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ASIA-PACIFIC APPROACHES TO ADDRESSING CLIMATE CHANGE

SUMMARY

The present document reviews the impacts and implications of climate change, as well as various effective approaches for Asian and Pacific countries that link sustainable development policies and measures with action on mitigating climate change. It also discusses the adaptation strategies which are of concern to the member countries in the region, especially the least developed countries and small island developing States. The Committee is invited to review the document and provide the secretariat with guidance and direction for its future work related to strengthening regional action on mitigation and adaptation strategies for addressing climate change, with a focus on enhancing the synergy between climate change action and the quality of economic growth.

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I. THE IMPACTS OF CLIMATE CHANGE

1. In the past few years, discussions on climate change have acquired new momentum by compelling the scientific evidences confirmed by the most recent report of the Intergovernmental Panel on Climate Change (IPCC).¹ The report states that most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations. In addition, compelling evidence of climate change has resulted in a significant shift away from political debates over the meteorological and ecological implications of greenhouse gases to discussions on how to make the emission reductions required to avoid the dramatic consequences of climate change. Thus, climate change has become an immediate challenge requiring actions and commitments by political leaders, corporations and citizens.

2. The IPCC report confirms that 11 of the last 12 years (1995-2006) rank among the 12 warmest years in the instrumental record of global surface temperature since 1850. The temperature of the Earth has increased by an average 0.74°C during the last 100 years. The report also confirms the rising temperature of the global ocean, and shrinking sizes of mountain glaciers, a key source of freshwater for millions of people. If this trend continues, global temperature is projected to increase, the best estimate for the low scenario being 1.8°C (the likely range is 1.1°C to 2.9°C), and for the high scenario, 4.0°C (the likely range is 2.4°C to 6.4°C) over the 21st century, making the Earth the warmest it has been during the last 650,000 years.

3. Another IPCC report² summarizes the impacts of climate change as follows. Warming is likely to be well above the global mean in central Asia, the Tibetan Plateau and northern Asia, above the global mean in East Asia and South Asia, and similar to the global mean in South-East Asia. Precipitation in boreal winter is very likely to increase in northern Asia and the Tibetan Plateau, and likely to increase in East Asia and the southern parts of South-East Asia. Precipitation in summer is likely to increase in northern Asia, East Asia, South Asia and most of South-East Asia, but is likely to decrease in Central Asia. It is very likely that heat waves and hot spells in summer will be of longer duration, and be more intense and frequent in East Asia. There would be fewer very cold days in East Asia and South Asia. It is very likely that there will be an increase in the frequency of intense precipitation events in parts of South Asia and in East Asia and extreme rainfall and winds associated with tropical cyclones are likely to increase in East Asia, South-East Asia and South Asia.

4. Climate change will have the following impacts in Asia:

(a) Glacier melt in the Himalayas is projected to increase flooding, and rock avalanches from destabilized slopes, and to affect water resources, within the next two to three decades. This will

¹ Report of Working Group I of the Intergovernmental Panel on Climate Change, Summary for Policymakers, <http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1_Pub_SPM-v2.pdf>

² Intergovernmental Panel on Climate Change, *Climate Change 2007: Impacts, Adaptation and Vulnerability*, available at <www.ipcc.ch/SPM13apr07.pdf>

be followed by decreased river flows as the glaciers recede. The availability of freshwater in Central, South, East and South-East Asia, particularly in large river basins, is projected to decrease owing to climate change and this, along with population growth and the increasing demand arising from higher standards of living, could adversely affect more than a billion people by the 2050s. Coastal areas, especially heavily populated mega-delta regions in South, East and South-East Asia, will be at greatest risk owing to increased flooding from the sea and, in some mega-deltas, flooding from the rivers;

(b) It is projected that crop yields could increase up to 20 per cent in East and South-East Asia and decrease up to 30 per cent in Central and South Asia by the mid-21st century;

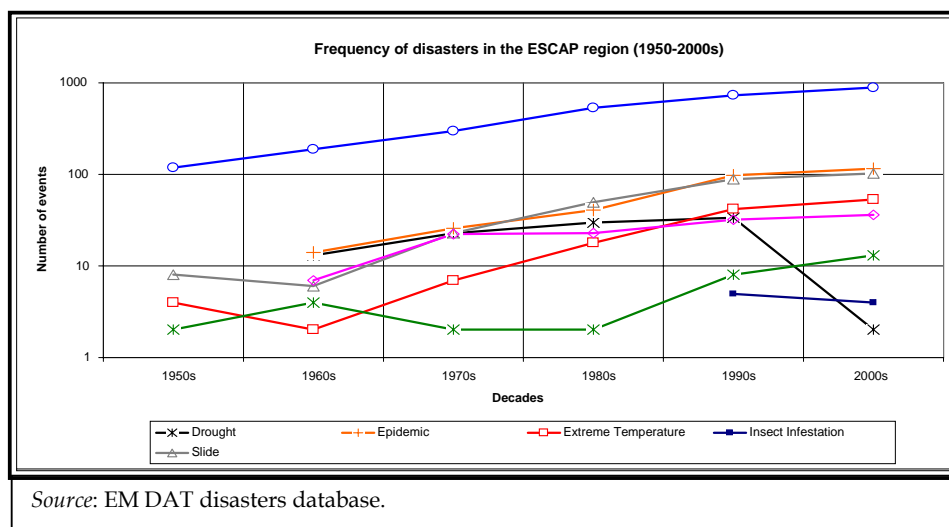
(c) Taken together and considering the influence of rapid population growth and urbanization, the risk of hunger is projected to remain very high in several developing countries;

(d) Endemic morbidity and mortality resulting from diarrhoeal disease primarily associated with floods and droughts are expected to rise in East, South and South-East Asia owing to projected changes in the hydrological cycle associated with global warming. Increases in coastal water temperature would exacerbate the abundance and/or toxicity of cholera in South Asia.

