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Impact of global recession on sustainable development and poverty linkages

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ADB Working Paper Series

**Impact of Global Recession on
Sustainable Development and
Poverty Linkages**

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and Armin Bauer

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Abstract

The global financial crisis and the resulting economic slowdown may be assumed to have at least the benefit of also reducing environmental degradation in the individual countries. This paper discusses the consequences of the crisis for energy use, pollution prevention, and land use in Asia and the associated emissions of greenhouse gases—the principal global warming pollutants—as well as their linkage with poverty.

There are some short-term benefits to the global environment from the economic slowdown. Such benefits include reduction in the rate of air and water pollution from reduced energy use—which has direct implications for the urban poor's health.

However, modest benefits to global and local environments arising from the economic slowdown are likely to be much smaller than the costs associated with many environmental conservation measures, related to energy savings, natural resources protection, and water environment.

Both supply and demand side investments in energy and environment are being affected. Many ongoing projects are being slowed and a number of downward revisions are being made in expected profitability. Meanwhile, businesses and households are spending less on energy efficiency measures. Tighter credit and lower prices make investment in energy savings and environmental conservation less attractive financially, while the economic crisis is encouraging end users to rein in spending across the board. This is delaying the deployment of more efficient technology and equipment. Furthermore, solution providers are expected to reduce investment in research, development, and commercialization of more energy-efficient models, unless they are able to secure financial support from governments.

The economic slowdown is likely to alter land use patterns by increasing the pressure to clear forests for firewood, timber, or agricultural purposes—the livelihood opportunities available with the rural poor.

Further, the likely additional delay in many countries in the construction of effluent treatment plans for limiting the discharge of pollutants into the rivers is expected to harm the water environment. Thus on balance, the modest benefits to global and local environments arising from the economic slowdown are likely to be much smaller than the costs of many environmental conservation measures for improving the livelihood conditions of the poor.

Natural resources and ecosystem services provided by the environment are essential to support economic growth and better livelihood conditions of the poor. Inaction on key environmental challenges, such as climate change, could lead to severe economic consequences in the future.

These concerns justify government action to support investment in green growth measures, promoting direct investment or fiscal incentives for energy efficiency and clean environment low-carbon technologies.

But much more needs to be done. The investment needed to put national economies in low-carbon green growth pathways far exceeds what is expected to occur. Governments should be looking to increase the new funds they commit to long-term energy and environmental policies to improve livelihood conditions and to shift our development trend into an environmentally sustainable future. Hence a commitment that extends well beyond the economic stimulus packages is needed.

JEL Classification: Q27, Q42, Q48, Q54, Q57

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1. INTRODUCTION

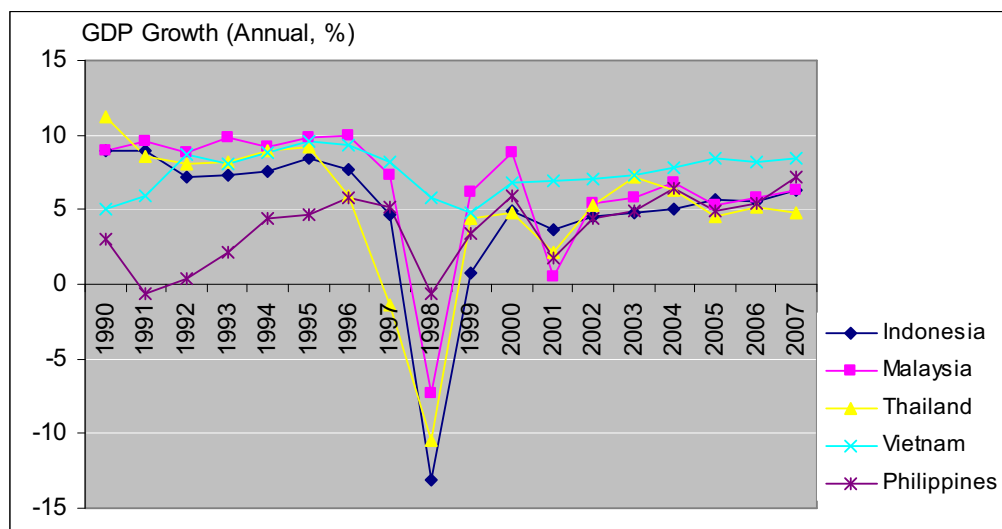
Economic crises never happen overnight. They are the results of years of global economic change, policy errors, and misjudgments. What has turned out to be the worst recession in 70 years began with the collapse of the US subprime house mortgage market in 2007, which then spread to the entire financial sector in other developed countries. Massive financial sector losses then spilled over to real estate and caused one of the deepest global economic slowdowns ever. The recent financial crisis that has engulfed Asia, has reduced economic growth in many countries—which depend on exports to the United States (US) for their growth. The International Monetary Fund (IMF) that the world economy contracted 1.4% in 2009, the worst performance since World War II. But everywhere economists point out green shoots sprouting in the gloom. Japan, Germany, and France have emerged from recession in the third quarter, and faster recovery is predicted for the US. After a brief pause, the People's Republic of China (PRC) and India have returned to their accelerated growth path, lifting much of Asia with it. Yet even if recovery is on track, this recession will not be like most others, when what went down slowly simply came back. The downturn is fundamentally affecting the Asian economic future, as well as environmental sustainability and the livelihood options available to the poor. As both the economic prosperity and environmental health of a nation are interlinked with poverty, this financial crisis also has social dimensions which need to be explored further.

This paper centers on the use of energy and other related services, the human activity with probably the largest impact on the global environment. This has the advantage that there is a fairly good correlation between economic activity, energy use, and the human development index (Kawai and Anbumozhi 2009). The consequences of energy use are larger for climate change, and we shall focus on this aspect, with some discussions on land use, which is closely related to the livelihood of the poor. Next the paper explores the linkages between poverty incidence and vulnerability to the global financial crisis, identifying the interactions between poverty reduction and green stimulus measures. Finally, key long-term policy issues that are closely related to environment and poverty are introduced.

2. IMPACTS OF THE PAST ASIAN ECONOMIC CRISIS AND CURRENT GLOBAL FINANCIAL CRISIS

Much has been written about the Asian financial crisis and the lessons learned for the financial and housing sectors, so that it is not necessary to discuss it here at length. The beginning of the 1997 crisis is usually associated with the floating of the Thai baht, leading to substantial devaluation and the rapid spread of economic slowdown to the Republic of Korea, Malaysia, Indonesia, and several other ASEAN countries. After years of high economic growth rates, these countries found their gross domestic product (GDP) growth rates slowed down considerably (Figure 1).

