 and 46 percent by 2030 (compared to 2002 levels).

A recently passed renewable energy standard commits the ROK to reaching 2 percent renewable electricity by 2012, 10 percent by 2022, and 11 percent by 2030. In 2009, its total investment in renewable energy was $20 million.[33] According to a recent report, the ROK had the highest growth rate globally in renewable energy investment: 249.4 percent over the past five years.[34]

The government plans to boost energy R&D spending significantly over the next five years, committing approximately US$6.6 billion (or US$1.3 billion per year) to clean energy R&D to advance 27 core green technologies, including light-emitting diode (LED) technology, solar, and hybrid vehicles. Preferential financing to small clean technology business will amount to approximately US$900 million by 2013, and the Korean Development Bank will also establish a US$237 million fund to support R&D activities of private sector green industries.[35] The plan also rolled out the second round of green stimulus funding. The government plans to distribute a total investment amount of US$83.6 billion between 2009 and 2013, US$22.3 billion of which will be directed to advancing green industries.

The Five Year Green Growth Plan also includes promotion of nuclear power, from 24 percent of electric power produced in 2009 to 32 percent in 2020. To meet this goal, the government laid out plans to build 10 domestic nuclear reactors by 2030, in addition to the 8 now under development, 6 of which are under construction (currently, there are 20 reactors at four power stations). By 2012, the industry plans to be wholly sufficient in the domestic manufacture of nuclear reactors.

Further, the ROK is a growing exporter of nuclear power plant technology, recently beating out France and Japan for a contract in the United Arab Emirates. Following this sale, the Korean government declared that it planned to increase exports of nuclear power technology to become the third-largest suppler by 2030, behind the United States and France.[36] This plan includes the

31. See "National Strategy for Green Growth and the Five Year Plan," November 11, 2009, available at http://epsis.kpx.or.kr/epsis/servlet/epsis/EECU/EECUController_BBS?cmd=view&cd_upper=&cd_bbs= 004001&leftPos=004001&no_index=1807.

32. Ibid.

33. Pew Charitable Trusts, *Who's Winning the Clean Energy Race?*, 35.

34. Ibid.

35. Atkinson et al., 80.

36. World Nuclear Association, "Nuclear Power in South Korea," updated March 18, 2010, http://world-nuclear.org/info/inf81.html.

Figure 3.8. The Republic of Korea's Energy Consumption by Fuel in 2006 and Its Goals for 2030

a. Energy consumption, 2006

b. Energy consumption goals, 2030

Source: EIA, *International Energy Outlook 2009*, 210; and "National Strategy for Green Growth and the Five Year Plan," November 5, 2009.

operation, maintenance, and repair of reactors, which helps the ROK maintain an active, skilled workforce in the nuclear industry.

Barriers

Financial barriers, however, are a concern for the implementation of the ROK's low-carbon pathway. The government experienced budgetary difficulties in 2008 with the massive response to the high megawatt caps for the feed-in tariff program. This forced the government to reduce the quotas in order to build a domestic manufacturing capacity.

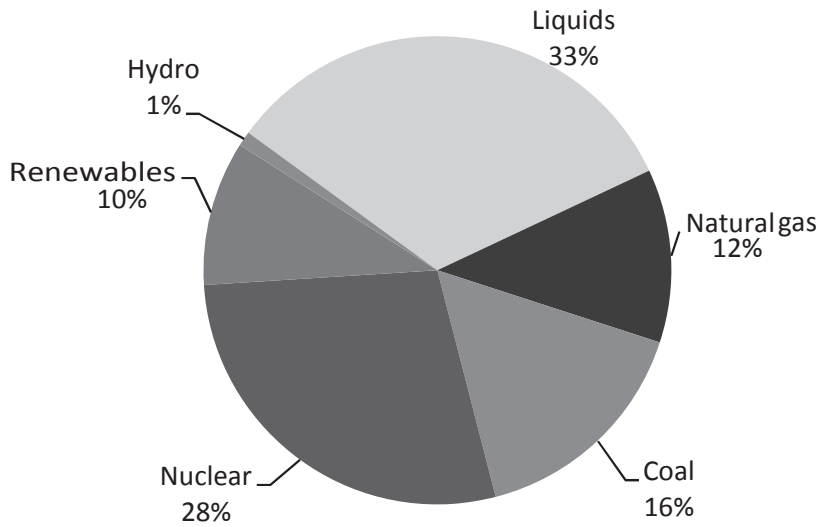With all the focus on creating a new, competitive clean technology industry, Korean industries—especially the energy-intensive ones such as cement, steel, and petrochemicals—have voiced concerns about their ability to stay competitive under new emission reduction standards, especially if other nations adopt less stringent targets or no targets at all.

The promotion of nuclear power has also caused some push back among environmental groups in the ROK, who cite the need to focus on renewable energy technologies. Whether nuclear power should be defined as a green energy is still controversial in the ROK and elsewhere.

Taiwan

With its 23 million people, Taiwan must adjust rapidly to a world economic crisis even as it transitions from "emerging economy status" to "advanced economy status." Climate change policies are balanced against these economic and development goals. While not a signatory to the UN Framework Convention on Climate Change, in its effort to reduce GHG, Taiwan has adopted a climate change policy that meets international environmental standards.

Background and Framing

Overall energy consumption in Taiwan has more than doubled since 1990, from 2.04 quadrillion British thermal units (Btu) to 4.57 quadrillion Btu in 2006. Taiwan remains heavily dependent on fossil fuels, with oil making up more than half the total primary energy supply, with coal next at nearly one-third in 2008. Natural gas, mostly from imported liquefied natural gas, and nuclear provide most of the rest.[37] Energy security concerns are clear, with Taiwan relying on imports for 99 percent of its energy supply: nearly two-thirds of its oil is imported from the Middle East, and virtually all its natural gas and coal is imported. Taiwan is the tenth-largest importer of oil.[38]

As noted in figure 3.9b, nonfossil fuels accounted for a small but growing segment of the domestic energy supply in 2007. Solar (both photovoltaic and solar thermal) and wind power accounted for less than 1 percent of the total primary energy supply in 2007. In the past two decades, however, solar photovoltaics and wind power have grown at an average rate of 15.9 percent per year.[39] Nuclear power currently supplies around 8 percent; its percentage share has decreased slowly in the past decade as cheaper coal penetrated the electricity market.

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37. Bureau of Energy, *Energy Statistics Handbook 2008,* Ministry of Economic Affairs, Taiwan, June 2009, available at http://www.moeaboe.gov.tw/English/Statistics/EnStatistics.aspx.

38. EIA, "Top World Oil Importers 2008," Country Energy Profiles, http://tonto.eia.doe.gov/country/index.cfm.

39. Geothermal included in growth rate until 1994. See Bureau of Energy, *Energy Statistics Handbook 2008.*

Figure 3.9. Energy Consumption in Taiwan by Sector and Fuel, 2007

a. Consumption by sector

Transportation 17%

Industrial and power generation 65%

Commercial 7%

Other 10%

Agriculture 1%

b. Consumption by fuel

Hydro/Renewables 1%

Natural Gas 8%

Nuclear 8%

Oil 51%

Coal 32%

Source: Bureau of Energy, *Energy Statistics Handbook 2008,* Ministry of Economic Affairs, Taiwan, June 2009.

Energy demand is largely dominated by the industrial sector, as seen in figure 3.9a. Taiwan's energy-intensive industries—paper, chemicals, basic metals, petrochemicals, and nonmetallic mineral products—accounted for 35 percent of total energy consumed in 2007, while accounting for slightly more than 3 percent of total GDP.[40] These industries are heavily dependent on coal and are therefore a major contributor to Taiwan's GHG emissions.

In 2007, Taiwan emitted 276 million tons of CO_2, nearly 1 percent of the world total, ranking it twenty-second in the world.[41] Emissions per capita have been on the rise since the early 1980s and have more than doubled since 1990. Without changes to existing policies and regulations or absent a major technological advancement, emissions are forecast to rise to 407 million tons in 2025.[42]

Transition Summary

Due to its unique diplomatic status, Taiwan is not a signatory to the UN Framework Convention on Climate Change or the Kyoto Protocol, but it has adopted the policy of "voluntary compliance" to international environmental agreements in its efforts to reduce GHG.

In 2008, the Taiwan cabinet released a policy framework for sustainable energy. The thrust of the framework is to balance energy priorities, economic development, and environmental protection concerns to create a "win-win-win solution."[43] The major components are improving energy efficiency, development of clean energy, and securing a stable energy supply.

In June 2008, officials announced the Guidelines for a Sustainable Energy Policy, which outlined four pieces of energy legislation: a greenhouse gas reduction law, an act for renewable energy, an energy tax act, and an energy management act. Together, these form the main components of Taiwan's low-carbon pathway.[44]

The government has pledged to cut carbon emissions to 2005 levels by 2020 and to 2000 levels (214 million tons compared to 276 million tons in 2007) by 2025. One major instrument for accomplishing this goal was to improve energy efficiency 2 percent annually to 2010 and hence decrease energy intensity more than 20 percent by 2015 and 50 percent by 2025.

The plan for creating a sustainable energy pathway is divided into two areas: development of a cleaner energy supply and lowering the growth rate of demand. The supply side of the equation includes a host of targets, including nearly doubling the share of renewable energy to more than 15 percent by 2025, greater use of natural gas, continued consideration of nuclear electric power, replacement of existing power plants with the best available technologies, international cooperative efforts to begin use of CCS and clean coal technologies, and consideration of energy pricing to reflect true internal costs.

On the demand side, there is a mix of incentives and conservation measures for the public sector (government energy reduction plans, carbon-neutral planning concepts), the residential and commercial sector (green urban planning, improving appliance efficiency standards, efficient lighting programs), the transport sector (mass transport development, fuel efficiency standards

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40. Bureau of Energy, Ministry of Economic Affairs, Taiwan; see Pi Chen, "A Secure, Low-Carbon Pathway for Taiwan," presentation, CSIS Secure, Low-Carbon Pathways Workshop, February 26, 2010, Tokyo.
41. IEA, *Key World Energy Statistics 2009,* 50.
42. Pi Chen, "A Secure, Low-Carbon Pathway for Taiwan."
43. Framework of Taiwan's Sustainable Energy Policy, Ministry of Economic Affairs, June 5, 2008.
44. Policy and Act, EPA, Taiwan, http://ivy1.epa.gov.tw/unfccc/english/04_our_efforts/061_policy.html.

for private vehicles, intelligent transport systems), and the industrial sector (targets for lowering carbon intensity through lower energy use, promotion of green energy industries).

Looking across the government plans for efficiency gains, renewable energy standards, price reforms, and other reduction measures, Taiwan's Environmental Protection Administration forecasts a gap between actual emissions and the government emission reduction plans of nearly 164 million tons of CO_2 in 2025. [45]

Drawing on the analysis and modeling of the Chung-Hua Institution for Economic Research (CIER), this section reviews a proposal for an energy and environment tax coupled with increased R&D. The taxes are structured to act much as a tax on carbon: the energy side focused on fossil fuels (gasoline, jet fuel, diesel, and the like) and the environment tax focused on reducing emissions and pollution more broadly. Revenue from these taxes would be reinvested in the low-carbon pathway by means of subsidies to low-income families for increased energy prices, subsidies for public transportation, and R&D on energy savings, emissions reductions, and conservation. Taxes would be implemented gradually over a 10-year period. This plan does dampen GDP growth rates in the first several years but quickly returns to positive growth in the 2030 time line.

Barriers

The framework provided by the Taiwan government relies heavily on building new technologies. The issue that Taiwan will face is that it is starting from a low base: meeting new targets will require rapid construction of the new renewable sources. The framework may present an unrealistic time line for restructuring, siting, and building new, clean electric power plants.

Taiwan is likely to encounter financial barriers as well. The scheme calls for heavy government involvement and investment. The expected growth in renewables requires investment from the public sector to reach targets and to be competitive with fossil fuel sources. In the development of a domestic green energy industry, the government has pledged to invest NT$20,810 million (US$660 million) in R&D for new energy technologies. This commitment will also require continued political will and economic growth.

In additional, industry and the public are likely to oppose any new or higher tax rates (as envisioned by CIER and the government). Historically, Taiwan has had some of the lowest prices for energy. Reforms need to be crafted so that those least able to afford an increase do not bear the brunt of higher energy costs. Energy-intensive industries will be most vulnerable. The industrial sector will likely call on the government to protect it from higher costs, so that it can remain competitive regionally.

United States

The United States occupies an important role in global energy markets, the world economy, and the global environment. The United States is the second-largest emitter of greenhouse gases, the largest energy consumer and economy, and a major producer of energy. Although the U.S. position in all three areas is expected to decline relative to major new emerging economies, decisions taken by the United States on energy and on economic and environmental issues will still have a significant impact in the foreseeable future.

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45. The Chung-Hua Institution for Economic Research provided assessments and analysis of some of the key government proposals. See Pi Chen presentation.

Against the backdrop of the economic recession, the United States has been engaged in a difficult discussion about paths to securing a low-carbon economy. It has not yet decided to embark on a transition to a secure, low-carbon economy, despite strong support from the current administration and ample pressure from the international community. The pressure to balance economic, security, and environmental priorities—with economic concerns being primary—still serves as a barrier to more aggressive action toward implementing a secure, low-carbon pathway.

Assumptions and Framing

Recently surpassed by China, the United States is currently the second-largest emitter of greenhouse gases and the largest historical emitter. In per capita terms, the United States emits nearly four times more than China, approximately twice that of other industrialized countries like Europe and Japan, and around four times more than the world average. U.S. emissions come from a combination of energy production and use, as well as land-use practices. In 2008, U.S. GHG emissions were 7,052 million metric tons of carbon dioxide equivalent (MMTCO$_2$e), with nearly 81.3 percent (5,814.4 MMTCO$_2$e) coming from energy-related CO$_2$ emissions.[46]

U.S. energy consumption is predominantly fossil-fuel based (see figure 3.10b), although the share of fossil fuels in the nation's energy mix is expected to drop from current levels of around 84 percent to 78 percent in 2035 under a business-as-usual or reference case scenario. The transportation sector is dominated by petroleum, which makes up nearly 95 percent of total consumption. In the current forecast, however, biofuels are expected to make up most of the increase in transportation fuel demand going forward. Nearly half the U.S. electricity supply comes from coal, although electric power mixes can differ significantly by region.

Over time, U.S. emissions intensity (emissions per unit of GDP) has declined because of structural changes in the U.S. economy (less heavy manufacturing) and increases in energy efficiency. According to the most recent reporting from the EIA, the intensity of energy-related carbon dioxide emissions is expected to decline 40 percent between now and 2035 because of the impact of lower electricity demand, a higher share of renewables, more efficient transportation, and higher fuel prices. Energy-related emissions are still estimated to grow 9 percent between 2008 and 2035, absent further changes in energy and climate policies.[47]

The low-carbon pathway results presented in this chapter reflect the findings of the official assessment of the American Clean Energy and Security Act or H.R. 2454 (also known as the Waxman-Markey bill) conducted by the EIA. The Waxman-Markey bill passed in the House of Representatives in June 2009, and its emissions reduction trajectory was used as the basis for the U.S. commitment in the UNFCCC climate negotiations in Copenhagen and the official pledge in the Copenhagen Accord. It is therefore the pathway that most accurately reflects the closest consensus view of what is politically feasible for emissions reductions in the United States (although this matter is subject to further debate).

Transition Outlook

Waxman-Markey establishes a nearly economy-wide cap-and-trade program designed to reduce emissions below a 2005 baseline by 17 percent in 2020 and 83 percent in 2050. The primary

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46. EIA, *Emissions of Greenhouse Gases Report* (Washington, D.C.: EIA, December 2009), http://www.eia.doe.gov/oiaf/1605/ggrpt/index.html.

47. EIA, *Annual Energy Outlook 2009*, December 2009,11.

Figure 3.10. Energy Consumption in the United States by Sector and Fuel, 2006

a. Consumption by sector

Transport
29%

Industrial
25%

Electricity-
related losses
27%

Commercial
8%

Residential
11%

b. Consumption by fuel

Coal 22%

Natural Gas
22%

Nuclear 8%

Renewables
7%

Oil & Liquids
41%

Source: EIA, *International Energy Outlook 2009,* 205.

Note: Electricity-related losses represent energy lost through generation, transmission and distribution of electric
power and may include heat production.

mechanism for driving emissions reduction is a cap-and-trade program that caps GHG emissions of all entities that emit over 25,000 tons per year. As figure 3.11 highlights, the cap on covered emissions covers roughly 84 percent of total U.S. GHG emissions by 2016. Cumulative covered emissions in the reference case from 2012 to 2030 are about 113 billion metric tons, compared to 89 billion metric tons allowed under the cap, about a 21 percent or 24.6 billion metric ton reduction requirement (shaded areas of figure 3.11). The bill also included stricter efficiency standards and a nationwide renewable electricity standard. On the technology front, it included incentives for large-scale CCS demonstration and deployment as well as new technology centers to spur research and development as well as widespread deployment of promising new technologies.

The EIA cases revealed that the majority of reductions are likely to come from the electric power sector. There is a clear trade-off between the availability of nuclear, renewable, and CCS technologies and policy mechanisms like offsets. In cases where nuclear, CCS, and renewables are available at expected costs and during expected time frames, coal will be driven out of the energy sector most aggressively and nuclear will nearly double. When those technologies are not available, companies will turn to purchasing offsets and relying on fuels like natural gas.

The EIA also estimated the price impacts of the Waxman-Markey bill and found that although the policy does increase energy prices, much of the price increase in electricity and natural gas bills is mitigated by the free allocation of allowances that must be passed through to consumers by utilities and that the price increase for gasoline is negligible. In terms of the overall economic impact of the bill, EIA estimates total discounted GDP losses over the 2012–30 time period would be $566 billion (-0.3 percent) but could range from US$432 billion (-0.2 percent) to US$1,897 billion (-0.9 percent) depending on the scenario.
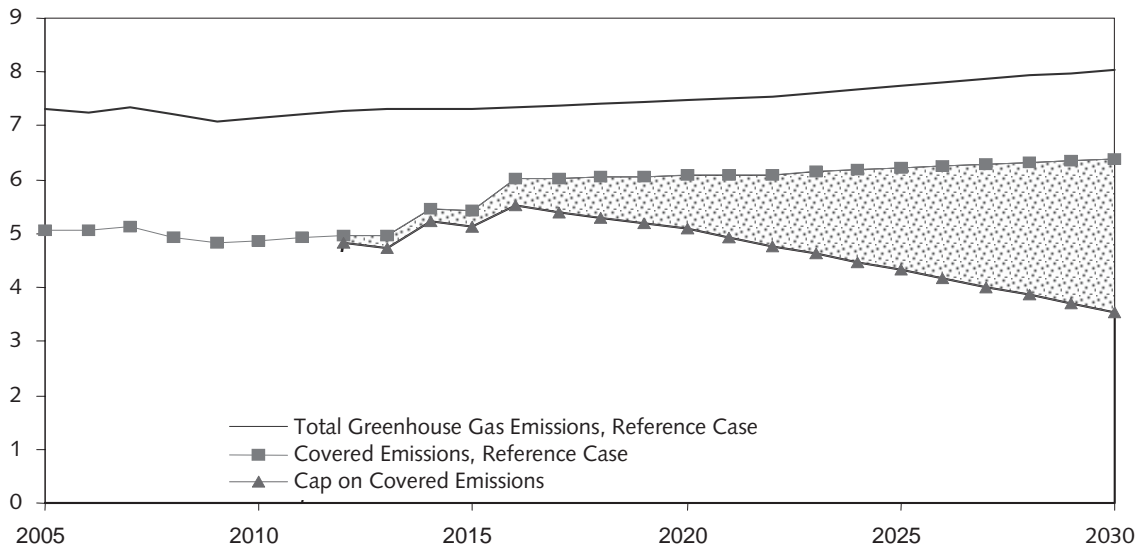
Barriers to Transition

Even at its height of support, the Waxman-Markey bill faced some enormous social, economic, technological, and commercial barriers, which have only grown more daunting since its passage by the House of Representatives.

From a political perspective, support for and momentum behind passing the legislation necessary to pursue this pathway have dropped precipitously. The U.S. Senate tried to pass legislation patterned after Waxman-Markey but was not able to come up with enough support and has now turned toward crafting new legislation. Opposition to the pathway comes from a number of concerns, some substantive and some purely political. The potential for bipartisan policymaking has taken a hit following the recent passage of the health insurance bill, a brutal battle that expended a lot of the Obama administration's political capital. In strictly political terms, sustained interest in pursuing energy and climate legislation is difficult to maintain.

The biggest concern over pursuing a low-carbon pathway is cost. Consumers are concerned that reducing emissions will make energy costs higher, a sensitive issue for politicians. The issue of economic impacts has only been made worse by the continued economic downturn. The political will and public support for the policies necessary to change energy consumption patterns and drive new technologies into the market have eroded significantly. The economic downturn and lower energy prices have also hurt markets for renewable energy generation and increased the burden on government support to promote renewable energy through measures like massive stimulus spending. The recent oil spill in the Gulf of Mexico further complicates the political dynamics surrounding passage of comprehensive climate and energy legislation by upsetting the balance between environmental and energy security interests. While the spill could strengthen support for

Figure 3.11. Three Scenarios of GHG Emissions in the United States under the Waxman-Markey Bill, 2005–2030 (billion metric tons of CO2)

Source: EIA, "Energy Market and Economic Impacts of H.R. 2454, the American Clean Energy and Security Act of 2009," August 2009, http://www.eia.doe.gov/oiaf/servicerpt/hr2454/index.html.

the move away from fossil fuels, removing provisions that expand access to offshore resources will diminish support from advocates for increasing domestic production.

The technological barriers to the transition envisioned by the Waxman-Markey bill are also a source of concern. Many in the energy industry question the feasibility of basing a low-carbon pathway on technological advancements that have yet to materialize. For example, many find it hard to accept the reliance on CCS as a proven technology when it is not currently proven at scale over relevant time frames. Nor have the barriers to widespread deployment been tested, and such efforts will likely be met by public opposition, problems with associated infrastructure, and cost constraints.

Commercial entities also question the scale of the transformation presented in this pathway. Twenty years is a very short time to make such drastic changes to energy infrastructure that requires a long lead time to develop and significant capital stock turnover. One prime example is the nuclear build out that occurs in the pathway. From 2007 to 2030, nuclear power generation in the United States nearly doubles, under the Waxman-Markey bill. But the United States has not build a new nuclear power plant in nearly 30 years, and of the nuclear plants currently awaiting construction, none are scheduled to come online before 2016 at the earliest. While it is not impossible to meet these and other aggressive targets, transitions of this magnitude often require a great deal of political, commercial, and economic support to come to fruition.

Role of Key Stakeholders and the International Community

It is fair to say that without support from key stakeholders and the public, the secure low-carbon pathway will not be realized in the United States. Transformations of this scale require policy support to drive significant investment and technological innovation. Over the past several years,

the business and technology community have been asking for greater certainty with regard to the long-term policy toward greenhouse gases in the United States so that it can decide whether to begin to shift its investments and innovation focus to new technology and fuel options that reduce emissions. Without these policy signals, businesses have no reason to make the requisite investments or strategic shifts. Policymakers, academics, and stakeholders from the private sector and the NGO community are still trying to find new ways to overcome some of the barriers to realizing a low-carbon pathway but have experienced only incremental success so far.

The time frame needed for this stakeholder-building process to materialize in the United States is at loggerheads with deadlines set by the international community and the time needed to mitigate the detrimental effects of climate change. Yet without international support and action on climate policy, any U.S. effort to reduce emissions will have little or no effect on the pace and direction of climate change. The international community, by enacting climate policies of its own, also does a great deal to shape the future of global energy markets and influence the mindset and strategic positioning of many energy companies. The United States is under pressure to take a more aggressive role in reducing emissions and in demonstrating greater leadership on the issue, but this pressure can help advance policy only to a limited extent. Loss of support for climate policy around the world, however, can have an immediate and negative impact on the U.S. policy debate.

Competitiveness and the Clean Energy Economy

The current administration and many within Congress have been championing the "new green deal," believing that the United States should be a leader in the clean energy economy. Many other members of Congress, especially those from states with energy-intensive and trade-exposed industries, believe that pursuing a low-carbon pathway will hurt U.S. economic competitiveness and send jobs and industries outside the country. This argument is perhaps the most divisive and controversial portion of the current U.S. debate on whether to pursue a low-carbon pathway. Both sides have been effective in pushing their agenda into the new policies, but the result may be an erosion of an effective low-carbon pathway. While energy-intensive, trade-exposed industries have been able to win special concessions and protection within draft legislation (border tariff adjustments and free allowances, for example), all energy and climate efforts now underway have a distinct job creation and innovation element even to the point of protecting jobs and manufacturing. Many questions remain about the appropriate strategic positioning for the United States in the new clean energy economy. Most important, the administration's rhetoric about being a leader in the new clean energy economy is predicated on the country's ability to pass energy and climate legislation in Congress.

Asian Regionalism and Secure, Low-Carbon Pathways

The review of these six economies suggests that they are all searching for a secure pathway to low-carbon growth. The countries all share the need to maintain secure, reliable flows of energy that will support economic growth while minimizing the emissions of greenhouse gases. This assessment demonstrates, however, that divergences in countries' economic development, energy mix, and social priorities will lead to different policy agendas and objectives. Developed countries such as Japan and the United States must confront the need to transform their energy systems within

the context of mature economies and lower economic growth. The transition to a low-carbon energy system must be done at a time of relatively lower levels of investment in new infrastructure. Other economies like China, the Republic of Korea, and Taiwan have experienced strong economic growth based on energy-intensive industries and will need to shift their economic structure to a different growth path. India is facing the need to extend electricity for the first time to a large portion of its population and maintain high economic growth that avoids rapidly growing carbon emissions.

This review also revealed important similarities in component pieces of the policy strategies. Improving the efficiency of energy use throughout the entire economy is clearly an overriding objective for everyone. Encouraging the adoption of the most efficient industrial processes, constructing more energy-efficient buildings, and improving the efficiency of conventional electricity production through coal are part of the strategies for all countries. All countries place a priority on the deployment of low-carbon energy technologies and grapple with the tools to make these technologies competitive with the use of fossil fuels. In addition, the transportation sector plays a key role in the search for secure, low-carbon pathways. Traditional internal combustion engines provide efficient transportation options but contribute to concern about energy security and GHG emissions.

Competitiveness in the production of the technologies necessary for a low-carbon economy is another important dimension of the secure, low-carbon pathways. Most countries see an opportunity to create new jobs through the production of these technologies for domestic consumption and for export. It is also clear that there will be differences in each country's role in the production of clean energy technologies and that the region will gain as a whole by taking advantage of these differences as opposed to competing on every facet of the innovation, manufacturing, installation, and operation of new energy technologies.

A strategy for Asian regionalism on climate change mitigation needs to recognize the differences in countries' situations while building a framework that facilitates achieving common objectives. Each country will develop its own approach to energy security and greenhouse gas reduction. To be effective, regional collaboration will have to add value to the basic domestic policymaking process. Regional cooperation can take place in existing forums, such as the Asia-Pacific Economic Cooperation forum and the Asia-Pacific Partnership on Clean Development and Climate, but new or expanded multilateral and bilateral interaction may be necessary.

Some areas for regional collaboration follow:

- Enhanced communication and collaboration on the analysis of secure, low-carbon pathways. Improve understanding of each country's energy security and climate change position and the analytical tools being used to evaluate the trade-offs among energy, the economy, and the environment; expand discussion among countries on what low-carbon pathway they have opted to develop and mechanisms for implementing targets and policy, to determine if overlaps or similarities could be useful in developing a strategy.

- Preventing green technology protectionism. Fostering the relative strengths of each economy in developing a green strategy without creating trade wars over clean energy technologies.

- Exchanging information on energy efficiency opportunities and clean energy technologies. Share information on industrial efficiency performance, building efficiency, appliances, power

generation, and deployment strategies; this approach could become the basis for setting energy efficiency goals or standards for the region.

- Exchanging information on deployment strategies for low-carbon energy technologies.

- Cooperating on the development and integration of carbon markets. Many countries are looking at ways to establish a price on carbon as a powerful tool in promoting the transition to a low-carbon economy. International carbon investments provide an avenue for making globally efficient investments in the mitigation of greenhouse gases. Governments in the region should work to gain maximum benefit from newly emerging carbon markets.

