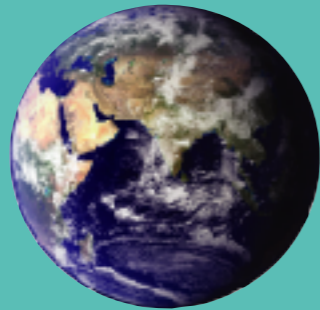


Regional Resource Centre for Asia and the Pacific

"Our world has enough for each person's need, but not for his greed."



You must be the change you wish to see in the world."

Mahatma Gandhi (1869-1948)

United Nations Environment Programme
Regional Resource Centre for Asia and the Pacific
(UNEP RRC.AP)

Outreach Building, Asian Institute of Technology
P.O. Box 4, Klong Luang, Pathumthani 12120
Thailand

Tel: +66 2 516 2124, 516 0110 Fax: +66 2 524 6233

www.rrcap.unep.org

Sustainable Development Priorities for Northeast Asia



www.unep.org

United Nations Environment Programme
P.O. Box 30552-00100, Nairobi, Kenya
Tel: (254 2) 624105
Fax: (254 2) 624269
E-mail: dewainfo@unep.org
Web: www.unep.org
www.unep.net



Sustainable Development Priorities for Northeast Asia



Sustainable Development Priorities for Northeast Asia



Published by United Nations Environment Programme Regional Resource Centre for Asia and the Pacific

Copyright 2004, United Nations Environment Programme Regional Resource Centre for Asia and the Pacific

This publication may be reproduced in whole or part in any form for educational or non-profit purposes without special permission from the copy right holder, provided acknowledgement of the source is made. UNEP would appreciate receiving a copy of any publication that uses this publication as a source. No use of this publication may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from the United Nations Environment Programme.

Disclaimers

The contents of this volume do not necessarily reflect the views or policies of UNEP or contributory organizations. The designations employed and the presentations do not imply the expressions of any opinion whatsoever on the part of UNEP or contributory organizations concerning the legal status of any country, territory, city or area or its authority, or concerning the delimitation of its frontiers or boundaries.

Distributed by

United Nations Environment Programme
Regional Resource Centre for Asia and the Pacific
(UNEP RRC.AP)
Outreach Building, Asian Institute of Technology
P.O. Box 4, Klong Luang, Pathumthani 12120 Thailand

FOREWORD

The Sustainable Development Priorities for Northeast Asia is published by UNEP to present the sustainable development challenges and priorities for the Northeast Asian region over the next decade. The report aims to focus on the existing set of policy initiatives, various strategies to implement the policies, and the challenges that need to be overcome.

Chapter 1 provides an overview of geographical and climatic characteristics, as well as the environmental, social, and economical concerns and challenges in Northeast Asia. The most serious social and economic challenges that developing parts in Northeast Asia have been facing are the prevalence of poverty, poor food security, and increasing population and urbanization.

The responses, major achievements, and future challenges for sustainable development beyond the World Summit on Sustainable Development (WSSD) preparatory process have been provided in chapter 2. The responses include development of national strategies with their action plans, establishment of institutional and legislative arrangements, and response to multilateral environmental agreements.

Although many strategies and action plans were already developed in Northeast Asia, they mostly focus on sectoral environmental issues. Other overarching issues such as sustainable production and consumption integrated with other socio-economic and environmental issues should also be developed, in depth. Chapter 3 analyzes the actions which involve the integration of national strategies and the challenges to enhance effective national sustainable development strategy (NSDS) implementation and mechanisms to attain Millennium Development Goals (MDG) and Johannesburg Plan of Implementation (JPOI).

UNEP hopes that the Sustainable Development Priorities for Northeast Asia would be useful for government, non-government, private, regional and international organizations in the pursuit of developing policies, strategies, and action plans. UNEP gratefully acknowledge the contribution of institutes and individuals in the preparation of the report, in particular the valuable support and input provided by the Institute for Global Environmental Strategies (IGES), Japan.



A handwritten signature in black ink, appearing to read 'Klaus Toepfer', written in a cursive style.

Klaus Toepfer

United Nations Under-Secretary
General and
Executive Director, United Nations
Environment Programme

ACKNOWLEDGEMENTS

UNEP would like to thank many individuals and institutions who have contributed to the preparation of Sustainable Development Priorities for Northeast Asia 2004. They included individuals from Government Departments, intergovernmental organizations, academic institutions, and Civil Society Organizations. A full list of contributors, reviewers and participants are included in the Annex 7. Special thanks are extended to:

- Mr. Hideyuki Mori, Mr. Takashi Otsuka, Mr. Akira Ogihara, and Mr. Toru Hashi, from Institute for Global Environmental Strategies Japan, for preparing the report; and
- Division of Policy Development and Law for providing the funding support to the report

UNEP RRC.AP Project Team

Surendra Shrestha
Subrato Sinha
Achira Leophairatana
Purna Chandra Lall Rajbhandari
Twinkle Chopra
Tunnie Srisakulchairak