Figure 1: Impact of Asian Financial Crisis on the GDP of Selected Economies



Source: World Development Indicators, <http://data.worldbank.org/data-catalog/world-development-indicators>, accessed 25 August 2009.

In some cases, it showed even negative growth. This situation improved somewhat during 1999, and a return to modest growth was observed until the current global financial crisis. As shown in Table 1, a number of research institutes now project lower growth up to 2010 and beyond.

Table 1: Annual Percent Changes in GDP

Country	2008	2009 (forecast)	2010 (forecast)
Cambodia	6.03	-0.51	2.99
PRC	9.05	6.52	7.51
Indonesia	6.06	2.5	3.50
Japan	-0.64	-6.2	0.52
Korea, Rep. of	2.22	-4.02	1.53
Lao PDR	7.22	4.38	4.72
Malaysia	4.64	-3.50	1.34
Myanmar	4.54	5.02	4.03
Philippines	4.64	3.4	0.97
Singapore	1.15	-9.99	-0.11
Thailand	2.58	-2.97	1.04
Viet Nam	6.51	3.27	3.97

Source: IMF (2009).

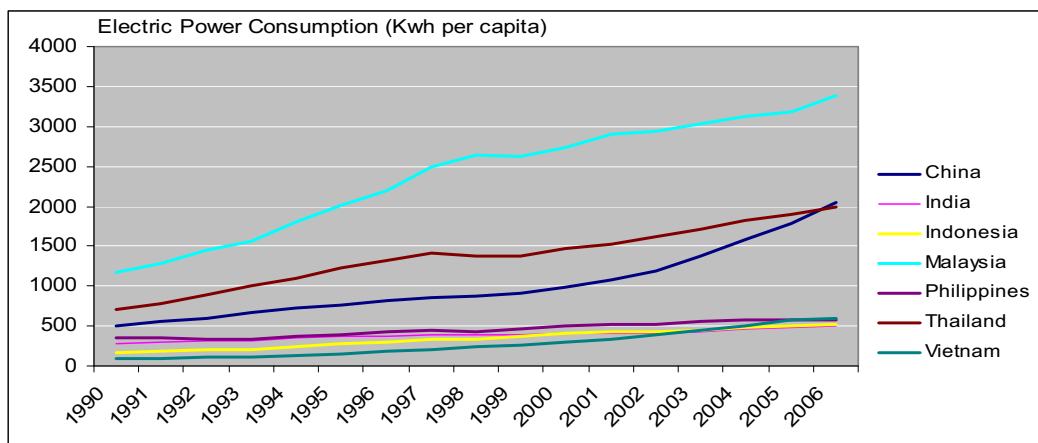
The recession has highlighted the role of major players in the world economy. For decades, the US consumers have been the primary driver of global growth. The inherent dangers of such dependence on one source have long been obvious, and the Asian producers are trying to find replacements. But this lowering of the anticipated economic growth rate in many countries of Asia has implications for energy use and for related environmental impacts, as discussed in the following sections.

2.1 Impact of the Economic Slowdown on Energy Use

As mentioned earlier, the fairly good correlation between economic activity and energy consumption has been known for some time. During the 1990s and 2000s, it has become clearer that for countries that have moved beyond the industrial era to become information societies, energy use grows much more slowly than GDP. This can also be true for industries that depend on services for growth. For countries beginning to industrialize, the

rate of growth for energy use is close to that of GDP, and may even exceed it for some time, if energy efficiency measures are not undertaken. Figure 2 shows the changes in energy consumption during the first crisis period.

Figure 2: Changes in Energy Use during the First Crisis Period



Source: World Development Indicator, <http://data.worldbank.org/data-catalog/world-development-indicators>, accessed 25 August 2009.

The rate of growth in energy consumption is lower than that of GDP for Japan, and somewhat higher than that of GDP for most other countries. The exceptions are the PRC and India, which have a low energy-to-GDP ratio. This is due to factors including the substantial increase in energy efficiency in the PRC, along with the rapid growth in the services sectors.

Since the beginning of 2009, in energy, there has been a steady stream of announcements of cutbacks in capital spending and project delays and cancellations, mainly as a result of lower prices and cash flow. Estimates by the International Energy Agency (International Energy Agency [IEA] 2009) indicate that global upstream oil and gas investment budgets for 2009 have already been cut by around 21% compared with 2008, a reduction of almost \$100 billion. Between October 2008 and the end of April 2009, over 20 planned large-scale upstream oil and gas projects, valued at a total of more than \$170 billion and involving around 2 million bbl/day of oil production capacity and 1 billion ft³/day of gas capacity, were deferred indefinitely or cancelled. A further 35 projects, involving 4.2 million bbl/day of oil capacity and 2.3 billion ft³/day of gas capacity, were delayed by at least 18 months. It is likely that the upstream industry will reduce spending on exploration most sharply in 2009, largely because most spending on development projects is associated with completing projects in Canada, accounting for most of the postponed oil capacity. The drop in upstream spending is most pronounced in the regions with the highest development costs and where the industry is dominated by small players and small projects.

Power investment is expected to be severely affected by financing difficulties, as well as by weak demand. The IEA (2009) estimates that global electricity consumption could drop by as much as 3.5% in 2009, the first annual contraction since the end of the Second World War. Asian countries show weaker demand: in the PRC, for example, demand fell by 7.1% in the fourth quarter of 2008 and by a further 4% in the first quarter of 2009. Weak demand growth is reducing the immediate need for new capacity additions. At the same time, commercial borrowing has become more difficult and the cost of capital has risen markedly; venture capital and private equity investment have fallen sharply. If a recovery takes longer than expected, and energy prices remain lower than recent peaks, a shift to coal- and gas-fired plants at the expense of nuclear and renewable resources could be seen, although this will depend on the policies and support mechanisms individual countries and regions have in place.