4 ASIAN REGIONAL INSTITUTIONS AND CLIMATE CHANGE

Teresita Schaffer

Introduction

Asia is home to one-third of the world's population and accounts for 46 percent of global trade, according to figures from the International Monetary Fund.[1] China and India, the world's two largest countries, are also two of the world's fastest-growing economies and the fastest-growing energy markets. To them, the 10 countries, 620 million people, and $1.3 trillion economy of the Association of Southeast Asian Nations (ASEAN) add significant heft and an additional growth dynamic.

In terms of climate change, Asia includes four countries with significant carbon emissions, making the region integral to any global efforts to combat climate change. Two are megacountries with populations of more than 1 billion and rapidly growing economies: China became the world's largest emitter of greenhouse gases (GHG) within the past year, and India's overall emissions now place it in the top 10 countries. Japan is the most industrialized country in the region and the fifth-largest GHG emitter in the world. Indonesia is the third-largest GHG emitter and is home to some of the world's major tropical forest resources.[2] Deforestation and forest degradation, as well as peat forest fires, release large amounts of carbon into the atmosphere. These factors make Indonesia's potential for reducing emissions completely different from that of the other significant emitters, as their emissions are derived from a different source.

At the other end of the spectrum, Singapore and the Maldives are seriously concerned that a rise in sea levels could wipe them out altogether. Because of their size, the ability of these countries to contribute directly to a solution depends entirely on ideas and diplomatic encouragement. Their climate change policy consists of seeking greater energy efficiency and encouraging maximum regional cooperation.

Climate change is a primary challenge in Asia not only because of the number of emitters and the contradictory national motivations for mitigation and adaptation strategies but also because Asia is projected to be significantly affected by the consequences of climate change. Areas with high population density, relatively low economic development, and geographical sensitivities place a disproportionate burden on Asia in dealing with the impacts of climate change. The melting of the Himalayan glaciers due to global warming could cause floods followed by water shortages and land degradation that would affect a population of 1 billion.[3] In Central and South Asia,

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1. International Monetary Fund, *Regional Economic Outlook: Asia and Pacific* (Washington, D.C.: IMF, 2006), http://www.imf.org/external/pubs/ft/reo/2007/APD/ENG/areo1009.pdf.

2. Yoko Nishikawa, "Japan Pledges $400 Million Climate Change Loan to Indonesia," Reuters, October 25, 2009, http://www.reuters.com/article/idUSTRE59O0JQ20091025.

3. United Nations Framework Convention on Climate Change (UNFCCC), *Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries*, April 29, 2009, http://unfccc.int/resource/docs/publications/impacts.pdf.

crop yields could decrease by 30 percent, creating food insecurity in predominantly agricultural economies. Today, in Asia, 1.4 billion people live in low-lying regions. With rising sea levels, these populations face the acute threat of permanently losing the coastal land on which they reside and make their livelihoods.[4] These projections make combating the adverse effects of climate change an urgent issue.

The way Asia addresses the interconnected problems of energy, climate change, disaster relief, and growth will have profound implications for the region and the world. Other chapters in this volume examine how the Asian powerhouses are formulating their individual policies on climate change. This chapter examines the role of regional and global institutions in addressing these issues.

What Does Addressing Climate Change Mean?

Although regional organizations have begun to serve as consensus builders on the desirability of addressing climate change, they have yet to develop much of a profile in creating common policies or response mechanisms. Because Asia does not have a single dominant institutional architecture, this consensus-building role is diffused over a variety of organizations and discussion channels with different degrees of authority and varied membership.

Regional organizations have been less effective as mobilizers, and their role on climate change has been noticeably less concrete and operational than, for example, their role on disaster relief. If one argues that the vigor and effectiveness of regional organizations derive from their track record on bringing together officials and leaders with a common purpose, the climate change issue may help advance that dynamic. Based on the experience of the past decade, Asian institutions are likely to intensify their consensus-building role and expand their work in developing practical approaches to specific problems or sectors. However, they are not likely to transform their climate change work in the next 10 years into a more muscular role in, for example, regulatory harmonization or collective standard setting.

Discussions of international cooperation on climate change operate at two very different levels. The one most often in the headlines is the effort to establish global norms and targets for mitigating climate change, controlling emissions, adapting to the change that is already inevitable, and paying for both mitigation and adaptation. Those efforts are the focus of the United Nations Framework Convention on Climate Change (UNFCCC) and of the major conferences of its member states, including the Bali conference in December 2008 and the Copenhagen conference in December 2009. Thus far, regional organizations in Asia have played a relatively small role in these negotiations, in spite of an effort by ASEAN and the Asia-Pacific Economic Cooperation forum (APEC) to organize its members' preparations for Copenhagen.

The second level is more operational—the development of best practices, common policies, and channels of cooperation among governments and businesses that will facilitate the mitigation or adaptation efforts referred to above. As we will see below, the work of Asian regional organizations in putting climate change on the regional agenda often highlights this kind of issue, and some of the potentially most important work may not come directly under the banner of "climate change."

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4. Ibid.

A Look at the Institutions

Asia's regional organizations differ in membership, scope, and ambition. They have not developed the supranational authority of, for example, the European Union, and there seems little appetite in the region for this level of political, economic, and regulatory integration. South, Southeast, and East Asia have gravitated toward different institutions, with limited crossover membership. While regional organizations have begun to play a significant role in bringing Asian countries together to address humanitarian crises, their role on climate change has been more modest and aspirational.

This chapter will examine how effective these regional organizations are at present and what aspects of the response to climate change would benefit from a stronger regional approach. It will also highlight other major global and bilateral efforts being undertaken in the region to address the challenge of climate change.

APEC

The Asia-Pacific Economic Cooperation forum, founded in 1989, consists of 21 member economies from both sides of the Pacific, including Australia; Brunei; Canada; Chile; the People's Republic of China; Chinese Taipei; Hong Kong, China; Indonesia; Japan; the Republic of Korea (ROK); Malaysia; Mexico; New Zealand; Papua New Guinea; Peru; the Republic of the Philippines; the Russian Federation; Singapore; Thailand; the United States; and Vietnam.[5] APEC is the only regional institution that draws members from Asia and from North and South America and is also the only one that includes both China and Chinese Taipei. It does not, however, include the South Asian countries. In 1991, India, whose economic and political ties with East Asia had grown substantially (and have continued to do so since), requested APEC membership, but its application was denied. Seven years later, APEC imposed a moratorium on new members until 2010.[6]

APEC was founded to foster trade and investment, economic development, and cooperation throughout the Asia-Pacific region. It has worked to reduce trade barriers to increase exports and improve the efficiency of its members' economies.[7] Because APEC works by consensus and has no binding provisions, members make commitments and try to meet them, but there is no penalty for economies that fall short, other than peer pressure and review. Until 2007, APEC's work on climate change centered on energy efficiency and security issues, with little or no discussion of climate change among the member economies.

APEC's Energy Working Group (EWG) was founded only a year after the creation of APEC. It has since acquired a more significant climate change dimension, although its primary focus still remains on energy and sustainable growth issues. The EWG works through the establishment of initiatives, task forces, and information sharing, in a relatively formal process involving proposals either from APEC staff or from member economies and buy-in from the rest of the membership. Comprising representatives from each of the member economies, it is one of the largest and most

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5. Asia-Pacific Economic Cooperation (APEC), "Member Economies," http://www.apec.org/apec/member_economies.html.

6. APEC, "APEC History," http://www.apec.org/apec/about_apec/history.html.

7. Raghbendra Jha, "Bring India into Club," *Courier Mail*, November 16, 2006, http://www.couriermail.com.au/news/opinion/bring-india-into-club/story-e6frerdf-1111112535055.

active groups in APEC.[8] Its areas of emphasis include clean fossil energy, energy security, energy efficiency and conservation, data analysis, and new and renewable energy technologies.

APEC's Energy Security Initiative (ESI), launched in 2000, is the principal mechanism through which the EWG addresses long- and short-term energy security.[9] The ESI operates by assigning expert groups to develop measures that promote energy security and is aided by research undertaken by the Asia-Pacific Energy Research Centre in Tokyo.

ESI's short-term efforts include encouraging data sharing, maritime security, creation of emergency oil reserves, and other energy emergency responses. The group's long-term efforts include facilitation of energy investment, natural gas trade, energy efficiency, the expansion of energy choices, and the encouragement of technological innovation.[10] Energy efficiency and the encouragement of technological innovation are examples of activities that serve the dual purpose of mitigating the adverse effects of climate change and securing energy supplies.

The EWG has also undertaken technical projects that serve the goal of climate change adaptation more directly. The promising technological innovation of carbon capture and storage, used to reduce harmful emissions from coal-fired power plants, is being further developed. The Expert Group on Clean Fossil Energy is currently undertaking projects to make this practice commercially viable in developing member economies. The EWG's Expert Group on Energy Efficiency and Conservation is also trying to establish an energy efficiency certification system that would somewhat resemble the "energy star" system in the United States. The system would not, at least initially, be harmonized among the members, demonstrating the limitations of Asian regional organizations.

In several cases, APEC and its member economies are working with other organizations with membership from beyond the region, spurred on by their energy ministers who have recognized that "cooperation and partnerships are essential in addressing energy security and energy challenges."[11] For example, the EWG collaborates with the International Energy Agency (IEA) on energy indicators, clean coal technology, data sharing, and renewable energy technologies. In addition, the Renewable Energy and Energy Efficiency Partnership, the Energy Charter Secretariat, and the Asia-Pacific Partnership on Clean Development and Climate (APP) have been granted guest status in the EWG.[12] The EWG has also actively coordinated with other committees within APEC on crossover issues, such as the Transportation Working Group on projects related to energy-efficient transport.

In 2007, under the leadership of host country Australia, members of APEC adopted the Sydney Declaration on Climate Change, Energy Security and Clean Development. This historic measure formally placed climate change on APEC's agenda, although some of the EWG's activities mentioned earlier started before and continued after the Sydney Declaration. The declaration, however, more fully addressed issues of climate change, and the EWG is now working to support

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8. APEC, "Energy Working Group," http://www.apec.org/apec/apec_groups/som_committee_on_economic/working_groups/energy.html.

9. APEC Energy Working Group, "EWG Work Plan: 2009–2011, Thirty-ninth EWG Meeting, Tokyo, Japan, March 9–13, 2010."

10. APEC, "Energy Working Group—Energy Security," http://www.ewg.apec.org/energy_security.html.

11. APEC Energy Working Group, "EWG Work Plan: 2009–2011."

12. APEC, "Energy Working Group."

the declaration's listed goals, which include reducing energy intensity[13] by at least 25 percent by 2030 from the 2005 levels and increasing forest cover in the region by at least 20 million hectares of all types of forests by 2020.[14] Formal statements like the Sydney Declaration have an important role in driving the organization's work. They provide the justification for the creation of new working groups and for budget allocations to the work of the secretariat.

At the Copenhagen conference in 2009, the APEC leaders withdrew the specific emission reduction goals that had been included in an earlier draft, calling into question their commitment to the goals of the Sydney Declaration.[15] As demonstrated by the work of the EWG, however, the recognition of climate change as a serious threat to the region has culminated in a series of efforts that has kept these targets in mind.

Asia-Pacific Partnership on Clean Development and Climate

The Asia-Pacific Partnership on Clean Development and Climate (APP), founded in 2005, is a nontreaty cooperative arrangement that includes Australia, Canada, China, India, Japan, the ROK, and the United States. Its member countries include some of the largest economies and are collectively responsible for more than 50 percent of GHG emissions. It has the most operational work plan of any of the Asian regional institutions that deal with climate change. It aims to develop results-oriented, cost-effective models of public-private approaches to addressing climate change, energy security, and air pollution, with a broader goal of promoting investment and trade in environmentally friendly, energy-efficient technologies. Member countries collaborate among themselves and with the private sector. Its focus has been on industry-by-industry technological solutions to the climate change problems it faces.

The APP is structured with a policy and implementation committee at the top. The United States currently chairs this committee, which is supported by an administrative group, also chaired by the United States, and by eight task forces, chaired by the various countries in the partnership. The task forces work on the following sectors: aluminum, buildings and appliances, cement, cleaner fossil energy, coal mining, power generation and transmission, steel, and renewable energy and distributed generation.

Each task force meets independently on a regular basis and pursues a list of projects designed to develop or test specific proposals for saving energy or reducing carbon emissions. Each project has participation from a number of the member countries, and there is substantial private sector participation as well. The various task forces identify areas of priority, develop action plans, and provide information and updates on the status of their work.[16]

In September 2009, the U.S.-China-Australia Dialogue on Energy Security and Climate Change, meeting in Washington D.C., announced eight APP projects that will receive more than US$6.7 million in U.S. government funding and leverage more than US$8 million in additional funding for activities in China. Similarly, through a U.S. government-funded APP project, Orb

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13. In this chapter, *energy intensity* refers to the consumption of energy per unit of GDP.

14. Jiang Yuxia,"APEC Leaders Adopt Sydney Declaration on Climate Change," Xinhua News, September 9, 2007, http://news.xinhuanet.com/english/2007-09/09/content_6692153.htm.

15. Linda Mottram, "APEC Leaders Douse Hopes of Climate Deal," ABC News, November 16, 2009, http://www.abc.net.au/news/stories/2009/11/16/2743455.htm.

16. Asia-Pacific Partnership on Clean Development and Climate, "Fact Sheet," http://www. asiapacificpartnership.org/pdf/translated_versions/Fact_Sheet_English.pdf.

Energy is expanding the commercial solar photovoltaic and solar thermal market in India. As of April 2010, there were 349 APP projects at the development stage.[17]

The specificity of these projects is both their biggest advantage and their principal limitation. Although they have a good chance of being practical and implementable, the APP does not appear to have a formal mechanism for incorporating technically feasible solutions into broader government policies. Arguably, the APP is still young and is therefore undertaking pilot projects. In the future, it may be able to scale up and streamline successful endeavors, bringing them into wider technological acceptance or more formal government policy.

ASEAN and Its Partners

The Association of Southeast Asian Nations, founded in 1967, works to promote economic growth, social progress, and cultural development among its 10 members: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. ASEAN has a small secretariat in Jakarta. The style in ASEAN—referred to as "the ASEAN way"—is to avoid any action, especially any public action, that could be seen as challenging the sovereignty of one of the members. While there have been frictions, some of them public, within the group, the organization has held to its role of discreet consensus builder. ASEAN's leaders have set a vision for the group, encompassed in the ASEAN Charter, which envisions economic, political, and socioeconomic integration with specific time frames.

ASEAN's work on climate change grew out of an earlier, more general focus on the environment. The issue with the greatest effect on relations among its members was transborder haze, primarily resulting from fires in Indonesia's extensive tropical peat forests. This is a unique regional issue and thus the kind of problem for which a regional approach is especially well suited.

Transborder haze had been a sore point within the ASEAN membership for years. The members negotiated an Agreement on Trans-boundary Haze Pollution in 2002. The agreement entered into force the following year—with Indonesia still not having deposited its instrument of ratification. Indonesia clashed publicly with Singapore and implicitly with other ASEAN members, characterizing the haze problem as a "domestic issue" for Indonesia, in which the other members should not interfere.

Despite this seemingly unpromising backdrop, ASEAN members succeeded in working together to a significant extent. Indonesia and Singapore drew up a master plan for 35 fire-prone districts. An ASEAN Haze Fund was used to help finance work in these districts. At the ASEAN level, remote sensing and meteorological data were used to monitor the fires. In short, the legal structures that ASEAN set out to create have remained incomplete, but practical cooperation has nonetheless followed. This outcome follows a pattern of effective Asian regionalism being most prevalent in response to crises such as the 2004 tsunami, Cyclone Nargis in 2008, and various other natural disasters such as earthquakes, flooding, and typhoons. This cooperation, however, falls well short of harmonizing the regulatory structures of ASEAN members, for example.

Perhaps more important, other areas of ASEAN cooperation, not explicitly characterized as climate change efforts, may be critical to any serious effort to reduce GHG emissions. One exam-

17. Asia-Pacific Partnership on Clean Development and Climate, "APP Projects Interactive Map," http://www.asiapacificpartnership.org/english/app_interactive_map.aspx.

ple is infrastructure development aid[18] that can serve adaptation purposes. Another is law enforcement and customs cooperation, needed to prevent illegally obtained logs from being sold outside the country of origin, a critical issue for Indonesia's forests.

In 1997, ASEAN started creating formal partnerships with countries beyond the organization's membership. The closest consultations are with the ASEAN Plus Three, including China, Japan, and the ROK. Cooperation between ASEAN and these three partners has expanded to 20 areas, including energy, science and technology, and the environment. ASEAN has also created "dialogue partnerships" with a larger number of countries, including India, the United States, and a number of countries outside Asia. These dialogue partnerships cover important cooperation in the law enforcement area.

ASEAN Plus Three specifically added climate change to its agenda in a declaration made at its 2007 summit, about a year before Indonesia hosted the Bali Conference of Parties of the UNFCCC in December 2008. Although the declaration demonstrated a certain commitment to climate change mitigation strategies by the region's leaders, it stopped well short of providing common guidance on how to address climate change. The statement itself stressed that each country would individually determine its precise goals in mitigating climate change or adapting to it and the means of implementing its policies. As has often happened, in the contest between sovereignty and common action, sovereignty exerted the stronger influence.

ASEAN has tried to serve as a coordinating forum for its members before global environmental meetings, and the group's environmental ministers have instructed the ASEAN staff to prepare as a group for the upcoming Conference of Parties to take place in Mexico. ASEAN did make a statement expressing the common views of the organization at the Bali meeting. The negotiations in these meetings, however, have not been organized by region. In Copenhagen, China and India were part of the negotiations leading to the final agreement, but they were negotiating not as Asian countries but as part of a group of large developing countries (BASIC—Brazil, South Africa, India, and China). Four ASEAN members have submitted undertakings on emissions reduction following the Copenhagen meeting. Indonesia was one of the first to do so and pledged to reduce its emissions by 26 percent, with a further drop of up to 15 percent if financing were made available. Malaysia's undertaking was couched in terms of the energy intensity of its economy, which it pledged to reduce by 40 percent by 2020. These undertakings were not coordinated within ASEAN, nor were they matched by the full membership. In a region where consensus and the appearance of harmony have unusual importance, however, ASEAN's consultative mechanisms may have encouraged wider participation in the process of creating the beginnings of a new global norm.

SAARC

The South Asian Association for Regional Cooperation (SAARC), established in 1985, includes India, its six immediate neighbors, and Afghanistan.[19] SAARC initially functioned mainly through its periodic summits (in principle, one each year), which could take place only when all member heads of state or government were willing and able to participate. It also meets at the ministerial level.

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18. Hua Hin, "Leaders of ASEAN+3 Discuss Regional Cooperation, Combating Global Financial Crisis," Xinhua News, October 24, 2009, http://www.ccun.org/News/2009/October/24%20n/Leaders%20of%20 ASEAN+3%20Discuss%20Regional%20Cooperation,%20Combating%20Global%20Financial%20Crisis. htm.

19. Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.

The organization's principal work related to climate change has been motivated by energy security concerns. SAARC energy ministers established an Expert Group on Energy and the Environment in 2005, intended to focus chiefly on energy conservation and efficiency options for the SAARC region.[20] In 2007, at its New Delhi meeting SAARC launched an action plan for climate change, leading to the signing of the SAARC Climate Change Declaration.[21] This is a comprehensive plan covering issues of adaptation, mitigation, technology transfer, and capacity-building strategies. The most notable achievement has been the establishment of five SAARC centers of excellence for climate change–related research. At the most recent meeting of the heads of states in April 2010, an intergovernmental expert group on climate change was established to oversee timely implementation of the action plan.[22] In the past, environmental collaboration has leaned toward disaster management, especially after the tsunami. In the future, however, we can remain hopeful that the scope of the action plan will enable it to be used effectively for dealing with other areas of overlapping concern such as crossborder climate refugees.

Attitudes toward climate change vary within SAARC, as is the case with ASEAN. All members give priority to economic growth. India is a major emitter in the aggregate because of its size. Bangladesh, India, Nepal, and Pakistan would suffer major impacts such as water stress and flooding from changes in the Himalayan glaciers.

Maldives, a nation of a thousand atolls nearly 1,000 miles from the South Asian land mass, is in a unique situation: it stands to disappear if sea levels rise. Its ability to influence the policies of its SAARC partners is close to nil, however. Its most recent effort to dramatize the importance of climate change came in 2009, when the newly elected president held a well-photographed cabinet meeting under the sea, with the ministers decked out in masks and oxygen tanks.

SAARC tried to make its collective voice heard at the December 2009 Copenhagen Conference on Climate Change.[23] Its statement, made by Sri Lanka's environment and natural resources minister, Champika Ranawaka, stressed that although SAARC nations have not contributed to the staggering global greenhouse gas emissions, they are nevertheless committed to working together to combat climate change.[24]

SAARC is slowly creating a larger network among the trade, environmental, and energy officials of member countries. But the organization is weak, structurally and politically unsuited to an ambitious role. India dwarfs the other members and has complicated relations with all of them. Physically, India lies in the middle of the region, so that the only pair of other members with a common border is Pakistan and Afghanistan. All SAARC members trade with India; however, most have little or no trade with other members.

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20. Henry D. Jacoby, Richard Schmalensee, and Ian Sue Wing, "Toward a Useful Architecture for Climate Change Negotiations," MIT Joint Program on the Science and Policy of Global Change, May 1999, p. 3, http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt49.pdf.

21. SAARC, "Road Map: Regional Cooperation on Climate Change Adaptation and Disaster Risk Reduction in South Asia," Kathmandu, Nepal, August 21–22, 2008, available at http://saarc-sdmc.nic.in/pdf/roadmap/road_map3.pdf.

22. "Thimphu Statement on Climate Change," Sixteenth SAARC Summit Thimphu, April 28–29, 2010.

23. "SAARC to Make Statement in Copenhagen," *The Hindu*, October 21, 2009, http://beta.thehindu.com/news/national/article36525.ece.

24. Chamikara Weerasinghe, "Climate Change Threatens Lanka's Sustainable Development," *Daily News*, December 18, 2009, http://www.dailynews.lk/2009/12/18/news32.asp.

Most important, the 60-year history of serious problems between India and Pakistan makes it impossible for SAARC, which operates by consensus and is barred from taking up bilateral issues, to move beyond a very modest set of activities. Observers of SAARC have commented wryly that the most useful part of its meetings are the tea breaks, where members can address the full range of their problems informally if they wish and where they can start creating useful networks of cooperation.

Global Organizations

In addition to regional institutions, international organizations are also a part of the architecture in place to meet the challenges of climate change in Asia. The International Energy Agency, the United Nations, international financial institutions (IFIs), and more recently the G-20 all play important roles in coordinating Asia's response to climate change.

Setting Global Standards: The United Nations and the G-20

The UNFCCC is the principal global agreement through which the countries of the world have tried to reach an understanding on global goals and standards for mitigating climate change. It has 192 member countries and four observers. The framework also supports cooperation on "national strategies for adapting to expected impacts, including the provision of financial and technological support to developing countries, and to cooperate in preparing for adaptation to the impacts of climate change,"[25] through instruments such as the clean development mechanism. [26]

The UNFCCC'S Conferences of Parties have become the principal forum for setting global goals and standards on climate change and for establishing rules and methodologies to support the viability of global carbon markets. The Copenhagen climate talks in December 2009, however, illustrated the persistent disagreement between developed and less developed countries on how to proceed. Countries preferred to form alliances and negotiate on the basis of economic congruence as opposed to geographical proximity, as demonstrated by groups like BASIC (Brazil, South Africa, India, China).

The UNFCCC faces the classic trade-off of being virtually universal but unwieldy, while the G-7 (more recently, the G-8) is a highly restricted group of major developed economies that leaves out such major players as China. Since November 2008, the G-20, which includes Asia's three largest developing countries (China, India, and Indonesia) as well as two of its more advanced economies (Japan and the ROK), has emerged as the principal coordinating forum on global financial issues and has begun to take on a global consensus-building role on climate change. It is likely to operate in the same part of the climate debate as the UNFCCC and its global climate meetings—that is, trying to move toward agreed goals and their implementation and seeking to establish broad aggregate measurements and equally broad commitments on both emissions and financing.

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25. UNFCCC, *Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries.*

26. The clean development mechanism is a flexible instrument established under the Kyoto Protocol wherein "Annex I" countries, under Kyoto's emissions targets can fund or develop sustainable, clean energy projects in "Non-Annex I" countries that are not under emissions targets. In order to be certified as a CDM and earn certified emissions reductions (CERS), the projects must undergo a rigorous validation procedure is overseen by the UNFCCC's CDM executive board. See "About CDM," http://cdm.unfccc.int/about/index.html.

It is too early to tell how effective it will be in reaching these goals. It has given its Asian members, who with the exception of Japan were not represented in the G-7 or G-8, a seat at the table as these issues are discussed and prepared for the more public debate that takes place in the UNFCCC meetings.

International Energy Agency

The International Energy Agency was originally established in 1974 as an organization of the world's major energy consumers. Its members are also members of the Organization for Economic Cooperation and Development (OECD), which includes the countries of Western Europe, as well as Australia, Canada, Japan, Mexico, New Zealand, the ROK, and the United States. The IEA is an intergovernmental organization that helps advise its members on how to ensure reliable, afford-able, and clean energy for their citizens. When it was founded during the oil crisis of 1973–74, its main focus was on helping its members put in place emergency measures to overcome sup-ply disruptions. Over the years, it has broadened its energy security mandate to cover aspects of economic development and environmental protection. It conducts research, collects and analyzes data, provides technical assistance, and produces publications on current energy policy and best practices.[27]

The IEA's two roles are in some tension, however. On the one hand, it is an offshoot of the OECD and hence part of the industrialized countries' economic cooperation structure. On the other hand, it is an organization of energy consumers, and since it was established, China and India have become two of the largest consumers and the two fastest-growing energy markets but are excluded from the IEA's formal structure.

Because of these countries' high profile in energy markets, the president of the IEA, Nobuo Tanaka, has stated that he favors bringing China and India into the organization.[28] Under pres-ent rules, for the two nations to join the IEA they would first have to join the OECD, a step that entails adoption of a long list of financial and economic measures that neither country is yet ready for. Officials of several countries including the United States have been exploring mechanisms for inviting them to join the IEA without first joining the OECD. In practice, the smaller OECD countries are likely to resist such a move, believing that these two giant countries could potentially dilute their own influence within the IEA.

The IEA has reached out beyond its membership and conducted extensive data-gathering and technical assistance missions in Asia. Its 2007 annual energy report was focused primarily on the energy markets of China and India. This kind of outreach can bring Asian countries within the ambit of the IEA's technical work, but its major limitation is that it will not be able to serve as a mobilizing or coordinating mechanism beyond its own membership.

International Financial Institutions

The World Bank, the largest of the IFIs, has established itself as one of the major funding and re-search conduits for climate change–related development work. Some of the work is financed with

27. IEA "What Does the IEA Do?" http://www.iea.org/journalists/faq.asp.

28. IEA, "The Next 10 Years Are Critical: The World Energy Outlook Makes the Case for Stepping up Co-operation with China and India to Address Global Energy Challenges," IEA Press Release, November 7, 2007, http://www.iea.org/press/pressdetail.asp?PRESS_REL_ID=239.

World Bank funds, but much of it consists of special-purpose trust funds that individual country donors have decided to channel through the World Bank to take advantage of the World Bank's project management and environmental expertise. The World Bank has made major investments in clean energy and climate change–related projects in Asia.[29] Between the clean development mechanism and the other donors' trust funds, the World Bank has about $6 billion available for work related to climate change.

Much of the work financed by these funds goes to promote energy efficiency. In South Asia, the World Bank has also begun supporting adaptation projects, to help countries deal with aspects of climate change that have already become inevitable. The World Bank's Economics of Adaptation to Climate Change Study predicts that it will cost developing countries US$75–100 billion each year to adapt to climate change from 2010 to 2050.[30]

The Manila-based Asian Development Bank (ADB), which works in the same way as the World Bank, broadly speaking, considers environmental sustainability an essential part of Asian economic development and poverty alleviation. According to a 2009 ADB report, 1.6 billion South Asians will be affected by food and water shortages caused by climate change. Of this 1.6 billion, the poor will be most negatively affected. Therefore, the ADB's clean energy program not only works to promote energy efficiency but also aims to increase the access of the region's poor to clean forms of energy.

