

Chapter Two

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Climate Change and Environmental Security in the Asia-Pacific Region: A Role for APEC?

Executive Summary

- Climate-related global change poses real threats and complex challenges to environmental and economic security.
- Addressing the problems of this transnational phenomenon requires international collaboration at multiple levels.
- Multilateral activities to address these problems and to connect research to policy are sparse and unintegrated in the Asia-Pacific region.
- An opportunity exists for APEC to expand upon current mechanisms and activities to enhance regional economic and environmental security.

Introduction

According to a recent report by APEC's Energy Working Group, "energy security and climate change have emerged as two key and related challenges to maintaining regional economic growth and prosperity."¹ Establishing the linkages between security and climate change is a case study in complexity, illustrating the need for both interdisciplinary and international collaboration to understand and address an interactive set of complex problems.

This chapter is concerned with the need and scope for security cooperation in the Asia-Pacific region to address the problems posed by climate change. It suggests that a timely opportunity exists for APEC to play an important, leadership role in meeting that need.

¹ APEC Peer Review on Energy Efficiency (February 2008), available at: http://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-TechnicalCooperation/Working-Groups/~media/Files/Groups/EWG/PREE_Guidelines.ashx.

The Science of Climate Change

According to the Intergovernmental Panel on Climate Change (IPCC), the average global temperature has increased by about one degree Celsius over the past 100 years, largely as a consequence of anthropogenic greenhouse gas (GHG) emission from the burning of fossil fuels and the destruction of forests.² The phenomenon is explained by the Greenhouse Effect, whereby GHG molecules in the atmosphere are transparent to incoming visible light but opaque to infrared radiation (IR) reflected from the Earth's surface. As the atmospheric GHG concentration rises, less IR escapes into space and more is reflected back to Earth, raising its temperature.

This excess heat contributes to the expansion of oceans and rising sea levels; greater evaporation, precipitation, and eventually flooding; more intense storms; higher evapotranspiration rates and, thus, dryer lands; the melting of snow packs and glacial ice, with consequent changes to fresh-water supplies; and other changes to the natural environment, such as the northward spread of vector-borne diseases.

The atmospheric GHG concentrations that are slowly reversing have important security policy implications: 1) developing nations cannot safely pursue the same fossil fuel-based industrialization strategies as their predecessors because of the cumulative effect of GHG emissions; 2) global warming will continue at an increasing rate and with increasing impacts until atmospheric GHG concentrations are substantially reduced through a combination of emission reductions and natural or engineered carbon sequestration; and 3) even aggressive GHG mitigation policies cannot quickly reverse the impacts of past emissions, making some level of human adaptation to a changed climate necessary.

² IPCC, Fourth Assessment Report (2007), available at: <http://www.ipcc.ch/>.

Climate Change, Economic Development, and Security

Economic development ultimately depends on the consumption of natural resources and the expenditure of energy in their transformation into distributed products. The tension between environmental security and economic security is captured by the concept of sustainable development articulated in the twenty-seven principles of the Rio Declaration on Environment and Development in 1992.

Climate change has the potential to affect both environmental security and economic security through its impacts on the natural and built environments. Those threats to human security, in turn, pose traditional security threats to the governments that must deal with them. Climate impacts on environmental security are direct: changes in precipitation, sea-level rise, and extreme weather events can degrade food production and fresh water supplies in vulnerable regions. Impacts on the built environment occur through riparian flooding, coastal storms, or the melting of permafrost. Threats to economic security follow as a consequence of environmental degradation, and also from the impacts of climate change on food, energy, and infrastructure costs.

Unfortunately, climate trends will interact with other global trends in negative ways. In some Asia-Pacific nations, increasing populations will create growing needs for food, water, and energy. Economic development and a rising middle class will further increase demand. Urbanization of coastal areas will increase climate vulnerability, while air and water pollution will further stress water supplies and human health. Deforestation, desertification, and agricultural land degradation will decrease terrestrial carbon sequestration, contributing to the greenhouse effect.

Climate change thus threatens economic security by narrowing the window for achieving sustainable development. The security problem is exacerbated because the nations at highest risk are not typically responsible for the industrial development that contributed to current GHG levels. Indeed, for some Asia-Pacific nations, the threat of climate change is existential. Rising sea levels and

storm surges threaten water, food, and shelter on low-lying island nations.³ Other low-lying nations, such as Bangladesh, are highly vulnerable to climate change, as are coastal cities in nations including Vietnam, the Philippines, China, and India. Water supplies and, thus, agriculture are at risk in eastern and southern Asian nations where rivers originate in Himalayan glaciers, and in areas threatened by drought or desertification, including large areas of China and Australia. Competing demands for water may be exacerbated by climate change in transnational watersheds such as the Indus, Ganges, Brahmaputra, and Mekong rivers, requiring international cooperation for conflict management.