The outlook for 2010 investment in renewable-based power projects is mixed, depending on the policy framework, but is generally falling proportionately more than in other types of generating capacity. The IEA (2009) estimates that for 2009 as a whole, investment in renewable resources could drop by as much as 38%, although the stimulus provided by government fiscal packages can probably offset some of this decline. Investment in renewable energy assets has surged in the first decade of the 21st century, recording year on year growth of 85% in 2007. But activity slowed in 2008 as sources of financing contracted and lower fossil-fuel prices reduced the economic incentive for new investment, particularly in the last few months of the year. Preliminary data for the first quarter of 2009 indicated that the slump in investment has accelerated, with spending 42% lower than in the previous quarter. In most regions, investment in bio-refineries has all but dried up due to lower ethanol prices and scarce financing.

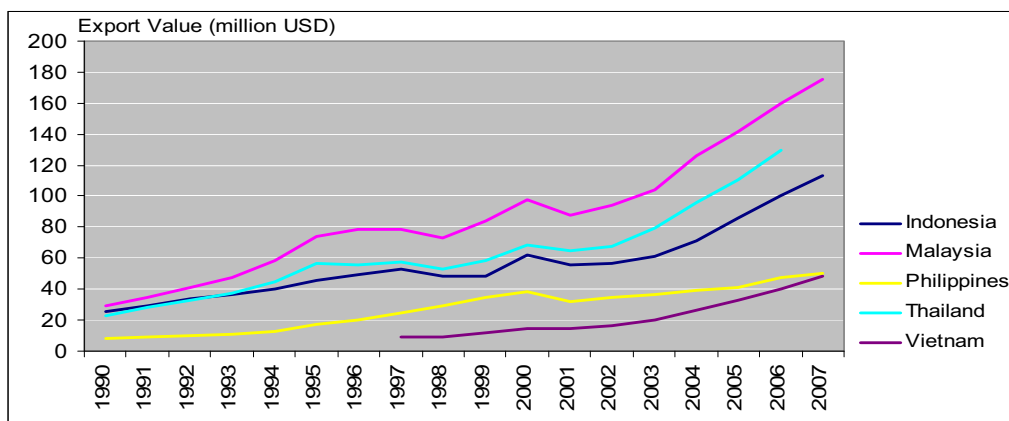
Asian industry surveys suggest investment in coal could drop by 40% in 2009 compared to 2008. Nonetheless, this drop is from very high levels reached in 2007 and 2008, which were exceptionally profitable: coal companies used free cash flows to increase their investments, as well as pay out large dividends to shareholders. Expected reductions in capital spending in 2009 are most marked among high-cost producers, especially those supplying export markets, such as in the US and Australia. In contrast, Indonesian coal producers continue to enjoy high margins with little apparent disruption to planned expansions.

The economic slowdown has also depressed almost all energy-consuming sectors, particularly steel, automobiles, and construction. The reduced demand for energy has led to corresponding reductions in overall energy consumption. In the Republic of Korea, for example, the total energy consumption during the first crisis period was about 8.1% lower than in the preceding years, according to the Korean Energy Economics Institute (2000). The reduction in overall energy consumption, most of which is in the form of fossil fuels, has resulted in a decline in carbon emissions, a major cause of global warming.

This influences local environmental problems also. Pollutants such as total suspended particulates, sulfur dioxide, and nitrogen dioxide are also closely correlated with power generation, industrial activities, and transportation. A reduction in energy consumption will be accompanied by reduced emissions of air pollutants. Thus the economic slowdown is reducing the emissions of air pollutants in the short term and is improving the health and livelihood conditions of the urban poor. The combustion of fossil fuels and woody biomass by rural poor also results in haze and acid precipitation, frequently across national borders.

2.2 Impact of Economic Slowdown on Trade and Embedded Emissions

The emissions of carbon dioxide due to combustion of fossil fuels in Asian countries have increased dramatically, now exceeding those from Europe and the US. Three of the six largest emitters—the PRC, Japan, and India—are in Asia. From 1990 to 2006, emissions from the PRC increased by 37 times, from Japan by 12 times, and from India by 13 times. Other emerging economies like Indonesia, Thailand, and Viet Nam, which very much depend on exports to drive their economies, also had increases in emissions. And hence most of the emissions are embedded. The late 1990s Asian economic slowdown affected the trade volumes of these countries (Figure 3) in varying degrees.

Figure 3: Export Value of Products during the First Crisis Period

Source: UN Comtrade database, <http://comtrade.un.org/>, accessed 27 August 2009

The growth rate of trade volume slightly decreased, but energy use growth still remained positive. However, the embedded emissions of Indonesia, Thailand, and the Republic of Korea actually declined during the Asian crisis as both the energy use and trade volume declined during 1998. Given the lower economic and energy growth rates, one could say that the economic slowdown will be good for the global environment.

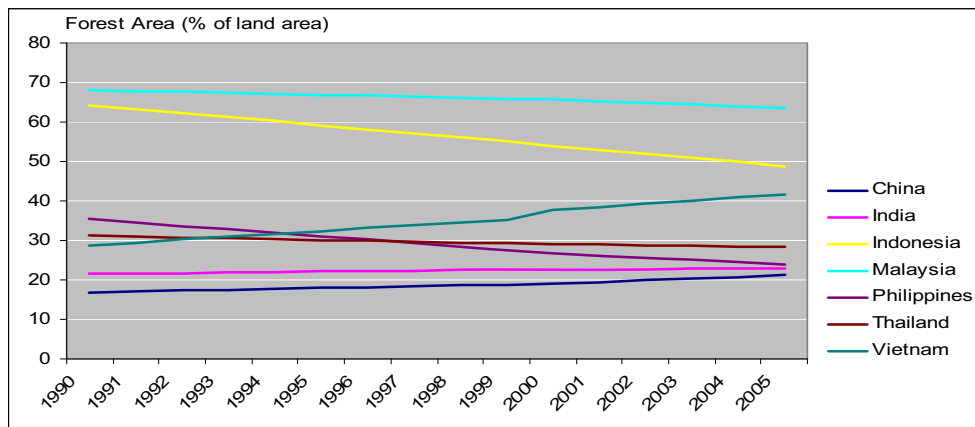
The economic slowdown resulted in reducing the oil imports too. Most oil and goods are transported over the oceans. A decline in oil and goods shipped should result in lower transport-related emissions and marine pollution.

2.3 Impact of Economic Crisis on Land Use

Among the Asian countries, poverty affects large populations in India (44% of the rural population), the PRC (26%), Indonesia (24%), Philippines (23%), and Viet Nam (21%) in 2009 (United Nations Economic and Social Commission for Asia and the Pacific [UNESCAP] 2010; International Fund for Agricultural and Development 2009; Palanivel 2009; United Nations Environment Programme [UNEP] 2009). In addition, some of these countries have a very high population density. One would thus predict that in countries that combine high poverty levels with dense populations, the economic recession could trigger additional pressures on rural natural resources, including forest habitats, originating in subsistence households.