The ADB finances both mitigation and adaptation. Its mitigation program focuses on promoting low-carbon energy sources, sustainable transportation, urban sanitation, and sustainable forestry practices. Acknowledging that Asian countries must adapt to climate change to prevent further climate change–induced damage from occurring, the ADB's adaptation program highlights four important areas: safeguarding national development strategies, strengthening vulnerable sectors such as agriculture and urban development, climate proofing ADB projects, and addressing the social impacts of climate change.[31]

Major Multilateral and Bilateral Efforts in the Region

Beyond the efforts of regional institutions to combat the adverse effects of climate change, a few significant multilateral and bilateral activities are occurring. American involvement is noteworthy as are Japan's aid efforts. The multilateral efforts presented through the Mekong River Commission and the Coral Triangle Initiative and on the Himalayan glaciers are also positive indicators of how the fight against climate change can occur both within and outside formal regional or international institutions.

29. World Bank, "Climate Change—Financing: What We Do," http://beta.worldbank.org/climatechange/financing.

30. World Bank, "Climate Change—Economics of Adaptation to Climate Change Study," http://beta.worldbank.org/content/economics-adaptation-climate-change-study-homepage.

31. Asian Development Bank, "ADB and Climate Change Adaptation," http://www.adb.org/Climate-Change/cc-adaptation.asp.

The United States

The United States has been directly involved in energy and climate change issues in Asia, supporting both regional organizations and bilateral efforts.

The U.S. Agency for International Development (USAID), for example, has a regional program that includes a significant environmental component. The top priorities for this program are clean energy, land use and forestry, and coral resources.[32] USAID has funded small technical assistance programs at both APEC and ASEAN. In particular, the U.S.-funded advisers try to encourage activities that engage private business in the work of the organizations, including climate change–related work. USAID also funded the South Asian Regional Initiative for Energy Cooperation and Development, which promotes regional energy security through energy market development and trade.

The U.S. Environmental Protection Agency also partnered with USAID under the U.S. Climate Technology Cooperation Gateway, a more global effort to promote the development and transfer of climate change technologies.[33]

The United States also has extensive programs of bilateral consultation and cooperation throughout the region. For example, the Joint U.S.-China Collaboration on Clean Energy, founded in 2007, brings together energy experts from around the world to develop and facilitate clean and efficient energy use in China. The collaboration also assists private companies in finding cost-effective approaches to "going green."[34] Although it is a fairly young organization, it represents an important dialogue between two of the world's largest greenhouse gas emitters. The China and the United States also have an active program of bilateral cooperation, including the U.S.-China 10-Year Energy and Environment Cooperation Framework and the U.S.-China Protocol for Cooperation in the Fields of Energy Efficiency and Renewable Energy Technology Development and Utilization, among others.

The U.S.-India Energy Dialogue, conducted by the U.S. Department of Energy and the corresponding Indian ministries, identifies and pursues areas of collaboration on energy sources such as coal, oil, and gas and on new technologies and renewable energy.[35] In November 2009, the U.S. and Indian governments signed a memorandum of understanding on enhanced cooperation on energy security, energy efficiency, clean energy, and climate change

In Indonesia, the emphasis of USAID's work is on adaptation, especially in the country's extensive coastal areas, and on saving Indonesia's forests. The USAID program in Indonesia has also worked extensively in improving governance, an essential precondition for any effective effort to reduce deforestation or forest degradation, since enforcing laws on logging and land use cannot proceed without stronger governance.

In 2002, the ROK and the United States established a bilateral dialogue on policy issues and agreed to collaborate on reducing greenhouse gas emissions through research on institution build-

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32. USAID, "Asia's Environmental Challenge," http://www.usaid.gov/rdma/programs/en.html.

33. Environmental Protection Agency, "Multilateral Partnerships and Activities," http://www.epa.gov/climatechange/policy/international_multilateral.html.

34. Joint US-China Collaboration on Clean Energy, "What is JUCCE?" http://www.juccce.com/about_us/our_goals#What%20is%20JUCCCE?#What%20is%20JUCCCE?#What%20is%20JUCCCE?

35. Embassy of India, Washington, D.C., "India-US Energy Dialogue," March 2, 2006, http://www.indianembassy.org/newsite/press_release/2006/Mar/15.asp.

ing and on climate change science and technology. Like India, the ROK also participates in the Integrated Environmental Strategies program.[36]

Japan

Aid for climate change mitigation and adaptation strategies is integral to the new regional persona Japan is trying to create. Japan is eager to share (or sell) much of the clean energy technology it has pioneered. Japan has always been a large global aid donor. Recently, some of this aid has shifted away from infrastructure projects and toward climate change–related technology transfers. A great deal of Japan's aid related to climate change is channeled through the ADB. Other projects are done on a bilateral basis. Regardless of how Japan structures its contributions, its projected volume could have a significant impact on climate change in Asia as well as on how mitigation or adaptation efforts are conducted.

For example, as part of its official development assistance for individual issues in the environmental field, Japan has so far announced the Environmental Conservation Initiative for Sustainable Development (2002), the Water and Sanitation Broad Partnership Initiative (2006), the Cool Earth Partnership (2008), and the "Hatoyama Initiative" (2009), which was developed by restructuring the Cool Earth Partnership.[37] Under the Hatoyama Initiative, Japan has pledged US$15 billion in conditions-based financial and technical assistance to developing countries to help address the problem of climate change. India, Indonesia, Malaysia, the Philippines, and Sri Lanka are among Asian countries that will benefit from this initiative.

The Mekong River Commission: An Independent Multicountry Partnership

The Mekong River Commission (MRC) is an agreement among the governments of Cambodia, Laos, Thailand, and Vietnam, founded in 1995. The four countries signed the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin and agreed on joint management of their shared water resources and development of the economic potential of the river.[38] In 1996, China and Myanmar became dialogue partners of the commission, and the countries now work together within a cooperation framework. Most of its activities involve sustainable development and environmental monitoring that assess the impact on the poorer population of the Mekong River basin. The goal is to improve information sharing and to increase the capacity of the integrated water resources management system. Although this agreement was not reached for the purposes of climate change adaptation, it is a good example of how aspects of economic cooperation can be expanded or adapted to alleviate the impacts of climate change in a regional context. This agreement seems to be a model that other countries in the region with shared rivers could emulate.

36. Environmental Protection Agency, "Bilateral Partnerships and Activities," http://epa.gov/climatechange/policy/international_bilateral.html.

37. Ministry of Foreign Affairs, "Japan's Initiatives to Cope with Global Environmental Problems," March 2010, http://www.mofa.go.jp/POLICY/environment/pdfs/jp_initiative_pamph.pdf.

38. Mekong River Commission, "About the MRC," http://www.mrcmekong.org/.

Coral Triangle Initiative: A Multipartner Effort

The Coral Triangle Initiative (CTI) is a unique partnership that brings together governments, nongovernmental organizations (NGOs), and multilateral agencies to protect the coral reefs in Indonesia, Malaysia, Papua New Guinea, the Philippines, Timor Leste, and the Solomon Islands (the CT6 countries). The 5.7 million square kilometers of the Coral Triangle is home to the highest diversity of marine life on Earth. These reefs will be increasingly threatened by changing weather patterns, acidification of the ocean, and extreme weather events caused by climate change, along with other human-induced harmful practices. USAID and the U.S. Department of State are jointly supporting the CTI with a US$40 million, five-year program implemented by a consortium of NGOs. These projects are currently under development, in close consultation with the CT6 countries, and are expected to be finalized and endorsed in the near term. While this effort displays hope and incredible willingness to cooperate to tackle a cause of common concern, it is yet to be determined whether, in fact, national economic policies relating to fisheries and development in the region will be superseded by this effort.

Protecting the Himalayan Glaciers: An Inspiring Initiative

In what could turn out to be a significant boost to climate change cooperation, in April 2010, three neighboring Himalayan countries, China, India, and Nepal launched a transboundary project for the conservation and sustainable development of the greater Mount Kailash Region of the Himalayas. This partnership is historic in that it brings together the two large competitors and major GHG emitters, China and India, to cooperate on preserving a common natural resource, with far-reaching consequences. This project entails crossboundary collaboration on ecological and climate change monitoring and information exchange networks. It could be an important stepping-stone for the management and conservation of a region that includes the sources of some of Asia's largest rivers, known collectively as the circum-Himalayan Rivers (Indus, Ganga, Brahmaputra, Salween, Mekong, Yangtze, and Yellow).[39]

What Do Regional Organizations Do Best?

It is relatively easy to identify the agenda for national policies on climate change. Policies affecting energy pricing and use, incentives for efficiency, land use, and technological innovation are high on the list. Similarly, institutions with a worldwide membership are pursuing a global climate change agenda.

What is the "comparative advantage" of regional organizations? This snapshot of Asian regional organizations and channels for cooperation suggests a few answers. First, regional organizations have a special role, perhaps a unique one, in addressing climate change–related issues whose direct impact falls on a limited number of countries in a specific area. The problem of transboundary haze in Southeast Asia, as well as the closely related issue of the management of Indonesia's tropical forests, presents a clear example and one in which ASEAN has had some success, drawing both on its networking ability and on its preference for discreet and informal approaches. Other

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39. ET Bureau, "India, China, Nepal Come Together for Mt Kailash," *Economic Times,* April 11, 2010, http://economictimes.indiatimes.com/features/the-sunday-et/dateline-india/India-China-Nepal-come-together-for-Mt-Kailash/articleshow/5783219.cms.

examples where direct mutual benefits are evident include damming of the Mekong River, glacier management in the Himalayas, and illegal logging in other areas, such as Kashmir. The parts of the region affected by these problems, however, do not have as effective a regional organization at their disposal.

Regional organizations can also be useful in developing mechanisms for sharing or coordinating physical infrastructure (such as electric grids) and in harmonizing standards and policies (such as energy pricing). Preconditions for this type of cooperation include higher levels of economic integration and a greater willingness to allow one country's policies to be influenced by its neighbors.

Regional organizations have an advantage in developing networks of cooperation. While such cooperation can in theory occur just as effectively through organizations that go beyond a particular region, officials and leaders from nearby countries who have to interact on border issues or other common problems are more likely to develop close working relationships than those whose home countries are distant and very different. The same logic applies to developing private sector networks.

Finally, regional organizations play an important role in establishing norms and expectations for regional policies. In Asia, this role stops short of harmonizing policies or regulations. Expressing common values through joint declarations and recurring high-level meetings, however, does have an impact and provides a framework in which countries can shift toward more decisive policies.

Global organizations, though, are likely to have the edge when it comes to mobilizing resources, measuring the impact of climate change, or developing trade rules that by their nature need to be applied around the world. In principle, regional organizations could be instruments for coordinating the positions of one region within the larger global community. The United Nations, for example, has evolved groups of countries, based partly on geography and partly on affinity, that serve a basic sorting-out function. In the climate change world, however, the differences among countries have generally not broken down along regional lines. It is thus not surprising that regional groups like ASEAN and SAARC have had relatively little impact on global climate negotiations. Because Asia includes countries at so many different levels of development, Asian regional institutions have blunted the tendency to handle climate change as a developed-versus-developing-country issue.

The role of regional organizations, however, will be limited by two factors. The first is the relatively modest role that Asian countries are prepared to grant multinational organizations. Even ASEAN, the most robust of the regional organizations, is built on a highly developed sense of sovereignty on the part of its members, who are not prepared to concede to ASEAN or anyone else the right to determine their policy.

The second is the nature of the climate change issue. In contrast to disaster relief, which usually appears on a country's or an organization's agenda in response to a crisis, climate change builds up day by day, and for most people (and for most policymakers) it is classified as an issue for the long term. This factor makes it harder for countries to deal with and harder still for organizations with limited authority over national policies.

Recommendations

What kind of regional institutions to create, whom they include, what they do, and how they are staffed reflect the views of the countries in the region. In Asia, the prevailing style, unlike Europe, is decentralized, nonexclusive, at least partly open to extraregional countries with a close connection to the region, and a relatively modest policy reach. This preference is unlikely to change within the next decade. Europe's strong push toward unity grew out of its experience in the cataclysm of two world wars, and even with that strong motivation on the part of the leadership, it has taken over half a century to reach its current degree of unity. Asia's regional dynamics are different.

As we look at regional institutions and arrangements through the prism of climate change, two kinds of recommendations come to mind: the first are recommendations for enhancing the effectiveness of regional organizations that recognize the decentralized and relatively modest character the region preserves; and the second are recommendations for enhancing the region's ability to address climate change and perhaps prevent the slow-onset disasters that could loom on the horizon. These recommendations are directed both toward the region and, in recognition that the Center for International and Strategic Studies is a Washington-based organization, toward the United States.

The pathway to more effective regional institutions includes the following steps:

- *The United States should strengthen its dialogue with the major regional organizations.* This is already established U.S. policy and is bolstered by the support the United States provides through its regional aid program. This activity is relatively inexpensive but will continue to pay dividends. Expanding the participation of specialized U.S. government agencies (such as the Environmental Protection Agency and the Department of Energy) in this dialogue would be a good step.

- *Both the United States and the regional countries should recognize the strengths and weaknesses of regional organizations.* Strengthening dialogue with the regional organizations should not mean treating them as smaller versions of the global organizations. The United States and other extraregional countries have useful experience they can share on dealing with region-specific environmental problems (such as U.S. problems with Canada over acid rain) or policy harmonization (grid connections, again with Canada). This approach would also lend a much-needed practical grounding in what the regional organizations do.

- *The regional organizations need to build capacity on climate change; the United States should help.* The technical assistance programs now in place at the APEC and ASEAN secretariats are an excellent resource. The organizations need to strengthen their analytical capability and their ability to identify practical measures that their members can adopt to reduce emissions and adapt to environmental change that is already taking place. The secretariats of regional institutions are the natural place to build up knowledge of what is happening elsewhere in the region and beyond. The regional organizations already serve as facilitators and bridge builders among the members; they could become a channel for importing useful experience from the rest of the world.

- *Regional organizations should build up their role as assemblers of data and expertise.* It is not easy to find the basic data needed to understand trends in climate change and to assess the impact of policies under consideration. This challenge should be a particular focus of capacity

building in regional organizations. It would help both national policymakers and the organizations themselves.

- *The United States and the regional countries should encourage Asia-wide outreach.* Not every organization needs to have every major Asian country as a member, enhancing the dialogue among Asia's subregions has clear benefits. This is true both for general and economic issues and for environmental issues. China and India share many of the same water sources; the risk of climate-driven refugees straddles the line between East and South Asia; the dynamic economic growth all over Asia is creating dozens of new economic dependencies. There is some incipient outreach between the staffs of regional organizations (e.g., ASEAN and SAARC), but in general channels for outreach efforts today are thin.

The region's response to climate change could also be strengthened through specific efforts:

- *The United States should work actively to bring China and India into the IEA.* The IEA is the most important of the global organizations involved in energy issues, and, given its focus on major energy consumers, the absence of these two giants is hard to defend. Some countries will resist, especially those in Western Europe whose relative weight in the IEA would be reduced, but that is not a good reason to stay with the current arrangement. Moreover, if the United States wants China and India to act as stakeholders in a market-based system, it needs to treat them that way.

- *The United States should make it a point to consult with the major Asian countries—China, India, Japan, and the ROK—as the agendas for the G-20 and future conferences of parties to the UNFCCC take shape.* Such consultation could help develop a more broadly based consensus and enlist the support of the large Asian countries whose participation is essential to serious global action. These consultations need not necessarily take place through regional organizations, although if regional organizations take on this kind of coordinating role, it will be a sign that they are considerably expanding their reach.

5 DISASTER MANAGEMENT IN ASIA
THE PROMISE OF REGIONAL ARCHITECTURE
Stacey White

Many scholars refer to the twenty-first century as the Asian Century. Still others designate it the Age of Nature.[1] It is the thesis of this chapter that both are true and that the Asian Century and the Age of Nature are about to interface in ways that will have a profound impact on the world's future.

Critical to this interface will be the future direction and efficacy of the region's multilateral architecture. Over the past 10 years, and in particular since the 2004 Indian Ocean tsunami, regional initiatives to assist states in preparing for and responding to the risks posed by natural disasters have proliferated. In the "fog" of this activity, it has been hard to gauge the relative promise of the various efforts. While growing regional focus on disaster management has certainly facilitated unprecedented interstate dialogue on the issue, it has also produced a crowded, competitive, and convoluted "marketplace" for action.

Regional *hyper*activity in the area of disaster management has been powered by many factors, some of which have their roots in Asian regional dynamics, while others relate more broadly to international dictates. At its core, the propagation of regional initiatives stems from the overwhelming need to respond to an exponential increase in risk in the region. This sharp increase has been driven by both a rise in the frequency and intensity of natural hazards and a rise in Asian exposure.

Notwithstanding astonishing risk, a number of other factors are behind the proliferation of efforts. Most obvious is the regional economic growth that has occurred in tandem with the expansion of disaster management architecture. With the means for significant engagement, states have sought to participate in a number of action networks and have been even more anxious to host emerging efforts in their capital cities. Developments on the international scene have further encouraged regional engagement. Since 2000 alone, official global spending on humanitarian action has jumped from US$6.5 billion to US$11.2 billion in 2008, an increase of nearly 60 percent.[2] In this context, maturing Asian economies have come to view effective disaster management as a measure of modern economic strength.

Regional countries have also been quick to employ disaster management as a political tool for nurturing interstate trust without necessarily having to tackle more controversial issues. A case in point is the collaboration between China and Chinese Taipei in the context of the Asian-Pacific Economic Cooperation's (APEC) Task Force for Emergency Preparedness (TFEP).[3] Following the Sichuan earthquake of 2008, China and Chinese Taipei cohosted a TFEP-sponsored conference

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1. Thomas Homer Dixon, *The Upside of Down: Catastrophe, Creativity and the Renewal of Civilization* (Washington, D.C.: Island Press, 2006), 13.
2. Global Humanitarian Assistance/Development Initiatives, *February 2010 Update* 5, http://www.globalhumanitarianassistance.org/analyses-and-reports/gha-reports/gha-update-february-2010.
3. Elevated within APEC to the Emergency Preparedness Working Group (EPWG) in February 2010.

focused on the Sichuan response. They also attended the joint APEC-United Nations International Strategy for Disaster Reduction (UNISDR) conference in Kobe, Japan, in 2010, something of a first, given the UN role as cohost.[4] With the potential for these kinds of political successes, Asian states are prioritizing disaster management as never before.

Developments in science have also spurred regional action in this area. Progress in climate science, in particular, has led to increasingly effective tools for monitoring weather patterns and predicting the likelihood of extreme events, which, in turn, have changed attitudes about the ability to prepare for disasters. In the 1970s and early 1980s, Asian societies—and indeed societies worldwide—were relatively fatalistic about disasters. Without the tools to anticipate them, governments were not impelled to take action until *after* a disaster hit. Over the past 20 years, however, scientific developments have increasingly allowed for forecasts and for a clearer link between climate change and an escalation in both the frequency and the severity of extreme climatic events.[5]

These major scientific advances together with accelerated technological developments have led to a dramatic rise in citizen expectations regarding state responsibility for managing risk. With mobile telephone penetration rates in Asia and the Pacific at well over 45 percent,[6] response expectations have soared in recent years, ushering in a new humanitarian era that holds governments accountable for effective response in near real time. The sharp rise in expectation has also been connected to the growing space provided civil society as a result of political changes in Asia. Although still uneven across the region, the growth of civil society in many Asian countries has been considerable and has led to a regional environment that holds governments highly accountable for disaster management.

Finally, major changes in the international disaster management industry have influenced the growth of networks in Asia. Since the 2004 tsunami, there has been unprecedented global momentum for reducing exposure to disaster risk. Inherent in many international efforts has been recognition that traditional distinctions between emergency response and development are outmoded. At the same time, there has been tacit acknowledgment by the humanitarian community that there is still quite a long way to go in understanding how to build disaster-resilient societies. In short, the tsunami was a lesson in humility for many international actors and has been responsible for a strong push to reframe the humanitarian agenda ever since.[7] A landmark moment in this movement included the signing of the Hyogo Framework for Action by 168 nations in January 2005, just three weeks after the tsunami. For the first time in history, Hyogo offered a common agenda

4. Personal interview, APEC Secretariat, Singapore, January 2010.

5. In its second report of 1992, the Intergovernmental Panel on Climate Change did not address extreme events; in 2001, the panel's third report linked extreme precipitation and temperatures with climate change; then in 2007, in its fourth report, the link between extreme temperatures (resulting in tropical storms and tornados) and climate change was clearly made. IPCC, *IPCC Fourth Assessment Report: Climate Change 2007*, Geneva, 2007, http://www.ipcc.ch/publications_and_data/ar4/syr/en/main.html.

6. It should be noted that penetration rates in South Asia are estimated to be significantly lower at 25 percent growth since 2000. Source: *World Development Indicators*, 2007, as found in Shanza Khan and Adil Najam, *The Future of Globalization and its Humanitarian Impacts* (Boston: Frederick S. Pardee Center for the Study of the Longer-Range Future, Boston University, November 2009), 23.

7. See John Borton, *Future of the Humanitarian System: Impacts of Internal Changes* (Boston: Feinstein International Center (FIC) and Humanitarian Futures Programme (HHP), November 2009). Also Feinstein International Center and Humanitarian Futures Programme, *Humanitarian Horizons: A Practitioner's Guide to the Future* (Boston: FIC / HHP, January 2010).

for addressing not only immediate threats to life but also recurrent human vulnerability in the context of an increasingly hazard-prone future.

With so many factors driving the growth of disaster management initiatives, Asia has found itself the site of intensified activity in this area, so much so that a description of the multiple configurations of regional networks is enough to make one's head spin. From specialized instruments within the Association of Southeast Asian Nations (ASEAN) and APEC to others within the South Asian Association for Regional Cooperation (SAARC) and the ASEAN Regional Forum (ARF), there would seem to be a pillar, committee, task force, or working group engaged in disaster risk in every corner of the region. Many practitioners criticize the rapid growth of these various arrangements, pointing out that the bulk of them are both duplicative in effort and, at the same time, very thin on real technical capacity. And the argument certainly carries weight, for even if one accepts the existence of myriad networks as part and parcel of operating in Asia, it is questionable whether their proliferation reflects an enhanced regional capability in stand-by and surge response or an overall improvement in national capacities to withstand disaster.

Nevertheless, this chapter does not focus on the inefficiencies of overlapping arrangements, nor does it recommend a neat streamlining of existing efforts. Instead, it accepts the seemingly messy patchwork of Asian efforts as reflective of the diversity of the region and of the complexity of the modern world in which it has been pieced together. While conceding that the current architecture is cumbersome and even more lacking in coherent strategic vision for now, this chapter argues that the main impediment to effective action does not relate to form but more squarely to function. In a world experiencing unprecedented change and uncertainty, the humanitarian endeavor has become highly complex, making it more and more difficult for humanitarian actors to know how best to address the challenges at hand and, moreover, when it is best for states to work independently and when it is best to join together to confront the risk burden as a region.

That being the case, this chapter asserts that Asia, after a decade of tough humanitarian lessons, finds itself faced with great challenges but also equipped with unique capabilities. With an exceptionally rich disaster response experience, maturing economic means, and a growing regional imperative to cooperate on transboundary disaster-related issues, Asia possesses a very real opportunity to become the global leader in natural disaster management. Its ability to seize this opportunity and set an example for the world will hinge on the capacity of its emergent regional institutions to rationalize their discrete roles and responsibilities vis-à-vis one another and to exploit key niches for action at reasonable transaction costs for their member states.

Evolving Notions of Disaster Risk

Global thinking about disaster risk has changed considerably over the past years and merits analysis here if regional efforts to address it are to be fully understood. As noted above, disasters used to be viewed as exogenous shocks or "acts of God" that could be neither forecast nor mitigated. The 1970 Bhola cyclone in Bangladesh (then East Pakistan) is probably the most stunning historical example of what used to happen when disaster hit an unknowing society. The Bhola cyclone, the deadliest on record, killed approximately 300,000 people and devastated much of the Bangladesh coastline. Interestingly, the costs of the cyclone were not necessarily due to its intensity but, rather, to an overall lack of national and community preparedness. Through difficult lessons such as this one, much has changed about the way that the international community views risk and ways to address it.

In the UNISDR's most recent *Global Annual Report*, it explains that disaster risk "is configured over time through a complex interaction between development processes that generate conditions of exposure, vulnerability and hazard."[8] It goes on to note that in any given country, the landscape for disaster risk is conditioned by underlying social drivers such as economic development, demographic shifts, and globalization. The manner in which these drivers interact with physical hazards either to enhance or to reduce human resilience and are, in turn, affected by recurrent physical hazard over time is called the disaster risk–poverty nexus, a nexus that is now acutely magnified by climate change.

The addition of climate change to the risk equation underlines the important conceptual notion that disaster risk occurs on two temporal streams: one that results in a greater frequency, intensity, and unpredictability of extreme events or small, fast-risk processes and the other that results in more incremental threats through slow-onset processes that affect livelihoods, health, and quality-of life-opportunities. While the former is linked to what we traditionally think of as disaster preparedness or risk reduction, the latter is more directly associated with fundamental changes and adaptation strategies that seek to sustain the productive bases of society.[9]

As humanitarian practitioners have increasingly begun to understand the interplay between fast- and slow-risk processes, there has been a growing movement to study their interconnections and address risk holistically, most notably through climate change adaptation strategies. So important has this area of international action become that the Development Assistance Committee of the Organization for Economic Cooperation and Development (OECD) recently announced its plans to track funding for climate change adaptation as a means for managing international commitment to it.[10] Together with measures for disaster risk reduction, strategies for climate change adaptation are now widely viewed as critical components in building disaster-resilient societies.

Enter Asia, and it becomes easy to see why disaster risk in the region is so acute. With an exponential increase in hazard and exposure, both of which are amplified by changes in climate, disaster risk has reached an all-time high. In fact, Asia is so routinely cited as the region hardest hit by natural disasters that it would be a cliché were it not so disturbingly true. The 10 countries with the highest number of people exposed to flooding are all in Asia. Asian countries also have the highest absolute exposure to severe tropical storms and earthquakes.[11] Finally, four of the six biggest mega-disasters over the past 10 years have been in Asia: the Indian Ocean tsunami of 2004, the Kashmir earthquake of 2005, and Cyclone Nargis and the Sichuan earthquake, both of May 2008.[12]

Further to the sheer multiplicity of hazards in Asia is the issue of exposure. The two critical factors raising exposure are, first, unprecedented growth in national populations and, second, unprecedented growth in national economies.

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8. United Nations, *Risk and Poverty in a Changing Climate: 2009 Global Assessment Report on Disaster Risk Reduction* (New York: United Nations, 2009), 5.

9. Feinstein International Center and Humanitarian Futures Programme, *Humanitarian Horizons,* 15.

10. Members of the OECD's Development Assistance Committee (DAC) approved a policy marker to monitor CCA as of January 2010. The marker will complement the existing DAC marker on climate change mitigation and thus allow for a more comprehensive picture of all aid in support of climate change efforts. OECD, *OECD DAC to Monitor Aid Flows in Support of Climate Change Adaptation*, December 11, 2009, http://www.oecd.org/document/7/0,3343,en_2649_34421_44252935_1_1_1_1,00.html.

11. UNISDR. *Regional Synthesis Report on the Implementation of the HFA in Asia and Pacific 2007–2008* (Bangkok: UNISDR, 2009), 11.

