Chapter 4

Engendering a Resilient and Sustainable ASEAN

October 2015

This chapter should be cited as

ERIA (2015), 'Engendering a Resilient and Sustainable ASEAN', in Intal, Jr. P., V. Anbumozhi, F. Zen, H. Nishimura and R. Prassetya (eds.), *Framing the ASEAN Socio-Cultural Community Post-2015*. ERIA Research Project Report 2014-01, Jakarta: ERIA, pp.167-207.

Chapter 4

Engendering a Resilient and Sustainable ASEAN

I. Introduction

ASEAN is working towards achieving sustainable development by protecting the natural resource base for economic and social development including conservation of soil, water, mineral, energy, biodiversity, forest, coastal and mineral resources, as well as the improvement in water and air quality. ASEAN is also actively participating in global efforts towards addressing global environmental challenges such as climate change and disasters, which have high impacts on local communities. While most of the outputs of major projects under the ASEAN Socio-Cultural Community (ASCC) Blueprint are recorded as successful, the achievement of goals and targets takes a longer time because the rapid economic expansion of ASEAN since the 1990s has not only has made the region the centre of global growth in consumption, but it has also created strong pressure on the region's natural resources. The impact of the overuse of minerals, water, fisheries, forests, and other resources is being felt across the region (ASEAN, 2013a, 2013b, 2014b). Carbon emissions have risen dramatically, harming the quality of air, water, and arable land and heightening the risks of climate change (ADBI, 2013). Social, cultural, and environmental impacts further increase the vulnerability to disasters and tend to set back development, destroy livelihoods, and increase the disparity nationally and region wide. A resource-efficient, resilient, and low-carbon sustainable green growth will curtail future economic and social costs of environmental degradation and climate change. This chapter discusses the key strategies and required actions for a resilient and sustainable ASEAN under the thematic areas of (1) climate change and food security, (2) natural resource management (NRM) and biodiversity loss, (3) trans-boundary air pollution, (4) liveable cities, (5) energy poverty and clean energy provision, (6) disaster risk management, and (7) green growth.

ASEAN's sustainability challenges will require cooperation in technical capacity, knowledge, and large-scale investments. Regional cooperation,

shared governance, and public participation will help reduce carbon emissions, manage natural resources, conserve biodiversity, and mobilise funds for infrastructure improvement.

II. Climate Change and Food Security

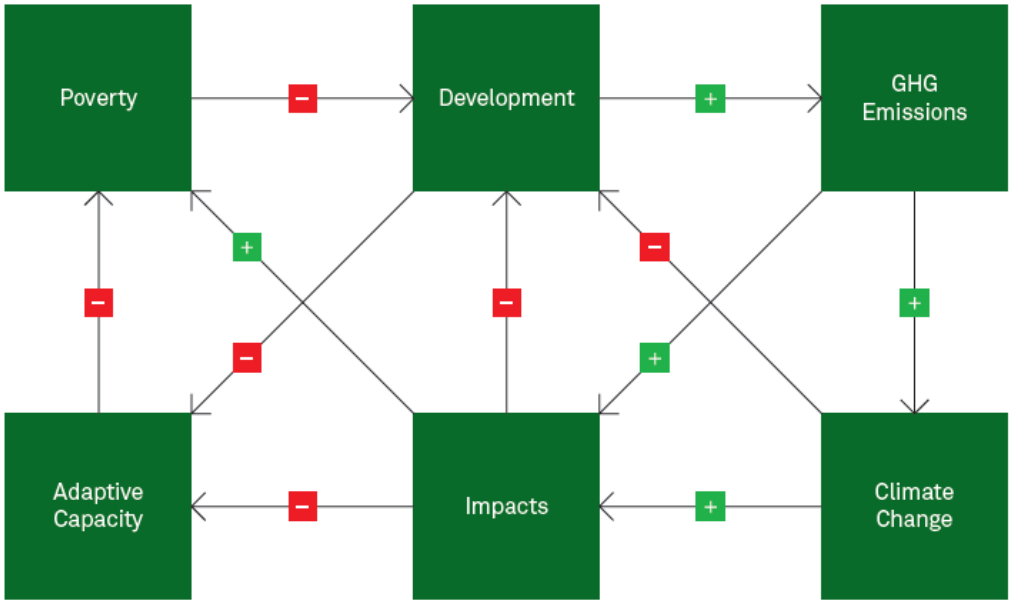
Climate change is one of the most significant challenges to regional economic development. Left unchecked, continued global warming could cause social and environmental disruption at the community level. ASEAN's food security is more vulnerable to climate change risks due to member states' dependency on natural resources and agriculture sectors. Densely populated coastal areas, weak local institutions, and the poverty of a considerable proportion add to the susceptibility of this region.

Food security and climate change are governed under two separate communities in ASEAN. The former currently falls under the umbrella of the ASEAN Economic Community (AEC), while the latter is firmly within the realm of the ASCC. Under the AEC, the ASEAN Integrated Food Security Framework aims to address long-term food security challenges. The Strategic Plan of Action on Food Security in the ASEAN region has six objectives: (1) increase production, (2) reduce post-harvest losses, (3) promote conducive markets and trade for agricultural commodities, (4) ensure food stability, (5) promote availability and accessibility to agriculture inputs, and (6) operationalise regional food emergency relief. Amongst them all, the objective of operationalising regional food emergency relief arrangements has seen substantial progress in the form of the ASEAN Plus Three Emergency Rice Reserve and the ASEAN Food Security Information System (Caballero-Anthony, et al., 2015). However, climate change has adverse impacts on post-harvest losses, agricultural commodity trade, and food market stability (ADB, 2009; ADBI, 2013). Hence, the AEC will be unable to achieve the objectives on food security unless it addresses the region's vulnerability to climate change and build resilience to it.

Towards addressing ASEAN's vulnerability to climate change, the ASEAN Multi-Sectoral Framework on Climate Change: Agriculture, Fisheries, and Forestry Towards Food Security was formed under the AEC in 2009. Several workshops have been conducted to share knowledge on climate change adaptation. Several bilateral and multilateral statements, pilot projects, and work programmes have been initiated under ASEAN Plus collaborations to increase awareness on the impact of climate change on the

livelihood conditions of communities. With this momentum under the ASEAN Multi-sectoral Framework on Climate Change, ASEAN needs to move beyond knowledge sharing and give more emphasis on concrete actions in the post-2015 blueprint (Caballero-Anthony, et al., 2015).

Figure 4.1. Links between Climate Change, Poverty, and Adaptive Capacity



Note: GHG = greenhouse gases.
Source: Prepared by the authors.

Climate change, poverty, and adaptive capacity of farm households are interlinked (**Figure 4.1**). Climate change adaptation – making adjustments in natural and human systems in response to actual or expected climate stimuli – should become a key pathway for the ASCC for sustaining economic growth. Adapting to climate change and achieving food security in ASEAN member states implies three levels of action: (1) communities and farming households need to be aware of weather fluctuations and their potential impacts; (2) the cost benefits of adopting responsive measures need to be quantified; and (3) farmers need to decide how to respond (FAO, WFP, and IFAD, 2014). However, these procedures are yet to be widely mainstreamed to assist the agriculture sector to enhance its resilience to climate vulnerability (Lam, 1993; Lassa, 2012). Despite the urgent need for innovative food value chains, market channels, and agricultural practices, implementation is lagging due to the poor capacity of farm households and weak institutional capacity (Kuneepong, et al., 2013).

Some of the major impediments to the adaptation and diffusion of innovative and climate adaptation strategies in ASEAN countries are:

- Declining public investment in agricultural research, development, and extension services
- Inadequate local training and capacity building programmes
- Lack of investment in location-specific technologies
- Weak intellectual property rights covering advanced technologies
- Limited private sector investment and involvement in the seed sector
- Weak local institutions that support farmers' access to and use of new technologies
- Lack of financial mechanisms to support climate insurance initiatives (for example, micro-insurance, catastrophe bonds, and reduced insurance premiums).

Mainstreaming Climate Change Risks into Developmental Planning for Post-2015

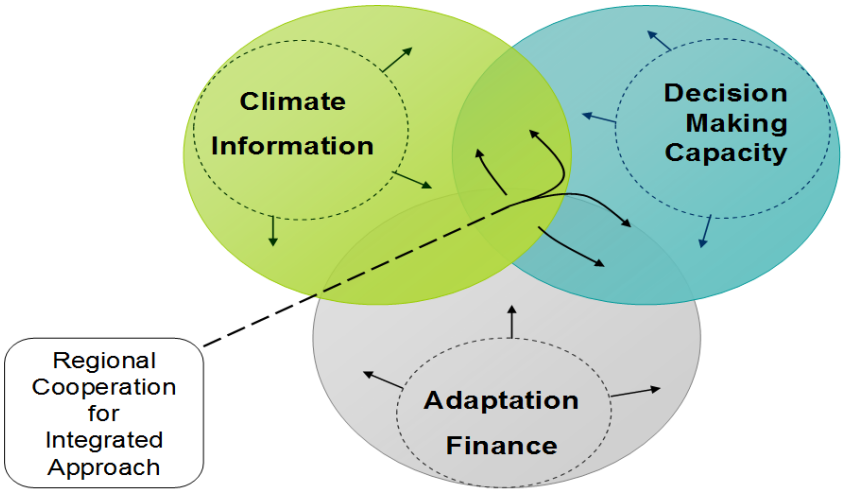
To promote the integration of climate-smart agricultural practices and overcome the above-mentioned food security barriers, policy instruments at a national and regional level are needed to guide, speed up, and enhance local community actions. In the first stage, ASEAN member states need to draw their attention to measures that simultaneously bring environmental, developmental, and social benefits; whereas, in the long term, climate actions should include broader spectrum approaches. Main policy measures that enable mainstream climate considerations into sectoral planning should include:

- Support to farm households and local communities in developing diversified and community-based agricultural systems that provide adequate food to meet local and consumer needs, while guaranteeing critical ecosystem services.
- Invest in better climate information to predict extreme weather events accurately.
- Develop new channels skill transfer between farmers and the research community to mainstream sustainable agricultural production methods.
- Invest in transport and storage systems.
- Emphasise developing locally shared infrastructure and improving value-added activities for farmers.
- Achieve policy coherence and effective coordination of different governmental departments and their activities.

- Enhance investment in research and development (R&D) programmes on high-yield crop varieties that are tolerant to drought and nutrient stress.
- Implement a crop insurance scheme for payments to finance climate-smart agricultural development framework.
- Implement regulations in the financial sector that facilitate the international flow of funds for adaptation at local levels for environmental benefits.
- Leverage agricultural official development assistance to enhance innovation and extension systems, climate-resilient ecological farming methods, and supportive infrastructure.
- Implement best management practices for greening the agricultural supply chain.
- Reformulate trade-related policies to accommodate climate risks and strengthen food security. On the export side, increase market access in developed countries for products exported by developing countries to raise farmers' income. Reinforce food security by introducing climate insurance and financial rebate programmes.

