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STATE OF THE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT POLICY

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REVIEW OF THE STATE OF THE ENVIRONMENT IN ASIA AND THE PACIFIC

Note by the secretariat

SUMMARY

The analysis of the state of environment in Asia and the Pacific demonstrates that overall environmental conditions continue to deteriorate. This can be seen in degraded croplands, falling water tables, diminishing forests, unprecedented numbers of forest fires, solid waste build-up, pollution of land and water, and declining biodiversity resources. In this gloomy scenario, hopeful trends are the decline in birth rates, increased life expectancy, somewhat reduced poverty levels, improved nutritional levels, growing awareness and public participation, an improved policy environment and the enhanced role of the private sector in environmental protection and the promotion of sustainable development. The principal environmental challenge in the twenty-first century is policy reform and its effective implementation in both cross-sectoral and sectoral areas. Issues such as the alleviation of poverty and promotion of equity, the promotion of growth while safeguarding natural assets, the promotion of eco-efficiency and countering the negative impacts of globalization, and sustainable management of natural resources and various sectors of the economy constitute the most daunting cross-sectoral and sectoral challenges.

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INTRODUCTION

1. The pressure on natural resources and the environment in Asia and the Pacific is almost overwhelming. Environmental degradation can be discerned in the form of atmospheric pollution, depletion of biodiversity, drying of aquifers, and pollution of aquatic and marine ecosystems, as well as the increasing load of wastes, including hazardous wastes. During the past few years, the following major factors have contributed directly to the excessive pressure on the environment and natural systems in Asia and the Pacific: rapid population increase, including urban migration; rising economic output; the prevalence of a high consumption/high waste lifestyle for some, associated with increasing affluence; and lack of access to resources for a vast majority. The negative effects of globalization, involving trade, investments and debts, are an additional cause that has struck the environment harshly in recent years.

2. The population of the region more than doubled from 1.7 billion in 1960 to 3.7 billion in the year 2000. The accompanying demands of the burgeoning population have largely been satisfied through increased economic output, which has quadrupled in the last 20 years. The growth has no doubt assisted in reducing poverty, but a large part of this growth in output was at the expense of natural resources and the environment. The adoption of unsustainable consumption patterns is also becoming a problem. For example, with one car for every two persons, as in the United States of America today, in 2025 the region would have 2.5 billion cars, a fleet that could prove disastrous to the environment. Similarly, to replicate the pattern of grain consumption as evidenced in the United States, the regional requirement would be 4.5 billion tons of grain, the harvest of more than two planets at earth's current output levels. Increasingly, while the affluent overconsume, the poor are compelled to cut trees, grow crops on steep slopes or hazard-prone land and exploit fragile resources to meet their basic needs for survival. The negative impacts of globalization are evident in trade-related loss of natural resources, the heavy burden of debt repayment and abrupt investment shifts that have negative consequences for the environment.

3. The five root causes mentioned above have basically resulted from policy and institutional failures. For too long, the attitude of the region's policy makers of "grow now, clean up later" and "economic growth will automatically reduce poverty" has resulted in inadequate attention being paid to the environmental and social impacts of rapid growth. Popular demand for a cleaner environment responds only slowly to rising incomes, and even then, private markets do not respond, so the lack of government concern on pollution and resource degradation in the past was a major problem.

I. ENVIRONMENTAL CONDITIONS AND TRENDS

4. Although the extent and nature of the pressure on the environment varies depending on demographic factors, resource endowments and style of development, an overall deteriorating trend has been observed as the most common denominator in all environment media of the region from land, forest and biodiversity to inland water, marine and coastal environment and the atmospheric ecosystem.

A. Land and associated resources

5. Data on the regional extent of land degradation and its toll on productivity are worrisome. It is estimated that approximately 214 million hectares of cropland, equal to 37 per cent of today's regional cultivated area, has been damaged to some degree by agricultural mismanagement since the Second World War. As well as croplands, forested lands have been degraded, with damaged areas of about a fourth (356 million ha) of forests and 281 million ha of permanent pastures, a fifth of the total.

6. In the most severe or extreme cases, land degradation has been irreversible, either beyond restoration or requiring major engineering work to restore its productivity. This loss of an area of 460 million hectares (13 per cent of all cultivable land), equivalent to the size of India and the Islamic Republic of Iran together, is serious for a region already experiencing tremendous pressure for productive land. Data on the magnitude of arable land lost are not available separately but, assuming a modest 13 per cent loss, it amounts to 46 million hectares, which is more than twice the cultivated land of Pakistan. If this land was producing a grain yield at the average rate of the 1990s, it could feed about 650 million people. In an era of tight food supplies, this loss of production capacity is alarming.