12. The other two megadisasters were Hurricane Katrina (2005) and the Haiti earthquake (2010).

As for population growth, the region is set to experience a massive spike in numbers over the next four decades. Demographers estimate that by 2050 the region will stand as the world's "population giant," with nearly 5.5 billion persons or approximately 60 percent of the world's population.[13] Not only will the volume of new persons in Asia bring about greater relative exposure, but also the new number of people born into poverty will function as a key determinant in increasing Asia's disaster risk. It is well documented that the highest total fertility rates globally are a feature of the poorest segments of societies.[14] As such, the bulk of growth in Asia is projected to occur in the poorest countries of the region and, further, within the poorest segments of Asian national populations.[15]

Finally, Asian exposure is influenced by the region's rapid economic growth and concomitant urbanization. Although urbanization is a global phenomenon, in absolute numbers, Asia is and will continue to be the epicenter of urbanization for the foreseeable future.[16] In fact, according to the World Bank, East Asia is currently the site of the largest rural-to-urban shift of populations in human history.[17] Given that cities in Asia are estimated to generate about three-quarters of annual output and between one-half and two-thirds of exports,[18] economic migration to regional urban centers is expected to continue at unprecedented scale and velocity. The strain on cities is already apparent, particularly in coastal areas where risk of natural disasters is inherently higher. Coastal cities are particularly attractive to migrants because they have as much as double the per capita gross domestic product (GDP) of cities further inland and also attract significantly greater foreign investment.[19]

Despite the many disaster risk factors that Asian countries have in common, it would be incorrect to portray Asian countries as homogenously vulnerable. Although many countries face the same types of hazards, actual vulnerability to risk is uneven across the region as well as within countries, given variations in governance, infrastructure, and poverty. In developed countries,

13. South Asia is the subregion expected to have by far the largest increase in population, related in large part to a population explosion in India (expected to surpass China in population between 2020 and 2025) but also due to projected growth in Bangladesh and Pakistan. See Carl Haub, *Demographic Trends and Their Humanitarian Impacts* (Boston: Feinstein International Center and the Humanitarian Futures Programme, 2009), 21.

14. Ibid., 23.

15. To give some indication as to how this will all add up, the World Bank calculated in 2005 that some 150 million East Asians (8 percent of the regional population) were living in absolute poverty, below US$1 per day, while 585 million were living on less than US$2 per day. With the total fertility rate at no less than four or five children per woman for these segments of society, there will be a staggering number of people born into risk. See Indermit Gill and Homi Kharas. *East Asian Renaissance: Ideas for Economic Growth* (Washington, D.C.: World Bank, 2007), 30.

16. Neeraj Prasad et al., *Climate Resilient Cities: A Primer on Reducing Vulnerabilities to Disasters* (Washington, D.C.: World Bank, 2009), note 5.

17. Gill and Kharas, *East Asian Renaissance,* 29

18. Often, much of this is concentrated in single cities. For example, Bangkok accounts for 40 percent of Thailand's GDP; Manila, for 30 percent of the Philippines'; Ho Chi Minh City, for 20 percent of Vietnam's; and Shanghai, for 11 percent of China's. It should also be noted that four East Asian cities have one quarter or more of the total national population. These include Seoul, Taipei, Tokyo, and Ulaanbaatar. Finally, 7 of the world's 21 megacities (those with populations in excess of 10 million) are in East Asia. Ibid., 27–28.

19. The World Bank notes that 80 percent of China's foreign direct investment has gone into coastal provinces and 60 percent of Vietnam's has gone to only three coastal cities: Dong Nai, Hanoi, and Ho Chi Minh City. Gill and Kharas, *East Asian Renaissance,* 28.

vulnerability to disaster is diminished as a result of improvements in governance and infrastructure; however, in developing countries, vulnerability does not diminish at a rate commensurate with the rapidly rising exposure experienced at the time of their growth. This is precisely the phenomenon happening in Asia today and one that is likely to continue until sustainable development in the region becomes more entrenched and widespread.

Some practitioners would even argue that there are such broad variations in development across Asia—and, thus, in the types and degrees of social resilience to risk—that it is very difficult to view disaster management through a regional lens. Across 19 countries in Asia, human development rankings range from 10 (Japan) to 146 (Bangladesh). GDP per capita averages stretch from a high of $50,200 in Brunei to a low of only $904 in Burma.[20] A striking example of the variable impact of disasters in the region comes from UNISDR's *2009 Global Assessment Report*. Through a comparison of Japan and the Philippines, it asserts that although Japan has about 1.4 times as many people exposed to tropical storms, if the two countries were hit by a cyclone of the same magnitude, mortality in Japan would actually be 17 times less than for its regional neighbor.[21]

Practice as Policy

Given rising disaster risk in Asia together with national disparities in dealing with it, regional movement to support disaster risk initiatives has been less than strategic. Today, the myriad regional and subregional networks in place to contribute to disaster management exist for a range of overlapping but distinctly different reasons. There are now more than 10 important regional arrangements—military networks, intergovernmental organizations, nongovernmental organizations (NGOs), and interstate scientific platforms— engaged in one way or another in disaster management (see annex 5A for a full listing of the primary regional initiatives).[22] And while they all offer specific subregional or thematic know-how, not one has either the resource capacity or the political wherewithal to "do it all."

It is worth noting that the expansion of regional initiatives over the past decade has not necessarily been prompted by rivalry or competition per se, although the combination of overlapping efforts and a growing sense of pride among nations in improving disaster management may have generated a certain competitive spirit over time. While surely some pride is associated with leading or hosting a regional center for disaster management, the regional proliferation is most directly associated with a widespread recognition of the complexity of disaster risk and its inherent interconnections with all aspects of regional peace and prosperity.

A chronicling of responses to the four most recent mega-disasters in Asia as well as an analysis of interstate cooperation efforts in the face of two of the most important slow-onset threats in the region will demonstrate the dynamics behind the growth of the industry. The sudden-onset disasters to be included are the 2004 Indian Ocean tsunami, the 2005 Kashmir earthquake, the 2008 Cyclone Nargis, and the 2008 Sichuan earthquake (see table 5.1).

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20. UNDP, *Human Development Report 2009,* http://hdr.undp.org/en/reports/global/hdr2009/.

21. United Nations, *2009 Global Assessment Report*, 7.

22. Some observers count as many as 50 disaster management mechanisms and programs in the region. However, the number of the most important initiatives is still well under 20. See Australia Indonesia Partnership, *Joint Feasibility Study: Regional Centre for Disaster Relief and Coordination*, Jakarta, October 3, 2008.

Table 5.1. Data Summary of Four Sudden-Onset Disasters in Asia, 2004–2008

Disaster	Date	Country or countries	Death toll	Estimated damage (US$)	Total external aid (US$)	Biggest regional donors (US$ millions unless otherwise indicated)[a]
Indian Ocean tsunami	December 2004	14 countries	228,000	9.9 billion	13.5 billion[b]	ADB, 900 Japan, 500 Australia, 80 China, 60 Korea, 50 India, 23
Kashmir earthquake	October 2005	Pakistan and India	74,000 in Pakistan and 1,400 in Indian-administered Kashmir	5.2 billion	3 billion (including grants and aid in kind)	Pakistan, — Japan, 175 India, 25 China, 21 Australia, 12 Korea, 4
Cyclone Nargis	May 2008	Burma	138,000	10 billion	59 million	Australia, 53 Burma, 45 (unconfirmed) Japan, 12 China, 12 (unconfirmed) Korea, 3
Sichuan earthquake	May 2008	China	87,000	20 billion	Under 300 million	China, over US$200 billion budgeted; US$52 billion spent as of April 2009. Other, under US$300

Sources: Development Assistance Research Associates (DARA), Human Development Index (HDI), UN OCHA Financial Tracking System (FTS).

Note: — = not available.

[a] Transparency in humanitarian giving remains far from ideal even with the financial tracking system of the UN Office for the Coordination of Humanitarian Affairs (OCHA) now in place. Best estimates have been provided here for review and discussion by stakeholders.

[b] "This does not represent 40 per cent over-funding as it may first appear as the US$13.5bn includes the cost of the international relief effort, some parts of which were quite expensive (the US military services cost US$0.25bn alone). Also, the figure for loss and damage does not include costs of transitional shelter or livelihood support, all of which have to be borne by the response. Some initial cost estimates (such as for housing) have proved optimistic, and some components of the response have wasted money." See John Telford and John Cosgrave, *Joint Evaluation of the International Response to the Indian Ocean Tsunami: Synthesis Report,* Tsunami Evaluation Coalition, July 2006, 40, http://www.alnap.org/pool/files/synthrep(1).pdf.

Indian Ocean Tsunami

The Indian Ocean tsunami was a catastrophe of such unprecedented scope and scale that it provoked a transformative shift in the way that the world—and specifically Asia—thought about risk. Although regional initiatives to manage disaster risk existed before 2004, the tsunami, with major loss of life and damage across many different countries, is widely viewed as the single catalytic event that raised Asian nations' awareness of the need for coordinated transnational disaster management mechanisms.[23]

Of perhaps the greatest long-term significance for regional action after the tsunami was the signing of ASEAN's Agreement on Disaster Management and Emergency Response (AADMER) by its 10 member countries in 2005.[24] AADMER represents the most comprehensive legally binding treaty in the world for cooperative interstate disaster management. The treaty contains provisions on disaster risk identification, monitoring and early warning, prevention and mitigation, preparedness and response, rehabilitation, technical cooperation and research, and simplified customs and immigration procedures. AADMER also provided for the establishment of an ASEAN Coordinating Center for Humanitarian Assistance on Disaster Management (the AHA Center) and stipulated the eventual set up of the AADMER Fund to support both the implementation of the treaty and oversight of the coordination center. The stated overall objective of the treaty was to build a disaster-resilient ASEAN community by 2015. Following the tsunami, ASEAN also initiated its first-ever ASEAN Regional Disaster Emergency Response Simulation Exercise. The purpose of the exercise, which has been held annually since that time, was to enhance the capacities and capabilities of member states in joint disaster management operations through simulation.

The tsunami also led to the creation of a much-needed regional early warning system for tsunami and earthquake hazards.[25] Through the intensive efforts of 26 different governments around the Indian Ocean, the system is now established, managed by revolving state chairmanship from its base at the Asian Institute for Technology in Bangkok.[26] The efficacy of its actual operation is still in question for many, and work continues to ensure its implementation by Indian Ocean stakeholders.[27] The tsunami also facilitated the establishment of the APEC Task Force on Emergency Preparedness at its secretariat in Singapore in 2005, now a permanent working group of this

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23. Even though this chapter focuses on multilateral initiatives, it is nevertheless of interest that the tsunami led to the establishment of new disaster preparedness structures in four out of the five most-affected Asian countries, namely Indonesia, the Maldives, Sri Lanka, and Thailand. India already had a government body to deal with disasters but seized the opportunity to devolve authority to local administrators. See Tsunami Global Lessons Learned Project (TGLLP), *The Tsunami Legacy: Innovation, Breakthroughs and Change,* Banda Aceh, 2009.

24. Although there were a number of temporary ad hoc mechanisms established in the weeks following the tsunami, notably the Tsunami Core Group consisting of Australia, India, Japan, and the United States, the focus here is on longer-term institutional efforts that developed still further after the immediate tsunami response.

25. This effort was supported by the UN Educational, Scientific, and Cultural Organizations and the Intergovernmental Oceanographic Commission. Technical assistance was provided by Pacific Disaster Center. See TGLLP, *The Tsunami Legacy,* 14.

26. The creation of a tsunami early warning center was a complicated effort involving the placement throughout the Indian Ocean of buoys that are monitored not only by the center's headquarters but by monitors in each of the participating nations. Much of the technical support in creating the system was provided by the Pacific Disaster Center and based on the U.S. National Oceanic and Atmospheric Administration's Pacific Tsunami Warning Center. The current chairmanship of the center is held by the Maldives.

27. According to a number of persons closely involved in the process in Asia, personal interviews, 2010.

large regional institution. The tsunami also led the Asian Disaster Preparedness Center—a long-time regional NGO focused on technical training and community-mitigation methods on disaster risk[28]—to seek intergovernmental rather than nongovernmental status as a means to enhance its regional influence.[29] And finally, it facilitated still further investment in the Asian Disaster Reduction Center, a regional research and information-sharing umbrella established in Kobe in 1998. In January 2005, at the World Conference on Disaster Reduction, the International Recovery Platform was conceived as an off-shoot of the disaster reduction center to identify gaps and constraints experienced in postdisaster recovery.[30]

In addition to spurring the growth of specific regional initiatives, the tsunami response was also transformative in that it led to a number of significant changes in the overall humanitarian relief landscape. As is widely known, the tsunami prompted the most rapid and generously funded disaster response in history. A total of 99 countries around the world offered assistance, and more than 41 percent of the money came from the general public of developed countries.[31] This overwhelming financial support brought about two major changes in the disaster response environment that would dramatically affect the "playing field" for future action. First, the large-scale funding resulted in a proliferation of new actors who often had insufficient experience and competence. In Banda Aceh, for instance, as many as 180 international NGOs and 430 national NGOs were registered and operating on the local scene at one particular time, obliging a sophisticated coordination of the response by state apparatus at national and local levels.[32]

 The large-scale funding also facilitated a trend wherein established actors began to venture into response and recovery activities outside their normal areas of expertise. This was particularly true of military forces active in the disaster response, many of which were, in any event, in the midst of reorienting their strategic toolkit as a result of 9/11 and the subsequent U.S.-led war on terror.[33] For the first time ever, military forces were present in large numbers at all phases of a response, highlighting the need for more streamlined standard operating procedures and protocols between different military forces and a more integrated exchange between military and civilian responders.

The tsunami response also prompted China's entry into the international humanitarian fore. Following the tsunami, China made its largest-ever donation to an international disaster in the sum of US$60 million.[34] Since that time, China has consistently engaged in regional and international response efforts and has even made annual contributions (since 2007) to the relatively new UN Central Emergency Relief Fund.[35]

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28. Established in 1983.

29. Although the Asian Disaster Preparedness Center has never achieved this status, it is a goal that it still strives for to this day. Interestingly, resistance to its intergovernmental status comes from Thailand among others, which hosts the center at its capital in Bangkok. Personal interviews, 2010.

30. See the International Recovery Platform Web site, http://www.recoveryplatform.org/.

31. Telford and Cosgrave, *Joint Evaluation of the International Response to the Indian Ocean Tsunami,* 80.

32. Ibid., 55.

33. Military forces involved in the tsunami response include Australia, Austria, Bangladesh, Brunei, Canada, France, Germany, India, Indonesia, Japan, Malaysia, New Zealand, Norway, Pakistan, the Republic of Korea, Singapore, Sri Lanka, Switzerland, Thailand, the United Kingdom, and the United States. Ibid.,154.

34. UN OCHA's financial tracking system, http://ocha.unog.ch/fts/pageloader.aspx?page=home.

35. The UN established the Central Emergency Relief Fund in 2005. In 2007, 2008, and 2009, China contributed $500,000; for 2010, it has pledged $1,500,000. It may also be of interest to know that Bangladesh,

Kashmir Earthquake

The Kashmir earthquake, occurring less than a year later, shaped regional networks for disaster management still further. It also underlined the importance of national capacity to self-manage disaster, a theme that has become central to Asian states.

For many observers, the principal take-away from Kashmir was that strong management by national governments and their militaries is integral to an effective response. Before the earthquake, no centralized authority existed within Pakistan to plan for natural disasters or coordinate response. Therefore, Pakistan had to create new entities—in particular, the Federal Relief Commission, which it put up within 24 hours, and later the Earthquake Reconstruction and Rehabilitation Authority—to coordinate and implement the reconstruction process. Both of these entities functioned effectively. At the same time, Pakistan benefited from a national military—at the helm of response efforts—that was immediately able to demonstrate a strong command of civilian-military coordination.[36] In fact, although humanitarian observers initially viewed the military's predominant role with skepticism, practitioners and beneficiaries were ultimately very satisfied with the quality of the military's actions, some even concluding that the military-led response to the Kashmir earthquake ranked among one of the most effective of all time.[37]

Another factor underscoring the importance of national capacity to self-manage in Kashmir was the relatively lackluster performance of international machinery during the disaster. Unlike international reaction following the tsunami, donor response to the earthquake in Pakistan was lukewarm at best, with the UN encountering difficulties in garnering official donor support through its appeal process.[38] An additional letdown related to the UN's introduction of the "cluster system" in Pakistan, the first time it had been employed in Asia. The cluster system, introduced in nine countries in 2005 as part of UN efforts to reform the global humanitarian system, was designed as a lead organization structure that sought to cover critical gaps in assistance.[39] According to a variety of stakeholders, however, the cluster system failed in Kashmir because it did not facilitate communication between sectors nor did it adequately engage national resources and knowledge networks in international response efforts.

Given the primary support roles of the United States and the UN in Kashmir, in large part due to its political sensitivity, regional response efforts were not developed following the 2005

India, Japan, the Republic of Korea, Sri Lanka, Thailand, and the Hyogo Prefecture gave to the fund for the first time in 2006. China and the Philippines followed in 2007, the same year that China officially pushed for (Chinese) blue helmets in Darfur. See UN OCHA's financial tracking system, http://ocha.unog.ch/fts/pageloader.aspx?page=home.

36. The Pakistan military's integral involvement in the Kashmir response is said to have stemmed from three factors: Pakistan's government had been militarized since the country's 1999 coup; the sensitivity of the Kashmir border; and its logistical capacity to respond to and reach isolated communities. See Riccardo Polastro, "Pakistan (South Asia Earthquake): Testing Reform of the Humanitarian System," in *Humanitarian Response Index 2009* (Madrid: DARA, 2010), 121.

37. Desiree Bliss and Lynnette Larsen, *Surviving the Pakistan Earthquake: Perceptions of the Affected One Year Later* (San Francisco: Fritz Institute, 2006), 6.

38. It is said that poor funding response was due in part to the fact that the scale of the disaster was not fully realized until some time later. The statement is judged by observers to be partly true, and international contributions did ultimately rise to above 60 percent for the UN appeal, which is considered about average. See Polastro, "Pakistan (South Asia Earthquake)," 120.

39. UN Inter-Agency Standing Committee (IASC); see UN OCHA link, http://ochaonline.un.org/roap/WhatWeDo/HumanitarianReform/tabid/4487/Default.aspx.

earthquake in Pakistan. In this context, the South Asia Association for Regional Cooperation, the closest subregional entity, had not yet fully engaged in the humanitarian agenda. It was only in October 2006 that it established the SAARC Disaster Management Center to provide policy advice and strategic learning for disaster management to its eight member countries and in 2007 that it approved a SAARC Comprehensive Framework on Disaster Management.[40]

The ASEAN Regional Forum was also inactive in Kashmir. It was only after the earthquake in Pakistan that it began stepping up its self-designated humanitarian responsibilities. In July 2006, ARF made the decision to articulate its humanitarian responsibilities by way of its Statement on Disaster Management and Emergency Response with specific mention of plans to develop standard operating procedures for the military, multinational table-top exercises, and a database of ARF members' military assets and other capacity-building tools. In mid-2007, it followed up this statement with the adoption of rules for the creation of a quick-reaction group that would facilitate speedy coordinated action in an emergency.[41] The efficacy of this quick-reaction group has not yet been tested.

Finally, it is important to note that the UN International Strategy for Disaster Reduction [42] established a presence in the region in June 2005, just before the Pakistan earthquake. UNISDR's presence in Asia, with a base in Bangkok, has offered a strong boost to regional awareness and advocacy efforts about disaster risk and has underscored the centrality of the Hyogo Framework for Action to all Asian state efforts in this area.

Cyclone Nargis

In stark contrast to the immediate and effective response to the Kashmir earthquake by the Pakistan government, response to Cyclone Nargis was troublesome from the start. First, there was minimal national capacity to respond to a disaster of its scale; second, the government of Burma refused international humanitarian access for almost a month (21 days).

In spite of major delays in response, the political impasse in Burma was positive in that it led to the creation of a never-before-seen model for regional and international humanitarian interface. In this instance, ASEAN and the UN worked together to ease tensions with the government of Burma during this difficult time, ultimately establishing the Tripartite Core Group as a diplomatic tool for encouraging the government to yield to international pressure for access.[43] Although representing a very unusual situation in Asia, one that many people are skeptical will ever resurface,[44] Nargis did raise awareness of ASEAN's unique role as a regional diplomatic force in the face of international impotence. It also offered it the opportunity to capitalize on the experience of its members from the tsunami in terms of coordination mechanisms and financing support. In Nar-

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40. See SAARC SDMC Web site, http://saarc-sdmc.nic.in/framework.asp.

41. AFP, "Asian Security Forum to Adopt Rules for Quick-Reaction Group," July 27, 2007. As found on ARF Web site, http://www.aseanregionalforum.org/News/tabid/59/newsid399/48/Default.aspx.

42. The UN International Strategy for Disaster Reduction is an organization born out of the Hyogo Framework for Action signed in January 2005 and, as such, is a relatively new instrument of international disaster machinery.

43. It should also be noted that Indian political support also helped convince the Myanmar government to allow aid to enter the country. John Cosgrave, "Myanmar: Humanitarian Needs Continue after Humanitarian Funding Ends," in *Humanitarian Response Index 2009* (Madrid: DARA, 2010), 170–177.

44. This point was made multiple times by humanitarian observers during the author's research trip to the region in January 2010.

gis, ASEAN established the TCG Recovery Centre and Recovery Hubs manned by ASEAN and UN staff. ASEAN also mobilized more than US$88 million to cover the recovery funding gaps.[45]

Overall, it can be said that ASEAN's presence in Nargis was generally well received. Of particular note was its assessment work under the auspices of the Tripartite Core Group. For the first time, ASEAN deployed an emergency rapid assessment team to assess critical needs in concert with the UN and the government of Burma, and the reports produced by the core group were widely noted to be thorough and reflective of good humanitarian practice.[46] It was also observed by a number of practitioners on the ground in Burma that ASEAN was very effective in filling the cultural gap that existed between national actors and populations on the one hand and international actors on the other.

Following Nargis, there was a strong push to expand ASEAN's humanitarian role, in part as a result of its success but also as a result of increased attention and efforts by a new ASEAN leadership as of January of the same year.[47] Under new organizational leadership, the ASEAN Disaster Response Committee gained significant prominence both within the ASEAN region itself and beyond. Member state negotiations to ratify the AADMER treaty intensified following Nargis, as did international efforts to support the drafting of a work program for its soon-to-be-realized implementation.[48]

Sichuan Earthquake

Only one week after Nargis, China was hit with an 8.0-magnitude earthquake, killing 87,000 people and causing US$20 billion in damage. In the quake's aftermath, China called on the international community for assistance, an event that came as something of a surprise to many observers, given China's traditionally closed diplomatic stance. As it turned out, the call for international assistance was largely symbolic as the Chinese government ultimately budgeted some US$200 billion of its own funds for relief and recovery efforts, in which was included an astounding US$9.5 billion raised and contributed by the Chinese Red Cross.[49] Many practitioners believe that the Chinese decision to accept at least symbolic international aid following the earthquake was influenced by the negative international reaction to the behavior of the Burmese government after Nargis. And although financial support was not needed, the openness of Chinese authorities to international aid is said to have facilitated a positive exchange of humanitarian expertise between China and the outside world.

Of interest in the context of the Sichuan emergency is that OECD countries provided only 25 percent of official international funding compared with an average of 97–99 percent for humanitarian crises globally. Instead, it was non-OECD countries and private contributors who gave the bulk of outside money, together accounting for 75 percent of international funding. For instance,

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45. As noted by ASEAN staff member, June 2010.

46. Cosgrave, "Myanmar," 170–177.

47. ASEAN Secretary-General Surin Pitsuwan took office on January 1, 2008, just five months before Cyclone Nargis.

48. Many different governments including that of the United States have provided technical support to the Agreement on Disaster Management and Emergency Response work program 2010–15. Entities of particular note include UN OCHA, Pacific Disaster Center, US ADVANCE technical team, Oxfam, and Save the Children, among others.

49. John Cosgrave, "China: An Aid Giant in the Making?" in *Humanitarian Response Index 2009* (Madrid: DARA, 2010), 111–117.

Give2Asia, a San Francisco–based organization that promotes individual and family philanthropy, was able to give US$12.5 million to the earthquake response from its funding bases in the United States. The Chinese diaspora in Canada also contributed significant amounts through a matching grants program of the Canadian government that brought in a total of US$30 million (half from private giving and half matched by the government).[50]

Response to the Sichuan earthquake was also remarkable in that China was able to encourage and manage large amounts of corporate giving. Given its global economic importance, the international corporate community gave generously, as did oil rich countries like Saudi Arabia and United Arab Emirates.[51] In addition, the other two largest donors to Sichuan were the U.S. Business Roundtable and the U.S.-China Business Council. In fact, some 80 percent of all direct donations from the United States are said to have come from corporate sources.[52]

With robust funding and an effective national military at work (140,000 People's Liberation Army forces were deployed in Sichuan), China was able to implement a response effort that, from its inception, recognized the inherent connections between emergency relief and recovery, something that is generally problematic for international machinery. According to reports, all rural homes were to have been reconstructed by late 2009, urban homes by mid-2010.[53]

Unfortunately, larger, long-term technical lessons from the Sichuan response have not yet been compiled. While it was noted that China's openness following the earthquake facilitated a certain level of international exchange regarding best practices, clear details about the methodology of China's response in Sichuan are not yet available in industry literature. What has been noted is that the Chinese employed a system of city twinning following the earthquake, wherein other Chinese cities were responsible for certain aspects or geographic areas of Sichuan relief and recovery efforts. Apparently, this twinning approach worked very well, with outside municipalities competing with each other to raise the most funds and, apart from some unevenness in the levels of support, is thought to be a promising model for replication.[54]

A final detail of the Sichuan response that has interesting implications for regional humanitarian action in the future relates to the function of the Red Cross and the Red Crescent societies as intermediaries in situations of political sensitivity. After the Chinese earthquake, Japanese corporations operating in China chose to make contributions through the Japanese Red Cross rather than through the Japanese government in light of certain political tensions between the two governments. Interestingly, the same approach was said to have been taken by the Chinese government vis-à-vis Indonesia after the tsunami. In this case, the Chinese Red Cross Society transferred significant funds through the Indonesian Red Crescent Society rather than giving bilaterally, apparently as a result of political sensitivities between the two governments in the wake of the 1998 riots in Jakarta during which a number of Chinese migrants were killed.[55]

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50. Ibid.
51. Saudi Arabia was the largest single donor to the Sichuan response, offering over $76 million. United Arab Emirates gave to the tune of $50 million. Ibid.
52. Ibid.
53. From all literature available about Sichuan, it would appear that these government targets have largely been met. Ibid.
54. Ibid.
55. Personal interview, Jakarta, January 2010.

Slow-Onset Disasters

Over the past decade, regional initiatives surrounding slow-onset disasters have developed along a trajectory and pace very different from their sudden-onset equivalents. Not surprisingly, regional efforts to address slow-onset threats have garnered much less attention and interstate cooperation. Longer-term threats have taken a backseat for two reasons: first, their remedy is viewed as a direct challenge to national economic growth; and, second, controversy over the scientific certainty of their adverse impacts hinders decisive action by national policymakers.

One of the trickiest aspects of addressing slow-onset crises both within and across states is that measures to tackle the effects of human activity on longer-term natural processes involve a more direct review of national economic development policies than emergency disaster response. Discussions about these issues raise difficult political questions associated with government prioritization of resources and commitment to equity among their own populations. As a result, regional approaches, when considered at all, have met with significant resistance.

Still, the future may prove less bleak than the present, at least as far as progress on interstate cooperation on these issues goes. Advancements in science are not only improving the overall understanding of how these slow-onset processes affect populations but are also highlighting the link between slow-onset threats and sudden-onset disasters. As a result, there are some encouraging signs that regional governments are feeling a heightened sense of urgency about the potential impacts of slow-onset processes. Whether these growing worries translate into greater momentum for regional collaboration or more intense interstate competition is yet to be seen.

The Mekong River Basin

The Mekong River basin is a complex river ecosystem running through Burma, Cambodia, China's Yunnan Province, Lao PDR, Thailand, and Vietnam (44 percent of its course is in China). It has faced increasing risk over the past decades because of intensified construction of hydroelectric dams and river dredging for commercial navigation. International scientists now suggest that the adverse impacts of these man-made activities are being exacerbated by natural phenomena related to climate change. Of particular note for the Mekong River basin ecosystems is diminishing glacial and snow pack runoff from the upper Himalayas as well as increased flooding and salt intrusion at the delta due to the rising sea levels.

