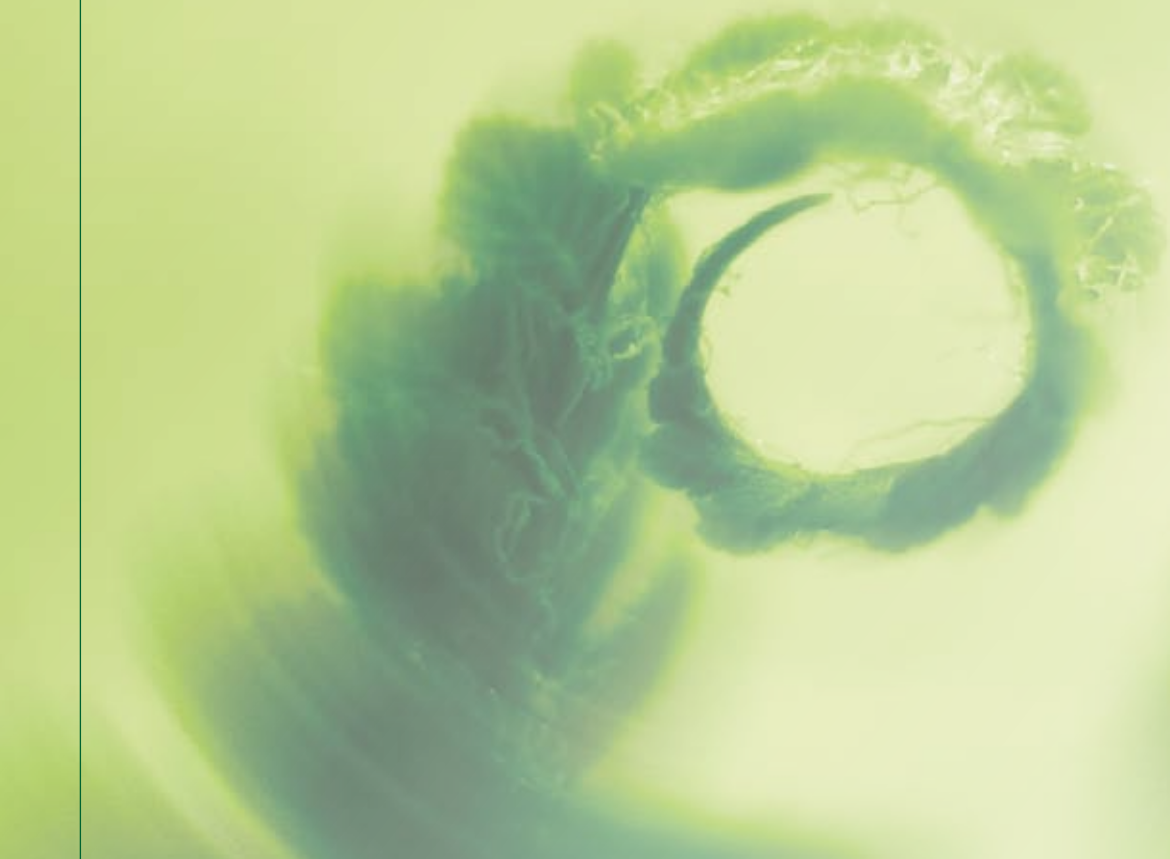
Low Carbon Green Growth:

Integrated Policy Approach to Climate Change for Asia-Pacific Developing Countries



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Objective: *To introduce participants to the significance of resource scarcity and climate change and how adopting Low Carbon Green Growth can provide win-win solutions for fostering inclusive sustainable development while mitigating and adapting to climate change.*

Countries within Asia and the Pacific, particularly South-East Asian, are already witnessing the negative effects of climate change through increased temperatures and frequency and intensity of climatic events (e.g. tropical cyclones, floods and droughts). These effects are a direct result of, historically, very carbon and resource-intensive patterns of development. It is estimated that these and other impacts from climate change will likely intensify– both in the near and late future– compounding the already pressing problems of resource scarcity. Within this region, particularly in developing countries, vulnerable individuals such as women and the poor will bear a disproportionately greater share of the burden and have the lowest capacity to adapt. Failing to incorporate climate change mitigation and adaptation considerations into development policy has the potential to undermine future economic growth, the continued improvement of the Millennium Development Goals (MDG) beyond 2015 and the basic livelihoods of the poor. It is therefore essential that Asia-Pacific policy makers adopt immediate measures to transfer to a low carbon development trajectory. Green Growth offers a roadmap to such a path: synergizing climate action with development goals.

Green Growth is environmentally-sustainable economic progress that fosters low carbon, socially inclusive development. There are six major entry points through which policy makers can initiate a greening of their economy: Sustainable Consumption and Production, Greening Business and the Market, Sustainable Infrastructure, Green Tax and Budget Reform, Investment in Natural Capital and Eco-efficiency Indicators. Intervention within and promotion of these areas, particularly within sectors that have high levels of greenhouse gas emissions and stand to be most impacted by climate change, can enhance mitigation and adaptation efforts and strengthen their resilience. Governments within Asia and the Pacific have already started to adopt various Green Growth initiatives, however, much more is needed to ensure sustainable development goals are met and safeguard their citizenry against the current and future consequences of environmental and climate change. Increasing green taxation and phasing-out environmentally harmful subsidies can incentivise private sector investment and mobilise public funds to support greater efforts. International sources, such as climate adaption funds and the Clean Development Mechanism are additional options that can provide assistance.

This Module is arranged into Four Subsections:

- Significance of Climate Change in Asia-Pacific's Development Agenda
- The Need for Low Carbon Development
- How Green Growth Policy Options Work for Low Carbon Development
- Financing Green Growth

Key Concepts:

- Climate Change
- Mitigation and Adaptation
- Low Carbon Development
- Green Growth
- Eco-efficiency
- Sustainable Consumption and Production
- Greening Business and Markets
- Sustainable Infrastructure
- Investment in Natural Capital
- Green Tax and Budget Reform

SIGNIFICANCE OF CLIMATE CHANGE IN ASIA-PACIFIC'S DEVELOPMENT AGENDA

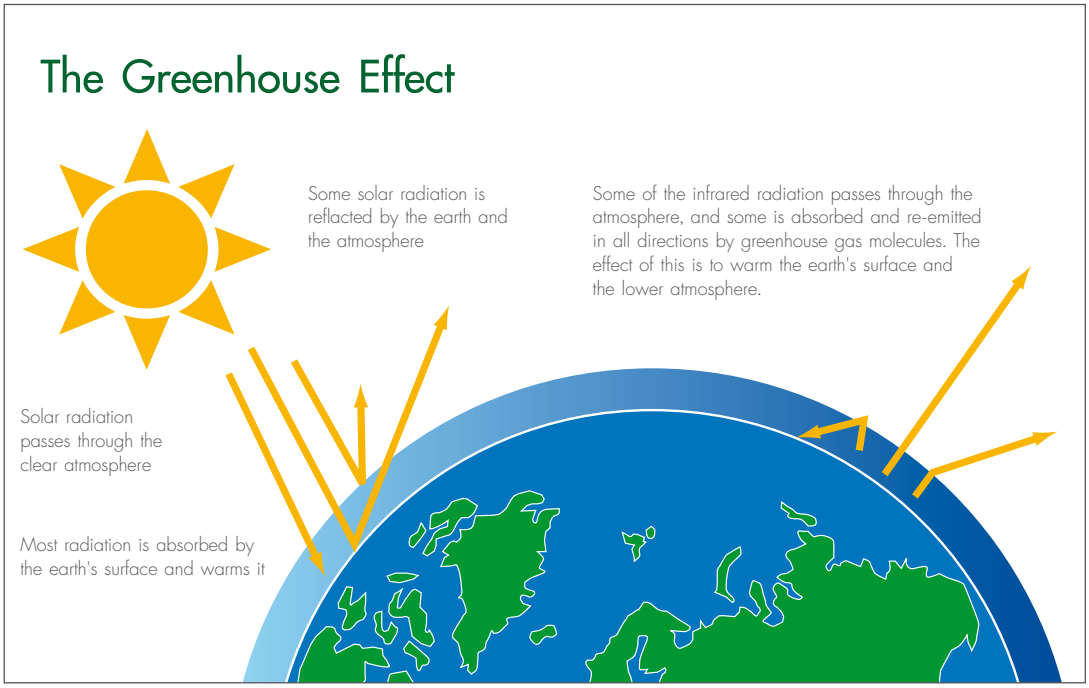
Pressures on Development within Asia and the Pacific

Asia and Pacific is currently facing unprecedented threats to its development (ESCAP 2009, iii). Economic recession, food and fuel price volatility, and water scarcity are severely impacting the region, affecting the livelihoods of the poor and especially women. The natural resource base for which much of Asia-Pacific's export-led, economic growth rests is declining rapidly. The environment simply does not have the capacity to continuously support the demands placed upon it by current levels of consumption and production. If "development as usual" persists, changes brought by high population growth and a burgeoning middle class will only further weaken the region's ability to sustain these activities. Many of these challenges to development stand to be further compounded by the adverse impacts of climate change.

Defining Weather, Climate and Climate Change

Weather can be defined as the state of the atmosphere at a particular time and location in regards to a number of variables including temperature, rainfall, dryness, wind speed and cloudiness, among others. Climate refers to the "average weather" conditions over a long period of time, often as it pertains to a particular geographic region. Throughout history there has been a great degree of *natural* climate variability and change. Since the beginning of the industrial revolution, however, human activities that emit greenhouse gases (GHG) have influenced how the Earth's climate changes. This type of human-induced change is referred to as anthropogenic climate change, or "global warming".