The vulnerability risks and the trans-boundary nature of climate change impacts on poverty also warrant a regional strategy to improve the adaptive capacity. ASEAN member states, through the ASEAN University Network and related networks, can work together to conduct local climate impact assessment on key watersheds, and upscale the ongoing pilot adaptation projects. Regional level climate monitoring systems, and index-based flood insurance systems (as finance model to augment decision-making capacity at different levels) warrant immediate attention under the stewardship of the ASCC. **Figure 4.2** illustrates such a cooperating opportunity in three frontiers.

Figure 4.2. Regional Approaches to Climate Change Adaptation



Source: Anbumozhi (2012).

Further, ASEAN should strengthen its technical expertise on climate change resilience by collaborating with international organisations such as International Rice Research Institute (IRRI), the World Fish Centre (WFC), the International Fund for Agriculture Development (IFAD), the Asian Development Bank (ADB), and the Intergovernmental Panel on Climate Change (IPCC). Leveraging the existing committees, institutions, or mechanisms in ASEAN under the concept of shared governance for mainstreaming climate considerations will help the region address the issue comprehensively.

III. Natural Resource Management and Biodiversity Loss

The ASEAN region is regarded as one of the most heavily forested areas in the world as almost 43 percent of the region is covered in forest. Moreover, over 20 percent of all known plant, animal, and marine species of the world can be found in the region. However, the region's total forest cover has decreased to 1,904,593 square kilometres (km^2) in 2010 from 2,089,742 km^2 in 2000 at the rate of 1.3 percent per year between 2000 and 2005 and 1.1 percent between 2005 and 2010 (ASEAN, 2013a). The driving forces behind the deforestation include rising population, increasing agricultural production, logging, and mining. Many member countries still rely on timbre production to provide livelihood for the people. Similar to the terrestrial

ecosystem loss, the freshwater and marine ecosystems in the region are at risk. The region has also suffered from the empty forest syndrome – forests that have lost all their species on record – and wetlands loss, and thereby adversely affecting the region's rich biodiversity. Hundreds of species in the ASEAN region are being threatened, arising from natural habitat loss due to deforestation, climate change, pollution, population growth, and poaching to fuel the illegal wildlife trade. Four of the world's 34 biodiversity hotspots facing serious loss of habitat are located in the region (ASEAN, 2013b).

Cognisant of the need to manage well its natural resources and engender biodiversity conservation and sustainable use, ASEAN in 2009 identified 11 priority areas and 98 action lines for implementation. The priority areas are (1) addressing global environmental issues, (2) managing trans-boundary movement of hazardous wastes, (3) promoting sustainable development through environmental education and public participation, (4) promoting environmentally sound technology, (5) promoting quality living standards, (6) harmonising environmental policies and databases, (7) promoting the sustainable use of coastal and marine environment, (8) promoting sustainable management of natural resources and biodiversity, (9) promoting the sustainability of freshwater resources, (10) responding to climate change and addressing its impacts, and (11) promoting sustainable forest management. Each priority area is allotted to subsidiary organisations, with a lead country, which is responsible for setting the strategic direction and overall responsibility for the programme. The priority areas also represent the multi-faceted aspects of NRM with specific actions to be taken spelled out. However, there is wide variability in the implementation performance of the programmes and action lines (ASEAN, 2012b).

The strategic policy tools that have been used across the region for implementing the action lines include:

- Land: Clear and protected rights and effective rules defining access and regulating land and other natural resource use are essential means of ensuring long-term sustainable land and resource management. Successful policy practices include integrated watershed management, resource-efficient urbanisation, protecting prime agricultural lands, improved forest management, payment of ecosystem services, and Reduced Emissions from Deforestation and Forest Degradation (REDD+), and agro-forestry and silvopastoral practices – the simultaneous production of trees and animals.

- Water: The equitable and sustainable management of fresh water bodies such as rivers, lakes, and ground water resources is a major challenge to all water user groups (communities, industries, and agriculture), with most

governments, from the local to regional levels, facing the need to realign the availability of quality water that also maintains ecosystem integrity. Policies identified as successful across ASEAN member states include integrated water resource management, conservation and sustainable use of wetlands, promotion of water use efficiency, water metering and volumetric based tariffs implemented at the subnational level, recognising safe drinking water and sanitation as a basic human right, and industrial effluent charges.

- Marine resources: Policies, such as integrated coastal zone management and marine protected areas, and economic instruments such as user fees have provided a level of success in some ASEAN member states. However, there are further opportunities to exploit innovative approaches such as the Connectivity of Hills, Humans, and Oceans (CoHHO) programme in Japan that has a 'whole ecosystem' approach to development of sustainable ecosystem corridors. Thus, strategic measures like 'encourage application of whole ecosystem' or 'hills-to-seas approach' to corridor development planning at the subnational level shall be promoted, especially in ecologically sensitive areas and islands in ASEAN.

- Biodiversity: Biodiversity policies promote the protection, conservation, and sustainable use of biologically diverse ecosystems and habitats. In doing so, they create significant public benefits and contribute to social well-being. Successful policy instruments adopted across one or more ASEAN member states include market-based instruments for ecosystem services, including Reduced Emission from Deforestation and Forest Degradation (REDD+), increasing and improving the management of protected areas, establishing trans-boundary biodiversity and wildlife corridors, community-based participation and management, and sustainable agricultural practices.

- Sustainable consumption and production: Important multilateral agreements and frameworks have been adopted with regard to sound management of hazardous waste; life cycle analysis; reduce, reuse, recycle – the 3R – alongside cleaner production; and control of inappropriate import and export of hazardous chemicals and waste.

Regarding biodiversity conservation, with the establishment of the ASEAN Centre for Biodiversity, ASEAN member states are putting greater emphasis on mainstreaming biodiversity conservation and sustainable use into various sectors – government, corporate, economic, education, education, tourism, trade, and food production – to ensure individual and collective supportive actions are taken in a cohesive way. The concept of

functional diversity, which provides more options for livelihood improvement based on conservation principles, is getting incorporated in major regional programmes in the Greater Mekong Subregion, the Heart of Borneo, and ASEAN Heritage Parks, among others. Substantial progress has been made in implementing National Biodiversity Strategy and Action Plans that take into consideration the Nagoya Protocol Targets set for 2015–2020 and the 10th Conference of the Parties of the Convention on Biological Biodiversity. Most ASEAN member states are signatories to the Global Plan of Action and the International Treaty on Plant Genetic Resources for Food and Agriculture, which establishes a framework for access and benefit sharing within a multilateral system for most of ASEAN's food crops. However, ASEAN as a region is slow in controlling invasive alien species, addressing the impact of biodiversity on species and ecosystems, and abating pollution and exploitation of forests and wetlands (Sajise, 2006). Weak and often separate coordination between the sectoral ministries as well as the lack of support by local government units and the private sector could be cited as challenges in the rehabilitation of degraded ecosystems.

The most practical way forward for ASEAN's goal of empowering communities and strengthening national and regional platforms for biodiversity conservation would be to make use of existing institutions, programmes, and mechanisms as platforms or a nucleus to create and install more effective links and networks which can respond more effectively. Sajise (2015) identified programmes that could be put together under the ASEAN shared governance umbrella, with measurable targets, as follows:

- Enhancing the ASEAN agenda on the characterisation of protected areas as food and nutrition baskets and as a watershed of ecosystem services for the country and the region by linking this to the International Treaty on Plant Genetic Resources for Food and Agriculture implementation as well as the Globally Important Agricultural Heritage System.
- Supporting and monitoring the enhanced exchanges of biodiversity materials under the Nagoya Protocol and plant genetic resources for food and agriculture under the International Treaty on Plant Genetic Resources for Food and Agriculture through existing ASEAN networks.
- Providing mechanisms for enhanced coordination between the ministries of natural resources, agriculture, and forestry, local government units, and academe in a fully integrated National Biodiversity Strategy and Action Plans including enhanced coordination at all political levels.
- Strengthening capacities for biodiversity conservation and sustainable use, especially in coping with climate change through networking of various seed banks at the regional, country, and community levels.

- Building the capacity of farmers, fishers, and forest users through participatory processes such as the model of the farmer field school and partner countries and community-based organisations.
- Supporting markets and adding value for enhancing the value of biodiversity.
- Developing an ASEAN consortium on research for biodiversity and climate change.

Applying Natural Resource Management and Biodiversity Conservation Policies in a More Effective Way under the Post-2015 Framework

Absent or inadequate governance – that is, weak monitoring and implementation deficits, top–down approach in management of key resources like forests, and lack of land rights – is the main challenge in NRM. NRM and governance at the national and regional levels have evolved into a set of organisations, policy instruments, financing mechanisms, rules, procedures, and norms that regulate the process on NRM and biodiversity loss. Some successful strategies to overcome the implementation deficits are (1) moving the policy discussion up to a higher level, for example, environmental council, chaired by the president; (2) investing in good monitoring systems and assessment; (3) strengthening administrative capability; and (4) addressing the bottom-up and driver approach, for example, providing economic activity and/or alternatives for the people, will help communities.