Tampering with the river's balance first began with an aggressive dam construction program launched by the Chinese in the Upper Mekong basin in the 1980s. Since that time, the Chinese have completed three hydroelectric dams and begun construction on two more (due to be finished in 2012 and 2017). Plans apparently exist for at least two further dams, and by 2030, it is said there could be as many as seven dams in China's Yunnan Province.[56] In addition, memoranda of understanding have apparently been signed for 11 more dams in Cambodia, Lao PDR, and Thailand. Investors in the proposed dams are thought to include Chinese-backed firms and other foreign private capital.[57]

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56. Milton Osborne, "River at Risk: The Mekong and the Water Politics of China and Southeast Asia" Lowry Institute Paper 02, November 27, 2009, 11–12.

57. Although it is unclear which of the dams will actually be built or when, the bulk of environmental concern is focused on two sites: Don Sahong at the Khone Falls in southern Laos and Sambor in northeastern Cambodia. If built, they will block the fish migrations that are essential to food security in both Lao PDR and Cambodia. Ibid., 11–13.

Apart from the issue of dam construction on the Upper Mekong, the river is under acute stress at its lower delta as well.[58] In a worse-case projection, the Vietnamese government reports that more than one-third of the delta, where 17 million people live and nearly half the country's rice is grown, could be submerged should sea levels rise by three feet in the next decades.[59] Delta residents are already struggling with changing flood patterns and salt intrusion that are destroying the river basin and surrounding agricultural land.[60] In fact, many river-dependent communities have already begun a pattern of seasonal migration to urban centers such as Ho Chi Minh City.[61]

It is dismaying that, in response to the multiple stresses on the river, no international body is able to mandate or control what individual countries choose to do on their sections of it. The agreement establishing the Mekong River Commission (MRC) in 1995—the only regional institution even talking about these issues—does not include Burma or China (except as "dialogue partners"), and the fact that China has refused to become an MRC member means that the commission has no real power and little actual meaning. In fact, the role of the MRC in dealing with the impacts of dam construction in the upper reaches of the Mekong has been ineffectual since its inception, and relationships among the countries—determined by present water use and alleged future needs of upstream and downstream countries—have remained politicized.[62]

In fact, regional pressure to safeguard the river has been so impotent that China has never consulted downstream countries in its unilateral construction and planning of dams on the river. At the same time, downstream countries, feeling increased anxiety over national energy sources, are now following China's lead, solidifying a political environment where national self-interest trumps any efforts for collaborative action. A prime example of this attitude is the manner in which Lao PDR has acted over the proposed Don Sahong dam.[63] For the two years that the dam has been under consideration, there has been absolutely no consultation with neighboring Cambodia. Likewise, Cambodia has not consulted with either Lao PDR or Vietnam about its planned dam at Sambor.[64]

The Third Pole

Related to the sustainable ecology of the Mekong River are receding glaciers and diminishing snow packs in the mountains of the Hindu-Kush Himalayan (HKH) mountains. The complex ecosystem of these mountains source 10 major river systems across Bangladesh, China, India, and Pakistan. It is also home to some 9,000 glaciers, most of which are located in China, Nepal, and Pakistan and provide irrigation, power, and drinking water for an estimated 1.3 billion people or

58. The delta, which is home to 22 percent of Vietnam's population, produces half the nation's rice output, 60 percent of seafood, and 80 percent of fruit crops and accounts for 90 percent of total national rice exports. See Seth Mydans, "Vietnam Finds It Vulnerable If Sea Rises," *New York Times,* September 23, 2009, http://www.nytimes.com/2009/09/24/world/asia/24delta.html?pagewanted=1&_r=1.

59. Ibid.

60. This is said to be due both to sea-level rise and to increased precipitation, both of which stem from climate change.

61. Ibid.

62. Asia Society, *Asia's Next Challenge: Securing the Region's Water Future,* A Report by the Leadership Group on Water Security in Asia. April 2009, 16.

63. The proposed Don Sahong Hydropower Project is located on the Mekong River's mainstream in the Siphandone area of southern Laos, less than two kilometers upstream from the Laos-Cambodia border. International Rivers Web site, http://www.internationalrivers.org.

64. Osborne, "River at Risk."

more than 20 percent of the world's population.[65] This expansive mountain area—often referred to as the Third Pole—is now under considerable stress through a combination of man-made and natural processes.[66]

The HKH region represents an area of approximately 3,500 square kilometers, wherein special atmospheric and hydrological processes formed by glaciers, permafrost, and persistent snow create a natural water-producing and water-storage system. Climate change is now thought to be threatening the natural flow of water from this system. With warming temperatures, scientists explain that river discharges from the HKH are actually expected to increase for a limited time because of rapid glacier and snow pack melt but that then the flow is expected to diminish permanently as the storage capacity of the glaciers decreases. The effects of the glacier melt will apparently be felt most severely in the arid parts of the region. At the same time, the future distribution, productivity, and ecological health of HKH forests will be affected.

In addition to concerns about the adverse impacts of slow-onset processes are sudden-onset risks that also surface as a result of receding glaciers. One such risk is glacial lake outburst floods. With accelerated melting, glacial lakes often form at the foot of retreating glacial valleys and pose a severe hazard as they threaten to burst into surrounding areas. An inventory recently compiled by the International Center for Integrated Mountain Development identified some 8,790 glacial lakes within selected parts of the Hindu-Kush-Himalayas, some 204 of which are considered potentially dangerous.[67]

Over the past several decades, few regional initiatives have existed either to study or to develop interstate policy around the greater Himalayan region. Apart from the International Center for Integrated Mountain Development—an intergovernmental organization that has worked to raise regional awareness and develop information-sharing mechanisms regarding challenges in HKH—Asian states affected by changes in the Third Pole have generally conducted their own scientific studies with little exchange of information across borders.[68] As a consequence, data about what is happening to the glaciers is patchy at best.

Interestingly, a recent controversy over the Fourth Report of the Intergovernmental Panel on Climate Change, wherein international scientists erroneously contended that the glaciers in the Himalayas could potentially melt by 2035, has resulted in greater political movement on this

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65. River systems include the Tarim, Amu Darya, Indus, Ganges, Brahmaputra, Irawaddy, Salween, Mekong, Yangtze, and the Yellow. See Randolph Kent et al., *Humanitarian Crisis Drivers of the Future: The Waters of the Third Pole* (London: Aon Benfield UCL Hazard Research Center, China Dialogue, Humanitarian Futures Programme, forthcoming). It is estimated that 210 million people actually live in the mountains themselves and that 1.3 billion live in the 10 major river basins downstream. See the International Center for Integrated Mountain Development, http://www.icimod.org/.

66. Kent et al, *Humanitarian Crisis Drivers of the Future,* 15.

67. There were at least 35 glacial lake outburst floods in Bhutan, China, and Nepal during the twentieth century. International Center for Integrated Mountain Development, *Climate Change in the Himalayas: Information Sheet #3/09,* Kathmandu, 2009.

68. Some such initiatives include the Indian Institute of Tropical Meteorology, which has developed one of the most comprehensive climate change projection studies for the region, as well as the Himalayas Interdisciplinary Paleoclimatic Projects, GEWEX Asia Monsoon Experiment on the Tibetan Plateau (CAPM/Tibet), the Pyramid Laboratory, and Monsoon Asia Integrated Regional Study, among others.

fragile ecosystem. With India's vociferous opposition to the panel's findings,[69] a regional dialogue and high-level awareness about the Third Pole have bubbled to the surface, spurring a number of regional scientific declarations about what is thought to be happening in the mountain region.

Of particular note has been India's recent plans to establish two separate but interrelated scientific bodies to deepen understanding of how fast the glaciers are melting and how the melt is affecting HKH hydrology. As of February 2010, the Indian government was considering plans to establish a separate National Institute of Himalayan Glaciology to monitor the effects of climate change in the Third Pole with the potential for sharing scientific information with similar institutions in Bhutan, China, Nepal, and Pakistan.[70] In early 2010, India also announced plans to put into place an Indian Climate Resource Network to assess the overall impact of global warming on the country and region.[71] Although the Indians insist that the network will not challenge the Intergovernmental Panel on Climate Change, it will bring together 125 research institutions to publish its own findings on the Himalayan glaciers and other climate-related subjects, the first of which is expected for release in November 2010.[72] Worthy of note in the context of all this activity is that the National Institute of Himalayan Glaciology has initially had great difficulty in finding staff scientists, given the scarcity of regional experts in this specialized area,[73] an important point that will be addressed later in this chapter.

Overall, the Indian dispute over the findings of the Intergovernmental Panel on Climate Change has been positive, as it has brought about bold action and much-needed political awareness about the HKH region. The current discussions on the specificity of the climate science, on standards and methods for collecting and analyzing data, and, finally, on practice for sharing data across borders are all positives for the sustainability of the region.

At the same time, the latest actions by India demonstrate a regional leadership not previously seen on this issue. Together with the recent establishment of the Third Pole Environment project by the Chinese Academy of Sciences, India's initiative may suggest that Asia's regional giants are beginning to take responsibility for the future of this critical transboundary water source. The Third Pole Environment project—born out of a workshop held in Beijing in August 2009 that

69. Scientists largely believe that it could take more than 300 years for the Himalayan glaciers to melt. IPCC admitted its fourth report finding was an error but reiterated its broader conclusions that water availability is a key issue for the region. IPCC, "IPCC Statement on the Melting of the Himalayan Glaciers," Geneva, January 20, 2010, http://www.ipcc.ch/pdf/presentations/himalaya-statement-20january2010.pdf.

70. The Indian Department of Science and Technology has mooted a proposal to the Ministry of External Affairs and the Ministry of Defence to allow data sharing on the Himalayan glaciers with Bhutan, China, Nepal, and Pakistan. It still worries that security concerns will block collaboration on this initiative and is apprehensive about whether it will be implemented given the sensitive nature of the terrain where all of these glaciers are located. See Neha Sinha, "Cracking the Ice Code," IndianExpress.com, February 16, 2010, http://www.indianexpress.com/news/cracking-the-ice-code/571952/0.

71. The Indian Climate Resource Network was officially launched in early March 2010 with a two-day national conference of climate researchers. At this stage, the network brings together the Indian Institute of Technology Delhi, the Indian Institute of Technology Madras, and the Centre for Science and Environment, the Delhi-based research and advocacy body.

72. Sinha, "Cracking the Ice Code."

73. Ibid.

attracted some 70 scientific and technical staff from 15 countries interested in the subject—is now set to carry out joint studies focusing on the changing processes in the region.[74]

Moving Forward

The past decade has been one of steep learning for Asia. During this time, the region has gained extensive hands-on disaster management experience and moved forward in developing vigorous interstate dialogue on the issue of risk. The regional architecture is still very new, however, and not yet fixed in either form or function. As demonstrated by the case studies, regional networks are in a state of nascent dynamism, changing and shifting with every new disaster.

With that said, the discussion on regional disaster management becomes less about what is right or wrong with existing institutional arrangements and more about how best to build on these formative efforts. Certainly, many of the leading initiatives could be doing more to build meaningful technical expertise either in their own secretariats or specifically in collaboration with their member states. They could also be making a more concerted effort to rationalize their strengths and contributions vis-à-vis one another. But in many ways, these are "early days," particularly given that the path toward disaster-resilient societies is a long one.

In view of the developing character of the architecture, it has to be acknowledged that the recent activity in Asia has pushed forward the global disaster management agenda in important and unprecedented ways. For one, the ratification of ASEAN's Agreement on Disaster Management and Emergency Response (AADMER) as a framework for regional action in this area is a triumph, despite whatever level of skepticism surrounds its potential implementation. The development of its work program over the next five years—success or failure—will be a "proof of concept" example for the world, something that no other region has provided for the global community.

Likewise, the work of the ASEAN Regional Forum in bridging the gap between military and civilian humanitarian actors is very significant, particularly given that it is showing positive signs of development just at a time when the world is seeking tested models for military-civilian humanitarian interaction. Although long criticized by some for its weak approach, it would seem that Asia observers are increasingly identifying ARF as an institution that could provide support to disaster response coordination, given its widespread membership and its determination to take on a major role in dealing with nontraditional security threats.

Of particular interest is its running of a first-ever humanitarian exercise, called a voluntary demonstration of response, in the Philippines in late 2009, something that civilian and military participants applauded for both its design and its execution.[75] While a single exercise cannot erase ARF's traditional troubles in consensus building for action, it is an encouraging step forward. Following the exercise, even the ASEAN disaster unit—ironically having poor relations with ARF—explained that it may wish to join forces, offering ARF observer status at its next annual simulation exercise.[76] It is also worth noting that the current American-Thai cochairmanship of ARF is keen

74. Xinhua, "Int'l Scientists to Launch Environmental Studies on 'Third Pole,'" March 9, 2010, http://english.peopledaily.com.cn/90001/90776/90881/6913151.html.

75. According to various persons interviewed for the purposes of this chapter.

76. As noted by ASEAN staff representatives during the author's trip to Asia in January 2010. The voluntary demonstration of response was led by the United States and the Philippines.

to raise the entity's profile as a regional organizer of multiple disaster management efforts.[77] One challenge for ARF has been the voluntary nature of its guidelines, which mutes their effectiveness; it also struggles with risk of duplication with ASEAN and other established international mechanisms.

Moving beyond Southeast Asia, other interesting disaster management platforms are in varying stages of development. The Asian Disaster Reduction Center's peer-to-peer review mechanism is something of clear interest to humanitarian relief practitioners for both its process and its product potential. The mechanism facilitates the examination of member states' responses to disaster during relief and recovery phases by a small team of peer member states. Given that the center is the only regional disaster risk network that brings together both China and India, this kind of learning mechanism could prove critical to building a regional community. In addition, SAARC's Disaster Management Center is slowly showing signs of promise. Its most recent plans to create and manage a digital vulnerability atlas is a very important regional task, one that has been talked about elsewhere but never attempted because of its technical and political complexity.

Smaller initiatives such as the newly established Australia-Indonesia Facility for Disaster Reduction are also important. In this instance, regional neighbors have agreed to work bilaterally to deepen the science of disaster risk reduction and transfer their findings directly into the hands of humanitarian practitioners. This kind of regional humanitarian arrangement is new in that it eschews traditional models of tool development, wherein standards and processes are produced by external donors and arbitrarily imposed on affected countries. Here, Indonesian and Australian scientists and other specialists work side-by-side to enhance understanding of best practices. India's proposed establishment of the National Institute of Himalayan Glaciology and the Indian Climate Resource Network is interesting as well, providing further evidence that there is a paradigm shift afoot, "localizing" the collection, analysis, and application of scientific data on regional disaster threats.

Finally, Red Crescent Societies and other members of civil society are doing some very interesting work to share information and coordinate at lower levels of government, although admittedly regional multilateral institutions will have to do more to link up to NGOs and civil society organizations in the future. Of particular note, for bridging the gap between disaster risk reduction and climate change adaptation is the Asian Cities Climate Change Resilience Network, a project supported by the Rockefeller Foundation. This network brings together an array of municipal authorities from 10 cities across India, Indonesia, Thailand, and Vietnam to share information and exchange best practices on urban planning, coastal city resilience, and the like. The objective of the initiative is to build a network of cities by 2012 that "will have developed robust plans to prepare for, withstand and recover from the predicted impacts of climate change."[78] Focusing on municipal capacities and government networking at devolved, horizontal levels is a relatively new approach and not one that has ever been attempted at the scale planned by the network.

Five Dilemmas

In spite of hopeful beginnings for regional multilateral architecture, room for progress remains. In many ways, Asian interstate disaster management initiatives find themselves at a "moment of

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77. According to U.S. government officials closely involved in the process.

78. The Asian Cities Climate Change Resilience Network. See link, http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/sian-cities-climate-change-resilience/.

truth." Will they be able to deliver on their promise, or will they falter, ultimately overcome by the speed and complexity of events around them? Furthermore, will they support meaningful regional expertise and information-sharing capacities, or will these efforts remain fixed in the "aspirational" sphere over the longer term? In an assessment of Asia's probability for success in this area, it is important to look at a number of dilemmas or challenges that regional institutions will have to address both proactively and creatively if the disaster management agenda is to move forward.

1. **While disaster risk in Asia has facilitated cooperation and trust across a number of action areas, the politicization of the humanitarian agenda risks diverting its primary objective of making communities safer.**

    The humanitarian agenda has clearly enabled regional cooperation and trust across a host of action areas in Asia. The will to collaborate on disaster risk issues has been widespread and overwhelming. And overall, it can be said that there is a "we-are-all-in-this-together" feeling among Asian countries in regard to disaster management.

    What is less evident is whether the use of humanitarian forums for more general regional conciliation is necessarily a good thing for the disaster management agenda, given that the current arena in Asia would seem to be heavy on process and light on product. The focus on inclusive dialogue at all political levels over the past decade has resulted in an ever-increasing number of conferences or "talk shops," something that is a positive in the earliest iterations of collaboration but arguably a distraction as regional initiatives have matured.

    While high-level political engagement in disaster management has definitely raised awareness of the issues at hand, it has also created a crowded, overly diplomatic environment, sometimes too stiff to move forward at a pace in step with the rapidly changing world around it. At the same time, regional institutions dealing with disaster management have become so voluminous in membership that functional capabilities have become diluted. ARF would seem to suffer from such a dynamic. With a total of 27 members of varying risk and capability, it has become a very large and cumbersome ship to steer, particularly when all decisions are to be taken by consensus.

    In disaster management, the devil is in the details. Without the opportunity to conduct repeated, in-depth discussions about the strategic and technical aspects of the agenda, the complex task of making communities more resilient becomes all the more elusive. And with disaster risk as pervasive as it is in Asia, the necessity for removing any impediments to tangible progress is quite urgent.

2. **Asian states are torn between committing themselves to more integral multilateral regional arrangements on the one hand and investing in their own disaster self-management tools on the other.**

    With a rising awareness of the transboundary nature of physical hazards, most starkly demonstrated by the 2004 tsunami, Asian countries recognize a need for coordinated transnational action. At the same time, however, the more capable Asian countries have a clear desire to self-manage disasters to the greatest extent possible. In addition, countries in the region have

widely acknowledged that real capacity has to lie in the hands of governments, not regional institutions, as they are the governance entities that can act most swiftly and directly in a crisis.[79]

Unlike traditional models of disaster response whose international mechanisms implicitly assume the weakness or corruption of affected governments, many countries in Asia have both the economic and the political capabilities to manage disasters on their own with only limited outside support. What is more, quite a number of them deal so frequently with recurrent disasters that they arguably have more extensive hands-on disaster experience than the external apparatus that comes in to help them. China's and Pakistan's effective national responses to their respective earthquakes are cases in point, as is the behavior of Indonesia and the Philippines in late 2009 following the earthquake in West Sumatra and Typhoon Katsana. At that time, both governments showed steadfast resolve to manage these disasters to the greatest extent possible with local assets and local knowledge.[80]

The challenge created by the dual need for regional coordination mechanisms, on the one hand, and national capacity tools, on the other, is that—given limited resources for disaster management—regional commitment to either can be diluted. The situation is further complicated by the fact that there are still major gaps in self-management capacities between Asian states, resulting in varying degrees of enthusiasm for multilateral arrangements. What may work for the Philippines may not work for Vietnam, making it difficult to develop a common vision of priorities for regional multilateral institutions vis-à-vis their member states.

At the same time, humanitarian observers note somewhat shifting interest on the part of Asian states in regional arrangements. While national governments are open to the increased role of multilateral arrangements in principle, countries are less enthusiastic about regional institutions' "managing" or "coordinating" the responses of national governments in practice. Now that the AADMER treaty on disaster management is ratified, many observers point out that member states believe it was negotiated too quickly without a common understanding among ASEAN countries about what they signed up for. Overall, it can be said that states view the primary role of regional institutions as enhancing national capacities, not operating as additional bureaucratic layers in response.

3. **An uncoordinated donor environment has inadvertently encouraged the bankrolling of different, duplicative regional initiatives.**

Creating links and building coherence in disaster response has always been easier said than done. In Asia, there is overwhelming acknowledgment that the various regional initiatives should collaborate and not compete. At the same time, however, little or no coordination has taken place between the most significant donors to enhance unity of action among the various emerging initiatives.

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79. Countries in Asia have made impressive strides over the past 10 years in creating national disaster risk capabilities. Since 2004, at least nine Asian countries have established new national disaster management mechanisms; still others have reformed and/or improved national machinery that was already in place, underlining the importance that Asian countries place on strong humanitarian relief efforts.

80. As noted by a number of regional humanitarian practitioners during the author's trip to Asia in January 2010, neither government called upon or wanted ASEAN engagement, preferring instead to handle matters on their own with their closest bilateral partners.

Traditionally, international financing structures, based on previously adhered to phases of the "disaster cycle," provided some order to contributions and to the development of a common international strategy for a particular disaster or complex emergency. Today, however, as evolving notions of "risk" have led to an operating environment wherein overlapping agendas are still further conflated, there are no longer wholly accepted guidelines regarding the discrete responsibilities of different actors or the precise sequencing of response activities. Instead, donors fund humanitarian, development, and environmental causes all at once, creating an environment that encompasses complicated layers of action and duplication of effort. Donor coordination becomes all the more convoluted when new, nontraditional actors enter the fold in significant ways, as has been the case with the more capable Asian nations of China and India as well as Indonesia, the Philippines, and Thailand.

For emerging regional institutions that are just now building their respective identities, duplication of effort has become an unfortunate by-product of capitalizing on potential funding opportunities required to sustain themselves in the short term. The business reality of the humanitarian endeavor is this: organizations are obliged to fulfill the requirements of the donor grants that fuel them—most of which are no longer than 18 months—as a means to survive. As such, institutions become focused on bankrolling their efforts with short-term outputs and are therefore inherently discouraged from developing a coordinated longer-term strategic vision with relevant partners. In a high-risk and dynamic environment like Asia, where so many countries outside the region are looking to engage, opportunities for potential overlap would seem to have multiplied. If the most promising regional institutions are to be effective, however, donors will have to start working "smart" and become more strategic to ensure coherence and cost-effective investment in a regional network of shared risk management.

4. **Given the central role of national military forces in responding to disasters, multilateral regional arrangements will need to enhance military capacity while tempering potential concerns about rising militarism.**

It is evident that Asian countries with military power consider the management of disaster response by national forces as a first tool of response. And why not? It has historically been the practice of states to deploy national military assets in a domestic disaster context. Moreover, recent experience in China and Pakistan (as in the United States and elsewhere in the world) has demonstrated that national military assets are a key component of any modern approach to disaster management.

To date, the military's increased role in providing humanitarian assistance has both its proponents and its detractors. Overall, however, it would seem that those engaged in disaster management increasingly accept that the scope and scale of future crises will require response capacities that go beyond those offered by the civilian humanitarian sector.[81] Thus, the primary question for many states and for the regional institutions that represent them is how to

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81. Following the tsunami, it would seem that military presence in disasters has become part and parcel of the response landscape. Unlike complex emergencies in which humanitarian needs result from conflict, the use of national and international military assets would seem to be much less controversial in times of natural disaster. For more on the emergent role of the military in humanitarian action, see Borton, *The Future of the Humanitarian System,* 12–14.

leverage and streamline the capabilities of different regional military forces for a more efficient interstate response without more generally raising security concerns in the region.

What is interesting in the Asian context is that although the military assets of 26 different countries were deployed following the tsunami and those of another 19 countries following Kashmir, the bulk of international military action in Asia has been just that, international. Only in the case of Cyclone Nargis did a regional power, namely India, deploy military forces to the sovereign territory of a regional neighbor (and this is indeed viewed as a special case due to Burma and India's special relationship following Nargis), suggesting that a significant level of work on interstate command protocol and trust building would be required before an Asian multilateral entity comprising Asian military forces could function routinely in disaster response without raising fears about state security and national sovereignty.

The task for multilateral arrangements such as the ASEAN Regional Forum will be to build capacity around a common humanitarian agenda and clear rules of engagement that do not make states—"many of whom," according to Michael O'Hanlon, "see threats in a fundamentally different light and in some cases themselves pose risks or at least create anxieties for each other"[82] —feel insecure. At the same time, civilian populations will need to be sensitized to the changing military role and added value of military assets as a routine part of humanitarian action. Moreover, ARF and others involved in the military equation will need to think much more profoundly about the connections between the military and other national law enforcement entities such as police, coast guard, and others.

5. **Asia is called upon to synchronize its regional efforts with those of existing international mechanisms while ensuring that it moves beyond these instruments, some of which are proving less effective in addressing the challenges of the twenty-first century.**

Asian commitment to international institutions and norms in disaster management has been unwavering. The Hyogo Framework, in particular, has stood as a central tenet in the development of national and regional machinery in Asia since its inception in 2005. Given the growth of the regional disaster management industry and the changing humanitarian landscape over the past 10 years, however, it is important for those shaping multilateral arrangements in Asia to think carefully about how they wish to interact with international instruments and actors in the future.

The ratification of the Agreement on Disaster Management and Emergency Response in Southeast Asia and the Indian announcement of its plans to establish the National Institute of Himalayan Glaciology and the Indian Climate Resource Network demonstrate that a paradigm shift in the world order of disaster risk machinery may be stirring. Although both regional efforts are still in their infancy, these arrangements reflect the need to "localize" global trends and bring everything—data collection, analysis, advocacy, and action—down to the level where it will have the most meaning and greatest direct impact on at-risk populations.[83]

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82. Michael E. O'Hanlon, "Defense Issues and Asia's Future Security Architecture," in *Asia's New Multilateralism,* ed. Michael Green and Bates Gill (New York: Columbia University Press, 2009), 296.

83. Given that the Agreement on Disaster Management and Emergency Response represents a very similar coordination arrangement to that prescribed internationally to UN OCHA by UN Resolution No. 46/182 (1991), a resolution to which ASEAN member countries are also committed, what happens when

For all intents and purposes, these regional initiatives will not contend for power with their international counterparts for some time, given their nascent capacity and expertise. Still, their existence is already something of a challenge to an international system undergoing an identity crisis itself. Despite the launching of significant humanitarian reforms in 2005, the success of the UN disaster response apparatus in the most recent past has been variable, and interest in the UN reform process seems to be waning. Even in its efforts to monitor global financing, the tracking system of the UN Office for the Coordination of Humanitarian Affairs (OCHA) has failed to achieve the transparency and coordination for which it was established.

Of greatest concern, however, is that the international machinery continues to remain too insular and self-referential in a world that increasingly calls for the building of multiple networks across a host of different disciplines. In particular, it should be noted that the international humanitarian system has not yet succeeded in adequately harnessing national knowledge and assets, both considered primary to disaster management in the twenty-first century. Furthermore, the ability of UN OCHA to facilitate cooperation between humanitarian and military actors in Asia is said to be limited by the presence of only one full-time civil-military officer.[84]

The challenge for Asian regional institutions will be to find unique nodes for joint action with the international apparatus while still maintaining sufficient autonomy to deal with regional challenges in new and creative ways that perform beyond the constraints of their international counterparts. Emerging areas of action to which regional institutions will have to pay much greater attention include exploiting private giving, ensuring the integration of national knowledge and assets in disaster management initiatives, improving civilian-military coordination, and building a longer-term regional capacity for disaster mitigation and response through postgraduate education programs and greater exchange between scientists and practitioners.

Recommendations

Given the challenges described above, this chapter makes the following initial recommendations with the view toward supporting the continued development of the Asian disaster risk agenda and the regional architecture that drives it. These recommendations are broken down into three sections: improved coherence, enhanced functionality, and regional accountability.

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both the agreement and UN Resolution 46/182 are called into force will very much depend on the development of institutional ties and common understanding of priorities by ASEAN and UN OCHA at the regional level.

In terms of the recently established National Institute of Himalayan Glaciology and Indian Climate Resource Network, there would seem to be a similar regional-international balance of power at play. Although national in character now, these scientific institutions will seek to share information with neighboring states and, in the case of the network, may function over the long term as something like a regionally based Intergovernmental Panel on Climate Change . With scientific data ostensibly being produced by both regional and international climate science bodies, it will be interesting to see whether the regional-international interface will create dynamics that deepen the overall understanding of climate change processes as they affect Asia or, alternatively, whether a politicization of the science will ensue, hijacking the disaster risk agenda.

84. Certainly, in actual emergencies, OCHA sends additional civilian-military coordination officers, but they need time to understand the regional dynamics. Moreover, the rapid turnover in UN coordination personnel is said to hinder efforts overall.

Improved Coherence

Recommendation: Accept a judicious mix of approaches to disaster risk but insist on coherence and clear links between them.

