

Chapter 10

Fostering Capacity Development for Asia's Leapfrog

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Abstract *Capacity Development Is the Basis for Asia's Leapfrog*

Most major development paths of Asian countries are moving toward green growth. Under the constraints of the energy crisis and climate change impact, future Asian growth, while appearing to be the most significant in comparison with other regions, needs a good knowledge-based pathway to light up and pave the road to a low-carbon society.

Capacity development is the basic need and a urgent issue to be explored in Asia. It is one of the effective tools for Asia to leapfrog to a low-carbon society with the concern of unlocked carbon intensity development.

A Bullet Train Model

Development needs to be done on several levels from communities to the subnational and national levels. To leapfrog from the current situation, capacities need to be built at many levels through various mechanisms of networking, research forums, initiatives, training, etc., in order to bridge, transfer and transform the results from research to policy and to implementation. Policy makers with good understanding, as the head of the bullet train, will lead society in the right direction, while scientists and researchers are the engines to back up and accelerate this movement. Finally, practitioners in communities play key roles as the fuel, enhancing the movement toward green growth through their activities. It is, therefore, essential to have these three components for a compatible basis of knowledge and comprehension through capacity development.

Asian Countries Need Collaboration

Asian countries are different in nature but rich in culture and resources. Low-carbon activities are various and depend on internal factors and situations. There are many good practices and philosophies that can be shared among the countries. The experience of learning from each other facilitates accomplishments and reduce risks in implementation. Collaborative activities in capacity development help Asian countries move toward green growth in their own ways with their own uniqueness while seeing the same goal in the future together.

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Key Message to Policy Makers

- Capacity development is a basic need and an urgent issue for Asia's leapfrog.
- This can be done through knowledge transfer, research collaboration and joint education programs among Asian countries.
- A full loop of knowledge transfer from research to policy and to implementation is the key to success for capacity building in Asia.

10.1 Capacity Development Is Important in Asia—A Tool for Leapfrog

This chapter will explain the need to have capacity development (CD) in Asia, which is a so-called tool for leapfrogging to a low-carbon society. Comparison of emissions from the past and future projections will be drafted. The nature of Asian countries in terms of population and competition, resource utilization, understanding of the people on the ground, and some philosophies of implementation in specific countries will be illustrated. This will lead to the conclusion of capacity building for leapfrogging to a low-carbon society. Entering into a low-carbon society for developing countries is difficult. While there is the potential for Asia to lead climate change abatement, implementation is the key and this cannot be achieved if there is no capacity building at all levels.

10.1.1 The Power of Asia

The merging of 10 ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam) into the ASEAN Economic Community (AEC) from 2015 onward makes ASEAN become more important in the Asian region. These ten countries of the AEC contribute 9 % (585 million people) of the world's population while their GDP contributes 3 % (1275 billion USD) of the global GDP. In addition, the ASEAN +3, with the coverage of China, Japan and South Korea, increases the share of the world's population by 31 % (2068 million people) with 18 % (9.901 billion USD) of the global GDP. The immense contribution with a high impact on economics can be

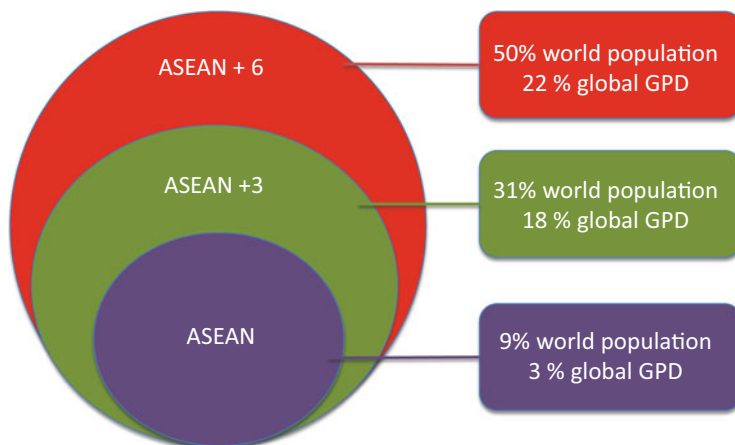


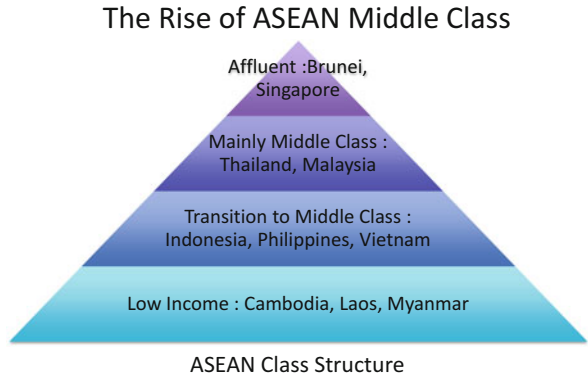
Fig. 10.1 Shares of population and GDP in the global situation

seen with the ASEAN +6 (Australia, China, India, Japan, New Zealand, South Korea) where the share of the world population is 50 % (3284 million people) and its contribution covers 22 % of the global GDP. Figure 10.1 indicates that the path of movement into the future of ASEAN and the Asian countries will have an impact on the world's development.

