



CHAPTER 9

Climate Change Policy: A Review

Key Messages

All governments in the region have developed plans for addressing climate change challenges and designated key agencies to implement such plans.

As Non-Annex I parties, Southeast Asian countries have no obligation to set quantitative targets for emissions reduction, but they have developed policies, programs, and measures for adaptation and mitigation.

Multilateral institutions and United Nations agencies support climate change initiatives in the region through: sector-specific international initiatives from which the region could benefit to enhance its mitigation efforts and access to low-carbon technologies; institutions and programs that support climate change capacity building and development; international funding sources and mechanisms available for mitigation and adaptation.

Going forward, Southeast Asian countries should integrate adaptation and mitigation actions more closely into their sustainable development poverty reduction strategies and policy-making processes.

While the existing international funding sources available for supporting adaptation and mitigation actions in developing countries fall far short of what is required, and need to be scaled up, the region should enhance institutional capacity to make better use of existing and potential international funding sources.

A. Introduction

Climate change is the most serious market failure the world has ever witnessed. Like any market failure it can only be resolved through the intervention of public policy. As a global public good, its solution requires the intervention of both individual national governments and the world community. In recent years, Southeast Asian countries have established their own national plans and institutions to deal with climate change and its impacts, and to support adaptation and mitigation activities. This chapter looks at the policies, initiatives, and institutional arrangements that exist in the region; at the action plans and programs developed for adaptation and mitigation; and the finance available internationally to fund climate change initiatives.

B. National Policy and Actions in Southeast Asia

All governments in the region have developed climate change plans and designated key agencies to implement them.

As signatories to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol and as part of their commitment to the convention process, each study country has developed its own national plan or strategy for climate change and has established a ministry or agency as the focal point for climate change policy (Table 9.1).

- In Indonesia, the Ministry of Environment's (MoE) Climate Change Division is the focal point serving as the designated national authority for the Clean Development Mechanism (CDM). A National Committee on Climate Change and a related Steering Committee were established to offer broad policy guidance and to make funding allocation decisions. The Steering Committee is served by an advisory panel and a technical committee headed by the MoE and the National Development Planning Agency (BAPPENAS).
- The Philippines, in early 2007, created the Presidential Task Force on Climate Change to be the focal point for all climate change-related activities. It is composed of the Secretary of the Environment and Natural Resources as chair, with the Secretaries of Energy, Science and Technology, Agriculture, and Interior and Local Government, with two representatives from the private sector/civil society as members.

Table 9.1. Government Agencies and Climate Change Key Plans

Country	Focal Point	Key Plans/Strategy
Indonesia	Ministry of Environment, Climate Change Division	National Climate Change Action Plan 2007
Philippines	Presidential Task Force on Climate Change	Philippines Energy Plan 2004–2014
Singapore	Ministry of Environment and Water Resources	National Climate Change Strategy 2006, part of Singapore Green Plan 2012
Thailand	Ministry of Natural Resources and Environment, Office of Natural Resources and the Environmental Policy and Planning	National Strategic Plan on Climate Change 2008–2012
Viet Nam	Ministry of Natural Resources and Environment, Office for Climate Change and Ozone Protection	National Target Program in Response to Climate Change (draft close to completion)

Sources: Boer and Dewi (2008), Cuong (2008), Ho (2008), Jesdapipat (2008), Perez (2008).

- Singapore's Ministry of Environment and Water Resources, which leads the climate change program, developed in 2006 a National Climate Change Strategy as part of the Singapore Green Plan 2012. The strategy requires that climate change response must be sustainable, based on multi-stakeholder efforts, and developed through a consultative approach. In addition, the Ministry of National Development leads an inter-agency task force to review existing infrastructure adaptation measures, and the National Environment Agency has established the Energy-Efficiency Singapore Program Office. The Strategy document targets reducing carbon intensity by 25%, from 1990 levels, by 2012.
- In Thailand, the Ministry of Natural Resources and Environment has responsibility for government policy, within which the Office of Natural Resources and Environmental Policy and Planning (ONEP) is the national focal point to the UNFCCC. The National Climate Change Sub-committee was established under the National Environmental Board after the country ratified the UNFCCC. In July 2007, the government upgraded the National Climate Change Sub-committee to the National Climate Change Committee (NCCC), chaired by the prime minister. Technical subcommittees are also established under the national committee to support different aspects of climate change issues, including mitigation and vulnerability and adaptation. Thailand has already developed the country strategic plan on climate change and is currently developing its 10-year climate change plan. Thailand also established the Thailand Greenhouse Gas Management Public Organization (TGO) in July 2007. While NCCC sets policy, the TGO aims to cover all aspects of implementation of climate change projects, including CDM projects. A key policy aim is to strengthen the links between measures to address sustainable development and those to address climate change. Important areas of overlap include improvements to energy efficiency, and promotion of carbon sequestration.
- In Viet Nam in July 2007, the National Steering Committee for implementing the UNFCCC and the Kyoto Protocol was established. The Department of Meteorology, Hydrology and Climate Change under the Ministry of Natural Resources and Environment (MONRE) is the focal point for climate change activities in the country. A number of financial mechanisms and policies were instituted to support climate change activities through the Prime Minister Decision No. 130 August 2007. In December 2007, the prime minister tasked MONRE, in coordination with other relevant ministries, to establish a national target program in response to climate change.

As Non-Annex I¹ parties, Southeast Asian countries have no obligation to set quantitative targets for GHGs, but they have developed policies, programs, and measures for adaptation and mitigation.

1. Non-Annex I parties are mostly developing countries and recognized by the UNFCCC as especially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought. Others (such as countries that rely heavily on income from fossil fuel production and commerce) feel more vulnerable to the potential economic impacts of climate change response measures.

- Indonesia released its National Climate Change Action Plan in 2007, which calls for greater integration between mitigation, adaptation, and national development goals through better coordination between relevant agencies (energy, transportation, forestry, agriculture). It also called for incorporating climate-related funding decisions into all development plans, with the most promising signs of institutional coordination in medium- and short-term development plans. The plan is based upon “pro-poor, pro-job, pro-growth and pro-environmental” principles. It is also apparent that many sectors treat mitigation or adaptation as a climate co-benefit of developmental policies. Table 9.2 lists selected policies and measures in various sectors in

Table 9.2. Sectoral Policies, Programs, and Measures Relevant to Mitigation and Adaptation in Indonesia

