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THEME PAPER

**ACHIEVING ENVIRONMENTALLY SUSTAINABLE ECONOMIC GROWTH
IN ASIA AND THE PACIFIC**

(Items 6 and 7 of the provisional agenda)

SUMMARY

The Asian and Pacific region is experiencing the fastest economic growth among the regions of the world. However, this rapid economic growth is placing increasing pressure upon the environmental carrying capacity of the region. The challenge for the region lies in pursuing the economic growth that is acutely needed in order to achieve the Millennium Development Goals related to poverty reduction and environmental sustainability for the current generation without jeopardizing the environmental carrying capacity for future generations.

For a region with a large population and a limited carrying capacity, it is imperative in pursuing economic growth that conventional policies focusing on improving environmental performance of pollution control should be combined with policy options focusing on enhancing environmental sustainability by improving ecological efficiency of our production and consumption patterns as called for by the Johannesburg Plan of Implementation adopted by the World Summit on Sustainable Development.

The concept and system change necessary for the shift towards “Green Growth” is being elaborated for the consideration of the representatives to the Ministerial Conference in the preparation of the Ministerial Declaration and the Regional Implementation Plan.

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I. INTRODUCTION

1. Asia and the Pacific is experiencing the fastest economic growth in the world.¹ However, economic growth in its current form is placing enormous pressure on the environmental carrying capacity of the region.² Unless economic growth is properly checked, the environmental carrying capacity for future generations will be seriously compromised.

2. In spite of the increasing environmental pressure arising from economic growth, it is only through economic growth that the nations of the region can reduce poverty and improve environmental management. Therefore, the challenge is not to limit economic growth but to convert it into an environmentally sustainable form. The region must urgently shift away from the conventional pattern of environmentally unsustainable growth, which could be called the “Grow first, clean up later” paradigm, towards a new paradigm of environmentally sustainable economic growth, which could be called “Green Growth”.

3. “Green Growth” is a paradigm that focuses on reducing the increasing environmental pressure arising from economic growth, thus enabling economic growth to reduce the poverty of the current generation while maintaining the carrying capacity for future generations. Under the conventional “Grow first, clean up later” paradigm, economy and environment play a zero-sum game.

4. However, under the “Green Growth” paradigm, countries would be required to integrate environmental policies with economic policies and create a positive win-win synergy between environment and economy.

5. “Green Growth” requires a reduction in the environmental pressure of economic growth through the improvement of the ecological efficiency of production and consumption patterns, thereby creating synergy between the economy and the environment, a win-win solution.

6. The success of “Green Growth” depends on the efforts to promote the concept and system change necessary for a mutually reinforcing integration and synergy of environmental and economic policies.

7. “Green” economic growth can be achieved only when conventional “environmental performance” is combined with “environmental sustainability”.

8. The term “environmental performance” is used here as a concept referring to the efficiency of environmental administration in reducing pollution and discharge and protecting the environment. The term “environmental sustainability” refers to the continuity of the ecological carrying capacity

¹ The designation “Asia and the Pacific” is used throughout the present paper as a general term referring to the ESCAP region. As a theme paper for the concept of the green growth paradigm, this paper does not elaborate on the specifics of the differences of each subregion. Therefore, economic growth refers to the average of the ESCAP region as a whole, while the economic growth rate varies according to subregion. Many countries in Central Asia and the Pacific, in particular, do not maintain high economic growth.

² Environmental carrying capacity refers to the environmental resources as used in the Millennium Development Goals. The term “ecological carrying capacity” is also used here interchangeably with environmental carrying capacity.

between the current generation and future generations. Thus, “environmental sustainability” is about the ecological efficiency of a society as a whole and cannot be changed unless a society changes the way it produces and consumes.

9. “Environmental performance” relates to conventional sectoral environmental policies, while “environmental sustainability” relates to ensuring a level of ecological efficiency which allows the current generation to sustain a production and consumption pattern that can be maintained indefinitely into the future without damaging the ecological carrying capacity of future generations.

10. The conventional environmental approach has been focused more on improving environmental performance by controlling and regulating pollution and the discharge resulting mainly from production processes. The efforts of the Governments of member States to improve their environmental performance in the area of pollution control have met with some success. Air quality degradation has been reversed or slowed in some cities, the rate of deforestation has also slowed down in some countries and institutional and legislative frameworks for environmental protection have been established or strengthened.

11. However, the environmental sustainability of the region has been placed under increasing pressure. In view of the region’s fairly limited ecological carrying capacity and the prospect for a rapid and huge increase in production and consumption in the course of economic growth, the environmental sustainability of the region is bound to deteriorate in the years to come unless “fundamental changes in the way societies produce and consume” are made as called for in the Johannesburg Plan of Implementation.³

12. Pollution control alone cannot improve the increasing pressure arising from economic growth and ensure “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs”,⁴ unless ecological sustainability is improved through “a fundamental change in the way societies produce and consume”. Millennium Goal 7 and target 9 also aim to “ensure environmental sustainability” by integrating “the principles of sustainable development into country policies and programmes and reversing the loss of environmental resources”. It is imperative to improve environmental sustainability by increasing efficiency in the way natural resources are consumed.

13. While conventional policies focus more on improving environmental performance in pollution control, they need to be combined with policy options focusing on maintaining environmental sustainability by enhancing ecological efficiency in pursuing economic growth.