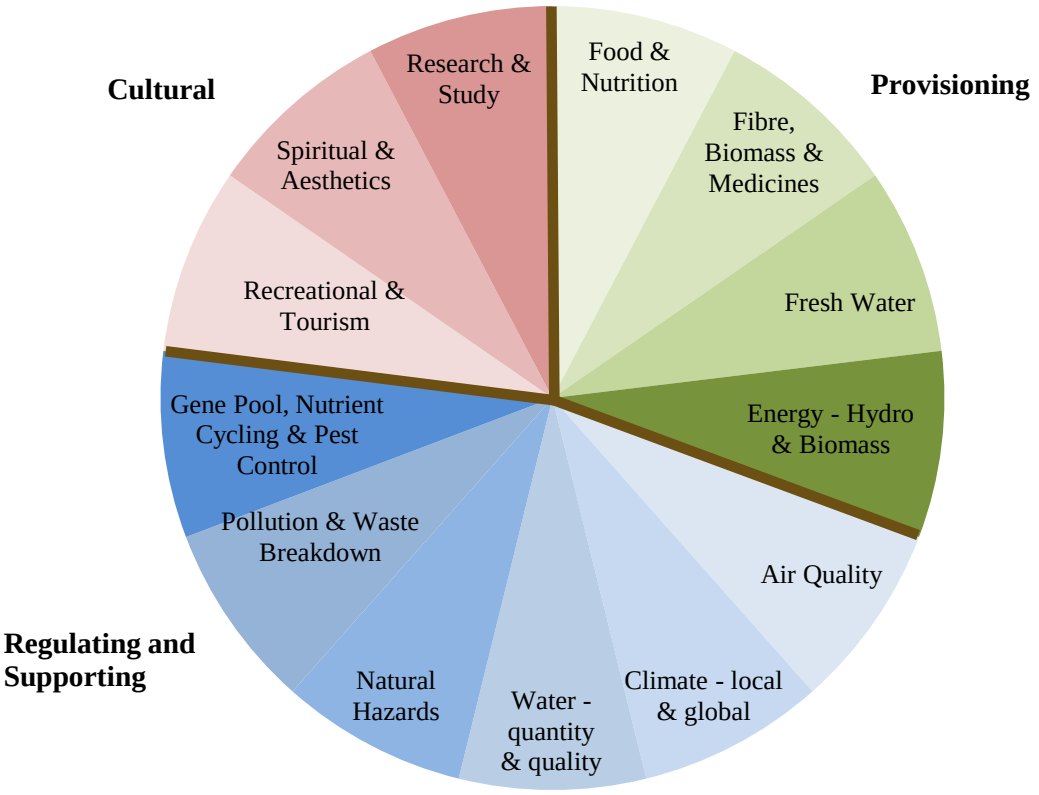
Application of the above strategic management concepts and policy tools can be innovative, if the following principles are adhered to.

- Strengthen cross-cutting policies across themes and sectors: It is important to maximise the benefits by focusing on options that are mutually reinforcing and cross-cutting. That will necessitate introducing policy integration to manage cross-sectoral issues like water, food, and marine resource management.
- Address the drivers: There is an increasing need to shift attention away from the effects of environmental degradation to a greater focus on underlying drivers such as population increase, poverty, ignorance on the life time value of resources, and intergenerational equity.
- Enhance monitoring, evaluation, and accountability: Monitoring and evaluation should be used to improve policy design, increase accountability of different stakeholders, and identify promising practices that can be applied subsequently in country settings. In this regard, key performance indicators

are necessary to evaluate policy progress and to identify the success and shortcomings of the implementation of selected policy instruments.

- Improve multistakeholder participation at local and national levels. The benefits of involving stakeholders (for example, communities, the private sector, local government, community-based organisations, and knowledge institutes) need to be acknowledged at all levels. Opportunities to share views, needs, and knowledge, to build consensus, to enable participants to influence outcomes, and to build commitment and a sense of ownership have to be enhanced and ensured during project or programme implementation.
- Stronger long-term policy and financial commitment on the part of governments is needed for the active involvement of the private sector and better use of market forces.
- More information-sharing and capacity-building programmes are needed across the region to enhance the potential for transferability and replication of successful policy instruments.

Figure 4.3. Type and Classification of Ecosystem Services Provided by Forests



Source: Prepared by the authors.

Natural resources such as forests, lakes, and oceans are the source of various ecosystem services (**Figure 4.3**). Hence, planning for NRM requires a different approach to any other conventional economic planning. A bottom–up approach involving the local community will bring sustainability as locals have better information on the current status and the condition of the natural assets. With the practical understanding and experience regarding the potential integration of the management of production and conservation across land, air, and water boundaries, local communities can contribute tremendously in identifying the future opportunities and livelihood options they can make.

Such information, along with the customised recommendation on NRM policy measures in a participatory way, will help in formulating short- and long-term plans as illustrated in **Table 4.1.**

Table 4.1. Focus Areas at Different Phases of Natural Resource Management

Phase	Focus Areas	Focus areas on programmes/plans	Focus areas of institutional development
Basic foundational	Baseline assessment on natural resources	Awareness, skill, and knowledge development	Needs assessment and designing NRM institutional framework
Short term	Immediate priorities to face the disastrous state of natural resources	Enhanced NRM involvement within communities and relevant stakeholders	Design institutional rules and capacity building issues
Medium term or intermediate	Maintenance or improvement of the state of all natural resources	Enhanced capacity and adoption of sustainable NRM practices across the broader ranges	Enhanced network among relevant institutions and modification/harmonisation of activities
Longer term	Natural resources conservation	Capacity to manage sustainable NRM activities jointly by	Establishment of well-managed institutional

Phase	Focus Areas	Focus areas on programmes/plans	Focus areas of institutional development
		respective stakeholders at all levels	settings with continuous thrive for innovation

Note: NRM = natural resource management.
Source: Kalirajan, et al. (2015).

It is best for ASEAN to adopt a standard framework for managing natural resources. The framework should address the significant inter-related and inter-connected political, institutional, economic, and governance areas. Regional level monitoring is vital in the case of a planned and adoptive approach towards NRM. With shared natural resource assets and differentiated programme implementation and performance, establishing a reporting mechanism at the ASEAN level will help make quick policy adjustments at the national and local levels. And through the reporting and peer review mechanisms, they can learn from other's experiences. Towards that, ASEAN can establish a regional trust fund for a specific portfolio of projects and programmes that enhance current actions on NRM.

IV. Managing Trans-boundary Air Pollution

Improper management of natural resources like forests can also become a cause of trans-boundary pollution. For example, the slash and burn practice of tropical forest trees results in haze, which is a serious health issue in parts of ASEAN. In 2014, nearly 50,000 Indonesians were suffering from respiratory, eye, and skin ailments due to the haze. The quality of air was at a dangerous level – people were wearing facemasks even indoors. The forest fires are extensive in areas with deep peat soils, indicating heavy air pollution with high volumes of carbon. All flights during a week of haze peak were cancelled and in the subsequent week only a few could fly due to poor visibility. From February to March 2014, Riau province lost about $1.75 billion or about 30 percent of its annual gross domestic product due to haze problems.[1] On 21 June 2013, Singapore hit the all-time record level at 401 of the Pollutant Standards Index that was described as potentially life-threatening to the ill and the elderly. Malaysians, especially those in Johor,

[1] According to the Head of Data, Information, and Public Communication of Indonesia's Disaster Management Agency, Sutopo Purwo Negoro.

also shared the same suffering. At the peak, the Pollutant Standards Index reached 383 (hazardous) in Muar, Johor. Roughly half of the fire alerts in Sumatra appeared within under-concession land to palm oil, pulpwood, and timbre. Most of the area burned in Riau is peat wetland, which can go down to a depth of 30 metres. A fire doused on the surface might fume underground long after. Indonesia legal system prohibits the burning of peat but it continues. The June 2013 and March 2014 incidents were the worst cases of forest fire that affected many people in Sumatra, Singapore, and Peninsular Malaysia (Sunchindah, 2015).

Sunchindah (2015) also points out that failure to prevent forest fires and trans-boundary haze has the following significant impacts:

- Losses to property and/or degradation of natural resources, biodiversity, and ecosystem.
- Increase in emissions of greenhouse gases and other hazardous pollutants.
- Harmful effects on health including injuries and fatalities to humans, animals, and plants.
- Adverse effect on transport operations due to safety concerns arising from poor visibility.
- Negative impact on tourism and business.
- Rights to clean air, good health, and quality livelihoods being denied to numerous affected communities and ordinary citizens.
- Strained neighbour relations among ASEAN member countries, if not others.
- Serious dent on the image of ASEAN solidarity and effectiveness.

Trans-boundary cooperation is important when natural resources are shared even if, given the archipelago in ASEAN, the haze problem affects the country of origin more than its neighbours (ASEAN, 2003; ASEAN, 2004; ASEAN, 2007; ASEAN 2009a). Indonesia's ratification of an agreement on trans-boundary haze in ASEAN in September 2014 should be a good start to have actionable discussions, especially among Indonesia, Malaysia, and Singapore. ASEAN member states have exerted joint efforts to monitor, prevent, and mitigate the trans-boundary haze pollution resulting from land and forest fires, endorsing the Regional Haze Action Plan (RHAP) in 1997 and adopting the ASEAN Agreement on Trans-boundary Haze Pollution in 2002. The ASEAN Peatland Management Strategy, composed of zero-burning and controlled-burning practices, is the most recent deployment to implement the RHAP. In 2014, Singapore's Parliament passed the Trans-boundary Haze

Pollution Act that allows prosecution of companies and individuals that cause severe air pollution in Singapore by burning forests and peatlands in neighbouring countries. With all ASEAN member states finally coming on board, more concerted actions should follow to address the haze problem.

The neighbouring member states considered the following factors in tackling the cross-boundary environmental problems through cooperation, coordination, and common understanding:

- The modus operandi of implementing the sectoral policies and the drivers associated with forest land clearance mechanisms.
- The speed at which sustainable forest policies like zero burning – a method of land clearing where the tree is either logged over secondary forests or an old area of plantation tree crops such as oil palm and are shredded, stacked, and left in situ to decompose naturally or controlled burning – any fire, combustion, or smouldering that occurs in open air, which is controlled by national laws, rules, regulations, or guidelines and does not cause fire outbreaks and trans-boundary haze pollution, have been widely adopted by countries since their first introduction.
- The degree by which the private sector and maligned communities have been convinced that the best practices are not harmful to their businesses and livelihood conditions.
- The approaches by which sectoral policies have contributed co-benefits that made them even more acceptable.

Cooperation has been shown to be effective for achieving sustainable management of forest fires where there are multiple stakeholders such as local communities, private sector operators, and local and national governments. However, efforts to enhance the sustainability of forests and prevention of forest fires also face a lack of national capacity and awareness, and intensifying competition in international forest product markets (Sunchindah, 2015). Hence, the following strategies to enhance the post-2015 agenda are suggested, noting that local effects are as serious as trans-boundary effects:

- Strengthen participatory monitoring with various stakeholders and use satellite maps of fires and concessions to help determine causes and accountability. High resolution satellites and/or remote-sensing technology allow real-time monitoring of land and forest fires. Note that about half of the fires in Sumatra are within palm oil, pulpwood, and timbre concessions.

- Strengthen domestic capacity and regional cooperation in comprehensive investigations to determine and prosecute accountable parties.
- Strengthen technical skills in fire-fighting, developing early warning systems, and monitoring.
- Educate farm households and local communities on economic, environmental, and legal consequences of burning forest and peatlands.
- Strengthen incentives for increased use of better land use management practices and technologies.