Sector	Policies, Programs, and Measures
Climate Change	<ul style="list-style-type: none"> • Act No. 23/1997 Environmental Management • Act No. 6/1994 Ratification of UNFCCC • Act No. 17/2004 Ratification of the Kyoto Protocol • Decree No. 206/2005 Afforestation and Reforestation (A/R) CDM projects • Decree No. 14/2004 Afforestation and Reforestation (A/R) CDM projects
Energy	<ul style="list-style-type: none"> • National Energy Law/Presidential Decree No. 5/2006 (Perpes) • National Energy Conservation Plan 2002 (RIKEN) • MEMR Decree No. 2/2004 (Green Energy Policy) • MEMR Decree No. 1122/2002 • MEMR Decree No. 02/2006 • Presidential Instruction No. 10/2005 • Ministerial Regulation No. 031/2005
Transportation	<ul style="list-style-type: none"> • The Blue Sky Programme • Indonesia Area Traffic Control System • Ministry of Energy and Mineral Resources Decree No. 1585/K/32/MPE (1999) on Criteria for Marketing of Gasoline and Diesel in Indonesia • Act No. 14 on Traffic and Land Transportation • Government Regulation No. 44 regarding vehicles and vehicle operation • Minister of Environment Decree No. Kep-35/MENLH/10/1993 on Emission Limit for Gas Waste of Motor Vehicles • Governor of DKI Jakarta Decree No. 1041 on Motor Vehicle Emission Standards for DKI Jakarta • President Instruction No. 1/2006 on biofuels • President Instruction No. 10/2006 on biofuels
Forestry	<ul style="list-style-type: none"> • Reduced Emissions from Deforestation and Degradation in Indonesia • Regulation PP6/2006 on Forest Management and Utilization • Ministerial Decree SK. 159/Menhut-II/2004 related to the restoration of degraded ecosystem in production forest areas • Presidential Instruction Inpres 4/2005 on illegal logging • Presidential Decree Keppres 32/1990 prohibiting development on peat >3m deep • Presidential Instruction Inpres 2/2007 on rehabilitation of the ex-Mega Rice Project in Central Kalimantan • Ministerial Decree KepmenEkuin 14/2001 on Integrated Water Resources • Regulation PP 4/2001 on Forbidding the Use of Fire • Ministerial Decree KepMenHut 260/1995 Guidelines for Fire Control/ Prevention
Agricultural	<ul style="list-style-type: none"> • Climate Field Schools • National Climate Information System for Agriculture Development
Water and coastal	<ul style="list-style-type: none"> • Law 27/2007 on Coastal Zone and Small Island Management Conduct • Coral Reef Rehabilitation and Management Programme • Coral Triangle Initiative

Source: Boer and Dewi (2008).

Indonesia, which have implications for climate change mitigation and adaptation.

- The Philippines has initiated many adaptation measures in agriculture, water resources, and coastal areas that also aim to enhance food security, water security, and coastal security (Table 9.3). On mitigation, the government has initiated various strategies through sectoral policies, and other initiatives at the national and local levels (Table 9.4).
- Singapore’s national policy on adaptation is embodied in the Singapore National Climate Change Strategy 2008 (Table 9.5). In the water sector, policies and measures for integrated water resources management, expansion and diversification of water sources (local water, NEWater, imported water, desalinated water); water conservation; and for demand-side management (for example, through pricing and an efficiency labeling scheme) have been introduced. In health, a comprehensive infectious disease surveillance program is also in place to prevent an outbreak of disease due to climate change. On mitigation, an inter-ministerial energy policy group has developed a national energy strategy to increase energy efficiency in all sectors of the economy, as a means to improve energy security, reduce CO₂ emissions, improve air quality, and reduce energy costs for companies and consumers.
- Thailand has taken adaptation measures in several sectors, including agriculture, water resource management, coastal defense, and forest, as shown in Table 9.6. On mitigation, the country has been tapping several policy areas where the link between sustainable development and climate change mitigation can be strengthened. Such policy areas include energy efficiency improvement, promotion of renewable energy, transportation policy, and promotion of carbon sequestration (Table 9.7).

Table 9.3. National Policies in the Philippines Related to Adaptation

Sector	Title of Law/Policy
Agriculture and fisheries	RA 9281 “The Agriculture and Fisheries Modernization Act of 1997” – An Act to Strengthen Agriculture and Fisheries Modernization in the Philippines by Extending the Effectivity of Tax Incentives and Its Mandated Funding Support, Amending for This Purpose Sections 109 and 112 of RA 8435 (March 30, 2004)
Water	RA 9275 “The Philippine Clean Water Act of 2004” – An Act Providing for a Comprehensive Water Quality Management and for Other Purposes (March 22, 2004)
	RA 8041 “The National Water Crisis Act of 1995” – An Act to Address the National Water Crisis and for Other Purposes (June 7, 1995)
	EO 222, Series of 1995 – Established the Committee on Water Conservation and Demand Management (January 24, 1995)
	PD 1067 “The Water Code of the Philippines” (December 31, 1976)
Fisheries	RA 8550 “The Philippine Fisheries Code of 1998” – An Act Providing for the Development, Management and Conservation of the Fisheries and Aquatic Resources, Integrating All Laws Pertinent Thereto, and for Other Purposes (February 25, 1998)
Waste	RA 9003 “Ecological Solid Waste Management Act of 2000” (January 31, 2001)
Coastal	PD 600 “Marine Pollution Decree of 1976” (August 18, 1976)

RA = Republic Act, EO = Executive Order, PD = Presidential Decree.

Source: Perez (2008).

Table 9.4. National Policies in the Philippines Related to Mitigation

Sector	Title of Law/Policy
Energy	RA 9367 “Bio fuels Act of 2006” – An Act to Direct the Use of Bio fuels, Establishing for this Purpose the Bio fuel Programme, Appropriating Funds Therefore, and for Other Purposes (January 12, 2007) Philippine Energy Plan 2004–2014 – Emphasizes Energy Independence and Savings, and Power Sector Reforms
	RA 9136 – An Act Ordaining Reforms in the Electric Power Industry, Amending for the Purpose Certain Laws and for Other Purposes (June 4, 2001)
	EO 462, Series of 1997 – Enabling Private Sector Participation in the Exploration, Development, Utilization and Commercialization of Ocean, Solar and Wind Energy Resources for Power Generation and Other Energy Uses (December 29, 1997)
	EO 123 – Institutionalizing the Committee on Power Conservation and Demand Management (September 8, 1993)
	RA 7638 “Department of Energy Act of 1992” – An Act Creating the Department of Energy Rationalizing the Organization and Functions of Government Agencies Related to Energy and for Other Purposes (December 9, 1992)
	RA 7156 “Mini-Hydroelectric Power Incentives Act” – An Act Granting Incentives to Mini-hydroelectric Power Developers and for Other Purposes (September 12, 1991)
	EO 433, Series of 1990 – Directing the Immediate Implementation of Additional Energy Conservation Measures (November 2, 1990)
	EO 418, Series of 1990 – Directing the Immediate Implementation of an Energy Conservation Program (August 13, 1990)
	EO 412, Series of 1990 – Institutionalizing the Energy Conservation Inter-Agency Committee (July 13, 1990)
	PD 1068 – Directing the Acceleration of Research, Development and Utilization of Non-Conventional Energy Sources (January 12, 1977)
RA 5092 “Geothermal Energy, Natural Gas and Methane Gas Law” – An Act to Promote and Regulate the Exploration, Development, Exploitation and Utilization of Geothermal Energy, Natural Gas and Methane Gas; to Encourage its Conservation; and for Other Purposes (June 17, 1967)	
Transportation	RA 8749 “The Philippine Clean Air Act of 1999” (January 23, 1999)
	EO 396, Series of 2004 – Reducing Rates of Import Duties on CNG Vehicles
	EO 397, Series of 2004 – Reducing Rates of Import Duties on Low-Displacement/Hybrid Vehicles
Forestry	RA 7586 “The National Integrated Protected Areas System (NIPAS) Act” (June 1, 1992)
	EO 263 – Adopting a Community-Based Forestry Management as the National Strategy to Ensure the Sustainable Development of the Country’s Forestlands Resources and Providing Mechanisms for its Implementation (July 19, 1995)
	PD 705 – Revised Forestry Code of the Philippines, Revising PD 389 (May 19, 1975)

RA = Republic Act, EO = Executive Order, PD = Presidential Decree.

Source: Perez (2008).