7. Deforestation is another critical problem in Asia and the Pacific. Findings of the Food and Agriculture Organization of the United Nations (FAO) indicate that the annual deforestation rate in the region increased from 2 million hectares during the period 1976-1981 to 3.9 million hectares in 1981-1990, but declined slightly to 3.6 million between 1990 and 1995. Among the tropical regions of the world, the Asian and Pacific region has the fastest rate (1.2 per cent/year) of deforestation, the fastest rate of commercial logging and the highest volume of fuelwood removals. On the positive side, the region has experienced a faster rate of reforestation than any other tropical region (increasing plantation area by 2.7 million hectares per year). The degradation of forests has also made them vulnerable to fires. Between 1996 and 1998, uncontrolled fires swept through forests in China, Indonesia, the Russian Federation and Turkey, affecting vast areas. The estimated health cost of forest fires and associated haze to the people of South-East Asia alone was US\$1.4 billion.

8. The Asian and Pacific region boasts a rich biodiversity; seven out of the 17 megadiversity countries of the world, listed by Conservation International, are located in the region; these not only have a wealth of biodiversity but are also noted for their high rates of species endemism. The biodiversity in the region, however, has been under serious threat as a result of habitat modification, fragmentation and loss, overexploitation of resources, and the introduction of exotic species. According to the 1997 Red List of Threatened Plants of the International Union for Conservation of Nature and Natural Resources (IUCN), more than 10,000 higher plant species and over 3,000 vertebrate animal species in the Asian and Pacific region are threatened. The genetic diversity is also diminishing in agricultural crops and domesticated livestock. Over the short term, this means enhanced vulnerability to pathogens or pests and declining resilience to drought or temperature extremes. Over the long term, it means loss of well-adapted genetically variable varieties from the fields.

9. Protected area systems in the region are limited in extent and constitute only 5 per cent of the total area against the IUCN guideline of 10 per cent. Moreover, many important habitats are either not represented or under-represented in the present system of protected areas. The resources allocated to manage protected areas have been estimated as being two to three times lower than what is required for their effective management.

B. Water resources

10. Although the inhabitants of the region have struggled with seasonal water shortages for centuries, the spreading scarcity of fresh water is very serious as the region enters the new millennium. Massive withdrawals from rivers, lakes and underground reservoirs in several countries have led to an imbalance between supply and demand. Sectoral competition and conflicts have become critical. Irrigation for agriculture, for example, has led to a significant increase in food production but has also resulted in substantially diminished supplies of water for other end-users. Owing to excessive withdrawal and over-pumping, the volume of water in some rivers and lakes has become depleted while water tables in underground aquifers have sunk, leading to land subsidence and saltwater intrusion.

11. Unfortunately, the growing scarcity is also being accompanied by deteriorating water quality as a result of pollution and environmental degradation, with serious consequences for aquatic ecosystems, human health and welfare. Levels of suspended solids in Asia's rivers have almost quadrupled since the late 1970s and rivers contain typically four times the world average and 20 times the levels recommended by the Organisation for Economic Cooperation and Development (OECD). Water pollution caused by organic matter, pathogenic agents, and hazardous and toxic wastes is another serious problem. Biological oxygen demand in Asian rivers is 1.4 times the world average. Asia's rivers contain three times more bacteria from human waste (faecal coliform) than

the world average, and over 10 times the OECD guidelines. The reported median faecal coliform count in Asia's rivers is 50 times higher than the World Health Organization (WHO) guidelines. Severely polluted water bodies have led to increasing health problems and the proliferation of diseases in many areas of the region. Environmental damage to aquatic ecosystems through loss of biodiversity, sedimentation, siltation and unsound dam construction has also contributed to large economic losses through lost production and increased costs of control or remedial measures. These problems could become more acute in the future unless effective policy and precautionary measures are undertaken effectively on an urgent basis.