5. Small islands in the Pacific have characteristics that make them especially vulnerable to the effects of climate change, sea-level rise and extreme events. Deterioration in coastal conditions, for example through the erosion of beaches and coral bleaching, is expected to affect local resources, such as fisheries, and reduce the value of those destinations for tourism. Sea-level rise is expected to exacerbate inundation, storm surge, erosion and other coastal hazards, thus threatening the vital infrastructure, settlements and facilities that support the livelihood of island communities. By the middle of the century, climate change is projected to reduce water resources in many small islands in the Pacific to the point where they become insufficient to meet demand during low rainfall periods. With higher temperatures, increased invasion by non-native species is expected to occur, particularly in middle- and high-latitude islands.

6. Recent studies carried out by the secretariat show that in general, disaster trends are increasing as a result of the greater frequency of climate-related hazards, especially for hydrometeorological events. Figure 1 shows a marked increase in the number of floods and windstorms (the top curve) in the last five decades. The number increased from 119 in the 1950s to a total number of 879 for the current decade from 2001 to 2006, marking an increase of almost 150 events in every decade.

Figure 1. Trends of climate-related hazards in the Asian and Pacific region



7. These changing environmental conditions will inevitably make countries in Asia and the Pacific more vulnerable to dramatic climatic events. The region is already the major victim of extreme weather events. In 2006, the region accounted for 74 per cent of over 21,000 casualties from natural disasters in the world, which represented a slight decrease from the average annual share of 84 per cent for the period 2000-2005. Furthermore, eight members of ESCAP, China, Indonesia, the Philippines, India, Afghanistan, Viet Nam, Pakistan and Australia, are ranked in the top 10 countries most hit by natural disasters in 2006. The region also has the largest number of countries vulnerable to rising sea level, the small island States in the Pacific.

8. In response to the anticipated impacts of climate change, the global society has been moving towards more ambitious goals. However, the trend of temperature increase will continue for centuries even if the greenhouse gases (GHGs) are stabilized now owing to the inertia of the climate system. This implies that the global society should seek a result-based target that would stabilize the concentration of GHGs in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

9. In this regard, one notable proposal is to set the target of global actions to limit the rise in near-surface air temperature to a maximum of 2°C relative to the pre-industrial value.³ This will require a 50 per cent reduction in global GHG emissions by 2050 compared with a 1990 baseline. The G8 Summit, held in Heiligendamm, Germany, in June 2007, supported an initiative to achieve the result-based target. The Summit Leaders in their Declaration of 7 June 2007, “Growth and

³ In addition to a certain temperature threshold, it is equally important to consider, assess and capture the “multidimensional threshold” for both climatic and non-climatic factors that will cause the impacts.

Responsibility in the World Economy”,⁴ were committed to taking strong and early action to tackle climate change in order to stabilize GHG concentrations at a level that would prevent dangerous anthropogenic interference with the climate system. They stated that they would consider seriously the decisions made by the European Union, Canada and Japan, which include at least the halving of global emissions by 2050. This new commitment of Annex I countries would entail stronger demand for further action on mitigation on the part of non-Annex I countries.

10. While countries in Asia and the Pacific have to change the current increasing trends of GHG emissions to reduce their own risks caused by climate change, many countries, especially the developing countries, still face an imperative development challenge in ensuring that they meet the demand for energy supplies and provide universal access to modern energy services. A new challenge is posed by the rising prices of oil and gas, which have had an adverse impact on the budget deficit and trade balance of importing countries. The increasing demand will further accentuate the vulnerability of developing countries to supply disruptions and price shocks. Another imperative challenge is to meet the immense new demands of modern energy.⁵ Asia and the Pacific is home to almost 1 billion people who lack access to electricity. This situation has hindered the realization of the Millennium Development Goals on poverty eradication and primary education. However, meeting basic energy needs naturally increases the demand for oil and gas, GHG emissions and the financial burden of the developing countries for new investment. Thus, the question is how to meet basic needs with less environmental and economic cost. Minimizing the potential adverse impacts requires looking at an alternative option rather than following conventional paths. Such an option should be based on drastic changes in the fuel mix with more renewable energy and more efficient production and use of energy.

II. ECONOMIC IMPLICATIONS OF INACTION AND ACTION ON CLIMATE CHANGE

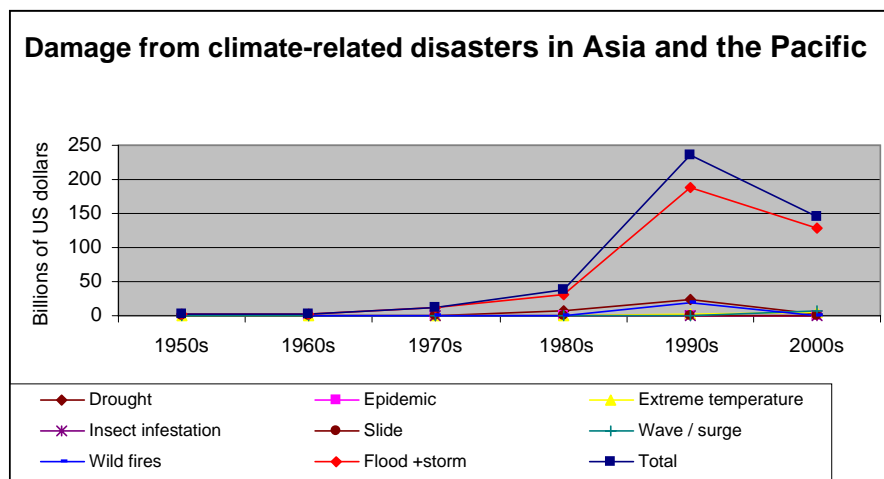
11. Climate change will also exacerbate the existing environmental crises, such as drought, water scarcity and soil degradation, jeopardizing the bases of many people’s livelihoods, especially in the developing regions, increasing their vulnerability to poverty and triggering further environmentally induced social conflicts. Particularly in countries with weak financial and institutional capacity, climate change is likely to overwhelm the local capacity to adapt to changing environmental conditions. Thus, it is expected that climate change will impinge on the sustainable development of all countries, including developing countries of Asia and the Pacific, as it compounds the pressures on natural resources and the environment associated with rapid urbanization, industrialization and economic development.