Table 9.5. National Climate Change Adaptation Plans and Implementation in Singapore

Sector	Adaptation Plans and Implementation
Water	<ul style="list-style-type: none"> • Increase reclaimed water to meet 30% of national needs • Installation of 136 million liters/day of water using reverse osmosis (RO) technology • Increase water catchment from half to two-thirds of national land area • Water conservation strategy through pricing • Mandatory measures to reduce excessive flow and wastage
Flooding and sea-level rise	<ul style="list-style-type: none"> • Further reduction of flood areas from current 98 ha to 56 ha in 2011 • Land reclamation policy (1991) minimum of 125 cm above highest tide level • Key infrastructure to be at least 1 meter above recorded flood levels • Review of storm water design criteria • Building of rain forecasting capabilities
Energy	<ul style="list-style-type: none"> • Displacement of oil in power generation by natural gas • Development of liquefied natural gas terminal by 2012 to further promote use of natural gas in all sectors of the economy • Promotion of research and development capabilities and manufacturing capacity in renewable energy, for example in biofuels and solar photovoltaic cells

Table 9.5. National Climate Change Adaptation Plans and Implementation in Singapore (continued)

Industry	<ul style="list-style-type: none"> • Energy Efficiency Improvement Scheme providing 50% of cost of energy audits of buildings and industrial processes • Grant for Energy Efficient Technology to provide funding to private sector companies to offset part of their investment costs for energy efficient equipment • Design for Efficiency Scheme has been introduced to help companies incorporate energy efficiency considerations during the conceptual design phase by co-funding cost of design workshops • Singapore Certified Energy Manager Training Grant has been introduced to equip facilities owners and technical staff with the knowledge and skills to manage energy services
Transport	<ul style="list-style-type: none"> • Land transport policies are focused to encourage public transport • Car ownership is discouraged through imposition of taxes on vehicle ownership • Vehicle congestion is managed through road pricing system and integrated land-use planning
Buildings	<ul style="list-style-type: none"> • Standard to reduce external heat transfer to air-conditioned buildings has been introduced, Envelope Thermal Transfer Value of such buildings is currently set at 50 W/m² • Green Mark Scheme, a building rating scheme, has been introduced to encourage incorporation of environment-friendly and energy-saving features. From 2008, all new buildings and existing buildings with gross floor area greater than 2,000 m² must meet this standard • From 2008, all household refrigerators and air-conditioners must be energy labeled.
Public health	<ul style="list-style-type: none"> • Improve health care system through raising standards of healthcare, increase capacities and resources of hospitals • Vector control and surveillance system and programme and research and development

Source: Ho (2008).

Table 9.6. National Climate Change Adaptation Plans and implementation in Thailand

Sector	Adaptation Plans and Implementation
Agriculture	<ul style="list-style-type: none"> • Germplasm banks for major crops • Increase use of degraded land for flood control • Specific policy on food security • Improve water efficiency in cropping and appropriate use of land • Experiment crops in marginal land areas • Financial and technological support for local communities in adaptation • Forest-set aside program
Water	<ul style="list-style-type: none"> • Reforestation in key watershed areas, with participation from rural communities • Introduce economic incentives for water management, especially for recreation and industry • Supply mapping, water balance • Research on climate change and water to gain better understanding of the issues • Research and capacity enhancement for local communities • Monitor use and sustainability • International cooperation, including with the Mekong River Commission (MRC) • Support community-level management of water • Enhance the capacity of water management agencies to comprehend and manage the potential impacts of climate change on water resources • Research the possibility of inter-basin transfer to enable Thailand to manage water resources
Forest	<ul style="list-style-type: none"> • Research and development on adaptation of forests • Monitoring of degraded forests • Ex situ and in situ conservation of tree species • Human intervention in forest management in key watersheds • Stop forest destruction and promote private sector forestation
Coastal areas	<ul style="list-style-type: none"> • Research, development and monitoring of sensitive areas • Financial support for area-based management • Climate proof design of public infrastructure • Monitoring of existing infrastructure in sensitive areas • Plan and monitor long-term use of coastal areas
Health	<ul style="list-style-type: none"> • National study on climate change and malaria • Monitoring and preventive measures for malaria • Regional training for preventive measures to malaria • Investigate other health-related impacts of climate change

Source: ONEP (2008).

Table 9.7. National Mitigation Plans and Implementation in Thailand

Issue	Mitigation Policy/Plan
Energy efficiency improvement	<ul style="list-style-type: none"> • Improve process efficiency in the industrial sectors • Efficient motors • Cleaner technology in small and medium enterprises through incentives
Renewable energy and other alternative energy	<ul style="list-style-type: none"> • Promote renewable energy, including rhododendron energy • Private sector–government sector partnership in renewable energy as a pilot phase • Revise pricing schemes to reflect the true cost of fuels • Fuel switching (toward bioethanol and biodiesel)
Transportation	<ul style="list-style-type: none"> • Master plan in large cities • Promoting use of mass transit systems in Bangkok • Car pool in government and private sectors • Use of economic incentives to encourage mode switching • Invest in mode supplies • Enhance co-benefits of energy use • Retrofitting and improvement of engine efficiency • Promote natural gas in vehicles
Non-energy sector: Rice	<ul style="list-style-type: none"> • Soil, water, and fertilizer management • Research and development for GHG reduction in the rice sector • Local knowledge and rice technology • Improve efficiency in rice production • Inter-agency coordination to implement plans
Waste	<ul style="list-style-type: none"> • Waste from livestock sector • Waste from household and industrial sectors • Policy coordination
Forest	<ul style="list-style-type: none"> • Master plan • Community forest law • Management plan for mangrove land • Reform of forest-related agencies
Other initiatives	<ul style="list-style-type: none"> • Secure natural gas supply by the state • Integrate the environmental aspects in fuel use • Promote environmentally friendly electricity production, especially in rural areas • Expand demand-side management • Reduce GHG emissions at source using economic incentives and technology • Revise the energy plan to enable technology transfer, research and development, and local knowledge

Source: ONEP (2008).

- In Viet Nam, there is scope for further addressing adaptation to climate change in policies on agriculture and water. On mitigation, Viet Nam introduced the Energy Law in 2005, aiming at improved energy efficiency and promotion of renewable sources of energy. Table 9.8 provides the country's climate change adaptation and mitigation policy initiatives in the context of its Agenda 21 priorities.

Tables 9.9 to 9.11 summarize the policies on energy efficiency, renewable energy, and use of biofuels in Indonesia, Philippines, Singapore, Thailand, and Viet Nam.

Table 9.8 Priority Areas of Viet Nam's Agenda 21 and Current State of Related Laws and Regulations (continued)

Area	Priority Areas Envisaged in Viet Nam Agenda 21	Laws/Regulations/Mechanisms/Studies
Mitigation		
Overall	<ul style="list-style-type: none"> • Shift in economy characterized by extensive exploitation and utilization of raw materials into one characterized by more skillful goods and processing capacity with a view to increasing added value for each unit of exploited natural resources • Save resources in the development process, effectively and efficiently utilize scarce natural resources, control consumption so that it will not encroach upon the welfare of future generations 	<ul style="list-style-type: none"> • Asia least cost GHG abatement strategy (study, 1995–1997) • Economics of GHG limitation (study, 1996–1998) • Preparation of initial national communication (program, 1999–2002) • National strategy study on CDM (study, 2002–2004) • Capacity development for CDM (program, 2004–2006) • National Target Programme as a basic strategy to respond to climate change was established under MONRE (program, 2007) • Viet Nam second national communication (program)
Energy efficiency and renewable energy	<ul style="list-style-type: none"> • Study and incorporate environmental and social aspects into the system of national accounting • Application of environmentally friendly and cleaner technologies • Healthy lifestyle and reasonable consumption pattern • Regulate inappropriate consumption patterns through economic instruments • Clean industrialization process through legislation, technologies, and economic instruments 	<ul style="list-style-type: none"> • The electricity law (2005) • Decree for energy saving and efficiency (2003) • Developing a model of vertical brick kiln with high energy efficiency (2001–2003) • Energy efficiency in public lighting (2005–2009) • Promoting energy conservation in small- and medium-scale enterprises (2005–2009) • Promotion of renewable energy, energy efficiency, greenhouse gas abatement (2002–2004) • Demand-side management and energy efficiency (2004–2007)
Forestry		<ul style="list-style-type: none"> • Law on forest protection and development (2005) • Strategy on forestry development for 2006–2020 (2007)
Land use		<ul style="list-style-type: none"> • Decree No. 70 requiring all documents registering family assets and land use rights to include the names of wives as well as husbands (2001)