Figure 1: The Greenhouse Effect



Source: (Withey 2009, 9) adapted from (U.S. EPA 2006)

Impacts of Climate Change

Climate Change is Already Upon Us

Climate change is a global phenomenon, but it will disproportionately impact developing countries with women and the poor shouldering most of the burden. According to the Intergovernmental Panel on Climate Change (IPCC), the mean global surface temperature has increased by 0.74 degrees Celsius between 1906 and 2005, with the years 1995-2006 being the warmest on instrumental record history (IPCC 2007, 30). The increase in average surface temperature in the Asian and Pacific region is significantly higher than the global mean. Projections for average global temperature increase range from 2.4 to 6.4 degrees Celsius (relative to 1980-99) by the end of the century under a high emissions scenario (IPCC 2007, 45). If this was to occur, the implications would be severe for the development prospects of Asia and the Pacific. This would be particularly true for countries located in South-East Asia.

South-East Asia (SEA) has long coastlines; in 2005, approximately 82 per cent of its population was living within 100 kilometers proximity; most residing in low-elevation coastal megacities. A great concentration of its economic activity also occurs within coastal areas. Due both to their location and low elevation, these populations and economic zones are especially vulnerable to increasingly severe climatic events and sea-level rise, with potential to inundate land areas and salinate already scarce freshwater resources. Even though SEA has achieved annual GDP growth rates around 5 per cent over the past two decades, an estimated 45 per cent of the population still remains under the poverty level of US$2 per day. Furthermore, the majority of this group relies heavily on agriculture for their livelihoods, accounting for 43 per cent of total employment and 11 per cent of GDP in 2006. Many of the countries also have a high dependence on natural resources, forestry and fisheries, all of which stand to be affected by climate change. For these reasons, SEA is positioned as one of the world's most vulnerable regions to climate change (ADB 2009, 10-11).

Within South-East Asia, the effects of climate change are already apparent beyond a rise in surface temperature. There has been a decrease in rainfall, but a markedly increase in the frequency and intensity of climate change-related, extreme weather events over the past few decades. In only the past 15 years, the Philippines, for instance, witnessed its strongest typhoon on record, deadliest storm, most destructive typhoon and the typhoon with the highest recorded rainfall in a twenty-four hour period (ADB 2009, 31). Such events have resulted in severe droughts, landslides and flooding, which have been responsible for billions of US dollars in damages, thousands of deaths and ultimately affected tens of millions of people within the South-East Asian region (ADB 2009, 30). In 2008, while Australia experienced its worst drought in over a century, Myanmar was hit by one of the deadliest storms in history, Cyclone Nargis, which claimed the lives of 84,500 people and left 53,000 missing (ESCAP 2009, V).

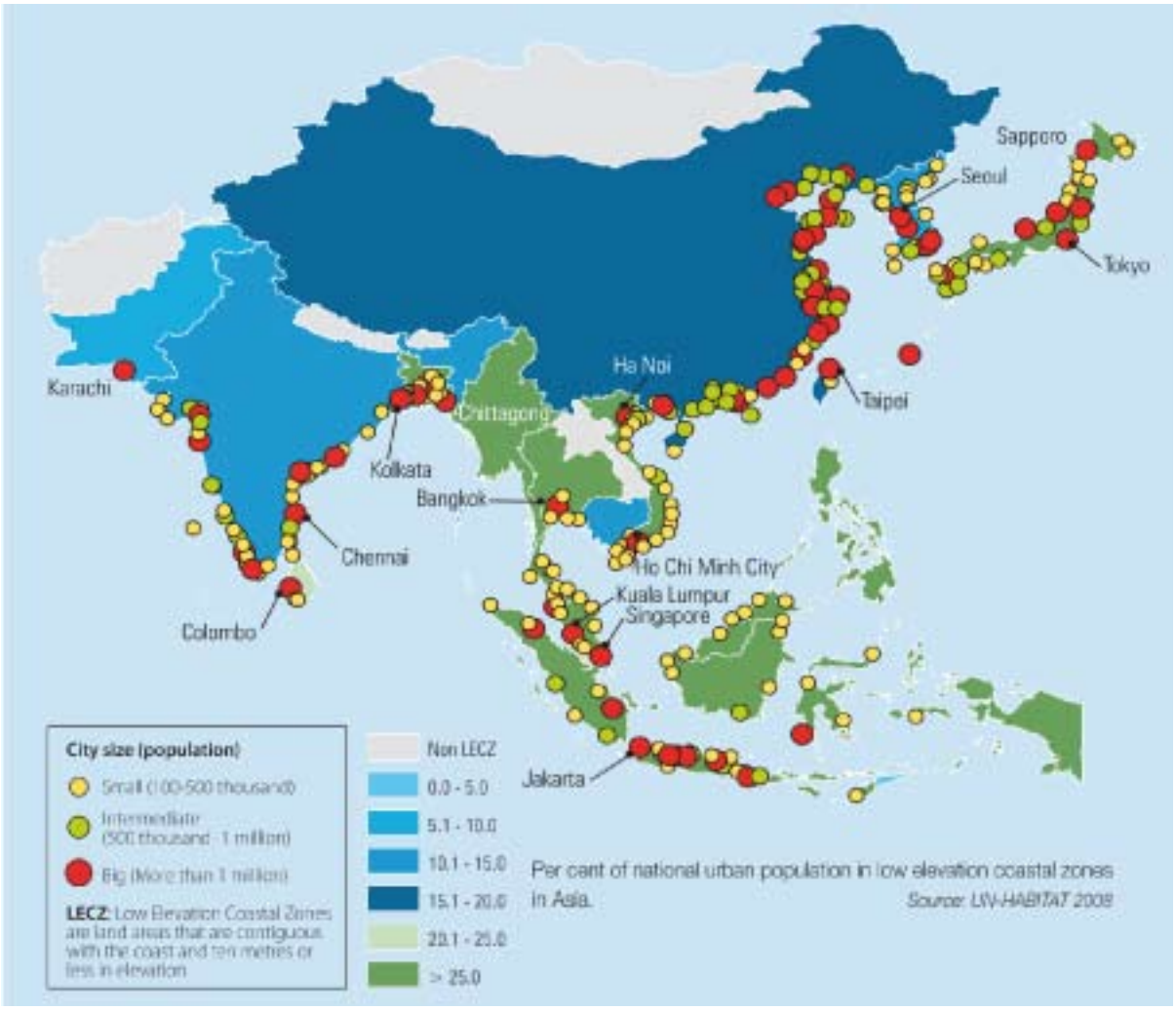
Climate Change is Accelerating

The IPCC and ADB predict that climate change within South-East Asia will escalate over this century. The degree to which climate change will intensify will depend on the development trajectory (e.g. low carbon development or "business as usual" / "high emissions scenario") that the world chooses. A recent study by the ADB published in 2009, which applied a global integrated assessment model, projected that under a "high emissions scenario":

- Indonesia, the Philippines, Thailand and Viet Nam's annual average temperature will increase 4.8 degrees Celsius above its 1990 level by 2100;
- Thailand, Viet Nam and Indonesia's weather conditions will, over the next few decades, become progressively drier;
- The Philippines will witness much higher levels of precipitation throughout the rest of the century; and
- The global mean sea level will rise by approximately 70 centimeters (ADB 2009).

This estimate of 70cm for a global mean sea level rise is greater than the previous prediction from the IPCC of 18-59cm. Nevertheless, it is still slightly more optimistic than some recent studies emerging from experts who worked on the IPCC AR4. They note that if the outflows from all global land ice sources (e.g. from Greenland and Antarctica) are included, then global sea levels could rise by as much as 1.5 (Schiermeier 2008) to 2 meters (Pfeffer 2008) within this century. A rise of 2 meters could completely inundate many of the SEA mega-cities, where tens of millions of people reside, and render devastating consequences of an incalculable magnitude.

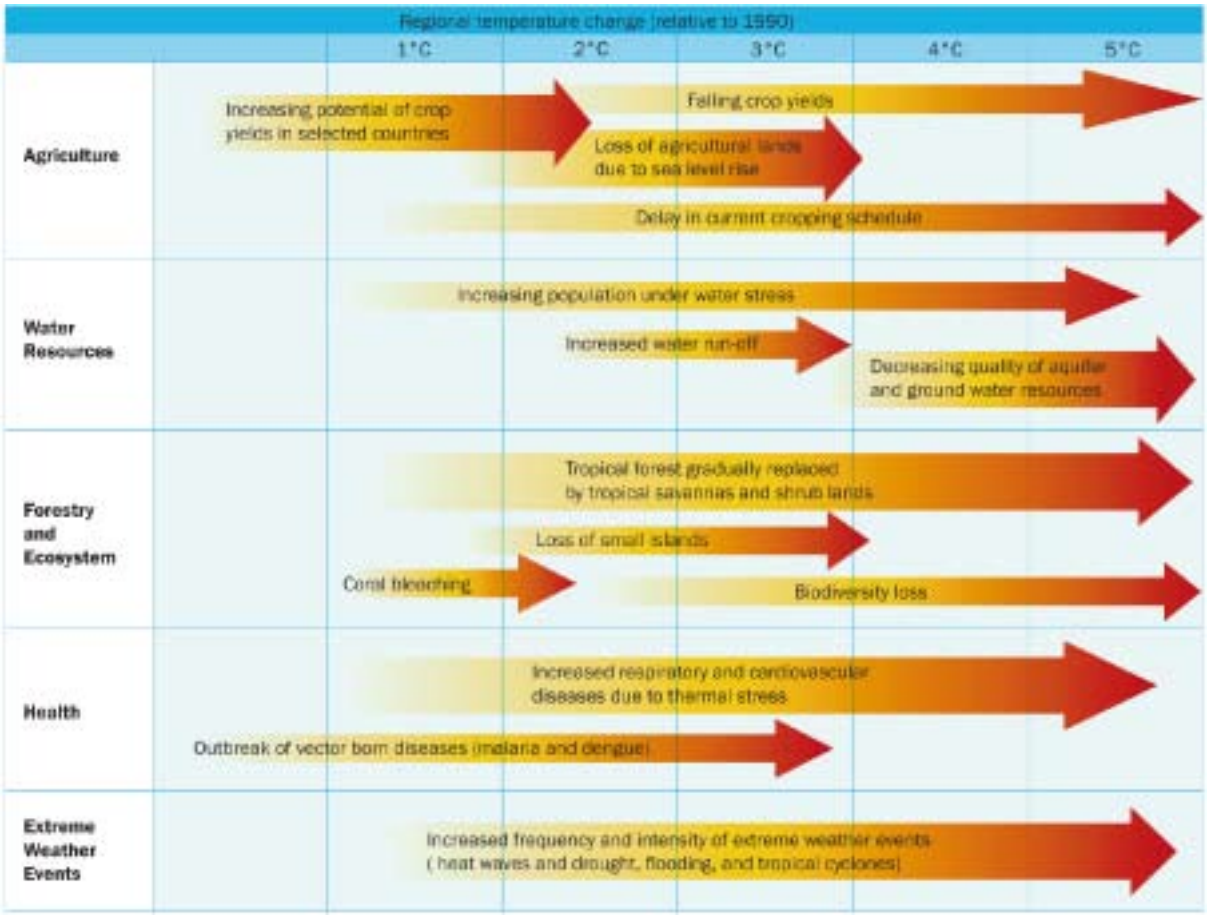
Figure 2: Asia cities at risk from climate change



