



ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC

Committee on Environment and Development

First session  
2-4 December 2009  
Bangkok

**TRENDS AND PROGRESS IN THE FIELD OF ENVIRONMENT AND  
DEVELOPMENT: ENHANCED ACCESS TO SERVICES TOWARDS  
SOCIAALLY INCLUSIVE AND SUSTAINABLE DEVELOPMENT:  
WATER, SANITATION, ENERGY, TRANSPORT AND HOUSING**

(Item 5 (b) of the provisional agenda)

*Note by the secretariat*

**SUMMARY**

In the present document, the secretariat: (a) reviews experiences related to the provision of water, sanitation, housing, energy and transport services for inclusive and sustainable development; (b) highlights important achievements, including the progress towards the Millennium Development Goals and the shift in development approaches by several countries in the region towards green growth for more sustainable development; (c) notes the difficulties in providing these services to everyone in an environmentally sustainable and socially inclusive manner; (d) describes regional trends in the integration of better provision of services into infrastructure development that have led to more environmentally sustainable socio-economic development, as well as various related regional, national and local initiatives; and (e) notes opportunities for synergy in the provision of services of different sectors through, among other things, eco-city development, and for providing rural areas with urban services. Finally, the secretariat calls for increased efforts to build a regional consensus on the security of resources utilization, with a view to improving the provision of services and drawing more political attention to this area.

The Committee may wish to deliberate on these issues and provide the secretariat with guidance on the direction of its future work.

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### **Introduction**

1. The provision of modern services is something that many urbanized societies today take for granted. Piped water in apartments, clean toilets, 24-hour electricity and more or less reliable transport services are basic amenities enjoyed by millions in Asia and the Pacific. Over the past few decades, the region has achieved rapid advances in economic performance, primarily thanks to a low-wage, hard-working and efficient labour force. The quality of service provision in Asia and the Pacific has in some cases led international standards—at competitive prices. Modern infrastructure significantly increases efficiency and reliability, offering quality and convenience never experienced before. As a result, in some countries of the region, the next generation may never know what it is like to live without abundant and safe water, clean toilets, air-conditioning, safe homes and air travel.

2. This scenario relies on two assumptions: (a) continuous growth that leaves no one behind; and (b) the availability of resources to fuel this promising growth. Recent environmental and socio-economic trends have started challenging both assumptions. Millions still do not have access to adequate housing, electricity, clean water, sanitation or transport. With the addition of 2.5 billion people in the next 40 years, it is almost certain that the world's resources will reach extraction peaks. In the present paper, the secretariat focuses on the provision of these basic services, including housing, and the challenges this entails.

3. Asia and the Pacific is a very diverse region in terms of geography, climate and population density. Countries in the region are also at different developmental stages. This diversity, however, can be contrasted with a few extraordinary similarities: the region's stellar aggregate economic performance, its increasing population and its rapid urbanization trends.

4. Recent urbanization has been a catalyst for rapid economic growth. Economies of agglomeration have led to cities becoming the centres of economic

activity, where cheap, abundant labour has gathered and fuelled significant economic achievements. Many cities in Asia have deep historical roots. They have sustained dense populations over time and have grown prosperous in recent decades. Furthermore, cities such as Incheon, Republic of Korea, and Da Nang, Viet Nam, are leading the way in setting international standards for sustainable urban development. With impressive eco-efficient infrastructure in place or in the pipeline, these cities are the mirror of the region's de facto leadership in operationalizing green growth.

5. Yet most cities in Asia and the Pacific still face significant planning challenges. The most important challenge is the unmet needs of the poor for housing, water, sanitation, energy and transport. Living in cities can offer opportunities, but there is no guarantee of an adequate level of income. As a result, the high-quality services offered are not affordable to everyone. If anything, income inequality within cities is likely to get worse before it gets better, complicating decision-making for local governments.

6. While people in Asia and the Pacific are flocking to cities, rural areas are left underserved. Economic considerations force policymakers to divert resources to cities, either because of economies of scale, or because attracting investments requires adequate basic "urban" infrastructure for cheap energy, water, and transport routes. People in rural areas, particularly farmers, continue working with old, poorly maintained infrastructure. The cost implications for rural dwellers include: (a) time wasted in collecting water and firewood; (b) health costs associated with poor sanitation and housing conditions; and (c) lost economic and social opportunities attributable to inadequate transport infrastructure services.

7. Making matters worse is the often irreversible environmental degradation associated with poor service provision. The imperative of continuous socio-economic development in Asia and the Pacific requires not only the provision of services to all, but also the redevelopment of old and inefficient infrastructure. However, if everyone is to be provided with these services, the resulting extraction of resources will be unprecedented and likely catastrophic for the environment. The region's natural resource base cannot support the consequential levels of production and consumption indefinitely. The current pattern of economic growth has already caused serious environmental damage—polluting the air, creating waste, degrading biological systems and accelerating climate change—with many of these effects coming from the energy sector.

8. The Asia-Pacific region has actively chosen to depart from current consumption and production patterns and, embracing its poor, embark on a greener development path. The concept of green growth, adopted at the fifth Ministerial Conference on Environment and Development in Asia and the Pacific, 2005 as the key regional strategy for achieving inclusive and sustainable development, is increasingly accepted in the region as an important paradigm shift towards an effective approach. There has been encouraging progress in the adoption of green growth by member States, with a number of countries actively pursuing it at the national level (for example Bhutan, Cambodia, China, Kazakhstan and the Republic of Korea) and through regional initiatives (see E/ESCAP/CED/1). If green growth can be fully operationalized, it has the potential to address effectively the development dilemma of providing basic services to all while ensuring environmental sustainability.