⁴ See <www.g-8.de>

⁵ United Nations Environment Programme and International Energy Agency, *Analysing Our Energy Future: Some Pointers for Policy-makers*, available at <www.uneptie.org/energy/publications/files/energyfuture.htm>

12. If the current trends of increasing damage from climate-related disasters are used as an indicator of the economic implications of inaction on climate change, a recent study of the secretariat has shown that an annual increase in damage could be over US\$ 20 billion, as illustrated in figure 2.

Figure 2. Damage from climate-related disasters in Asia and the Pacific



Source: EM/DAT: The OFDA/CRED International Disaster Database <www.em_dat.net>

13. In the light of the extensive scale of the action required for mitigating climate change, discussions on the economic implications of the action have mostly focused on its potential adverse impacts on economic growth. However, the outcomes of tangible experiences in GHG emission reductions in the private sector and recent researches on the economic assessments of mitigation actions suggest another side of the economic implications, that is, an investment opportunity for new types of economic growth. Instead of harming the economy, the investment for climate change is conducive to economic growth and job creation by providing new opportunities across the wide range of industries and services. Thus, vigorous and urgent responses to address climate change are not costs, but an investment for the future: for transforming society from an energy-intensive and high-carbon economy into an eco-efficient and low-carbon economy.

14. An IPCC report⁶ estimated that by 2030 the global average macroeconomic cost of ensuring that GHG levels eventually stabilize at 445-710 ppm ranges from less than 3 per cent to a gain of 0.6 per cent. This translates into an annual reduction in the gross domestic product (GDP) growth rate of less than 0.12 per cent to less than 0.06 per cent. This small loss should be compared with projections that the global economy is likely to expand dramatically for several decades. However, regional costs may differ significantly from global averages. The *Stern Review on the Economics of Climate*

⁶ Working Group III contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report, *Climate Change 2007: Mitigation of Climate Change*, available at <<http://www.ipcc.ch/SPM040507.pdf>>

Change,⁷ prepared for the Government of the United Kingdom October 2006, estimates that if no action is taken, the overall costs and risks of climate change will be equivalent to losing at least 5 per cent of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20 per cent of GDP, or more.

15. As the Review suggests, actions for mitigating climate change involve additional costs, particularly in reducing the demand for emission-intensive goods, increasing energy efficiency, switching to lower-carbon technology and taking action on non-energy emissions, such as afforestation.

16. While such actions require initial expenditures, the benefits gained from innovation will offset some of these costs. For instance, converting inefficient electronic generators emitting tons of CO₂ into energy-efficient ones with relatively low GHG emissions involves additional costs. However, this is not a sunken cost or deadweight loss to the economy. In the long term, increasing energy efficiency and switching to low-carbon technology are conducive to economic as well as environmental benefits. In terms of the economic benefits, countries and companies are able to save money and energy to produce the same goods and services as before using energy-efficient facilities. At the same time, energy-efficient and low-carbon technologies help to reduce GHG emissions significantly. At the company level, implementing climate policies can provide money-saving opportunities. At the economy-wide level, action on climate change can be a lever for reforming inefficient energy systems and removing distorting energy subsidies, on which Governments spend around \$250 billion a year. Therefore, the costs for new technologies that reduce GHG emissions and increase energy efficiency represent an investment for both the economy and the environment.

17. Action on non-energy emissions, such as afforestation, and adaptation could be regarded as an investment. In order to use afforestation as a carbon sink, land, management and plantation costs need to be considered. One estimation given in the *Stern Review*⁸ is that afforestation could save an additional 1 gigaton of CO₂/year, at a cost estimated at around \$5-\$15 per ton of CO₂e.⁹ However, planting new forests should not be regarded only as a cost since it can provide other benefits. Moreover, other costs for adaptation to climate change, including preventing unexpected floods or draughts, allow countries to cope with massive natural disasters. Thus, the costs for climate change adaptation and non-energy emission represent an investment for avoiding the risk society.

18. Implementing climate change policies not only constitutes new investment for the future but also provides new opportunities for job creation and economic growth. The California State Government, for instance, launched ambitious climate change policies in the belief that mitigation

⁷ Nicholas Stern, *Stern Review on the Economics of Climate Change* (HM Treasury, Government of the United Kingdom, 2006).

⁸ *Ibid.*, p. 216.

⁹ CO₂e is an abbreviation of “carbon dioxide equivalent” and is the internationally recognized measure of greenhouse gas emissions. CO₂e is a measure used to compare the emissions from a variety of greenhouse gases.

action could also help its economy. By 2020, the California Climate Action Team aims to reduce the 1990 emission level, which is equal to 145 million tons of CO₂e emission reduction. It aims to reduce CO₂e to 80 per cent below the 1990 levels by 2050. These ambitious goals could be achieved by implementing the most effective building and appliance efficiency standards, the renewable portfolio standard for energy resources and the motor vehicle GHG emission standards.¹⁰

19. There are mainly two reasons for which the California state government has tried to take the initiative in climate change action. First, it regards using technological innovation for climate change action as an excellent opportunity for it to become a leader in the world market for GHG emission reduction technologies, the value of which is estimated to be over \$180 billion. With an earlier start, the state could benefit from competitive advantages. Second, many policies for climate change action actually save money and increase employment, thanks to their indirect effects. For example, energy savings allow consumers to increase other spending and this promotes growth and employment in the state. Climate change action in California is estimated to yield net gains for the state economy, increasing the gross state product by about \$60 billion and creating 20,000 new jobs by 2050.¹¹ Companies also have incentives to participate in the climate change action since the benefits gained from cost savings, efficient resource management and a good reputation are huge. Some companies located in California have voluntarily reduced their GHG emissions by over 50 per cent, with a cost saving in the billions of dollars.

20. Outcomes of economic assessment also suggest that rigorous climate action policies could lead to environmentally sustainable economic growth, “green growth”,¹² by increasing energy efficiency, employment and economic growth, and decreasing GHG emissions. Through green growth, it is proposed to harness the win-win strategy between economic growth and environmental sustainability. Comparing the social-environmental costs of “business as usual”, for instance, the *Stern Review* estimates the net present benefits of a strong mitigation policy at \$2.5 trillion per year over the world. This figure would increase over time. Another publication on global economic growth and climate change¹³ also concludes that the “business as usual” scenario implies rapidly increasing levels of carbon emissions associated with increased environmental risks and adverse socioeconomic impacts in the long run. Instead, in the green growth scenario, which assumes vehicle fuel efficiency, low energy consumption building design and curving domestic energy use, global

¹⁰ California Climate Action Team (2007), *Climate Action Team Proposed Early Actions to Mitigate Climate Change in California*, California Environmental Protection Agency, available at <www.climatechange.ca.gov/climate_action_team/reports/index.html>

¹¹ Ibid.