Source: (UNEP 2009) and (UN-HABITAT 2008)

Higher increases in surface temperature will result in more serious consequences across numerous sectors. Some of the potential impacts are depicted below in Figure 3. Water resources, for example, in Viet Nam and Thailand will be especially pressured by 2050, exposing 8.4 and 3.9 million people to water stress, respectively. In terms of agriculture, the Philippines is expected to incur a 75 per cent rice yield decline compared to the 1990 level by 2100 (under the assumption that no adaptation or technical improvements are made). The forestry sector is projected to experience a major reduction in high-quality forests, biodiversity, and consequently, carbon sequestration potential. Human health will also be impacted. The increase in vector-borne diseases, such as malaria and dengue, coupled with cardiovascular and respiratory diseases from thermal stress, could result in more human deaths within Indonesia, Viet Nam, the Philippines and Thailand (ADB 2009).

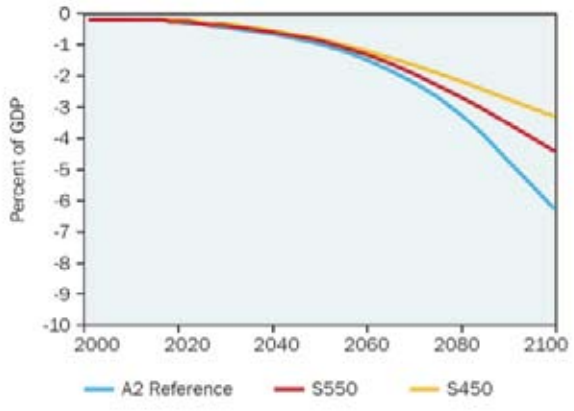
Figure 3: Potential Impact of Climate Change on Key Sectors



Source: (ADB 2009, 54), which was originally adapted from (Stern 2007)

Studies estimate the future aggregate economic cost of climate change to be enormous. According to the ADB, the mean total GDP loss under the best-case scenario (450 parts per million) could be 3 per cent, but under the worst-case scenario (business as usual) it could reach as high as 6 per cent by 2100 (see Figure 4). Considering that annual GDP growth for SEA averaged only 5.5 per cent from 1990-2007 (ADB 2009, 11), and that more developed countries' GDP tends to be much lower, climate change has the potential to cripple GDP performance to the point of negative growth.

Figure 4: Mean Total Loss under Different Scenarios in Four Countries



Note: Total loss includes market impact, non-market impact and catastrophic risks
Source: (ADB 2009, 89)

THE NEED FOR LOW CARBON DEVELOPMENT

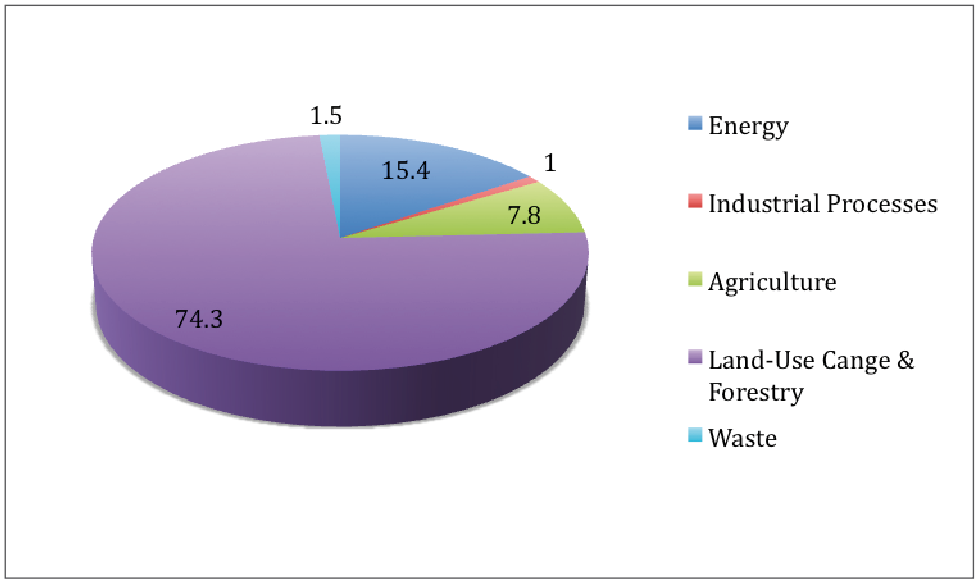
Limits to Asia and the Pacific's Development Path

Countries within Asia and the Pacific have experienced impressive economic growth over the past few decades. This growth has been responsible for lifting millions of people out of the poverty cycle and placing many nations on the road to developed country status. While economic growth is essential for development and poverty reduction, this particular type of growth has been extremely resource and carbon-intensive, and has come at the expense of enormous environmental degradation. Populations and incomes have been increasing, and in parallel, their demand for access to basic resources such as food, water, land and energy. This rapidly increasing competition for resources is placing an extreme amount of pressure on the Earth's eco-systems, at a rate faster than they can be replenished and to the point where some are on the verge of collapse (WWF 2008). As a result, these vital resources are becoming increasingly scarce, and the "limits" to "development as usual" in terms of resource depletion and environmental degradation are becoming strikingly obvious.

While the 2008 economic crisis demonstrated that the world is living beyond its financial means, the current food, fuel, water and climate crises serve as testimony to the consequences of borrowing beyond the Earth's available natural capital. Irrefutably, we can no longer continue down the path of resource and carbon-intensive development– there simply is not the natural resource base or waste-sinks to support it. The record shows that if everyone in the world were to consume the same amount as the average US citizen, the human population would require three to five additional planets to support it (WWF 2008). The challenge posed by resource scarcity is being further complicated by the adverse impacts of climate change, which, if left unchecked, have the potential to severely undermine governments' future ability to address key development priorities, including the Millennium Development Goals (MDG) (OECD 2009).

Climate change, in this light, presents a new global challenge to development, especially for developing countries. Within the region, developing countries are responsible for an increasing share of global carbon emissions, with middle and low-income countries representing approximately 74 per cent of Asia and the Pacific's 12 billion ton annual contribution (ESCAP 2008, 185). Most of the recent growth in emissions has arisen from China, The Russian Federation, Indonesia, Thailand and Malaysia. From 1990 to 2000, South-East Asia's total GHG emissions increased by 27 per cent, considerably faster than the global average rate of increase (ADB 2009, 68). The region's GHG emissions in the energy sector over the same period increased by 83 per cent, and are estimated to continue increasing rapidly as energy and food demand grow (ADB 2009, 69). If left unabated, these increases could seriously impact the level of climate change.

Figure 5: Potential Impact of Climate Change on Key Sectors



Source: (ADB 2009, 54), which was originally adapted from (Stern 2007)

With their low level of adaptive capacity and often high reliance on natural resources for supporting livelihoods, developing countries are particularly vulnerable to the adverse impacts of climate change, disproportionately so than developed countries. Recognizing climate change as a direct threat to development, many Asia-Pacific developing countries are already taking action. For example, in 2007, the Philippines created the Presidential Task Force on Climate Change and Viet Nam established the National Climate Change Steering Committee to be a focal point for climate change related activities.

While developing countries are already making substantial efforts, much more is still required in order to effectively surmount the challenges that climate change and resource scarcity present. There is an urgent need for countries to systematically reevaluate how they approach development– their patterns of consumption, production processes, and the way businesses operate– while looking at how these opportunities can translate into realizable benefits for the environment and society as a whole.