Developing nations in the Asia-Pacific region tend to frame climate change as a sustainable development problem. Developed nations, concerned about regional stability in the face of climate-related stress, have begun to frame it as a security problem. Indeed, the “securitization of climate change” has itself become a matter of contention. Since 2007, developed nations, including the United States and Australia, have begun to adopt a security framework for addressing problems of climate change,⁴ a perspective resisted by major developing countries, including China, India, and the Russian Federation. In a July 2011, debate in the U.N. Security Council, as reported in *The New York Times*, “Western powers like the United States argued that the potential effects of climate change, including the mass migrations of populations, made it a crucial issue in terms of global peace and security. Russia and China, backed by much of the developing world, rejected the notion that the issue even belonged on the Security Council agenda.”⁵

³ See, for example, Pacific Small Island Developing States, “Views on the Possible Security Implications of Climate Change” (September 2009), available at: http://www.un.org/esa/dsd/resources/res_pdfs/ga-64/cc-inputs/PSIDS_CCIS.pdf.

⁴ U.S. Department of Defense, *2010 Quadrennial Defense Review Report* (February), 84–88, available at: http://www.defense.gov/qdr/images/QDR_as_of_12Feb10_1000.pdf.

⁵ Neil MacFarquhar, “U.N. Deadlock on Addressing Climate Shift,” *The New York Times* (20 July, 2011), available at: <http://www.nytimes.com/2011/07/21/world/21nations.html>.

The complexities of the Earth system are compounded by the different interests and perspectives of the nation states that must cooperate to address the problems of climate change. Moreover, pathways for the solutions of those problems must cross boundaries of practice, such as scientific research, economic development, and security, and those of institution and protocol, including global, regional, and bilateral international relations.

Climate Change and International Cooperation for Development and Security

It is possible to discern three areas for action to address the complex problems of climate change: 1) GHG mitigation through emission reduction and sequestration; 2) adaptation, or changes in practice and resilience to ameliorate the impacts of warming; 3) knowledge creation and dissemination to support policy and planning in the other two areas.

Responsibility for both human and national security is exercised primarily by sovereign nations through their agencies of government, and internationally through bilateral and multilateral agreements. Climate change is an inherently transnational phenomenon, and addressing its problems requires action at several levels. Climate change is on the agenda of global organizations such as the United Nations (UN) and the World Bank, and regional organizations such as APEC, the Association of South East Asian Nations (ASEAN), and the Asian Development Bank (ADB). Bilateral relations to address issues of climate change have been established across the Asia-Pacific region by national agencies for development, research, and security. The role of multilateral regional organizations is less developed and less known.

Global organizations have been most successful at knowledge synthesis and dissemination. IPCC has successfully drawn upon worldwide scientific research to inform policy makers and the public worldwide. Global organizations have been less successful at crafting agreements for GHG mitigation. The UN Framework Convention on Climate Change (UNFCCC) has worked since

1992 to forge an agreement on national actions for GHG mitigation. The Kyoto Protocol of 1997 failed to resolve differences between developed and developing nations, and subsequent attempts to find common ground have yet to achieve general agreement. Meanwhile, global GHG emissions continue to grow.⁶

More recently, UNFCCC conferences have begun to consider global needs for adaptation to climate change. Most agreements concern multilateral funding to support adaptation projects in the least developed countries. In 2001, the Marrakesh meeting agreed to support the world's forty-nine least-developed countries, including thirteen Asia-Pacific nations, in preparing National Adaptation Programs of Action. The Cancun conference of 2010 adopted a UNFCCC Adaptation Framework, followed in 2011 by an agreement in Durban to establish a Green Climate Fund with a goal of \$100 billion per year by 2020.⁷

That is an ambitious goal, given OECD's calculation that multilateral aid for climate adaptation and mitigation was \$718 million in 2010. Bilateral aid, on the other hand, totaled \$23 billion, with Japan the largest donor, at almost \$8 billion.⁸ National development agencies in several OECD nations have instituted programs to help developing nations adapt to the impacts of climate change. In 2010, for example, President Barack Obama established a Global Climate Change Initiative as a pillar of U.S. development policy. In 2012, USAID published its Climate Change & Development Strategy, with a goal to "enable countries to accelerate their transition to climate-resilient low emission sustainable development."⁹

⁶ Justin Gillis, "Carbon Emissions Show Biggest Jump Ever Recorded," in *The New York Times* (December 4, 2011), available at: <http://www.nytimes.com/2011/12/05/science/earth/record-jump-in-emissions-in-2010-study-finds.html>.