## I. ISSUES OF PROVISION OF RESOURCE-INTENSIVE SERVICES IN THE REGION

### A. Key socio-economic and environmental challenges in Asia and the Pacific

#### 1. Poverty and high population growth

9. The ESCAP region remains the fastest growing region in the world. Real gross domestic product (GDP) growth rates in developing ESCAP countries have been consistently above 5 per cent over the past five years. The region is also the production house of the world, with merchandise exports growing annually by 12.9 per cent on average, two percentage points faster than the world average.<sup>1</sup> At the same time, it is plagued by great inequalities and home to more than half of the world's poor.

10. Although some countries have made great progress in improving access to services, the total number of people without access has not decreased significantly, due to population growth.<sup>2</sup> In 2006, over 900 million people in Asia and the Pacific did not have access to electricity and over 600 million people were short of access to improved water sources. Even worse, almost 1.8 billion (46 per cent of the total ESCAP population) lacked access to improved sanitation. Insufficient transport infrastructure remained an obstacle for most developing countries in the region, particularly for people living in rural and remote areas and in small island developing States. In addition, about 40 per cent of urban residents in Asia and the Pacific were without adequate housing.

11. In 2008, three global crises converged to threaten development in the Asia-Pacific region, bringing to the fore particularly testing challenges for policymakers: a recession in developed countries, and volatility in both food and fuel prices. Estimates predict that GDP growth rates in the region will fall to 2.8 per cent in 2009, down from 8.8 per cent in 2007. Preliminary estimates indicate that in 2009, unemployment in the region could increase by between 7 million and 23 million workers.<sup>3</sup> Unemployment affects the poor and marginalized population first, mostly because they have less to "cushion" the impact of shocks, such as real assets and savings, but also because they have less influence on economic and political decision-making.<sup>4</sup> High unemployment diminishes disposable income, with a direct impact on people's ability to sustain their lifestyle, including paying their utility bills and maintaining their houses. During 2007 and part of 2008, millions felt the sting of paying 74 per cent more for their energy needs.<sup>5</sup> Although no specific impact has been felt on low-income housing during the current crises, the 1997 crisis and collapse of Asian economies saw a marked increase in slum populations. These negative impacts usually last much longer than the actual crisis. While economic growth was re-established relatively quickly after the 1997 crisis, it took up to 10 years to recover ground lost in the struggle against poverty in some countries.<sup>6</sup>

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<sup>1</sup> For the period 2000-2006. See ESCAP, *Statistical Yearbook for Asia and the Pacific 2008* (United Nations publication, Sales No. E.09.II.F.1).

<sup>2</sup> Ibid. Average ESCAP population growth is 1.1 per cent.

<sup>3</sup> International Labour Office, *Global Employment Trends 2009* (Geneva, 2009), as cited in ESCAP, *Economic and Social Survey of Asia and the Pacific 2009* (United Nations publication, Sales No. E.09.II.F.11), p. 13.

<sup>4</sup> International Labour Office, "Shaping a fair globalization: perspectives and prospects for a decent work agenda" (Working Party on the Social Dimension of Globalization, 2008) (GB.303/WP/SDG/1).

<sup>5</sup> United Nations Development Programme, *Overcoming Vulnerability to Rising Oil Prices, Options for Asia and the Pacific* (United Nations publication, Sales No. E.08.III.B.5).

<sup>6</sup> International Labour Office, "Shaping a fair globalization: perspectives and prospects for a decent work agenda" (Working Party on the Social Dimension of Globalization, 2008) (GB.303/WP/SDG/1).

## 2. Climate change

12. It will take even longer for the region to cope with the manifestations of climate change. A result of intensive energy use and greenhouse gas (GHG) emissions, climate change is emerging as a significant threat to poverty reduction efforts and to people's health and productivity. To a certain extent, GHG emissions are associated with improvements in infrastructure and services, particularly in the housing and transport sectors. In 2004, CO<sub>2</sub> emissions by the transport sector accounted for 13 per cent of world energy-related GHG emissions; among end-user sectors, transport is responsible for the highest growth rate of CO<sub>2</sub> emissions. Furthermore, it is estimated that approximately 9 per cent of GHGs can be attributed to buildings; this figure excludes electricity generation, which contributes about 25.9 per cent of global GHG emissions.<sup>7</sup> The Asia-Pacific region plays an important role in this equation. CO<sub>2</sub> emissions have grown faster here than in any other region of the world, reflecting strong growth in energy consumption. In 2007, Asia and the Pacific contributed about 45 per cent of the global CO<sub>2</sub> emissions, and this is projected to increase if the region stays on the same development path.<sup>8</sup>

13. The impact of climate change is more significant on water services provision, housing and transport infrastructure, and this impact is already being felt as extreme climate variability. The worst effects of climate change are directly related to water, including drought, storms and floods, shrinking glaciers and rising sea level. There is a growing concern that climate change may create thousands of refugees as the sea level rises or the land can no longer sustain rural populations. These "eco-refugees" will increase demand for urban housing. Already, most slums are vulnerable to extreme weather events and they may have to be resettled. With increases in extreme weather events, zoning regulations become essential and new housing has to be made resilient. Transport infrastructure is also vulnerable, particularly to flooding, when the infrastructure runs between highlands and lowlands. With heavy and escalating flood occurrences, traffic movements will be further disrupted. Flooding can also destroy transport infrastructure, as the water weakens the foundations and can cause landslides or cave-ins along roads and highways. Subways and underground infrastructure may also be totally inundated.

### B. Challenges to the provision of services

14. With these concerns in mind, Asia-Pacific leaders endorsed green growth during the fifth Ministerial Conference on Environment and Development in Asia and the Pacific, 2005. The region is already leading the world in quality services provision and green technology. China is currently the world leader in production of solar cells<sup>9</sup> and it was also the most dynamic wind market in 2008, more than doubling installations for the third time in a row, with more than 12 GW of wind turbines installed.<sup>10</sup> Japan and the Republic of Korea have also been at the frontline of resource efficiency and have championed green growth.