Table 9.8 Priority Areas of Viet Nam's Agenda 21 and Current State of Related Laws and Regulations (continued)

Area	Priority Areas Envisaged in Viet Nam Agenda 21	Laws/Regulations/Mechanisms/Studies
Adaptation		
All sectors	<ul style="list-style-type: none"> • Improve agriculture sustainability through agroforestry, sustainable water management methods, expanding organic agriculture and other sustainable practices • Development of regions and localities through capacity building for better planning and management in all spheres of life, participatory planning • Eradication of extreme poverty, narrow the gap between economic classes and rural and urban areas, empower women and other social groups • Control population growth rate • Sustainable urban growth through better local and regional planning • Enhanced health care facilities with a focus on disadvantaged sections of the society • Sustainable land and water management through legislative, economic, and technical means • Protection of marine, coastal, and island environments 	<ul style="list-style-type: none"> • Environmental protection law (1993 and amendments in 2005) • National strategy on environmental protection to 2010 and vision to 2020 (2003) • Strategic orientation for sustainable development (VA21) • Socio-economic development strategy 2001–2010 • Directive to the implementation of KP to the UNFCCC (2005) • The comprehensive poverty reduction and growth strategy through Document No. 1649/Cp-QHQT dated 26 November 2003 (2003) • 2nd national strategy and action plan for disaster mitigation and management 2001–2020 (2001) • Climate change in Asia: Viet Nam (program, 1992–1994) • CC:TRAIN for formulating climate policy (1994–1996) • Socio-economic and physical approaches to analyzing climate change impacts in Viet Nam (study, 1996–1998) • Disaster preparedness and climate change (2003–2005)
Agriculture and water	<ul style="list-style-type: none"> • Forest protection and development 	<ul style="list-style-type: none"> • The water resources law (1999) • Developing a model to reduce methane emission from paddy rice cultivation through innovative water management (program, 2002–2004)
Coastal resources		<ul style="list-style-type: none"> • Viet Nam coastal zone vulnerability assessment (program, 1994–1996) • Viet Nam–Netherlands integrated coastal zone management project (2000–2003) • Viet Nam coastal wetlands protection and development project (project, 2001–2006) • Climate change impacts in Huong river basin and adaptation in its coastal district Phu Vang (program, 2005–2008)

Source: Cuong (2008).

Table 9.9. Comparison of Policies on Energy Efficiency

Policy Type	Indonesia	Philippines	Singapore	Thailand	Viet Nam
National energy efficiency strategy					
Energy audits and conservation fund					
Financial subsidies					
Tax incentives					
Regulatory Instruments					
Energy performance standards					
Mandatory product labels					
Voluntary labels					
ISO certified companies	369	312	573	974	-

- = data not available.
Source: IGES (2008).

Table 9.10. Comparison of Renewable Energy Policies

Policy Type	Indonesia	Philippines	Singapore	Thailand	Viet Nam
Renewable energy targets					
Independent power producer frameworks					
Net metering regulations					
Public-private partnerships					
Research, development, and deployment					
Investment incentives					
Tax measures					
Feed-in tariffs					
Voluntary corporate efforts					

Source: IGES (2008).

Table 9.11. Comparison of Biofuel Policies

Policy Type	Indonesia	Philippines	Singapore	Thailand	Viet Nam
Numerical target	Biofuel use: 2% of energy mix by 2010	No target (Biofuel Act of 2006)	1 million tons biodiesel per year by 2012 and 3 million tons by 2015	To replace 20% of fuel consumption with biofuels and natural gas by 2012	500 million liters of ethanol by 2020; and 50 million liters of biodiesel by 2020
Blending mandate	Blending is not mandatory but blended (2-5%) fuels are sold	Gasoline: at least 5% ethanol; 10% by 2010 Diesel: 1-5% coconut blend	No	2% palm oil for all diesel vehicles from April 2008	Targets biofuel production of 100,000 tons of 5% ethanol blend and 50,000 tons of 5% biodiesel blend each year
Economic measures	No special incentive	Tax incentives; income tax holiday; duty-free imports	No	Taxes and levies for E10 are lowered	Government plans to create favorable conditions for the development of biofuels and promote investments, including tax incentives and low-interest loans
Policy for new biofuels	Considering jatropha and cassava	Considering jatropha	Yes	Yes	Yes

Sources: APEC Biofuels (2008), Boer (2008), Ho (2008), Jesdapipat (2008), Perez (2008).

C. Global and Regional Initiatives in Southeast Asia

Multilateral institutions and United Nations agencies are active in supporting climate change initiatives in the region.

There are strong reasons why regional financial initiatives have an important role in climate change policy. As a regional development bank, the Asian Development Bank (ADB) has several dedicated funds for financing climate change mitigation and adaptation in Asia and the Pacific (Sharan 2008). These perform a variety of functions, including mobilizing concessional resources, catalyzing private capital, and using market mechanisms to address environmental issues. The following are the key regional funds available:

Climate Change Fund (CCF)

The CCF was established in May 2008 to provide grant financing for projects, technical assistance, research, and other activities to address the causes and consequences of climate change in ADB's developing member countries (DMCs). ADB has provided an initial \$40 million to CCF, with \$25 million made available for clean energy development, \$5 million for sustainable forestry and other land use, and \$10 million for adaptation. There are several technical assistance projects being developed across ADB to be supported by the fund. The fund is open for further contributions from countries, other development organizations, foundations, the private sector, and other sources.

Clean Energy Financing Partnership Facility (CEFPF)

Established in April 2007, the CEFPF provides financing to DMCs to improve energy security and transition to low-carbon economies through cost-effective investments in technologies and practices that result in GHG mitigation. The CEFPF also finances policy, regulatory, and institutional reforms that encourage clean energy development. It has a target size of \$250 million and has received donor commitments amounting to about \$90 million from Australia, Japan, Norway, Spain, and Sweden as of April 2009.

Asia Pacific Carbon Fund (APCF)

The APCF was operationalized in May 2007 as part of ADB's Carbon Market Initiative (CMI). It provides upfront co-financing to projects eligible for the Clean Development Mechanism in return for a proportion of GHG emission reduction to be generated until 2012. The APCF has received funding commitments of \$151.8 million from seven European countries—Belgium, Finland, Luxembourg, Portugal, Spain, Sweden, and Switzerland. It has committed over \$50 million in several CDM projects across the region and expects to commit the entire fund in projects by end of 2009.

Future Carbon Fund

An integral part of ADB's CMI, the FCF was approved in July 2008 and operationalized in January 2009. The FCF provides upfront financing to project developers through purchase of post-2012 carbon credits. As of April

2009, the Fund is capitalized by contributions from three European sovereign and public bodies and is expected to have additional public and private sector participants by the Fund closing before March 2010. The initial target size of \$100 million is expected to be surpassed in the first half of 2009.