Many of the rural poor still rely heavily on traditional fuels such as agricultural and animal wastes and forest wood for energy. Even though their reliance on traditional fuels has declined in most Asian countries, this has been due more to an increase in amount of commercial energy used, rather than less biomass. Bangladesh, Myanmar, and Viet Nam still obtain about half or more their energy requirements from traditional fuels. India, Indonesia, Pakistan, Philippines, and Thailand still rely on these fuels for at least 20% of their total energy needs.

The need for energy as well as for agricultural land in highly populated Asian countries of the region has been the prime factor in the changes in land use patterns. As shown in Figure 4, for many countries, the loss of forests sometimes exceeds 2–3% of total forest area each year, as in Philippines, Thailand, and Indonesia. For other countries such as the PRC and India, the rate of forest loss has declined considerably. The reason for this disparity varies from one country to another.

Figure 4: Changes in Land Use during the Asian Economic Crisis

Source: World Development Indicators, <http://data.worldbank.org/data-catalog/world-development-indicators>, accessed 25 August 2009.

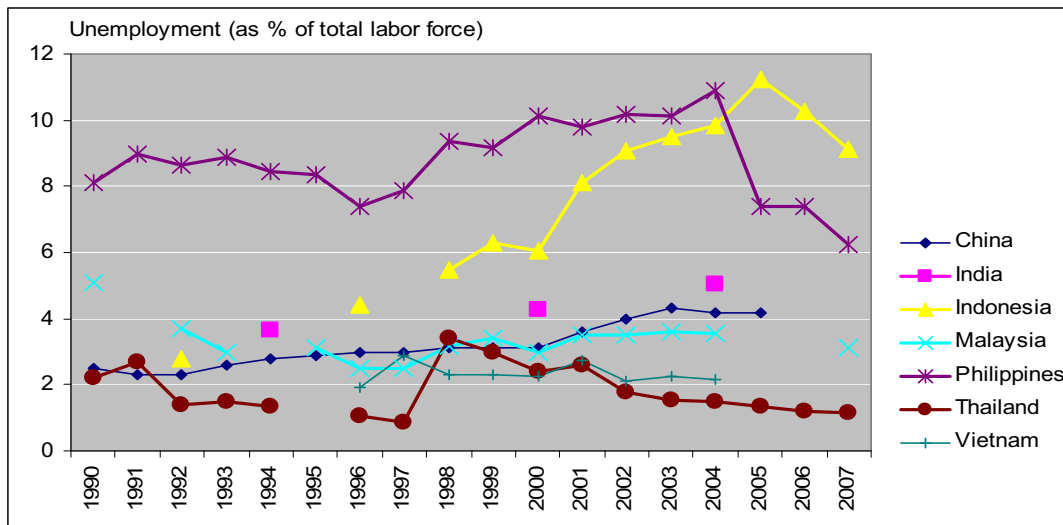
2.4 Overall Impacts of Recession on Energy Security, Environment, and Poverty

Falling energy and environmental investment will potentially affect climate change and energy poverty, depending on how governments respond. Cutbacks in investment in energy infrastructure will only affect capacity over several years at most. So in the early 2010s at least, weaker demand is likely to result in an increase in spare or reserve production capacity. But sustained lower investment in supply could lead to a shortage of capacity and another spike in energy prices later in the 2010s, when the economy is recovering. The faster the recovery, the more likely that such a scenario will happen.

The impact on greenhouse gas emissions will depend on how the crisis affects investment in different types of energy technology. In the short term, slower economic growth will curb growth in emissions. But in the medium and longer term, the crisis may lead to higher emissions, as weak fossil fuel prices and financing difficulties curb investment in clean energy technologies, increasing reliance on fossil fuel capacity. At the same time, investors will remain risk averse, so that funding for clean energy projects will be available primarily for proven technologies in attractive markets. Once the recession is over, the likely burst of economic growth or “catch-up effect” may also cancel out any short-term emissions benefit.

Cutbacks in energy investment will impede access by poor households to electricity and other forms of modern energy—a vital factor in pulling people out of poverty. There are an estimated 900 million people across Asia still lacking access to electricity. This figure may grow as a result of increasing unemployment (Figure 5) due to the financial crisis, as some households that previously had access are no longer able to afford electrical service, and financial problems limit the ability of service providers to connect new customers at lower costs.

Figure 5: Changes in Unemployment (as % of Total Population) During and After the Asian Crisis Period



Source: World Development Indicator, <http://data.worldbank.org/data-catalog/world-development-indicators>, accessed 25 August 2009. Data for some years are missing.

However, environmentally friendly growth without economic slowdown could reduce carbon emissions too. The reason for this is that many measures to improve environmental quality, such as the replacement of less energy-efficient equipment by more efficient equipment, and more rapid introduction of natural gas and nonfossil fuels instead of continued reliance on coal and oil, would be deferred during a protracted economic slowdown. Thus, the global environment and local environment would benefit from the ending of the financial crisis earlier rather than later.

The economic slowdown is likely to delay the ability of many countries to provide alternative sources of energy to the rural poor who currently depend on traditional fuels. As the populations of these areas and their demand for energy increase, they will have to rely even more on their traditional sources of energy. The additional cutting of forests will result in emissions of carbon when this additional energy could otherwise have been supplied by renewable energy sources such as hydropower, solar energy, and wind energy. In this way too, the current recession is likely to harm the environment and the poor.

The above discussions lead to the conclusion that there are some short-term benefits to the global environment from the economic slowdown. Such benefits include reduction in the rate of air and water pollution from reduced energy use, which directly influences the urban poor’s health. At the same time, the continued economic slowdown is leading to deferment of plans in many Asian countries to replace inefficient equipment with more efficient and nonpolluting equipment, and to build the infrastructure to use clean fuels such as solar and wind energy as well as restructuring of polluting industries.

The economic slowdown is likely to degrade land use patterns by increasing the pressure to clear forests for firewood, timber, or agricultural purposes—the livelihood opportunities available with the rural poor. Further, many countries’ likely delays in building effluent treatment plans for limiting the discharge of pollutants into the rivers is expected to harm the water environment. Thus on balance, the modest benefits to global and local environments arising from the economic slowdown are likely to be much smaller than the costs associated with deferment of many environmental conservation measures for improving the quality of life for the poor.