¹² “Green growth” is continuing economic growth through enhancing the ecological efficiency of the growth pattern to ensuring the environmentally sustainable economic growth. It was endorsed at the Fifth Ministerial Conference on Environment and Development in Asia and the Pacific, held in Seoul in 2005, which adopted the Seoul Initiative on Environmentally Sustainable Economic Growth (Green Growth) (see E/ESCAP/1337).

¹³ John Hawksworth, *The World in 2050: Implications of Global Growth for Carbon Emissions and Climate Change Policy* (PriceWaterhouseCoopers, 2006), available at <[www.pwc.com/extweb/pwcpublishations.nsf/docid/DFB54C8AAD6742DB852571F5006DD532/\\$file/world2050carbon.pdf](http://www.pwc.com/extweb/pwcpublishations.nsf/docid/DFB54C8AAD6742DB852571F5006DD532/$file/world2050carbon.pdf)>

carbon emissions would peak around 2025 (about 15 per cent above current levels) and then gradually decline to close to current levels by 2050.

21. Earlier actions also benefit the economy and the environment since the risks of inaction on climate change might be irreversible. The magnitude of the adverse effects of climate change, including lower agricultural yields, the impacts of sea-level rise, adverse effects on human health, unexpected and massive natural disasters, and lessened biological diversity, could be tremendous. The *Stern Review* concludes that the benefits of strong, early action on climate change outweigh the costs. Ignoring the outcomes of climate change will impede economic growth, given the ecological and socio-economic damage that climate change can bring. Thus, tackling climate change constitutes pro-growth strategy over the long term.

III. ASIA-PACIFIC APPROACHES TO ADDRESSING CLIMATE CHANGE

22. Green growth was endorsed by the Fifth Ministerial Conference on Environment and Development in Asia and the Pacific, held in Seoul in March 2005, as a new approach to moving towards sustainable development in this region. The core concept of green growth is to improve the eco-efficiency of the rapid economic growth, so that it can be compatible with the limited carrying capacity of the region. Climate action aimed at improving energy efficiency and promoting a low-carbon economy is an important component of eco-efficiency. Thus, green growth based on the eco-efficiency concept could be an effective regional approach to halting climate change.

23. Action on addressing climate change has been viewed as a burden or extra cost, while considering energy security, especially the energy supply issue, as a critical factor for the success of economic development. Now more and more people think that ensuring energy security and action on climate change are closely linked and the objectives almost identical. “Climate security” will be as important as “energy security”: it will not just be for reducing natural and human-induced disasters but also a driving force for continued economic growth and business.

24. Many countries in the region have taken action towards mitigation and adaptation on climate change under the fundamental principles of the common but differentiated responsibilities. For example, China, the largest emerging economy in the world, recently presented its National Climate Change Programme and National Five-year Plan (2006 to 2010), which provide a blueprint for a resource-saving and environmentally-friendly society. India and Indonesia are currently developing national action plans on climate change. Japan has proposed the “Cool Earth 50” initiative aiming to reduce global carbon emissions by half by 2050, in the firm belief that GHG emissions can be reduced while continuing to foster economic growth. Most Pacific island Governments view climate change and sea-level rise as priority issues, recognizing that they have a significant impact on the economic, environment, social, cultural and traditional sectors of the small island developing States.

25. The policies, measures and approaches adopted by developing countries have been primarily motivated by sustainable development objectives in the region, focusing on the promotion of energy efficiency, the increasing use of renewable energy, the preservation and increase in the number of carbon sinks in forests, and enhancing efforts towards adaptation.

A. Enhancing efforts towards energy efficiency and renewable energy utilization that link with carbon reduction

26. The energy sector accounts for around two thirds of total greenhouse gas emissions. It is crucial to take effective action in the energy sector since it can address both the problem and its resolution. During the last three years, the price of oil has doubled from less than \$30 per barrel in early 2004 to around \$70 in August 2007.¹⁴ The rise in the price of oil far exceeds any projections. Two or three years ago, projections for oil prices in 2030 were commonly agreed to be at the level of around \$50 per barrel. This dramatic increase in global oil and gas prices creates a strong incentive for investment in the improvement of energy efficiency.

27. For example, a study by the International Energy Agency estimated that in the electricity sector, every \$1 invested on demand-side management of electricity would save more than \$2 of investment on the supply side. This benefit is even more pronounced in developing countries, where almost \$3 of investment in supply can be avoided for every \$1 invested in demand-side management because their low efficiency of energy production and consumption has great potential for energy saving.¹⁵ In turn, the rising energy prices provide developing countries with further economic and environmental benefits from strengthening policy measures for energy efficiency, and for the reduction of carbon emissions. For example, the Government of Thailand has developed a plan to increase the share of renewable energy in primary energy supply to 8 per cent by 2011. The Government formulated such measures as its concrete approach to the reduction of carbon emissions.

28. While the demand for increasing energy supplies is huge in most developing countries, to support economic growth and increase energy accessibility, it is imperative to capture untapped energy efficiency. Improving energy efficiency could achieve a triple dividend: enhancing energy security, improving local environmental quality and mitigating GHG emissions. Considering the path dependence aspect of energy and resource use, which is heavily influenced by development patterns, the efforts towards energy efficiency should be incorporated into development plans as well. As the investment in energy efficiency is directly compatible with the mitigation of GHG emissions, developing countries could become more proactive in linking their action on energy efficiency with that on climate change.

¹⁴ Department of Energy, United States, *World Crude Oil Prices*, accessed on 8 August 2007.