10.1.2 The Rise of ASEAN

The nature of the ASEAN countries varies, particularly their economic conditions. Regarding the classification of income in ASEAN countries, the composition of income classification is shown in Fig. 10.2. Four categories of income have been identified. Singapore and Brunei are identified as affluent countries while Malaysia and Thailand belong to the middle class. Three countries are in the process of transitioning to the middle class and the remaining three countries fall within the low-income range. The interesting aspect is that the ASEAN middle-income class is more than 25 % of the ASEAN population and in the year 2030 it is anticipated that the middle-income class segment in Indonesia will include more than 50 million people. While the share of the middle-income class increases, development of countries to move toward a middle-income trap has been raised in some countries like Thailand and Malaysia. How the rise of ASEAN can gear its direction toward a low-carbon society is challenging.

Fig. 10.2 Classification of incomes in ASEAN countries



Derived from Suwit Maecinsri

10.1.3 Regional Development

While moving to middle incomes but aiming to avoid a middle-income trap, countries' development is still based on energy consumption. High energy use has been found to be related to the human development index as seen in Fig. 10.3. In addition, high carbon intensity, particularly in electricity production, is still evident. Although renewable energy and energy efficiency policies have been implemented in many countries in Asia, there is room for improvement toward a low-carbon path, taking into account the fact that greenhouse gas emissions in 2035 for the whole of Asia will contribute almost 50 % of global emissions (Fig. 10.4).

10.1.4 Decoupling of GHG and GDP

Entering into a low-carbon pathway means driving the country's development with low emissions of greenhouse gases. Decoupling of CO₂ emissions from GDP growth is one of the indicators showing that the path of development has to take low-carbon technology and activities into account (see Fig. 10.5). Many developing countries such as Japan, Germany, the USA, Australia, France and the UK have been through this disconnection while some prominent countries in Asia such as China, India, Malaysia and Thailand have not reached met the point of decoupling.

10.1.5 How Can Asia Leapfrog to a Low-Carbon Society?

In the situation of Asian development, green growth policies are promoted. However, looking back to the development from 1990 until 2010, as seen in Fig. 10.6,

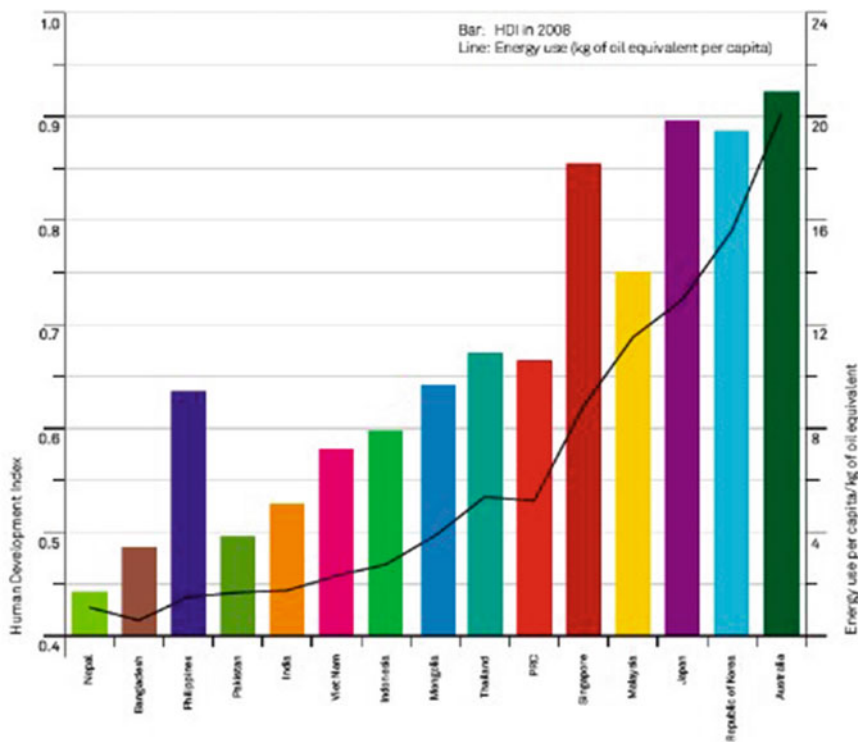


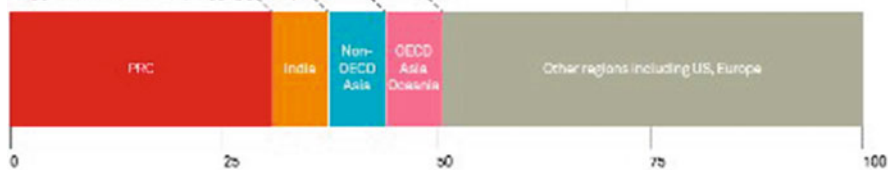
Fig. 10.3 Relation of energy used and human development index (Source: ADB 2013)

Regional Emissions, 2009 and 2035

2009 Co₂ Emissions (of 28,999 Mt)



2035 Co₂ Emissions (of 35,432 Mt)



Mt=million tons.
Source: IFA (2009).