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<sup>7</sup> Intergovernmental Panel on Climate Change (IPCC), "Climate change 2007: synthesis report", adopted at the IPCC Plenary XXVII, Valencia, Spain, 12-17 November 2007, available at [www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf).

<sup>8</sup> International Energy Agency (IEA), *Key World Energy Statistics* (Paris, IEA, 2009), accessed from [www.iea.org/textbase/nppdf/free/2009/key\\_stats\\_2009.pdf](http://www.iea.org/textbase/nppdf/free/2009/key_stats_2009.pdf) on 14 September 2009.

<sup>9</sup> See [http://ec.europa.eu/dgs/jrc/downloads/jrc\\_090921\\_newsrelease\\_pv\\_en.pdf](http://ec.europa.eu/dgs/jrc/downloads/jrc_090921_newsrelease_pv_en.pdf).

<sup>10</sup> World Wind Energy Association (WWEA), *World Wind Energy Report 2008* (Bonn, WWEA, 2009), accessed from [www.wwindea.org/home/index.php?option=com\\_content&task=blogcategory&id=21&Itemid=43](http://www.wwindea.org/home/index.php?option=com_content&task=blogcategory&id=21&Itemid=43) on 14 September 2009.

15. Despite this remarkable performance, a worrisome contradiction is at play, as the scale of unmet basic needs is surprising. While in some cases market forces create world-leading companies, in other cases market failures and distorting policies lead to suboptimal conditions for large parts of the population. The housing market is a case in point, as 42 per cent of the total urban population in Asia and the Pacific still lives in houses that are considered inadequate. Adequate shelter, a basic human right, should at least be durable and have sufficient living area, access to clean water and proper sanitation, while its occupants should enjoy secure tenure.<sup>11</sup> Generally, governments provide enabling environments that regulate the land and housing markets and set standards; however, most of those environments make formal housing unaffordable for the poor, creating slums.

16. Even where basic services are provided, quality can be compromised. For example, minimum service standards for drinking-water quality as well as wastewater treatment and disposal have been proposed within the framework of the Millennium Development Goals. These standards mainly cover minimum requirements of accessibility and affordability, but do not capture important conditions of household water security such as quality, reliability, sustainability and convenience for all users.

17. While Asian airlines, shipping companies, seaports and fast trains are setting worldwide quality standards, developing countries in the region still lack basic transport infrastructure. The existing networks need improvements, intermodal transport systems are limited, the accessibility of rural areas is poor and the environmental impact is not taken into account. Without basic conditions in place, people's productivity lags behind, energy is wasted and air pollution accumulates alarmingly.

### **1. Participation, poverty and gender dimensions**

18. ESCAP projects and research have consistently identified lack of stakeholder participation to be among the most important reasons for inadequate quality of service provision. Usually, limited consideration is given to equity in access and community participation in decision-making. In the provision of energy services, many projects fail because they exclude users. Services for poverty reduction require a qualitative understanding of the role that these services play in people's lives and in improving livelihoods.

19. Often, women are disproportionately excluded from such services. In 2006, women were responsible for collecting water in 90 per cent of households in Bangladesh, 86 per cent in Nepal, 84 per cent in the Lao People's Democratic Republic and 82 per cent in India. In East Asia, men tend to take a more active role: 48 per cent of men collect water in Cambodia, 49 per cent in Mongolia.<sup>12</sup> Women are also often responsible for firewood collection, reducing the time and opportunity for other activities, such as education and income generation. Nevertheless, when electricity is extended to households, often it is not used to reduce the drudgery of women, but rather for purposes selected by the men. In addition to socio-economic discrepancies, cultural reasons can often explain why women-headed households have less access to housing.

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<sup>11</sup> UN-HABITAT and ESCAP, *Quick Guide 1: Urbanization: The Role the Poor Play in Urban Development* (UN-HABITAT and ESCAP, 2008).

<sup>12</sup> WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, *Progress on Drinking Water and Sanitation* (UNICEF and WHO, 2008).

20. Access to services is also biased towards rich people. Issues such as land tenure, lack of a voice of the poor and limited access to finance all play a role in this distribution. In some cases, such as Bangalore, India, and Kathmandu, the richest 10 per cent of households were found to receive more than twice as much in water subsidies as the poorest 10 per cent.<sup>13</sup> Poor households find it difficult to pay upfront connection fees and monthly fees, while rich households pay rates significantly lower than their willingness to pay. Increasing block tariffs tend to penalize the poor, who may share the same household connection or whose only water source is a single vendor. It is the poor who usually lack access to electricity, as well. Even if electricity is available in their area, they usually cannot afford it, exacerbating poverty. People living in small island developing States tend to be further burdened, as they often pay considerably more for basic energy services due to the cost of importing primary energy, such as oil, from very far away. Accessibility and road maintenance presents another set of difficulties in developing countries, in particular small island developing States and landlocked and least developed countries.

## 2. Urban-rural discrepancy

21. Problems associated with a lack of access to services become more acute in cities. Urbanization leads to increased consumption rates of energy, water, materials and ecosystem services, and to significant displacements in natural ecosystems. Urban infrastructure systems determine the delivery of services to communities and can support or hamper economic growth. Traffic congestion costs, which can be as high as 6 per cent of GDP,<sup>14</sup> and poor-quality transport infrastructure have been found to negatively influence the competitiveness of urban areas. Urban infrastructure also has immediate and long-term environmental impacts, as it locks cities into consumption and production patterns for decades.