¹⁵ Economic and Social Commission for Asia and the Pacific, *Socio-economic Policy Brief*, issue No. 8, April 2007, *Oil Price Volatility: Learning from Asia-Pacific Country Experiences*, available at <www.unescap.org/pdd/publications/pb/pb_8.pdf>

B. Promoting the market mechanism for mitigation

29. Market mechanisms are playing a major role in providing incentives to encourage member countries to take action on climate change.

30. The clean development mechanism (CDM) is one of the three mechanisms under the Kyoto Protocol¹⁶ designed to help Annex I Parties (industrialized countries) to reduce the costs of meeting their emission targets by achieving emission reductions at lower costs in other countries (developing countries). The number of CDM projects has increased rapidly in the last two years and reached the level of 1.9 billion carbon emission reductions by mid-2007. However, the diversity of project types and sectors currently encompassed by the CDM has been limited, with the majority of offsets to date flowing from “end of pipe” interventions that generate few or no sustainable development benefits. Similarly, the geographic coverage of the CDM has been narrowly distributed, with the large developing countries dominating the number of registered projects to date, while the least developed countries have had minimal participation. As at mid-2007, 10 countries shared 85 per cent of 732 registered CDM projects and in particular four, China, India, Brazil and Mexico, dominate 74 per cent. In terms of carbon emission reductions, Asia as a whole shares 80 per cent of the market share of the volumes transacted. There are 18 countries¹⁷ in the region that have hosted CDM projects recently, but China and India had market shares of 61 and 12 per cent, respectively.¹⁸ As a result, most developing countries lack the access to the full benefits of the CDM that had been expected.

31. The international community should assist more developing countries in taking advantage of the CDM through capacity-building to improve their national capacity to develop CDM projects. Further, many member countries in the region consider that the current CDM does not adequately address their interests, concerns and development aspirations. Its current structure should be reviewed and options for improving and reforming it, so that it can become a fully functioning market mechanism, should be considered. This may include widening the scope of CDM projects, simplifying the procedure and relaxing the criteria of project additionality to cover more emission reduction projects. The development of unilateral CDM has been a good example. This allows non-Annex I countries to initiate CDM projects unilaterally and sell carbon emission reductions to Annex I countries. It has been a popular mechanism since 2005 and currently involves 60 per cent of the total CDM projects. Programmatic CDM was recently formalized: this mechanism refers to a CDM project activity in which the emission reductions are achieved by multiple actions executed over time. It is expected to enhance considerably the chances of small and poor countries gaining access to the CDM.

¹⁶ See FCCC/CP/1997/7/Add.1, decision 1/CP.3, annex, article 12.

¹⁷ Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Lao People's Democratic Republic, Malaysia, Mongolia, Nepal, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Sri Lanka, Thailand and Viet Nam.

¹⁸ The World Bank (2007), *State and Trends of the Carbon Market 2007*, Washington, D.C., available at <http://carbonfinance.org/docs/Carbon_Trends_2007_FINAL_-_May_2.pdf>

32. At the same time, the number of joint implementation projects has been growing in the eligible countries since the official launch of the JI Track 2 process in October 2006.

C. Harnessing the voluntary markets

33. In addition to the carbon market governed by the United Nations Framework Convention on Climate Change,¹⁹ voluntary carbon markets known as “carbon offset” activities have been expanding rapidly since 2003. Individuals contribute voluntarily to carbon reduction projects as a way to offset the GHG emissions linked to their way of life. Non-profit organizations and corporations try to offset GHG emissions from their specific events or products. In particular, corporations investing in voluntary markets tend to make such actions prove their commitment to corporate social responsibility rather than gaining carbon credits per se.

34. As the voluntary markets are not formally governed by the Convention mechanism and lack credible and common standards for project implementation and verification, the markets face questions about the real outcomes from invested goodwill and financial resources. The informal nature of the voluntary markets also shows a great range of prices from a low of US\$ 1 to US\$ 78 per carbon tonne and plays a minimal role in carbon reduction, as the size was only about 23 million tons of CO₂e in 2006. However, the growing concern of the public about climate change and motivation for participating in action will boost the size of voluntary markets significantly. Some optimistic projections estimate that the size of the voluntary market in 2010 could be equal to the current scale of the CDM market. It is estimated that United States demand alone for carbon offsets under the voluntary market could almost double annually from today to reach 250 million tons of CO₂e by 2011.²⁰

35. While the Convention mechanism needs to find ways to promote the voluntary markets and improve the credibility of the markets to make carbon-offset activities play a significant role in GHG emission reductions, developing countries in Asia and the Pacific should seek to harness the resources invested in the voluntary markets. Considering the relatively philanthropic aspects of carbon-offset activities, a sizeable portion of activities are based on a low commercial interest, small-scale and community-based approach.²¹ Another important aspect to which countries in Asia and the Pacific need to pay attention is the key investment area of the voluntary markets.

36. These characteristics provide many developing countries, in particular, those that are not able to obtain the benefits of CDM projects, with opportunities to host projects. Although the scale of the contributions of carbon-offset activities to national action on climate change might be small, they

¹⁹ United Nations, *Treaty Series*, vol. 1771, No. 30822.

²⁰ The World Bank, *op. cit.*

²¹ Katherine Hamilton and others, *State of the Voluntary Carbon Markets 2007: Picking Up Steam*, The Katoomba Group's Ecosystem Marketplace and New Carbon Finance, available at <http://ecosystemmarketplace.com/documents/acrobat/StateoftheVoluntaryCarbonMarket18July_Final.pdf>

could become an important channel for transferring financial resources and knowledge for community-based sustainable development, in particular. However, government action is needed to harness the benefits of voluntary markets. One important action required is the establishment of a supporting system for project development and verification to assist investors in finding efficient ways to undertake activities and provide them with proven results of GHG emission reductions from projects. In these markets (in contrast to the CDM market), land use, land-use change and forestry projects command the majority of investments an estimated 56 per cent of the projects funded.²² Since progress is being made on developing standards for voluntary markets, Governments should be proactive in putting the relevant mechanisms in place to increase the potential flow of benefits from voluntary carbon markets, which are becoming more and more important.