C. Marine and coastal resources

12. The most pressing threats to the marine and coastal environment in the region are species over-exploitation, pollution, habitat degradation and climate change. Their impact is exacerbated by poorly planned commercial activities and coastal population growth. According to FAO, several of the region's most important fishing areas and almost two thirds of the major fish species are either fully or over-exploited. Fishermen, with their modern gear, are now capable of wiping out the entire population of a variety of fish. For example, in South Pacific, the catch of orange roughy has plummeted by 70 per cent in just six years. In terms of pollution, land-based activities contribute an estimated 44 per cent of pollutants to the marine environment. An additional 33 per cent is contributed by airborne pollution. Nutrient-rich sediments, fertilizer and human waste, toxic heavy metals and synthetic chemicals are other sources of marine pollution. As a result, blooms and diebacks such as red tides have become increasingly common in the last 20 years, with major outbreaks in Australia, China, Japan, New Zealand, the Philippines and the Republic of Korea. This also causes tremendous economic losses; for example, in 1997, toxic blooms wiped out US\$10 million worth of high-value fish from Hong Kong, China's mariculture industry, not to mention innumerable incidences of human morbidity.

13. Degradation of the coastal habitat has been manifested through loss and damage to such ecosystems as coral reefs, seagrasses and mangroves as a result of pollution, over-exploitation in filling, dredging, and hydrologic disruptions and coastal alterations. Finally, stratospheric ozone depletion and potential climate change may also take their toll on oceans and seas. One of the early signs of human-induced climate change is coral bleaching. Massive bleaching of corals was reported throughout the tropics in the spring of 1998, including, for the first time, among reefs in the Indian Ocean. This bleaching event has been linked to a reported increase in sea surface temperature of 1°C attributed to El Niño, although other instances were linked to a complex mix of monsoonal, oceanographic and climatic variables.

D. Atmosphere and related ecosystems

14. Depending on the rate and extent of warming, the global sea level may rise 5-95 centimetres by 2100, up to five times as much as during the last century. The human cost of this could be enormous because the region has long coastlines, a large amount of productive land in low-lying areas and large concentrations of people in coastal cities or near the sea. The densely populated river deltas of Bangladesh, China, Indonesia and Viet Nam, as well as the small island developing states, are particularly vulnerable. Besides sea-level rise, other important consequences of global warming may include an increase in climate-related natural disasters (floods, droughts and storms) and the disruption of agriculture and biodiversity due to change in temperature, rainfall and winds. The effects may be quite severe on coastal mangrove forests, wetlands and coral reefs. It has been observed that a 25-centimetre rise in sea level could destroy about half of Asia's remaining wetlands. The potential threat of global warming demands a reduction in emissions of greenhouse gases through effective implementation of the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

15. The threats posed by haze, acid rain and transboundary pollution have also increased substantially in recent years. Incidents of haze have occurred from time to time but the most serious episode occurred in 1997 when forest fires affected 12.4 million people in Indonesia alone. The effects of haze extended to neighbouring countries such as Brunei Darussalam, Papua New Guinea, the Philippines, Singapore and Thailand. Acid rain has also become a major concern in several parts of the region, particularly North-East Asia. At least two thirds of acid depositions are caused by coal-fired power plants and industrial sources and the balance by transport, residential heating and cooking. Most power plants in the region have little pollution control equipment, which is mainly for rudimentary particulate control. Sulphur and nitrogen oxide emissions have both a local and a transboundary impact as these can be carried hundreds of miles. Given the projected growth of energy consumption, acid emissions are likely to increase considerably over the next 10 years.

E. Urban environment

16. The region's urban population of 1.4 billion is expected to swell to 2.2 billion by 2020. This massive 800 million increase has many serious implications. The increase implies the equivalent of the full establishment of a new city of 150,000 people every day for the next 15 years. Further, if present densities are maintained, by 2020 urban areas will be one and a half times more extensive than they are now. The environmental impacts of such growth are enormous. Great pressure would be exerted on natural resources such as land, forests and water. For example, in India alone, urban growth between 1980 and 2000 has been estimated to have transformed 600,000 hectares of land to urban uses, an area equivalent to 20 new cities the size of Mumbai. The shelter

and dwelling environment, and the environmental infrastructure such as water supply and sanitation, which are already overstretched, would also suffer and seriously affect the quality of life.

17. The quality of air in cities has also deteriorated seriously. Of the 15 cities in the world with the highest levels of totally suspended particulates (TSP) in the air, 12 are located in Asia. Six of the 15 cities with the highest level of sulphur dioxide are also located in the region. The levels of TSP in several cities are three to four times those recommended by WHO. Increasing numbers of vehicles, congestion and traffic jams are the principal contributors to deteriorating air quality. Developed and newly industrialized countries such as Japan, the Republic of Korea and Singapore have been able to reduce the ambient pollution mostly from stationary sources and the transport sector.