22. Urban planners have to consider the numerous interconnections among housing, water, energy, solid waste, telecommunications and transportation, which have not yet been adequately recognized. First, there is little integration of environmental and social aspects into the stages of infrastructure development, from planning, financing and building to management and operation. Limited coordination also exists among economic, environmental and social aspects in policies and institutions. Another dimension is fragmentation between sectors, which causes distortions in the allocation of public resources. The result is a waste of natural resources, duplication of efforts and inefficient coverage.<sup>15</sup>

23. If inefficiency and fragmentation are concerns for urban infrastructure, the challenges for rural areas are more fundamental. Electricity grids, piped water and sewage systems, as well as modern transportation services, are often too expensive to be extended to remote areas. Decentralized systems for water, wastewater, transport and energy often fail due to limited training and skills needed to maintain and operate new technologies. Failure to consider the role of these services in people's lives leads to poor policy formulation and inadequate service provision. In addition, with the rapid growth during the past three decades driven mainly by industrial activity, agriculture has been neglected. Stagnant agricultural productivity, lack of rural infrastructure, incomplete land reform and poor basic service delivery are some of the

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<sup>13</sup> Transparency International, *Global Corruption Report 2008* (New York, Cambridge University Press, 2008).

<sup>14</sup> Report on The First Asia-Pacific Mayors' Forum on Environmentally Sustainable Urban Infrastructure Development, Ulsan City, Republic of Korea, 21-23 April 2008.

<sup>15</sup> ESCAP, "Report on the Expert Group Meeting on Sustainable Infrastructure Development in Asia and the Pacific", Bangkok, 11-13 June 2007.

manifestations that form a vicious circle of agricultural neglect.<sup>16</sup> Providing better services to rural areas will not simply help cover the basic needs of the rural population; it will also lead to the multiplier effect of increased agricultural production and will control increasing income inequality, thus improving social cohesion.

### 3. Carrying capacity

24. Limitations on carrying capacity are often linked to poor provision of services. In both urban and rural areas, environmental degradation associated with poor service provision is affecting the quality of growth. Poor sanitation practices and inadequate waste disposal systems in cities take a large toll on the environment. In rural areas, poor farming practices contribute to water pollution and the depletion of natural resources. Although environmental legislation is usually in place, practices often blunt enforcement.<sup>17</sup> In many countries, water pollution has become a significant problem in areas with rapid population increase.<sup>18</sup> For example, in China, 700 million people drink water contaminated with animal and human waste and estimates suggest that poor quality water accounts for 60,000 premature deaths each year.<sup>19</sup> Water pollution from the above causes has thus increasingly affected the carrying capacity of water ecosystems, as clean water is locked further and further away from potential users, for example in the centre of lakes when the band of polluted water, usually concentrated near the shore, expands. This can hamper future opportunities for growth.

25. The pressure for development results in keener competition for resources. For example, an average of 49 cubic metres of water per capita per year is consumed in Asia and the Pacific. Further growth and quality-of-life improvements could bring this level higher, closer to the European or Latin American averages of 97.7 and 86.3 cubic metres respectively, causing additional stress to the dwindling water resources available for development. According to ESCAP research, the rate of withdrawals from internal renewable water resources in the region already has been running very high during the past three decades, up to 50 per cent in some countries. In India, groundwater depletion for irrigation is emerging as a serious threat to development. To meet growing food needs, the International Water Management Institute and the Food and Agriculture Organization of the United Nations predict a further increase in global water withdrawals. According to estimates, farmers will need to divert between 10 and 57 per cent more water to agriculture in South Asia by 2050, and between 16 and 70 per cent in East Asia.<sup>20</sup> With these and other competing needs, the pressures on water resources will be high.

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<sup>16</sup> ESCAP, *Economic and Social Survey of Asia and the Pacific 2008* (United Nations publication, Sales No. E.08.II.F.7), p. 124.

<sup>17</sup> Transparency International, *Global Corruption Report 2008* (New York, Cambridge University Press, 2008).

<sup>18</sup> The Water Environment Partnership in Asia (WEPA) ([www.wepa-db.net/](http://www.wepa-db.net/)) under the Institute for Global Environmental Strategies (IGES), Ministry of Environment, Japan, has developed a database on the water environment in 11 countries of the Asia-Pacific region. WEPA findings indicate that while in some countries water quality has improved in general, there are still severe pollution problems in some areas, especially in urban and peri-urban areas (see WEPA, *Outlook of Water Environmental Management Strategies in Asia* (IGES, 2009)).

<sup>19</sup> Transparency International, *Global Corruption Report 2008* (New York, Cambridge University Press, 2008), p. 23.

<sup>20</sup> International Water Management Institute (IWMI), Food and Agriculture Organization of the United Nations (FAO) and Asia-Pacific Water Forum, *Revitalizing Asia's Irrigation* (IWMI and FAO, Colombo, 2009). The figures depend on whether optimistic or pessimistic assumptions are made.



26. Energy resources are also under pressure. Rapid rates of motorization, led by increasing incomes per capita and demand for mobility, already have a significant impact on energy consumption. In the United States of America, for example, there are about 800 motor vehicles in use per 1,000 inhabitants.<sup>21</sup> In Europe and some Organization for Economic Cooperation and Development countries, that number is 500. These figures contrast markedly with those of many developing countries in the ESCAP region, particularly those that are more populous; India, for example, has 7.8 passenger cars in use per 1,000 inhabitants (2003); China 16.2 (2005), Indonesia 24.3 (2005), Malaysia 19.1 (2004) and the Philippines 30.5 (2005). Per capita household electricity consumption also varies significantly across the region, but, in 2005, it was almost 10 times more for high-income economies compared to the Asia-Pacific average. This regional average doubled between 1990 and 2005, from 163 kWh per person to 315 kWh per person. For high-income countries, the household electricity consumption per capita rose from 1,325 kWh per person in 1990 to 2,245 kWh per person in 2005. By comparison, the least developed countries consumed 14 kWh per person in 1990 and 44 kWh per person in 2005. Although this depicts a great improvement in electricity access for least developed countries, it still clearly shows the vast disparity. It also suggests the vastness of expected future demand increases, if the current development path is followed by least developed countries.