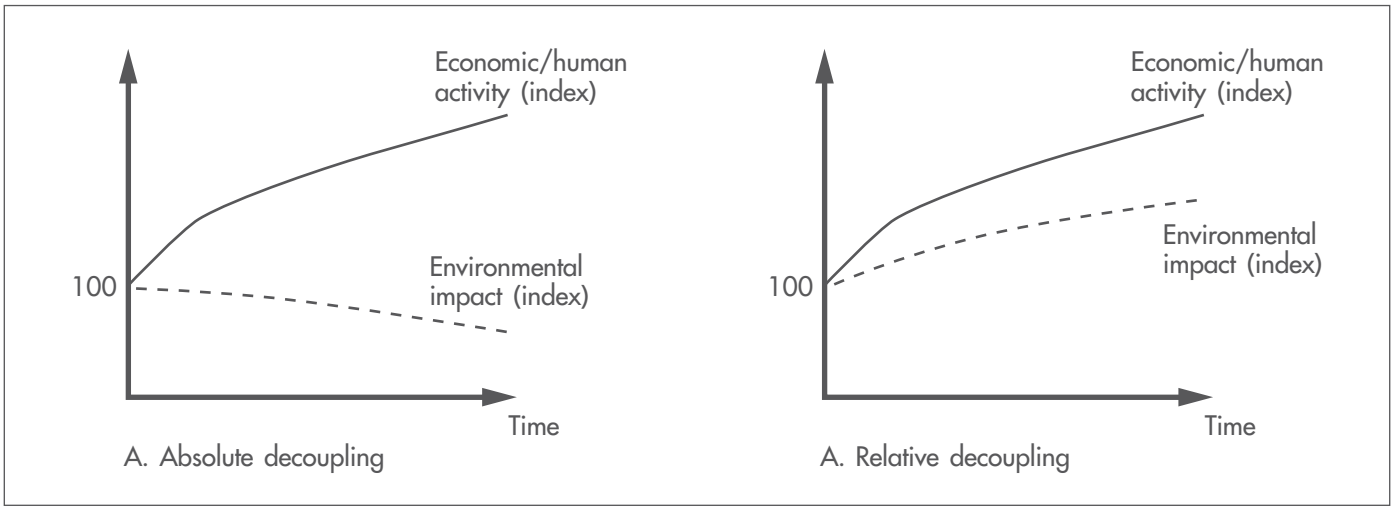
Changing Development Trajectories

Low carbon development refers both to a strategy and development trajectory that emphasizes "de-carbonizing" and de-linking material and energy-intensive practices from economic development to foster climate change mitigation and socio-economic progress. This can be accomplished by increasing investment in natural capital (e.g. carbon sinks) and access to sustainable infrastructure (e.g. renewable energy and public transport), enhancing eco-efficiency (e.g. energy-efficiency), and promoting sustainable consumption and production patterns. As carbon is a key element in most of the anthropogenic greenhouse gases (CH_4, CO_2, PFCs, HFCs, etc.), the term low carbon is used when referring to their collective reduction.

Traditional paths of development have generally witnessed increases in gross domestic product (GDP) accompanied by proportionately similar increases in environmental impact (e.g. the rates of resource use and carbon emissions). Low carbon development deviates from this pattern. In basic principle, it involves transitioning onto a development trajectory whereby economic growth, for instance, does not increase in parallel, or is not "*coupled*", with environmental pressure such as resource use and carbon emissions. The transition onto such a path is often referred to as "*decoupling*". Decoupling is observed or measured in "changes over time". According to the OECD, it "occurs when the growth rate of an environmentally relevant variable is less than that of its economic driving force (e.g. GDP) over a given period" (OECD 2002, 11).

There are generally considered to be two different types of *decoupling*: absolute and relative. These are also sometimes referred to in the literature as *strong* and *weak* decoupling. Figure 6 below graphically illustrates both concepts in detail. Absolute (*strong*) decoupling occurs when, over a specified period of time, the anthropogenic driving force is positive and a measured environmentally relevant variable is zero or negative. Relative (*weak*) decoupling refers to an occurrence where the environmentally relevant variable is positive, but smaller than that of the human-induced driving force (OECD 2002).

Figure 6 : Decoupling environmental impact from economic/human activity



Source: (ESCAP 2006, 137)

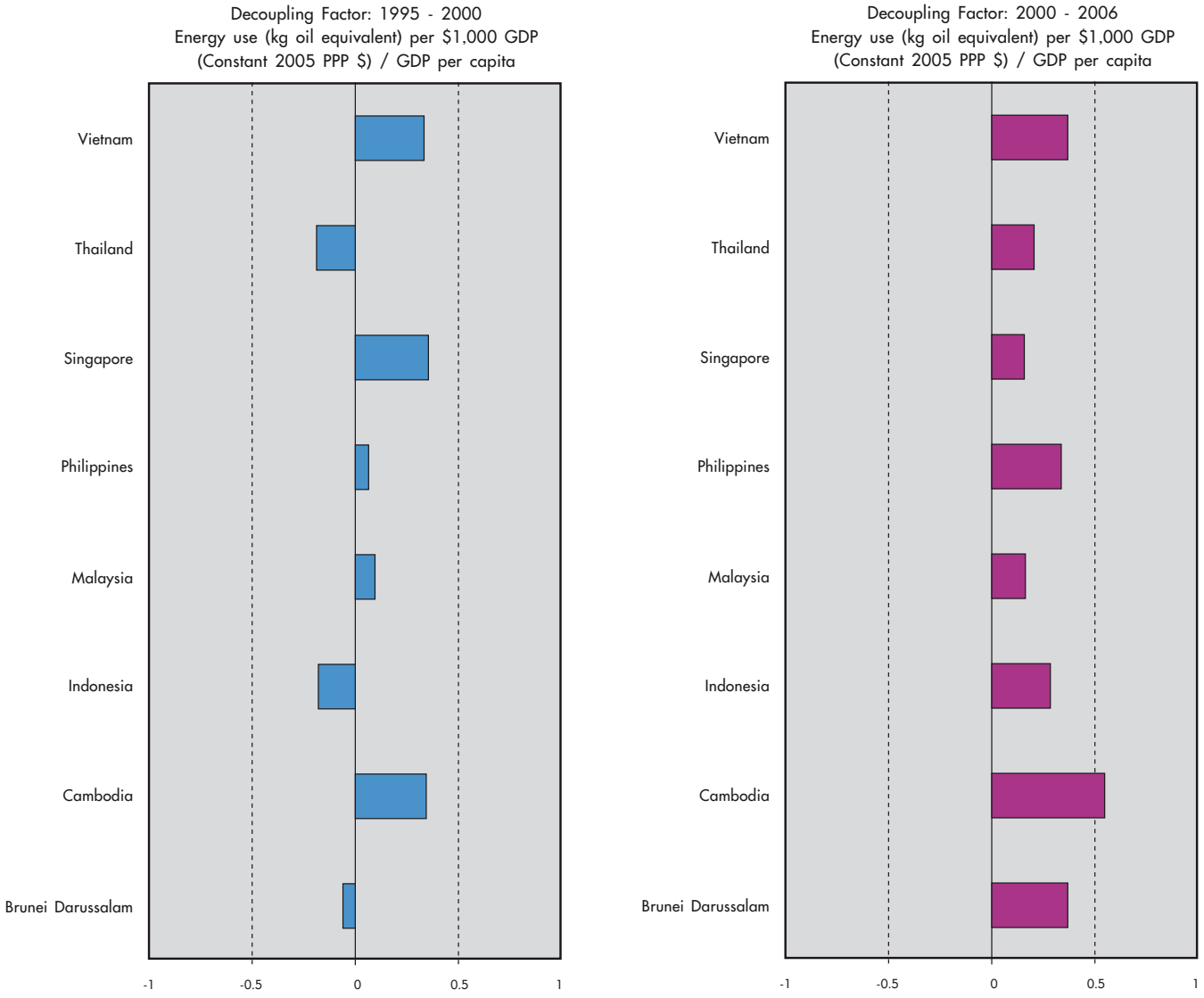
While the above illustrations (indexed time series graphs) are useful for displaying individual country or region performance in terms of decoupling, they lack the ability to provide a clear platform for comparison. Comparing the progress of decoupling among countries is often best approached by a graphical representation of their decoupling factors.

Decoupling Factor = 1- [(EP/DF)end of period / (EP/DF)start of period], where EP= Environmental Pressure and DF= Driving Force. Sources: (OECD 2002)

Decoupling can be observed when the factor (ratio) is less than one, but greater than zero. A factor of one equates to zero environmental pressure. Any factor below zero (negative) is not a case of decoupling, but rather a movement in the opposite direction of unsustainable development. While decoupling indicators can provide one glance at a country's development trajectory, they do not capture the entire picture. Other variables such as the environment's capacity to withstand anthropogenic pressure or transboundry flows of pollutants must all also be taken into consideration.

The graphs below demonstrate the decoupling factors for eight out of ten South-East Asian countries. Over the period 1995-2000, decoupling did not occur in three countries (Thailand, Indonesia, Brunei). However, from 2000-2006, all eight countries experienced some degree of decoupling. While all eight countries are exhibiting progress, much greater effort will be required to reach absolute decoupling and transition to a path of low carbon development.

Figure 7: Decoupling Factors of Selected South-East Asian Countries

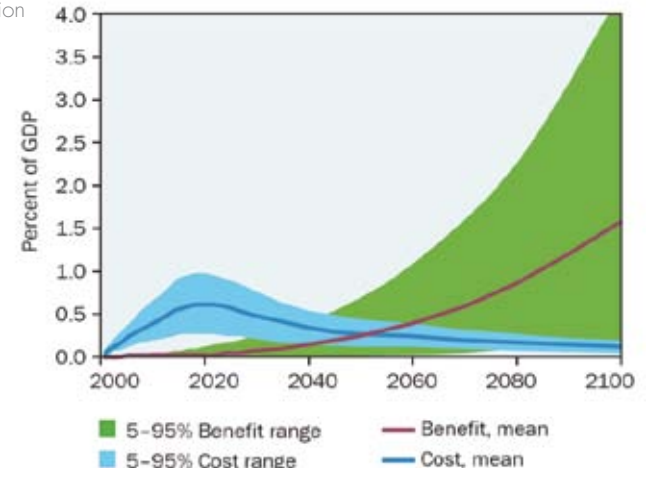


Decoupling Factor= 1- [(EP/DF)end of period / (EP/DF)start of period], where EP= Environmental Pressure and DF= Driving Force. Sources: (OECD 2002); All data was collected from Word Development Indicators Database except energy use (Kg oil equivalent) per $1,000 (PPP) GDP, which was taken from Millennium Development Indicators.

Co-benefits and Win-win Solutions

Climate change action is estimated to require considerable investment. As illustrated in the graph below, the estimated total cost of adaptation in the agricultural sector and coastal zones in Indonesia, Viet Nam, Philippines, and Thailand by 2020 would amount to approximately US$5 billion per annum. These costs, however, are likely to be recouped quickly, with benefits (avoided damages) outweighing the costs by 2050, and eventually rising to 1.9 per cent of GDP by 2100.