D. Linking sustainable development policies and measures with action on climate change

37. Both the Convention and the Kyoto Protocol clearly define “sustainable development” as a means as well as an outcome of action on climate change. In article 3, the Convention affirms: “Parties have a right to, and should, promote sustainable development” as a guiding principle and in article 10 the Protocol reinforces this principle by observing that mitigation commitments be advanced “in order to achieve sustainable development”. While the Convention and Protocol highlight the mutually enforcing roles of sustainable development and action on climate change, sustainable development policies and measures have not been clearly recognized as actions on climate change, or vice versa. As a means of action on climate change, the policies and measures target both mitigation and adaptation issues. With regard to mitigation, it is noteworthy that an effective response to the concerns on oil price and energy security is the improvement of economy-wide energy efficiency and diversification of energy sources, so that the economy is less susceptible to the adverse impacts of growing energy insecurity. This in turn necessitates deploying policies and measures to enforce the improvement of energy efficiency, thereby contributing to the mitigation of GHG emissions.

38. In the context of adaptation, it is important to note that national capacity cannot be attained by designing individual projects to be “climate-proof” alone. Increasing environmental and socioeconomic vulnerability to climate change demands that developing countries take different development paths. That vulnerability also necessitates improving not only physical infrastructure but also non-physical infrastructure, such as human, policy and institutional foundation.²³ In fact, developing countries have, to a certain extent, institutionalized mitigation and adaptation action in the framework of national development.

²² Based on a sample of retailer project portfolios by project numbers and averaged across the sample. Elizabeth Harris, *Working paper on the Voluntary Carbon Market: Current and Future Market Status, and Implications for Development Benefits*, prepared for the International Institute for Environment and Development/new economics foundation roundtable discussion, “Can voluntary carbon offsets assist development?”.

²³ Hannah Reid and Saleemul Huq, *Adaptation to Climate Change: An IIED Briefing, “How we are set to cope with the impacts”*, International Institute for Environment and Development (2007), available at <www.iied.org/pubs/pdf/full/17006IIED.pdf>

39. However, it is necessary to strategically enhance the linkage between sustainable development policies and measures and action on climate change. In particular, a national plan for sustainable development could identify or quantify the positive benefits of individual policies and measures on the mitigation of GHG emissions; develop new or more stringent measures for tangible outcomes; develop a national goal for GHG emissions based on the expected outcome from the integration of the policies and measures into mitigation action; and link some policies and measures with programmatic CDM to mobilize financial resources and technology.²⁴

40. In fact, many economic development policies are contributing to the mitigation of GHG emissions through improving productivity and reducing energy intensity. For instance, supporting the development and use of renewable energy, effective energy-saving technology is obviously an essential step towards reducing GHG emissions while improving energy security and enhancing economic growth. It will also create employment opportunities. Policymakers, the private sector and other stakeholders should work together to maximize the compatibility climate change action, energy security and economic growth.

41. Furthermore, regional cooperation could facilitate learning exercises among similar and different groups of countries to promote the benefits of sustainable development policies and measures on GHG mitigation and enhance national capacity. One such example is the green growth approach of ESCAP, which has facilitated regional policy consultations on eco-tax reform, sustainable infrastructure, sustainable consumption, and eco-efficiency indicators. As the areas of consultations are directly compatible with GHG mitigation action, the green growth approach could be reformulated in such a way as to assist developing countries in formulating under the policies and measures climate change regime.

E. Linking climate change with the Millennium Development Goals

42. The current trend of climate change clearly demonstrates its significant potential for hindering the achievement of the Millennium Development Goals by the deterioration of basic socioeconomic and environmental conditions. In particular, its adverse impact could become a key obstacle to attaining the Goals in least developed countries as their national capacity to cope with the meteorological and biological results of climate change is highly dependent on the level of socioeconomic development. A key problem of those countries in relation to climate change is the narrow and climate-sensitive sources of livelihood of most of the population, which often cause the countries to face irreversible humanitarian and economic damage when they are hit by extreme weather events. Climate change could result in deterioration of the national bases for Goals 1, 2, 4, 6 and 7. It may cause decreasing crop yields through unpredictable patterns of rainfall and temperature. In addition to this direct negative effect, the fragile economic foundations of the least developed

²⁴ World Resources Institute, *Growing in the Greenhouse: Protecting the Climate by Putting Development First (2007)*, chap 1. *Introduction to sustainable development policies and measures*, available at <www.wri.org/climate/pubs_description.cfm?pid=4087>

countries could face indirect impacts on their purchasing power of food in the world market. The combination of the indirect and direct effects causes worsening extreme poverty and hunger (Goal 1). This situation could also lead to the decrease in poor children's access to primary education (Goal 2).

43. Assessments of climate change predict an increased incidence of vector-borne diseases and heat-related mortality, which could reverse the progress in attaining the goals on child mortality and combating diseases (Goals 4 and 6). Such impacts on society and the nature of the climate change per se result in deterioration of environmental sustainability through more exploitation of natural resources, and serious disturbances of hydrological and biological systems (Goal 7). Considering the significant impacts of climate change on least developed countries, action on climate change is clearly in line with efforts to attain the Millennium Development Goals. Moreover, action on climate change could contribute significantly to strengthening the foundations of the Goals.

44. Thus, instead of separating policies and measures for attaining the Goals from those for climate change, Governments in least developed countries should have a holistic view and take an integrative approach to both challenges. While those countries need to lower the carbon intensity of their energy and economic systems to contribute to the global efforts to reduce GHG emissions, they also need to make serious efforts to enhance national adaptation capacity for climate change. For example, such adaptation measures include developing climate-resilient crops, enhancing the carrying capacity of the ecosystem to buffer societies against dramatic changes in natural conditions. The international community also needs to increase financial and technical assistance to those countries' actions targeting both the Goals and climate change. In particular, it should provide least developed countries with more resources to enhance their national adaptation capacity. This would also help to attain Goal 8, on a global partnership for development.

F. Reversing deforestation: a low-cost opportunity for climate change action

45. Forests play a critical role in shaping the future of climate change as current deforestation is responsible for almost 25 per cent of global GHG emissions and the deteriorating carbon uptake capacity of the planet. Reversing deforestation is therefore critical for progress on climate change mitigation; it also represents a relatively low-cost strategy because of the low opportunity costs of alternative land uses, particularly on degraded lands. Reversing the loss of forests across the region is not only important for global climate change mitigation, but also for supporting national economies. Forest ecosystems provide critical ecosystem services such as flood mitigation, regulation of water supply and quality and the provision of timber. However, the ability of forests to provide these ecosystem services is in decline as a result of growing environmental pressure and continued loss of forests, in particular natural forests. At the same time, as regional economies and populations grow, there is growing national demand for forest ecosystem services.