#### 4. Market and financing obstacles

27. Providing these services to everyone will also require significant financial resources. Research shows that \$25 can finance basic access to safe water, improved hygiene and sanitation for one person with unmet needs.<sup>22</sup> For Asia and the Pacific, this means that between \$16 billion and \$32 billion of investment is required to cover unmet needs. Meanwhile, studies in South-East Asia estimate that the average cost to society of lack of sanitation is about \$21 per person per year.<sup>23</sup> This cost is higher than the estimated \$11.10 per person it would cost to provide sanitation facilities for those with unmet needs.<sup>24</sup> Although the choice for policymakers seems obvious, few are aware of the socio-economic rationale behind such investments. Facing competing demands from many sectors, policymakers have paid less attention to these goals. For the poor, a combination of lack of awareness of the costs and little or no access to finance makes it impossible to invest \$25 per person for water and sanitation.

28. Regulatory systems are not always in place to help curtail costs for consumers. It is expected that greater transparency in water-sector management could reduce water network connection costs by more than 30 per cent. This could reduce the price tag for achieving the Millennium Development Goals for water and sanitation by a staggering \$48 billion.<sup>25</sup> Good regulatory systems can also prevent private vendors, cartels or water mafias from interfering with network extension or causing system disruptions.

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<sup>21</sup> Department of Economic and Social Affairs, *World Statistics Pocketbook 2007* (United Nations publication, Sales No. 08.XVII.5).

<sup>22</sup> WaterAid website, Statistics, available at [www.wateraid.org/uk/what\\_we\\_do/statistics/default.asp](http://www.wateraid.org/uk/what_we_do/statistics/default.asp).

<sup>23</sup> The cost is estimated at \$9 billion in Cambodia, Indonesia, the Philippines and Viet Nam alone (middle scenario). See WSP, *Economic Impacts of Sanitation in Southeast Asia* (World Bank, Jakarta, 2008).

<sup>24</sup> This assumes that the \$25 cost of providing both basic water and sanitation infrastructure to one person with unmet needs is borne across society, since everyone is affected by the lack of sanitation facilities.

<sup>25</sup> Transparency International, *Global Corruption Report 2008* (New York, Cambridge University Press, 2008).

29. Initial infrastructure investment is also a significant limitation in many developing countries where foreign investment and domestic resources are scarce. An important factor holding back this investment is limited cost recovery. With insufficient revenues to cover the operations and maintenance of existing infrastructure, network expansion and infrastructure upgrading becomes an unattainable goal. Resources are wasted and coverage remains poor. Furthermore, abrupt and poorly communicated rate increases for toll roads, water, and energy services can place an unequal burden on the poor, thus leading to social unrest and feelings of unfairness. For energy services, the expense of extending the grid to remote locations makes it uneconomical for utilities, especially if prospective customers cannot pay.

### **C. Summary of challenges**

30. When all these resource, environmental, financial and regulatory challenges converge, the result is poor coverage and infrastructure that does not take into account the needs of the users, particularly the poor. The traditional top-down approach of policymaking and planning at the national level, while aimed at raising the living standards of the poor, has in many cases failed to address the needs and priorities of the intended beneficiaries. Often, all these obstacles are aggravated by poor coordination between the different levels of subsidiarity (regional, national and local).

31. The current economic downturn poses significant challenges but also presents opportunities for better provision of water, sanitation, transport, housing and energy services. Amidst the dim scenarios, one topic has advanced from a distant issue to a discernible opportunity: the transition to the low-carbon economy. Consumers, industries and even countries will have to abandon current forms of carbon-based consumption and switch to new, less-polluting alternatives. Clear goals are needed for decoupling resource use from economic development and environmental degradation. Already, many countries recognize the benefits of developing clean energy industries and transport options, which not only reduce dependence on fossil fuels, but generate economic growth and employment opportunities.

32. Vast sums of capital will be required to fund infrastructure that leads to emissions reduction. Restrained bank lending has been an obstacle to private corporations' ability to grow out of the crisis. Governments now have the obligation and opportunity to step up to their roles as providers for the poor and as enablers of prosperity and growth. Through eco-efficient infrastructure, green taxation and budgetary reform, leaders in Asia and the Pacific can provide much needed services to all their citizens and ensure the sustainability of resources for future generations.

## **II. EXISTING EFFORTS FOR GREENER PROVISION OF SERVICES**

### **A. Regional progress**

33. In various studies, expert group meetings and workshops, ESCAP member countries have acknowledged and analysed these challenges to providing water, sanitation, energy, transport services and housing to all. In response, regional trends have emerged in several countries, advocating for better integration of services provision into infrastructure development. These trends have enabled more environmentally sustainable socio-economic development, as well as various related regional initiatives and better coordination between the three levels of subsidiarity—regional, national and local.

34. With green growth as a guiding principle, many strategies have been promoted to help address the vast unmet needs. The Baku Initiative on Energy Efficiency and Conservation reflects regionally adopted principles for sustainable consumption and production, as advocated by the green growth approach. The Asia-Pacific Water Forum has also enabled closer regional coordination in making issues of water and sanitation higher priorities on the political agenda. The Asian Highway and the Trans-Asian Railway are aimed at connecting people and transporting products. The provision of housing has also seen progress through various regional initiatives. A good example is the Asian Coalition for Community Action, a programme to upgrade slums and provide housing for the poor through community processes.