Fig. 10.4 Future emission contributions of Asia (Source: ADB 2013)

Unfolding of Renaissance – CO₂ Emissions and Gross Domestic Product

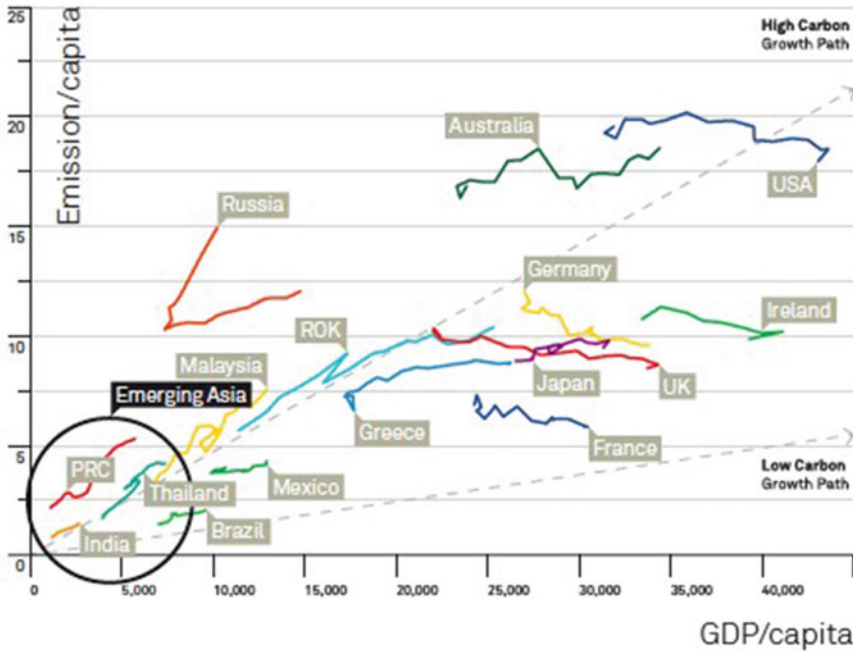


Fig. 10.5 CO₂ emissions and gross domestic product in selected countries (Source: The World Bank 2012)

real GDP growth has been increasing in parallel with CO₂ emission increases. The growth rate and emission rate have increased sharply. Conversely, population growth has increased at a slower rate when compared to other parameters. The implication of this figure is shown in Table 10.1, where the GDP of ASEAN, particularly four countries in Asia (China, India, Japan and South Korea) in the next 15 years (until 2030) will cover 38 % of the global GDP, which will be increased by almost 10 % from 2010. This potential growth in GDP is from 47 % of the world population, where its share has been constant since 2010. These constant population shares will take responsibility for the increasing GDP development of the countries. Therefore the future activities of these populations are crucial for the pursuit of low-carbon development. These activities will be integrated with technology-based and behavioral-based functions. Considering the various circumstances and the different natures of the Asian countries, comprehensive knowledge and technology transfers are essential in order to increase capacity at various levels. Understanding of climate change and its impact, as well as mitigation and abatement, are the key to initiating activity for unlocked carbon intensity development. Responsibility arising from understanding will lead to

Key Indicators of Carbon Emissions in Asia and the Pacific, 1980–2008

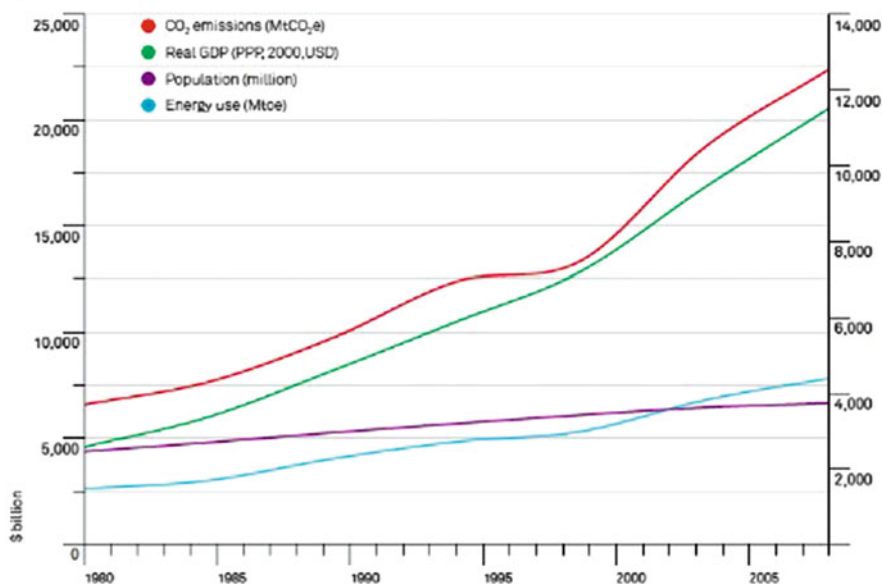


Fig. 10.6 Key indicators of carbon emissions in Asia and the Pacific (Source: ADB 2013)