Figure 8: Costs and Benefits of Adaptation



Note: 'Mean' indicates the average outcome of the simulations and the range of estimates from the 5th to the 95th percentile are the shaded areas. Source: (ADB 2009, 90)

These estimated costs for climate change action, as they stand now, have been hailed by some policy circles as being in direct competition with fiscal revenue generally designated for other conventional development objectives. Consequently, they argue that costs and challenges should take a backseat to more pressing budget demands and policy formulation considerations. As demonstrated previously, however, climate change is already upon us, threatening the derailment of economic growth and achievement of basic development goals. It thus warrants equal attention. If designed effectively, following a holistic approach that focuses on "win-win" policy initiatives can yield co-benefits for achieving the objectives of both development and climate change action while avoiding duplicated investments.

Table 1: Key Development and Climate Change Objectives

Key Development Objectives	Key Climate Change Objectives
➢ Millennium Development Goals • End poverty and hunger • Universal Education • Gender equity • Child health • Maternal health • Combat HIV/AIDS • Environmental Sustainability • Global Partnerships	➢ Mitigation 1. Curtail GHG emissions 2. Increase carbon sinks
➢ Improved access to and security of: • Energy • Water • Food • Housing • Employment • Economic growth	➢ Adaptation 1. Enhance adaptive capacity 2. Reduce vulnerability 3. Build resilience
➢ Greater income equality	

Designed effectively, Green Growth has the potential to address the overarching development challenges of the 21st Century: promoting environmental sustainability in ways that complement low-carbon economic growth, advancing opportunities for inclusive, sustainable development, while simultaneously mitigating and adapting to climate change.

Box 1: Key Climate Change Concepts Defined

Sensitivity *is the degree to which a system can be affected, negatively or positively, by changes in climate. This includes change in mean climate and the frequency and magnitude of extremes* (OECD 2009, 34). *The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea-level rise)* (IPCC 2007).

Mitigation can be described as measures to avoid, reduce, or capture greenhouse gas emissions (e.g. CO_2, N_2O, CH_4, SF_6, HFCs, and PFCs) prior to their release into the atmosphere, or by sequestering previously emitted GHGs that still remain in the atmosphere through carbon sinks (e.g. forests).

Adaptation refers to measures that reduce the vulnerability of systems to actual or anticipated effects of climate change and variability. *Adaptive capacity* is a system's entire set of capabilities, resources and institutions of a particular area to 1) adjust to climate change and variability, 2) moderate potential damage, 3) cope with consequences, or 4) exploit opportunities. Variables that affect the degree of adaptive capacity include the relative level of available economic resources, institutional and administrative capacity, access to technology, access to climate change and variability information, skills to take advantage of the information, and equitable resource distribution.

Vulnerability refers to the degree of susceptibility or inability of a system to deal effectively with the challenges of climate change. It is a function of a systems exposure, sensitivity and adaptive capacity, as well as climate change's magnitude and rate. Increases in climate change sensitivity or magnitude will raise vulnerability. Improving adaptive capacity can reduce vulnerability.

Resilience is the capability of a system to absorb disturbances while preserving the same essential structure and functionality, the capacity for self-organisation, and the capacity to adapt to and rebound from change and pressure.

Sources: (IPCC 2001), (IPCC 2007) and (OECD 2009).

Climate change action and development objectives are not mutually exclusive. The IPCC's 2007 hallmark report has already outlined some key co-benefits; the following section– entitled *How Green Growth Policy Options Work for Low Carbon Development*– details win-win policy solutions.

Co-benefits Include:

- Enhanced environmental quality
- Improved health from a reduction in air pollution and vector-borne diseases
- Rural electrification and distribution of renewables
- Reduced cost of fuel and infrastructure
- Diversification of energy mix
- Improved energy and water security
- Flood prevention and mitigation
- More sustainable community-based management of forests, watersheds and fisheries
- Reduced bleaching of coral reefs and ocean acidification
- Improved economic performance
- More green jobs and skills

Often, measures taken to accomplish development objectives such as those for improving nutrition, education and health also inadvertently improve adaptive capacity. In this regard, a single policy or mix of policies could simultaneously work towards both goals of climate change action and development, consequently yielding co-benefits. However, the integration of climate change considerations within development policy should be undertaken with special consideration in order to avoid **maladaptation**. Maladaptation is defined by the OECD as "*business-as-usual development which, by overlooking climate change impacts, inadvertently increases exposure and/or vulnerability to climate change. Maladaptation could also include actions undertaken to adapt to climate impacts that do not succeed in reducing vulnerability but increase it instead*" (OECD, 2009, 49). An example of this might be weatherproofing road expansions. While the weatherproofing of a road might increase the road's resilience to climate change, if it encourages new human settlements in heavily exposed areas to sea level rise or severe climatic events, such as coastlines, then the road expansion itself can actually drastically increase a community's vulnerability to climate change, and possibly undermine future development and livelihoods.

HOW GREEN GROWTH POLICY OPTIONS WORK FOR LOW CARBON DEVELOPMENT

A failure of the market to reflect the "real" cost of "business as usual" has resulted in the rise of unsustainable patterns of consumption and production, which are key drivers for many of the current crises Asia and the Pacific is currently facing, particularly that of climate change. Infrastructure has the potential to lock-in those unsustainable patterns for decades after it is installed, hindering the timely abatement of these crises.

Solutions to the problems of economic recession, resource scarcity and climate change can be one in the same. The *Global Green New Deal*, a mix of recommended policies/measures set to reinvigorate economies through directing investment and incentives toward renewables and sustainable infrastructure, was an excellent case in point. Future green stimulus packages could act as a catalyst for transitioning to a low carbon economy. However, a short-term stimulus package will be insufficient for effectively steering markets towards a path of low carbon development in the long-term. A restructuring of the market's entire incentive/disincentive system, driving it away from "development as usual" and towards Low Carbon Green Growth, is absolutely critical for ensuring sustainable development and livelihoods. Through increasing green taxes, removing environmentally harmful subsidies, developing more sustainable infrastructure and adopting complementary policies—such as payments for environmental services, green public procurement and eco-labeling— governments can encourage more sustainable consumption and production patterns, green business and markets, all while enhancing climate change mitigation and adaptation. The Map to Green Growth lays out a framework for policy makers to catalyze and sustain such a transition.

Green Growth Concept

Green Growth is environmentally-sustainable economic progress that fosters low carbon, socially inclusive development. The concept of Green Growth is centered on the premise that— while there remains a critical need for Asia-Pacific countries to grow in order to meet basic development goals— this growth will only be possible if it is undertaken equitably and sustainably. Improving the eco-efficiency of an economy on both the micro and macro levels is the means by which this can be achieved.

The World Business Council for Sustainable Development maintains that eco-efficiency can be realized on the firm or micro-level through the provision of "*competitively priced goods and services that satisfy human needs and bring quality of life while progressively reducing ecological impacts and resource intensity...in line with the earth's estimated carrying capacity*." When scaled-up to the national level, eco-efficiency can be described as the efficiency with which natural capital can be utilized to enhance socio-economic progress. Clearly stated, improving eco-efficiency means enhancing the efficiency of how material inputs are converted into outputs with less impact to ecosystems and the environment as a whole.

Steps to improve eco-efficiency involve, for example, adopting a process or technology that reduces the amount of water or energy required to produce a good or service. In a more holistic manner, it could also entail transforming the waste generated from that same production cycle into useable energy to power the process over again. This byproduct could also be used as raw material in the manufacture of a secondary good. Another solution could be to fulfill a consumer demand, such as that of transportation, by expanding access to public transit services. An example of this might be the development of dense, diverse, transit-oriented communities, which by design offer attractive alternatives to automobile ownership.

Innovations such as these provide examples of how eco-efficiency can bring about win-win solutions: benefiting the environment, increasing economic productivity through the generation of new green jobs, while contributing to the overall well-being of society.

Eco-efficiency is thus about reinventing and redesigning the method and manner in which we consume, produce, and fundamentally live our lives. It is an opportunity to devise innovative solutions for adapting and coping within an ever-changing climate. However, eco-efficiency is a temporary solution, feasible only as far as the transition towards sustainability can be achieved within an ever-expanding economy. In other words, an economy based on finite natural resources and which leads to an increasing rate of externalites such as waste, pollution and climate change.

Efforts to improve eco-efficiency have sometimes led to what is termed in the literature as the "rebound effect". Rebound effects can be described as the loss of potential efficiency gains when a gain in resource efficiency corresponds with a lesser improvement in resource use" (ESCAP 2007, 27). An example of a rebound effect might be the more frequent use of airplane travel as such an option becomes more efficient in terms of cost and time. As history demonstrates, people are now traveling by air more frequently and further distances. This increase has outpaced the savings gained from increases in efficiency and is now having an even greater impact on the environment (e.g through greater levels of air pollution and GHG emissions). Increasing gains in eco-efficiency while avoiding the rebound effect can be achieved, in part, by continuously managing the market's demand to pollute and use natural resources through clear price signals and regulation.

Green Growth, in this regard, articulates concise and clear entry points and policy approaches for making real gains in eco-efficiency and transferring to low-carbon development: synergizing climate action with development goals.