³ See *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (United Nations publication, Sales No. E.03.II.A.1 and corrigendum), chap. I, resolution 2, annex, para. 14.

⁴ World Commission on Environment and Development (Brundtland Commission), *Our Common Future*, Oxford, New York: Oxford University Press, 1987.

14. Against this background, this paper suggests that, at the fifth Ministerial Conference on Environment and Development, whose main theme is “Achieving environmentally sustainable economic growth”, policy measures could be categorized into two groups; namely measures for environmental performance and for environmental sustainability.

15. The rest of the paper is organized as follows: increasing environmental pressure from rapid economic growth and signs of stretched carrying capacity in Asia and the Pacific are briefly reviewed in chapter II. After discussing the relationship between economic growth, environmental performance and environmental sustainability in chapter III, chapter IV discusses how the concept and system of current environmental management need to be changed to shift towards the “Green Growth” paradigm. In particular, that chapter proposes a system that embraces the environment as an opportunity and not a burden and where positive synergy between the environment and the economy could be promoted. Chapter V describes the expected role of the three major stakeholders: government, the private sector and civil society. Conclusions are offered in chapter VI.

II. INCREASING ENVIRONMENTAL PRESSURE ARISING FROM ECONOMIC GROWTH AND THE LIMITED CARRYING CAPACITY OF ASIA AND THE PACIFIC

16. Asia and the Pacific is a vast region covering 40 per cent of the world territory, and is home to 61 per cent of the world’s population. Dramatic economic growth has enabled the reduction of poverty and social progress in many parts of the region. However, the rapid increase in industrial and agricultural production, as well as rising levels of consumption, are exerting increasing pressure on the ecological carrying capacity of the region. The region’s environmental sustainability is under serious pressure and the need for continued economic growth is urgent, given the continuing high poverty levels, population growth and a nutritional status that is still far from satisfactory in many countries.

17. Meeting future economic growth needs, given the region’s limited ecological carrying capacity, will require the region not only to improve its environmental performance, but also to improve the ecological efficiency of consumption and production patterns.

A. Increasing pressure from economic growth

18. The major pressures on environmental carrying capacity arising from economic growth can be identified as follows:

(a) Industrial production in the region increased by almost 40 per cent, as compared with a global increase of 23 per cent, from 1995 to 2002. The fastest-growing areas of production include highly polluting industries that often use outdated technologies and operate under pollution control regimes that have little or no enforcement;

(b) Agricultural production increased by 62 per cent from 1990 to 2002, largely through agro-chemical use intensity that exceeds world averages. Over 60 per cent of water used is for agriculture in at least 30 countries in the region;

(c) About 352 million persons are projected to swell the ranks of urban residents in the next 10 years, some 40 per cent in South Asia. Some 600 to 800 million persons in the region have been estimated to be without adequate provisions for sanitation (UN-HABITAT, 2003). The development of waste-water treatment, solid waste management and transportation infrastructure is not keeping up with the growth in urban populations;

(d) Total consumption has risen with increases in disposable income and population growth. The nature of waste is also changing, reflecting the adoption of urban lifestyles and a growing demand for personal vehicles and energy-intensive consumer durables;

(e) The region's existing energy supplies are inadequate – the region has access to less than half the energy per capita of the global average. Meeting the basic needs of existing and future populations and the high rates of growth in demand for energy based on fossil fuel sources will present major environmental challenges;

(f) Growth in water demand will also place significant pressure on the environment. Extraction from various sources is projected to increase by 25 per cent from 1990 to 2010.

B. Signs of stress from limited carrying capacity

19. Action by Governments to achieve sustainable development has, in most cases, focused on improving short-term environmental performance rather than the environmental sustainability of the economic and social systems that drive production and consumption. There has been significant success in improving environmental performance in some areas, such air quality in some cities, slowed rates of forest loss, increased forest planting rates, and considerable success in reducing the use of ozone-depleting substances.

20. However, the pressures described in paragraph 18 above are already stretching the limits of the region's carrying capacity, as highlighted by the following:

(a) Suspended particulates are of concern in a growing number of cities. In over 50 per cent of reporting cities, average annual concentrations of suspended particulates and NO₂ have exceeded WHO standard limits. Indoor air pollution as a result of dependence on biomass fuels for heating and cooking causes significant mortality and health impacts;

(b) Per capita water availability is reaching "scarcity limits" in many areas which are subject to seasonal shortages. More than 462 million persons were affected by drought (including deaths and homelessness) in south Asia alone during 2000-2004. Surface and groundwater resources

have been degraded because of over-extraction and pollution, particularly from nitrates and heavy metals;

(c) Only about 28 per cent of the total land area of the region is forested.⁵ (FAO, 2004). Forest losses in South-East Asia and South Asia have contributed to the offsetting of significant reforestation gains resulting from the efforts of countries such as China;

(d) Over 28 per cent of the region's land area is degraded to some degree⁶ (FAO, 2004), with significant degradation in dryland areas used for agriculture;

(e) The region has contributed significantly to the rapid global decline in biodiversity, with several countries having particularly large numbers of endangered species, as compared with other parts of the world (IUCN, 2004);

(f) There have been dramatic declines in fishery resources and continued degradation of coastal ecosystems. The mangrove forests lost from 1990 to 2000 represent approximately 60 per cent of the global loss, with South-East Asia accounting for the majority. Approximately 60 per cent of the region's coral reefs are at risk.