The complex configuration of disaster risk initiatives in Asia—although initially difficult to understand—should be seen as an asset, reflecting the complexity of the modern world in which it has developed. Unlike the UN machinery born out of the post–World War II industrial era, Asian architecture has come about during a time of remarkable technological change, change that has transformed the way in which we communicate and hence the ways in which we organize ourselves.[85]

In an increasingly complex world, humanitarian actors—states, institutions, or individuals—will need to participate in a combination of different and overlapping collaborative networks to understand the multiplicity of disaster hazards and their interconnectedness. The mixture of networks in Asia is useful in that it ensures a diversity of thinking, mutes the domination of single-minded agendas, and works to neutralize state-to-state competition. In short, the current Asian patchwork would seem to constitute the kind of layered and diverse networks required to produce the greatest number of bold, new ideas.

As such, the discourse on Asian disaster management needs to move from a focus on format to a focus on function. Asian regional institutions and their sponsors need to accept the crowded "marketplace," while making a more concerted effort to nurture dynamic and mutually beneficial links between the various actors. Following a period of initial growth, it is now time for the regional disaster management industry to rationalize the strengths of its various components, challenging them to carve out discrete niches for value-added action.

Some of this activity is already taking place in the form of the development of a legal framework by ASEAN, civilian-military cooperation by ARF, and new technological applications for humanitarian action such as digital mapping by SAARC's Disaster Management Center. The point here is not to set out resolute areas of action for each of the players but rather to develop a more explicit sense of who is good at what, so that the different institutions and their member states can conduct an honest dialogue about shared roles and responsibilities.

Recommendation: Identify creative ways to "nest" within international machinery while still maintaining local autonomy for action.

Regional institutions such as ASEAN and the new Indian-led climate change institutions will need to work closely with the UN and other international bodies to find creative ways to interact and enhance one another's regional and international contributions. UN political and technical support in crafting an innovative regional-international interface will be critical to success in this area.

Asian regional institutions should be cautioned not simply to mimic what is done internationally. Rather, they should identify gaps in international practice that need filling. In addition, they should look to some of the less successful models in international humanitarian practice such as the cluster approach as a means of enhancing their understanding of what works and what does

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85. Clay Shirky, *Here Comes Everybody: The Power of Organizing without Organizations* (New York: Penguin Press, 2008), 17.

not in modern-day institutional dynamics. The success of the cluster approach, for example, has been variable, and it would behoove regional observers to study why this is so and how it may provide lessons for the development of effective regional organizing models that are specifically tailored to the times and challenges at hand.

Finally, regional multilaterals will have to find ways to ensure the engagement of more than governments only in the regional approach to disaster management but that of whole societies as represented through national NGOs and civil society associations. At present, it would seem that only the Asian Disaster Preparedness Center focuses heavily on community adaptation strategies, and its efforts will need to be robustly supported or expanded by other major regional institutions if Asian communities are to be more disaster resilient in the future.

Enhanced functionality

RECOMMENDATION: Maintain a long-term view but provide practical, short-term gains.

Building disaster-resilient communities is a complex, long-term objective. As such, regional institutions will need to prepare their respective member communities for the future, always striving to anticipate emerging as well as emergent risks. This effort will require institutional leadership that encompasses a longer-term vision while always acknowledging the possibility of surprise. Member states, perhaps more encumbered than regional institutions because of the sovereign "responsibility to protect," will require guidance in preparing for the future, a role that regional institutions can provide for them by keeping their eyes on the future regardless of the constraints of today.

At the same time that they remain forward-looking, regional institutions will have to provide pragmatic "today" tools to maintain the confidence of their members. Without short-term gains that support the needs of states in very tangible ways, countries may lose interest in the regional imperative. Therefore, regional institutions will have to be tactical in their growth and identification of short-term priorities.

Some ideas for what regional institutions might wish to offer to member states in very practical terms are as follows:

- Regional digital mapping tools with potential for data overlays and other user-manipulated tailoring (following the SAARC DVA lead).

- Detailed methodology and case studies for closing the gap between disaster risk reduction and climate change adaptation policies

- Creation of interstate communities of practice in areas such as engineering, urban planning, glaciology, fishery and others

- Postgraduate education opportunities that go beyond short-term professional training to build a future body of Asian scientists and experts equipped to deal with disaster risk management issues (the proposal of the U.S. Pacific Command for an executive master's degree program in disaster management out of University of Hawaii)

- In-depth training of regional stakeholders on emerging technologies for application in disaster management (SMS, complex adaptive systems modeling, and information-sharing tools, among others)

- "How to" guidelines for states wishing to operate more actively as donors in the international humanitarian arena

Recommendation: Provide distinct regional services at the lowest possible transaction costs.

For governments, as for all institutions, every collaborative transaction has a cost. Every meeting, every conference, and every tabletop exercise requires them to expend a limited resource, either time, attention, or money.[86] And more time, attention, and money are expended as the number of groups one collaborates with becomes larger and the larger the collaborative groups themselves become. This factor necessarily makes regional interstate coordination a weighty endeavor.

For this reason, regional disaster risk institutions should focus less on building hierarchical structures, managed in layers according to traditional organizing methods, like the large, formal conferences and multiday training workshops evident today. Instead, they will have to create innovative platforms for shared action that participants can access regularly and easily as and when needed in their everyday work. Such platforms could bring together small teams of experts motivated by mutual benefit that are also able to speak the same trade language, exchange sophisticated experience in their discipline, and develop "highest common denominator" ideas quickly.

Regional institutions will want to use their convening power to facilitate the creation of more informal communities of practice that can develop a common understanding of problems as well as test discrete, technical tools for use by states. The idea here is more than simply employing social media or introducing virtual wikis; rather, it is about nurturing practitioner networks that have made the conceptual shift in the way that they consider "management" and "coordination" to reflect a more platform-based collaborative model that allows ease of access and varying levels of participation and that operates without a central filter or administrator.[87]

Recommendation: Integrate and utilize the military in creative ways for humanitarian practice.

Regional military arrangements that implement joint simulations, gaming, and tabletop exercises for nontraditional security threats will have to incorporate cultural training that builds trust across states but that also builds greater confidence between military and civilian communities. In so doing, the understanding of military-humanitarian interaction will have to move beyond simply using the military for its logistical support to a much more integrated partnership that allows for the transformation of identities and roles well beyond what has traditionally been thought possible. The logistical capability of military assets will have to be matched with humanitarian leadership skills by both military and civilian actors if the humanitarian-military interaction is to lead to meaningful response.

Facilitating an overall shift in culture will also require more careful thought about the costs involved in deploying military assets. Military action in the context of disasters is very expensive[88]

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86. Ibid.

87. In many ways, a low-cost regional collaboration model is already being tested by the Asian Cities Climate Change Resilience Network . This kind of mutually beneficial, minimal transaction-cost approach could be brought to bear on other areas of disaster risk management.

88. In response to the 2004 tsunami, the U.S. military services alone cost US$0.25 billion. See John Telford and John Cosgrave, *Joint Evaluation of the International Response to the Indian Ocean Tsunami: Synthesis Report* Tsunami Evaluation Coalition (TEC), July 2006, 40, http://www.alnap.org/pool/files/synthrep(1).pdf.

and will have to become much leaner and more cost effective if it is to make itself a longer-term component of the architecture of regional disaster management.

Recommendation: Invest in efforts that close the gap between science and practice.

As touched upon above, humanitarian practitioners will need to pay much greater attention to science in the future. Previously, the humanitarian community was able to operate as an insular and self-reflective industry, rarely seeking information from outside the field. The complexity of the future, however, will no longer extend the luxury of working "in silos." Instead, humanitarian practitioners will need to participate in a variety of collaborative networks, many of which will involve the scientific community. Hence, both practitioners and scientists will need to work more deliberately to understand each other and to develop practical humanitarian applications to emerging science as directly as possible.

Regional institutions in Asia, with a rich experience in natural disasters, are well positioned to bridge the gap between science and practice. Of particular note is the work already being done by the Indonesian Australian Facility for Disaster Risk Reduction, the Chinese Academy of Sciences through the Third Pole Environment Project, the International Center for Integrated Mountain Development, and the Indian-led climate change initiatives of National Institute of Himalayan Glaciology and the Indian Climate Resource Network. Following the lead of emerging initiatives such as these, the Asian regional architecture for humanitarian action will need to put science at the forefront of its agenda.

Regional Accountability

Recommendation: Oblige member state ownership of current and emerging regional initiatives.

Regional disaster management initiatives cannot move forward without a meaningful investment of time and resources by the states most closely involved. If member states want to see these kinds of initiatives perform over the longer term, they will need to demonstrate ownership of them through robust and consistent budgetary contributions. Currently, many regional initiatives are poorly supported by the member states they are designed to serve, instead relying too heavily on international financial institutions, UN agencies, and the pledges of external donor governments.

The development of ASEAN's Agreement on Disaster Management and Emergency Response is a case in point. Although an AADMER Fund is stipulated by the treaty, ASEAN member states had not, at the time of this writing, agreed on a formula for regular contributions to the regional framework. The establishment of the AHA Center in 2001 and its on-going management by member states will be something to watch as a measurement of national interest.

At the same time, the development of APEC's Task Force for Emergency Preparedness, which was elevated to permanent working group status at the last APEC official's meeting in February 2010 and is now formally called the Emergency Preparedness Working Group, will be something to monitor. Historically, the Task Force for Emergency Preparedness has been poorly funded and staffed. Given its new status and growing interest among APEC member states, however, it looks as though the forum could make meaningful contributions to the Asian disaster management agenda in the future.

RECOMMENDATION: Create a regional financial tracking system.

An adage in business holds that "you can manage something only if you can measure it"—an idea that rings true in disaster management. International disaster management architecture has struggled with measuring contributions from the donor community as a means for improving transparency and coordination among primary givers. The success of global efforts in this regard has been marginal, and Asia—a region producing more and more humanitarian donors—should employ lessons learned on the international scene to produce a similar but perhaps more effective tool at the regional level.

Given that the OECD Development Assistance Committee grouping of humanitarian donors includes only the Asian countries of Japan and the ROK,[89] there would seem a need for a regional mechanism to track and thus manage the contributions of the emerging humanitarian donor countries of Asia. China and India have become major regional and global donors but so have Indonesia, the Philippines, and Thailand, among others.

Therefore, Asia—perhaps through APEC's Task Force on Emergency Preparedness (now the Emergency Preparedness Working Group)—should perhaps consider establishing a regional financial tracking system. The system could follow the design of the OECD Development Assistance Committee model with the potential inclusion of mechanisms to track and harness corporate and private (including diaspora) giving, both so important to disaster management in the region.[90]

RECOMMENDATION: Make disaster risk a people's issue.

Regional institutions will have to make it a priority to move discussions about disaster management from inside the corridors of government to the streets of Asian cities and towns. A recent e-mail to the Center for Strategic and International Studies from India illustrates this point with some poignancy:

> Sir, Most respectfully,
>
> I have involve whole timer social worker of Ananda marga universal relief team.
>
> (AMURT) an UN accord organisation and with cooperation of local based organisation (PROGREESS) rendering service in the field of rescue, relief and rehabilitation in Orissa (India) since last 18 years. I got an INTERNATIONAL AWARD at the time of super cyclone in Orissa, due to our dedicated service towards carcass disposal more than 1200 cases were disposed in the critical juncture. I have been always doing sacrifice service provide for victims in man-made and natural made calamities in any difficulties we were being rush there place with our supporters. So we need with your active supports to develop all round more training , attend more programmes to develop capacity building for that benevolent of the societies and we shall be highly grateful to develop of our team of AMURT and PROGRESS.
>
> With regards
> Yours in the service of Humanity

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89. Officially, South Korea became part of OECD's Development Assistance Committee in January 2010.

90. This recommendation is in line with the Tsunami Evaluation Group's recommendation that "All actors need to make the current funding system impartial, and more efficient, flexible, transparent and better aligned with principles of good donorship."

It is often remarked that it is a priority to get disaster management tools to the grass-roots level. This seems obvious enough. However, as we all observed in the case of Haiti in 2010, affected communities are still not adequately integrated into international response efforts. Even with the most sophisticated stand-by and surge arrangements in place, without real partnership in response with affected communities, personnel capacity, lack of local knowledge, and cultural issues will always make the delivery of aid by external entities less than ideal.

Therefore, disaster management will have to become an integral part of the Asian lifestyle. In light of exponential developments in technology, affected communities are more in touch and informed than ever before. As such, they should no longer be considered "beneficiaries" or even part of a "global audience" to which the humanitarian community is accountable. Instead, they represent a new "community of practitioners" that is central to capacity building for disaster resilience. Mass media and other popular campaigns should be promoted as tools for enhancing the anticipatory and response capabilities of at-risk populations. With better access to relevant information about how to self-organize, assess disaster losses, and absorb external aid, communities will be better positioned as primary as opposed to tertiary actors in disaster management.

Annex 5.A. Primary Regional Arrangements for Disaster Risk Management in Asia

Organization	Secretariat location, establishment date	Members, partners, participants	Coordination centers or other machinery	Latest developments	Perceived strengths and weaknesses
			Intergovernmental		
Association of Southeast Asian Nations (ASEAN)	Jakarta, 1967	Brunei, Burma, Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand, Vietnam	ASEAN Charter for Disaster Risk Management AADMER (work program and fund mandated as part of treaty) AHA Center ERAT, SASOP, ARDEX	AADMER treaty ratified in December 2009 AADMER implementation work program finalized in 2010 AHA Center to be operational in 2010	Strong initial buy-in to AADMER Inadequate staff support at secretariat level Lack of funding for treaty implementation and for oversight of AHA Center
South Asian Association for Regional Cooperation (SAARC)	New Delhi, 1985	Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka	SDMC South Asia Disaster Knowledge Network (SADKN)	Current effort to create subregional Digital Vulnerability Atlas (DVA)	Largely viewed as weak subregional forum, overly dominated by India
Japan, Korea, China Tripartite Cooperation	None, 2008	China, Japan, Republic of Korea	Declaration of Cooperation	In its infancy	Primarily a diplomatic platform at this stage

Organization	Established	Programs	Members	Status/Meetings	Comments
Asian Disaster Reduction Center (ADRC)	Kobe, 1998	International Recovery Platform as off-shoot since 2005 Peer-to-peer disaster risk reduction review process Global training programs	Armenia, Azerbaijan, Bangladesh, Bhutan, Burma, Cambodia, China, India, Indonesia, Japan, Kazakhstan, Republic of Korea, Kyrgyzstan, Lao PDR, Malaysia, Mongolia, Nepal, Pakistan, Papau New Guinea, Philippines, Russia, Singapore, Sri Lanka, Tajikistan, Thailand, Uzbekistan, Vietnam, Yemen Adviser countries: Australia, France, New Zealand, Switzerland, United States	Annual disaster reduction conferences	Comprises regional powerhouses of China and India Japan International Cooperation Agency guidance and funding mean it has access to high level of technical know-how Japanese secretariat leaves many Asian nations lukewarm
Asia-Pacific Economic Cooperation (APEC)	Singapore, 1989	TFEP or EPWG	Australia, Brunei, Canada, Chile, Hong Kong, China, Indonesia, Japan, Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Chinese Taipei, Thailand, United States, Vietnam	TFEP established in 2006. Task Force elevated to permanent Emergency Preparedness Working Group (EPWG) as of February 2010	Access to large grouping of strong economies Priorities are business and community resilience, public-private partnerships, disaster risk reduction, preparations for the recovery phase; still searching for "actionable" role in disaster management Inadequately staffed and poorly funded within APEC
Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR)	UNISDR regional office in Bangkok, 2005		More than 52 countries from Asia Pacific region		Seoul meeting scheduled for 2011 Little further information about what it does.

Annex 5.A. (continued)

Mekong River Commission (MRC)	Vientiane, 1995	Cambodia, Lao PDR, Thailand, Vietnam. Dialogue partners: Burma and China	Agreement on Cooperation for Sustainable Development of Mekong River basin	First Mekong River summit took place April 2010	Does not include Burma or China as members Has had little influence on state actions in Mekong River basin
Australian-Indonesian Facility for Disaster Reduction	Jakarta, 2009	Australia and Indonesia		In infancy	Well financed Equipped with "supercomputer" for climate change modeling Small and more agile than multilateral institutions
Intergovernmental, security focus					
ASEAN Regional Forum (ARF)	Jakarta, 1994	ASEAN members plus Australia, Bangladesh, Canada, China, DPRK, East Timor, the EU, India, Japan, Mongolia, New Zealand, Pakistan, ROK, Russia, Sri Lanka, and United States,	ARF unit at ASEAN SOPS, ARFNet, VDR	Voluntary demonstration of response in Philippines in 2009 was largely viewed as an excellent cooperation exercise.	Strong push by current joint chairmanship (U.S./Thai) to take a leadership role in region Too large to maintain a focused agenda with more powerful members only partially invested Consensus approach to decisionmaking seen as weak Also weak due to apparent power struggles with its host agency, ASEAN

| Multinational Planning Augmentation Team Program | Honolulu (U.S. PACOM), 2000 | Described not as an organization but a program. Partners include Australia, Bangladesh, Brunei, Cambodia, Canada, East Timor, France, Fiji, Germany, India, Indonesia, Italy, Japan, ROK, Malaysia, Maldives, Mongolia, Nepal, New Zealand, Papua New Guinea, Philippines, Singapore, Solomon Islands, Sri Lanka, Thailand, Tonga, Tuvalu, United Kingdom, United States Vanuatu, Vietnam | Military procedures ("Multinational Force Standing Operating Procedures"); table-top exercises; and a cadre of trained military responders for potential surge capacity[1] | A focus on integrated response efforts by: civil governmental representatives; humanitarians; and militaries | Strong sponsorship by the U.S. Pacific Command while continuing to remain a cooperative program guided by all participating nations

No bureaucratic hurdles

Lack of formal agreements means regional nations do not avail themselves of this capability |
| Asia-Pacific Conference on Military Assistance to Disaster Relief Operations | Bangkok (UN OCHA, regional office for Asia and the Pacific), 2005 | | Development of an Asian-focused set of guidelines ("Facilitation of Foreign Military Assistance to Disaster Relief Operations in the Asia-Pacific Region") for civil-military cooperation recognizing the predominant role of militaries in Asian governmental responses | | Guidelines in development since 2006 yet still not finalized; meetings only held once per year |

[1] Military assistance in humanitarian assistance and disaster relief is only one of many missions under the MPAT Program.

		Nongovernmental			
Asian Disaster Preparedness Center (ADPC)	Bangkok, 1986	Not an intergovernmental organization but seeking to become one. Now an NGO with 15 countries on board of trustees: Australia, Bangladesh, China, Denmark, France, India, Japan, Netherlands, Norway, Pakistan, Philippines, Sri Lanka, Sweden, Thailand, Vietnam	Recently assisted in the development of tsunami early warning center		Extensive experience in community-based disaster risk reduction methods and technical training NGO so formal structure does not impede functional capability NGO so less regional influence than intergovernmental organizations
International Center for Integrated Mountain Development	Kathmandu, 1983	Afghanistan, Bangladesh, Bhutan, China, India, Burma, Nepal, Pakistan	Regional knowledge and learning center for Hindu Kush-Himalayan region	Conference in August 2009	Strong technical and community-based experience in mountain and water management issues No leverage in obliging HKH states to cooperate on water security issues
Pacific Disaster Center (PDC)	Honolulu, 1995	No membership.	Information and communications technology	Assisted in establishment of early warning system Drafted three sections of the ADMEER work plan Pledge to provide technical assistance to AHA Center	Profound technical know-how
Asian Disaster Risk Reduction Network	Kuala Lumpur, 2004	More than 30 NGOs from across Asia			

Municipal government

			Robust five-year funding support Horizontal, municipal-level networking is a relatively new regional arrangement
Asian Cities Climate Change Resilience Network	Bangkok (supported by Rockefeller), 2008	*Selected cities in India:* Surat (Gujarat); Indore (Madhya Pradesh); Gorakphur (Uttar Pradesh) *Selected cities in Viet Nam:* Da Nang Quy Nhon Can Tho *Selected cities in Thailand:* Chiang Rai Hat Yai *Selected cities in Indonesia:* Bandar Lampung Semerang	

Scientific research

Third Pole Environment project	Led by Chinese Academy of Sciences (with international scientists)		Project launched with workshop held in Beijing in August 2009 (attracted some 70 scientific and technical staff from 15 countries)

Annex 5.A. (continued)

Indian Climate Resource Network	March 2010, New Delhi	India (with international scientists) Indian Institute of Technology, Delhi and Madras Center for Science and Environment		Expected to publish findings on glaciers in November 2010
National Institute of Himalayan Glaciology	March 2010, New Delhi	India (with proposal to share information with Bhutan, China, Pakistan, and Nepal)		
U.S. government, with regional security focus				
Asia Pacific Center for Security Studies	Honolulu, 1995	U.S. Department of Defense academic institute	Executive training, research, conferences alumni associations Nearly 8,000 attendees from 77 countries since 1995	Alumni associations are excellent way to build person-to-person collaboration across regional boundaries
U.S. government, with global humanitarian focus				
Center for Excellence	Honolulu, 1995	U.S. Department of Defense outreach center	Provides strategic advice to military, civilian and international organizations	Still finding its feet

continued next page

Annex 5.A. (continued)

Australian government, with regional humanitarian focus			
Asia Pacific Civil-Military Center for Excellence	Canberra, 2008	Australian government Department of Defense Institute	Training, education	Supports development of national civil-military capabilities to prevent, prepare for and respond to conflicts and disasters in the region

Source: CSIS Asian Regionalism Initiative.

THE GEOMETRY OF ASIA'S ARCHITECTURE
TRADITIONAL AND TRANSNATIONAL SECURITY
Victor D. Cha

The Rush to Judgment

The verdict rendered by many scholars and policy experts is that Asia has been relatively unsuccessful at thinking innovatively about organizing regionally to address two of the most pressing issues of the twenty-first century: climate change and managing the risk of disasters. This judgment is based on two diametrically opposed observations. First, problems posed by climate change and humanitarian disasters require governments and international organizations to operate in post-sovereign spaces, increasingly relying on transnational forms of cooperation between governments and among peoples.[1] Climate change and humanitarian disasters constitute a "globalization" of security threats that clearly span national borders. Second, in spite of these proximate challenges, Asian countries still prefer to operate according to more traditional templates, prizing sovereignty over collective efforts. In a recent survey of strategic elites from Asia-Pacific nations, a plurality of respondents indicated that the most effective institution for responding to natural disasters is national military forces.[2]

Scholars therefore judge Asia a failure because it has not been successful at organizing regionally to deal with the difficult issues of humanitarian disaster response and relief or climate change. There is no formal all-encompassing regionwide institution to address these issues. This inactivity is compounded, as well as informed, by an underwhelming record of regional architecture initiatives in Asia. Unlike Europe, the history of architectural design has been unimpressive. No Asian institutions are comparable to the European Union (EU), the North Atlantic Treaty Organization (NATO), or the Warsaw Pact. States instead have chosen paths of security self-reliance, neutralism, or bilateralism (largely with the United States but also with China or the Soviet Union). Attempts at constructing institutions have taken place, but these were largely subregional rather than regionwide efforts (e.g., the Southeast Asia Treaty Organization, SEATO, 1954; the Australia-New Zealand-United States Pact, ANZUS, 1951; and the Five Power Defense Arrangements, FPDA 1971) and met with limited success.[3] Efforts at a regionwide Pacific Treaty Organization

1. Victor D. Cha, "Globalization and the Study of International Security," *Journal of Peace Research* 37, no. 3 (May 2000): 391–403.
2. Bates Gill et al., *Strategic Reviews on Asian Regionalism* (Washington, D.C.: CSIS, 2009), 24.
3. The Southeast Asia Treaty Organization was established at the Manila Conference of 1954 largely based on the model of NATO but failed because members found internal subversion rather than compelling external threats as their primary security concerns. The Australia-New Zealand-U.S. Pact formed in 1951 as an extension of the U.S.-Australia treaty (the U.S.-New Zealand axis dissolved in 1986). The Five Power Defense Arrangement was established in 1971 among Australia, Britain, Malaysia, New Zealand, and Singapore. Its function was consultative, based on historical legacies of the Commonwealth rather than on any overt security purpose. See Leszek Buszynski, *SEATO: The Failure of an Alliance Strategy* (Singapore:

(PATO) equivalent to NATO failed miserably despite a compelling Cold War security environment and established venues for dialogue.[4] While more recent institutions at official and track-two (nonofficial) levels have been more successful (e.g., the ASEAN Regional Forum, ARF; the Asia-Pacific Economic Cooperation forum, APEC; the Council for Security Cooperation in the Asia Pacific, CSCAP; the Northeast Asia Cooperation Dialogue, NEACD; and the Asia-Europe Meeting, ASEM), they differ fundamentally from these predecessors, exhibiting a "softer" quality not extending beyond dialogue and transparency or consensus building.[5] The most advanced of these regionwide organizations is the ASEAN Regional Forum, formed in July 1994 and meeting annually with regard to cooperative security dialogue and preventive diplomacy.[6] The East Asia Summit (EAS) is the newest regional innovation composed of 16 nations, first held in 2005 and thereafter on an annual basis following the ASEAN leaders' meetings. Yet aside from the symbolism of a meeting of Asian leaders to demonstrate regional coherence, the substance of this grouping still remains a question.[7]

The situation, however, may not be as bad as many think. This chapter and the others in this volume reveal a substantively different picture of a distinct architecture emerging and evolving in the region. Some of this emerging architecture is directly related to climate change and disaster response issues, but other aspects of it link more broadly to political and security imperatives. The core distinction, however, is in the metrics and assumptions that we use both to designate architectural edifices and to judge their effectiveness. In both cases, readers must understand that these look quite different from what they may be accustomed to seeing in the European experience. These distinctions are not specific to climate change and disaster management but more broadly define the evolution of regional institutions in Asia across the political, security, and nonsecurity spectrum. What emerges for architecture is a "patchwork" of multiple organizations and groupings that deal with issues of security, the environment, and humanitarian disasters (see chart 6A).[8] It is

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Singapore University Press, 1983); Chin Kin Wah, "The Five Power Defence Arrangement: Twenty Years After," *Pacific Review* 4, no. 3 (1991); and Michael Yahuda, *International Politics in the Asia-Pacific* (London: Routledge, 1996).