Table of Contents

Executive summary	1
Chapter 1 Introduction	7
Chapter 2 Responses for sustainable development during and beyond the WSSD preparatory process	13
2.1 Environmental issues	16
2.1.1 Atmospheric pollution	16
2.1.2 Freshwater quality	20
2.1.3 Degradation of the marine environment	23
2.1.4 Land degradation and desertification`	25
2.1.5 Deforestation and biodiversity loss	28
2.1.6 Natural disasters	30
2.1.7 Energy/renewable energy	32
2.2 Social and economic issues	34
2.2.1 Poverty	34
2.2.2 Population and urbanisation	37
2.2.3 Food security	38
2.2.4 Sustainable consumption and production patterns	40
Chapter 3 Actions to further promote sustainable development in the subregion	45
3.1 Development of integrated national strategies	47
3.2 Major challenges in enhancing the implementation mechanism	48
3.2.1 International cooperation	48
3.2.2 Capacity building for sustainable development	50
3.2.3 Partnership and participation	52
3.2.4 Financial mechanisms	53
3.2.5 Technology development and diffusion	54
3.2.6 Governance, institutional settings, and policies	55
3.3 Major subregional challenges with regard to attain MDG and JPOI	56
3.3.1 Tackling poverty, sanitation, and health issues	56
References	59

Annexures		63
Annex 1	Acronyms and Abbreviation	65
Annex 2	Strategies, Visions, and Legislative/Institutional Arrangements Integrated Response towards Sustainable Development at Nation Level	67
Annex 3	Achievements made with regard to Environmental Issues Responses to Major Environmental Issues: Strategies, Legislations, and Program/Projects	69
Annex 4	Ratification of Multilateral Agreements and Conventions Vienna Convention Montreal Protocol Basel Convention	87
Annex 5	Subregional Institutional Arrangements	88
Annex 6	Mechanisms for Cooperation not limited to the Subregion	90
Annex 7	Lists of contributors and reviewers	91



Executive Summary



Executive Summary

The Northeast Asian subregion dealt with in this report consists of the People's Republic of China, Japan, Republic of Korea (Korea Rep.), Democratic People's Republic of Korea (Korea DPR), and Mongolia, and covers 11.5 million square kilometres with a total population of 1.47 billion people. The subregion holds about one forth - 24 percent - of the world's population on 8.8 percent of total global land area. The geographical and climatic characteristics of the subregion are diverse, and its climate zones vary, from a frigid zone in Mongolia to a subtropical zone in southern parts of China and Japan. Fauna and flora vary as geographical and climatic conditions vary, hence a number of species unique to the subregion widely exist. By and large, the subregion still maintains rich natural resources and biodiversity in its natural forests, grasslands, mountains, deserts, and wetlands, although biodiversity loss remains pervasive.

At the same time, Northeast Asia is recognised as a subregion experiencing rapid industrialisation and economic growth. In particular, this trend is notable in China, which had actively started introducing a market economy in the 1990s. Mongolia has also followed with the introduction of a market economy, though its total economic activity is quite lower than other countries in the region. An increasing trend of overexploitation of natural resources, accelerated by both economic and population growth, has been realised as a great threat to sustainable development of the subregion as well as to that at the global level.

Priority issues in Northeast Asia to further promote actions towards sustainable development include many components. Environmental issues that require highest priority include atmospheric pollution, degradation of freshwater resources, degradation of the marine environment, desertification, land degradation and deforestation, biodiversity loss, and natural disasters, etc. The energy issue is another common concern in the subregion, because it exerts major pressure on the atmosphere and causes other types of environmental degradation. In addition to the issues mentioned, social and economic challenges such as the prevalence of poverty, poor food security, and increasing population and urbanisation also receive the highest attention at the same time. Changing unsustainable patterns of production and consumption is also, and the largest, challenge that the subregion and the world face as their economies expand.

Achievements made in developing institutional and legislative arrangements

Given a momentum by two milestone international conferences on sustainable development, namely, the United Nations Conference on Environment and Development (UNCED) in 1992 and the World Summit on Sustainable Development (WSSD) in 2002, major achievements have been made in five countries of Northeast Asia to move the sustainable development agenda forward.

Achievements include preparation of national strategies and action plans, strengthening of institutional and legislative arrangements, capacity building, participation of multiple stakeholders, reinforced financial mechanisms, as well as development and diffusion of technologies.

By and large, responses in terms of establishing institutional and legislative arrangements at a national level are widely observed in most of the countries in the subregion and made significant achievements. Many laws and acts addresses above mentioned environmental issues were newly adopted and/or amended in each country. National strategies and action plans towards sustainable development as well as responses to relevant multilateral environmental agreements are also well developed and examples of these responses include amendment of the Basic Environment Plan in 2000 (Japan), Green Vision 21 (Korea Rep.), and the National Strategy for Conservation and Sustainable Use of Natural Resources (Korea DPR). China has integrated environmental and social priorities into its national development plans, the Ninth and Tenth Five-Year Plan for National Economic and Social Development (1996–2000 and 2001–2005), has Mongolia, with its Action Programme for the 21st Century (MAP-21).