One concrete proposal along these lines is to adopt a protocol to the ASEAN Agreement on Trans-boundary Haze Pollution, as provided for under the agreement, of institutionalising the above recommended measures of ensuring appropriate cross-sectoral coordination and cooperation and therefore effective and timely implementation on the ground, and of ASEAN officialdom according it as a matter of high priority. In addition, the ASCC should make sure that its component of the ASEAN Community post-2015 vision contains elements that would interface with the AEC and the ASEAN Political-Security Community (APSC) pillars especially in connection with the trans-boundary haze pollution issue. ASEAN has also set an indicative target of endeavouring to stop fires from peatlands by 2020.

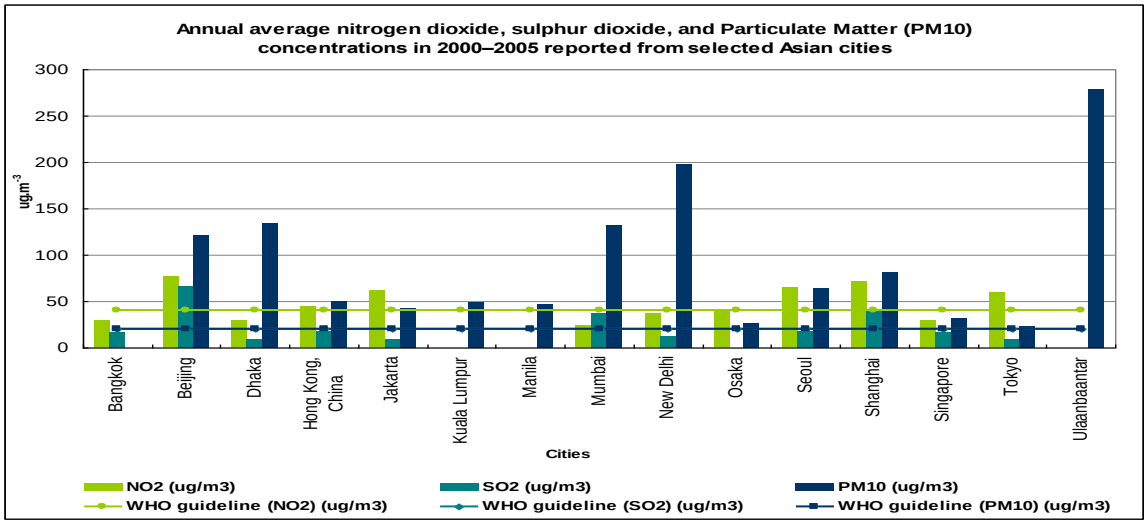
In summary, the following key points should be noted, reiterated, and acted upon by ASEAN governments, businesses, and citizens in the years ahead.

- The ASEAN Agreement on Trans-boundary Haze Pollution is the only ASEAN environmental agreement so far. When it came into being in 2002, it was hailed as *'*the first regional arrangement in the world that binds a group of contiguous states to tackle trans-boundary haze pollution resulting from land and forest fires. It has also been considered as a global role model for the tackling of trans-boundary issues*'.*
- As ASEAN moves into its post-2015 period, where building an integrated, cohesive, people-focused, and caring/sharing ASEAN Community with unity in diversity would in principle start becoming a reality, then successfully addressing the region's trans-boundary haze pollution problem should also become an important priority in line with ASEAN's stated aims.

V. Resilient and Liveable Cities

ASEAN cities have been the drivers of the economy and have lifted millions out of poverty. However, the environmental consequences of this rapid development are apparent, and the urban communities are increasingly insistent that something should be done. Air pollution commonly exceeds safe levels across the cities of developing member states. Emissions of noxious gas and particulate matter from motor vehicles, industry, and other causes – plus the rising urban population exposed to them – are increasing the regional burden of respiratory illnesses and cancer (WHO, 2010). On a global basis, about 55 percent of urban air pollution mortality occurs in developing Asia (WHO, 2009).

Figure 4.4. Air Pollutant Concentrations in Major Asian Cities



Notes: PM_{10} refers to particulate matter <10 µm in diameter, SO_2 is sulphur dioxide, NO_2 is nitrogen dioxide. WHO Guidelines for annual concentration averages is 20 µg/m^3 for PM_{10} and SO_2, and 40 µg/m^3 for NO_2. Data is a five year average from 2005–2009.
Source: Anbumozhi and Bhattacharya (2014).

As shown **Figure 4.4**, urban air pollution in large cities is not simply a localised environmental issue but also a health issue, as most of the cities are far from the World Health Organization (WHO) guidelines on safe cities. This rapid urbanisation and a growing middle class are causing an explosion in motor vehicle ownership in ASEAN, which, on recent trends, is projected to create a rise in vehicles on roads of 130 million to 413 million between 2008 and 2035 (World Bank, 2012). In addition, as the economies of ASEAN are becoming more urbanised, more water will be needed to be reallocated from the 70–90 percent that is consumed by agriculture to other economic activities such as domestic, industrial, and commercial sectors (Kumar, 2013).

Currently around 60–90 percent of water in the ASEAN region is used for industrial and domestic purposes (AWGWRM, 2011). However, an increase in water extraction is expected to increase by about one-third over the next 20 years in the region due mainly to increase in city-centred economic activities. With climate-induced regular storms and flood-hit cities affecting households, practical strategies are needed to create more sustainable, resilient, and liveable cities.

The role of cities in dealing with air pollution, climate change, and the sanitation problem is recognised by ASEAN countries (Dhakal, 2009). In one or more ASEAN member states, progress has been made in starting new programmes in improving energy efficiency, fuel efficiency, and other efforts towards low-carbon climate-resilient growth.

- Energy performance certification programmes: A labelling system on energy performance for non-residential buildings should be implemented. Building owners are required to present energy performance certificates when conducting transactions and leasing. The certification system also uses the data from Green Building Programme and increases the level of detail of ratings.

- Green labelling or rating programmes for buildings: Residential and office buildings are encouraged to be competitive in green ratings to improve environmental performance.

- Requirement of higher energy standards for large urban developments. Since construction of large-scale buildings utilises urban planning systems that include bonuses – such as increasing the permitted total floor area to site area – in the application of such urban development systems, building environmental performance now must meet progressively higher standards than usual developments.

- Transport sector: Promotion of the following are being done: carpooling, banning private vehicle traffic in peak hours and holidays; the next generation of vehicles, including electric vehicles; fuel efficiency reporting systems; and environmental education programmes for consumers.

- Water and sanitation: Programmes being introduced in ASEAN include minimisation of unaccounted-for water, access to sanitation facilities, level of domestic water consumption per capita, water that meets WHO drinking water quality guidelines, and access to clean drinking water sources.

- Municipal solid waste: Recycling rate of solid waste through a reduce–recycle–reuse (3R) programme is being promoted in many cities along with new economic opportunities.
- Climate resilient cities: Retrofit projects to improve the resilience of transport and other infrastructure are promoted through regulations and financing programmes.

Designing Liveable and Resilient Cities in Post-2015 Era

A liveable and resilient city is characterised by less air pollution and virtually no waste and traffic congestion. The planning of future cities requires that every part of the design include the following five principles that shape the city: Citizens to Live, Nature to Thrive, Business to Invest, Cultures to Celebrate, and Visitors to Enjoy (KeTTHA, 2011; Leichenko, 2011).

- Citizens to Live: In providing a liveable environment for citizens, cities look at the balanced provision of basic needs and urban resources: food, water, transportation, education, health care, and safety. It means the provision of human-scale communities that encourage the well-being, social equity, and public engagement of citizens. It weaves together a highly liveable urban fabric that connects the citizens with their city.
- Nature to Prosper: A resilient and low carbon city has enough green infrastructure and public realm to allow its citizens to thrive. It provides clean and reliable sources of water supply and wastewater management, and promotes the reduction of energy consumption while exploring alternative energy strategies. Ordinary public infrastructure like canals, elevated rail lines, and rooftops double as usable public spaces for leisure and recreation and are made resilient to thunderstorms.
- Business to Invest: Behind every city's success is a robust, innovative, and regulatory framework to govern development. It must foster a fair, yet competitive, market that promotes public–private partnerships, and must attract and retain talent, which is key to weaving the efficient urban fabric that is the backbone of a resilient city. Without a strong basis in this area, one essential component of liveable cities would be missing.
- Cultures to Celebrate: The planning of urban spaces must accommodate the coexistence of new lifestyles with existing indigenous cultures and preservation of urban heritage. The cities must be shaped by a dynamic and tolerant cultural, social, and religious environment. Too often, in recent decades, new master plans in ASEAN cities have overlooked the city's old culture as an integral part of the development process, which is often the determinant of the vibrancy and authenticity of the urban centres.

- Enjoyable Cities: To attract visitors and encourage citizens to sink their roots in their home communities, planners and leaders should seamlessly incorporate elements like accessibility, safety, and quality of the environment.

The foregoing conditions are not utopian, though their integration is only achievable through a multi-stakeholder and multifaceted integrated planning approach. This approach incorporates planners, designers, architects, engineers, and municipal leaders with a common goal of creating liveable, resilient, and green cities that can sustain the challenges of today and the aspirations of tomorrow.