Green Growth for Low Carbon Development or Low Carbon Green Growth

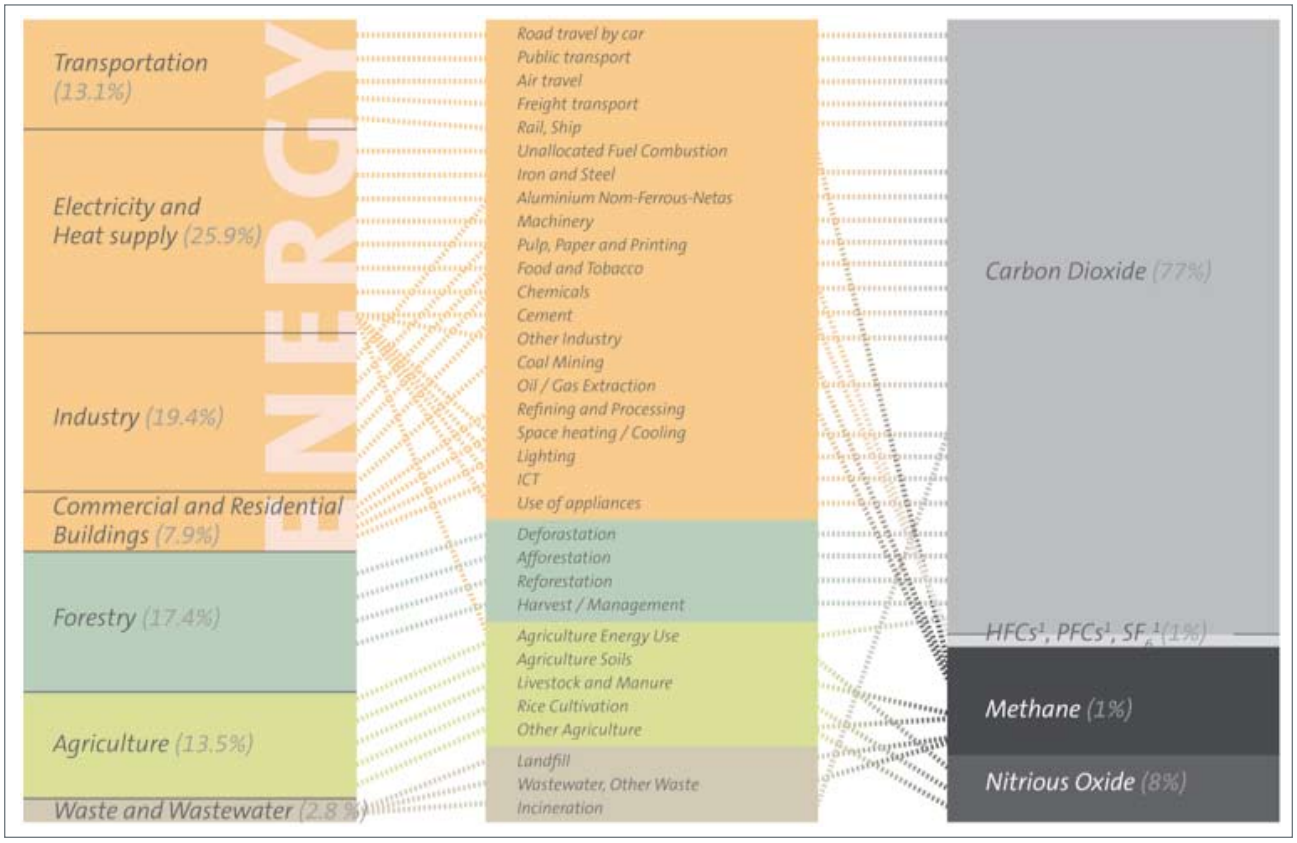
Green Growth comprises six, mutually-reinforcing "Paths", or entry points, through which policy makers can focus interventions:

- Sustainable Consumption and Production (SCP)
- Greening Business and the Markets (GBM)
- Sustainable Infrastructure (SI)
- Green Tax and Budget Reform (GTBR)
- Investment in Natural Capital (INC)
- Eco-efficiency Indicators (EEI)

Sustainable Consumption and Production

The manner in which a society consumes and produces directly influences its development trajectory. The unsustainable consumption and production patterns that have driven economic growth have been directly responsible for climate change through the buildup of GHG emissions in the atmosphere and the rapidly diminishing natural resource base for which mankind's existence so heavily relies upon. If left unchanged, they could be the same patterns that impair future socio-economic progress. Figure 9 below makes the connections between GHG emissions and their consumption and production activity.

Figure 9: Split of Global Greenhouse Gas Emissions by Source of Emission and Consumption and Production Activity



Source: (Burcu Tuncer 2009, 5)

Transitioning towards a path of low carbon development and building the resilience of communities to climate change and resource scarcity requires shifting to more sustainable patterns of consumption and production. Sustainable consumption and production (SCP) aims to meet the rising demand for goods and services that are needed to sustain future livelihoods, while reducing the level of natural resources, GHG emissions, waste, pollutants and energy used or released over the lifecycle.

Conventional development planning has largely relied on managing the supply side of the economy in order to cope with rising demands for materials, greater mobility, energy and water; constantly expanding the supply capacity of energy and water production facilities and roads. Particularly within in Asia and the Pacific– where population densities are high and environmental carrying capacities to support them low– the approach of supply-side management is not sustainable; the region simply lacks the space, natural resource base and capital to support it. Sustainable consumption can play a role in resolving this conflict through its focus on demand-side management (DSM). By managing aggregate consumers' demand for certain environmentally harmful products and services, governments can conserve scarce natural resources, reduce environmental degradation and GHG emissions, and improve the eco-efficiency of the economy. This can be accomplished, for instance, through expanding public transportation options as opposed to roads and parking, mandating eco-labeling and green public procurement, regulating energy and water prices with taxes and charges, and limiting access to extract fish and timber stocks.

Sustainable production, the second element of SCP, emphasizes reinventing and redesigning the way goods are created. It follows a whole-systems approach: examining every aspect of the product throughout its entire lifecycle– including how the product is produced, used, disposed or recycled. Production can be made more sustainable by adopting resource efficient technologies (e.g. fluorescent or LED light bulbs instead of incandescent) and/or processes (such as "waste to feed" practices that waste to produce energy which in turn powers production), or even meeting a consumer demand with a service instead of a product (e.g. providing copying and printing services that forego the need to purchase a copying machine).

Greening Business and the Markets

As evidenced by the current crises, *Business as Usual* (BaU) is no longer an option. The limits to business profitability and long-term sustainability are becoming increasingly evident. Basic inputs to production such as natural resources are diminishing rapidly and are projected to continue increasing in price, consumers and governments are demanding greater corporate social responsibility (CSR), and the adverse effects of climate change threaten to significantly disrupt business operations and dislocate trade.

Against this backdrop, it is clear that the private sector will have to play a key role in both the mitigation of and adaptation to climate change. While business sector's initial efforts to respond to climate change are trailing governments and NGOs, they have a greater capacity to quickly innovate and adapt new emerging threats and opportunities. Expediting these efforts, and more broadly an entire greening of the market, however, necessitates governments to create a more favorable environment for green businesses to prosper. Many policies, which can work to such an end, are highlighted in the sub-section entitled Green Growth Policy Toolbox.

Green businesses are enterprises that consider environmental sustainability as an essential element of their long-term business strategy. They realize this objective by adopting and promoting eco-efficient production activities, as well as by marketing sustainable products and services that enhance the livelihoods of the poor and women and their resilience to and mitigation of climate change. Green businesses can be a key partner in the fight against climate change through various avenues: through public private partnerships for extending essential basic services to the vulnerable (e.g. water and sanitation); as consultants to governments for policy formulation (e.g. amassing data on sectoral impacts of climate change); or through the provision of goods that assist in adaptation (e.g. mosquito nets or early warning systems). Sunlabob, highlighted in Box 2 below, is an excellent example of green business that is turning the need for rural electrification into a profitable social endeavor.

Box 2: Green Business Drives Rural Development and Poverty Alleviation– Sunlabob, Lao PDR

Sunlabob is a renewable energy provider that operates in remote regions where there is little or no access to on-grid serviced electricity. Its core philosophy is that profit-making organizations are the best driving forces for sustainable economic development through the provision of managerial, technical, and financial resources needed to meet social and environmental challenges. Since 2001, Sunlabob has installed over 5,600 renewable energy systems in 450 villages across Lao PDR, and based on this success, opened new branches in Cambodia, Indonesia, Bhutan, East Timor, and Eastern Africa. Given the low level of grid connectivity, most rural residents rely heavily on fuel wood or kerosene lamps to meet their energy needs. Dependence on such sources, however, can exacerbate the rate of deforestation, incidence and severity of forest fires and chronic respiratory illness, as well as the amount of carbon emissions. In light of these dangers, there is a clear and present need for inexpensive, reliable, easily maintained, and low-impact alternative energy sources.

In response, Sunlabob provides solar lantern charging services through a selected and well-trained network of franchises. Sunlabob rents maintenance equipment and trains village technicians to perform installation and day-to-day maintenance of solar photovoltaic (PV) equipment. The Village Energy Committee leases the equipment to village entrepreneurs, who make profits by collecting a fee for recharging lanterns at affordable prices. Through the provision and financing of PV as an alternative to fuel wood and kerosene, Sunlabob, a private enterprise, has improved access of the rural poor to a public service (energy), and in the process, increased green jobs and skills, reduced poverty and carbon emissions (climate change mitigation) and enhanced the rural poor's resilience to climate change.

Source: (Sunlabob Renewable Energy 2009)

Sustainable Infrastructure

Infrastructure is both the foundation upon which business and the economy as a whole operate, as well as the vehicle through which people access basic needs and services. Its design largely dictates the patterns of consumption and production of an economy, and has the potential to "lock-in" those patterns for decades to follow. As they currently stand, however, most infrastructure systems within Asia and the Pacific are unsustainable. Due to their design and often high dependence on fossil fuel-based energy production, they are largely responsible for the emission of 34 per cent of global GHG— which drive climate change— and increasing the level of energy, food and water insecurity. While much progress has been made in improving the delivery of basic services (e.g. water and sanitation), one billion people still live without access to electricity, approximately 600 million without safe drinking water, and one and a half billion without access to proper sanitation. Transferring to a more sustainable system of infrastructure is thus crucial for improving livelihoods through expanding the provision of basic services, reducing GHG emissions, and building resilience to climate change.

A *Sustainable Infrastructure* (SI) system is one that facilitates a higher-quality delivery of housing, transport, energy, water, waste and sanitation services, with less use of resources, to support social and economic development in an integrated, eco-efficient and inclusive manner. Examples of such systems or components of such systems might include rainwater harvesting, renewable energy production (e.g. wind, solar, micro-hydro, geo-thermal), smart grids, waste-to-energy, green buildings, light rail transit and bus rapid transit.