### **B. Examples of commitment at the national level**

35. The recent progress in providing services to people is attributable to consistent government efforts. Visions are already being translated into specific policies, with increased transparency and improved regulatory environments. In 2006, the China Water Pollution Map, a public, searchable, online database that records water pollution by more than 2,500 enterprises, was launched. The Water Supply Authority in Phnom Penh made significant progress in improving transparency and service delivery to the poor by improving bill collection services, subsidizing the connection fees and bills of the poorest people, installing meters, establishing inspection teams and enforcing penalties for illegal connections.<sup>26</sup> To allow private sector participation in electricity provision, the Government of Indonesia enacted a new electricity law in 2009. The law requires the Government to put an end to the power institution's monopoly on electricity distribution, allowing the private sector to sell electricity directly to consumers. In housing, several national programmes have helped improve living conditions for thousands. Among those that stand out are the Baan Mangkong programme in Thailand, the Khuda ki Basti and Orangi pilot projects in Pakistan, the Trading in Transferable Development Rights initiatives in India, the Kampung Improvement Programme in Indonesia and the Community Mortgage Programme in the Philippines. ESCAP has worked to disseminate the lessons learned from these initiatives to more development actors and governments.

36. Additionally, some Asia-Pacific countries have already introduced integrated and eco-efficient approaches to infrastructure development. In particular, the concept of the eco-city has been advocated in various regional forums and adopted by visionary local governments. Eco-city approaches to urban development can increase the quality of life and growth significantly, adding value to property, creating employment opportunities and increasing socio-economic benefits for all. In search of a new development paradigm, Bhutan, China, Indonesia, Malaysia, Mongolia, Nepal, the Philippines and Viet Nam established country teams to promote eco-efficient water infrastructure development. The Philippines and Indonesia have started the process of incorporating eco-efficiency dimensions into their National Development Plans. Specific eco-efficiency measures on river rehabilitation and storm-water management are in the process of being adopted in Nepal, the Philippines and Viet Nam. ESCAP has already identified and helped disseminate numerous good practices, including Water Sensitive Urban Design in Australia, the Wastewater Reclamation and Reuse Practice for Agriculture and the Taehwa River Development in the Republic of Korea, and the Singapore Active, Beautiful and Clean (ABC) Waters Programme (see box for two specific examples of such initiatives). In India, the Prime Minister's Rural Roads Scheme, funded entirely by the central Government, was launched with the objective of boosting rural connectivity. Similar schemes exist in other countries. China, for example, constructed about 2 million kilometres of roads classified as rural during the period 1996 to 2004.

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<sup>26</sup> Ibid.

### **Examples of eco-efficiency**

Starting from the Kallang River Basin, Singapore cleaned waterways by relocating the sources of pollution, such as the hawkers, squatters and illegal factories along the river, into centrally managed, dedicated areas.

As a result, catchment areas have increased from half of the total area in 2006 to two thirds in 2009. Today the eco-efficient concept is embraced by city planners. The city-State is being transformed into a garden city, and its infrastructure is being developed in an integrated, connected and multifunctional manner. For example, Marina Barrage at the mouth of the Kallang River will not only provide an area for recreation and flood control, but will also be a source of fresh water, once the desalinization process is completed.

Putrajaya, the administrative capital of Malaysia, covers 4,931 hectares which were previously mostly palm plantations. The city has prioritized planning, including the integration of infrastructure and service utilities.

Lush greenery and botanical gardens are spread across the landscape, criss-crossed by large bodies of water and wetlands created by the embankment of the Chuah River. The wetlands are now rich in biodiversity and attract north-south migratory birds. The management and maintenance of the water resources are based on the integrated river basin management principle, essentially an eco-efficiency concept. The project was started in 1993 and the federal capital officially moved in 1999.<sup>a</sup>

<sup>a</sup> See [www.fauzan.my/2009/09/](http://www.fauzan.my/2009/09/).

37. The role of local communities and civil society organizations has been instrumental in voicing the needs of people for improved services and adequate housing. Many countries have adopted innovative community-based approaches to addressing housing and energy needs. Several rural electrification projects have been based on decentralization, such as setting up rural electric cooperatives (Bangladesh) and allocating rural electrification to a department of the national distribution company (Thailand). Another successful example of community participation is the Pro-Poor Public Private Partnership project in Cinta Mekar, Indonesia. In this small community, a small-scale hydropower public-private partnership was set up to provide electricity to all. The project incorporated community participation, awareness creation, education and income generation for social development.<sup>27</sup> Common success factors of such approaches include a high degree of autonomy for local governments, clear performance-tracking systems, involvement of local communities and good customer service.

### **III. MATTERS CALLING FOR THE ATTENTION OF THE COMMITTEE**

38. Emerging from an economic slump, the region needs infrastructure to support and sustain growth. Research shows that productivity improvements in service industries such as electricity supply and telecommunications were important drivers of overall productivity during the second half of the previous century.<sup>28</sup> As all businesses use local services, electricity, water and sanitation and transport quality influence the overall attractiveness of investments that lead to growth. In the current global economic environment of risk aversion, investors will be looking for political

<sup>27</sup> ESCAP, *Lighting up Lives: Pro-Poor Public Private Partnerships (Energy component, Indonesia)* (Bangkok, ESCAP, 2004).

<sup>28</sup> McKinsey Global Institute, "Domestic services: the hidden key to growth" (December 2005), accessed from [www.mckinsey.com/mgi/reports/pdfs/domestic\\_services/Domestic\\_Services.pdf](http://www.mckinsey.com/mgi/reports/pdfs/domestic_services/Domestic_Services.pdf) on 14 September 2009.

stability and high quality local services as well as the availability of potential natural resources. Private investment is very active in sourcing for eco-efficient concepts and processes in the hope of ensuring sustainability. However, the right economic, policy and political climate is needed to attract private investment to developing countries. Technical, economic, regulatory and environmental risks related to the political stability of a country, the rate of return on investment, and the presence of a stable and consistent technology policy, tend to dissuade private sector participation.