Water Financing Partnership Facility (WFPF) and the Poverty and Environment Fund (PEF)

Two smaller funds are the Water Financing Partnership Facility (WFPF) and the Poverty and Environment Fund (PEF). The WFPF provides financial resources and technical support for rural water services, urban water services, and river basin management. For 2007/2008, the WFPF had secured donor commitments for a total of \$26 million from Australia, Austria, Netherlands, and the Norway Fund. The PEF is a \$3.6 million multidonor trust fund administered by ADB that promotes the mainstreaming of environmental and climate change issues into development plans.

Regional Other Initiatives

ADB also operates a range of programs supporting climate change initiatives in relation to specific sectors. It has sought to promote energy efficiency savings and the development of renewable energy sources. It has set up a \$250-million facility, the Energy Efficiency Initiative, to finance energy efficiency projects; and its Carbon Market Initiative aims to fund clean energy projects. In terms of waste management ADB has joined the United States Environmental Protection Agency's Methane to Markets Partnership. In the transportation sector, ADB has launched the Sustainable Transport Initiative to ensure that climatic effects are incorporated in the design of future transport projects. In support of this goal, ADB is funding the development of energy efficient public transport systems in Bangkok, Ho Chi Minh City, and Manila. In contrast to energy and transportation, ADB has made relatively less progress in the forestry and land use sectors. It has assisted several forestry-based initiatives through the Greater Mekong Subregion (GMS), acting as an executing agency for the Global Environment Facility (GEF). It has also supported investments to prevent forest loss and degradation for more than 3 million ha of forest in Viet Nam. In Indonesia, it has provided technical assistance to the Ministry of Environment to implement forestry-based CDM projects. However, more remains to be done in this area.

In coastal and marine resources, ADB has launched the Coral Triangle Initiative to protect the region's coral resources from further degradation. In relation to coastal resources, ADB has worked with the GEF on the Coral Triangle Initiative to preserve some of the world's most valuable coral resources. It has also co-funded the Coral Reef Rehabilitation and Management Program to develop decentralized community-based resource management systems in Indonesia.

ADB also encourages private sector involvement in climate change initiatives. For example, it is making equity investment of up to \$20 million each in three regional private equity funds focused on clean energy—the Asia Clean Energy Fund, Global Environment Fund Management Corporation South Asia Clean Energy Fund, and MAP Clean Energy Fund. It is also trying to use

private sector expertise in the pricing of risk to create insurance products for countries facing the risk of climate-related natural disasters. In collaboration with the World Bank, ADB is developing a Pacific Catastrophe Risk Pool Initiative, which will ensure short-term liquidity to Pacific island states after a natural disaster.

World Bank

The World Bank, recognizing the primacy of the UNFCCC process, has adopted a Strategic Framework for Development and Climate Change in 2008 based on six areas that address adaptation and mitigation: (i) support climate actions in country-led development processes; (ii) mobilize additional concessional and innovative finance; (iii) facilitate the development of market-based financing mechanisms; (iv) leverage private sector resources; (v) support the acceleration of the development and deployment of new technologies; and (vi) step up policy research, knowledge, and capacity building. This framework will provide better support to developing countries in achieving poverty reduction and growth objectives, while recognizing the adverse impacts of climate change.

On adaptation, the World Bank work covers climate-sensitive sectors, such as agriculture and natural resources, water, energy and health. The World Bank develops tools for climate data dissemination and mapping, screening of climate risk to projects, and pilot insurance programs for protection against bad weather. On mitigation, World Bank activities are directed to supporting operations of its clients to reduce GHG emissions in the energy, urban, transport, and forestry sectors. Such operations provide benefit from carbon revenues through the carbon finance (CF) program or access to GEF cofinancing.

- In March 2008, the World Bank signed an innovative Emission Reduction Purchase Agreement with PT Gikoko Kogyo Indonesia (Gikoko) to reduce GHG emissions, improve solid waste management, and provide funding for local communities in the Municipality of Bekasi. Under this agreement the World Bank serves as the trustee of the Netherlands Clean Development Mechanism Facility to purchase Certified Emissions Reductions. This kind of public-private sector partnership removes the barrier that restricts private sector involvement in solid waste management. The initiative can be seen as a catalyst to develop similar CDM projects in the municipal solid waste sector.
- The World Bank has developed a technical assistance program called CF Assist that enhances the capacity of developing countries in climate change and CF to enable them to effectively participate in the carbon market. The program supports institutional strengthening, engagement of financial and new industrial sectors, project portfolio

development and knowledge sharing, and information outreach. The earliest CF Assist programs were launched in Cambodia, People's Republic of China, Indonesia, and Philippines. New programs have been launched in Mongolia and Viet Nam.

- The World Bank has developed some carbon offset programs/initiatives in the region including: (i) Philippine Ethanol Plant Wastewater Biogas Project; (ii) Makassar-TPA Tamangapa Landfill Methane Collection and Flaring in Indonesia; (iii) Livestock Waste Management in Thailand; and (iv) Kota Kinabalu Composting Project in Malaysia.

United Nations Environment Programme (UNEP)

UNEP has developed climate change strategy on four themes: (i) facilitating a transition toward low-carbon societies; (ii) adapting by building resilience; (iii) improving understanding of science; and (iv) communicating and raising public awareness. In Southeast Asia, UNEP was involved in projects such as (i) integrating climate change adaptation measures into the Mangroves for the Future Initiative; (ii) capacity building to integrate disaster risk reduction into coastal zone management; (iii) enhancing capacity to adapt to climate change in the Philippines under the Millennium Development Goal (MDG) Fund; (iv) developing tools and methodologies for national and city assessments for Viet Nam and Thailand; (v) holding a series of national workshops with the aim of building the capacity of policymakers in developing and implementing national climate change laws and policies to combat climate change challenges in Cambodia, Lao People's Democratic Republic (Lao PDR), Myanmar, and Viet Nam.

UNEP also launched the project Capacity Development for the Clean Development Mechanism, with the aim of generating a broad understanding of the opportunities offered by CDM in participating developing countries, and developing the necessary institutional and human capabilities that allow them to formulate and implement projects under the CDM. In Asia, during Phase I of this project, capacity and project development activities were completed in Cambodia, Philippines, and Viet Nam.

United Nations Development Programme (UNDP)

UNDP has been active in the region through its country offices as well as regional office in Bangkok. In June 2007, UNDP launched the MDG Carbon Facility, an innovative support scheme for the development and commercialization of CDM projects. In the coming years it is expected to play a key role in mobilizing the potentially significant benefits of CF for the developing world including Southeast Asia. The key objectives of the MDG Carbon Facility are to broaden access to CF by enabling more developing countries to participate; and to further promote CDM emissions reduction

projects that contribute to the MDGs, by yielding additional sustainable development and poverty reduction benefits.

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

UNESCAP has been working on four areas related to climate change in Southeast Asia: (i) advocacy of the concept of “green growth”; (ii) promotion of a regional approach to achieving climate-friendly and climate change-resilient society; (iii) promotion of voluntary participation of developing countries in Asia and the Pacific in global GHG emission reduction through preparation of guidebooks for promoting unilateral CDM; and (iv) promotion of a regional perspective on a post-2012 climate framework.

Through a combination of these four-track activities, UNESCAP promotes the integration of climate change policies into national development planning with emphasis on environmental and socio-economic co-benefits. In particular, it ensures the policy compatibility of national climate actions and sustained economic growth/recovery. It offers various forms of support to member states, such as regional/subregional policy dialogue, leadership training and tailor-made national capacity building events focusing on tackling climate change issues through a green growth approach, upon request from member countries.