21. At the same time, the impact of natural disasters and extreme weather patterns possibly linked to climate change have continued to affect human health and livelihoods and damaged critical ecosystems, thereby increasing the vulnerability of member countries.

C. Need for further growth

22. The extent of the need for further economic growth to support ever increasing populations is enormous. An increase in the total population of the region of some 418 million persons by 2015 is projected.⁷ About 712 million persons in the region, or about 65 per cent of the global total and 22 per cent of the region's population,⁸ are estimated to live on less than \$1 per day. An estimated 545 million people in the region are still undernourished, comprising 65 per cent of the world's ill-fed (FAO, 2004).

23. In order to meet huge demand for housing, environmental and transport infrastructure, the countries of the region must pursue even greater economic growth than what they have achieved thus far.

⁵ Excluding Armenia, Azerbaijan, Brunei Darussalam, Georgia, the Russian Federation, Singapore and Turkey.

⁶ Excluding Armenia, Azerbaijan, Brunei Darussalam, Georgia, the Russian Federation, Singapore and Turkey.

⁷ Slower population growth rates in North-East Asia have been responsible for overall slower population growth rates in the region in the last 10 years. However, population growth in South Asia continues unabated; by 2015, it is projected that the population of South Asia will overtake that of North-East Asia.

⁸ ESCAP estimate based on World Bank Data. Source: <http://www.developmentgoals.org/poverty.htm>. Accessed on 28 January 2005.

D. Need to improve ecological efficiency

24. In view of the region's limited carrying capacity, which is already showing signs of stress under the pressure of the current economic growth and the enormous need for further economic growth to reduce poverty and meet the basic needs of its vast population, the ecological efficiency of economic growth in the region must be improved. The environmental sustainability of production and consumption patterns has to be improved in order to continue economic growth. The region urgently needs the new paradigm of "Green Growth", which reduces environmental pressure and ensures environmental sustainability by enhancing the ecological efficiency of economic growth.

III. LINKAGES BETWEEN GROWTH, ENVIRONMENTAL PERFORMANCE AND ENVIRONMENTAL SUSTAINABILITY

25. The possible interaction and linkages between economic growth, environmental performance and environmental sustainability are reviewed in the present chapter.

26. The Environmental Kuznets Curve (see section C below) implies that there is a positive relationship between economic growth and environmental performance, as beyond a certain income level, the pollution level declines as income increases. However, there is still no empirical evidence that the Curve could also apply to the relationship between the economic growth and environmental sustainability. There is no guarantee that environmental sustainability will improve as income rises unless a society as a whole improves ecological efficiency in the way that it produces and consumes, whether by adopting a more ecologically friendly lifestyle or by expanding the ecological carrying capacity itself.

27. In any society, once a lifestyle is established, it is quite difficult to change it later. Thus, it is all the more important for a country to adopt an ecologically efficient way of producing and consuming early in the course of its economic growth.

A. Relationship between the three pillars of sustainable development and environmentally sustainable economic growth

28. While the Brundtland Commission's definition of sustainable development was a development that "meets the needs of the present generation without compromising the ability of future generations to meet their own needs", Agenda 21 defines it as a combination of environmental protection, economic well-being and social equity.

29. Among the three pillars of sustainable development, the linkages between economic and social policies have been relatively well established. In contrast, environmental policies and their linkages with economic policies are generally less understood (OECD, 2001b).

30. Neither are the linkages between the environment and social development well understood; hence, further studies on the environmental-social connection are needed. However, the present paper

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focuses on the relationship between economic growth and the environment. The relationship between environmental policies and social policies could be reviewed in depth at a later stage.

B. Linkages between environmental performance and environmental sustainability

31. As noted in the introduction, “environmental performance” refers to the efficiency of environmental administration in reducing pollution and discharge and protecting the environment, while “environmental sustainability” refers to the continuity of the ecological carrying capacity between the current generation and future generations.

32. Environmental performance can be improved by conventional means, environmental regulations, to reduce pollution. Eco-efficiency and environmental sustainability, however, can be improved only when a society adopts cleaner and more resource-efficient production patterns and changes its consumption patterns to accept the idea of “zero waste” or a recycling society. This means that a society should live only within the boundary set by the limits of the regenerative space of the ecological carrying capacity.

33. In spite of a certain overlap between the policy options for environmental performance and those for environmental sustainability, there seems to be no direct relationship between the two. For example, the environmental sustainability of country A, which has a limited land area, high population density and high levels of socio-economic activity, will be lower than that of country B, which has a large natural resource base, lower population density and lower socio-economic activity, unless the ecological efficiency of country A is far greater than that of country B.

34. While policy measures for pollution control could also improve ecological efficiency, a country with fairly good environmental performance could still have deteriorating environmental sustainability or vice versa. A developed country with fair environmental performance could have low environmental sustainability if it maintains low ecological efficiency and its production and consumption place greater pressure upon a limited ecological carrying capacity. A developing country with poor environmental performance could still have high environmental sustainability if it has a large environmental carrying capacity and a low level of production and consumption.

35. Since environmental performance and sustainability as defined above do not always go hand in hand, the categorization of environment management policies into environmental performance policies, focusing on pollution control, and environmental sustainability policies, focusing on ecological efficiency as described above, is useful in formulating the necessary concept and system change.