39. Lessons of the past and technological advances point to a new direction and a different kind of infrastructure, which is environmentally sustainable and socially inclusive. The need for economic growth and the imperative of providing housing, as well as adequate water, sanitation, energy and transport services to everyone in Asia and the Pacific is prompting a renewed interest in green growth, especially as the world is reaching peak extraction levels for many of its resources, including many minerals, fossil fuel and water. For effective and sustainable provision of services, efforts need to be made within a green economy and eco-efficiency framework and infrastructure should be developed in an integrated manner.

#### **A. Key policies: green growth and inclusive development**

40. Infrastructure has a significant impact on the way societies produce and consume. To date, infrastructure projects have been assessed on short-term economic valuation, a narrowly defined cost-benefit analysis. Immediate capital costs and political considerations have underpinned many new investments and costs to the environment have not been internalized. Green growth approaches propose to consider long-term socio-economic conditions, concerns of the poor, future generation needs, resource limits, and impact on the environment. Utilizing smart planning and eco-efficient principles in the initial construction phase helps avoid locking economies into a wasteful consumption pattern for decades.

41. In most developing countries, investment in infrastructure has been altogether curtailed by the lack of resources. The economic downturn threatens to aggravate this setback, but stimulus packages can offer an opportunity for greening the recovery. They can be supported by green taxes, budget reform and measures to promote demand for eco-efficient products and services, particularly those produced in rural areas.

42. Sustainable consumption and production goals have already emerged in the green agendas of Governments. In order to better manage demand, China plans to reduce to 125 cubic metres the amount of water used for each 10,000 yuan of GDP by 2020.<sup>29</sup> In India, the National Water Mission set a goal of a 20 per cent improvement in water-use efficiency through pricing and other measures. Through its Green Mark Incentive Scheme, Singapore encourages the adoption of various green building technologies to achieve a sustainable built environment by improving energy efficiency, water efficiency, indoor environment quality and environmental management. Such initiatives need to be mainstreamed in policymaking.

43. Investment in infrastructure can spur development. The revitalization of historic districts that have decaying infrastructure may generate employment in the tourism or retail sectors. Where rivers are rehabilitated and environment is protected, property values can increase and additional economic benefits and social services can be made available to locals and tourists. Investment strategies, such as the greening of

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<sup>29</sup> Jason Subler and Li Jiansheng, "China vows to squeeze 60 percent more out of its water", Reuters, 15 February 2009, accessed from [www.reuters.com/article/environmentNews/idUSTRE51E0BB20090215](http://www.reuters.com/article/environmentNews/idUSTRE51E0BB20090215) on 19 July 2009.

capital and financial markets, and the swapping of debts for re-investment in natural and human capital can also contribute to social support systems for the most vulnerable while greening economic growth. Lessons can also be applied in the agricultural sector, which should be strengthened based on eco-efficient rather than intensive models of agriculture.

44. Integrated design of infrastructure networks offers enormous opportunities for various synergies and savings in the provision of services. Bundling services such as water, electricity, sanitation and education multiplies benefits to the community. Synergies among land use and transportation planning, affordable housing, water and energy are not difficult to see. Integrated infrastructure could deliver multiple benefits at a lower cost. Most gains could be made at the initial macroplanning phase when long-term patterns of infrastructure development are established. To achieve these gains, the planning and redevelopment of infrastructure systems should be consistently coordinated across various national and local government agencies and sectors.

45. Planning for residential development is a key element of an integrated approach. Energy efficiency increases through the use of new technologies and waste-to-energy approaches. Housing values can also increase with proximity to transport services, particularly for the poor. Development of eco-efficient water infrastructure could therefore be planned in conjunction with the development of energy, transportation, sewage and disaster preparedness structures and networks. Even within the same sector, opportunities for integration are abundant. For example, integrating water supply and sanitation solutions is a proven way of delivering sanitation services, since willingness to pay for wastewater systems alone is quite low.

46. Regulation also has an important role to play, particularly for energy and water services. Accessibility for all citizens, adequate service quality, high operational efficiency, service reliability, affordability and supply security are all issues that an empowered and independent regulator can address effectively. Where water provision is inadequate, small private-service providers and informal vendors fill the gap. Currently, many of these actors operate outside of the regulatory system. The quality of services they deliver is uncontrolled, prices are unregulated and the impact on the environment is not taken into account. It could be to the benefit of consumers—particularly the poorest—to consider regulating these actors formally. Linking these providers to utilities will require innovative solutions, such as providing small amounts of investment finance, introducing appropriate regulatory mechanisms and adopting strategies for eliminating illegal and abusive activities, without driving such small providers out of business.<sup>30</sup> For electricity provision, successful solutions include standardizing system design and providing a lifeline tariff to the poorest consumers. Encouraging and supporting private independent power producers and rural electricity cooperatives formed under the leadership of local communities and non-governmental organizations (NGOs) is another answer to the high cost structure of large utilities.

47. Institutional changes can widen people's access to services. National and local governments, rural communities, NGOs, the private sector and international organizations need clearly defined roles for a coordinated and integrated effort to provide required services. Overarching policies are usually developed at the national level, but decentralization is an important instrument of translating the policies into achievements. Mandates at all subsidiarity levels need to be clearly defined, as do feedback and accountability, both from the bottom up and top down, to allow

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<sup>30</sup> Water and Sanitation Program, *Guidance Notes on Services for the Urban Poor: A Practical Guide for Improving Water Supply and Sanitation Services* (World Bank, 2009).

flexibility. Needs for services should be considered within the overall context of community life, and policies and projects should be integrated with improvement efforts related to health, education, agriculture and job creation. In a 2008 ESCAP-led survey on sanitation, “slow-moving” institutions, such as social norms and practices, were identified as playing the most important role in achieving sanitation goals. Civil society was also recognized as the most important driver of change.<sup>31</sup>

48. An integrated framework for eco-efficient infrastructure needs to be developed in tandem with the establishment of a firm foundation for effective provision of services. At the core of this effort is the strengthening of inclusive, programmatic development approaches and the promotion of regional mechanisms.

