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Climate Change and Human Security in Southeast Asia: Issues and Challenges

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Introduction

Against the flurry of international summits and meetings held on the environment – most recently the UN Summit on Climate Change – the critical issue of climate change has no doubt become the top security agenda for the global community. Spurred by a number of scientific studies on the catastrophic effects of climate change and more recently by the report of the influential Intergovernmental Panel on Climate Change (IPCC), world leaders have agreed that climate change is now a global problem.

The global consensus on the grave security challenges posed by climate change, however, is not matched by a consensus on how best to address this problem.[1] The differing political responses and contentious negotiations taking place in the international community has been aptly described by US Secretary of State, Condoleezza Rice, who argued that the 'one size fits all approach would not work; there must be room for each nation to tackle the problem through medium-term programmes that reflected its own needs and did not require it to put aside economic growth for the sake of the environmental health'.[2]

The complexities that come into play in this environmental conundrum are most saliently found in Southeast Asia – a region noted as one of the highest emitters of greenhouse gasses (GHGs), a place most often plagued by serious forest fires causing transboundary pollution haze as well as where rapid deforestation and destruction take place. It is also a region most adversely affected by natural disasters brought on by torrential rains and large-scale floods, and where irregular weather patterns increasingly bring on periods of long droughts. And as though these crises were not enough, the states and societies of Southeast Asia are also still experiencing the deleterious impact of other major security crises – most notably the Asian financial crisis of 1997 and the SARS health crisis in 2003. In the face

A. Marquina (ed.), *Global Warming and Climate Change*

of huge and serious security problems affecting the region, the question that therefore confronts us today is how states in the ASEAN are dealing with the grave challenge of climate change.

Climate change: Implications for Southeast Asia

Before we examine the kinds of responses found in the region, it will be useful to discuss some facts about the implications of global climate change – global warming – for the ASEAN region. The 2007 Expert Group Report on Climate Change and Sustainable Development has identified five likely outcomes most pertinent to Southeast Asia. These are:

1. Rises in sea levels (which will submerge low-lying coastal plains and river deltas) and more intense cyclones increase flooding of deltas and coastal plains – placing already endangered coastal ecosystems at risk; and which could alter river flows and affect hydroelectric power;
2. More intense summer monsoons, increasing the degree and frequency of destructive flows and soil erosion;
3. Major loss of mangroves and coastal reefs;
4. Melting of mountain glaciers (from the Himalayas) reducing vital rivers flows and increasing pressure on water resources (in turn, decreasing fresh water availability resulting from higher rates of evaporation and salinization);
5. Greater uncertainty associated with water management and supply – leading to increased pressure on water resources what with rising population and the need for irrigation.[3]

With these projected climate outcomes, we can draw out a number of threats and risks to human security. In the interest of time, let me just highlight some of more 'immediate' risks and threats.

Frequency of natural disasters

It has been established that around 188 million people worldwide were adversely affected by natural disasters in the 1990s – six times more than the 31 million directly or indirectly affected by war.[4]

- Meanwhile, in 2006, Asia suffered 44 per cent of worldwide natural disasters, with 119 million killed or affected and about US$25 billion in economic damage (72.9 per cent of worldwide damage).
- Considering that most of Asia's densest aggregations of people and productive lands are on, or near, the coasts, including the cities of Shanghai, Tokyo, Jakarta, Manila, Bangkok and Singapore – the risks and vulnerabilities have therefore increased with their increased susceptibility to cyclones driven by sea warming and the rising sea levels. Furthermore,

these cyclones produce strong tidal waves, especially during La Niña years, which can increase the severity of coastal flooding – consequently threatening lives, infrastructure, agriculture and fresh water supply.

Food security

The Consultative Group on International Agricultural Research has predicted that food productivity in Asia will decrease by as much as 20 per cent due to climate change as the geographical boundaries of agro-ecosystems, as well as species composition and performance, will change. In addition, more permanent shifts in seasonal climatic patterns that bring on more frequent and intense weather extremes will badly disrupt agriculture, fisheries and the natural resource base of the region.

- In terms of fish stocks, we note that Asia is currently the world's food bowl, producing nearing 60 per cent of global fish production – which in turn makes up a large chunk of Asian countries' export earnings – contributing up to 40 per cent to the agricultural GDP. Three of the top 12 fish-producing nations are in SEA (Indonesia, Thailand and the Philippines) and produce much of the fish supply in the region. This supply would be severely challenged with rising sea levels and higher inland water temperatures.
- For the mostly agriculture-based economies of ASEAN, increased temperatures could threaten grain supplies due to high temperature-induced grain sterility; while shifts in rainfall patterns could render previously productive land infertile – accelerating erosion, desertification and thus reducing crops and livestock yields.
- Furthermore, a reduction in water available for irrigation will have a serious impact on crop yields especially in the region which is much more dependent on irrigation than other regions of the world that grow rice and cereals.

Health security

The rise in global average temperatures has been identified as one of the primary reasons behind the extending ranges and seasons of various tropical disease-carriers (including malaria and dengue fever). Warmer temperatures change the distribution of vectors and enable them to thrive in previously inhospitable areas, thus at warmer temperatures parasites develop more rapidly in mosquitoes.

- For instance, a study by the WHO has estimated that 154,000 deaths annually are attributable to the ancillary effects of global warming, due mainly to malaria and malnutrition. This number could nearly double by 2020 and currently, some 40 per cent of the world's population lives in

areas affected by endemic malaria and many countries in ASEAN and the wider A-P region are already seriously affected by the diseases.[5]
- With high incidence of poverty and an overpopulated environment, the risks of infectious diseases in SEA are therefore heightened – but the problem is further compounded by its poor public health infrastructure.