The Association of South East Asian Nations (ASEAN)

During the 13th ASEAN Summit in November 2007, ASEAN reaffirmed the need to tackle climate change based on the principles set out by the UNFCCC through the Singapore Declaration on Climate Change, Energy and Environment. The declaration aims, among other things, to deepen the understanding of the region’s vulnerability to climate change and to implement appropriate mitigation and adaptation measures. These include intensifying ongoing operations to improve energy efficiency and the use of cleaner energy, promoting cooperation in afforestation and reforestation, and continuing support and initiatives under the UNFCCC. Among concrete measures, the 41st ASEAN Ministerial Meeting in July 2008 delegated the responsibility of mainstreaming climate change actions into ASEAN programs to the ASEAN sectoral bodies on energy efficiency, transportation, and forestry.

- On energy generation, the Memorandum of Understanding on the ASEAN Power Grid, should it materialize, could harmonize the region’s power generation potential and benefit the region in a more environmentally friendly manner. This is in line with the ASEAN Plan of Action for Energy Cooperation 1999–2004 adopted at the 17th ASEAN Ministers on Energy Meeting, and the ASEAN Plan of Action for Energy Cooperation 2004–2009 adopted at the 22nd ASEAN Ministers on Energy Meeting.
- On the adaptation front, the Ministerial Understanding on ASEAN Cooperation in Rural Development and Poverty Eradication of 1997 forms the basis for cooperation. The important strategies identified were capacity building, sharing of experiences, promoting networking, and developing a common position on matters related to rural

development and poverty eradication. The ASEAN Ministers on Rural Development and Poverty Eradication was established to oversee initiatives undertaken in line with this cooperation.

- On technology cooperation, the ASEAN Science and Technology Ministers endorsed the Plan of Action on Science and Technology 2007–2011. The plan identified six areas of thrust and 24 supporting actions for science and technology cooperation among member countries. The cooperation also includes a science fund with contributions from member and non-member countries.
- ASEAN was also instrumental in launching an ASEAN Climate Change Initiative (now dormant), ASEAN Haze Action Plan, ASEAN Agreement on Trans-boundary Haze, ASEAN Disaster Response Programme, ASEAN Peat Land Management Initiative, European Union–ASEAN agreements, ASEAN+3 cooperation, and others.

All these regional initiatives have some relevance to integrating climate change concerns in sustainable development policy, but many opportunities for collaboration have not been explored.

The GMS confirmed its commitment to environmental protection at recent ministerial summits.

Comprising two provinces of the People’s Republic of China, Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam, the GMS has agreed to a strategy of “greening the corridors” through carbon sequestration in its economic and road corridor projects. As yet, however, relatively little has been achieved in this regard.

Southeast Asia could benefit from sector-specific international initiatives to enhance its mitigation efforts and access to low-carbon technologies.

On Land-Use Change and Forestry

- The Collaborative Partnership on Forests (CPF) acts as an umbrella organization for 14 international forest-related organizations, institutions, and convention secretariats that support the work of the United Nations Forum on Forests. The CPF has adopted a non-legally binding instrument on all types of forests to create an international instrument for sustainable forest management. There are significant synergies between the work of the CPF and REDD (reduced emissions from deforestation and degradation) initiatives in the post-2012 climate regime that could be exploited.
- The Asia Forest Partnership could be a good forum for information sharing. It hosts annual meetings intended to facilitate joint identification of new programs and research on issues relevant to Southeast Asia, such as illegal logging, fire prevention, land rehabilitation, and REDD-related issues.

On Energy

- The Climate Technology Initiative (CTI) could also improve the region's access to climate-friendly technologies. The CTI fosters cooperation in the development and diffusion of climate-friendly technologies by building partnerships between developed countries and developing countries. The CTI works closely with the UNFCCC and other international organizations. The CTI may have implications for energy security and GHG mitigation in Southeast Asia, but its current emphasis tends to be on information exchange and technical support.
- The Future Gen Alliance is another initiative that could have longer-term implications for energy security and GHG mitigation in Southeast Asia. It is a consortium of 13 power producers and electric utilities (11 from the United States) that pooled their resources to build the first zero-emissions coal-fired power plant. FutureGen has advanced coal-based technologies that generate electricity for families and businesses, and also produce hydrogen to power fuel cells for transportation and other energy needs. The technology also integrates the capture of carbon emissions with carbon sequestration, helping to address the issue of climate change as energy demand continues to grow. These technologies could play a potentially sizable role as governments in Southeast Asia contemplate expanding coal use.

There are institutions and programs that support climate change capacity building and development in the region.

The global System for Analysis, Research and Training (START) provides an international framework for improving scientific knowledge and technology to conduct regional and local research and to inform and influence decision makers. The Southeast Asia START Regional Center (SEA-START), established in 1996, is one of the regional research nodes of the Southeast Asia Regional Committee for START. SEA-START supported many scientific studies on climate change such as Southeast Asia Regional Vulnerability to Changing Water Resource and Extreme Hydrological Events Due to Climate Change.

The Japan-based Institute for Global Environmental Strategies has established a program that increases the capacities of Asian countries related to institutional and operational aspects of CDM. The Institute organizes training workshops for government officials to prepare the approval procedure for CDM projects, and initiates study groups to conduct research on sector-wide project formulation. In Southeast Asia, activities have been implemented in Cambodia, Indonesia, Philippines, and Thailand.

D. Financing Climate Change Mitigation and Adaptation Activities

Implementing climate change mitigation and adaptation measures requires investment, technologies and know-how, and financial resources. For Southeast Asia, many mitigation and adaptation technologies are still relatively costly to deploy, posing a considerable challenge (Box 9.1).

There are a large number of international funding sources and

mechanisms available for mitigation and adaptation by developing countries, but Southeast Asian countries have barely tapped these sources.

Table 9.12. Multilateral Financial Schemes

Name of Fund	Institution	Date	Objective	Budget
Prototype Carbon Fund (PCF)	World Bank	April 2000	Provision of finance and piloting production of emissions reductions within the framework of CDM and Joint Implementation. The fund is designed to support projects addressing urgent and immediate adaptation needs in less developed countries identified by National Adaptation Plans of Action. Target areas include water, agriculture, and public health.	\$180 million
BioCarbon Fund (BioCF)	World Bank	November 2002	Provision of finance for projects that sequester or conserve carbon in forests and agro-ecosystems and GHG mitigation.	Tranche One: \$53.8 million Tranche Two: \$38.1 million
Community Development Carbon Fund (CDCF)	World Bank	March 2003	Provision of funds to support projects that combine community development with emission reductions to create “development plus carbon” credits.	Tranche One: \$128.6 million
Carbon Partnership Facility (CPF)	World Bank	2008	Provision of funds to support the purchase of emissions reductions for at least 10 years after 2012. The CPF is comprise of two trust funds: (i) the Carbon Asset Development Fund (CADF) to prepare emissions reduction programs, and (ii) the Carbon Fund (CF) to purchase carbon credits from the pool of emissions reduction programs.	~\$500 million
Forest Carbon Partnership Facility (FCPF)	World Bank	December 2007	Provision of funds to developing countries for their REDD efforts. The FCPF has two components: 1) Readiness Mechanism Provision of technical assistance in calculating opportunity costs of possible REDD interventions, designing and adopting REDD strategy. 2) Carbon Finance Mechanism Implementation and evaluation of pilot incentive programs for REDD based on a system of compensated reductions.	\$300 million

Table 9.12. Multilateral Financial Schemes (continued)				
Name of Fund	Institution	Date	Objective	Budget
Prototype Carbon Fund (PCF)	World Bank	April 2000	Provision of finance and piloting production of emissions reductions within the framework of CDM and Joint Implementation. The fund is designed to support projects addressing urgent and immediate adaptation needs in less developed countries identified by National Adaptation Plans of Action. Target areas include water, agriculture, and public health.	\$180 million
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Tables 9.12 to 9.14 summarize some of the financial opportunities for mitigation and adaptation available to Southeast Asian countries from both the public and private sectors.