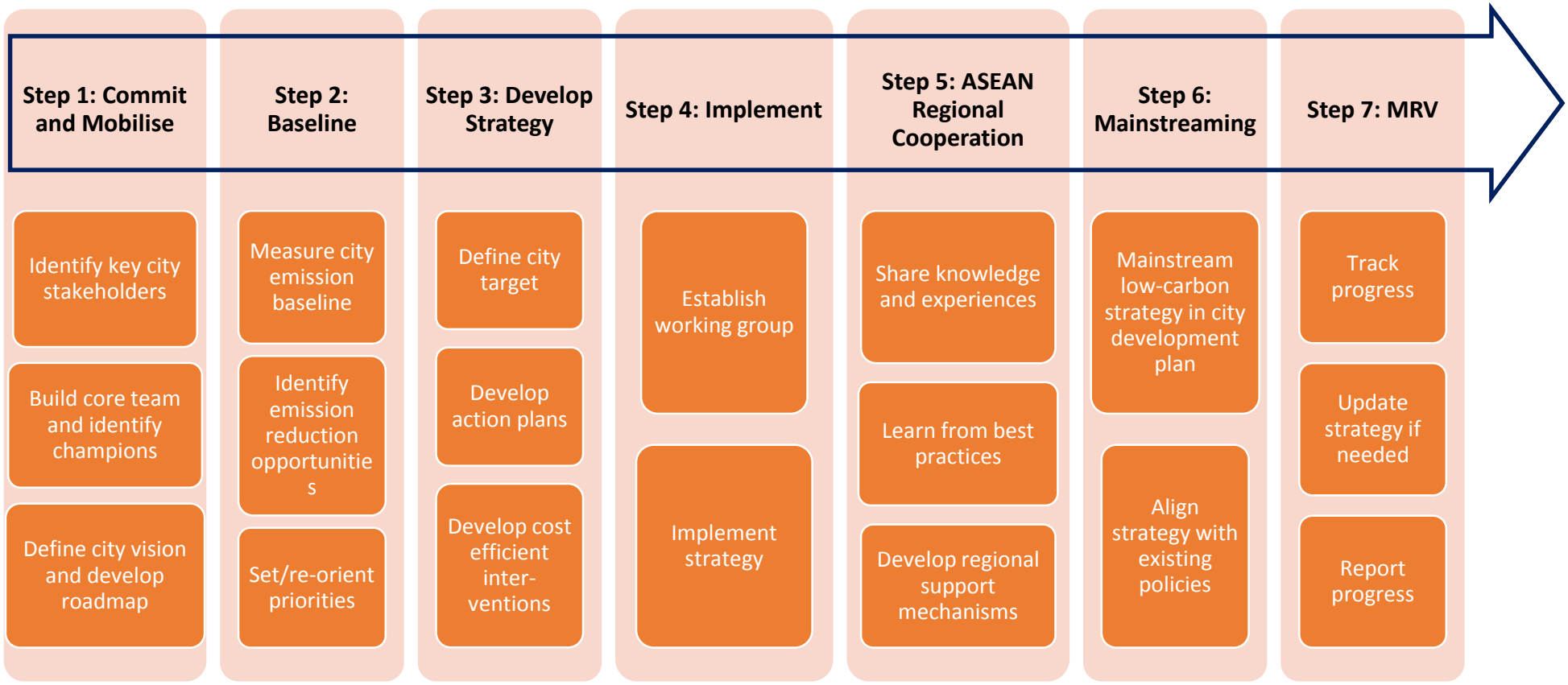
Summarising the above-mentioned framework and taking into consideration the ASEAN context, a seven-step approach for building liveable cities is proposed in **Figure 4.5.**

The development of a smart liveable city is an integrated approach that needs commitment from city executives, active participation of public and private sectors, flow of private sector investment, and cross-sectoral implementation of best practices and green and/or smart technologies and services. ASEAN member states are already implementing various measures pertaining to green development of a low-carbon economy. However, a complete and well-constructed approach to develop a smart liveable city, that fosters low-carbon development, is still absent in most of the ASEAN region.

Nevertheless, city-level decision-making processes will need to involve all levels of stakeholders including national governments, the research community, practitioners, non-governmental organisations, and the private sector. Engendering liveable and resilient cities for the ASEAN region will need to address the following:

- City leaders should advocate for national policy adjustment to support cities' green liveable initiatives.
- Cities need to start measuring their emissions and pollutions, that is, develop an emission inventory. While national-level emission inventories have been developed for some countries, city-level emission inventories are generally absent. Focus should be on using a consistent framework of emission accounting to ensure cross-border applicability of emission data.
- Consider the development of a knowledge management centre to share experiences and lessons learned to maximise regional cooperation. This will help cities to learn from each other and to implement best practices without the need for reinventing the wheel.

Figure 4.5. Proposed ASEAN Framework for Liveable Low-Carbon City Development



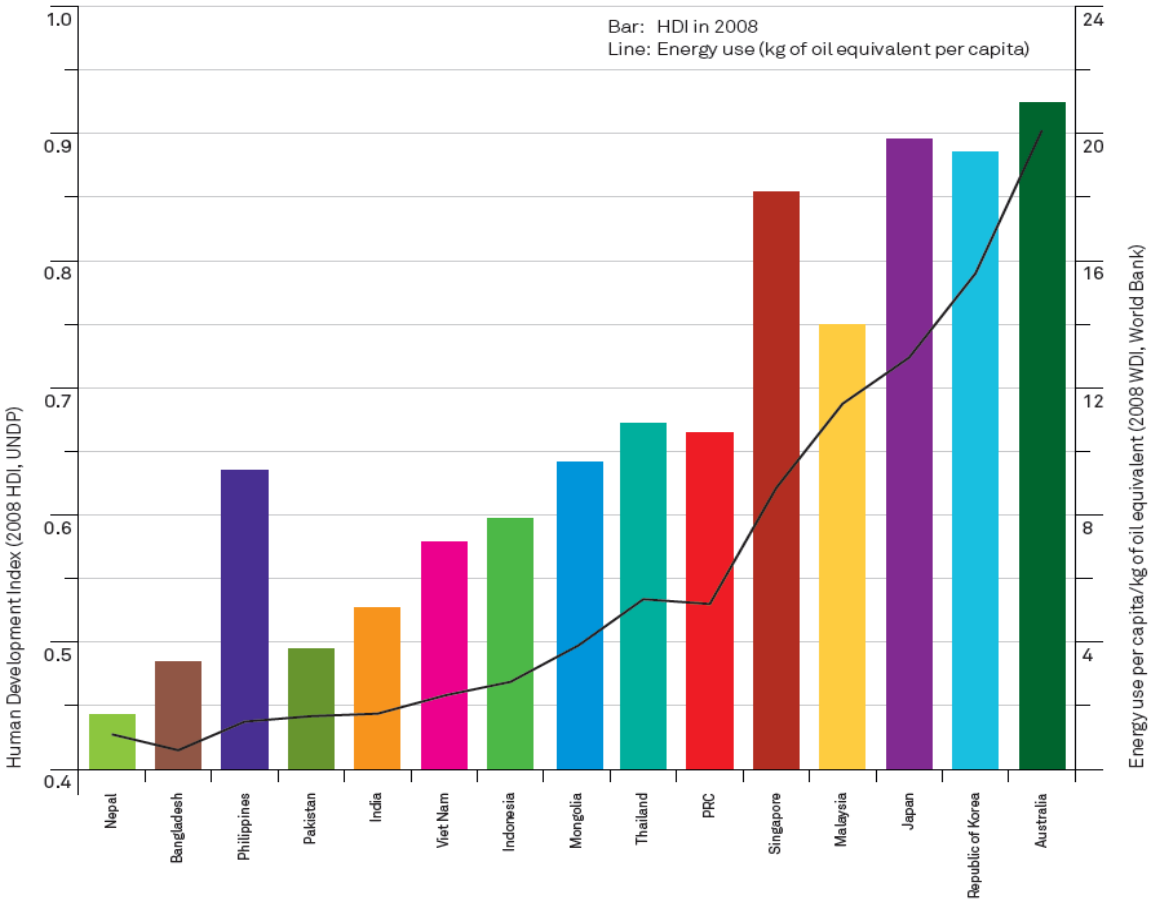
Note: MRV = Monitoring Reporting and Verification.
Source: Kumar (2015).

- City-level targets should consider any existing national and regional targets and policies to avoid any conflict in the longer term. Such targets and policies may also include national commitments to the Millennium Development Goals (MDGs) and Nationally Appropriate Climate Mitigation Actions, amongst others.
- Liveable, resilient, and green initiatives should be linked with wider food security, energy security, and water security to maximise the benefits of city transformation and ensure alignment with the overall development agenda.

VI. Energy Poverty and Clean Energy Provision

Access to cleaner and affordable energy is essential for improving the livelihood of poor households in ASEAN countries (ERIA, 2014b). There is often a two-way relationship between the lack of energy services and poverty in ASEAN. This relationship is, in many aspects, a vicious cycle in which poor households who lack access to energy are often trapped in re-enforcing cycles of deprivation, lower revenues, and the means to improving their living conditions, while at the same time using significant amounts of their limited income on expensive and unhealthy incomes that provide poor and or unsafe services. The link between energy and poverty is demonstrated by the fact that the poor households in rural areas constitutes the bulk of an estimated 300 million people relying on traditional biomass for cooking and the overwhelming majority of them do not have access to grid electricity (Anbumozhi and Phoumin, 2015).

Figure 4.6. Energy Access and Human Development



Notes: HDI = Human Development Index; PRC = People's Republic of China.
Sources: World Development Indicators (2011); Human Development Report (2012).

On the other hand, access to modern forms of energy is essential to achieve high levels of human development (**Figure 4.6**), overcome poverty, promote economic growth and employment opportunities, and support the provision of social services and essential input for the MDGs.

To ensure that modern, cleaner, and affordable forms of energy are accessed by poor households, the right choice of energy supply has to be made. For example, solar and wind – renewable energy technologies that have lower running costs – might be in the longer term the most attractive option for low-income households. Currently ASEAN is adopting the following strategic goals to upscale renewable energy (ACE, 2004).

- To achieve a collective target of 15 percent for regional renewable energy in the total power installed capacity by 2015.
- To strengthen regional cooperation on the development of renewable energy including hydropower and bio-fuels.

- To promote R&D on renewable energy in the region.
- To promote cooperation in the renewable energy sector and related industries as well as investment in the requisite for renewable energy development.

It is also envisaged that, in the post-2015 period, clear policies and responsive plans and programmes for renewable energy development are addressed to enhance commercialisation, investment, market, and trade potentials of renewable energy technologies.

With abundant renewable energy resources, ASEAN member states are currently implementing a vision of renewable energy into progressive actions by engaging more stakeholders and enhancing greater regional collaboration. They are also working to identify areas where clean and renewable energy can emerge and be deployed to mitigate the adverse impact of climate change. At the national level, each country has tried to come up with its own renewable energy policy such as feed-in tariffs. Although countries in the region have set higher targets for the share of renewables in their national energy mix, overall the use of renewable energy in the region is limited relative to their potential. In ASEAN, wind and tidal energy are largely untapped, and the huge solar potential in the region remains underdeveloped.

The reasons for these are many. As the mechanisms of power generation from renewables are different from those of conventional energy sources, adopting renewable energy into existing national energy systems is a challenging undertaking. Renewable energy developments are capital intensive, and are far less competitive than the dominant fossil fuels.

The varying levels of performance could also be attributed to the fact that renewable energy sources are often located in remote areas, rendering connection to main power grids a significant technical hurdle. Cumbersome administrative processes arising from overlapping and uncertain regulations and a lack of coordination among relevant authorities further hinder clean energy penetration in the national energy market. Limited access to financing options and insufficient financial incentives also dissuade investors from participating in clean energy development in ASEAN. Furthermore, it has to be highlighted that the disparities in the macroeconomic factors affect the level of energy system development across ASEAN (Anbumozhi and Phoumin, 2015). Given this disparity, the suite of strategic actions will be at different stages of development within member states. But they provide an

indication of where ASEAN members should focus their efforts in the coming years.