F. Wastes

18. The region's rapidly rising incomes have brought about a dramatic increase in solid waste. The burden is especially severe for small island states. The total amount of municipal solid waste generated each year in the region is about 700 million tons and industrial activities generate 1,900 million tons of waste per year. Much of the waste goes untreated, contaminating groundwater and contributing to various health risks. As nations advance to higher stages of development and affluence, the composition of their garbage will also change to include more non-compostable materials such as plastic and paper, exacerbating the problem.

19. Open dumping and burning still constitute major disposal methods for solid wastes. Although landfilling, incineration and composting are increasing, these methods still account for about a quarter of waste disposal. Collection services remain low, with only 50-70 per cent of residents receiving any service. In terms of sewage, high-income developed countries produce more domestic wastewater than middle- and low-income countries. Sewage treatment plants and septic tanks, the two major disposal systems, are rare in the region. Generation of hazardous waste from manufacturing, hospital and health-care facilities, and nuclear power and fuel-processing plants is rising, and it has been estimated that this will more than double within the next 10 to 15 years. Transboundary movement of 3.5 million tons of hazardous waste into the developing countries of the region has also been reported from 1994 to 1997. Along with control on transboundary movement, recycling, resource recovery and waste minimization are required to slow the consumption of natural resources and limit waste generation. Safe disposal of hazardous waste from mushrooming small industrial and business establishments is particularly essential. On average, cities of the region spend between 50 and 70 per cent of their revenue on municipal waste management. The cost of urban solid waste management will double in the next 25 years from US\$25 billion to US\$50 billion. Resource recovery from waste is therefore important. This has

already increased from less than 10 per cent of all municipal solid waste in 1988 to 30 per cent in 1998.

G. Food security and poverty

20. The rapid growth of the urban and overall population raises the issue of food security. Of the three current main sources of food, two--oceanic fish and cattle from rangeland--have both reached their limits. There is a potential for aquaculture but not without environmental impact. This means that future growth in food supply should come mainly from croplands. However, irrigation water supply may not expand much further and the marginal utility of fertilizer is diminishing in many areas of the region. The new developments in biotechnology have the potential to raise land productivity but this also presents many risks. This does not mean that food production cannot be increased. It can be and probably will be, but it is becoming much more difficult to sustain the supply to meet the demand as shown by the declining production growth rate of cereals from 3.2 per cent in 1969-1971 to 1.9 per cent in 1994-1996. The region is currently a net food importer and is projected to remain so until at least 2010. The volume of cereal imports grew at an average annual rate of 9.5 per cent between 1986 and 1996. The region has also been a net importer of fish and fish products at an annual average rate of over 2 million tons valued at nearly US\$5 billion. Given the challenge, it is important for countries to calculate the future population carrying capacity by projecting the land available for crops, the amount of water and other inputs that are available over the long term, and the likely crop yield.

21. The problem of food availability is also very closely related to its distribution and poverty. The poor are the victims of environmental degradation but they also contribute to it. In the early 1970s, half of the population of the region was poor. Today, one third of the people are poor but their absolute number is still high at 900 million. Desperation drives the poor to clear steep slopes for cultivation, cut down the last trees, overgraze and shorten the fallow period to eke out their living. Environmental damage almost always hits those living in poverty the hardest. The overwhelming majority of those who die each year from air and water pollution as a result of respiratory infection or diarrhoea are poor. So are those most affected by desertification and those worst affected by floods, storms and harvest failures. Between 1990 and 1995, the number of deaths caused by natural disasters exceeded 200,000 and the total damage to property was US\$50 billion. Further, in 1997 alone, Asia suffered 33 per cent of the world's catastrophic events, 67 per cent of the casualties and 28 per cent of economic losses. However, only 0.2 per cent of these losses were covered by insurance. The poor, who could not afford insurance, suffered most. All over the region, poor people generally live nearest to natural hazard-prone areas, dirty factories, busy roads and waste dumps, making them more vulnerable to environmental disasters.

22. In order to alleviate poverty and simultaneously protect the environment, the strategy should be to provide the poor with access to resources. The poor lack healthy water systems not only because they cannot afford them, but also because they lack the political space to organize, and the political leverage to make the public sector respond to their needs. Their access to resources and empowerment would improve conservation and management of resources such as land, forest and biodiversity.