4. For example, the Vietnam War Allies Conference met regularly in Saigon in the late 1960s and early 1970s, providing a ready venue for multilateral security discussions on larger Cold War issues and strategy beyond Indochina, but nothing came of this. The Asia and Pacific Council (ASPAC) was established in 1966 as a forum for cooperation among Asian states on cultural and economic issues. Members included Australia, Japan, Malaysia, New Zealand, the Philippines, the ROK, South Vietnam, Taiwan, and Thailand. Proposals in the early 1970s were floated by various countries (e.g., the ROK in 1970) to devise a new ASPAC charter based on collective self-defense with regionwide membership (including Indonesia, Laos, and Singapore), but these failed in part because of lack of support for an active Japanese leadership role in the group. For other studies of northeast Asian regionalism focused more on economics and the Russian Far East, see Gilbert Rozman, "Flawed Regionalism: Reconceptualizing Northeast Asia in the 1990s," *Pacific Review* 11, no. 1 (1998): 1–27.
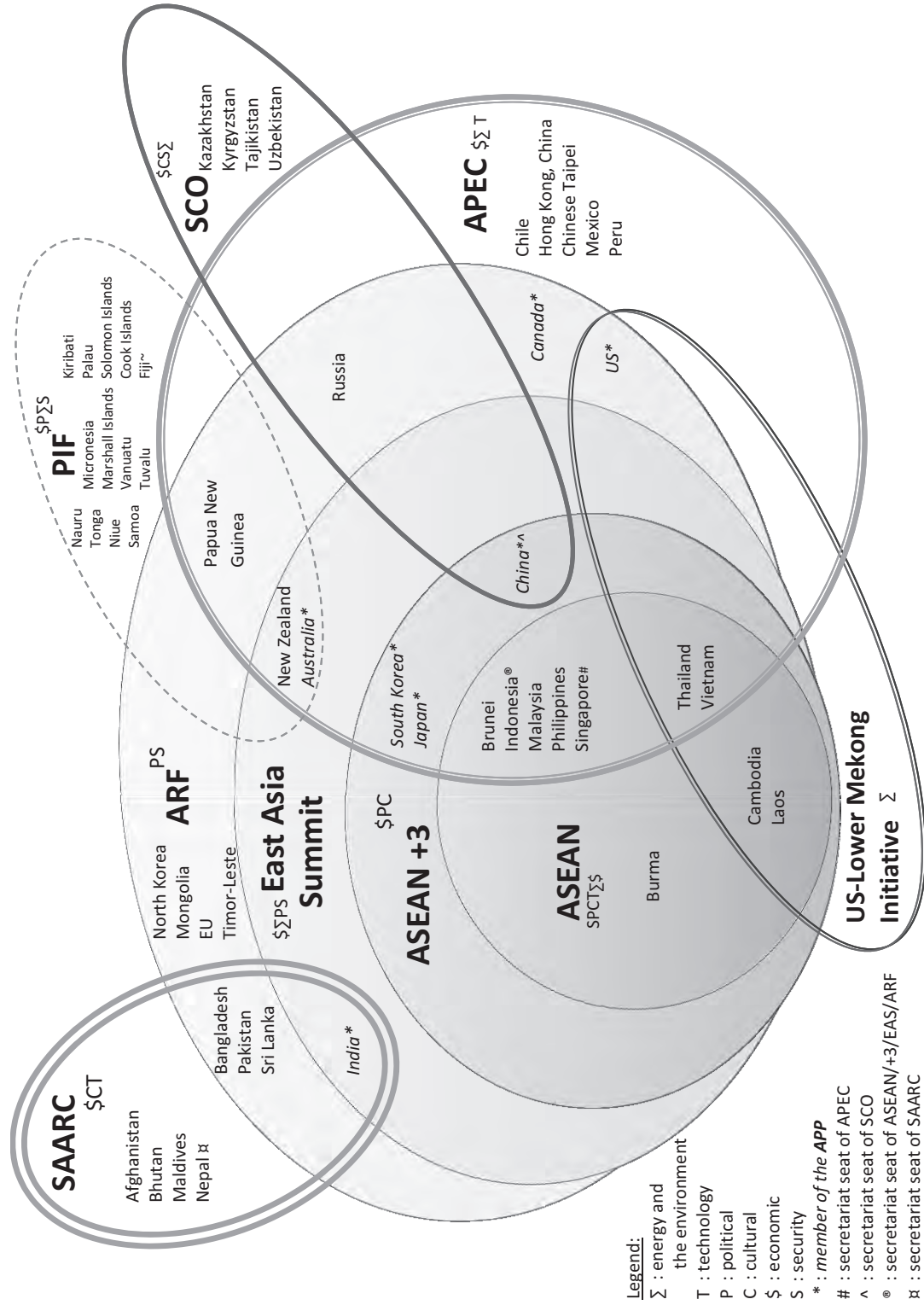
5. Higher degrees of institutionalization exist among the original ASEAN nations, including proposals for national defense manufacturer associations, C-130 flight training centers, F-16 joint training bases, and so forth.

6. ARF was formed pursuant to meetings of the ASEAN Post-Ministerial Conference in 1993.

7. The EAS members consist of Australia, Brunai, Cambodia, China, India, Indonesia, Japan, Laos, Malaysia, Myanmar, New Zealand, the Philippines, the ROK, Singapore, Thailand, and Vietnam. Russia and Timor Leste are candidate members.

8. See chart 6A, "The Complex Geometry of Asian Regional Architecture," by the CSIS Asian Regionalism Team, based on input from the U.S. Department of State.

Chart 6.A. The Complex Geometry of Asian Regional Architecture

SCO $CS∑
Kazakhstan
Kyrgyzstan
Tajikistan
Uzbekistan

APEC $∑ T
Chile
Hong Kong, China
Chinese Taipei
Mexico
Peru

PIF $P∑S
Nauru   Kiribati
Tonga   Palau
Niue   Marshall Islands   Solomon Islands
Samoa   Vanuatu   Cook Islands
        Tuvalu   Fiji~
Micronesia

Russia

Papua New
Guinea

Canada*

US*

China*^

New Zealand
Australia*

ARF PS

East Asia
Summit $∑PS

South Korea*
Japan*

ASEAN +3 $PC

Brunei
Indonesia®
Malaysia
Philippines
Singapore#

Thailand
Vietnam

ASEAN
SPCT∑$

Burma

Cambodia
Laos

US-Lower Mekong
Initiative ∑

North Korea
Mongolia
EU
Timor-Leste

Bangladesh
Pakistan
Sri Lanka

India*

SAARC
$CT

Afghanistan
Bhutan
Maldives
Nepal ¤

Legend:
∑ : energy and
    the environment
T : technology
P : political
C : cultural
$: economic
S : security
* : member of the APP
# : secretariat seat of APEC
^ : secretariat seat of SCO
® : secretariat seat of ASEAN/+3/EAS/ARF
¤ : secretariat seat of SAARC
~ : secretariat seat of PIF

Source: U.S. Department of State and CSIS Asian Regionalism Initiative.

not elegant, nor is it simple, but it is fairly effective. Moreover, the complexity of these groupings has distinct advantages for Asia. It is not pretty, but it gets the job done.

Architectural Design

Metric 1: No Single Institution Shall Define the Region

The first metric is that no single umbrella institution best defines the region. The conventional comparison has always been made to Europe, in which Asia is seen as lacking because there is no regionwide Asian equivalent of the EU or NATO. But every region has its own history and its own identity. What serves the political, security, and economic interests of one region may not be optimal in another.

Indeed, many attributes about postwar Asia make it less suited to a regionwide grouping than Europe in security, environment, or disaster management. In security, for example, East Asia was unlike Europe in that it did not consist of a contiguous ground theater opposed by 200 Soviet divisions with a clear dividing line between East and West. The Asian theater was both land and maritime, and there was no "goal line stand" in the heartland of the continent (for example, in the Soviet Far East) for which to prepare.[9] Couple these geostrategic facts with the absence of true wartime allies in Asia during the Pacific War, as existed in Western Europe, and it is clear that the conditions for the creation of a postwar multilateral coalition were far from ideal.

The absence of a single regionwide security institution was also a function of the region's deep distrust of Japan as part of Asia's postwar, postcolonial, nationalist identities, which trumped any arguments for collective regional security.[10] Social historians also argue that American planners prioritized Europe over Asia after World War II and believed that regional security was a more complex form of organization requiring a level of sophistication and responsibility presumed of Europeans and assumed to be nonexistent among "inferior" Asians.[11]

In Asia, furthermore, the level of postwar intraregional trade was low and insufficient to spur greater economic regionalization when compared with Europe.[12] Low levels of economic devel-

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9. Paul Bracken, *Fire in the East: The Rise of Asian Military Power and the Second Nuclear Age* (New York: HarperCollins, 1999), 26.

10. Gerrit W. Gong, ed., *Memory and History in East and Southeast Asia* (Washington, D.C.: CSIS, 2001); Nicholas Kristof, "The Problem of Memory," *Foreign Affairs* 77, no. 6 (November/December 1998): 37–49.

11. Memorandum by the Regional Planning Adviser (Ogburn), Bureau of Far Eastern Affairs, to the Assistant Secretary of State for Far Eastern Affairs (Allison), January 21, 1953, Secret. *Foreign Relations of the United States (FRUS), 1952–1954, East Asia and the Pacific,* vol. 12, part 1 (Washington, D.C.: U.S. Government Printing Office, 1987), 260–262. As Bruce Cumings wrote, the idea of little yellow and brown people sharing a multilateral table as equals with Ivy League–educated East Coast intellectuals was beyond comprehension. See Cumings, *Origins of the Korean War,* vol. 2 (Princeton: Princeton University Press, 1990), 93; MacArthur testified in 1951 that his rule of thumb was to treat the Japanese as 12-year-olds. See John Dower, *War without Mercy* (New York: Pantheon, 1986), 303; also see David Capie, "Power, Identity, and Multilateralism: The United States and Regional Institutionalization in the Asia-Pacific," (PhD diss., University of Toronto, May 2002); and Christopher Hemmer and Peter Katzenstein, "Why Is There No NATO in Asia? Collective Identity, Regionalism, and the Origins of Multilateralism," *International Organization* 56, no. 3 (Summer 2002): 588.

12. Anthony McGrew and Christopher Brook, eds., *Asia-Pacific in the New World Order* (London: Routledge, 1998), 57.

opment reduced the incentive for regional economic integration because there was no incentive for states to venture outside the relationship with Washington to secure material needs. Unlike in Europe, Asian politics ranged from authoritarian to democratic, making it more difficult to organize in a single umbrella political institution based on common values.[13] Finally, Asia's threat matrix was not nearly as binary as that of Europe, where a singular threat called for a collective response. In Asia, some viewed the Soviet threat as paramount (e.g., Japan), others viewed the Chinese threat as compelling (Taiwan), others viewed Japan as the threat (Korea), and yet others were focused on internal threats.

The prescriptive point to be made here is not an opposition to regionwide groupings but merely that the "answer" to regional architecture may not equate with a single institution. Heaping such expectations on efforts like the EAS, for example, or some equivalent regionwide organization for disaster management or climate change is unfair. It creates a standard that is impossible for the institution to meet, given the history and diversity of the region. And it leads to false judgments on the failure to create effective regional architecture in Asia.

In the case of disaster management in Asia, as in the security arena, no one institution has the resources, technical capabilities, or political clout to act as an umbrella institution. As chapter 5 notes, at least 10 institutions are involved in disaster management, and they are not neatly identifiable in classic interstate terms. While some efforts take on characteristics of international organizations, others are less well defined, ranging from nongovernmental to transnational to a network of common military practices.

In the climate change arena, no single institution defines regional interaction on issues like data sharing, energy conservation, or new technologies. Instead, a multitude of groupings such as the APEC Energy Working Group and its Energy Supply Initiative play critical roles individually and in aggregate to build consensus on the desirability of different modes of addressing climate change. As chapter 5 observes, these multiple groupings do better as a group than they do individually at creating a collective knowledge base and setting normative standards for behavior (i.e., best practices) by imposing reputational costs for bad behavior. These various groupings also collectively have the capacity to convene leaders to create political will toward a common purpose. To cite the absence of a single institution as the metric for success would therefore be wrong. This has not been the history of institution building in Asia, and the lack of such an institution in the disaster management and climate change sectors tracks more broadly with other issue areas like security.

Metric 2: Ad Hoc Institutions Can Work Better than Formal Ones

The second metric is that the history of institution building in Asia generally shows that formal institutions have not always been the most effective ones. Some organizational literature tells us that the creation of formal structures can create a self-reinforcing dynamic where institutional purpose and growth occur in a symbiotic manner. In Asia, however, the few attempts at formal security institutions in northeast Asia have been spectacularly unsuccessful (we define success as tangible and coordinated steps by multilateral partners that advance solutions to substantive problems). In the early 1950s, for example, Syngman Rhee of the Republic of Korea (ROK), Chiang Kai-shek of

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13. Aaron Friedberg, "Ripe for Rivalry: Prospects for Peace in a Multipolar Asia," *International Security* 18, no. 3 (Winter 1993/94): 13–14.

Taiwan, and Elpidio Quirino of the Philippines put forward the concept of a PATO, which failed to gain support. John Foster Dulles attempted to create a Pacific Ocean pact comprising Indonesia, Australia, New Zealand, Philippines, and Japan which also failed.[14] During the Vietnam War, the South Korea sought to create a multilateral grouping out of the Vietnam War allies, but this effort failed as well. In each case, the key similarity was the relative priority placed on the formality of the institution over the functional purpose or task at hand. And like many institution-building ventures that emphasize structure over purpose, a great deal of attention and energy becomes wasted on the criteria for membership and the rules of the organization (e.g., in what country should the secretariat be; how should the chairmanship rotate).

In Southeast Asia, there has been relatively greater success than in the northeast subregion in creating formal institutions with established secretariats, regular meetings, and packed agendas.[15] The primary criticism of these institutions, however, is that they end up being "talk shops" in which opinions are discussed, only to be rediscussed at the next meeting with no real substantive progress on resolutions. Harshest critics ridicule the "talent show" performances at the ARF as an example of the substanceless nature of the meetings in which diplomats are reduced to amateurish performances that may build some goodwill (and lasting memories) but that do not advance solutions to bilateral or multilateral problems. Many criticize the newest regional initiative, the EAS, in this fashion. The first meeting of the EAS in December 2005, involving the ASEAN ten members, the "Plus Three" members (China, Japan, and South Korea) and Australia, New Zealand, and India, was accompanied by much fanfare. Kishore Mahbubani, the former Singaporean foreign ministry official and opinion leader, declared that the meeting marked the official start of the long-touted "Pacific Century."[16] Yet, more energy was arguably expended on the criteria for membership than on substantive issues. Both the George W. Bush and Barack Obama administrations have been cautious about their support for this new institution in part because it has shown little value added and might detract from what Americans perceive to be the more substantive work done in APEC.[17]

Institutions that appear to have been more successful at taking tangible, coordinated steps to solve a substantive problem are often ones formed on an ad hoc basis for a functional purpose. In December 2004, for example, when the worst tsunami in recent history killed more than 300,000 people in South and Southeast Asia, there was no formal regional or multilateral institution available to conduct tsunami disaster response and relief operations. Once the scale of the disaster became apparent (initial reports from the most devastated areas in remote Banda Aceh, Indonesia, and other locations were delayed), international actors scrambled to find an appropriate response. None of the existing institutions, however, like the ARF or APEC were capable of responding to the devastation in Indonesia, Sri Lanka, and India.

Instead, a makeshift coalition of willing countries formed—known as the Tsunami Core Group—consisting of the United States, Japan, Australia, and India within the initial 48 hours of

14. Victor D. Cha, "Powerplay: Origins of the U.S. Alliance System in Asia," *International Security* 34, no. 3 (2009): 158–196.

15. Amitav Archarya, *Constructing a Security Community in Southeast Asia: ASEAN and the Problem of Regional Order* (London: Routledge, 2000), especially chap. 6.

16. "Rising Unity in East Test for Global Trade," *New Zealand Herald,* November 19, 2005, cited in Bruce Vaughn, "East Asia Summit (EAS): Issues for Congress," Congressional Research Service, January 11, 2006, 4.

17. Ibid.

the crisis to set up disaster response infrastructure and to bring an unimaginable amount of relief supplies and assets to the area. Within a nine-day period, the coalition countries together provided more than 40,000 troops and humanitarian first responders, helicopters, cargo ships, and transport planes. The core group set up the basing arrangements, provided financial resources, military assets and personnel, and constituted the core of the global response to the problem until other international relief agencies could mobilize and get on the ground.[18]

If institutions are defined by their capacity to address a problem successfully, then the core group met that mark. If the success of Asian institutions is judged superficially by how long its extant structures remain in place and by its procedures and rules, however, then the core group was not successful. The consultation "procedures" of the core group were distinct from other multilateral institutions in their sparseness and functionality. Consultation consisted initially of phone calls between the U.S. president and the leaders in Tokyo, Canberra, and New Delhi, and then daily conference calls at 22:00 (EST) and e-mails at the deputy foreign minister levels. As one State Department official recounted, the calls were limited to 40 minutes in duration, and never more than three items were on the agenda.[19] There were no grand meetings or "G-4" type formal gatherings. The only adjustment to this "procedure" was the eventual inclusion of Jan Egelund, the UN undersecretary general for humanitarian affairs and emergency relief coordinator, in the daily calls as the core group sought to coordinate its efforts in preparation for the arrival of the United Nations on the scene. Moreover, as soon as its mission was accomplished, the Tsunami Core Group disbanded itself, deferring to international disaster response efforts. Then-U.S. Undersecretary of State Marc Grossman put it best: "The Tsunami Core Group was an organization that never met in one of diplomacy's storied cities, never issued a communiqué, never created a secretariat, and took as one of its successes its own demise."[20]

As discussed in other chapters in this volume, many ad hoc regional efforts to address humanitarian disasters in Asia have been effective. In the case of Cyclone Nargis in Burma, ASEAN neighbors and India quietly convinced the government to allow humanitarian aid, after which an ad hoc tripartite core group, consisting of ASEAN, Burma, and the United Nations, succeeded in entering the country to assess critical needs through the creation of an emergency rapid assessment team. In the example of the haze problem in Indonesia, initial attempts at formally organizing a common regulatory structure fell short when Indonesia rejected the proposed intervention on sovereignty grounds. Despite the absence of such a structure, practical cooperation followed. Indonesia and other ASEAN countries eventually concluded the Agreement on Transboundary Haze Pollution, which created the ASEAN Haze Fund to pool resources necessary for developing an effective action plan. Finally, when the Kyoto Protocol proved ineffective at securing commitments from countries such as China and India for hard targets for cutting greenhouse gas emissions, the Bush administration pushed for the creation of an ad hoc grouping of countries in the Asia-Pacific Partnership for Clean Development and Climate. This grouping focused on the promotion of environment-friendly development strategies as an alternative functional approach

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18. Daniel Twining, "America's Grand Design in Asia," *Washington Quarterly* 30, no. 3 (Summer 2007): 79–94; and Ralph Cossa, "South Asian Tsunami: U.S. Military Provides Logistical Backbone for Relief Operation," *eJournal USA: Foreign Policy Agenda,* March 4, 2005, http://www.america.gov/st/washfile -english/2005/March/20050304112100dmslahrellek0.5331537.html#ixzz0a5F8S6oo.

19. "Bush Announces Tsunami Aid Coalition," CNN.com, December 29, 2004, http://www.cnn .com/2004/US/12/29/bush.quake/index.html.

20. Marc Grossman, "The Tsunami Core Group: A Step toward a Transformed Diplomacy in Asia and Beyond," *Security Challenges* 1, no. 1 (2005): 11.

to bringing major gas emitters like China and India on board in a climate regime alternative to the formal Kyoto institution. An independent report found that the Asia-Pacific Partnership helped promote an environment for accelerated technology development and enhanced collaboration between the public and the private sectors.[21]

The absence of a multilateral security institution for northeast Asia is perhaps the most striking aspect of its security architecture when compared with other regions of the world. While multilateral institutions of some form took root at the beginning of the Cold War in Southeast Asia, Europe, and even the South Pacific (i.e., ANZUS), nothing of a similar type formed in northeast Asia.[22] The one institution that has evolved, however, was formed initially in an ad hoc fashion. In 2003, shortly after revelations surfaced that the Democratic People's Republic of Korea (DPRK) was in violation of a 1994 Geneva Agreed Framework denuclearization agreement with the United States, the five powers in the region agreed to come together in a multilateral negotiation with the DPRK to solve the nuclear problem. The Six-Party talks were never conceived as a formal security institution for northeast Asia but were an ad hoc reaction to the second DPRK nuclear crisis. The group continued for some six years thereafter, albeit haltingly at times. The organization reached some interim agreements on denuclearization and in the process created habits of consultation, greater familiarity, and interaction among the five parties (U.S., Japan, ROK, Russia, and China). Moreover, putting China in the chair of the Six-Party talks created greater Chinese stakes in solving the problem because it put Chinese face at risk. The 2005 Six-Party Joint Statement holds out the vision, if the talks ever lead to the denuclearization of the DPRK, for transforming the Six-Party talks into a formal institution for northeast Asian peace and security.[23]

Ad Hoc Arrangements Help Circumvent Barriers to Collective Action Problems

The experiences of the Tsunami Core Group, tripartite core group, ASEAN Haze Fund, and Six-Party talks are significant for institution building in Asia. One of the primary impediments to institution building in northeast Asia is a collective action problem. That is, in the course of multilateral efforts, states generally try to secure private goods rather than provide public goods. Naturally, this preference makes it harder to incentivize states to invest in formal institutions without a specific near-term payoff. Ad hoc groupings in response to an immediate problem help solve the collective action problem for several reasons:

- First, those players with a proximate interest in the issue will step forward (thereby solving the membership problem).

- Second, the task-oriented nature of the grouping leaves no time for long, drawn out procedural discussions, rule making, and other material and opportunity costs associated with formal institution building.[24] Function is more important than form and process. Parties are forced to work together, on the spur of the moment; yet the urgency of the task creates efficient coordination and effective solutions. As Undersecretary of State Marc Grossman, who was a critical player in the tsunami response, noted, "[The Core Group] was an ad hoc coalition that

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21. "Independent Review of Asia-Pacific Partnership Flagship Projects," Baker & McKenzie, Cleantech AustralAsia, WSP Environmental, September 2009, 9.
22. Cha, "Powerplay."
23. For the Joint Statement, see http://www.state.gov/p/eap/regional/c15455.htm.
24. In the case of the Six-Party talks, the costs associated with the grouping were eventually borne by China as the host, which at one point, Beijing disdained and requested that such costs be more evenly divided among the six parties.

ignored traditional groupings. We pulled these specific countries together simply because they were the ones with the resources and the desire to act effectively and quickly."[25]

- Third, through this coordination, the parties developed habits of consultation, greater transparency, and a degree of familiarity and trust.

- Fourth, these ad hoc institutions can serve "institutional growth" purposes as well. In the case of the Tsunami Core Group, even though the institution disbanded after the crisis, the experience spawned the growth of other related institutions in Asia, including the regional tsunami early warning system (Japan–United States); the Trilateral Strategic Dialogue (TSD) involving Australia, Japan, and the United States; and the proposal for a quadrilateral group (U.S.-Japan-Australia-India) based on the original core group concept.[26] In the case of the Six-Party talks, while the grouping has not solved the DPRK nuclear problem, the regularized sessions, sometimes lasting more than two weeks at a time, provided the parties opportunities to use the institution to accomplish other business. In the course of the talks, two parties might hold side discussions on preparing for an upcoming bilateral summit; or, in the case of the United States during the Bush administration, the Six-Party venue became a useful place to hold additional discussions about creating a new grouping to address climate change (e.g., the Asia-Pacific Partnership for Clean Development and Climate).[27] In addition, as part of the effort to explain Six-Party diplomacy to other countries in the region, Secretary of State Condoleezza Rice created another ad hoc "add-on" institution, the "Five Plus Five"—that is, the five of the Six-Party countries (without the DPRK) plus Australia, Canada, Indonesia, Malaysia, and New Zealand. These meetings took place at the ARF or at the UN General Assembly. Again, this was a purely functional group in nature with no larger grand designs but a very effective ad hoc institution.[28]

In some cases, the "spinoff" from ad hoc institutions can be formal institutionalization. The experience of the 2004 tsunami and the core group prompted the creation of a regional early warning system for tsunami and earthquake hazards (RIMES). Based out of Bangkok with a formal secretariat, RIMES involves 26 countries on the rim of the Indian Ocean. It establishes a regional network of multihazard observation stations, also aiding in national capacity building for early warning systems. It also helped invigorate the Asian Disaster Preparedness Center, which focuses on promoting greater formal intergovernmental cooperation on disaster mitigation (rather than just regional cooperation of nongovernmental organizations). The center works with the governments in the region to provide the technical expertise necessary to maintain the early warning systems for tsunamis and other natural disasters.

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25. Grossman, "The Tsunami Core Group," 12.

26. The TSD was not a direct result of the Core Group experience but was a core element of the TSD agenda (to carry on the cooperation experienced among the three). See William Tow, "Assessing the Trilateral Strategic Dialogue," East Asia Forum, February 12, 2009, http://www.eastasiaforum.org/2009/02/12/assessing-the-trilateral-strategic-dialogue/. The Quad concept was pushed by the Abe government in Japan. See Brahama Chellaney, "Quad Initiative: An Inharmonious Concert of Democracies," *Japan Times,* July 19, 2007, http://search.japantimes.co.jp/cgi-bin/eo20070719bc.html.

27. The AP-6 (Australia, China, India, Japan, the ROK, and the United States) was officially inaugurated in January 2006 in Sydney, Australia, but key discussions on concept and membership occurred on the sidelines of the Six-Party talks. See "US Agrees Climate Deal with Asia," BBC News, July 28, 2005, http://news.bbc.co.uk/2/hi/science/nature/4723305.stm.

28. "Asia, US Hold Talks without Defiant North Korea," Agence France-Presse, July 28, 2006, http://www.aseanregionalforum.org/News/tabid/59/newsid399/36/Default.aspx.

As noted earlier, Cyclone Nargis and the Burma government's poor response and initial unwillingness to allow international access led to an ad hoc grouping of Burma, ASEAN, and the United Nations to assess Burma's critical needs. But it also later encouraged ASEAN to ratify the Agreement on Disaster Management and Emergency Response Treaty in 2009, the first legally binding treaty on comprehensive interstate disaster management to establish practices for dealing with humanitarian disasters that all signatories must agree to.

Metric 3: Bilateral and Multilateral Institutions Can Be Mutually Reinforcing

The third concept critical to measuring the success of regional institutions is that the multitude of minilateral and multilateral groupings that may form in security, environment, and disaster management sectors may be complex, but they are not necessarily at odds with one another. Moreover, while the smaller groupings may provide private goods to partnering countries and institutions, the aggregation of these groupings in an issue area can provide public goods.

The postwar "hub-and-spokes" system of bilateral alliances created by the United States in East Asia was, for some five decades, the only true "architecture" in the region that was successful. It provided private goods to alliance partners, and the aggregation of these individual alliances provided public goods to the region. The growth of other regional initiatives led many to view a potential contradiction. Americans saw regional initiatives like Mahathir's East Asia Economic Caucus as deliberately intended to undermine the alliance network. Others blamed the inability to form effective "truly Asian" regional institutions directly on the American alliance system. Thus, a zero-sum algorithm was created. U.S. bilateral alliances operated at odds with multilateral institutions in Asia. China made this point clear when it once referred to the bilateral alliance system as "Cold War anachronisms" that no longer fit the region's architectural needs.

Closer analysis of the region's recent successes, however, suggests that the U.S.-based bilateral alliance structure (or other bilateral alliance relationships) in Asia and the emergent multilateral groupings are not mutually exclusive. On the contrary, the relationship is far from zero sum. In fact, it is positive sum in the sense that effective and successful multilateral efforts have often been built on preexisting bilateral relationships. Conceptually, this idea would appear to make sense. Any collective effort to address a problem or advance a policy agenda among several players may work best when the players already have established patterns of cooperation, consultation, and a degree of trust. In the case of bilateral relationships, whether in the form of the U.S.-Japan alliance or ROK-China relations, the history of transparency, working together, and joint capabilities can become very useful, if not indispensable, assets for any collective effort.

Again, we are drawn back to the prominent cases of the 2004 tsunami and the Six-Party talks, as well as recent multilateral counterproliferation initiatives. The tsunami case is already being remembered as a classic example of how multilateralism and bilateralism are tightly intertwined. The coalition countries—U.S., Japan, India, and Australia together provided more than 40,000 personnel in a little over nine days. Over 4,000 Indian first responders arrived in Sri Lanka. The United States supplied more than 12,600 personnel, 21 ships, the U.S.S. Mercy hospital ship (with 1,000 beds), 14 cargo planes, and more than 90 helicopters to bring relief supplies to the most inaccessible damaged areas in Indonesia. Australia and Japan provided more than 1,000 person-

nel, medical teams, and other material and financial assistance.[29] By any stretch of the imagination, this was a herculean effort completed at unimaginable speed. A multilateral, regional effort of this magnitude would not have been conceivable if it had not been built on the existing bilateral relationships shared among the Tsunami Core Group members. Many of the U.S. ships diverted to the area to help were moved out of U.S. bases in Japan, for example. The need for logistics support from Singapore and Thailand to move relief supplies into hardest-hit and inaccessible areas in northwest Indonesia could not have happened at the speed it did without preexisting channels of bilateral communication between Washington and those countries. Australia's immediate action and willingness to jump into the fray was in part due to the close bilateral relations between the Bush and the Howard governments. The Tsunami Core Group showed how a successful multilateral "institution" in Asia effectively grew out of the existing network of bilateral U.S. alliances and other bilateral relationships in the region. Although counterfactuals are difficult to prove, it would have been hard to imagine a similar degree of cooperation among countries without such ties.