Accelerating Clean Energy Provision for Low-Income Households in Post-2015 Framework

The reliance on private sector–driven approaches that have proven a determinant to widening access to electricity in many parts of ASEAN is also becoming more prevalent in efforts to distribute improved cook stoves, efficient solar panels, and enhanced wind farms. There is also heavy emphasis in national development plans on providing energy access to low-income households. In community-driven approaches, limited attention being paid to the important role of public finance and long-term plans to scale up and reach millions of non-electrified households. A more balanced approach that combines large-scale, long-term public initiatives with innovative private sector–based, community-driven programmes is needed.

Creating an enabling environment for renewable energy investments, which include implementing policies, enacting reliable regulations, and simplifying administrative processes, needs to take place at the national level.

When it comes to regional cooperation, governments are required to identify priorities. Of the various strategic actions made and implementation deficits identified at the regional level, three collaborative efforts will collectively accelerate renewable energy development in meaningful ways: (1) conduct research to strengthen ASEAN manufacturing capabilities for renewable energy technologies and products, (2) establish innovative financing instruments and mechanisms, and (3) standardise and harmonise ASEAN-made clean energy products. Acquiring the capability to manufacture and operate the technologies at the community level will make clean energy significantly cheaper; this will need training and skills development. Having secured financial assistance mechanisms will greatly support renewable energy development in its earlier stages. Furthermore, standardising and harmonising systems before the renewable energy market is fully developed will lay a good foundation for continuing future cooperation. Getting things right from the outset will cost less than refurbishing them later. To this end, governments in the region need to stay strongly committed to clean energy development. Evidence suggests that without effective financial systems, entrepreneurs cannot sustain their businesses. Therefore, policy interventions are necessary to encourage and financially support low-income

households to adopt best available renewable energy technologies and incorporate innovative practices towards an environmentally beneficial direction.

What is needed is an approach that includes local communities in innovation and developing clean energy products and green services to achieve sustainable win-win scenarios, where the poor are actively engaged and the enterprises providing services to them are profitable at the same time (**Table 4.2**). The penetration of clean energy business models into low-income households of ASEAN member states is currently constrained by an inherent weakness in terms of market responsiveness.

Table 4.2. Changing Perceptions of Renewable Energy Business Models

From	To
Low-income households are a problem for development.	They represent a market. The private sector can and should participate effectively in this process.
Low-income households are wards of the state.	They are active consumers and entrepreneurs.
Low-income households do not appreciate clean and green technologies. Old technology solutions are appropriate.	Creative bundling of renewable energy products and services with a local flavour
Follow the urban rich model of development	Selectively leapfrog
Carbon efficiency in a known model	Innovation to develop a clean energy model
Focus on resource constraints	Focus on creativity and entrepreneurship

Source: Anbumozhi and Bauer (2013).

Integrated energy, fiscal, educational, skills enhancement, and social development policy actions can help reduce these challenges over the short to medium term. There are three important policy recommendations.

- *Introduce flexible redistributive and transformative public expenditures to remove the bottlenecks towards renewable energy.* Fiscal

policies can redistribute the benefits of growth through pro-poor public expenditure. Through economic growth, governments can effectively use revenue to provide basic developmental amenities such as renewable energy, which can be designed to be explicitly pro-poor through broad-based expenditure on isolated communities in the rural areas. This provides an important opportunity for the benefits of growth to be more inclusive, and in a manner which is not likely to have major disincentive effects in the future. On the contrary, increased spending on clean energy infrastructure is likely to be an important cornerstone for future growth.

- *Promote flexible subsidies and banking sector development for increasing the rate of renewable energy enterprises that also create rural jobs.* It is also important that a clean energy programme is associated with significant job creation to provide opportunities for rural people to innovate and benefit from new entrepreneurial skills to move out of poverty. But the record level of employment creation with clean energy provision has been weak in many ASEAN member states. An increased level of entrepreneurial activity through skills development and specialised job training is an important prerequisite that requires substantial financial sector development, including new models of microfinance.

- *Implement broad-based fiscal reforms for inclusive and renewable energy business models.* The argument for environmental tax reform – a shift in the burden of taxation of economic 'goods' (for example, income) to ecological 'bads' (for example, pollution) – has been broadly accepted but the progress towards this goal is slow in ASEAN. There is urgent need to achieve an order of magnitude to change the structure of taxation. A sustained effort by governments is now required to design appropriate mechanisms for shifting the burden of taxation from incomes onto resource consumption and emission reduction to augment the elimination of energy poverty. A further requirement is to adjust such policy frameworks to account systematically for socio-economically disadvantaged groups.

VII. Disaster Risk Management

ASEAN is one of the most disaster-affected regions in the world. With the Indian Ocean tsunami in 2004 hitting several countries in the region and Cyclone Nargis in 2008 devastating Myanmar, the region has seen two of the world's deadliest mega-disasters in the last decade. More recently, floods in Thailand in 2011 caused over $45 billion in damages and the latest major disasters super typhoons Yolanda and Haiyan, which were the deadliest in 2014, left more than 6,000 dead (Thomas, et al., 2013). According to the international disaster database, they accounted for over 31 percent of all global fatalities from 2003–2013 (ADB, 2013a). Losses related to natural disasters cost the ASEAN region, on average, more than $4.4 billion annually over the last decade (Parker, 2014).

ASEAN member states have a much higher level of understanding of commercial and household vulnerability to disasters, including the fiscal vulnerability of state budgets. That enhanced capacity now routinely drives budgetary, fiscal, development, and investment decisions. ASEAN has implemented several measures in compliance with the Hyogo Framework for Action (HFA), and progress is substantial. As the region journeys forward in forging the ASEAN Community, disaster management continues to face challenges and opportunities brought about by more complex disasters and the evolving humanitarian landscape. The year 2015 ushered in global conventions that impact national and regional initiatives in disaster management and, conversely, provide opportunities for ASEAN to inform and influence these discussions (ASEAN, 2009d and 2013b). These conventions include, amongst others, the Sendai Framework on Disaster Risk Reduction, which builds on the HFA, the review and subsequent development of the post-2015 sustainable development goals, the ongoing debates on climate change, and other emerging issues on protection against displacement such as the Nansen initiative on disaster-induced, cross-border displacement and potential occurrence of natural disasters in conflict areas (UNCHR, 2011).

At the regional level, the role of regional organisations in disaster management is deepening and becoming more pronounced and relevant to the member states and the international community. Large-scale disasters underscored the necessity of enhancing and strengthening synergy and cooperation between and amongst various stakeholders across multiple sectors. In reaching out to other stakeholders and sectors, ASEAN strives to maintain its centrality and leadership through the ASEAN Agreement on

Disaster Management Emergency Response (AADMER) while, at the same time, being open and flexible to changes. As regional and global forces converge, it is fast becoming an imperative for the communities to become more resilient. Attaining a shared analysis and understanding of existing and emerging issues in disaster management would better equip ASEAN member states, ASEAN as a regional organisation together with its ministerial and sectoral bodies, and the communities to continue building resilient communities. The ASEAN Committee on Disaster Management fulfils a critical role as the main driver of the implementation of the AADMER, as guided by the ASEAN Ministerial Meeting on Disaster Management. Pro-actively supporting the ASEAN Committee on Disaster Management both at the strategic policy and operational levels are the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) and the ASEAN Secretariat (ASEAN, 2013b; Anbumozhi et al., 2014).

ASEAN member states also see the transfer of some of these disaster-related risks to reinsurance markets or to capital markets through securitisation and other means, as well as international and domestic and risk-sharing arrangements through active partnership between the private sector and public authorities (Liu and Huang, 2014; Liu, 2015). ASEAN also saw increased resilience to natural disasters that manifests into faster response time and reduced fiscal impacts. This is mainly attributed to moderated macroeconomic impacts on sectoral activities and more prompt recovery of infrastructure and livelihoods, immediately after the disasters (Liu, 2015). Ex ante and ex post policy measures are being implemented in more than one ASEAN member state that creates a distinction between actions taken in anticipation of disaster events (such as risk analysis, prevention, awareness, reserving, and insurance), which collectively are components of disaster risk reduction, and those taken in consequence of an actual disaster event (such as relief, response, and post-disaster construction). Within the context of public financing, a division exists between ex ante finance (for example, reserving, contingent credit, various kinds of risk transfer products, including insurance; and capital market solutions) and ex post finance or post-disaster response funding (for example, covering response and reconstruction cost via fiscal measures, new borrowing, or foreign assistance) (Cummins and Mahul, 2009; Ishiwatari, 2013).

Strengthening National and Regional Capacity for Disaster-Resilient ASEAN in Post-2015 Framework

ASEAN has come a long way in building disaster resilience since the ratification of the AADMER, which is one of the most ambitious and comprehensive regional disaster response management treaties in the world. In a diverse region with multi-layered complex institutions at the national level, it is important for ASEAN to move forward to grow and expand its resilience from the perspective of progress made in implementing the HFA. To achieve a broad vision of a resilient, inclusive, and competitive ASEAN by 2035, taking into consideration commitments made to the Sendai Framework of Action, a wide range of steps are recommended to be taken at the regional, national, and local levels.

- Strengthen legal frameworks for improved coordination and to lead concerned subcommittees of national disaster management organisations. ASEAN member states and institutions should come up with a mid- to long-term vision for disaster resilience. The devolution of power to local governments is also needed to effectively respond to the needs of the people. The capacity of local governments could further be improved by the legal framework, developing seconded staff programmes across social development, environment, and economic ministries.

- Strongly support a shift from reactive to proactive disaster management. Most member states are currently working hard to institutionalise a shift from ex post to ex ante integrated disaster risk management philosophy. ASEAN, as a strong supporter of the implementation of the HFA, can support the process of implementing the Sendai Framework on Disaster Risk Reduction by engaging member states more in peer learning process. Integrating climate change adaptation and disaster risk management is increasingly important to capitalise new financial resources.

- Increase the resources substantially for AADMER implementation. ASEAN members should seriously think about developing high quality and sustainable regional disaster risk management systems through the public–private partnership model, wherein conditions for ensuring access to innovative insurance (such as a system of risk-based premium, sound capital requirements, and rigorous insurance regulation and enforcement) are assured. With some creativity, considering options, such as in-kind support and contributions to special disaster risk management funds modelled after catastrophic bonds or funding of special projects in the most vulnerable

countries, is expected from countries or dialogue partners which possess more resources and interest in disaster resilience.

- A more assertive role for the three ASEAN institutions involved in AADMER is expected. Setting clear boundaries is to be tasked for the institutions to collect and maintain accurate data on disaster relief, early reduction, and recovery as well as reconstruction expenditure. Early warning systems and public responsibilities in the event of disaster to inform public contingent viability need to be part of the process.