Table 10.1 Changes of population and GDP between 2010 and 2030 for ASEAN + 4^a

	Population (million)		GDP (billion USD)	
	2010	2030	2010	2030
ASEAN	592	704	1852	5587
ASEAN + 4	3206	3790	15,979	46,501
World	6641	7933	62,124	129,547
Percentage of ASEAN + 4 in the world	48 %	47 %	26 %	36 %

Source: Derived from ADB 2013, Low Carbon Green Growth in Asia

^a+4 = China, India, Japan and South Korea

sustainable development. Capacity development to direct society to know what to do, and how to do it, is the key to success in order to leapfrog for a massive reduction in GHG.

10.2 Structure and Mechanisms of Capacity Development

In order to understand the low-carbon pathway that can help Asia unlock carbon intensity, a good structure and mechanisms of capacity building need to be designed across the region. The structure to develop capacity should have a broad space for

knowledge-sharing and a full loop of knowledge transfer which starts from research and leads to policy and to various level of implementation.

10.2.1 Knowledge-Sharing Platform

Sharing of knowledge should be done on both the horizontal and vertical levels. This means that knowledge is shared among the same level of society and through different levels of the related society. There are at least four levels of society, including the community, researchers, practitioners and policy makers. To accomplish capacity development, different mechanisms are applied in each society. The 'community' itself is the ground basis for implementation of low-carbon development. Mass media and direct communication to disseminate knowledge and information through the society are good mechanisms as this is a broad and heterogeneous society. Integration of a good knowledge management system into everyday life would be an effective tool of communication. The key function of the society is understanding of the facts and impacts of climate change as well as perception of their own adaptive capacity to be resilient to global change. In Asia, this society is mostly low-income to middle-income communities and they are the majority of the Asian population. Empowering this society is an effective strategy to leapfrog toward a low-carbon society.

A society of scientists and researchers is unique in the way that knowledge and information are developed from this society. The mechanisms of research and education should be promoted in order to find real solutions to the change and to cope with the change. This society is the key to fostering capacity development in this region through knowledge management. Collaboration among Asian countries needs to be strengthened in order to gain and exchange experience as well as joint research in the framework of the Asian region as climate change is a global issue but different coping situations can be learnt from each other. Nevertheless, the key issue of this society is to connect to other levels of society in order to disseminate the knowledge to the real implementers.

Practitioners are mostly people from government and industry who are involved in implementation either by planning or actions. This community drives low-carbon activities in the real sector to be implemented. They need to be equipped with skill and to be competent to initiate activity, suggest appropriate technology and solve any problems that may occur during implementation. The mechanism to promote LCD of this society is to improve their skill and enhance technology and knowledge transfer to facilitate their activities.

The top level is policy makers where their role is planning and laying down the strategies and policy. To enhance the capacity for low-carbon development, policy makers should have special mechanisms such as high-level dialogue or high-level executive training. Nevertheless the achievement of this will lead to a high impact of change. A key issue is dissemination of the right and most feasible information in a timely manner so that good policies will be executed in a timely manner.

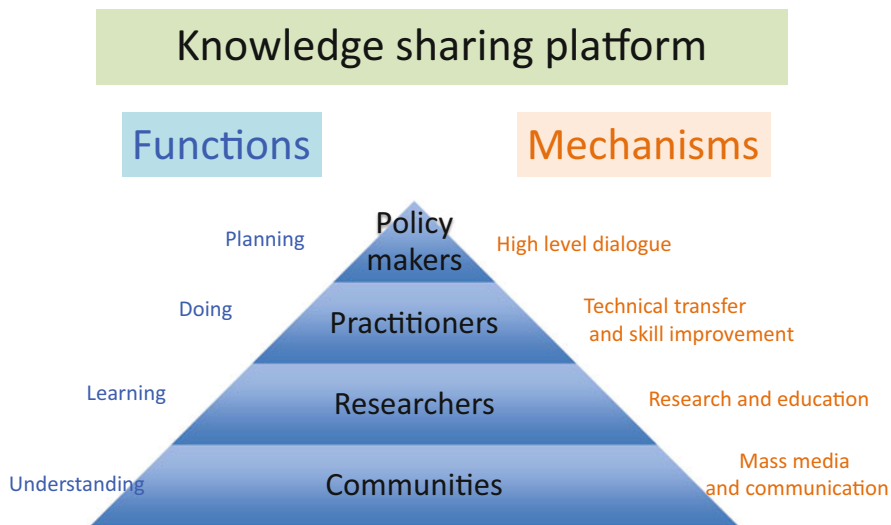


Fig. 10.7 A knowledge-sharing platform among different societies on their function and mechanisms

There is a need for Asian countries to have a knowledge-sharing platform to circulate the information at different levels of society so that they will all understand the same target and the reason for each policy and action to be pursued and implemented. Designs for connected pathways between these societies have to take into account how to stimulate the action of these sharing platforms for the greatest benefit of low-carbon development.