Since SI strategies involve the provision of basic services, and also because of the abundance of relatively inexpensive labour resources across the region, SI has a great potential for new green job creation and skills. These types of employment provide opportunities for enhancing the health and livelihoods of rural populations often outside the reach conventional infrastructure through decentralized, onsite services, protecting against potential disruptions to centralized infrastructure services which might occur from the increasing frequency and intensity of major weather events brought about by climate change.

Sustainable infrastructure can be developed through public private partnerships (PPP) with green businesses and financed in whole or in part through funds from new green taxation, phased-out environmentally harmful subsidies, or international sources such as adaptation funds or the Clean Development Mechanism (CDM).

Green Tax and Budget Reform

Markets left unto themselves usually allocate resources inefficiently. In the case of climate change and resource scarcity, prices within the market have failed to capture the full cost to society of extracting natural resources and emitting GHG. This failure of market prices to reflect the real value of the Earth's environmental assets has led to unsustainable and inefficient levels of natural resource extraction/use and GHG emissions, which are driving climate change. Nicholas Stern, former chief of the World Bank, has described the inability of the market to reflect the costs of climate change in the prices of fossil fuels as a "*market failure on the greatest scale the world has ever seen.*" Market failures do not usually correct themselves, and thus, necessitate government intervention. Green Tax and Budget Reform offers policy makers a pathway of intervention for both correcting market failure and transitioning to low carbon development.

Green Tax and Budget Reform (GTBR) refers to a wide spectrum of fiscal pricing measures that have the potential to simultaneously increase revenue, reduce GHG emissions and foster Low Carbon Green Growth. GTBR is a key driver for sustainable infrastructure, greening business, and sustainable consumption and production. It entails two major complementary policy initiatives that should be implemented in coordination to maximize effectiveness. The first, green taxation, involves levying taxes on environmentally relevant activities and products, such as the extraction of natural resources, carbon emissions or pollution. Green subsidy reform, the second component, consists of gradually eliminating counterproductive subsidies (e.g. those to fossil fuels) that favor unsustainable development and redirecting fiscal funds towards areas that support Low Carbon Green Growth and poverty reduction. The combination of such actions sends a price signal that more correctly reflects the costs of negative environmental *externalities* (e.g. pollution and GHG emissions), which can incentivize more sustainable consumption and production patterns, enhancing climate change mitigation.

GTBR offers instruments for greening all sectors of the economy. Table 2 below highlights a number of instruments that can be utilized within key climate change-related sectors.

Table 2: GTBR Instruments for Key Climate Change-related Sectors

Sector & Respective GHG Emissions	Instrument
Transportation (13.1%)	Parking Pricing Congestion Charges Vehicle Tax Tax Incremental Financing Fuel Tax Subsidies to Sustainable Infrastructure
Electricity and Heat Supply (25.9%)	Carbon Tax Broad-based Energy Tax Greenhouse Gas Tax Feed-in Tariffs Feebates Subsidies for Renewables
Industry (19.4%)	Tax Incentives for Businesses that Adopt Green Business Practices, such as Green Procurement and Training on Energy Efficiency (Because industry comprises many economic sectors, all instruments listed contribute to the greening of industry)
Commercial and Residential Buildings (7.9%)	Value Capture Smart Growth Tax Credits Water Pricing Materials and Product Taxes Energy Pricing Rating System/Tax Incentives for Green Buildings
Forestry (17.4%)	Income Tax Credits for Agro-forestry Stumpage Taxes Excise Taxes "Saw-Mill Gate" Log Export Taxes Concession Fees Auction Mechanism Corporate Income Tax, BIT Performance Guarantee Mechanism
Agriculture	Reduced VAT and Export Tariff Rates for Organic farming Reduced Import Tariff and VAT Rates for Energy-efficient Irrigation Systems Nitrogen-based Fertilizer Tax Pesticides Tax Commercial Agriculture Water Charges
Waste & Wastewater (2.8%)	Water Effluents Tax Land Fill Tax Storage Tax Waste-end Tax Hazardous/dangerous Waste Tax Burning (Incinerary) Tax Variable Tip Fees

Enhancing the equity of the fiscal system and the application of GTBR instruments, in line a "polluter-pays approach", can be achieved in part through the application of differentiated/full variable pricing systems and targeted subsidies for affected groups, particularly the poor. Extending "life-line" tariffs and/or setting price thresholds for the use of basic services such as energy and water, whereby any amount under a set level is not taxed, is one method of assisting the poor and women meet their basic livelihood needs.

Investment in Natural Capital

Natural capital in the form of "green" infrastructure underpins human well-being and socio-economic progress. It is the "stock of natural ecosystems that yields a flow of valuable ecosystem goods or services into the future" (Costanza 2008). Natural capital, such as mangrove forests, acts as a carbon sink and a buffer against climate change impacts, providing a crucial service to mankind. Ecosystem services thus represent a critical component of natural capital, and can be broadly defined as the benefits that people receive from ecosystems (Millennium Ecosystem Assessment 2005, 49).

Investments in natural capital can take many forms. Any expenditure that results in improved sustainable management of ecosystems that support socio-economic progress can be viewed as an investment in natural capital. Investments to reduce soil erosion and nutrient loading through improved watershed management would be a "natural capital investment" alternative to an investment in a water treatment plant.

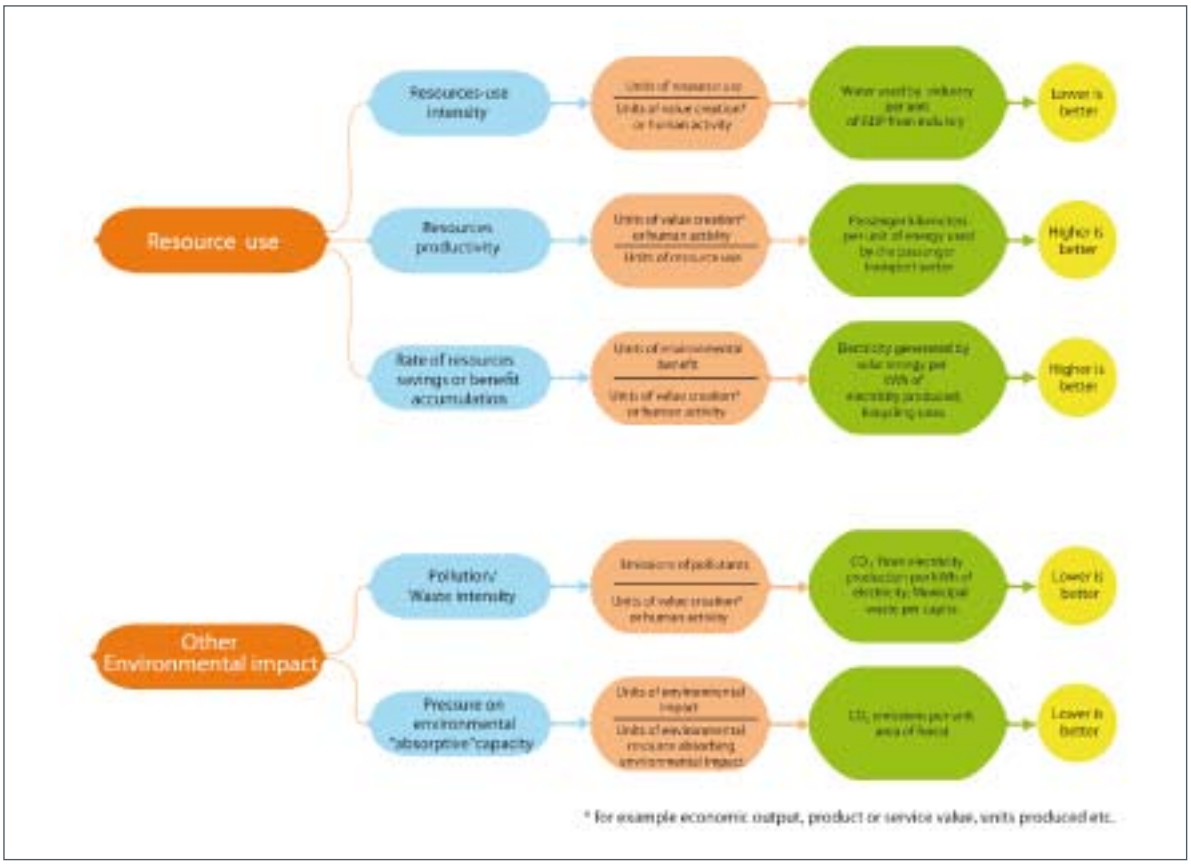
In many ecosystem service markets, such as in Viet Nam and Indonesia, the economic impacts of declining ecosystem services flows are real, immediate and quite local. For example, as watersheds degrade, greater sedimentation rates are experienced, along with, flooding and dry-season flows. Downstream hydropower producers, water producers and communities can experience, as a result higher costs associated with the provision of power, social as well as economic losses from flood damage. Such scenarios create ideal opportunities for payments for ecosystem services (PES) to be implemented– which work to not only preserve and enhance the services these ecosystems provide, but also to augment rural incomes and provide alternative livelihoods.

Specific investment mechanisms can allow multiple stakeholders to invest in the sustainable management of environmental systems that support the economy and society. Innovations in the Costa Rican Payments for Ecosystem Services (PES) system, for instance, allow the private sector and individuals to make payments through a website to invest in forest management. Tourists can also make a similar investment through airlines flying to Costa Rica and through Costa Rican hotels. International payments for ecosystem services through forest carbon markets can complement investments from local beneficiaries (e.g. water and energy users) to ensure that services such as carbon sequestration and watershed protection continue to benefit the local economy and communities, but also mitigate climate change– a global good.

Eco-efficiency Indicators (EEI)

The aforementioned threats to Asia-Pacific's development can be largely attributed to a heavily resource and carbon intensive development paradigm that often positioned the rate, or *speed*, of economic growth (e.g. GDP ppp) as the number one development priority. However, in the words of Mahatma Gandhi, "*Speed is irrelevant if you are headed in the wrong direction*". As our development goals change, so must our indicators to measure them. Eco-efficiency indicators offer such a solution to measuring/benchmarking our progress towards the *right direction*– Green Growth– for socially inclusive, low-carbon development.