- The ASEAN Secretariat should work with other bilateral and multilateral and international communities to establish supporting initiatives such as experience-sharing workshops, simulation exercises, staff exchanges, training networks, and certification programmes. It needs to work with the ASEAN University Network and other regional knowledge institutes to establish a knowledge hub to facilitate, develop, exchange, and disseminate cross-border disaster risk management data, best practices, and climate modelling tools.

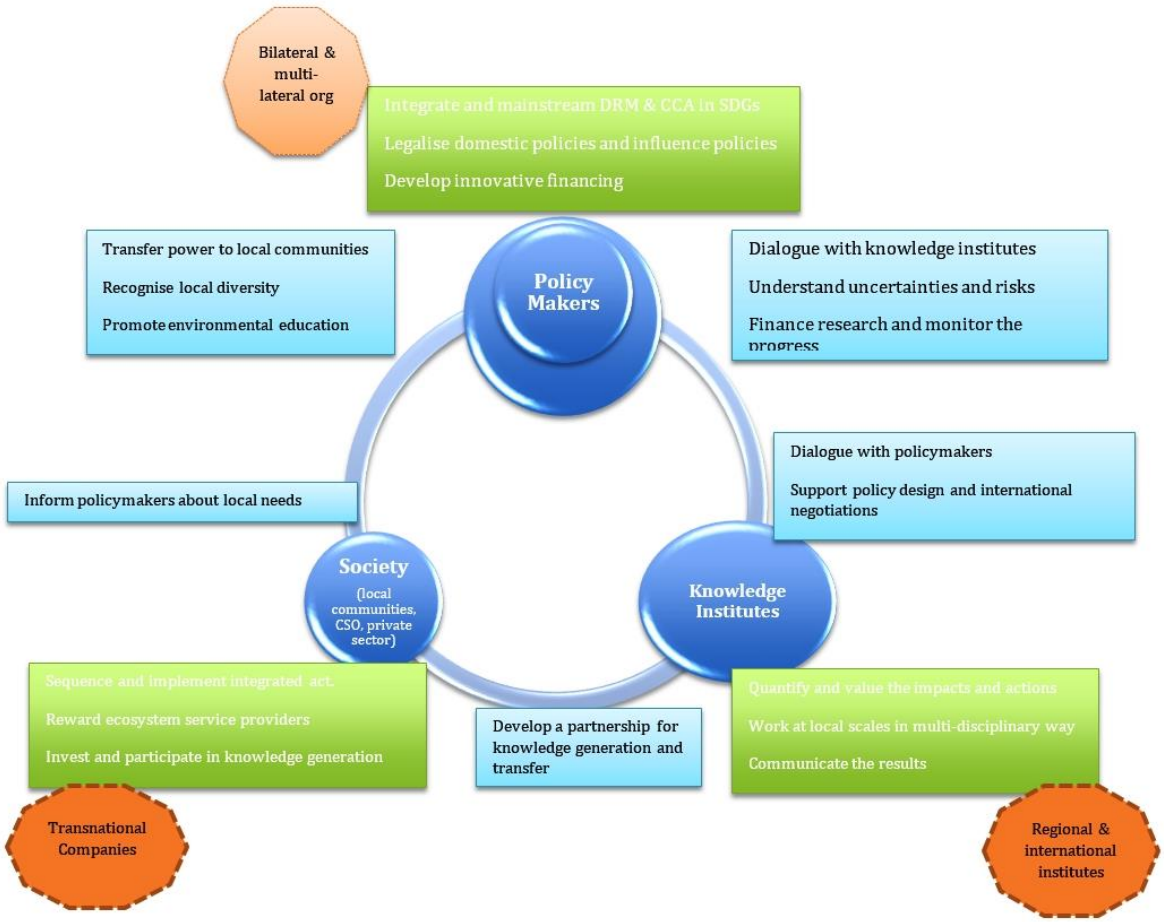
- Governments must accept the primary responsibility to develop ex ante structures that deliver rewards today for investments that also produce benefits in the long term. Such financial mechanisms should not produce long-term dependency or subsidies but energise risk management frameworks. ASEAN member states can employ their taxing power to provide short-term tax credits to individuals and firms for insurance costs or to provide tax incentives for disaster risk reduction infrastructure investments. Risk pools formed among local governments, national governments, and the private sector at the regional level can bring forward benefits by demonstrating tangible benefits to the region – even though the disaster may have occurred in a single locality.

- Engage civil society actors in implementing the AADMER programmes via national platforms and networks. Developing a shared understanding about the complementarity of their roles in monitoring the implementation of new programmes and strengthening their cooperation with other state and private sector actors will help increase the effectiveness and forestall the possible creation of parallel structures. They should also engage with other institutions like the AHA Centre on how current plans and future activities can be translated to changes at the local level.

Nevertheless, the growing funding for the disaster risk management and climate change adaptation agendas provide ample opportunities for continued integration of those agendas for shared learning and joint

implementation (Anbumozhi, 2015). In addition, the pressure on global aid budgets has increased the need to make the case for risk management as an effective development strategy and to integrate it into regular development policy and practice. **Figure 4.7** illustrates the key messages of this recommendation to the three groups of stakeholders: (1) national policymakers; (2) local communities, the private sector, and other members of civil society; and (3) knowledge institutes.

Figure 4.7. Stakeholder Involvement and Links to Resilience

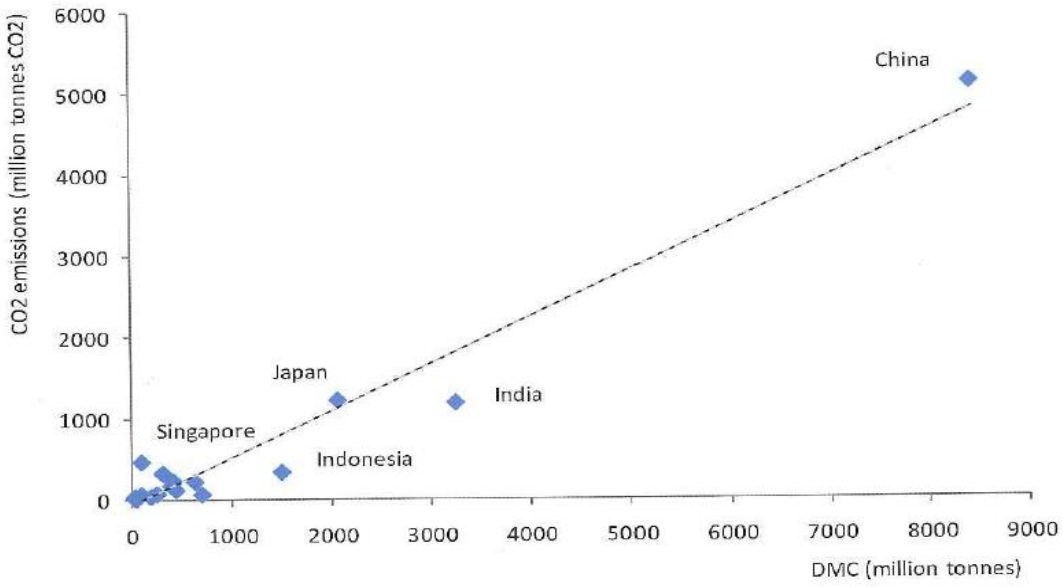


Notes: AHA = ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management; ASEC = ASEAN Secretariat; CSO = civil society organisation.
Source: Prepared by the authors.

VIII. Towards Green Growth

ASEAN environmental challenges are some sort of 'wicked problem'. Green growth is often defined as a decoupling of economic growth from emissions and pollution, which implies a new growth paradigm, where resource efficiency and job creation are achieved as co-benefits. Thus, the best one can hope to articulate a solution for the wicked problem is to introduce principles for accelerating green growth at sectoral and local levels that are useful in dealing with a number of environmental problems (Anbumozhi and Intal, 2015). Among them, climate policy is the most important environmental policy region wide, and the question arises as to what extent climate policies could help reduce resource use and increase resource productivity or, vice versa, to what extent ASEAN's NRM policies could contribute to mitigation of climate change. **Figure 4.8** correlates material consumption (expressed with the domestic material consumption indicator) and energy-related CO_2 emissions in major ASEAN, China, and India for 2009.

Figure 4.8. Domestic Material Consumption and Emissions in ASEAN



Note: DMC = domestic material consumption.
Source: Prepared by the authors.

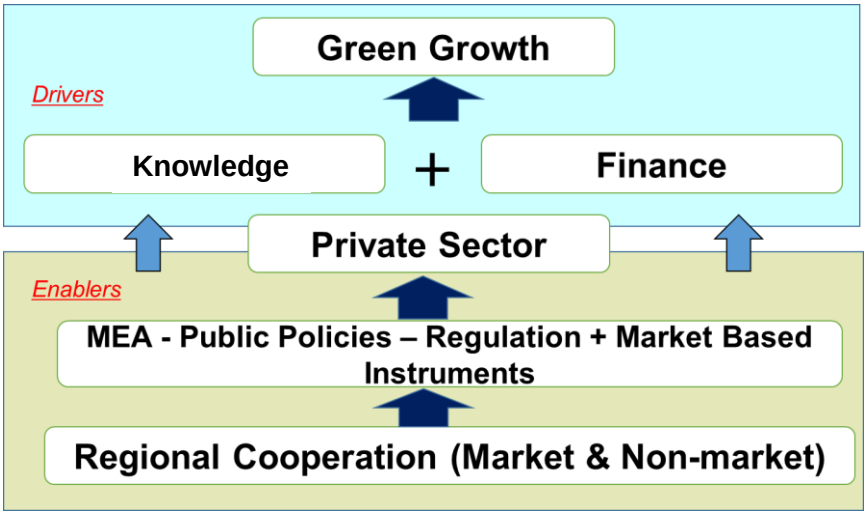
Recognising environmental risks and socio-economic benefits, policymakers are giving increasing weight to resource-efficient economic growth opportunities that will simultaneously bring down carbon emissions. While resource efficiency has increased significantly in some ASEAN

countries over the past 20 years, economic growth has in general overcompensated these efficiency gains (ADB, 2013b; Jacob, et. al., 2013). Efforts therefore need to be intensified to make future economic growth in ASEAN 'greener', and further decouple growth from material consumption and energy-related carbon emissions. Different policy priorities can be derived for the different groups of ASEAN countries:

- For countries with high and medium levels of resource consumption, targeted policies to drastically increase resource efficiency need to be implemented, clearly targeted at increasing efficiency and decreasing resource throughput. Resource- inefficient patterns of excessive consumption need to be identified and addressed.
- For the dynamic emerging economies, priorities are resource efficiency in building up their infrastructure, that is, fostering energy and material efficiency in buildings and transport systems, amongst others, as well as improving efficiency in their basic industries, such as metals, chemicals, and pulp and paper. The challenge is to avoid being locked into material and energy-intensive development trajectories leading to levels of per capita consumption as high as those currently observed in industrialised countries.
- Countries with very low consumption levels will require support from other countries to increase material affluence to a humane level and reduce or erase poverty. This group of countries will be particularly dependent on the transfer of green technologies from abroad, in order to achieve these objectives with the highest possible resource efficiency.