Figure 10.7 shows the linkage of four societies linked to the knowledge platform for both their function and mechanisms. Transforming of knowledge can be intra-society and inter-society.

10.2.2 From Research to Policy and Implementation

Not only the platform of knowledge-sharing but also the ability to make things happen both need a driving body. From research to policy, as mentioned in many scientific forums, it is not enough to unlock carbon intensity development. Figure 10.8 shows the linkage of research to policy and to implementation by the driving body in each component for clearer understanding. Usually, universities, research institutes and even non-governmental organizations that work on research are the main bodies to initiate knowledge, information and technology while the policy makers are the government itself or the ministry. Connections of the bodies

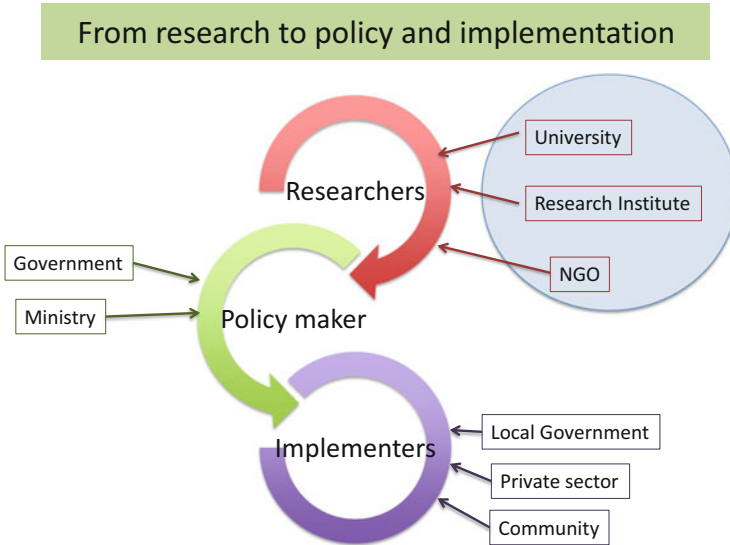


Fig. 10.8 Institutional body in the context of research, policy and implementation

of research to policy are established in some Asian countries such as Thailand where the Division of Science, Technology and Innovation Office of Planning and Policy (STI) and the Ministry of Science, Technology and Innovation initiate the MOU system with some universities and work together on how to launch the policy under the science and research support. The implementation of policy needs implementers. Local government, the private sector and communities are the different players in each role according to the policy formulation.

Institutional arrangements to cover the full loop of research to policy and to implementation can chain the different actions of the organizations mentioned above to implement low-carbon activity effectively. Any committee appointed to tackle low-carbon development should comprise the three figures of research, policy and implementation to push all action into full implementation.

10.2.3 Level of Low-Carbon Society Implementation

In order to show a good practice of capacity development that has shown potential for the leapfrog to a low-carbon society, some example of this scheme at different levels of implementation are shown below.

Community Level Ban Pred Nai Community on Environmental Protection and Energy Dependence

Ban Pred Nai is a small community located in the coastal area of the Trang Province in the eastern part of Thailand. This community, led by the Venerable Phra Subin Praneeto, who has preached the concept of truthful words which create "trust", has not only successfully preserved the local mangrove forest, but has also used improvisation from forest products and nature to generate both income and better wellbeing for the community. It is a unique knowledge transfer of the 'Sufficiency Economy Philosophy' (SEP) wisdom from this venerable monk to the community where rules and activities to protect the mangroves and energy independence have happened.

The SEP concept was introduced to the village by the Venerable Phra Subin Praneeto who endorsed the implementation of coexistence with nature to the community. In order to have an environmental management plan, the micro-credit saving fund called 'Sajja group' was operated and the revenue from this activity was raised to help community members replant mangrove trees while setting up local regulation to sustainably allow members of the community to have protection while living positively with the mangroves. The saving fund in terms of cooperation business was now operating with more than 700 million baht per year. By protecting the mangrove forest, it was shown that the Ban Pred Nai community could reclaim 2000 ha of forest back from the year 2001 onward after implementing the concept of coexisting with nature, which is one of the SEP concepts. In addition, after the mangroves had been restored, the local sea crab business was reactivated again, introducing big incomes to the community. In terms of climate change mitigation, it was found that through communal management, the mangrove forest in Ban Pred Nai absorbs 1.85 tonnes of carbon dioxide per person per year, when compared to the non-communal forest absorption rate of 0.91 ton per person per year. The reforestation activity in Ban Pred Nai creates a CO₂ sink of 2.0 tonnes of CO₂ per capita per year (Towprayoon et.al. 2011).