In the case of the Six-Party talks, although built as an ad hoc coalition to deal with the DPRK nuclear crisis, Obama administration officials have already informally recognized it as the first and only multilateral institution comprising the five major powers of East Asia (United States, Japan, South Korea, China, and Russia). While the success of the institution in denuclearizing the DPRK has been far from complete, given Pyongyang's intransigence, few observers would deny its utility as a negotiation process that has worked tirelessly over the past seven years and created new habits of consultation and transparency among the parties involved. The success of this institution derived from the strong bilateral relationships that constituted the multilateral body. In the initial thinking behind the formation of the group, the United States relied on its alliances with Seoul and Tokyo, as well as on trilateral coordination, as an important spur for cooperation within the group. Both Seoul and Tokyo saw the Six-Party talks as a way to improve and grow their bilateral relations with Beijing. And President George W. Bush was fond of challenging his Chinese counterpart to view success in the Six-Party process as an important test of the strength of U.S.-China relations. Similarly, another new grouping, the Trilateral Strategic Dialogue (TSD), involving Japan, Australia, and the United States, constitutes another useful new multilateral institution dedicated to dealing with a wide range of items, including climate change, counterterrorism, counterproliferation, UN reform, and disaster relief.[30] As a participant in some of the first meetings of the TSD, I was personally impressed by the degree to which the bilateral agendas of the three countries truly comprised the multilateral tasks and action plan of the TSD. By way of comparison, other multilateral groupings that are not grounded in tight bilateral relationships such as the Shanghai Cooperation Organization have been far less active or successful.

Recently, several other multilateral institutions based on core bilateral relationships have formed. The Proliferation Security Initiative (PSI) deserves mention. Created in May 2003, PSI is now an international coalition of more than 90 countries dedicated to stopping trafficking of weapons of mass destruction (WMD) and related delivery systems and materials to terrorists and to countries of proliferation concern. PSI is a functionally based institution that relies on voluntary actions by member states to use their existing national and international authorities in cooperation to interdict illicit movement of WMD by sea, air, or land. Member states endorse a set of

29. Grossman, "The Tsunami Core Group," and Cossa, "South Asian Tsunami."
30. For a good study of the TSD, see *Assessing the Trilateral Strategic Dialogue*, National Bureau of Asian Research Special Report 16, December 2008, http://www.nbr.org/publications/specialreport/pdf/SR16.pdf .

principles to stop illicit WMD transfers.[31] By most accounts, this has been a successful multilateral effort.[32] More than 37 interdiction exercises have involved PSI countries.[33] Although specifics have not been publicly released, U.S. officials have estimated about two dozen cases of successful PSI cooperation to prevent WMD transfer. And Ulrik Federspiel, Denmark's ambassador to the United States, asserted at a May 2005 event that "the shipment of missiles has fallen significantly in the lifetime of PSI."[34] President Obama in his April 2009 Prague speech declared his intention to strengthen and expand PSI.[35] The effectiveness of this multilateral institution, however, rests on strong bilateral relationships. Although the U.S.-led PSI has eventually grown to 95 countries, its core and initial formation rests on 11 countries, all of whom already had close bilateral relations with the United States (Australia, France, Germany, Italy, Japan, the Netherlands, Poland, Portugal, Spain, and the United Kingdom). This initial group, because of the preexisting ties and common nonproliferation agenda, speedily devised a set of core principles in September 2003. Some of the early flagship exercises that cemented PSI as a real entity were hosted by countries with which the United States already had strong bilateral security relationships: Australia, Poland, and Singapore. These countries have also played key roles in PSI's growth, chairing subgroups like the Operational Experts Group and other PSI outreach activities.

In addition, bilateralism has been critical to PSI's success, partly because of the countries it has excluded. John Bolton, one of the chief architects of PSI and then undersecretary of state for arms control and international security, stated in November 2003 shortly after President Bush's announcement of PSI that the new multilateral grouping would not target the trade of India, Israel, or Pakistan. Again, such arrangements could not have been agreed upon with such alacrity in the absence of preexisting bilateral ties between the United States and the core PSI countries to allow for such exceptions in the multilateral effort. Finally, consistent with the principles of functionalism and informality, PSI is meant to be ad hoc and informal, without a secretariat or formal organization that serves as a coordinating body. Information about potentially dangerous WMD transfers is to be shared on an ad hoc basis and with appropriate parties to ensure effective counterproliferation successes. U.S. officials in fact have discouraged talking about PSI as an organiza-

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31. The principles call on PSI participants, as well as other countries, to not engage in WMD-related trade with countries of proliferation concern and to permit their own vessels and aircraft to be searched if suspected of transporting such goods. The principles further urge that information on suspicious activities be shared quickly to enable possible interdictions and that all vessels "reasonably suspected" of carrying dangerous cargo be inspected when passing through national airports, ports, and other transshipment points. See "Proliferation Security Initiative," U.S. Department of State, http://www.state.gov/t/isn/c10390.htm.

32. China, Indonesia, Iran, and Malaysia oppose PSI, disputing the legality of its efforts.

33. Opening Remarks by Acting Deputy Assistant Secretary of State Tony Foley at the PSI Regional Operational Experts Group Meeting, Sopot, Poland, June 22, 2009, 5, http://dtirp.dtra.mil/TIC/treatyinfo/psi/psi_remarks.pdf.

34. U.S. officials also point to an October 2003 operation to seize centrifuge components aboard the German-owned BBC *China* destined for Libya as a successful PSI operation. U.S. official cited was the then-undersecretary of state Robert Joseph, cited in Arms Control Association Fact Sheet, "Proliferation Security Initiative (PSI) at a Glance," http://www.armscontrol.org/factsheets/PSI, and Wade Boese, "Interdiction Initiatives Successes Assessed," *Arms Control Today* (July/August 2008), http://www.armscontrol.org/act/2008_07-08/Interdiction. For other cited successes, see Opening Remarks by Acting Deputy Assistant Secretary of State Tony Foley at the PSI Regional Operational Experts Group Meeting, 7.

35. "Remarks by President Barack Obama," Hradcany Square, Prague, Czech Republic, April 5, 2009, http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/.

tion but rather as a series of common practices among like-minded states regardless of political orientations.

Feedback Effect

The positive-sum relationships between bilateralism and multilateralism are not unidirectional. Just as bilateralism can fuel and facilitate multilateral efforts, these regional practices can feed back and reinforce existing bilateral relationships or create new ones. In the case of the Tsunami Core Group, not only were the preexisting bilateral ties critical to the success of the multilateral effort, but also the core group's work fed back and contributed to an improvement, indeed a rejuvenation, of key bilateral relationships between the United States and India and between the United States and Indonesia. In the case of the TSD, as noted earlier, the new multilateral grouping drew its strength from U.S.-Japan and U.S.-Australia bilateral ties, but the added feedback effect was a strengthening of bilateral ties between Australia and Japan. This process eventually led to the first bilateral security declaration between Tokyo and Canberra in March 2007.[36] Howard government and later Rudd government officials also valued the TSD as a way of engaging the United States and reinforcing their bilateral ties, which some felt were being neglected by Washington. This reinforcement of bilateral ties, moreover, occurred at minimal cost to U.S.-China and China-Australia relations in large part because bilateral ties at the time were quite strong in both cases.

Similar feedback effects are observed between Australia and Indonesia in disaster response. Out of the various efforts in response to the West Sumatra earthquake, Australia and Indonesia established a bilateral facility for disaster risk reduction. The two countries will work together to deepen the science of reducing the risk posed by such disasters. This deepening of bilateral ties will also help multilateral efforts because their findings will be shared broadly.

The "Patchwork" Architecture of Asia

If we accept the three metrics laid out in this chapter—that no single institution defines the region's architecture, that effective regional institutions can be informal and ad hoc, and that positive-sum relationships exist between bilateralism and multilateralism—then the vision of architecture in Asia is a more complex and fluid one than that of a single PATO or EAS. Instead, the emerging architecture comprises a wide variety of subregional organizations as well as bilateral and plurilateral groupings organized on a functional basis to solve a problem.

Some of these groupings stay together and take on a more formal institutional structure, but others do not. Some last after the problem is solved to conduct additional business within the group, but others do not. Thus, the model for this sort of "regional community" is not simply cultural or political, where a particular "Asia-ness" (e.g., Hatoyama's East Asia Community concept) or dominant ideology (as in postwar Western Europe) defines the group. To be sure, regional organizations such as ASEAN or the South Asian Association for Regional Cooperation may be based to a large extent on shared cultural identities or political values.

Many of the more informal arrangements, however, are more akin to a business model, where coalitions form among entities with the most direct interests in solving a problem. Entities participate because they seek to secure private goods (i.e., either profits or avoidance of losses), but the

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36. For the text, see http://www.mofa.go.jp/region/asia-paci/australia/joint0703.html.

aggregation of their atomistic efforts precipitates collective benefits for the region (market). The membership in these coalitions is not defined by political ideology but by functional need. And, as seen in models of pluralistic societies, they are more often than not overlapping and interlinked in terms of the memberships. The United States, Japan, and Australia, for example, may discuss UN reform in the TSD, but China, Japan, and the ROK will discuss currency swaps in the ASEAN Plus-Three forum. And the U.S., Japan, China will discuss counterproliferation in the context of the Six-Party talks. What emerges is not a hub-and-spokes conception nor an East Asian Community, but "networks and patchworks" of differently configured and overlapping bilaterals, trilaterals, quadrilaterals, and other multilateral groupings that, stitched together, define the regional architecture.

This patchwork design for regional architecture is especially evident in the area of disaster responses. As noted in other chapters, at least 10 major regional arrangements of military, intergovernmental organizations, international organizations, NGOs, and countless other smaller groupings exist for disaster risk management. The space occupied by these organizations is therefore admittedly messy and lacks a coherent vision that might be found in a single overarching group. But the multitude of groupings deals effectively with enhanced stand-by and surge-response capabilities.

Advantages

Some may argue that the geometry of regional groupings I describe for Asia is too complex a vision for regional architecture because it has no core, no metrics for coherence, and no single superstructure. The common view is that complexity is suboptimal for multilateral institutions because it heightens the chances for misperception and miscommunication, increases transaction costs, and decreases efficiency.

But complexity is actually a critical component of this pluralistic architecture for Asia. Given the underlying historical animosities, the diversity of regime types, and the shifting balance of power, complexity offers distinct benefits. Conceptually, it creates opportunities, and it does not constrict space for formation of bilaterals and multilaterals. Materially, it helps mute security dilemmas between countries distrustful of one another. Complexity allows powers of Asia to operate in multiple groupings, sometimes with each other, and sometimes exclusively, which helps circumvent zero-sum competition. A quadrilateral among U.S.-Japan-Australia-India, as proposed by the then Japanese prime minister Shinzo Abe in 2006, for example, might incite insecurities in China, if it were the only regional grouping available. But Beijing would be engaged with Japan in the context of the ASEAN Plus Three, with the United States and Japan in the context of a U.S.-Japan-China trilateral, and with India in the context of the EAS. ROK insecurities sparked by a China-Japan-United States trilateral might be ameliorated by its own participation in the Plus Three with China and Japan and the traditional Japan-ROK-United States trilateral alliance consultations. The point here is not that insecurities disappear merely with membership in these various groupings but that the complexity and density of these many groupings greatly reduce anxieties associated with exclusion.[37]

In sum, complexity and functionality help mute security dilemmas. If groupings form that do not include a given party, the rationale for exclusion is usually functional rather than ideological.

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37. In this context, the most potentially troublesome groupings may be ones of larger than three members that exclude China. From a policy prescription perspective, it might be best to avoid these—or to ensure that there are comparable groupings in which China can play to mute security dilemmas.

Moreover, because the excluded party knows that the given grouping is not the only game in town, it recognizes that it has many other opportunities for regional engagement. Finally, functionality as a criterion for the groupings largely ensures that the major powers (i.e., U.S., Japan, and China) will be included in most of the "heavy-lift" regional efforts, also helping reduce security dilemmas.

In a related fashion, this ad hoc patchwork in environmental and disaster relief areas can offer countries opportunities for confidence building. Entities with preexisting political difficulties might be more inclined to engage on climate change or disaster relief issues when they otherwise might not normally be inclined to do so. The patchwork has that effect by expanding the space in which protagonists might interact. After the 2008 earthquake in Sichuan, for example, China and Chinese Taipei (Taiwan) participated in the APEC Task Force for Emergency Preparedness. They cohosted a task force meeting and participated in a UN conference on international strategy for disaster reduction conference in Kobe in 2010 without the requisite "one-China" complaints from Beijing. Responses to the Sichuan earthquake also provided a context in which Japan could engage with China, providing support through the Red Cross in a way that precipitated good will amid longstanding historical tensions. Similarly, after the tsunami, China made donations to Indonesia through the Red Cross, despite continued sensitivities over anti-Chinese riots in Jakarta in 1998. The response to Cyclone Nargis also provided an opportunity for nations and international organizations to engage with the otherwise reclusive regime in Rangoon. While no one advocates natural disasters as a "diplomatic tool" of engagement, the multitude of efforts that emerge in response to these events do offer new political spaces in which countries can interact.

Another important advantage of patchworks, especially in the climate change and disaster relief area, is that they promote transparency and adherence to rules. When norms become established on disaster relief, for example, even the most opaque countries feel compelled to abide by such norms. Cyclone Nargis forced the Burmese government to become accountable to the outside world about how it was treating its own citizens. The cyclone led ASEAN finally to ratify an agreement to codify these norms. China responded to the earthquake in Sichuan with more than $200 billion in assistance—more than enough to address the needs of its citizens. At the same time, however, Beijing sought help from the outside world as a way of conveying that it was abiding by international norms, unlike Burma's relative opacity after Cyclone Nargis.

Patchworks, because they are sometimes ad hoc and informal, also have a tendency to be more adaptable to change and innovation. Unlike a formal organization with standard operating procedures, bureaucratic biases, and entrenched ways of doing business, patchworks can be receptive to new knowledge, new partners, and new ways of doing things. The Tsunami Core Group exhibited innovative new ways for the U.S. military to be used in disaster response. The Pakistan military found itself having to adapt and lead the response to the Kashmir earthquake because it was the only organization with the capacity to help in isolated communities and was the only entity that could operate in the sensitive Kashmir border areas.

Patchworks also foster creative competition that is not necessarily bad. If several different organizations are trying to accomplish similar objectives, they are likely to learn from one another, adopt best practices or new technologies that succeed, and shed those that do not. Competition to improve climate change capabilities or disaster risk management expertise can also become emblematic of levels of economic development that generates additional pressures to do better. These pressures are real: as chapter 5 notes, spending on disaster risk management increased from $6.5 billion in 2000 to $11.2 billion in 2008. The frenetic pace of these different ad hoc functional

groupings, therefore, creates a "dynamic density" that is useful for confidence building, creativity, and change.

Disadvantages

Patchworks, however, have potential downsides. The "hyperactivity" of multiple groupings can be inefficient. At one point during the 2004 tsunami relief efforts, some 180 international NGOs and 430 national NGOs were registered and operating at once. Efforts were often duplicative of one another, and, therefore, the assistance provided by some 99 countries to these groups may not have been the most efficient use of funds. Such duplication also means that many groups could be working superficially in similar areas; the cost of this overlap and duplication is a resulting void in deeper substantive capabilities. Moreover, the proliferation of such groups creates demands that can severely tax the resources of governments and regional organizations, possibly reducing rather than increasing overall capacity to respond effectively to crisis. This problem is perhaps now the most prominent one in disaster risk management efforts in Asia.

When groupings are formed in an ad hoc and immediate fashion, the time horizons of these groups are likely to be short. As chapter 5 point out, relief organizations are driven by their bottom lines rather than by some broader strategic vision:

> The business reality of the humanitarian endeavor is this: organizations are obliged to fulfill the requirements of the donor grants that fuel them, most of which are no longer than 18 months old, as a means to survive. As such, institutions become focused on bankrolling their efforts with short-term outputs and are, hence, inherently discouraged from developing a co-ordinated longer-term strategic vision.

The "on-the-go" nature of patchworks also means the groupings come together only under a confluence of two conditions: first, when there is a crisis; and second, when there is a collective goods provider willing to lead the effort. This is a core problem if such groupings are meant not only to respond to crises but also to create a preventive capacity. Slow-onset disasters highlight the nature of the problem: no immediate crisis is spurring action, and while solving the problems is clearly a collective good, no country or entity is willing to take on a leadership role.

The Mekong River basin is the quintessential example. The Mekong River Commission (MRC) was created in 1995 to coordinate the actions of upstream and downstream countries. But China chose not to join because it wanted to maintain freedom of action in securing its own private goods from the river. As a result, the MRC is an ineffective institution. Perhaps other opportunities for more informal cooperation among an ad hoc group of countries will arise once a near-term crisis materializes, but this outcome would be suboptimal compared to a longer-term preventive strategy.

Arguably, the opposite of the Mekong River basin case is that of the Himalaya and Kush Hindu mountains. As chapter 5 observes, there were no regional efforts to coordinate interstate policies for addressing the slow-onset disaster of glacier melting in the greater Himalayan region. A controversy, however, over data presented at the Fourth Intergovernmental Panel on Climate Change has led India to take on a leading role in gathering better data on the rate of glacial melting. India, moreover, is considering plans to set up an ad hoc group of concerned countries, including China, Pakistan, Nepal, and Bhutan to mine accurate data on the glacier area.

Finally, by their very nature, patchworks are not designed to enhance coherence across a wide range of actors or issue areas. They are usually formed to meet the urgent and immediate needs of specific groups, often only possible by not confronting more fundamental issues or involving a wider group of actors. Because of their nature as ad hoc and informal groupings, they will be less adept at formulating a single policy that all nation-states will adhere to.

Ways to Improve

Ways of improving the patchwork naturally derive from some of the deficiencies cited above. First, a degree of formalization can be useful. This outcome can sometimes happen after patterns of cooperation have become well established through ad hoc arrangements. Formalization can help increase transparency among actors and decrease apathy and free riding. It can also be used to produce clearer guidelines for a rational division of labor that can reduce duplication and enhance response to future crises.

Second, the development of more technical and material capabilities on the ground could enhance the patchwork efforts to manage disaster risk. Norms of cooperation are being established, but, to work effectively, they need to be backed up with real capacity for cooperation. The UN's effort to create regional supply hubs is a good example. The World Food Programme has set up its first humanitarian response depot in Asia, which will carry emergency supplies—including first aid, generators, water purification, satellite phones, and high-energy biscuits—to a disaster within 48 hours. The UN has set these depots up in Dubai, Ghana, Italy, and Panama. The Asian depot will be in Subang, Malaysia. The International Federation of Red Cross and Red Crescent Societies created logistics hubs near Kuala Lumpur about four years ago. These were useful in responding to the Sichuan earthquake in China and Cyclone Nargis in Myanmar in 2008 and the Padang earthquake in Indonesia in 2009. Another good step in formalizing capacity building was the establishment of the UN Central Emergency Relief Fund (CERF) in 2005. CERF was created to provide a mechanism for ensuring predictable and equitable funding to nations facing national disasters and humanitarian crises. Coordinating with aid organizations such as the United Nations Children's Fund, the World Food Programme, and the World Health Organization, CERF organizes more timely and reliable humanitarian assistance than was available in the past.

Streamlining the duplicative activities of the many different efforts may not be as useful as codifying the best practices from it, however. For example, the Agreement on Disaster Management and Emergency Response Treaty was signed by 10 ASEAN countries, making it the first legally binding treaty in the world for comprehensive interstate disaster management. The provisions for common metrics for disaster risk management, early warning, mitigation, preparedness, rehabilitation, technical cooperation, simplified customs, and immigration procedures all came about as a result of the multiple efforts of the many different actors involved in the process.

Finally, the American bilateral alliance system, while certainly not wholly constitutive of the architecture, still plays a very important role. Many of the plurilateral groupings in Asia "spin off" from the bilateral alliances (i.e., trilaterals constituted of two bilateral alliances) and some of the larger groupings (e.g., the Tsunami Core Group, Six-Party talks) are grounded in key U.S. alliances. Far from being "Cold War dinosaurs," U.S. alliances remain a critical component of Asia's future architecture to the extent that they have evolved toward the broader mission of promoting regional cooperation. The geometry of Asia's architecture will not be constructed out of one umbrella institution like EAS, nor will it remain wedded solely to the hub-and-spokes alliance system of the United States. Instead, it is a complex collection of different shapes—triangles, quadrilaterals,

hexagons—that are all functional in nature, ad hoc, and overlapping. Each of these shapes is important in its own right.

Final Thoughts

An urgent concern these days is the global financial crisis. The crisis itself does not impede architecture: indeed, it could spur the creation of other regional groupings. The agreement signed by the ASEAN Plus-Three members, China, Japan, and the ROK, in December 2009 to launch a $120 billion multilateral currency swap arrangement is an illustration of such an initiative.[38] The broader concern, however, is growing trade protectionist sentiment. If states address financial recovery by turning inward, viewing free trade as the source of problems rather than as a source of growth and recovery, the effect will be deleterious, largely because one of the key collective goods for the region—free trade—will not be provided for. More generally, attempts to form groups that aim to *exclude* rather than to *include* will tend to reinforce or create new rivalries that will make it more difficult for the region as a whole to respond to future challenges. It would be hard for any architecture to operate well in such an environment.

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38. Kanga Kong, "Asia to Launch Currency Swap Facility in March," *Wall Street Journal,* December 29, 2009, http://online.wsj.com/article/SB10001424052748704134104574623461597157356.html.

7 CONCLUSION
Robert S. Wang

The Road Ahead

Asia as a region has suffered terribly from natural disasters of all forms. The human toll alone from the four major disasters since 2004 described in chapter 5 in this study exceeded half a million dead, with countless homes and families destroyed, not to mention the tens of billions of dollars in economic damage. These calamities have finally prompted national governments and institutions in the region to begin to take some action. Despite the plethora of plans made and measures taken, however, it is still unclear just how effective or efficient these measures will be in preventing or providing relief in the future disasters that are almost certain to continue, if not increase, in the years ahead.

Moreover, as other chapters pointed out, the region's response to the challenge of climate change and its potentially devastating consequences has been recent and minimal. While there is increasing public recognition of this looming disaster, some of the major carbon-emitting countries in the region have been reluctant to undertake binding commitments and measures that they fear may hinder their continued economic growth. They look to the United States and other more advanced industrial countries to take on greater responsibility and financial burden in confronting this threat.

Finally, chapter 6 concluded that Asia's patchwork of regional institutions and ad hoc arrangements has managed to cope with urgent and visible crises, when broad consensus already exists and regional actors are willing to take the lead and assume responsibility. When this is not the case, however, these same institutions are not well structured and have not been able to mobilize the same degree of commitment and resources needed to address the threat of climate change and other long-term challenges.

Implications for U.S. Policy

Each of the chapters in our study had specific recommendations for policy that relate to their subjects. Generally, we saw that the United States and its strong bilateral relations in Asia have been critical in mobilizing the region's response to many of the natural disasters it has faced. In the case of the 2004 tsunami, for example, the deep bilateral partnerships, shared understandings, and working relationships of the United States made possible the remarkable collective response to this unprecedented crisis. No other country in the region has an equal capacity for response at this time. We recommend that the United States continue to help build and support the region's on-the-ground capability to meet future disasters. We encourage regional governments and institutions to improve coordination and assume greater responsibility in this area.

At the same time, we believe the United States should begin to focus Asia's attention increasingly on the long-term threat of climate change. Not only is the region expected to be a major victim of the consequences of climate change, it is also a major source of the global threat itself. As we have seen in this study, Asia's governments and institutions have clearly not been able to build the consensus or mobilize the resources to take action to mitigate or to adapt to this potentially devastating slow-onset disaster. While we recommend that current bilateral exchanges and programs in various regional institutions, e.g., the Asia-Pacific Economic Cooperation forum, to increase energy efficiency and the use of alternative energy and clean coal technology be accelerated, they are unlikely to be sufficient to meet global targets in the long term.

Hence, given the current structure of regional institutions in Asia, we further propose here that the United States significantly expand its efforts within the Asia-Pacific Partnership on Clean Development and Climate (APP) to enable and help its current members take concrete measures to reduce greenhouse gas emissions. Apart from developing and sharing new technology, for example, we propose that APP members also begin to explore and promote secure, low-carbon pathways and other strategies to reduce carbon emissions. As now constituted, APP members represent some of the major global emitters, including China, India, and the United States. It is also a regional institution focused solely on the issue of climate change. The United States should assume a leadership role by passing domestic climate change legislation that will commit to significant targets to reduce its carbon emissions as well as provide the necessary technology and assistance to other countries in the region.

Beyond this, we think the APP should consider expanding its membership to include other major emitters like Indonesia, as well as countries that expect to be severely affected by climate change. As noted in our study, hundreds of millions of people, especially in areas along the Mekong River basin and coastal waters, are concerned that their livelihood will be affected by increasing shortages of fresh water as a result of intensified dam constructions, river dredging, and the rise in sea levels. The impact of climate change in the upper Himalayas is expected to further aggravate this problem by initially triggering floods and then eventually diminishing glacial and snow pack runoff into the Mekong and other rivers. Additional members from some of these countries may spur the APP to accelerate its efforts and expand the scope of its mission to address this slow-onset crisis more broadly.

Finally, we expect global institutions will continue to be important players in environmental and disaster-related issues. They should continue to provide resources and services and work with regional institutions to address broad transborder problems, especially where economies of scale are involved. The eventual solution to climate change has to be an international one. At the same time, however, regional dialogue and cooperation can help shape the global debate and promote global solutions. We believe that U.S. leadership through such regional institutions as the APP can generate the momentum needed to build the consensus for a global agreement on climate change.

ABBREVIATIONS AND ACRONYMS

AADMER — ASEAN Agreement on Disaster Management and Emergency Response

ADB — Asian Development Bank

AHA Center — ASEAN's Coordinating Center for Humanitarian Assistance on Disaster Management

ANZUS — Australia-New Zealand-United States Pact

APEC — Asia-Pacific Economic Cooperation forum

APP — Asia-Pacific Partnership on Clean Development and Climate

ARF — ASEAN Regional Forum

ASEAN — Association of Southeast Asian Nations

ASEM — Asia-Europe Meeting

ASPAC — Asia and Pacific Council

BASIC —Brazil, South Africa, India, China

BAU — business as usual

Btu — British thermal unit

CCA — climate change adaptation

CCS — carbon capture and storage

CERF — UN Central Emergency Relief Fund

CIER — Chung-Hua Institution for Economic Research

CO_2 — carbon dioxide

COP — UN Conference of the Parties to the Convention

CSCAP — Council for Security Cooperation in the South Pacific

CSIS — Center for Strategic and International Studies

CTI — Coral Triangle Initiative

DPJ — Democratic Party of Japan

DPRK — Democratic People's Republic of Korea (North Korea)

EAS — East Asia Summit

EIA — Energy Information Administration

ERI — Energy Research Institute

ESI — APEC's Energy Security Initiative

EST — Eastern Standard Time

EU — European Union

EWG — APEC's Energy Working Group

FPDA — Five Power Defence Arrangements

GDP — gross domestic product

GES — global equity scenario

GHG — greenhouse gas

HKH — Hindu-Kush Himalayan

IEA — International Energy Agency

IFIs — international financial institutions

LNG — liquefied natural gas

MEF — Major Economies Forum on Energy and Climate Change

METI — Japan's Ministry of Economy, Trade, and Industry

$MMTCO_2e$ — million metric tons of carbon dioxide equivalent

MRC — Mekong River Commission

mtoe — million tons of oil equivalent

NATO — North Atlantic Treaty Organization

NEACD — Northeast Asia Cooperation
    Dialogue
NGO — nongovernmental organization

OCHA — UN Office for the Coordination of
    Humanitarian Affairs
OECD — Organization for Economic
    Cooperation and Development

PATO — Pacific Treaty Organization
PSI — Proliferation Security Initiative

RES — reference case
RIMES — regional early warning system for
    tsunami and earthquake hazards
ROK — Republic of Korea

SAARC — South Asian Association for
    Regional Cooperation
SEATO — Southeast Asia Treaty Organization
SES — sustainable energy scenario
SMS — stringent migration scenario

TCG — Tripartite Core Group
TFEP — APEC's Task Force for Emergency
    Preparedness
TERI — Energy and Resources Institute
toe — tons of oil equivalent
TSD — Trilateral Strategic Dialogue

UNFCCC — United Nations Framework
    Convention on Climate Change
UNICEF — United Nations Children's Fund
UNISDR — UN International Strategy for
    Disaster Reduction
USAID — U.S. Agency for International
    Development

WMD — weapons of mass destruction

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