3. GLOBAL ECONOMIC CRISIS, RECESSION, AND POVERTY LINKAGES

As outlined in the previous section, economic shocks such as the global financial crisis affect both urban and rural poor people's strategies to secure elements of basic livelihood, including the opportunity to earn an income and meet basic human needs, maintain health, and obtain a basic education. The global economic slowdown also poses risks to the governments and their development projects for water supply, food security, human health, and natural resource management—which will may affect the income vulnerabilities of communities. Poverty can be defined as the lack of opportunity to live a decent life, including material needs, education, and health.

3.1 Key Interactions and Critical Linkages

As will be detailed later, many governments are implementing stimulus packages to rescue their economies from recession. If stimulus packages are to be consistent with environmental conservation and poverty reduction goals, there is a need to understand why and how both rural and urban poor secure or fail to secure basic human needs. Specifically, there is a need to understand how such strategies and processes are affected by recession. Practically all developmental activities and economic sectors are affected by the global financial crisis. The critical question for development planners is how effectively responses to the global financial crisis could be targeted for poverty reduction.

In order to identify these complex linkages, two main challenges are to be addressed. The first challenge is that, despite increasing recognition that the global financial crisis and poverty incidence are interlinked (Bauer 2009), the linkages have not been clearly articulated in an environmental sense, and thus are difficult to address effectively in practice. The knowledge is fragmented; however, as was done in the previous section, even with little comprehensive assessment of sectoral sensitivities, the distributional effect of poverty incidence in urban and rural populations could be studied.

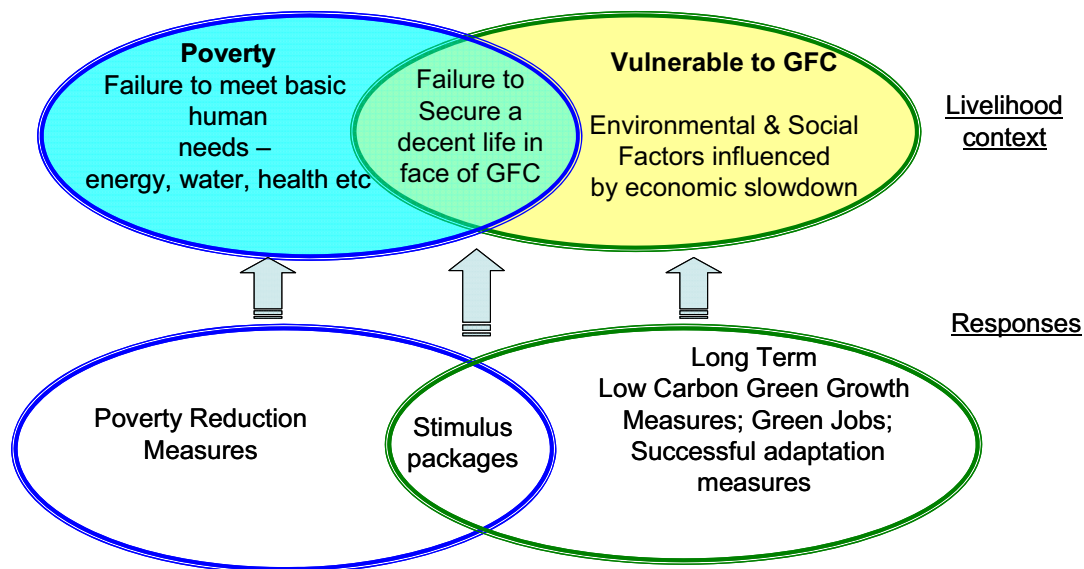
The second challenge is that, although it is becoming clear that governments need to integrate poverty reduction into their rescue programs, it is not always clear how this can be done effectively. Several stimulus packages have green job components. But it is less clear what stimulus programs currently emphasizing green investment and poverty reduction should be doing differently from what they are already doing. In short, there has yet been no synthesis of the lessons from the past economic crisis and their practical implications for integrating long-term green growth strategies to poverty reduction. The institutional barriers to integrating environmental concerns in poverty reduction also need to be clearly identified.

Current thinking on recovery from the global financial crisis encompasses two very different approaches, both of which can provide insights for poverty reduction. One approach is based on the assessment of vulnerable sectors and the other is on the end impacts on the projected poor. The studies conducted so far have emphasized the first approach, assessing the ways of reducing sectoral sensitivity to projected future changes. Sectoral adjustments can clearly reduce socioeconomic impacts and contribute to poverty reduction. Adjustments such as change in trade patterns, adaptation of new product servicing models, ecoproduct innovations, technology absorption, and uptake of renewable fuels can mitigate climate change by reducing greenhouse gas emissions. This study does not discuss particular pathways, but they are relatively well researched in other technical papers prepared for this conference.

The second approach to poverty focuses on changing the societal factors and conditions that affect people's capacity to respond to the global financial crisis, including direct employment opportunities, health reforms, and education. Some other conference papers seek to address how vulnerability to economic slowdown is influencing poverty. Figure 6

shows the interface between poverty and vulnerability to economic slowdown and between poverty and low-carbon green growth pathways. According to this two-track approach, the governments and poor communities must adjust their strategies to secure a decent life in the face of the global financial crisis and environmental crises such as climate change.

Figure 6: Poverty–Global Financial Crisis (GFC) Linkages and Overlap between Responses



Source: Authors' illustration

3.2 Integrating Poverty Reduction Strategies with Low-Carbon Green Growth Pathways

The interlinkages between low-carbon green growth strategies and conventional poverty reduction strategies could be optimized for improved livelihood conditions in the following ways:

- i. Strict stand-alone environmental policy measures can benefit as well as harm enterprises, workers, and communities. Adequate analysis of impacts on employment, income, and local development should be conducted to maximize benefits and to anticipate the need for just transitions.
- ii. Low-carbon green growth pathways should be guided by the principle of equity. They should be an opportunity for countries to broaden access to employment and income opportunities created in the transition to low-carbon economies, which are also resilient to climate change. The integrated vision for long-term cooperative action should therefore provide a framework for a just transition to a low-carbon, sustainable economy. This just transition framework should enhance the opportunities for development, for poverty reduction, for sustainable enterprises, and for access to decent work. This requires a strengthening of capacities and coherent policies to seize opportunities arising from environmental mitigation and adaptation while reducing economic harm.
- iii. In order to minimize the cost and harms and to realize the potential benefits, environmental, economic, and social policies and programs need to be well informed, broadly supported, and able to engage national and local governments

and representatives of employers' and workers' organizations to help design and implement policies.