Not only environmental management but also implementation of SEP can help protect the environment. Being aware of the erosion of the coastal shoreline causing a loss of the mangrove area, sea water invasion and a reduced biological food chain, the Ban Pred Nai community initiated the local technology to prevent coastal erosion. A blockade made from used tires in a cubic shape has been placed along the mangrove shoreline since 1992. It was found later that this activity can protect against erosion of the shoreline, while the area of non-blockade placement failed to be maintained and collapse of mangrove trees and loss of shoreline occurred. In addition, the placement of the blockade became the routine work of the community. This indicated good understanding of self-sufficient living with self-development of the people in Ban Pred Nai. It was also a good demonstration of how the community can adapt themselves to the dimension of climate change and showed the coping capacity to deal with it.

The issue of climate change is not only related to adaptation but also to greenhouse gas mitigation. The reduction of carbon dioxide is not the major concern in SEP but to live sufficiently using fuel that can be accessed within the village is the key. Farmers in Ban Prai Nai earn their living with a mixed fruit tree orchard including rambutan, loongkang, jackfruit and durian. During the off season,

farmers have to clear their excess tree branches which become wood residue. In order to avoid residue burning, several locally designed charcoal kilns have been constructed throughout the village to produce in-house use of charcoal and wood vinegar. This activity helps to produce more than 16 tonnes per year of charcoal from 53.7 tonnes per year of wood residue. This can replace around 10 tonnes of LPG, avoiding an LPG cost of approximately 200,000 baht per year. It should be noted that the community in Ban Prai Nai is only 650 people and this avoid costs of approximately 2 % of their incomes.

Subnational Level Low-Carbon City at Muang Klang Municipality

The activities of the low-carbon city in the Muang Klang Municipality in the Rayong province of Thailand are a good example of knowledge transfer from research to policy and to implementation. The Muang Klang Municipality is a member of the ICLEI but the actions of the low-carbon activities were themselves in the spotlight after a researcher from the Thailand Greenhouse Gas Organization of Thailand and the Joint Graduate School of Energy and Environment, King Mongkut's University of Technology Thonburi, set up the program with the Mayor to estimate the municipality greenhouse gas inventory from four major sectors and set up the target of reduction including energy efficiency in building, transportation, agriculture and the waste sector. The nine-steps approach to estimate GHG was initiated by JGSEE and implemented for the first time in this municipality, as seen in Fig. 10.9. The nine steps take into account the action plan where all stakeholders from the governmental office, industry and education join together and identify activities together in order to reach the target set by the study (The Joint Graduate School of Energy and Environment (2011)). Below are some action plans that have been implemented.

Mitigation Actions in the Waste Sector in the Muang Klang Municipality

- Install a municipal waste separation belt to sort organic waste and recyclables from general waste prior to landfill disposal.
- Collect fat and oil food waste from restaurants and markets to produce solid fuel used in the municipality's own slaughter house.
- Collaborate with the Ministry of Energy to install anaerobic digestion in order to produce methane gas used for heat production.

Mitigation Actions in the Agricultural Sector

- Convert unused land areas to rice fields and construct a municipal rice mill for local processing and consumption to reduce emissions from transporting rice from elsewhere.

The direct and indirect benefits from mitigation actions in the Muang Klang Municipality are shown in Table 10.2.

Regional Level Climate Change International Technical and Training Center (CITC)

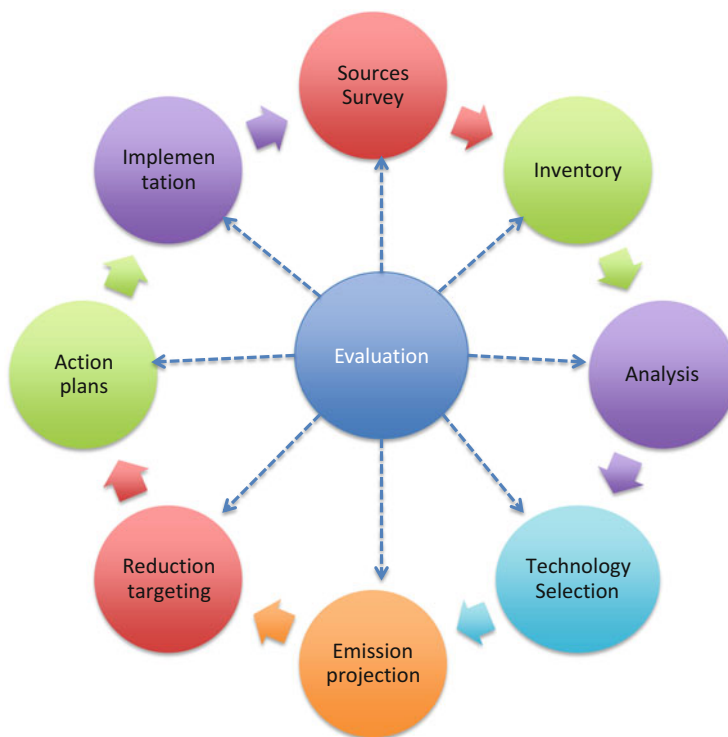


Fig. 10.9 Nine-steps approach to a low-carbon city by JGSEE

Table 10.2 GHG reduction and co-benefits

Mitigation measures	GHG emission reduction	Expected co-benefits
Installed municipal waste separation belt to sort organic waste and recyclables from general waste prior to landfill disposal	448.4 t CO ₂ e avoided over 10 years from landfill methane	Lowered solid waste disposal costs for municipal authorities by 312,500 baht over lifetime of equipment (10 years)
		New revenues generated from sale of recyclables
		Extended life of municipal landfill
Constructed municipal rice mill for local processing and consumption	At least 61.6 tCO ₂ e avoided from transport of rice from outside the municipality	New income generated from rice sales, benefiting smaller-scale farming households
		Reduced dependence on price in the rice market and purchases from outside the municipality
		Increased food security for local communities