⁷ John M. Broder, "Climate Talks in Durban Yield Limited Agreement," in *The New York Times* (December 11, 2011), available at: <http://www.nytimes.com/2011/12/12/science/earth/countries-at-un-conference-agree-to-draft-new-emissions-treaty.html>.

⁸ OECD, "First-ever Comprehensive Data on Aid for Climate Change Adaptation" (November 2011), available at: <http://www.oecd.org/dataoecd/54/43/49187939.pdf>.

⁹ USAID, "Climate Change and Development: Clean Resilient Growth" (January 2012), available at: www.usaid.gov/our_work/policy_planning_and_learning/documents/GCCS.pdf.

The U.K. Department for International Development and Canada's International Development Research Centre jointly sponsored a series of investigative reports on climate adaptation in Asia.¹⁰ The Japan International Cooperation Agency supports climate-related development projects in every Asian developing nation except North Korea.¹¹ The Korea International Cooperation Agency, in 2008, established an East Asia Partnership Program that undertakes bilateral energy and environmental development projects in ten Asia-Pacific nations.¹²

Asia-Pacific nations also cooperate in a variety of bilateral climate-related research programs. In 2011, for example, Australia's Pacific Climate Change Science Program published climate projections in cooperation with the meteorological services of 15 Pacific island nations.¹³ In 2009, China and the United States launched a U.S.–China Clean Energy Research Center.¹⁴ The U.S. Environmental Protection Agency lists eight bilateral research programs engaging Asia-Pacific nations, including China, India, the Philippines, and South Korea.¹⁵

Asia-Pacific regional security organizations have not played a leading role in addressing climate issues. ASEAN leaders issued an aspirational climate policy declaration calling for international agreement on GHG mitigation consistent with sustainable growth, and developed a common platform in advance of the Copenhagen summit in 2009.¹⁶ But ASEAN has not taken a lead in regional pro-

¹⁰ Reports on China, South Asia and Southeast Asia are available at <http://www.i-s-e-t.org/publications/reports>.

¹¹ Japan International Cooperation Agency, "JICA's Cooperation for Climate Change" (October 2010), 6, available at: www.jica.go.jp/english/publications/brochures/pdf/climate_change.pdf.

¹² See KOICA's website at <http://eacp.koica.go.kr/business/01.jsp>.

¹³ Available at: <http://www.cawcr.gov.au/projects/PCCSP/publications.html>.

¹⁴ See the Center's website at: <http://www.us-china-cerc.org/index.html>.

¹⁵ U.S. EPA, "Bilateral Partnerships and Activities" (undated), agency web page at: http://epa.gov/climatechange/policy/international_bilateral.html.

¹⁶ ASEAN Statement on Joint Response to Climate Change (April 9, 2010), available at: www.ascan.org/24515.htm.

gram development for mitigation or adaptation. In 2009 and 2010, the ASEAN Regional Forum (ARF) held seminars to discuss the security implications of climate change, but, to date, these meetings have not had programmatic results.”¹⁷

Regional R&D organizations have had varied levels of success. In 2005, seven Asia-Pacific nations formed the Asia-Pacific Partnership on Clean Development and Climate (APP), a non-treaty, public-private partnership for technology development and transfer for GHG mitigation. It was seen by some as a U.S.-sponsored, industry-friendly alternative to the regime of the Kyoto Protocols.¹⁸ If so, it was a short-lived initiative. APP quietly closed its doors in April 2011.

Three of APP’s eight industrial task forces (steel, power, and cement) became core members of a new, Global Superior Energy Performance Partnership established by the Clean Energy Ministerial Meeting in 2010.¹⁹ This suggests that GHG mitigation is inherently a problem of the global commons, and technology development for GHG mitigation is best addressed at the global level.

More successful has been the Asia-Pacific Network for Global Change Research (APN), based in Kobe, Japan. APN funds collaborative, problem-driven research that can contribute to the development of policy options to respond to global change. APN’s budget is small, but its projects are both inclusive and responsive to regional needs. Its awards are typically \$30,000 to \$60,000 per annum. About \$700,000 is awarded each year for research and

¹⁷ Manalo, Enrique A. “Results of ‘The ASEAN Regional Forum: Security Implications of Climate Change’ (March 30, 2011), remarks to the IOM Workshop on Climate Change, Environmental Degradation and Migration, available at: www.iom.int/jahia/webdav/shared/shared/mainsite/microsites/IDM/workshops/climate-change-2011/SessionIV-Presentation-Enrique-Manalo.pdf.