Figure 4.9 illustrates an operative framework for accelerating green growth in ASEAN countries.

Figure 4.9. Operative Framework for Accelerating Green Growth in ASEAN Countries



Note: MEA = multilateral environmental agreement.
Source: Prepared by the authors.

A green growth paradigm could be an engine of new growth, improving per capita income and employment, provided new knowledge and financing approaches are integrated. The greater levels of job generation, technology advances, and economic stability, together with reduced vulnerability to price fluctuations, can be expected if national actions, regional initiatives, and multilateral environmental agreements are coordinated.

The transition to the above state will involve coherent efforts by many actors, national and subnational governments, the private sector, international organisations, and knowledge institutes. Although such a transition involves many activities, the following concrete policy options could take advantage of the opportunities available.

- Establish well-designed regulatory frameworks that can define the right conditions for market-based instruments and create incentives as well as remove barriers for investments in resource efficiency. Adequate regulatory frameworks encourage social enterprise creation and increase private sector confidence.
- Employ market-based instruments, such as eco-labelling programmes at the regional level, to improve efficiency in resource use and promote innovations in green technology. Placing a price on emissions and

pollution has been found to stimulate innovation as firms and consumers seek out green alternatives.

- Prioritise government investments and spending in areas that stimulate resource conservation. Green subsidies such as price support measures, tax incentives, direct grants, and loan support may be used to avoid lock-in effects as well as foster new industries in the energy, water, and emission reduction sectors as part of a combined ASEAN strategy to build comparative advantage and drive long-term employment growth.
- Limit government spending in areas that deplete resources. By artificially lowering the cost of fossil fuels through subsidies, deter consumers and industries from adopting resource efficiency measures that would otherwise be cost effective. Though subsidy reforms are possible in ASEAN, it is challenging given the vested interest in their maintenance. But there are numerous examples such as conditional cash transfer schemes where aid is targeted to poor households.
- Invest in capacity building, training, and education. The capacity to seize the opportunities available with cross-border infrastructure projects varies from country to country. National circumstances often influence the readiness of ASEAN economies and population to cope with the challenges. Training and skills enhancement programmes are needed to prepare the workforce for cross-border projects.
- Strengthen trade and governance systems through regional cooperation. The Kyoto Protocol of the United Nations Framework Convention on Climate Change has already stimulated growth of trade and investment in a number of economic sectors of ASEAN. The cooperation among ASEAN, Japan, China, South Korea, and India in establishing a regional market could be a significant factor in determining the speed and scale of the new green growth projects.

To further accelerate the process, an establishment of a 'Regional Green Corps,' a regional club of experts and change agents who could back up the national institutions, provide training, technical support, and helping hands. Ideally, experts in universities, technical institutions, industry associations, and volunteer networks could be mobilised through financial support as well as network development to participate in a regional enterprise. Participants in this programme could be drawn from young entrants to related professions, experienced professionals, and highly skilled retirees from the private sector. For some, the motivation to participate would be the ideal of service; for others, especially young people from

member states, the programme would serve as on-the-job training and an employment opportunity. It would also help accelerate the development of the next generation of technical experts to service rapidly expanding creative economic sectors. These programmes, in addition to materially supporting and accelerating the implementation of a resource use revolution, will create a regional feeling of hope and inspiration – intangibles that are important to meeting the new challenges that ASEAN faces.

Regional cooperation, particularly cooperation for investments through regional funds, could bring multiple economic, social, and environmental funds and thus accelerate green growth in ASEAN. Such a coordinated regional funding mechanism could not only generate additional funding from ASEAN dialogue partners but also support national commitments and targets. The establishment of one such fund mechanism, the ASEAN Environment Fund, could contribute greatly to the mobilisation of regional funds.

Finally, a network of research and policy institutions would keep a close and continuous eye on green innovations and developments emerging around the globe. It would provide analyses on new opportunities to further improve the implementation of the programme with better technologies and additional policy support. The newly established organisation ASEAN Institute for Green Economy could be made as an anchor for such a coordinated research, and knowledge-sharing programmes on green technologies and management practices. Further, ASEAN could strengthen its technical expertise by collaborating with international organisations such as the Economic Research Institute for ASEAN and East Asia (ERIA), the Global Green Growth Institute, and the Asian Development Bank Institute (ADBI).

The message from these recommendations is clear: Concrete policy options for accelerating green growth do not only exist; they are in fact being implemented to some extent by many countries throughout ASEAN. The governments that act early to establish green growth–enabling conditions will not only support the transition to resilient and sustainable development, but also ensure they are in the best place to take advantage of it.

IX. Epilogue

As this chapter has articulated, the post-2015 framework conditions have the potential to achieve a resilient and sustainable ASEAN on a scale

and at a speed not seen before. The potential drivers have been dynamically changing and require fundamental rethinking of our approach to the socio-cultural community. As this chapter has argued, a reallocation of public and private investments – spurred through the principles of shared governance, public participation, and regional cooperation – is needed to build up or enhance natural capital such as forests, water, land, fish stocks, and cities, which are particularly important for sustainable development. For that ASEAN should:

- Recognise that sustainable development is the main priority in ASEAN, an environmentally efficient and resilient development path provides an opportunity to contribute towards this objective in a more efficient manner. The shared governance policy framework to promote a resource-efficient development path needs to clearly demonstrate strategies for removing current knowledge, capacity, and financial barriers in order to reap the co-benefits of development and environmental preservation. Pursuing low-carbon and climate-resilient growth will benefit ASEAN member states more than current sector- specific approaches.
- To promote a better understanding of public participation, it would also be necessary to enable ASEAN to quantify clearly the benefits that come from community involvement in setting the targets for sustainable development goals, climate change actions, and monitoring the progress towards the Sendai Framework on Disaster Actions.
- The translation of national goals need regionally coordinated technology transfer and financial mechanisms through innovative policies. More creative financing schemes at the regional level will be needed to implement strategies for access to clean water services, reduce land degradation, and improve air quality, fostering resource efficiency, reduce carbon emissions, and climate resilient actions.

It is in the environmental and social self-interest of ASEAN to implement the above strategic actions on priority basis, through collaboration, cooperation, and coordination. The degree to which considered pre-emptive action takes primacy over forced reaction will determine the burden of resilience and sustainability on ASEAN economic integration beyond 2015. As the window of opportunity is narrowing, the cost of taking action is much smaller than not taking action. Delaying action on those fronts will only increase the costs of building a resilient and sustainable ASEAN.

Appendix 4.A. Benchmarking Climate Change Adaptation Initiatives

Several regional and subregional initiatives have been taken to ensure security of food supply, meet growing demands, and enhance climate resilience of the agriculture sector in Asia. **Table A.4.1** illustrates the benchmark practices as observed in several ASEAN countries and policy interventions that could augment the uptake of such activities.

Table A.4.1. Climate Change Adaptation Measures and Policy Options for Safe and Secure Food Supply

Adaptation Measure	Recommended Policy Option for Achieving Safe and Secured Food Supply
Near Term Actions (5–10 years)	
Crop insurance for risk coverage	Improved access to information, risk management, revised pricing incentives
Crop/livestock diversification to increase productivity and protect against diseases	Availability of extension services, financial support, etc.
Adjust timing of farm operations to reduce risks of crop damage	Extension services, pricing policies, etc.
Changes in cropping pattern, tillage practices	Extension services to support activities, policy adjustments
Modernisation of irrigation structures	Promote water saving technologies
Efficient water use	Water pricing reforms, clearly defined property rights
Risk diversification to withstand climate shocks	Employment opportunities in non-farm sectors
Food buffers for temporary relief	Food policy reforms
Redefining land use and tenure rights for investments	Legal reforms and enforcements
Medium-term Targets (10–20 years)	
Develop crop and livestock technology adapted to climate stress: drought and heat tolerance, etc.	Agriculture research (cultivar and livestock trait development)
Develop market efficiency	Invest in rural infrastructure, remove market barriers, property rights, etc.
Consolidate irrigation and water resources	Investment by public and private sectors
Promote regional trade in stable commodities	Pricing and exchange rate policies
Improve early warning/forecasting mechanisms	Information and policy coordination across the sectors

Capacity building and institutional strengthening	Targeted reforms on existing institutions on agriculture and skills development

Source: Prepared by the authors.

Table A.4.2. Strategic Action Plans to Achieve Collective Targets

Pathway	Action
Increasing the development and utilisation of RE sources to achieve the 15 percent target share of RE in ASEAN power generation mix	- Promote technical cooperation to complement efforts on RE targets of ASEAN member states - Promote national RE programmes, available market and feasibility studies to investors, project developers, power utilities, and funding institutions - Monitor RE-installed capacity additions bi-annually
Enhancing awareness and information sharing and strengthening networks	- Organise media campaigns, conferences, seminars and workshops, and RE competition under ASEAN energy awards - Sharing information on research and innovation policies, market deployment policies, and market-based policies including the promotion successful cases of RE projects to encourage positive attitude in the further development of RE - Establish a network of R&D, training and education centres involved in RE to promote cooperation and synergy, with active participation of the private sector and other relevant organisations - Strengthen collaboration with leading regional and global RE centres to enhance ASEAN RE networks - Promote the use of CDM in the light of climate change and mitigation
Promoting intra-ASEAN cooperation on ASEAN-made products and services	- Propose harmonised standards for RE products - Develop the policy and system to strengthen local manufacturing

	capabilities for RE technologies and products - Encourage investment in manufacturing and fabrication
Promotion of renewable energy financing scheme	- Establish the framework for promoting innovative financing instruments or mechanisms to support and enhance RE projects implementation - Encourage involvement of the banking sector and financial institutions in RE projects - Strengthen collaboration with ASEAN dialogue partners and international agencies to support RE projects in member states
Promotion the commercial development and utilisation of biofuels	- Establish a functioning network consisting of key players in the biofuels and related industries to pursue cooperative partnership in R&D and to promote sharing information - Enhance commercialisation of biofuels - Develop harmonised specification for biofuels
Develop ASEAN as hub for RE	Establish a working programme task force to stockpile the development of RE and prepare RE road map

Notes: CDM = clean development mechanism; R&D = research and development; RE = renewable energy.
Source: ACE (2009).