Water scarcity

As noted earlier, changes in the variability and distribution of rainfall could also exacerbate fresh water scarcity in water deficient states. In a world where over 2 billion people already live in countries suffering from moderate to high water stress, and half the world's population is without adequate sanitation or drinking water, relatively small shifts in rainfall patterns could push countries and whole regions into deficit, leading to a series of water crises with global implications. In this regard, countries which are already water deficient will suffer the worst shortfalls as rainfall patterns shift and become more variable.

- In Asia alone, per capita water availability has declined by between 40 and 65 per cent since 1950 and the World Bank had estimated that by 2025 most states in the region would be facing serious water shortages unless strong action is taken. But this is compounded by the fact that 20 per cent of the global increase in water scarcity is directly attributable to climate change (with the remaining 80 per cent because of growing demand).
- Given the strong linkages between water supply and agriculture, declining water levels could therefore have adverse consequences for food production in countries like Myanmar, Thailand, Laos, Cambodia and Vietnam.
- There is also the potential for water scarcity as a potential driver of interstate conflict.

Energy security

The IEA expects a 50 per cent increase in fossil fuel usage over the next 15 years, which will dramatically push up GHS without mitigating measures. As we all know, fossil fuels are responsible for nearly 80 per cent of anthropogenic GHS, which are the major causes of global warming.

The problem we face now is that alternative technologies are either more expensive than conventional fuels, require longer periods to install or demand enormous capital investments.

- In ASEAN, concerns about climate change have fed into a parallel debate about energy security and have now led to more talks about plans to consider nuclear power as an alternative source of energy.
- Apart from the need to utilize carbon-free forms of energy, this nuclear power bandwagoning is driven by the need to increase energy supply

amidst rapid economic growth. The Indonesian government has indicated that Gorontalo in Sulawesi would likely become the country's first province to have a 4000 megawatt nuclear power plant, which is expected to supply 2 per cent of the country's total energy demand by 2017. Thailand also released plans to spend an estimated US$6 billion to build nuclear power plants by the year 2021 while Vietnam plans to build its first nuclear energy plant by 2020.

In brief, the negative impact of climate change has and will continue to generate human suffering, economic decline and potentially will increase political instability. In a region that is already grappling with a number of socioeconomic and security problems – the impact of the same consequences of climate change can only be much more severe.

What has been done?

ASEAN's responses to climate change can be understood by examining the underlying perceptions by states in the region about the kinds of environmental risks and values that threaten their own interests. In this regard, I suggest that we examine ASEAN's approach to dealing with climate change in four broad areas: (1) addressing the burning of peatlands and forest fires as root causes of climate change; (2) national initiatives among ASEAN member states on mitigating and adapting to climate change; (3) common challenges faced by ASEAN member states in mitigating and adapting to climate change; and (4) the regional framework of climate change mitigation and adaptation mechanisms.

Addressing root causes of climate change: burning of peatlands and forest fires.

There are several reasons why peatlands play such a significant role in tackling climate change. First, it is important to note that much of the peatland in the world is found in Southeast Asia – particularly in Indonesia. Apart from being a major source of carbon emissions, the burning of peatlands and environmental fires have also been a source of the annual transboundary haze problem in Southeast Asia.[6]

> Peat is dry un-decomposed plant material, is said to contain carbon equivalents of 100 years of current global fossil use. Moreover, it can be easily ignited thus causing more fires and carbon emissions due to intense heat during the dry seasons. In addition to this, it should be noted that carbon dioxide emissions would continue even if fires could be prevented and stopped. The oxidation of the current desiccated peatland top soil results in an average of about 86 tonnes of carbon dioxide a year.[7]

While carbon emissions covered under the Kyoto Protocol include emissions from industries, housing, traffic and agriculture,[8] a lot of the carbon

emissions in the developing states in Southeast Asia – such as Indonesia – result from forest fires from peatlands. (Unfortunately, forest fires are also the one major contributor to deforestation in the second-largest 'lung'/forest in the world due to commercial land conversion).[9] Second, there has been an established linkage between the haze crisis and global temperatures. Shortly after the major haze crises of 1997 and 2006, the world experienced record-breaking global temperatures in 1998 and (predictions for) 2007. Such an observation only serves to further reiterate the link between environmental fires and climate change. Global warming only serves to exacerbate the haze problem by creating a vicious cycle by increasing the risks of more intense forest fires during the hot and dry seasons.

Third, the burning of peatlands may only worsen as more incidents of deforestation may occur, ironically, as a result of giving in to global demands for alternative energy sources. Biofuels have been identified as a highly viable option as they are much cheaper than other renewable sources such as solar and wind energy. In January 2007, the European Commission had set a new target for its 27 member countries, to replace 10 per cent of petrol and diesel with biofuels by 2020 as compared to its previous target of 5.75 per cent by 2010.[10] Indonesia and Malaysia are prime markets for biofuel, in particular palm oil as they account for 83 per cent of production and 89 per cent of global exports.[11] Moreover, there is concern that unregulated biofuels production due to the expansion of plant fuels would take away land from food production, thus posing a threat to food security and perpetuating poverty. According to Wetlands International, poverty in Indonesian peatlands is said to be four times higher than in other lowland areas.[12] These factors therefore put further pressure on the Indonesian government and its ASEAN counterparts to effectively address forest fires and the haze issue.

In response, ASEAN leaders have securitized the haze problem since 1995, leading to the adoption of major agreements such as the Regional Haze Action Plan (RHAP) in 1997 and the ASEAN Agreement on Transboundary Haze Pollution.

The RHAP had three main component programmes – prevention, mitigation and monitoring. This signified a narrowing of intergovernmental action as the most affected countries were designated to spearhead the three RHAP programmes; Malaysia took the lead in prevention, Indonesia in mitigation and Singapore in monitoring of fires and haze. Yet despite this division of labour, mitigation on the part of Indonesia has been poor. Deploying officials to immediately respond to those hard to reach areas has been a time consuming exercise that deters catching the culprits. Widespread corruption has also impeded investigations in identifying the culprits.