C. Linkages between economic growth and environmental performance

36. It was generally accepted in the earlier theories that there would be a tradeoff between the economy and the environment. More recently, however, it has been suggested that the relationship

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between income and pollution is not linear so much as an inverted U curve. This means that, at relatively low levels of income per capita, pollution initially increases as income rises, but after reaching a certain threshold then pollution decreases with rising income. This pattern is called the Environmental Kuznets Curve (EKC), following the original Kuznets curve, which was an inverted U-shaped relationship between average income and inequality. Grossman and Kreuger (1991, 1994) and the World Bank (1992) made the pioneering studies which brought the EKC to public attention. Since its discovery, much supporting statistical evidence on the EKC has accumulated in favour of many pollution measures.⁹

37. Many studies have also attempted to explain the EKC theoretically.¹⁰ The story line of EKC is as follows. As growth and industrialization progress, the emission level (and intensity) of pollution increases owing to greater production of goods and services. The operation of less efficient and relatively dirty technologies combined with ignorance of the importance of the environment also contribute to the worsening of the environment in the earlier stages of development. However, as economic growth continues and income rises, increasing public demand for a cleaner environment forces government to allocate more resources for the environment and the private sector to adopt cleaner production methods.

38. There are three points to make with regard to the EKC:

(a) *First, economic growth is a requirement for improved environmental performance.* Therefore, economic growth should be encouraged not only to combat poverty but also to improve the environment in Asia and the Pacific;

(b) *Second, the EKC does not imply that the pollution level declines automatically with income or that the environment needs no particular attention.* Many studies reveal that some very high-income countries have greater pollution emission intensity than low-income countries. This implies that only if the appropriate institutions and effective policy measures are in place will the demand for higher environmental quality derived from higher income translate into the desired pollution reduction;

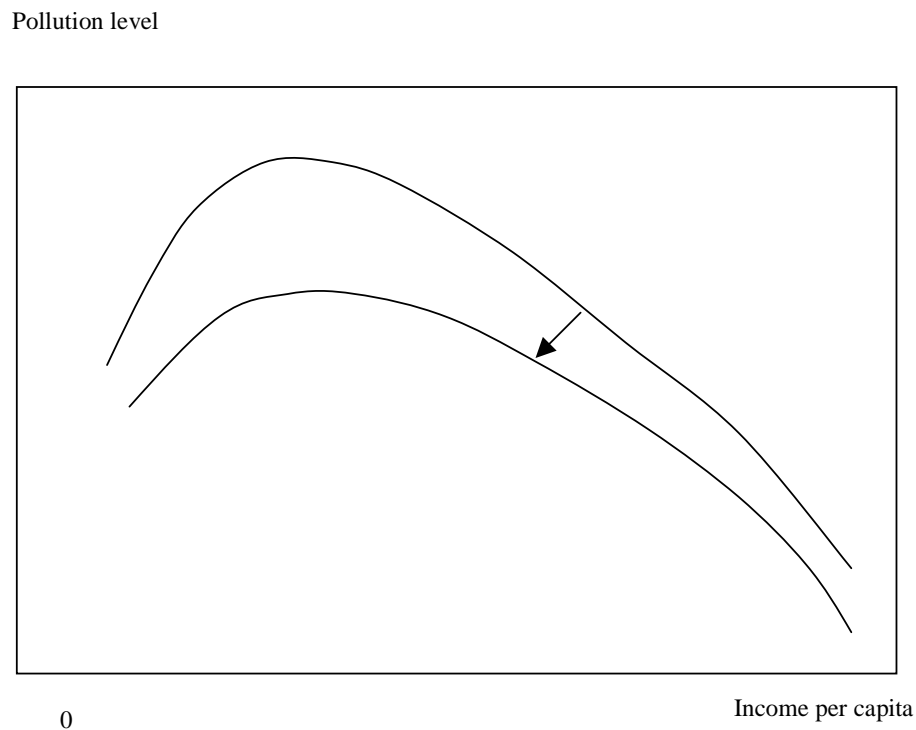
(c) *Third, it is also important to note that economic growth will initially increase environmental damage before it reaches the peak threshold.* This implies that even if EKCs are valid, economic growth in developing countries, if it proceeds according to past patterns and trends, will cause pollution to increase enormously in Asia and the Pacific because there are far more developing countries than developed countries in the region.

⁹ See Brock and Taylor (2004b) for a review of the empirical studies on EKCs.

¹⁰ They include Selden and Song (1994), Stokey (1998), Andreoni and Levinson (2001), and Brock and Taylor (2004a), among others. See chapter 2 of Copeland and Taylor (2003) and Brock and Taylor (2004b) for a comprehensive review.

39. Thus, the question is how to reduce the level of pollution in the initial stage of economic development and how to shorten the initial period of economic development. In other words, it is necessary to improve environmental performance by introducing decisive measures in order to flatten the EKC's in developing countries and shorten the time required to reach the peak threshold, as illustrated in the figure.

Figure. Improving environmental performance by reshaping the Environmental Kuznets Curve



D. Linkages between economic growth and environmental sustainability

40. As explained above, environmental sustainability refers to the ecological efficiency of the way a society in general produces and consumes, while environmental performance refers to the efficiency of environmental administration in reducing pollution and protecting the environment.