- The UNFCCC has established the Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF) to support adaptation activities. While the LDCF is aimed at helping the least developed countries meet their immediate adaptation needs as identified in their National Adaptation Plans of Action, the SCCF was created to not only support adaptation but also to support technology transfer, energy and infrastructure, and activities related to energy-intensive products and consumption of fossil fuels. Priority areas for funding

Table 9.12. Multilateral Financial Schemes (continued)				
Name of Fund	Institution	Date	Objective	Budget
Climate Investment Fund (CIF)	World Bank	July 2008 (approved by Board)	<p>Provision of interim funds to assist developing countries achieve their development goals through a transition to a climate-resilient economy and a low-carbon development path.</p> <p>The CIF is composed of two segments.</p> <ol style="list-style-type: none"> 1) Clean Technology Fund Investment in projects/programs (large-scale) to demonstrate, deploy, and transfer low-carbon technologies. The fund is also used for realizing environmental/social co-benefits. 2) Strategic Climate Fund Used for programs for climate resilience, green energy access, and sustainable forest management. <p>The Financing Pilot Program for Climate Resilience is designed to complement existing sources for the Adaptation Fund by assisting transformation of national development plans to make them more climate-resilient.</p>	\$5 billion (planned)
Asia Pacific Carbon Fund (APCF)	Asian Development Bank	May 2007	<p>Provision of upfront capital for CERs and technology support for enabling clean energy projects among member countries based on the Carbon Market Initiative.</p> <p>Aims to foster long-term partnerships between project developers in developing member countries, carbon investors in developed countries, and ADB.</p>	\$152 million
Clean Energy Financing Partnership Facility (CEFPF)	Asian Development Bank	April 2007	Provision of grant financing for improving energy security and for moving to a low-carbon economy.	\$250 million (target)
Water Financing Partnership Facility (WFPPF)	Asian Development Bank	2007	Provision of financial resources and technical support for rural water services, urban water services, and river basin management	\$26 million
Poverty and Environment Fund (PEF)	Asian Development Bank	2007	Promote mainstreaming of environmental and climate change issues into development plans	\$3.6 million
Future Carbon Fund	Asian Development Bank	July 2008 (approved)	<p>Provision of long-term financial incentives to scale up clean energy projects that will continue to generate CERs after 2012.</p> <p>Complementary to the Carbon Market Initiative.</p>	~\$100 million
Climate Change Fund (CCF)	Asian Development Bank	May 2008	<p>Provision of a more holistic financing program for activities in mitigation and adaptation.</p> <p>Provision of Grant financing for technical assistance, investment projects, research.</p>	~\$40 million

Table 9.12. Multilateral Financial Schemes

Name of Fund	Institution	Date	Objective	Budget
Asia-Pacific Fund for Energy Efficiency (APFEE)	Asian Development Bank	Proposed	Provision of finance for energy efficiency projects among developing member countries, in accordance with the Energy Efficiency Initiative of ADB.	\$200–500 million
Special Climate Change Fund (SCCF)	GEF (UNFCCC)	2001	Provision of finance for projects relating to adaptation; technology transfer and capacity building; energy, transport, industry, agriculture, forestry and waste management; and economic diversification.	\$34.7 million
Least Developed Countries Fund (LDCF)	GEF (UNFCCC)	2001	Provision of grants to support preparation and implementation of National Adaptation Programs of Action.	\$27.8 million
Adaptation Fund	GEF (Kyoto Protocol)	2001	Established under Kyoto Protocol with 2% share of proceeds from CDM. Provision of finance for concrete adaptation projects and programs in developing countries that are parties to the Kyoto Protocol.	€ 37 million (expected to be \$80–300 million in 2008–2012)
Thematic Trust Fund (TTF) on Energy and Environment	UNDP	2001 (two funds merged in 2005)	<ul style="list-style-type: none"> Provision of funds to activities at the country and global level leading to optimum development impacts from affordable and accessible energy services. Disbursement of funds for 43 projects from 2001 to 2004. Combination of TTF on Environment and TTF on Energy for Sustainable Development. 	\$ 15 million~
MDG Carbon Facility	UNDP	June 2007	<ul style="list-style-type: none"> Provision of funding for portfolio of projects that yield tangible sustainable development and poverty reduction toward MDG, such as methane, renewable energy, energy efficiency, carbon sequestration, transport, and clean fuel. Provision of an assistance for designing, implementing, managing, and monitoring GHG emission reduction projects, i.e., preparation of PDD and guidance on the application of baseline methodologies. 	

Source: Compiled by ADB study team.

under SCCF include water resource management, land management, agriculture, health, infrastructure development, fragile ecosystems, and integrated coastal zone management.

- A separate Strategic Priority on Adaptation fund has been created under GEF to reduce vulnerability and to increase adaptive capacity to the adverse effects of climate change in the focal areas that the GEF addresses. The Strategic Priority on Adaptation fund will support pilot and demonstration projects that address local adaptation needs and generate global environmental benefits in all GEF focal areas.
- The Adaptation Fund was established under the Kyoto Protocol from a 2% share of proceeds from CDM project activities and from other sources. Recently, the Adaptation Fund Board was created to support the implementation of the fund, with GEF providing secretariat services and World Bank serving as the trustee of the fund.

Table 9.13. Bilateral Financial Schemes

Name of Funds	Institution	Date	Objective	Budget
Cool Earth Partnership	Japan	2008 –2012 (5 years)	<p>Provision of funds to developing countries making efforts to reduce GHG emissions and achieve economic growth in a compatible way. The fund is allocated on the basis of policy consultations between Japan and beneficiary countries.</p> <p>The fund has the following two components.</p> <ol style="list-style-type: none"> 1) Assistance for Adaptation and Clean Energy The fund is allocated for access to clean energy, feasibility study on rural electrification projects with geothermal energy and “cobenefit” projects by means of environment program grant aid, technical assistance, and aid through international organizations 2) Assistance for Mitigation Climate change Japanese official development assistance loan with preferential interest. Yen 500 billion is allocated for projects to reduce GHG emissions. Capital and guarantees are shared by JBIC, NEXI, NEDO, and by the ADB Clean Energy Fund. A \$300 million loan to Indonesia was provided in July 2008. 	
Enhanced Sustainable Development of Asia (ESDA)	Japan (ADB)	May 2007	<ol style="list-style-type: none"> 1) Accelerated Co-Financing Scheme with ADB provision of a Yen 2 billion loan for 5 years. 2) Investment Climate Facilitation Fund Promotion of funds to facilitate investment climate and required infrastructure. 3) Asia Clean Energy Fund Provision of funds to promote energy efficiency in Asia. 	<p>¥ 2 billion</p> <p>\$100 million</p>
Global Initiative on Forests and Climate (GIFC)	Australia	July 2007 (5 years)	<p>Provision of funding for projects to reduce deforestation, encourage reforestation, and promote sustainable forest management.</p> <p>Establish a comprehensive and consistent approach to forest carbon monitoring through GCMS.</p> <p>Close coordination with the World Bank’s new Global Forest Alliance (provision of \$10 million to the Alliance).</p> <p>Setting Indonesia as a key partner country (\$40 million), and other countries in the Mekong subregion and the Philippines.</p>	\$200 million

Source: Compiled by ADB study team.