¹⁸ “The Asia-Pacific Partnership and the Kyoto Protocols: In Conflict or Cooperation?” in *Science Daily* (January 11, 2010), available at: www.sciencedaily.com/releases/2010/01/100111102529.htm].

¹⁹ Fujiwara, Noriko, “Sector-specific Activities as the Driving Force towards a Low-Carbon Economy: From the Asia-Pacific Partnership to a Global Partnership,” *CEPS Policy Brief No 262* (January 2012), available at www.ceps.eu.

\$600,000 for technology and policy capacity-building projects in the form of workshops and conferences.²⁰ APN's projects are multinational, regional, and address specific issues of adaptation or mitigation. For example, a 2009, Russian-led project engaged researchers from Australia, China, Thailand, and Vietnam to address water insecurity in Asia-Pacific river basins. An American-led project engaged researchers from Laos, Thailand, and Vietnam to study ways that small landholders could contribute to national GHG emission goals.²¹

Twenty-two countries participate in APN programs, but APN funding has been essentially bilateral. The Environment Agency of Japan and the Hyogo Prefecture provide about 80 percent of its budget, and the U.S. Global Change Research Program about 20 percent. Although APN has consistently sought to broaden its funding base, only Australia, New Zealand, and Korea have contributed occasional, token amounts to the general budget. Member nations do provide additional support to specific projects in which their institutions are involved.²²

As a regional economic forum, APEC has also become engaged with knowledge production and policy for climate change. In 2007, APEC leaders issued a "Declaration on Climate Change, Energy Security and Clean Development". The *Sydney Declaration* recognized the need for a mitigation agreement under the UNFCCC and set forth aspirational goals for mitigation and sequestration for member nations. It also promulgated an APEC Action Agenda that agreed to establish an Asia-Pacific Network for Energy Technology (APNet) and an Asia-Pacific Network for Sustainable Forest Management (APFNet), addressing two areas of importance

²⁰ APN, APN Science Bulletin, Issue 2 (March 2012), 122–124, available at: <http://www.apn-gcr.org/resources/items/show/1746>.

²¹ APN, Annual Report 2009-2010, 3, available at: http://www.apn-gcr.org/images/publications/institutional/annualReports/AnnualReport_0910_English.pdf.

²² APN, "Strategic Plan 1999-2004," "Strategic Plan 2005-2010," and "2010-2015 Strategic Plan," available at: <http://www.apn-gcr.org/publications/institutional/strategic-plans/>.

to GHG mitigation.²³ APFNet was launched in 2008, with support from China, Australia, and the United States. It has begun to implement programs to achieve the APEC goal of increasing forest cover by 20 million hectares by 2020.²⁴ APNet has yet to get off the ground.

Perhaps because of its emphasis on GHG mitigation, the Sydney Declaration did not take note of the APEC Climate Center (APCC). APCC was established in Busan, Korea, in 2005, in response to a proposal by the Korea Meteorological Administration. The center develops climate and weather models and provides stakeholders with long-term weather forecasts and projections of regional climate impacts on energy, agriculture, and environmental services. With APEC funding, the center has conducted a scientific symposium on climate change each year since 2006, most recently at the 2011 APEC summit in Honolulu. The center has also received funding for technical-training projects from KOICA and APN.²⁵ Although APCC's work has historically focused on meteorology and climate science, the keynote presentation at the 2011 symposium, by Rosina Bierbaum, proposed that adaptation to climate change "...is a huge research agenda that has not been tackled seriously domestically or internationally." She emphasized a need for integrative regional assessments involving stakeholders.²⁶ Subsequent to the symposium, APCC issued a statement, "While APCC has tried to widen its areas of research and services beyond climate science to its application since 2011, APCC is planning to

²³ APEC, "Sydney APEC Leaders' Declaration on Climate Change, Energy Security and Clean Development" (September 9, 2007), available at: http://www.apec.org/Meeting-Papers/Leaders-Declarations/2007/2007_aelm/aelm_climatechange.aspx.

²⁴ "Submission of the Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet) to the Eighth Session of UNFF, (2009), available at: www.un.org/esa/forests/pdf/national_reports/unff8/APFNet.pdf.

²⁵ APEC Climate Center, "History" (2011), web page at the APCC website, available at: http://www.apcc21.net/eng/about/hist/japcc010301_lst.jsp.