II. STATE OF POLICY RESPONSE

23. Although trends in the state of the environment are primarily negative, several positive trends can be discerned in the state of policy response. Among these are the improvement in governance by public authorities through strengthening of institutions, and improvements in the formulation and implementation of policies, growing environmental consciousness in business and industry, increased interest and participation of non-governmental organizations (NGOs) and civil society in environmental management and greatly enhanced environmental awareness as a result of the information explosion and improved means of communication such as the Internet.

A. Public authority action: emerging institutions and mechanisms

24. The following improvements in the government institutional framework have emerged:

(a) The creation of multi-stakeholder agencies at the apex level with the objective of formulating goals, rules and regulations, providing guidance to the executive branches of government, monitoring performance, and providing policy inputs;

(b) The designation of formal and informal coordination mechanisms for integrating cross-sectoral concerns; though the mode of coordination differs among countries, there is a recognition of the interdependence and interrelationships between various sectors of the government and the economy;

(c) The recognition that devolution of certain responsibilities and functions to local authorities creates the potential for better monitoring and management of resources;

(d) An increase in judicial activism and interventions, making the executive more responsive to meet environmental standards and safeguards; this has strengthened public intervention and support for eco-friendly measures.

25. The problem of reconciling environmental objectives with the need for economic growth, however, still remains a contentious issue amongst institutions in several countries. The segmented and compartmentalized structure of administration has created a legacy of fragmentation of concerns and responsibilities that act as a barrier to the holistic approach that is necessary for sustainable

development. Coupled with this is the appreciation of interdependence between various environmental concerns, lack of knowledge about tools and methodologies required for factoring environmental costs and a paucity of trained and skilled personnel. All these limit the capabilities of government institutions to analyse and enforce policy decisions.

26. Furthermore, the institutional environment continues to favour regulatory control mechanisms over the creation of incentives that can foster the emergence of competitive markets and promote the internalization of environmental costs. It is in this context that efforts are required for enhancing the capacity of governments to organize and utilize tools and methodologies for balancing environmental and development objectives, promoting exchange of information and experience and training personnel, both at policy-making and at policy-implementing levels.

27. Recent studies in the region have demonstrated that abatement of critical pollutants is a sound investment in many urban areas. However, regulating pollutants under all conditions is neither economically defensible nor politically sustainable. Regulators have limited skills and resources, and they will rapidly lose political support if the public regards them as sloppy, unfair or ill-informed. In this context, the public disclosure programme in some countries shows that a focus on accurately tracking and reporting a few critical pollutants from large emitters has considerable impact. Further, to maintain political support, it is important for environmental agencies to marshal reliable information, educate the public about environmental trade-offs and encourage broad participation of the private sector in setting goals.

B. Private sector initiatives

28. Industry and the private sector, despite their growing positive role, are still following a reactive rather than a proactive approach in addressing environmental problems. The share of investment going into pollution control is less than 5 per cent, and most of it goes into approaches and technologies for end-of-pipe pollution control, waste disposal and remedial clean-up. Two major constraints to the greening of industry in developing countries of the region are weak monitoring and enforcement and the lack of green consumerism. With the growing environmental awareness and consciousness, however, the region is heading towards becoming the greatest market for green goods. A group of countries including Australia, China, India, Japan, New Zealand, and countries of the Association of Southeast Asian Nations alone account for a market of US\$80 billion for environmental goods and services. The temptation to reap the benefit of this market response to public pressure and demand from foreign markets has led the corporate sector to improve its environmental performance.

C. Non-governmental organizations and major groups

29. Environmental movements of NGOs and major groups have also strengthened at grass-roots and community level, so as to ensure equitable participation in the development process. They have played a vital role not only in awareness-raising and campaigning, but also in education, training and capacity-building. In addition, they have collected and disseminated relevant information, analysed environmental trends and conditions, advocated reforms, advised and cooperated with governments on environmental protection and enhancement programmes, involved ordinary citizens in action programmes, assisted in the management of protected areas and vulnerable ecosystems, and encouraged greater corporate and governmental accountability in relation to the environment. Further, they have made considerable headway in their attempts to promote the concept of sustainable development, particularly among women, children, indigenous people and other major groups throughout the region. Their activities show that they effectively use all means of communication, traditional as well as new technologies, to spread their messages to the grass roots and to strengthen networking.