46. Attaining the co-benefits of global and local environment through sustainable forest management requires technical and financial support from developed countries through the

Convention mechanism, in particular the CDM project and international markets for forest products and services. However, developing countries hardly receive any benefits from the forest CDM project. Barriers to climate action through reversing deforestation include the high transaction costs involved in establishing land use and land-use change and forestry CDM projects; the lack of specific government policy support and mechanisms to enable CDM project development in the forest sector (with the exception of a few countries); the current exclusion of avoided deforestation as a basis for Annex 1 country investment in carbon emission reductions under the CDM; and the fact that most forests in the region are owned and managed by Governments and communities. The result is that only one per cent of the current commitment to carbon emission reductions is being met via land use and land-use change and forestry CDM projects.

47. There are two important developments to watch in international carbon markets as they relate to climate action through reversing the deforestation process. Both indicate the potential for greater investment flows to developing countries based on the proactive management of forests, and natural forests in particular. The first is the growing body of support for including avoided deforestation in regulated carbon markets, that is, under CDM regulations.²⁵ The second is the growth of voluntary carbon markets, carbon trading activity that is not regulated by CDM or other emission trading schemes, such as in the European Union carbon market. One report on voluntary carbon markets notes that some of the first carbon trades in voluntary markets compensated the protection of standing forests.²⁶ There is increasing recognition by the international community of the need for action on deforestation, including through support to facilitate investments in carbon sequestration in developing countries. Under its Global Initiative on Forests and Climate, the Government of Australia will invest AU\$ 200 million to tackle climate change and protect the world's forests through action to reduce deforestation, increase new forest planning and promote sustainable forest management practices. The activities proposed include the establishment of a Global Carbon Monitoring System.²⁷ The World Bank World Wildlife Fund Global Forest Alliance will help developing countries to establish credible estimates of national forest carbon stocks, identify sources of forest emissions and develop incentives for conserving forests and investing in sustainable forest management. Both initiatives are intended to support practical action on avoided deforestation while discussions under the Convention continue.

48. Furthermore, Governments need a clear strategy and policy aiming to secure environmental services from forests while achieving international goals on carbon sequestration. As part of such a

²⁵ The Conference of Parties to the UNFCCC at its thirteenth session, to be held in Bali in December 2007, will consider technical issues as a basis for making progress on reconciling divergent political positions as to whether avoided deforestation projects should be eligible for receiving funding through the CDM, and if so how. If approved, the increase in the supply of carbon emission reductions from avoided deforestation will require action to maintain carbon emission reduction price stability.

²⁶ Katherine Hamilton and others, *op. cit.*

²⁷ G. Picker, "Global initiative on forests and climate", presentation by the Department of the Environment and Water Resources, Government of Australia, at the Seventeenth Asia-Pacific Seminar on Climate Change, Bangkok, 31 July to 3 August 2007.

strategy, countries will need to establish national financial mechanisms and fiscal policy to support the capture of the international demand for carbon sequestration services and to distribute payments to local governments and communities, as well as other actors that take action to improve the sustainability of forest management. The national discussions on policy relating to environmental services under way in countries such as Indonesia, Nepal, the Philippines and Viet Nam can support the development of such strategy and mechanisms.

G. Enhancing efforts towards adaptation

49. It is apparent that while the world cannot avoid suffering the real consequences of climate change, it still has opportunities to determine the degree of its impact. Nevertheless, it becomes imperative to enhance adaptive capacity for the changing ecological and socioeconomic conditions induced by climate change. Adaptation is more crucial for poorer countries owing to their relative vulnerability to the impacts of climate change, which stems partly from their drought-prone or flood-prone geographic location. In particular, small islands in the Pacific are vulnerable to the effects of climate change, sea-level rise and extreme events. Their adaptive capacity is also lower than that of developed countries because of their limited financial resources, skills and technologies and high levels of poverty. Their reliance on climate-sensitive sectors such as agriculture and fishing is also high.²⁸ The scope of adaptation aiming to reduce vulnerability to climate includes various types of activities, from the purely technological (such as sea defence construction), through behavioural (such as shifts in choice of food or recreation), managerial (such as changes in farming methods) and policy (such as planning regulations). Such activities are particularly important in the sectors of agriculture and food security, water resources, coastal zone management, disaster management and health.

50. An effective climate policy involves a portfolio of mitigation and adaptation. An IPCC report²⁹ has identified four types of interrelationships that can be distinguished between mitigation and adaptation: mitigation actions that have consequences for adaptation; adaptation actions that have consequences for mitigation; decisions that include trade-offs and synergies between mitigation and adaptation; and processes that have consequences for both mitigation and adaptation. So far, only limited adaptation to climate change has taken place. High adaptive capacity does not necessarily translate into actions that reduce vulnerability. There are substantial limits and barriers to adaptation, which include the inability of natural systems to adapt to the rate and magnitude of climate change, as well as technological, financial, cognitive, behavioural, social and cultural constraints. There are also significant knowledge gaps connected with adaptation.

51. Thus, as highlighted in the IPCC report, further research and study are needed in the following areas, in particular: the monitoring of progress on adaptation and assessment of its direct and ancillary effects; the synergies and trade-offs between various adaptation measures, and between adaptation and other development priorities; the effect of human intervention to manage the process

²⁸ Hannah and Huq, op. cit.

²⁹ IPCC, *Climate Change 2007...*, p. 747.

of adaptation in natural systems; the economic and social costs and benefits of adaptation, in particular non-market costs and benefits; and the implications of adaptation for economic growth and employment.³⁰

Box. Adaptation funding

There are several funds to support adaptation in developing countries under the Convention and the Kyoto Protocol. The following funds contain a total of over US\$ 310 million to date.