Table 9.14. Other Financial Schemes—Private Sector

Name of Fund	Institution	Date	Objective and Target Sector	Budget
FE Clean Energy Services Fund (Asia ESCO Fund)	FE. Co.,Ltd. (funded by JBIC, etc.)	2004 (10 years)	Provision of capital to invest in energy efficiency and RE initiatives (ESCOs) in small and medium-size enterprises in Asian countries. Focusing on India, Malaysia, Philippines, and Thailand.	\$150 million (currently \$50 million)
MAP Clean Energy Fund (MAP)	MAP Capital (funded by ADB)	Proposed	Provision of investment (~\$15–40 million per project) in a portfolio of clean energy projects in Asia with focus on Indonesia and Southeast Asia. Geothermal projects in Indonesia being considered.	\$400 million
Asia Clean Energy Fund (ACE)	KTIC, KPMG/SIA (funded by ADB)	Proposed	Provision of investment in clean technology, RE, energy efficiency in Asia. Portfolio of projects includes palm oil projects, solar project expansions, replacement of used transformers, and solar photovoltaic business in Indonesia.	\$200 million

Source: Compiled by ADB study team.

- Additional financial support is also available through different bilateral funding sources such as the Organization of the Petroleum Exporting Countries Fund for International Development, Japan International Cooperation Agency, United States Agency for International Development, and United Kingdom Department for International Development. Nearly \$2 billion was made available by the Government of Japan for adaptation activities.
- A large number of funding mechanisms for mitigation have been established in recent years, in particular after the adoption of the Kyoto Protocol in 1997. The most important of these for developing countries is the CDM which allows emission reduction or removal projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one ton of CO₂. These CERs can be traded and used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol. The CDM provides a way for developed countries to invest in “clean” projects in developing countries while the latter are achieving sustainable development targets. The region’s share of the global carbon market is still very limited however.

E. Conclusion

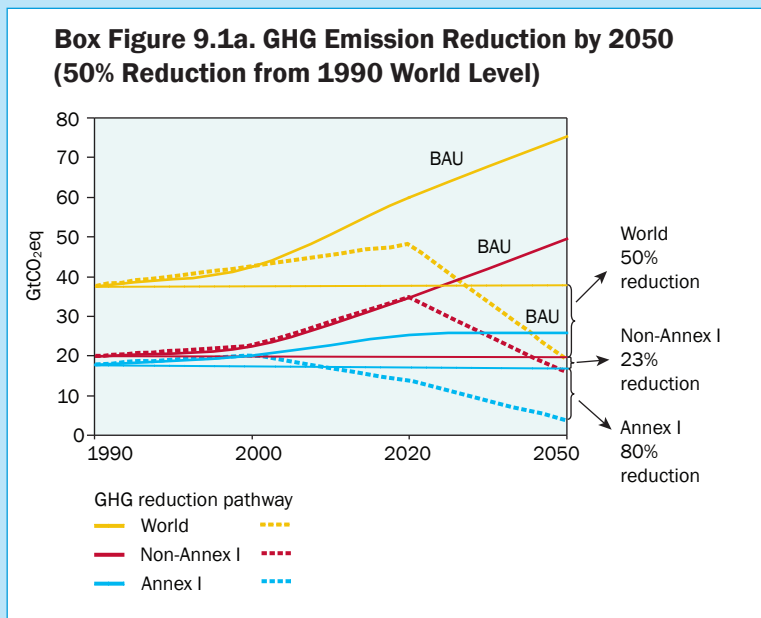
A review of climate change policies in the region suggests that while considerable progress has been made, there is a need for more closely integrating climate change concerns into sustainable development policy making. There are various international and regional initiatives and programs that Southeast Asian countries can benefit from in terms of funding, technology transfer, and capacity building. However, the tapping of these resources by the region appears to be limited. There is a need to find ways to increase the

Box 9.1. Funding Requirement by the Four Countries to Achieve Target under a Hypothetical Global Deal

There exist several low-carbon options that can help reduce emissions from what would occur by following a business-as-usual trajectory. However, stabilizing GHG concentration at a safe level to avoid extreme climate risks and impacts requires both widespread diffusion and adoption of currently available low-carbon technologies, as well as development of new technologies. Stern (2007) suggests that, in order to stabilize GHG concentration around 450–500 ppm and thus limit the risks associated with severe climate change, global emissions will have to be cut by at least half of the 1990 level by 2050 and even further thereafter. Furthermore, Annex I countries will have to reduce their emissions by at least 80% relative to the 1990 level by 2050, while Non-Annex I countries should be able to commit to their own national targets for reduction starting from 2020.

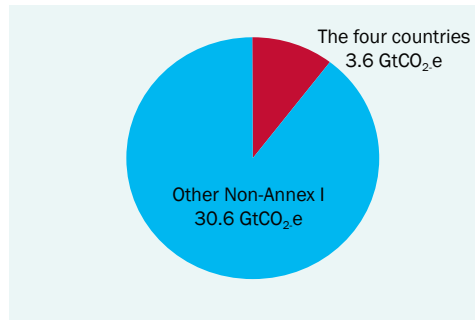
Box Figure 9.1a. depicts the GHG mitigation scenario suggested by Stern (2007) against the BAU emission projection. Under the IPCC (2007) B2 marker scenario, a 50% global emission cut, with 80% reduction from Annex-I countries by 2050, implies that Non-Annex-I countries will collectively be responsible for a reduction of about 23% from their 1990 level by the same year. Box Figure 9.1b shows that the total GHG reduction from the four countries—Indonesia, Philippines, Thailand, and Viet Nam—will be approximately 3.6 GtCO₂e in 2050, while that from other Non-Annex-I countries would be about 30.6 GtCO₂e (assuming that the proportion of the four countries GHG emissions in total Non-Annex-I's emissions remains unchanged at 10.5% from 2000). If GHG mitigation cost is \$10/tCO₂e on average, then the total investment required for the reduction in the four countries would be about \$36 billion (Box Figure 9.1c.). If the unit cost is \$15/tCO₂e, the total financial requirement would amount to about \$54 billion. Clearly, an enormous amount of investment will have to be made in new mitigation technologies, which in fact are still relatively costly to the four countries and also to developing countries in general.

Technological and financial support from developed to developing countries is one of the key elements to the success of the GHG stabilization target.

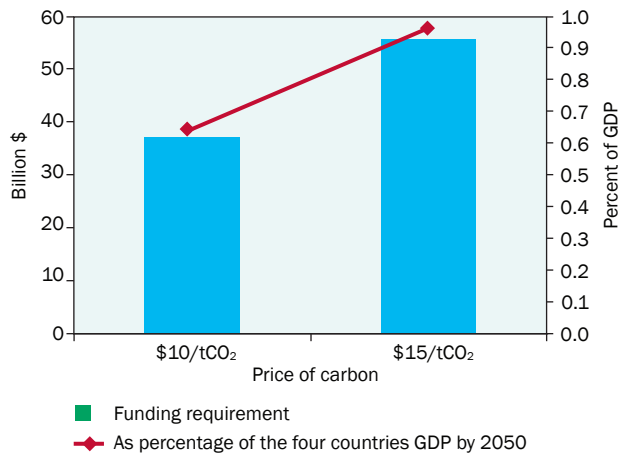


Box 9.1. Funding Requirement by the Four Countries to Achieve Target under a Hypothetical Global Deal (continued)

Box Figure 9.1b. Emission Reductions for Non-Annex I Countries



Box Figure 9.1c. Funding Requirement by the Four Countries



Source: ADB study team.

region’s presence in making use of these initiatives. Moreover, the current level of international financial transfer to address the region’s adaptation and mitigation challenges is far short of what is required.

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