41. Unlike the case of economic growth and pollution, EKC does not seem to apply between economic growth and environmental sustainability. In fact, a recent study has shown that the relationship between per capita income and various indicators of environmental sustainability is rather negative. Yale Center for Environmental Law and Policy, at Yale University, in collaboration with the Center for International Earth Science Information Network (CIESIN) at Columbia University, has produced the 2005 Environmental Sustainability Index (ESI), which is a composite profile of national environmental stewardship based on a compilation of 21 indicators. Among the 21 indicators,

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some are measures of environmental performance and others are measures of environmental sustainability.¹¹

42. The 2005 ESI report reveals that there is a statistically significant negative relationship between per capita income and most environmental sustainability measures, such as biodiversity, land, reduction of ecosystem stresses, reduction of water stress, natural resource management and eco-efficiency, respectively.¹² The 2005 ESI report also shows that highly developed countries exhibit diverse patterns of environmental sustainability. Many developed countries with fairly good pollution reduction performance have a low level of environmental sustainability.¹³

43. This fact should be interpreted to mean that environmental sustainability in general does not improve, and may in fact deteriorate, as income rises, while environmental performance in general may improve with income. Environmental sustainability could be more directly linked with the ecological carrying capacity and ecological efficiency of the way a society consumes and produces rather than the level of economic development. When carrying capacity is limited and population density is high, improving ecological efficiency is all the more difficult and requires a resolute policy response and intervention. Thus, separate sets of policies and interventions need to be devised in order to improve ecological efficiency and environmental sustainability.

IV. CONCEPT AND SYSTEM CHANGES FOR PURSUING “GREEN GROWTH”

44. Despite awareness of the need to protect the environment, the major reasons that Governments have not taken proactive environmental policies are the concerns that: (a) allocating scarce financial resources to environmental protection is a burden and cost; and (b) strengthening environmental regulations will damage industrial competitiveness.

45. These conventional concerns are based on a static negative relationship between the environment and the economy. What is needed is a dynamic and synergistic relationship. Investment for the environment needs to be regarded not as a burden on the economy but as a driver of economic growth and employment. The upgrading of environmental regulations has to be regarded as an opportunity for spurring technological innovations and creating an environmental market and industry.

¹¹ In fact, the ESI report states that the ESI “provides a valuable summary measure of environmental performance” (Esty, et al, 2005, p.1), but it is a summary measure of environmental performance and environmental sustainability, according to the ESCAP definition.

¹² The report also shows that there is no statistically meaningful relationship between per capita income and any other environmental sustainability indicators, such as water quantity and reducing ecosystem stresses, while there is a statistically significant positive relationship between per capita income and environmental performance indicators, such as air quality, water quality, environmental health, environmental governance and greenhouse gas emissions. See Esty, et al (2005; table 12, p. 28).

¹³ For example, such countries as Belgium, the Netherlands, the Republic of Korea, the United Kingdom of Great Britain and Northern Ireland and the United States of America show a low level of environmental sustainability. Despite the fact that the ESI used in this report not only measures environmental sustainability but also includes the environmental performance of pollution control, this information could still be quite indicative.

46. In the pursuit of “Green Growth”, what needs to be changed is not only the concept of the environment but also the system in which the economy functions. This can only be pursued by integrating the economy and the environment and creating synergy between the two.

47. Improving ecological efficiency requires the internalization of environmental costs into the price structure. In countries that lack the financial and technical capacity, this will require support through international and regional cooperation.

48. The present chapter addresses the way in which the concept of the environment and the current system need to be changed to attain the goal of “Green Growth.” It should be noted here that the word “system”, as used herein, encompasses not only the processes by which stakeholders reach decisions, but also the activities that they undertake to implement their decisions in order to reach “Green Growth” goals.¹⁴

A. Concept changes

1. From pollution control to eco-efficiency improvement

49. Conventional environment management has been focused primarily on pollution control. However, in view of the limited ecological carrying capacity of the region and the large population, improving the ecological efficiency of economic growth will be a more pressing concern in the days to come. That is, the extent of the success of “Green Growth” will depend more on the measures for the ecological efficiency of production and consumption that countries in the region adopt.

50. In spite of Millennium Development Goal No. 7, on environmental sustainability, and the call in the Johannesburg Plan of Implementation for a fundamental change in the way society produces and consumes, the issue of ecological efficiency has not yet achieved prominence in the minds of policy makers in the region. The reason for this is that, as ecological efficiency is relatively new concept, the policy options are multidisciplinary and therefore require the participation of all the stakeholders in a society; they cannot simply be left up to the environment ministry.

51. Conventional economic development planning has primarily focused on the supply side of the economy by emphasizing the building of more power plants, dams and highways to increase the supply capacity for energy, water and roads rather than improving the efficiency of energy and water consumption. However, ecological efficiency requires policy options focused mainly on demand-side management, such as expanding public transportation and railroads, controlling water and energy prices to improve the efficiency of consumption and licensing the right to purchase private passenger cars. This is all the more pressing in view of the limited ecological carrying capacity of the region and the prospect for rapid economic growth on a large scale.

¹⁴ Some reports (for example, the APFED Final Report, 2005) use “paradigm shift” in place of “system change”. In the present report, the two concepts are used interchangeably.