There is a proposal by the Thailand Greenhouse Gas Management Organization (TGO), which is the responsible agency in Thailand for GHG mitigation activities, to establish a Climate Change International Technical and Training Center (CITC), which is aimed to be a “one-stop technical training center” and networking platform on mitigation and adaptation for ASEAN countries and other developing countries (Thailand Greenhouse Gas Management Organization 2015).

The main activities of the CITC are to provide a training service in the area of climate change mitigation and adaptation, establish a networking platform for ASEAN countries, disseminate knowledge on climate change mitigation and adaptation, and be a learning resource center on climate change mitigation and adaptation. The target groups of the CITC are governmental agencies, academic institutions, private companies related to mitigation and adaptation, and the general public. The center currently has four major courses including GHG inventory management, a mitigation mechanism, low-carbon society development and sustainable GHG management. The course are offered at different levels to include practitioners, executives and those who are interested. The CITC is supported by JICA and other international agencies including the Thai Government. It is expected that capacity building through this center will raise the standard of knowledgeable people in ASEAN.

10.3 Mechanism of Knowledge Dissemination

Capacity building at various levels can increase understanding and enhance the radius of perception but may not be enough to unlock carbon intensity over time. Dissemination of knowledge with such capacity as has been built can accelerate Asian countries’ ability to fight the temperature increase of 2 °C. Knowledge dissemination can be through networks, forums or initiatives across Asia. These activities are illustrated below.

Networking Low Carbon Asia Network—LoCARNet

This network is a good example of regional collaboration in Asia and a platform to disseminate research for policy formulation.

LoCARNet is a network of researchers that facilitates the formulation and implementation of science-based policies for low-carbon development in the Asian region. It aims to facilitate science-based policies in order to realize a sustainable future based on a stabilized climate. The network endeavors to establish research capacity in the region based on South–South–North cooperation, and to reflect research findings in actual policies to achieve low-carbon growth (LCS-RNet Secretariat 2015).

With the success of the Low Carbon Research Network (LCS-RNet), the International Global Environment Study (IGES), which acted as the secretariat, has launched LoCARNet as an autonomous research network, operated through voluntary initiatives by researchers in various countries, sustaining close links with other

like-minded stakeholders. LoCARNet aims to promote research to support the development of policies for low-carbon growth by enabling dialogue between scientists and policy makers and to help the Asian region to move forward with low-carbon growth, with a number of ongoing favorable conditions to turn challenges into opportunities.

LoCARNet conducts a platform of information exchange as well as updating research progress, including pushing joint research on climate change in Asia. The uniqueness of LoCARNet is the creation of a network of prominent researchers in science, science policy and dialogue. The ownership of the knowledge is by countries and strengthening the South–South–North collaboration on climate issues.

The success of LoCARNet has been reflected by the number of country collaboration platforms, joint research projects and publications.

Research Forum Established in 2006 with the leadership of Kyoto University, Japan, and King Mongkut's University of Technology Thonburi, Thailand, the Sustainable Energy and Environment Forum (SEE Forum) is an Asia–Pacific academic and science and technological forum that brings forward dialogue on the global climate and energy security issues of common concern. The primary objective of the SEE Forum is to seek academic and science and technological cooperation that will contribute to solving the global climate and energy security issues (Sustainable Energy and Environmental Forum, 2015).

There are ten member countries—namely Brunei, Cambodia, Indonesia, India, Malaysia, Philippines, Japan, Singapore, Thailand, and Vietnam—that participate in this forum. The SEE Forum members will, either individually or collectively, bring the spirit of our common understanding and resolve to the attention of relevant policy makers and other science and academic networks, at national as well as international levels. Ultimately, the goal is to provide government agencies and policy makers with the information required to make sound decisions on global climate and energy security issues.

The main activity of the forum is to establish a research network that can work together on relevant topics with a focus on Asia. Promotion of bilateral and multilateral research, as well as exchange resources, including students, researchers and professors, are also a focus. The forum has allowed young SEE Forum researchers from Asian countries to work together on research into the energy situation in Asia. Within this initiative, knowledge of low-carbon activities has been disseminated from competent and experienced researchers to the younger generation. Members gather every year to update information and seek research collaboration. Linkage with the Asia University Network (AUN) and joint research supported by the SATREP Program are some of the products of this forum. More information can be found at www.seeforum.net.