The 2002 ASEAN Agreement on Transboundary Haze Pollution, which essentially sets forward a number of strategies to address land and forest fires in Indonesia, establishes a subregional Technical Working Group to address

land and forest fires in the northern part of the region, as well as build a regional Haze Pollution Control Fund. However, Indonesia still refuses to sign this agreement, thereby limiting the extent to which other ASEAN states are able to intervene in the problem. There is also the dilemma of addressing symptoms rather than the root causes of the fires. For instance, cloud-seeding initiatives to put out environmental fires are very costly and provide, at most, temporary relief. One cloud-seeding operation in Sarawak during the haze crisis in 2006 was said to have cost the Malaysian government RM55,000. Alternatively, irrigation of peatlands is a much more sustainable method but requires a long period before seeing results. This inexpensive local initiative of blocking existing canals that surround peatlands with logs and sandbags has proven to be a success, for not only has it put an end to fires but also allowed forests to recover and created a new food source with fishes breeding in the blocked off canals, thereby satisfying locals' food and water security.

The 2006 ASEAN Peatland Management Strategy (2006–2020) does acknowledge this by highlighting the need to employ measures that ensure sustainable development and multi-stakeholder and multi-agency involvement. The meeting also acknowledged its past errors, such as channelling resources to fire suppression and emergency purposes rather than preventive measures. The problem lies, however, in enforcing the policies which would only show results over time. Moreover, building up awareness amongst the locals, as well as providing compensation where necessary, is critical to ensure that locals would not have to resort to slash and burn tactics for their survival. It is also important to channel more funds into this project.

Since 2006, there has been escalation of talks on addressing the haze problems due to the recurrence of this problem. And, complementing these regional programmes there are also bilateral ones, such as that between Singapore and Indonesia. Singapore has offered to deal directly with the Muaro Jambi regency of Indonesia, which has been identified as part of the 35 fire-prone areas that need particular attention. Known as the Jambi Master Plan, the National Environment Agency (NEA) of Singapore will assist the regency in enhancing its capacity in preventing and mitigating fires. It would also assist the Jambi government in sourcing out for financial and technical resources, including matching agencies to project. The Asian Development Bank also noted that it would provide technical expertise and funding for some projects under the Jambi Master Plan. Other elements under the plan include legislation and enforcements and early warning and monitoring.[13]

National initiatives within ASEAN on climate change

Mitigation and adaptation are distinctly different measures to cope with climate change. Mitigation involves taking measures to reduce GHG emissions

and to enhance carbon sinks (the forests), targeted at reducing the extent of global warming. Such measures constitute the long-term solutions against climate change and could include, inter alia, energy efficiency and conservation, use of clean, alternative energy sources as well as carbon capture and storage. Adaptation, on the other hand, would consist of measures to reduce the vulnerability of human and natural systems against existing or anticipated climate change effects, and is necessary since not all climate change problems could be mitigated. It will be worthwhile to look at how ASEAN member states had individually attempted to mitigate and adapt to climate change.

Cambodia: The National Environmental Action Plan (1998–2002) was prepared to guide the integration of environmental concerns into national and local development policies, economic decision making, and investment planning, and it focused on selected key areas such as forestry, fisheries, agriculture, conservation, energy development, and waste management. In addition, the preparation of a National Biodiversity Strategy and Action Plan is at the final stage, with a goal 'to use, protect and manage biodiversity for sustainable development in Cambodia'. Besides these initiatives, a National Action Plan on Climate Change has been prepared with the aim of supporting national development priorities while contributing to global climate change countermeasures efforts.

Indonesia: Notwithstanding its refusal to accede to the 2002 ASEAN Agreement on Transboundary Haze Pollution, Indonesia has made preparations for a long-term adaptation strategy for coastal areas based on three adaptation strategies: retreat (whereby the government would also prepare and plan a migration strategy that would have only a slight impact to the livelihood of the communities affected), accommodate and protect.[14] Jakarta authorities would also inform the local communities of the dangers of certain areas through public campaigns, and issue residential bans on certain coastal areas. In addition, a public information campaign, explaining the dangers of certain coastal areas and explaining the government programmes to move local residents to a different location, would be implemented. Following the migration, the government would then issue residential bans on various coastal areas that are prone to the impacts of sea-level rise.

Laos: In terms of mitigating climate change, Laos has sought to address deforestation. Towards this end, it has cooperated with Germany on joint poverty reduction programmes, especially in rural areas.[15] This involves 6 million euros for 'avoided deforestation' activities in order to ensure sustainable forest management to help protect Laos' great potential as a carbon sink, noting that forests account for as much as 69 per cent of the country's area, for the benefit of global climate protection. The rural Laotians could benefit from this collaboration through the generation of income via biomass management and compensation payments for forest

protection. As such, the project would achieve the double effect of poverty reduction in parallel with environmental policies.

Malaysia: The country has instituted a range of guidelines and policies to mitigate climate change.[16] First, the fourth thrust of the Ninth Malaysia Plan 2006–2010 essentially strives to improve the standard and sustainability of quality of life. Also, the National Physical Plan has been initiated to designate environmentally sensitive areas (ESAs) for sustainable forest development.[17] To adapt to climate change, Malaysia has also implemented the Programme to Plant Mangroves and Other Species along the Coastal Areas in Malaysia, drawing from the lessons of the 2004 tsunami. A special taskforce was formed to coordinate the planting of mangroves and other species along coastal areas.[18] In raising public awareness, the Malaysian government has been engaging members of the media.[19] Kuala Lumpur has also attempted to enhance the streamlining of various non-state environmental activities. For instance, relevant NGOs in Malaysia have been organized collectively under the Malaysian Climate Change Group (MCCG) to generate discussion and dialogue with stakeholders.[20]

The Philippines: In 1989, the Philippines Strategy for Sustainable Development (PSSD) was adopted to serve as the blueprint for the country's sustainable development efforts. Also, the Philippine Agenda 21 (PA 21) was initiated towards developing the full human potential, which puts people at the centre of the development focus, involving science and technology (S&T) measures.[21] These have implications for climate change mitigation, since some of the principles envisage ecological soundness and achieving bio-geographical equity and community-based resource management.[22] To mitigate climate change through addressing deforestation, the Department of Environment and Natural Resources (DENR)'s agro-forestry programme has been intensified, involving the massive planting of fruit-bearing trees within forests funded by a PhP 2 billion budget by the Arroyo administration for the purpose which she announced during her State of the Nation Address.[23] In streamlining non-state environmental activities, the Philippine Network on Climate Change has been formed.[24] The Philippine Climate Change Program Development, the Foundation for the Philippine Environment (FPE), in coordination with the Institute for Climate, Energy and Environment (ICEE) provides training for local government units and other stakeholders on local action planning on climate change.