52. In short, “Green Growth” is feasible only when pollution control is coupled with the improvement of the ecological efficiency of the way economic growth is pursued.

2. The environment as a growth driver and employment creator and not only as a burden

53. In the initial stage of economic development when the absolute volume of financial resources is modest, allocating resources for the environment has been regarded by economic policy planners as a burden on economic development. Thus, the environment sector has been lacking in investment.

54. The fact that the environment requires a higher degree of investment means that the environment industry has a greater potential for promoting economic growth as well as creating employment opportunities. For example, many countries in Asia and the Pacific require a huge volume of investment in environment infrastructure, such as wastewater treatment plants. China and South-East Asian countries are planning for large investments in environment infrastructure. These investments will contribute to their economic growth and employment.

55. Nonetheless, many economic policy planners in the region still believe that investment in the environment is a sunken cost and a burden on the economy. In order to create synergy between the environment and the economy, investment in the environment should be regarded as an opportunity for economic growth and employment and should be embraced.

3. The environment as a business opportunity for the private sector and not as an extra cost

56. The environment is, in many cases, still regarded as an extra cost, even by private businesses. However, as the economy grows and income rises, the demand for environment-friendly and resource-saving goods and services increases.

57. The environment industry is growing rapidly. The environmental goods and services industry worldwide has been estimated to be larger in size than the pharmaceutical industry. In the United States, growth was around 5% per year in the 1990s, while in Germany growth has been estimated at 5-6% per year (Vickery and Iarrera, 2000). Thus, the environment industry is now a major industrial sector in its own right.

58. This recent trend provides the private sector with a good business opportunity. A firm that innovates new “green” products and new “green” technologies before others do will be in a position to enjoy a competitive advantage. Some firms are actively exploiting new opportunities and are even promoting environmental marketing. The environment should no longer be seen as an extra cost but rather as a new business opportunity.

4. Environmental regulation as a research and development opportunity for industrial competitiveness

59. Conventional economic thinking theorizes that strict environmental regulation would affect industrial competitiveness negatively. Many empirical studies, however, find little statistical evidence of adverse effects on competitiveness due to environmental regulation (for example, Jaffe *et al.* 1995). Instead, such researchers as Porter (1991) and Porter and van der Linde (1995) argue that environmental regulation can reduce production costs and stimulate competitiveness. This view, known as the “Porter Hypothesis”, argues that the regulations spur environmental innovations that strengthen the competitive position of firms and can offset the cost of regulatory compliance.

60. In fact, environmental regulations and incentives can pressure firms to upgrade technology and quality and provide new innovations in areas of important consumer and social concern. Thus, technological innovation stimulated by environmental regulations can result in new products or new business opportunities and thus have positive effects on both the environment and the economy. In fact, environmental regulation coupled with government research and development support and other incentive measures will be more likely to motivate firms to exploit win-win opportunities. There are a number of real-world examples where a new environmental initiative turned out to be profitable for a given firm or industry.¹⁵

B. System changes

1. Internalization of environmental costs into pricing mechanisms

61. One of the fundamental reasons for environmental problems is that the environment is regarded as a free good and pricing mechanisms do not reflect environmental costs. Thus, people end up abusing the environment. If environmental costs could be fully reflected and internalized into the market price structure, then people would no longer abuse the environment.

62. However, it would not be easy to make people pay for environmental services which they are accustomed to enjoying free of charge, especially when their income level is low. However, the pricing mechanism is the most efficient and effective tool for improving the eco-efficiency of the way people consume water and energy and generate waste.

63. Pricing will also provide the strongest incentives for the private sector to innovate. As long as there is no system that differentiates the price of environment-friendly products from other products, there is no incentive for firms to offer environmentally friendly products and services. Thus, it is urgent that policy makers devise a system where the price of protecting the environment is duly reflected in the price structure of the market. Internalizing environmental costs can be effected through economic instruments, such as charges, levies and eco-tax reform.

¹⁵ See Moore and Miller (1994) and Annandale et al. (2005) for such examples.

2. Improving the eco-efficiency of production and consumption patterns

64. As emphasized in paragraphs 49 to 52 above, eco-efficiency should be the criteria for changing the way a society produces and consumes.

65. Cleaner production has been actively pursued as a policy option for sustainable production patterns. However, not only do production methods need to be cleaner, but they also need to be more resource-efficient. In the future, resource efficiency rather than cleanliness will be more important in pursuing sustainable production patterns. Already, in 2004, there was a dramatic rise in the prices of such resources as steel, crude oil and aluminium.

66. Likewise, the eco-efficiency of consumption must also be the core focus of the policy options. For example, the social cost of traffic jams and proliferations of private passenger cars must be reviewed and the eco-efficiency of railroads vis-à-vis highways, public transport vis-à-vis private cars must be duly taken into consideration in pursuing sustainable consumption patterns.

67. In order for the economic growth of the region to continue, a system must be devised to review the eco-efficiency of production and consumption. Eco-efficiency should be introduced as a criteria for evaluating economic and social development planning. Relatively less focused policy options, such as demand-side management, to improve the eco-efficiency of consumption need to be further explored.

3. Creating synergy between the environment and the economy

68. In order to change the perception of the environment from a burden and a cost to a growth driver and a business opportunity, it is urgent that public policy makers devise a system where the market potential for environmental investment and research and development can be maximized to create synergy between the environment and the economy.