## **B. Programmatic approaches for regional cooperation**

### **1. Eco-city programme**

49. Opportunities for integration are better exemplified in urban landscapes, where resources are used more intensively and distances are small. Cities in Asia and the Pacific are now at the front lines of growth and of managing change.<sup>32</sup> Attempts to form eco-cities have already been made in the region. Eco-cities are defined as cities that create economic opportunities for their citizens in an inclusive, sustainable, and resource-efficient way, while also protecting and nurturing the local ecology and global public goods, such as the environment, for future generations.<sup>33</sup> However, many programmes in the past have failed for political, financial or other planning-related reasons. By setting very ambitious goals, they created a vast space for profiteering, while excluding the poor. Instead, ESCAP proposes a context-specific, incremental approach to building inclusive and sustainable cities, starting from the specific resource base and stage of development of the target country. Although there are many pathways to an eco-city, city planners are already embracing universal principles, such as public participation, inclusiveness, integration, affordability and respect for the environment. The time is ripe for policymakers to streamline these principles, boldly enforce related regulations and embrace transparency in decision-making.

50. As evidenced by the integrated Storm Water Management and Road Tunnel (SMART) project in Kuala Lumpur, solutions that tackle more than one problem can improve quality of life, particularly in highly urbanized areas. Before a city reaches this stage, it is important to manage the river basin and corridor effectively. Ex ante investments, both in resources and capacity, have been neglected by policymakers. Good management should be balanced between development and adaptive solutions, to obviate expensive retrofitting measures and to promote sustainable urban development. A change in mind-set is needed.

51. The potential of achieving sustainability through existing infrastructure is also sometimes glossed over, despite lower investment costs. Trends tend to highlight technological innovations, especially in energy. However, consideration should be given to how affordable these innovations are. For example, the scaling up of wind power is constrained by the cost of blade technology as well as spatial limitations, that is, where such wind power can be situated. The current socio-economic needs of developing countries require careful consideration of softer approaches to sustainable

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<sup>31</sup> ESCAP, *Institutional Changes for Sanitation* (United Nations publication, Sales No. E.09.II.F.15).

<sup>32</sup> ESCAP calculations indicate that about \$155 billion per year needs to be invested in cities in Asia and the Pacific to sustain current levels of gross domestic product (GDP) growth (estimated at about 4 per cent per year).

<sup>33</sup> See <http://go.worldbank.org/GOE82TSRO0>.

development, which do not require expensive new infrastructure. A combination of policy-based interventions, institution building and work on existing physical structures could prove a more efficient route to inclusive and sustainable development.

## **2. Providing urban services to rural areas**

52. A persisting challenge for city planners is migration from rural areas and greater income inequality. Improving living conditions in rural areas, where most of the underserved population lives, could offer a better response to the emerging problems associated with uncontrolled urbanization. As noted above, affordability is an important design challenge, as the intended beneficiaries live in remote settings and usually have a low ability to pay. A variety of mechanisms exist to enhance the delivery of transport, water and energy services in rural areas. For example, governments can support connections for piped water, sewage treatment and rural electrification by reducing initial connection charges as well as by spreading such charges over several years or rolling them into the tariff. Other possible financing mechanisms include green taxation or bartering schemes, in which part or all of the operating and maintenance costs are covered by in-kind contributions. Credit for services may also be provided by dealers, development banks or microfinance institutions.

53. Where network expansion is not an immediate possibility, integrated and decentralized area-based approaches to address local needs are necessary. These solutions require the use of locally available natural, human and institutional resources. They also require capacity-building, so that local communities can formulate programmes and implement them. Providing options is also important. If offered the choice to purchase small systems initially and “upgrade” or expand these services later, rural residents are less likely to feel excluded from development that is taking place in cities.

54. The presence of other services, such as roads and communications, as well as health and education facilities, markets, buildings, equipment and skilled personnel, maximizes the economic and social benefits of energy and water services in rural areas. For instance, energy services intended to increase agricultural productivity can be facilitated by farm-to-market roads. In general, an enabling environment can stimulate the market for energy, water, sanitation and transport services in rural areas and help meet needs faster and more efficiently.

## **3. Regional cooperation**

55. Given the numerous difficulties, national efforts need to ensure continuity and consistency with the various regional platforms of action, such as green growth. The most important challenge is building regional consensus to ensure the security of resources utilization. With the region’s natural resources depleting fast, extraction will become increasingly costly and potentially dangerous to ecosystems and future generations. Water, energy and housing security will require very careful planning of scarce and often shared resources. In order to avoid the pitfalls of the past, there is need for high-level political coordination.

56. Providing services to all is at the core of the regional objective of inclusive development. Experiences of regional cooperation in the provision of services can offer guidance and resources for both national- and local-level programmes. Strong regional cooperation mechanisms can also help establish the linkages between existing regional and national platforms and frameworks, as well as draw more political attention to the provision of services to the rural and urban poor.



57. ESCAP has been working closely with Governments and partners to promote a regional body of high-level coordination in the management of water resources, namely, the Council of Ministers on Water Security. Regional cooperation is also needed in order to improve coordination between different levels of subsidiarity, through the exchange of good practices and lessons learned, as well as through regional poverty reduction agendas. Regional groupings and existing engines such as the Pacific Islands Applied Geoscience Commission (SOPAC), the Mekong River Commission and the Association of Southeast Asian Nations should be capitalized on to encourage regional cooperation.

58. With fast developing technological advances, including innovative, decentralized solutions, there is a need for more capacity-building and South-South cooperation to share knowledge on cost-effective and sustainable service delivery. Green solutions need to be researched, identified and disseminated in order to satisfy the imperative of growth and universal services provision, without compromising precious natural resources.

59. The Committee may wish to deliberate on these issues and provide the secretariat with guidance on the direction of its future work.

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