Singapore: The tiny island state has a National Climate Change Strategy, overseen by a National Climate Change Committee (formerly known as National Energy Efficiency Committee) established to lead and coordinate efforts in addressing the issue amongst the various ministries, the private sector and the masses. The emphasis has been placed on a multi-level holistic approach towards improving energy efficiency.[25] In addition, government-endorsed and supported research on alternative energy sources, such as

solar energy, has been carried out. Public awareness of climate change has been raised through the promotion of energy efficiency, such as providing citizens with money-saving incentives and attractive prizes to be won in related contests and more energy-efficient infrastructure and appliances have become available on the market to encourage consumers to be more environmentally friendly.[26] The Singapore Environment Council, a state-oriented independent body, has been designated to nurture, facilitate and coordinate environmental causes and groups in Singapore.[27]

Thailand: The Royal Thai Government established a National Climate Change Committee (NCCC), chaired by the Permanent Secretary of the Ministry of Science, Technology and Environment (MOSTE), and a Climate Change Expert Committee (CCEC), in response to climate change issues. The Policy and Prospective Plan for Enhancement and Conservation of National Environmental Quality (1997–2016) provides the principal set of guidelines for national resources conservation and environmental protection in Thailand. Based on this 20-Year Environment Plan, a 5-year Environmental Quality Management Plan has been prepared to guide natural resources conservation and environmental protection, complementing the 5-year National Economic and Social Development Plan and thus giving equal emphasis to both natural resources conservation, environmental protection as well as economic and social development of the country.[28]

Vietnam: In May 2008, Hanoi instituted a National Target Programme on Climate Change and Sea-Level Rise, piloting climate change adaptation and mitigation projects in provinces most at risk of sea-level rise over the next two years, with the plan targeting nationwide adoption from 2011–2015.[29] As part of the national efforts in ensuring diverse and sustainable agriculture, farmers would be required to employ the latest energy-efficient technologies and infrastructure needed to be modernized. To reduce GHG emissions, the Vietnamese Government is also aiming to increase the proportion of forest coverage from 37 per cent in 2005 to more than 42 per cent by the end of 2010. Greater use of renewable energy sources such as solar, wind and hydroelectric power has been envisaged along with greater investment in nuclear energy. To adapt to climate change, anti-flooding initiatives have been proposed, chiefly the US$1.16 billion project dubbed 'Live Safely with Flooding' outlined during a recent meeting in Da Nang City between Hanoi and local government officials.[30]

Other initiatives: At the subregional level, other forms of partnerships and initiatives also exist. For instance, Laos and Vietnam are amongst the 14 recipients of the World Bank's Forest Carbon Partnership Facility (FCPF), which became functionally operational on 25 June 2008, aiming to reduce deforestation and forest degradation by compensating developing countries for GHG emission reductions.[31] Another interesting subregional climate change programme is the Heart of Borneo (HoB) Initiative, signed in Bali,

Indonesia on 12 February 2007, with the goal of conserving and managing the transboundary highlands of Borneo and parts of the adjacent foothills and lowlands, which straddle the borders of the three ASEAN Countries of Brunei Darussalam, Indonesia and Malaysia.[32] Towards implementing this initiative, Sabah and Sarawak are currently preparing project documents to be consolidated into a National Project Document.

Challenges facing ASEAN states

At the national and regional levels, ASEAN member states face a multitude of challenges in the process of tackling climate change. For instance, affordability of the technologies member states prefer to use has been a perennial issue, taking the utilization of renewables in power production as an example. As a result, nuclear power appears more appealing as it is cheaper than other renewable sources of energy. To date, Indonesia, Malaysia, the Philippines, Thailand and Vietnam are either mooting plans or have instituted programmes for civil nuclear energy usage.

More in-depth studies have to be undertaken to enable each country to develop appropriate measures and action with regard to the possible impacts of climate change, and this would include the implementation of more applications to gain field experience and additional operating data. However, the main issues surround the availability, reliability and variability of activity data and local emission factors, and institutionalization and linkages among government agencies of the inventory process. In the mobilization of people to support climate change initiatives, awareness of the importance and roles of the ecosystem has to be raised, along with the dissemination of information and knowledge on the ecosystems, habitats and biodiversity, as well as intensified popular participation.

At the micro and macro-level, a balance of social, economic and environmental development needs to be achieved. Capacity building, in particular at the local government level, carries greater room for improvement. ASEAN member states also possess varying standards of enforcement and limited resources to pursue climate change programmes.

Towards a regional framework on climate change (and energy)

While ASEAN member states' governments have recognized the potential risks of climate change and have taken steps to mitigate and/or adapt to climate change, a regional framework on climate change has not been developed at this current juncture. This was attributed to several reasons:

- Issues relating to climate change, such as sustainable development, water food and resource scarcity and energy security, are being addressed in

other separate agreements and plans of action. The ASEAN Vientiane Action Programme (VAP) (2004–2010) has outlined several working groups on: multilateral environmental agreements, nature conservation and biodiversity, coastal and marine environment, and environmentally sustainable cities' water resources management.