69. Governments should upgrade environmental regulations and provide incentives for firms to innovate and encourage consumers to make environment-friendly choices. The three major stakeholders are required to play their expected role in order to create synergy between the environment and the economy.

4. Support for the long-term perspective: resource allocation for the environment

70. The benefits of environmental protection often materialize only in the long run while there are many pressing economic and social needs demanding resource allocations. Investment for environmental research and development often can only be done in the long run and lacks commercial viability. This is the reason that environmental research and development must often be supported by public funds, as in the case of renewable energy.

71. Government and the public sector need to bridge the gap between long-term social benefit and short-term commercial benefit in order to promote the active participation of the private sector in the area of environmental research and development.

5. International system to support “Green Growth” in developing countries and level playing fields

72. As many developing countries in the early stage of economic development lack the financial resources and technological capacity to initiate pollution control and ecological efficiency measures, the international community needs to provide support for developing countries to pursue “Green Growth”. For global environmental issues, such as climate change and ozone depletion, support for their participation is even more critical.

73. Rapid diffusion of clean technologies and eco-efficient production patterns into developing countries is vital in order to ensure global sustainability. Regional environmental technology partnerships and innovative financing mechanisms are necessary to support the promotion of the “Green Growth” paradigm in the region.

74. It is worth noting that, in order to facilitate upgrading of environmental regulations and standards, there should be international harmonization and coordination to create a level playing field so that the countries concerned do not have to worry about losing their national competitiveness.

V. THE ROLES OF GOVERNMENT, THE PRIVATE SECTOR AND CIVIL SOCIETY IN “GREEN GROWTH”

75. The concept and system change described above can only be feasible when government, the private sector and civil society are respectively playing their expected roles.

76. Governments should lead the introduction of concept and system change while the private sector provides the technical innovations necessary for the integration of the environment and the economy and the creation of synergy between the two. Civil society is expected to embrace the new paradigm of eco-efficiency and promote its incorporation into people’s lifestyles.

A. The role of government

77. *First, provide ground rules for the private sector and the public.* Governments are required to lay down transparent and credible policies and measures designed to encourage the concept and system changes outlined in the previous chapter. Because the environment is viewed as a public good, it is crucial for Governments to take the leading role in laying down the ground rules for the private sector and the public.

78. *Second, do not include environmental regulations in a deregulation package.* As many Governments are pursuing economic deregulation to stimulate economic activity and competitiveness, they often deregulate environmental regulations together with economic regulations. However, these

two types of regulation should not be mixed. In order to stimulate the economy and improve the environment, economic regulations can be loosened, but environment regulations should be upgraded.

79. *Third, review public policies for environmental sustainability.* Governments not only need to lay down the rules for the private sector and the public, but they also need to adopt policies that promote integration and synergy between the environment and the economy. Government policies should be reviewed on the basis of criteria for environmental sustainability. In order to promote synergy and eliminate harmful distortions, Governments should promote internalization of environmental costs into the price structure and try to the extent possible to eliminate environmentally harmful subsidies. Economic instruments that aim to reflect environmental costs into the pricing mechanism, such as eco-tax reform, are possible options for public policies that could promote environmental sustainability.

80. *Fourth, improve environmental performance.* Governments should aim to improve the efficiency of their own policies. Policy coherence and consistency are needed to attain the desired goals of integrating and synergizing the environment and the economy. The growing complexity of multidimensional and multifaceted sustainable development issues makes it increasingly difficult for conventional single-issue approaches to deliver credible results. Sectoral policies introduced without due regard for environmental externalities often lead to inconsistencies and negative spillover effects. A successful shift towards the “Green Growth” paradigm requires the integration of economic and environmental objectives at all levels of policy development and decision-making in a coherent and consistent manner.

81. *Fifth, employ a wide range of policy tools.* In view of the ever growing complexity and the multidimensional nature of sustainable development issues, Governments should be able to employ a wide range of policy measures or a combination of multiple policies in order to attain desired goals and improve the efficiency of their environmental policies. The policy tools available include conventional command and control, market-based economic instruments, voluntary agreements and social instruments. Market-based instruments, such as pollution charges and environmental taxes, and tradable permits have the potential to stimulate cost-saving approaches and provide incentives for innovation to enhance eco-efficiency.

82. *Sixth, introduce environmental regulations in a manner that encourages innovation and acceptance.* Governments should upgrade environmental regulations gradually in such a way as to permit the private sector to accommodate and innovate and to induce the public to embrace them. Introduction of upgraded regulations and standards should be combined with package of incentives designed to encourage compliance, acceptance and innovation. Innovation is crucial for the integration of the environment and the economy and the creation of synergy between the two and thus forms the basis of the shift towards the “Green Growth” goal.

B. The role of the private sector

83. *First, be the ultimate sustainability innovator.* As much of the shift towards the “Green Growth” paradigm ultimately depends on technological innovations, the private sector holds the final technical solutions for clean production, eco-efficiency and economic growth. The corporate sector initially reacted to environmental regulations in a defensive and reactionary manner. In recent years, however, business has viewed the environment increasingly in a positive manner. Some firms are already adopting environmental marketing strategies to take advantage of the increasing consumer demand for improved environmental quality. Some firms are successfully turning the environment into a business opportunities and spearheading the emerging environment industry. For example, the World Business Council for Sustainable Development has provided a progressive business voice since the mid-1990s, promoting the concept of eco-efficiency. The number of companies that have attempted to embrace sustainable development as part of their corporate strategy is still limited (OECD, 2001a).