Initiative—Global Warming Forum (Thailand Research Fund) This is an initiative by the Multilateral Environmental Agreements Knowledge and Strategic Development Think Tank Project (MEAs Think Tank) supported by a Thailand

research fund (Global Warming Forum 2014). The forum frequently sets up dialogue and seminars on current topics on the low-carbon society with the right target group and consecutively updates information on low-carbon activities including negotiation and prominent scientific issues. The uniqueness of this initiative is the combination of participants comprising government, private industry, universities, NGOs and the community. This forum acts as a think tank and disseminates discussion papers, books and other output to policy makers and society.

Human Resource Development A leapfrog to a low-carbon society needs understanding of the real situation and problems in the region. This can be done collaboratively among countries in the region. An example of human development that answers the issue above is the Joint International Postgraduate Program on Energy and Environment (JIPP), which has been established by five leading universities in ASEAN, namely the Institute of Technology Bandung, Indonesia; University of Malaya, Malaysia; University of Philippines, Philippines; King Mongkut's University of Technology Thonburi, Thailand; and Hanoi University of Science and Technology, Vietnam. The program has led to a growing human resource and a network of experts who can drive energy technology and the energy market integration process in ASEAN. It will serve as a crystallization point to strengthen the cooperation in research and development among the universities in the member countries. The objectives of the program are to produce postgraduate students who can understand and find solutions to energy and environmental issues with the view of the ASEAN region and to support non-boundary competent human resources across the ASEAN region, as well as stimulating joint research and development among ASEAN universities. This program provides for students at the Masters and PhD levels in each university. The students have a chance to understand problems in other countries and collaborate on research topics under group supervisors from member universities. Mobility between universities is also encouraged (The Joint Graduate School of Energy and Environment 2014).

10.4 Conclusion and Key Messages

It is clear that the Asian countries will be an important region in the world in the future in terms of economic development and use of fossil fuels. While economic growth is projected to sharply increase by 38 % by 2030, the growth of the population is constant. Therefore, increased capacity of this region to cope with climate change is important, particularly given that the same population will drive global GDP growth for almost one third of the world. There are a number of activities currently that have shown their success and can be shared among countries. Capacity building can be done at the levels of communities, researchers, practitioners and policy makers in order to unlock from energy intensity and to leapfrog to a low-carbon society.

10.4.1 Capacity Development Is the Basis for Asia's Leapfrog

Most major development paths of Asian countries are moving toward green growth. Under the constraints of the energy crisis and climate change impact, future Asian growth, while appearing to be the most significant in comparison with other regions, needs a good knowledge-based pathway to light up and pave the road to a low-carbon society.

Capacity development is the basic need and an urgent issue to be explored in Asia. It is one of the effective tools for Asia to leapfrog to a low-carbon society with the concern of unlocked carbon intensity development.

10.4.2 A Bullet Train Model

Development needs to be done on several levels from communities to the subnational and national levels. To leapfrog from the current situation, capacities need to be built at many levels through various mechanisms of networking, research forums, initiatives, training, etc., in order to bridge, transfer and transform the results from research to policy and to implementation. Policy makers with good understanding, as the head of the bullet train, will lead society in the right direction, while scientists and researchers are the engines to back up and accelerate this movement. Finally, practitioners in communities play key roles as the fuel, enhancing the movement toward green growth through their activities. It is, therefore, essential to have these three components for a compatible basis of knowledge and comprehension through capacity development.

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References

- Asian Development Bank Institute (2013) Low carbon green growth in Asia: policies and practices. A Joint Study of the Asian Development Bank and the Asian Development Bank Institute. ISBN 978-4-89974-037-3
- Global Warming Forum (2014) MEAs Watch. <http://www.measwatch.org>. Accessed 9 Dec 2014 (in Thai)
- Joint Graduate School of Energy and Environment, KMUTT (2011) A study submitted to Thailand Greenhouse Gas Management Office. Thai pilot study of low carbon city in Muang Klang Municipality
- LCS-RNet Secretariat (2015) About LoCARNet. http://lcs-rnet.org/about_locarnet/. Accessed 15 Jan 2015
- Sustainable Energy and Environmental Forum (2015) Introduction. www.seeforum.net. Accessed 15 Jan 2015
- Thailand Greenhouse Gas Management Organization (2015) CICT in brief. <http://cic.in.th/index.php/en/>. Accessed 20 Jan 2015
- The Joint Graduate School of Energy and Environment (2014) Joint international postgraduate program on energy and environment <http://www.jgsee.kmutt.ac.th/jgsee1/researchProject/jipp/132.pdf>. Accessed 1 Dec 2014
- The World Bank (2012) World Development Indicator (2012). ADB-ADBI Study Team. <http://data.worldbank.org/data-catalog/world-development-indicator>
- Towprayoon S, Kadkarnkai Y, Srethasirote B, Sathirathai S (2011) An approach to sufficiency society: a case study of Ban Pred NaiCommunity. In: *Fostering economic growth through low carbon initiatives in Thailand*, Chula Global Network, Chulalongkorn University