- When addressing climate change, more emphasis is given to reducing carbon emissions. As mentioned above, the source of carbon emissions in ASEAN are largely from the burning of peatland and forest fires. According to Wetlands International, Indonesia accounts for a tenth of global carbon emissions from human activities as it emits on average 2 billion tonnes of carbon dioxide a year, thus making Indonesia the third biggest emitter of greenhouse gases in the world after the United States and China.[33] Since 'convincing' the region about the effects of climate change can be difficult, highlighting the haze and its immediate and apparent socio-economic problems on one level would be more effective in getting states in the region to act. In a way, it becomes a stepping-stone to addressing the broader issue of climate change; thereby increasing greater awareness on climate change, which would be gradual.

Nevertheless, there have been gradual, incremental steps towards closer regional cooperation to combat climate change. A notable instance has been the *Singapore Declaration on Climate Change, Energy and the Environment* adopted on 21 November 2007, emphasizing energy efficiency, countering deforestation, calling for individual and collective action by a broad range of sectors as well as encouraging active participation in the process of developing an effective, comprehensive and equitable post–2012 international climate change arrangement under the UNFCCC process.[34]

In July 2008, the inaugural ASEC Brown Bag Series forum was launched by the ASEAN Secretariat to raise awareness of ASEAN's initiatives among its staff, government officials and the public at large. It serves as a venue to share ideas and insights on key issues facing the region and to generate public interest. Without doubt, climate change tops the list of issues being discussed. In fact, the first of the Brown Bag Series had been titled 'Climate Change and Deforestation: What Role for the New ASEAN?' which was being organized by ASEAN in cooperation with the German Regional Forest Program (ReFOP).[35]

Another initiative which may signal closer regional harmonization of plans to mitigate and adapt to climate change is the *East Asian Summit (EAS) Cebu Declaration on East Asian Energy Security*, signed in Cebu, Philippines on 15 January 2007. This calls for a new approach linking climate change with the need to develop new, cleaner sources of energy. Goals outlined under this scheme include ways to improve efficiency and environmental performance of fossil fuel use; reducing dependence on conservational fuels through an intensified energy efficiency and conservation programme, hydropower, the expansion of renewable energy systems, and biofuel production/utilization

and for interested parties, civilian use of nuclear power, and mitigating greenhouse gas emissions through effective policies and measures – thus contributing to abating global climate change, for instance.

Two measures outlined in this agreement are worth noting:

1. The increasing of capacity and reduction of costs of renewable and alternate energy sources through innovative financing schemes. In this regard, it would be interesting to examine progress in the instituting Clean Development Mechanism (CDM) Capacity Building Activities (see table 22.1). A quick review of CDM projects undertaken by ASEAN countries revealed that the record is highly uneven. As of June 2006, seven countries submitted 61 CDM projects to the UNFCCC (see Table 22.2) and of the seven, three so-called LDCs submitted only six projects while the three LICs submitted six.

The majority of the projects are on biomass power and agricultural waste, consistent with economic structures that are based on agriculture and food processing in the region. It also reflects biomass as an important source of energy in the region.

But, when ranked according to the CER (carbon emission ratio – equivalent to one tonne of carbon dioxide) generation category, one can distinguish the ASEAN region by the three groups: high, middle and low CERs.

High CER-generating countries comprise Malaysia, Thailand and Indonesia. The middle CER-generating countries are the Philippines and Vietnam. Low CER-generating states comprise Cambodia and Laos PDR.

Two observations can be made. Although renewable energy is currently the leading CDM project type worldwide, when it comes to the number of projects, ASEAN countries so far only have a limited amount of renewable energy project documents in the official validation and methodology

Table 22.1 CDM institutions in ASEAN

Country	Kyoto Protocol ratified	DNA notified to UNFCCC	Published DNA Procedures	Necessary CDM conditions fulfilled	Supportive CDM framework
Cambodia	22 Aug 2002	Nov 2003	Yes	Yes	Yes
Indonesia	3 Dec 2004	Oct 2005	Yes	Yes	Yes
Lao PDR	6 Feb 2003	Nov 2003		Yes	
Malaysia	4 Sep 2002	May 2003	Yes	Yes	Yes
Philippines	20 Nov 2003	Sep 2004	Yes	Yes	Yes
Thailand	28 Aug 2002	Jun 2004	Yes	Yes	Yes
Vietnam	25 Sep 2002	Dec 2003	Yes	Yes	Yes
Total ASEAN 7	7	7	6	6	6

Source: Data from UNFCC website, status June, 2006 and personal communication.

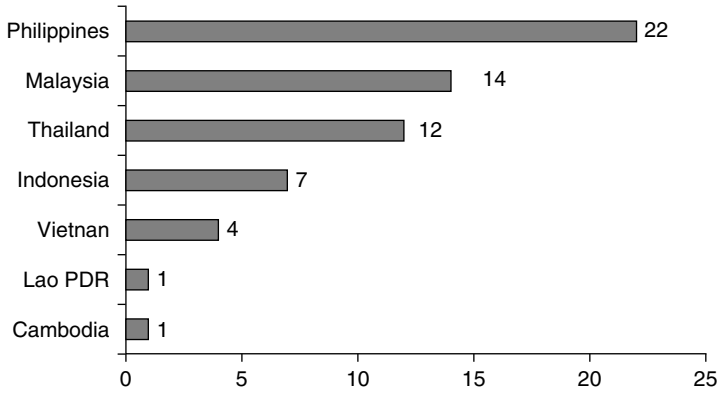

Table 22.2 CDM projects submitted to the UNFCCC as of June 2006 by ASEAN countries

Source: UNDCCC website as of June 2006.

development processes. This may be because CDM revenue is not yet taken into account by potential equity investors or loan providers despite generating free cash flow that can be readily applied to debt service obligations.

The weakness of the CDM projects (especially in the LICs) can therefore be summed up by the following: poor involvement of other stakeholders, especially from the private sector; bureaucratic, less flexibility to adapt to change in the CDM procedures and market; and staff are less motivated to work than in the mixed governmental-NGO model as those in some Latin America countries.