- iv. Dialogue will also be essential for dealing with the downside of reducing pollution and emissions. Workers and entrepreneurs should be assured that a green environment for society does not mean unemployment for them. Hence, training, social security schemes, active labor market policies, and programs to diversify economies need to be put in place to soften the blow for them.
- v. Labor markets and livelihood vulnerability assessments will provide a good understanding of social, labor market, and enterprise risks and vulnerabilities related to environmental risks such as climate change and the need for adaptation measures. Such a baseline is essential to quantify and qualify the needs for adaptation as well as to tailor interventions and allow monitoring of adaptation programs.
- vi. New green economic measures might disrupt local economies. The ability of enterprises to maintain or resume economic activity and of people to earn an income will be crucial after a storm, a flood, or a drought. Vulnerability assessments should include socioeconomic information on the structure of local economies, including the size and nature of enterprises and main sources of employment and income, as well as respect for human rights (including labor rights), coping strategies, and access to credit and social networks.
- vii. Embedding environmental standards and regulations into economic development leads to more integrated and effective capacity building. It provides opportunities to engage stakeholders in design and implementation. Targeted training can help affected individuals to find new economic activities and allow households to diversify their sources of income in line with the mitigation and adaptation strategies.
- viii. Building solid enterprises able to adapt to environmental risks is important in reinforcing the capacity of a local economy. The existence of a solid fabric of micro and small enterprises helps make local economies able to adapt to a changing environment and flexible enough to resist shocks. Building and maintaining such a fabric requires
 - An enabling environment for small and medium-sized enterprises (SMEs) and micro-enterprises.
 - Targeting of environmentally sensitive value chains.
 - Capacity development programs and business development services to unleash the potential of local economies to adapt to the changing situation.
 - Building up skills of workers and managers to identify and assess changes, to implement early warning systems, and to apply technical skills to improve and adapt technologies to economic changes and to diversify production.
 - Support to local saving, microfinance, and banking as well as consolidating the local banking system, diffusing microfinance programs, and developing financial risk sharing mechanisms.
 - Promotion of public-private partnerships to better engage the local private sector in low-carbon green growth programs.
 - Embedding of mitigation and adaptation to climate change in local economic development rather than adaptation as a stand-alone goal and program.

- Social dialogue among representatives of workers, employers' organizations, and governments at all levels, to build consensus and enhance efficiency of measures to be taken. This should be the base of any low-carbon green growth program.
- ix. Social security and safety net programs are important for enhancing the economic resilience of local communities. Vulnerable sectors and areas need social protection programmes and safety nets to cushion against economic slowdown and environmental impacts, particularly in the informal economy.

4. ECONOMIC SLOWDOWN, STIMULUS PACKAGES, AND GREEN GROWTH

4.1 Environmental Component of Stimulus Packages

The only way the economies of the region avoided more severe slowdown was the unprecedented intervention of governments and central banks by formulating stimulus programs, industrial bailouts, and near zero interest rates. The collapse in demand through falling exports and the inability of the private sector to generate growth have led most Asian governments to strive to expand domestic demand by introducing stimulus measures, as shown in Table 2.

Table 2: Fiscal Stimulus Packages in East Asian countries

Country	Amount in US\$ (billion)	As % of GDP	Green Measures Taken
Japan	774	16.4	Investments to support low carbon revolution; tax measures to encourage green investment and purchase of green products; eco-point systems to reward consumers when they purchase energy-saving home appliances; financial support via Local Green New Deals
PRC	586	14	Investment in energy conservation, emission reductions, and ecological engineering
Korea, Rep. of	86	12.8	Investments in green transport—measures to promote rail transport, green car purchase; investments to secure alternative water sources—protection of four major river basins; investments in waste recycling; eco-towns; measures to improve forests as carbon sinks; replacement of public sector lighting with LEDs
Singapore	13.8	10.7	Job credit program, corporate tax cut, personal income tax cut
Malaysia	18.1	10	Rehabilitation of public amenities, public housing, public transport, skill training
Thailand	3.3	1.2	Sufficient economy fund, infrastructure projects on energy, transport, and communication
Indonesia	6.1	1.2	Tax breaks for individuals and companies, infrastructure spending, diesel subsidy, rural development
Philippines	6.5	4.6	Job creation, tax reduction, infrastructure projects
Viet Nam	17.6	22	Subsidies and loans to SMEs, infrastructure projects, social security, special measures to support export sectors

Source: UNEP 2009; HSBC 2009.

This strong government response was unprecedented because of its unusually large size, wide scope, and the number of countries involved. Japan had the largest stimulus package, both in total size and as a percentage of the GDP (US\$774 billion, 16.4%), followed by the PRC (US\$586 billion, 14%) and the Republic of Korea (US\$86 billion, 12.8%). These three countries are comprehensive in tackling the environmental problems, and substantial parts of the packages were devoted for greening the economy. Malaysia, Singapore, and Viet Nam also had sizeable stimulus packages, indicating the severity of the economic contraction (Abidin 2009)

Japan announced a number of stimulus packages which totaled 16% of GDP. However, Japan's stimulus package may have been less effective because it was announced in small doses every three to four months. The first package was introduced in August 2008 and amounted to US\$107.5 billion, equivalent to 2.2% of Japan's GDP. This package comprised mainly nongreen measures such as lower road tolls, fuel subsidies, loans to businesses, assistance to farms, and help for part-time workers to find better jobs.

The second stimulus package was announced in October 2008, in which US\$51 billion (out of US\$275 billion) was new spending. More than US\$20 billion, or around 40% of the total new spending, was for a bank rescue plan and another US\$20 billion was distributed in US\$600 handouts to every household of four. The third package amounted to US\$255 billion, of which 44% went to tax breaks and public financing, such as a corporate tax cut from 22% to 18% for SMEs. The other 56% or US\$144 billion went to capital injections. A fourth package, amounting to US\$154.55 billion, equivalent to 3.2% of GDP, was announced in April 2009. The measures were aimed at stimulating the "green economy," creating 4 million new jobs in the economy, helping corporate finance, and developing strategies to reinforce Japan's environmental competitiveness.