84. *Second, be an agent for the promotion of the integration of the environment and the economy and the creation of synergy between them.* Unless the private sector creates the necessary innovations, creating synergy between the environment and the economy will not be feasible. Some firms are already turning environmental regulations into a market opportunity. The future competitiveness of firms will depend on their ability to innovate in order to meet more stringent environmental regulations. Therefore, firms need to take a proactive role in innovating new “green” products and new “green” technologies.

85. *Third, be a responsible caretaker of the environment and a promoter of environmental marketing.* As the environment cannot always be regarded as a business opportunity, there is a certain degree of essential corporate responsibility in protecting the environment. Just as citizens and governments are required to respect environmental standards and regulations, so too are firms. In particular, leading businesses need to take a proactive approach to environmental responsibilities. Corporate responsibility for the environment could improve the corporate image and some firms are already actively employing environmental marketing as part of their public relations strategy to improve their corporate image. Adopting more “voluntarily” voluntary agreements for sustainable production would be a good move. Private companies have a much better understanding of pollution and energy consumption in their own sector and are more aware of technology than governments. Thus, they are in a better position to limit the targets under voluntary agreements.

C. The role of civil society

86. *First, be a proactive partner for promoting eco-efficiency.* While governments are playing the leading role in introducing regulations and policies, it is increasingly important to secure the acceptance of the public. Internalization of environmental costs into the pricing mechanism is one of

the most important issues to be addressed. However, the price structure cannot be changed without the acceptance of consumers. While pollution can be reduced through government regulation, identifying the elements of cultural values and traditional lifestyles that respect harmony with nature and linking them with changing consumption patterns will be more effective way to promote environmentally sustainable choices among consumers.

87. However, improving the eco-efficiency of consumption patterns is not the job of the government. Therefore, civil society could play an important role as a proactive partner of the government in promoting the “Green Growth” paradigm. In particular, non-governmental organizations and consumer organizations could play a leading role in moving the public and consumers towards eco-efficiency and sustainable consumption patterns because a change in the consumption patterns and lifestyles of consumers can be effectively promoted only when the initiatives come from the public and consumers themselves.

88. *Second, be a partner for promoting an environmental market.* Consumers are exercising increasing influence over the way the market functions through their purchasing power and choice. Properly enlightened, these consumers could be important partners in promoting environmental market potential and presenting the environment as a business opportunity for the private sector. This is important because promoting an environmental market is necessary for the private sector to introduce innovations.

89. *Third, be a leader in demanding upgraded environmental quality and standards.* In many cases, it is civil society that pressures government and the private sector to improve the quality of life and of the environment. Increasing demand for improved quality of the environment is the basis for the environmental market and private sector innovations. As governments increasingly adopt market-based economic instruments as environmental policy tools, the effectiveness of these market instruments often depends on the demand for improved environmental goods and services and the willingness to pay for better environmental quality.

VI. CONCLUSIONS

90. The Asian and Pacific region is facing the serious challenge of reducing poverty among the current generation while preserving the ecological carrying capacity for future generations. This requires the region to adopt a new paradigm of environmentally sustainable economic growth or “Green Growth”.

91. **“Green Growth” requires a combination of policy options for environmental performance and environmental sustainability.**

92. In many subregions of Asia and the Pacific, conventional environmental approaches focusing on pollution control have been fairly well understood and implemented; hence environmental performance has improved in some sectors in recent years. As economic growth in the Asian and

Pacific region continues, the environmental performance of pollution control is expected to improve, as indicated by the EKC (see chapter III).

93. However, environmental sustainability is now under increasing pressure from rapid economic growth and is expected to decline further in view of the region's limited carrying capacity and the enormous extent of economic growth needed to carry its large population out of poverty.

94. As the ecological carrying capacity of Asia and the Pacific is quite limited and is already showing signs of stress, environmental sustainability depends more on the ecological efficiency of future economic growth.

95. In pursuing "Green Growth", policy measures aimed at improving not only the environmental performance of pollution control but also environmental sustainability are becoming more important. As ecological efficiency does not improve automatically with rising incomes, much more decisive policy interventions are needed.

96. Improving ecological efficiency requires a fundamental change in the way a society produces and consumes natural resources, as called for in the Johannesburg Plan of Implementation. Demand-side management for sustainable consumption patterns needs to be further strengthened. Special efforts to improve the ecological efficiency of the region are urgently required.

97. **"Green Growth" requires a policy concept and system change for the integration of the environment and the economy and the creation of synergy between the two.**

98. In order to pursue economic growth while ensuring environmental sustainability, the relationship between the environment and the economy should no longer be a zero-sum game. Policy concepts and systems must be changed in order to integrate the environment and the economy and create synergy between the two, as called for in the Millennium Development Goals. The environment should not be regarded as a burden or a cost but as an opportunity for investment, research and development and marketing. The policy concept and system change needed to support "Green Growth" based on synergy between the environment and the economy needs to be urgently designed and implemented throughout Asia and the Pacific.

99. There should be regional cooperation to provide support for those developing countries that lack the capacity or resources for green growth.

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