D. Environmental awareness and communication

30. Environmental awareness and communication in the Asian and Pacific region are on the increase as the region enters the new millennium. It is clear that a new surge of interest, enthusiasm and activity is taking place on many fronts to place environmental education, training and communication higher on the public agenda in countries of the region. This has been supported and facilitated in no small measure by the persistent efforts and activities of all sections of society ranging from national governments and international organizations to national and local-level NGOs, and from academic and research bodies to advocacy and activist groups. It is important to support these efforts continuously because a better informed and sensitized community and population can and will make the right choices in terms of their own lifestyles, as well as national-level decisions and practices, so as to help to achieve environmentally sound and sustainable development.

III. EMERGING CHALLENGES AND ISSUES FOR CONSIDERATION

31. The analysis of the state of environment in Asia and the Pacific demonstrates that overall environmental conditions continue to deteriorate. This can be seen in degraded croplands, falling water tables, diminishing forests, unprecedented numbers of forest fires, solid waste build-up, pollution of land and water and declining biodiversity resources. In this gloomy scenario, hopeful trends are the decline in birth rates and fertility levels, increased life expectancy, somewhat reduced poverty levels, improved nutritional levels, growing awareness and public participation, an improved policy environment and the enhanced role of the private sector in environmental protection and the promotion of sustainable development.

32. The principal environmental challenge in the twenty-first century is policy reform and its effective implementation in both cross-sectoral and sectoral areas. Challenges in this respect lie in how governments can provide clear signals and incentives to the agents who have the task of carrying out the underlying goals and objectives of development. Effective implementation of environmental legislation and standards remains one of the most daunting challenges in many countries of the region. This needs to be resolved by bridging the gaps between intent and action.

33. Another pressing challenge is the substitution of the command and control model with one more appropriate to the region. Already, in the wake of diminishing resources, a new policy model based on a mix of command and control and market-based mechanisms with a strong but limited government role by effective management and oversight is gaining ground. Characterized by the role of government as a facilitator rather than provider, by a prominent role for the private sector and civil society, by pricing reform of environmental goods and services and improved management, this model appears to have great potential for developing countries of the Asian and Pacific region, with its deficit in financial resources.

34. Among cross-sectoral issues, poverty and the promotion of equity, the promotion of growth while safeguarding natural assets, the promotion of eco-efficiency, and countering the negative impacts of globalization constitute the most daunting challenges. Empowerment of communities and the provision of access to resources could be very powerful mechanisms towards the alleviation of poverty while improving the environment. Globalization, while increasing awareness for development, has also brought new challenges for the developing countries of the region, making them vulnerable to diminishing investment, trade sanctions and international pressures. New and emerging issues have also surfaced from bioprospecting and recent developments in biotechnology (particularly those related to genetically modified organisms), which are threatening the cultural and traditional rights of indigenous communities and farmers through biopiracy and monopolization of improved varieties of seeds by a few multinational companies exercising property rights and patent regimes. Given this scenario, the need to acquire information and promote regional and subregional cooperation has never been so pressing in the region as it is today.

35. Among sectoral challenges, improved management of forest, rangeland, fisheries and biodiversity poses a major challenge. The tough future challenge for the region will be to enhance food production sustainably to meet the growing demand of the burgeoning population. Closely associated with food production, one of the biggest development challenges in many countries of the region is how to allocate water resources more efficiently, for example, by removing subsidies to save wasteful consumption and check the deteriorating trend of water quality, particularly from increasing discharge of sewage and industrial and hazardous wastes.

36. The growing waste, particularly hazardous waste, poses another major challenge. The need is to encourage waste minimization, along with appropriate planning for waste treatment and disposal infrastructure. The phenomenon of urbanization calls for a higher level of municipal management to curb pollution and improve living conditions. The pressing need is for better traffic management, conflict resolution among land uses and the provision of environmental services with cost recovery.

37. The gravity of the challenges calls for action from all sections of society, including governments, the private sector, major groups and civil society. Governments will need to focus on better governance and decentralization and devolution of power within their countries and they will need to enhance cooperation on the issues of global concern. The private sector will have to play a more positive role through innovation and incorporation of environmental considerations in its operations. Major groups and educated citizens will also have a crucial role to play as agents of change through participation, advocacy, partnership, communication and awareness.