The PRC announced the largest single fiscal stimulus package, which was equivalent to 14% of its GDP, in November 2008. Slightly more than 86% of its stimulus package went to infrastructure spending, out of which 45% was for roads, rails, and airports; 30% was for improving electricity, water, and roads in rural areas; and 7% for low-income housing and reconstruction of towns devastated by the May 12, 2008 Sichuan earthquake. The remainder of the loans went to healthcare and education, ecological and environmental protection, and technical innovation loans.

The Republic of Korea announced three stimulus packages in quick succession. The US\$26 billion stimulus in December 2008 was called the "2009 Budget and Public Fund Operation Plan to Overcome Economic Difficulties" and focused on infrastructure. It included projects to advance the metropolitan economy and provincial traffic network expansion. The country's second stimulus package was called the "Green New Deal Job Creation Plan" and it also had infrastructure spending on green transportation networks and clean water supplies, carbon reduction and stable supply of water resources, and new industrial and information infrastructure and technology development.

Malaysia first stimulus package was introduced in November 2008 and the second in March 2009. Nearly 43% of the first package was for infrastructure, for example upgrading, repair, and maintenance of public amenities, including schools, hospitals, roads, quarters for police and armed forces, police stations, the building of more low-cost houses, more public transport, and the implementation of high-speed broadband Internet service. The second package comprised four different parts assisting the private sector in tackling the crisis, building capacity for the future, easing the burden on the people, and reducing unemployment and increasing employment opportunities (3%).

Singapore introduced a US\$13.8 billion stimulus package in January 2009. Of this amount, 21% was for public sector infrastructure, such as mass rail transit and roads, basic amenities such as drainage and sewerage, and education and health infrastructure. The spending is also intended to develop suburban nodes that will decentralize economic activity and rejuvenate old public housing neighborhoods. US\$1 billion is targeted to be spent from 2009

through 2014 on sustainable development initiatives supporting programs such as energy efficiency for industry and households, green transport, clean energy, and the greening of living spaces. US\$4 billion is targeted for healthcare infrastructure.

Indonesia introduced a US\$6.1 billion stimulus package in February 2009, of which 17% is to be spent on infrastructure. The bulk of the stimulus package will be delivered via tax breaks for individuals and companies.

Philippines announced a US\$6.5 billion package in January 2009. This includes infrastructure spending such as repair and rehabilitation of roads, hospitals, bridges, irrigation facilities, schools, and government buildings.

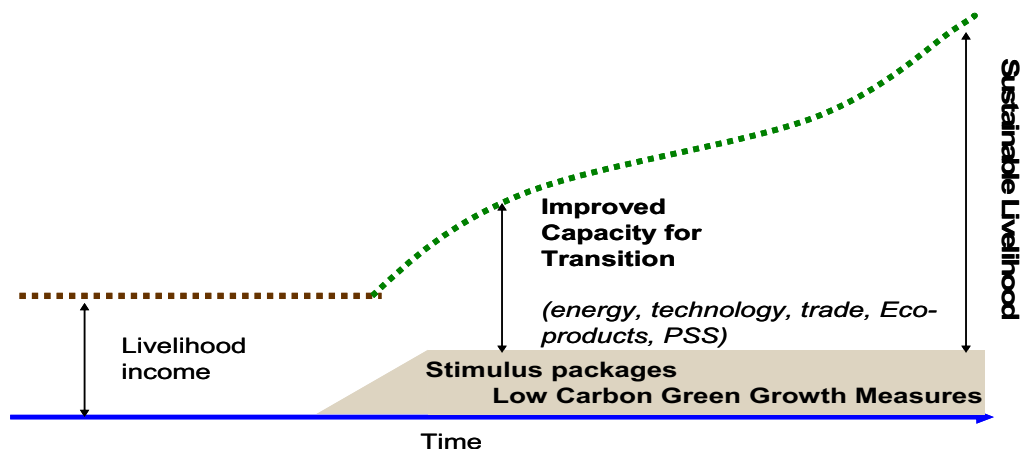
Thailand has two stimulus packages, announced in January and March 2009. The first US\$3 billion package included infrastructure measures, social safety nets for the unemployed and those working below a certain wage level, and tax measures to boost real estate, SMEs, and the tourism industry. The second US\$42 billion stimulus package will spend 80% on infrastructure and 16% on farm irrigation and water supplies to industry. However, financing for the second stimulus package has yet to be finalized. The government needs to borrow B800 billion outside the normal fiscal process to help finance the three-year package. Half of this amount is to be financed by domestic borrowing, mostly through new issues of government bonds and treasury bills, between now and the end of 2010. The other B400 billion will require more time to implement, as it requires a legislative bill to approve domestic borrowing.

Viet Nam announced its first stimulus package of US\$960 million in December 2008, and it included interest subsidies on loans, reduction in corporate income tax to SMEs, and exemptions from personal income tax. About 10% was for small-scale infrastructure programs for 61 of the poorest districts. Its second stimulus package was for US\$17.6 billion and was announced in March 2009, but financing for it has yet to be confirmed. Vietnamese law forbids the central bank to print money to finance the state budget deficit. Viet Nam has a large budget deficit and its second stimulus package was the equivalent to 22% of GDP, making it one of the largest in East Asia in relative terms. It is reported that the Vietnamese government's budget deficit reached 8% of GDP in 2009.

4.2 Employment Opportunities are Extensive in Stimulus Packages

As with other elements of the stimulus packages, some of the environmental measures governments are taking to spur growth will also help create new green employment opportunities and sustainable livelihoods as displayed in Figure 7. Some areas of renewable energy production, as well as implementation of energy efficiency measures in buildings, are quite labor intensive across a wide spectrum of job skills compared with fossil fuel-based energy production. As such, measures to move toward a low-carbon economy may help stimulate sustained employment, although their implications for productivity also need to be taken into account. Policies to promote green employment effects across the economy are more uncertain over the long term and should be carefully assessed.