1. **The Least Developed Countries Fund**, which has been operational since July 2001, was established to support a work programme to assist least developed country Parties to carry out, inter alia, the preparation and implementation of national adaptation programmes of action. The Global Environment Facility (GEF), as the entity that operates the financial mechanism of the Convention, has been entrusted with operating the Fund.

2. **The Special Climate Change Fund**, which has been operational since October 2005, was established to finance projects relating to adaptation; technology transfer and capacity-building; energy, transport, industry, agriculture, forestry and waste management; and economic diversification. The Fund should complement other funding mechanisms for the implementation of the Convention. GEF, as the entity that operates the financial mechanism of the Convention, has been entrusted with operating the Fund.

3. **The Adaptation Fund** was established to finance concrete adaptation projects and programmes in developing countries that are Parties to the Kyoto Protocol. The Fund is to be financed from a share of proceeds amounting to 2 per cent of certified emission reductions issued for a CDM project activity, and receive funds from other sources. The Fund is not yet active and is not expected to generate a significant amount of resources until at least 2010.

4. **The Strategic Priority on Adaptation Fund**, with an initial allocation of US\$ 50 million under the GEF Trust Fund, became operational in July 2004. It aims to ensure that climate change concerns are incorporated into the management of ecosystems through GEF focal area projects. It will pilot demonstration projects concerned with the management of ecosystems to show how climate change adaptation planning and assessment can be practically integrated into national policy and sustainable development planning. It will be evaluated by GEF before additional funds are allocated.

A number of bilateral funding agencies in some countries, including Canada, Germany, the Netherlands, Japan, the United Kingdom and the United States, have allocated funding for adaptation activities, including research and some pilot projects. To date, bilateral donors have provided around US\$ 110 million for over 50 adaptation projects in 29 countries.

Source: <http://thegef.org>; <http://unfccc.int/2860.php>; International Institute for Environment and Development, 2007.

³⁰ Ibid., pp. 770-771.

H. Promoting the participation of non-State actors

52. The State actors, Governments, are the Contracting Parties responsible for the formulation and implementation of policy measures for globally agreed goals and norms. However, the climate change issue makes all actors, comprising State, sub-State and non-State actors, become involved in the issue as de facto contracting parties. Sub-State actors such as municipal governments, and non-State actors, including non-governmental organizations and the private sector, could act as key initiators for new innovative approaches to the mitigation of climate change regardless of the legally binding commitments of the national Government to emission reductions. The state government of California plans to reduce carbon emissions to the level of 1990 by 2020 and 80 per cent below the 1990 level by 2050; however, the United States is not a party to the Kyoto Protocol. Seoul City plans to reduce carbon emission to 25 below the 1990 level by 2020, although the Republic of Korea does not have a legally binding target. In 2005, 40 major cities in the world set up the C40 Cities–Climate Leadership Group to make joint efforts towards GHG emission reductions. As cities consume 75 per cent of the world’s energy and produce 80 per cent of its GHG emissions, they have a central role to play in tackling climate change. However, taking action on climate change requires political leadership. Thus, the commitment of major cities to tackling climate change is indispensable. The accumulation of tangible experiences in such unilateral and joint actions through global networks could become a key source of concrete knowledge for further actions of Governments. Thus, it is necessary for Governments to encourage the expansion of voluntary actions and networks of sub-State and non-State actors.

I. Promoting an effective climate change regime after 2012

53. It has been widely recognized that the future climate regime should be based on the current one, which embodies the principles of common but differentiated responsibilities. It should have stronger compliance mechanisms, with Annex I countries committing to deeper reductions and targets that are more credible than in the current regime. It is also widely accepted that the success of the future climate regime rests on policies and measures adopted in the region.

54. The active involvement of member countries in the process of developing an effective climate change regime after 2012 will ensure that their concerns, for example, sustainable development, energy security and poverty eradication, are incorporated more proactively in the future regime than in the current one.

55. Strengthening the CDM by giving a clear signal for its continuity beyond 2012 is crucial for building a successful post-2012 climate change regime. The current CDM, as an economic instrument for a non-Annex 1 countries participation option, can be improved to create a virtuous cycle whereby non-Annex 1 countries can raise more revenue as they initiate more emission reduction projects and at the same time contribute to achieving even more global emission reduction without fearing a binding target that places a burden on their economy.

56. To address such issues, the secretariat has proposed a carbon emission reduction discounting scheme as one of the market mechanisms for a climate change regime after 2012. It supports the promotion of a unilateral CDM and maintains the stability of carbon emission reduction prices, which is necessary to keep the CDM projects initiated by developing countries commercially viable. Meanwhile, the carbon emission reduction discounting scheme could also function as an economic instrument to generate net global emission reductions even without imposing binding targets on developing countries. It would act as a strong incentive mechanism for non-Annex 1 countries to undertake emission reduction projects voluntarily for their own benefit and according to their own needs and priorities. In part II of the third session of the Committee on Managing Globalization, held in Bangkok in October 2006, member countries noted that the proposal could be an innovative mechanism for a future climate change regime.³¹

57. The secretariat has presented this idea on different occasions and drawn the attention of the international community to it. It is currently carrying out further studies and seeking continuing support and collaboration from member countries and international organizations, including the secretariat of the Convention.

IV. MATTERS FOR CONSIDERATION BY THE COMMITTEE

58. The Committee may wish to take note of the impacts and implications of climate change in Asia and the Pacific and also:

(a) Provide the secretariat with guidance on strengthening its role to develop a regional strategy so as to link regional actions with the global process under the Convention, and provide comments to the secretariat on the approaches suggested;

(b) Guide the secretariat's role in facilitating and promoting the policy approaches of member countries to mainstreaming climate change into their national sustainable development planning and strategy, in particular to least developed countries, landlocked developing countries and small island developing States and sharing good practices among the member countries;

(c) Suggest that the secretariat conduct further studies on the regional aspects and strategies for action on climate change through innovative market mechanisms for the mitigation and reduction of GHG emissions and the development of a future climate change regime;

(d) Guide the secretariat in assisting developing countries to enhance capacity and regional cooperation for adaptation, including assisting member countries in formulating and implementing adaptation projects under the Adaptation Fund.

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³¹ See E/ESCAP/63/11, para. 58.