2. On the setting of individual goals and plans of action for improving energy efficiency and increasing capacity through and developing new, cleaner sources of energy. The current concern about nuclear energy in Southeast Asia has been a significant development. Since the 1980s when interest in nuclear energy had waned due to international cases of nuclear accidents (Three Mile Island and Chernobyl), the renewed interest in nuclear power plans has generated mixed responses in the region.

Thus, varying levels of development of states in the region lead to different capacity levels to deal with the issue, which result in different priorities which may clash, for example, the issue of nuclear energy in SEA. For instance, in Indonesia, there is the need to secure increasing demand for energy. Since nuclear energy has been cited as a carbon-free form of energy and is relatively cheaper than other renewables such as solar and wind power, it is an attractive option. Indonesia has been seeking help from Russia to build a nuclear energy power plant.[36] However, the country's volatile terrain impedes the state from pursuing this energy policy.

Biofuels (such as palm oil) have also been attractive alternative energy sources. In January 2007, the European Commission set a new target for its 27 member countries, to replace 10 per cent of petrol and diesel with biofuels by 2020, as compared to its previous target of 5.75 per cent by 2010.[37]

Indonesia and Malaysia are prime markets for biofuels, in particular palm oil as they account for 83 per cent of production and 89 per cent of global exports.[38] This would be problematic as unregulated biofuels production to meet the demand for energy could result in land being taken away from food production, thus posing a threat to food security and perpetuating poverty.

In order to deal with this, it is vital to further engage companies and local farmers to ensure that they keep to sustainable practices, and organizations or institutions must provide incentives for them to do so.

One of these is the Roundtable for Sustainable Palm Oil (RSPO), an association created by organizations carrying out their activities in and around the entire supply chain for palm oil. They promote the growth and use of sustainable palm oil through cooperation within the supply chain and open dialogue with its stakeholders. They also aim to advance the production, procurement and use of sustainable oil palm products through the development, implementation and verification of credible global standards and, the engagement of stakeholders along the supply chain.

The incentive is already starting to grow even from those demanding biofuels. The Netherlands, which is Europe's largest biofuel importer, most of which comes from Indonesia, has been drafting the Cramer Commission which proposes legislating that the Netherlands should not accept biofuel imports that have been grown on peatland. The UK is currently working on biofuel certification systems.

Other issues

One issue that is getting quite some attention of late is the idea of Avoided Deforestation (AD). In fact, Indonesia wants to form the Forestry Eight, which will propose AD as a way to mitigate climate change. It was reported that Jakarta would more or less take up this position, and propose a main agenda discussion on how to achieve Reduced Emissions from Deforestation (RED), leading up to the United Nations conference on climate change held in Bali in December 2007.[39]

The major argument in favour of carbon market-financed AD is that it will provide an opportunity to respond with critically needed funding for conservation work. It has been said that global AD funds will be in the order of US$100 billion annually. However, carbon market-financed AD could hinder real and meaningful ways of mitigating global warming by reducing GHG emissions from fossil fuels.

For example, International NGOs like Friends of the Earth International have said that Avoided Deforestation/destruction, which is a carbon-offsetting scheme, is being used as a smoke screen to ward off legislation and delay the urgent action needed to cut emissions and develop alternative low-carbon solutions. Therefore, AD should be financed through public funds, sourcing from fossil fuel or carbon taxes, and should not come from the carbon-market mechanism.

Even with public funding, which has always been a financing mechanism for conservation work and NGOs, the London-based Forest People's Program in June 2007 warned that the AD scheme risks renewed and even increased state and 'expert' control over forests, overzealous government support for anti-people and exclusionary models of forest conservation (evictions, expropriation) to protect lucrative forest carbon 'reservoirs', and unjust targeting of indigenous and marginal peoples as the 'drivers' of deforestation. This is problematic as it might also create a culture of corruption at official and other levels, which in turn would lead to exploitation of these indigenous and marginal peoples, and to poverty.

Current AD development initiatives are led by the World Bank, big international conservation NGOs, and carbon-trading brokers and consultants. The failure and destructive performance of these parties in the past, and ongoing global environmental and development initiatives, is very well documented, which should have effectively undermined their authority and credibility to lead the world in fighting against climate change.

The way forward

The following discussions have underscored two major issues in the regional/global response to mitigate as well as to adapt to the impact of climate change – one is that this global issue requires no less than a multi-dimensional and comprehensive approach, and the other is that addressing climate change highlights the need for multi-level governance.

In Southeast Asia, the cognisance of the sub-national and intra-state dimensions in handling forest fires have significantly improved the way ASEAN is coping with the perennial problem of haze. To avoid deforestation, there is a need to tackle the underlying causes. Some of these are: macroeconomic strategies that provide strong incentives for short-term profit-making instead of long-term sustainability; deep-rooted social structures that result in inequalities in land tenure; discrimination against indigenous peoples, subsistence farmers and poor people in general; and political factors, such as the lack of participatory democracy, the influence of the military and the exploitation of rural areas by urban elites, overconsumption by rich consumers, and uncontrolled industrialization.

In contrast, there are measures worth taking in order to adapt to climate change, alongside efforts to mitigate climate change, comprising the following.