²⁶ Rosina Bierbaum, "Adaptation to Climate Change: A rich and timely agenda" (PowerPoint presentation to APCC Symposium, October 17, 2011), available at: http://www.apcc21.net/eng/acts/pastsym/japcc0202_viv.jsp.

further diversify its activities to support research and services to meet socioeconomic needs and interests through 2012.²⁷

It should be noted that APEC support to APCC is given through the Working Group on Industrial Science and Technology. Mitigation projects are also supported by the Working Group on Energy. This structure is consistent with APEC's origins and economic focus. However, the implications of climate change for economic security suggest that a new working group might be appropriate to deal with this emerging threat to economic security.

Conclusion: A Role for APEC?

Climate change is an emerging phenomenon, complexly related to other global trends impacting the physical and social environments. It poses a threat to both economic and environmental security, the scope and scale depending on actions taken to mitigate GHG emissions. Political response to the threat can be addressed in three categories: mitigation, adaptation, and knowledge creation and dissemination.

Mitigation, adaptation, and research activities will take place within the international order of sovereign nations, but the transnational nature of the problem and its threat to the stability of states make international collaboration to address the problem a necessity. Earth's atmosphere is a global commons, and emissions or sequestration at any site affect all locations worldwide. Accordingly, global organizations provide the best forums at which to craft international agreements on GHG mitigation, although specific solutions will depend on national actions within local economic and environmental contexts.

Adaptation is a more local enterprise of infrastructure strengthening and behavior modification to resist environmental degradation and increase resilience to disaster. Because environmental

²⁷ APCC "News and Events Exploring Climate Application and Enhancing Knowledge Sharing with the Developing World" (March 27, 2012), web page at: www.apcc21.org/eng/notice/nae/japcc0501_viv.jsp?news_seq=26.

phenomena are geographic, not political, regional cooperation of states with shared geographies can increase the efficiency and effectiveness of adaptation activities, through collaborative knowledge creation and dissemination, and the sharing of best practices. Examples include Asian river basins and coastal plains, nations on the Arctic rim, and low-lying island nations.

Because climate change is both an emerging and a complex phenomenon, knowledge creation and dissemination is needed at all levels. In her address to the APEC Climate Symposium, Bierbaum emphasized the need for closer links among research, policy, and stakeholder communities to support adaptive planning and management “in all sectors and regions,” and to prioritize policy-relevant research.²⁸ As the leading community of stakeholders in the Asia-Pacific region, APEC can bring unparalleled institutional strength and resources to support adaptive planning and management to meet the economic and environmental security threats of global change.

Environmentalist Stewart Brand has said, “Dealing with climate change “...involves a level of global cooperation that has never happened and the mechanisms for that are not in sight.”²⁹ Regional response to climate change in the Asia-Pacific region to date is consistent with Brand’s observation. Bierbaum’s analysis helps point the way toward regional development of mechanisms for regional collaboration to address the problems of global change.

APCC has a proven record of regionally based, scientific research, and a history of APEC funding. Although its origins are in the atmospheric research community, APCC has a stated intent to expand its activities into the socioeconomic sector. APCC has a history of relationships with APN. It received APN funding for a training course on climate modeling in 2008. It hosted the meeting

²⁸ Bierbaum (2011), see especially slide 3.

²⁹ Joel Achenbach, “Spaceship Earth: A new view of environmentalism,” *Washington Post* (January 2, 2012), available at: http://www.washingtonpost.com/national/health-science/spaceship-earth-a-new-view-of-environmentalism/2011/12/29gIQAZhHWP_story.html.

of the APN Secretariat in 2010. Moreover, APN has a successful, though modest, program of support to adaptive planning and management that engages stakeholders and researchers across the region. Multilateral in operation, it is largely bilateral in funding, though it has been seeking to expand its funding base.

Combining the insights of Brand and Bierbaum, what appears to be lacking in the Asia-Pacific region is a mechanism for managing and closing the links among research, policy, and stakeholder communities to support adaptive planning to meet the threat of climate-related global change. Here lies an opportunity for APEC. A new management mechanism would likely require the spin-off of a new Working Group on Climate-Related Global Change. The group would analyze the complex relationships between environmental and economic security in the Asia-Pacific region, in light of current knowledge at all levels, including the IPCC assessment reports. It would provide increased funding to APN and work to coordinate the efforts of APN and APCC. It would analyze requirements and opportunities for collaboration to meet the problems of mitigation and adaptation at the regional level, and set research priorities to meet those needs, using the power of the budget to do so. It would promote the dissemination of new knowledge to government, industry, and environmental stakeholders using both established and new channels for outreach.

More than any other regional organization, APEC has the foundational mechanisms, experience, and ability to find political consensus among its members and mobilize them to deal with the economic and environmental security challenges of climate-related global change, and achieve a higher level of regional cooperation.