Figure 10: Potential Eco-efficiency Measures



Source: (ESCAP 2006, 144)

Some key economy-wide indicators for measuring resource use and environmental impact intensity are highlighted in the table below.

Table 3: Selected Economy-wide Eco-efficiency Indicators

Resource Use Intensity	Environmental Impact Intensity
• Water use intensity [m^3/GDP]	• GHG emissions intensity[1] [t/GDP]
• Energy use intensity [J/GDP]	• Carbon emissions intensity [t/GDP]
• Forest resource use intensity[2] [m^3/GDP]	• Water pollution intensities[3] [t/GDP]
• Land use intensity [km^2/GDP]	• Waste water intensity [m^3/GDP]
• Material use intensity[4] [DMI/GDP]	• Air pollution intensities[5] [t/GDP]

1 GHG emissions include: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N2O), perfluorocarbon (PFC), hydrofluorocarbon (HFC) and sulfur hexafluoride (SF_6). While the unit for CO_2 emissions is tonne CO_2, the unit tonne of CO_2 equivalent is used for other gases.

2 It includes both domestic and imported forest resources

3 Water pollution intensities include Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD)

4 DMI: Direct material input

5 Air pollution intensities include: NOx, SOx and PM

Green Growth Policy Toolbox

While a vast array of policy options and mixes exist both across and within each Green Growth path, the following Green Growth Policy Toolbox provides a brief summary of key initiatives which can be undertaken by policy makers.

Table 4: Green Growth Policy Toolbox

- Demand-side management
- Green taxation (e.g. carbon and energy taxes, fuel charges, congestion pricing)
- Green subsidy reform
- Investment in sustainable infrastructure
- Public private partnerships
- Payment for environmental services (PES)
- Government-backed financing for new green business initiatives
- Feed-in tariffs
- Extended producer responsibility
- Net metering
- Life-line tariffs
- Full-cost pricing
- Full-variable pricing and differential taxes
- Public awareness raising campaigns about the significance of climate change, resource scarcity and Low Carbon Green Growth
- Eco-labeling
- Green public procurement
- Subsidizing research on climate change impacts in and across specific sectors and individual regions
- Government funded technical vocational and educational training (TVET) for developing new green skills, especially for small and medium-sized enterprises
- Green Growth capacity building for public administrators and policy makers
- Government support for the adoption and transfer of environmentally sound technologies (ESTs)
- Upgrading/enforcing of efficiency standards (e.g. building codes and energy efficiency of appliances)
- Decentralization with effective training and financing for local governments
- Prioritization of eco-efficiency indicators as measurements for benchmarking development progress
- Funding of research on the effects of climate change and techniques for adaptation within and across industries, sectors and regions
- Promotion of eco-industrial parks and smart growth zones
- Mandating the use of sustainability impact assessments on the policy and project level and adoption of integrated sustainability assessment for long-term, national development strategy
- Voluntary environmental agreements (between governments and the private sector)
- Carbon and energy registries/energy and water Auditing
- Urban growth boundaries
- Value capture
- Waste exchange programmes

FINANCING LOW CARBON GREEN GROWTH

It is no secret that climate change mitigation and adaptation efforts will bear significant financial costs; nonetheless, these costs will be pale in comparison to those of inaction. A recent study from UNDP estimates that by 2015, global climate change adaptation will require approximately US$86-109 billion per annum (S. Agrawala 2008). In 2006, the World Bank projected the cost of current adaptation for developing countries to be somewhere between US$9 and 41 billion per annum (World Bank 2006). For Indonesia, Philippines, Thailand and Viet Nam, the ADB estimates that by 2020, adaptation for the agriculture and costal-zones will average around US$5 billion per annum (ADB 2009, 90). As a whole for all of the SEA countries the ADB places the number close to one per cent of GDP. This is a small price to pay, however, for averting a future cost of six per cent of GDP if no climate action is taken.

There are a great number of international financing sources for assisting developing countries increase their capacity to adapt and mitigate the effects of climate change. Some of the major ones are highlighted in Table 5.

Table 5: Examples of International Funds for Assisting Developing Countries Mitigate and Adapt to Climate Change

Name of Fund	Main Organizer/Donor	Amount in US$	Time Period
Adaptation Fund	GEF (Kyoto Protocol)	80-300 million[1]	2001<
East Asia Climate Partnership	Republic of Korea	200 million	2008-2012
Cool Earth Partnership	Japan	10 billion	2008-2012
Climate Change Fund	Asian Development Bank	40 million	2008<
Strategic Climate Fund	World Bank	6 billion[2]	2008<

1 Estimated amount for 2008-2012, which could be raised by 2012; funds available fro distribution from 2009

2 This amount includes other World Bank Climate Change-related funds as well

Sources: (Withey 2009, 50-51) and (ADB 2009, 163)

These sources as they stand now, unfortunately, fall way short of meeting the necessary sum. In this light of the limits of international funding, it essential that developing countries also look domestically for alternative sources of financing. Many governments have already taken steps to provision and earmark considerable amounts. Bangladesh, one of the countries most vulnerable to climate change within the region, established a Trust Fund on Climate Change that will have access to US$40 million. In an a move to assist Bangladesh's efforts to combat the negative effects of climate change, the Government of the United Kingdom pledged US$132 million to the fund.

The majority of most countries' government funds are derived from taxation. Green Tax and Budget Reform, as previously described, is an excellent instrument for freeing up millions of dollars wasted on environmentally harmful (perverse) subsidies and mobilizing new funds, all of which can be redirected towards Low Carbon Green Growth initiatives.

London and Singapore are two excellent examples of successful implementation of GTBR instruments. Both cities adopted various pricing measures such as congestion charges, parking fees, vehicle taxes, and reinvested proceeds into sustainable infrastructure projects. Three years after its initial inception, London's congestion zone pricing scheme had reduced CO_2 by approximately 16 per cent, and in 1998 generated annual net revenue of 37 million Euros. Singapore's Area Licensing Scheme and Electronic Road Pricing system had similar results: 45 per cent initial reduction in traffic and 31.25 million dollars in annual net revenue. These cases are testimony to the win-win nature of Low Carbon Green Growth initiatives, whereby investments are met with short payback periods and high rates of return.

To be effective, adaptation funds should be targeted at the most vulnerable groups. The poor, particularly women, represent a large percentage of this group. As such, special considerations should be taken to ensure that their adaptation needs are sufficiently addressed. These may include but are not limited to the following:

- Ensure that the adaptation needs of the vulnerable are carefully considered, and if possible, prioritized in the planning and implementation of funds
- Monitor and evaluate how and to what degree the poor and women benefit from adaptation funds
- Prioritize adaptation needs of vulnerable persons during project funding considerations
- Employ women in adaptation fund management positions (Mitchell 2007)

Another Green Growth financing instrument that works to such an end at the local community level is Payments for Ecosystem Services (PES).

As illustrated through the examples below, PES also provides a means to raise financial capital which can be directly invested into the better management and conservation of essential ecosystems by local communities. When invested in systems such as forests, PES can mitigate carbon emissions, reduce environmental degradation, and raise the incomes and adaptive capacity of rural communities, who largely remain exposed to the negative effects of climate change.

Viet Nam is the first Asia-Pacific regional country to establish a pilot policy for PES. In Viet Nam, hydropower producers, water utilities and tourism operators are among the first ecosystem service beneficiaries targeted for "mandatory" investments that are anticipated to substantially increase rural incomes while simultaneously improving the management of ecosystems.

In Aceh, Indonesia, international PES through voluntary REDD markets are an important component of the Aceh Green strategy for economic development. Indonesia is the first country to establish the rules for the sharing of monetary benefits from REDD payments covering the extent to which the Indonesian Government would require in the form of a tax and the benefits for local government and communities. A national commission will approve avoided deforestation projects and a fund will be created to manage the payments.

The Clean Development Mechanism (CDM) and Verifiable or Voluntary Emissions Reductions (VER) are other international options for developing countries to mobilizing climate change funding and enhancing clean or environmentally sound technology transfer. The CDM is a mechanism under the Kyoto Protocol that allows Annex A countries (industrialized countries with GHG reduction commitments) to make more cost-effective GHG emission reductions by investing in projects in developing countries that reduce emissions which otherwise would not have been undertaken. Even though land use change and forestry are responsible for the greatest amount of emissions (3861 Mt CO_2-eq.) in South-East Asia, Viet Nam is the only SEA country to host an afforestation and reforestation CDM project. In fact, out 1785 total registered CDM projects, only 6 are afforestation and reforestation. In contrast to CDM's minimal coverage in the forestry sector, the market for VERs with respect to afforestation and reforestation is increasing rapidly. VERs generate emissions reduction credits that work outside the Kyoto Protocol and can be sold on voluntary markets. As the demand for such credits— and markets to trade them on— increase, developing countries will have greater opportunities to finance climate change mitigation and adaptation efforts.

Many developing countries still have yet to take advantage of the vast array of international climate change action funding options. And considering that these options, as well their amounts, are projected to increase in the near future, it would be very beneficial for governments to increase their capacity to absorb these funds and technical assistance. This may entail reorganizing or creating new institutions that have the capacity to apply for, accept, and effectively implement or make use of international assistance.

REVIEW QUESTIONS

1. What is the significance of climate change for developing countries in Asia and the Pacific? What do you think will be the most significant climate change-related threats to your country?

2. Which sectors, demographic groups and geographic areas are the most vulnerable to climate change in South-East Asia and your country in particular?

3. What types of Green Growth policies have already been implemented in your country? List some examples of Green Growth policies that you think could be successfully applied in your country to work towards mitigating and adapting to climate change. What would be the major obstacles to implementing such policies and how could they be overcome?

4. What are three options for financing low carbon green growth policy initiatives? List both domestic and international sources of funding. How can funds better address the poor and women's adaptation needs?

5. How does Green Growth deal with the broader environmental and social dimensions of development?

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