1 Improving health surveillance: Climate change has far-reaching consequences on safe drinking water, food sufficiency, secure shelters and healthy social conditions. Due to deterioration of such premises as a result of climate change, there was an anticipated outbreak of diseases such as malaria, diarrhoea as well as the Nipah and West Nile viruses carried by fruit bats and mosquitoes.[40] Therefore, a better region-wide health surveillance and alert system could be instituted as a safeguard against climate change-related epidemics that have transboundary ramifications.[41]

2 Following international mechanisms on GHG reductions: It would be ideal for ASEAN member states to adhere to international mechanisms on GHG emissions, through which developing nations could receive financial incentives from wealthier nations. This is particularly applicable for ASEAN due to problems with financial constraints in some of the member states. However, the issue of government prioritization has to be resolved. Environmentalist groups had pointed out that the Indonesian government had developed a habit of exploiting climate change as a justification to secure foreign loans, then channelling the funds elsewhere, paying direct cash assistance to poor citizens after fuel price rises for instance.[42]

3 Sustained investments in research, development and technology (RD&T): Climate change and its ramifications will not remain static. As such, to cope with changes anticipated with this global phenomenon, continual and sustainable investments in RD&T will be necessary to seek techniques to adapt to and mitigate climate change. However, as Singapore's Prime Minister Lee Hsien Loong pointed out in 2007, this would have to take into account the varying national contexts in Southeast Asia, in terms of geographical size, population, development stage and endowment of energy resources among other factors.[43]

All these would be applicable in the comprehensive, regional fight to cope with climate change.

Notes

1. See Chapter 1.
2. 'US Will Take Lead in Climate Change Fight', *Straits Times*, 28 September 2007, http//www.straitstimes.com.
3. See Executive Summary, Scientific Expert Group Report on Climate Change and Sustainable Development, Prepared for the 15th Session of the Commission on Sustainable Development, 'Confronting Climate Change: Avoiding the

Unmanageable and Managing the Unavoidable', February 2007, available at www.confrontingclimatechange.org.

4. N. Purvis and J. Busby (2004) 'The Security Implications of Climate Change for the UN System' in Geoffrey D. Dabelko (ed.) *Environmental Change and Security Project Report,* Report, Issue 10, Woodrow Wilson International Center for Scholars, pp. 67–73.
5. See World Health Organization, WHO (2002) *The World Health Report 2002: Reducing Risks, Promoting Health Life* (Geneva: The World Health Organization), p. 72, http://www.who.int/whr/2002/en/ (accessed 3 February 2009).
6. The effects of the 1997/98 haze crisis have been disastrous to the economic, health and social security of many in Southeast Asia. Air quality in Indonesia's neighbouring states Malaysia and Singapore deteriorated significantly during haze crises, with PSI levels remaining largely in the unhealthy range as a result of the various poisonous gases and particle matter from the fires. The economic loss caused by the haze crisis was estimated to be US$ 9 billion, not to mention the 70 million people who were adversely affected. See ASEAN (2001) *Second ASEAN State of the Environment Report 2000* (Jakarta: The ASEAN Secretariat).
7. 'Peatland Degradation Fuels Climate Change', *Wetlands International,* available from www.wetlands.org (accessed 20 April 2007).
8. 'Peatland Degradation Fuels Climate Change', *Wetlands International,* available from www.wetlands.org (accessed 20 April 2007).
9. Fifty-seven per cent of land clearing method is done by forest fires, see DFID and World Bank, 'Executive Summary: Indonesia and Climate Change – Working Paper on Current Status and Policies', March 2007, p. 3.
10. 'Greater Use of Biofuels Threatens Rain Forests, Environmentalists Warn', *AFP*, 19 April 2007.
11. *Ibid*.
12. 'Peatland Degradation Fuels Climate Change', *Wetlands International,* available from www.wetlands.org (accessed 20 April 2007).
13. 'S'pore Offers Help to Regency in Jambi to Fight Haze Problem in Indonesia', *ChannelNews Asia*, 6 March 2007.
14. 'Indonesia's Initial National Communication to the UNFCCC', July 2000, pp. 4–22.
15. Federal ministry for economic development and cooperation, 'Lao-German Government Negotiations: Parties Agree on Activities to Protect the Climate through Forest Conservation', http://www.bmz.de/EN/press/pm/2008/april/pm_20080403_30.html (accessed 2 February 2009).
16. Existing national guidelines to mitigate climate change include the Sustainable Forest Management (SFM), Integrated River Basin Management (IRBM) and Integrated Coastal Zone Management (ICZM). The National Environment Policy, National Biodiversity Policy and National Forestry Policy constitute the country's existing climate change policies.
17. Under NPP 18, ESAs would be integrated in the planning and management of land use and natural resources to ensure sustainable development while under NPP 19; a Central Forest Spine (CFS) would be established to form the backbone of the ESA network.
18. Mangrove forests can act as wave breakers and stabilize coastal areas. A RM40-million budget has been approved under the Ninth Malaysia Plan to fund this programme and involves the participation of several civil society organizations such as the MNS, WWF, SAM and GEC. By the end of 2007, a total of 397.1 hectares of mangrove and other species would be planted and

the target for 2008 is set at 2000 ha. See Presentation by Forestry development division, Ministry of Natural Resources and Environment, Malaysia. http://www.lestari.ukm.my/downloads/file/seminar/110308/Linking%20Protection%20of%20Ecosystem%20Services,%20Knowledge%20%0Sustainable%20Development.pdf.