Figure 7: The Long-Term Sustainability Scenario Presupposes That Low-Carbon Green Growth Measures Introduced As Part of Stimulus Programs Have the Potential to Keep Up Livelihood Conditions



Source: Authors' illustration

Generation of employment through emergence of service enterprises will not only improve people's livelihood conditions but also provide promising energy efficiency solutions. Energy servicing enterprises in rural and urban centers can help their clients to improve their carbon performance by doing energy audits, designing and installing energy-efficient equipment, financing energy-efficient projects, and providing risk guarantees for energy savings. The growth of energy servicing activities is notable in the PRC, India, Malaysia, Philippines, and Thailand and is catalyzing economic opportunities in the competitive energy markets

A number of countries are emphasizing employment creation with respect to the environmental measures in their recovery packages. For example, the Korean government hopes to create nearly one million jobs over the next four years starting from 2009 in green technology and industry as a result of its "Green New Deal" economic stimulus package, which includes investments in environment-related infrastructure as well as in R&D, and a range of tax breaks or loans to help households move toward less environmentally damaging consumption choices. In Japan, employment in environmental industries is expected to double to 2.8 million people by 2020. The PRC is developing its low-carbon industrial strategy, with the aim of realizing a step-by-step change in energy efficiency, a low-carbon energy infrastructure, and the development and production of low-carbon vehicles as well as developing new skills.

4.3 Green Recovery Is Not a Panacea

Investments in energy production, buildings, and transport infrastructure will stay with us for decades to come. It is important to ensure that stimulus packages do not lock in inefficient or polluting energy technologies, or dirty modes of production and consumption. Over the long term, these investments would impose a cost to the economy in terms of poorer health and other impacts of pollution, resource depletion, and climate change. In this context, countries should undertake strategic environmental assessments of policies and environmental impact assessments of projects included in economic stimulus packages. Some of the major construction projects that could be started earlier with support from the recovery packages are likely to have environmental assessments available or under way. Other measures can be taken to speed up such assessments in order not to unduly slow the planned investments, which will aggravate the poverty incidences. In the Republic of Korea, for example, the government is working to streamline the addressing of potential environmental and other impacts of eco-projects, as well as fast-tracking review and approval to get projects started sooner.

Many of the measures introduced in the stimulus packages are aimed at supporting infrastructure building, tax rebates, or switching to hybrid cars, and the overall environmental consequences of these measures need to be carefully assessed. In some cases, these measures may lead to increased emissions and pollution, although if carefully designed they can be environmentally neutral or even beneficial. In order to address these concerns, the Japanese and Korean rescue packages are designed to support more environmentally friendly vehicles and appliances. The PRC is also putting in place financial compensation schemes to prompt businesses to discard or scrap old cars. While these measures can help to remove older, less efficient vehicles from the roads, they may also encourage greater material consumption, vehicle use, and ultimately increased emissions, thus offsetting the environmental benefits. Measures aimed to support eco-products also can generate inter- and intrasectoral distortions, and can act as trade protectionist measures. Thus, the economic, trade, and environmental impacts of these measures should be carefully assessed.

The economic slowdown also poses a risk to ensuring efficient and effective environmental policies and to international cooperation to tackle global environmental challenges. It has often been difficult to introduce economic instruments for environmental policy because industries have argued that such measures would put them at a disadvantage with foreign competitors. Despite study results indicating that the effects of environmental policies on competitiveness are often quite small, this is a major concern to many countries, and one that is likely to increase in the economic downturn. A rapid transition toward low-carbon green growth, accompanied by short-term flanking measures to smooth the transition for affected workers or households, could help to address these concerns.

As mentioned in section 3, it is also important to understand how different policy instruments interact in the stimulus packages. Except where mutual reinforcement between instruments is likely, or when the instruments address different dimensions of a given problem, the introduction of overlapping instruments should be avoided. For example, while setting quantitative targets on renewables in the energy mix can help to create a framework for private investments and innovation in renewable energies, these regulated targets may overlap poverty reduction targets. This can result in an increase in the costs of action, without necessarily leading to any additional emission reductions unless governments use the higher renewables penetration as an opportunity to more rapidly generate employment. Thus, the use of potentially overlapping policy instruments should be limited to situations where they can be justified on other grounds, for instance to boost innovation and technology deployment, or to improve energy security.

5. CONCLUSION

Globally Asia is leading the way out of recession. The region's three largest countries—the People's Republic of China, India, and Indonesia—have remained buoyant throughout the downturn due in great part to domestic demand. In export-oriented economies, like Taipei, China; Thailand; and Malaysia, which were worst hit by the recession, the governments are promoting new domestically focused service industries. Yet questions remain about whether there has been enough change to set the recovery on a truly environment-friendly and pro-poor course.

At the same time, the crisis provides both an opportunity and an incentive to improve efficiency in the use of energy and eco-friendly materials, and to develop new green industries and business that can benefit both the poor and the environment. Over the longer term, moving toward a low-carbon green economy can also help to reduce poverty, increase energy security, and reduce vulnerability due to climate change. New public and private sector investments will be needed to deal effectively with many of the most pressing environmental challenges, for example in innovative energy-efficient buildings and transport

systems, alternative energy supplies such as renewable fuels and “smart” electricity grids, and pollution control, as well as investments in key environmental infrastructure, such as increased forest area and measures to protect coastlines or reduce flood risks. Investments will be needed to facilitate adaptation to the climate change that is already locked in, to “climate-proof” infrastructure, and protect urban areas. Investing in the environment is thus an important element of many of the stimulus packages being put in place by governments. Countries also need to ensure that the right policy frameworks are in place to encourage private investment flows that support environmentally sustainable long-term growth.

The global financial crisis and economic slowdown can also spur much-needed structural reform, which could result in both environmental gains and poverty reduction. This situation provides an opportunity to reform or remove policies that may be expensive, socially inefficient, and environmentally harmful. Examples of immediate win-win policies that governments can take advantage of include

- Formulating alternate energy policies that could achieve a given environmental objective more cost effectively. In this context, the long-term cost effectiveness of some renewable energy support policies should be carefully addressed. Such policies can encourage technology development and deployments but can also prove costly in the short term.
- Cutting trade barriers to environmentally friendly technologies. For example, barriers to trade in more renewable energy, energy-efficient waste treatment, and pollution prevention technologies should be addressed urgently.
- Addressing market failures that prevent the uptake of eco-products in socioeconomic systems. For example, where these failures are not already addressed through other sectoral policies, governments should strengthen the environmental and energy standards governing products and services.
- Restructuring trade patterns and policies. For example, appropriate environmental management systems and fair trade policies can conserve exhaustible natural resources as well as bring in potential competitive advantages.
- Enhancing low-carbon product and green service systems. For example, introduction of product service systems in high-impact sectors could both drastically reduce greenhouse gas emissions compared to business as usual, while contributing to increased economic efficiency.

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