19. A series of intensive training/workshop/brainstorming sessions would be held for journalists over a six-month period in Kuala Lumpur and five other major towns across the country. In parallel, the mass media would be monitored for six months following the training in order to assess the coverage that is given to climate change-related issues. Such an assessment would then help strengthen future training sessions as well as forming the basis for future projects to create greater public awareness. See 'Malaysia's Initial National Communication to the UNFCCC', July 2000, p. 107.
20. In collaboration with the National Climate Data Centre (MMS), the MCCG is preparing an educational fact-sheet for general distribution. The MCCG has also been closely following the UNFCCC intergovernmental negotiating process, besides monitoring the alternative sources of information on climate change being circulated among NGOs worldwide.
21. The principles of PA21 are: developing holistic science and appropriate technology, promoting the use of holistic rather than reductionist science in finding solutions to development problems; cultural, moral and spiritual sensitivity which encourages the nurturing of local and indigenous knowledge and respect for the diversity of culture, moral standards and spiritual nature of Filipino society; self-determination, which advocates respect for the rights and capability of people to decide on their development course; national sovereignty; gender sensitivity; peace, order, and national unity; social justice, inter- and intra-generational, as well as spatial, equity; participatory democracy; institutional viability; viable, sound and broad-based economic development; sustainable population; ecological soundness; bio-geographical equity and community-based resource management. Refer to 'The Philippines' Initial National Communication to the UNFCCC', 1999, p. 31.
22. The Philippines has also pioneered the regional initiative in phasing out inefficient incandescent light bulbs in favour of more energy-efficient compact fluorescent lamps (CFLs) which could achieve the double goal of reducing GHG emissions and cutting household energy costs. See 'ADB: Philippines Phasing Out Incandescent Bulbs to Cut Greenhouse Gas Emissions', *ENP Newswire*, 5 February 2008.
23. The programme includes the means of empowering upland communities by making them 'stewards' of their own environment, which would be the best way of protecting the country's natural resources and would provide them with more livelihood opportunities. President Arroyo has a vision of a nationwide upland development plan that is to be anchored on agro-forestry improvement and reforestation. See Dept. of Environment and Natural Resources, Philippines, 'DENR to intensify agro-forestry in upland areas to ease climate change and create economic opportunities', 16 Sept 2008, http://www.denr.gov.ph/article/articleview/4972/1/39 (accessed 3 February 2009).
24. This network comprises some eight national environmental NGOs involved in several information dissemination activities in schools, regularly organizing workshops to raise awareness on climate change issues among students and teachers. To raise public awareness of climate change, it has also disseminated t-shirts and multimedia materials such as brochures, and documentary films.

25. Initiatives to improve energy efficiency includes the energy labelling scheme for households, energy smart building scheme for buildings, the fuel economy labelling scheme for new passenger vehicles as well as the energy audit scheme for large energy consumers.
26. Efforts were also being made to create an aesthetically greener Singapore via the organizing of more outdoor and eco-friendly activities, such as nature walks and water activities.
27. These groupings include the Nature Society, Waterways Watch, ECO-Singapore and Climate Change Organization. See Singapore Environment Council, www.sec.org.sg.
28. 'Thailand's Initial National Communication to the UNFCCC', October 2000, p. 76.
29. 'Climate Change Threatens Vietnam', *Vietnam News*, 26 May 2008, http://vietnamnews.vnagency.com.vn/showarticle.php?num=03MIS260508 (accessed 3 February 2009); see also 'Climate Threat Taken Seriously', *Saigon Times Weekly*, 2 February 2008.
30. In the first phase of the project, US$638 million would be spent on relocating 21,300 families living in the most vulnerable areas of central Vietnam. Houses would be designed to withstand storms and floods and the people will receive financial assistance to reinforce them. Infrastructures would also be strengthened against the force of floodwaters, including irrigation works, reservoirs and anti-erosion dykes. This project is particularly significant for more than 15 million people in 11 central Vietnam provinces and involves the improvement of anti-flood measures until 2020 and even further for central Vietnam, as well as providing work opportunities for each province. See Ministry of Natural Resources and the Environment, Vietnam, 'Anti-flooding Projects Need Boost', 15 August 2008; and Ministry of Natural Resources and the Environment, Vietnam, 'Central Vietnam adopts $1b flood plan', 04 June 2008.
31. Under the FCPF, countries would receive grant support as they build their capacity for REDD (reduction of emissions from deforestation and degradation) and tap into future systems of positive incentives for REDD. The inclusion of Laos and Vietnam highlights their critical importance in terms of capacity building for reforestation largely due to the problem of illegal logging in Indochina. This initiative would also serve to provide greater support and assistance to rural communities that depend on forest produce for their livelihood.
32. http://www.lestari.ukm.my/downloads/file/seminar/110308/Linking%20Protection%20of%20Ecosystem%20Services,%20Knowledge%20&%20Sustainable$20Development.pdf.
33. 'Shocking Climate Impact of Wetland Destruction in Indonesia', *Wetlands International*, 2 November 2006, www.wetlands.org (accessed 20 April 2007).
34. The individual and collective actions aim to address climate change, including greenhouse gas emissions, considering the principles of equity, flexibility, effectiveness, and common but differentiated responsibilities and respective capabilities, as well as reflecting different social and economic conditions of the member states. See http://www.aseansec.org/21116.htm (accessed 3 February 2009).
35. The objective of this first of the series has been to reach a better understanding of the kind of policy coordination and integration that will be required in both the forest and the coronment policies in order to mitigate the risks of climate change. See 'Secretary-General of ASEAN Launches ASEC Brown Bag Series', *US Fed News*, 8 July 2008; and also 'ASEAN Forum Raises Awareness on Initiatives', *Thai News Service*, 8 July 2008.

36. 'Russia to Help Indonesia Build First Nuclear Power Plant', *People's Daily*, 23 November 2006, http://english.peopledaily.com.cn/200611/23/eng20061123_324487.html (accessed 3 February 2009).
37. 'Greater Use of Biofuels Threatens Rain Forests, Environmentalists Warn', *AFP*, 19 April 2007.
38. *Ibid*.
39. See A. Ruwindrijarto 'Community Logging May Address Deforestation', *Jakarta Post*, 22 September 2007.
40. In Southeast Asia alone, the estimated deaths linked to diarrhoea exceeded 500,000 in 2005 and climate change would be expected to increase this number significantly. See 'Climate-Related Diseases to Cause Health Setback', *The Jakarta Post*, 14 December 2007.
41. A study in India and Africa revealed a link between climate change and an increase in diarrhoea and vector-borne diseases such as malaria. See 'Climate Change/Possible Disease Outbreaks; Experts Call for Better Monitoring of Health', *Bangkok Post*, 1 September 2007.
42. 'Govt Told to Kick Climate Loan Habit', *The Jakarta Post*, 5 July 2008.
43. 'Singaporean PM in Bali Proposes Five Ways to Mitigate Climate Change', *BBC Monitoring Asia Pacific*, 12 December 2007.