Future challenges remain in strengthening implementation mechanisms

Despite the achievements in establishing many plans, as well as institutional and legislative arrangements, the implementation aspects remain as major challenges in the future. In order to strengthen and accelerate the steps towards sustainable development in the subregion, further efforts should be made in the following aspects: international cooperation; capacity building; partnership and participation; financial mechanisms; technology development and diffusion; and governance, institutional settings, and policies.

For example, multilateral cooperation schemes regarding environment and development needs to be further strengthened for substantial subregional collaboration based on several existing schemes such as the North-East Asian Subregional Programme of Environmental Cooperation (NEASPEC), the Tripartite Environment Ministers Meeting among China, Japan, and Korea Rep. (TEMM), the East Asia Acid Rain Monitoring Network (EANET), the Northwest Pacific Action Plan (NOWPAP), and the Northeast Asian Conference on Environmental Cooperation (NEAC). Considering the characteristics of environmental problems in Northeast Asia and future socio-economic trends, cooperation schemes on the following issues could emerge as a priority in the subregion: (1) extensive and efficient use of natural gas; (2) food security and sustainable agriculture; and (3) effective water use and water resources management.

Another example includes challenges in capacity building for sustainable development. Priority capacity-building issues include (1) improving national capability to integrate environmental factors in sectoral policies, (2) strategic information gathering and analysis to enable informed decision-making, and (3) training for various stakeholders and awareness-raising campaigns for the general public.

Challenge with regard to attaining MDG and JPOI

Millennium Development Goals (MDG) and Johannesburg Plan of Implementation (JPOI) include ambitious agenda to take necessary steps to attain world-wide sustainable development. Amongst agenda items in both initiatives, improvement of poverty, sanitation and health situation requires the highest political, as well as public, attention in the subregion. Behind the scene of rapid industrialisation and economic growth, these issues still remain as major challenges and

sometimes their situations worsen. For example, in the case of access to safe drinking water, insufficient infrastructure of waterworks and inadequate management of increasing volumes of household wastewater and toxic substances, in addition to industrial wastewater, are causing urban and suburban water quality degradation in some countries in the subregion.

Changing unsustainable patterns of consumption and production is another agenda with high priority in the subregion. It is quite apparent that whether consumption and production patterns of the subregion – with over 1.47 billion population with growing markets of goods and services - could shift towards sustainable ones or not has significant impacts on global sustainable development.

Needs for further integrated national strategies

Countries in the Northeast Asian subregion have made significant efforts to shift their development patterns to being more sustainable, but a number of challenges still remain. Perhaps the most basic challenge for each country in the subregion is the development of a further concrete and integrated national sustainable development strategy (NSDS) addressing challenges mentioned above. Elaboration of truly integrated sustainable development strategies based on comprehensive ecological viewpoints that fit into their national contexts, taking both long-term environmental and socio-economic implications into account, as well as paying attention to strengthening its implementation mechanisms, is vital to each nation in the subregion as well as to the subregional development in sustainable manner.



Chapter 1

Introduction

Chapter 1

Introduction

This paper, prepared by the Institute for Global Environmental Strategies (IGES), reviews progress made in working towards sustainable development in the Northeast Asian subregion, including the People's Republic of China, Japan, Republic of Korea (Korea Rep.), Democratic People's Republic of Korea (Korea DPR), and Mongolia, during recent years over the two milestone United Nations conferences on sustainable development, namely, the United Nations Conference on Environment and Development (UNCED) in 1992 and the World Summit on Sustainable Development (WSSD) in 2002. The paper identifies major achievements on the path to realising sustainable societies in the subregion, describes remaining challenges after WSSD in 2002, and highlights priority issues that require broad and urgent attention to put a number of ambitious plans into action at local, national, and subregional levels.

In preparing this report, IGES worked under the supervision of the United Nations Environment Programme Regional Resource Centre for Asia and the Pacific (UNEP RRC.AP). The report intends to provide inputs—information and suggestions—for the United Nations Environment Programme (UNEP) to develop strategies and work programmes on the environment for Northeast Asia. The first draft of the report was presented for review at the UNEP Asia-Pacific Civil Society Consultation Meeting, scheduled for 12–13 November 2003 in Bangkok. Then, the second draft was

prepared taking civil society perspectives into account. The final draft includes additional discussion on priority issues in Northeast Asian subregion in the relevance to issues highlighted in Millennium Development Goals (MDG) and Johannesburg Plan of Implementation (JPOI).

The initial basis of the paper was a subregional WSSD document entitled “Northeast Asia Subregional Report for the World Summit on Sustainable Development” prepared by IGES and submitted to the Task Force for the Preparation of WSSD in Asia and the Pacific consisting of the Asian Development Bank (ADB), the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), the United Nations Development Programme (UNDP), and UNEP in 2001. Information was updated and suggestions were scrutinised in light of recent responses taken to further promote sustainable development in the subregion. Major sources of information included provisions of the Johannesburg Plan of Implementation (JPOI), country reports, and other relevant documents prepared for the subregion during and beyond the WSSD preparatory process.

Overview on Northeast Asian subregion

The Northeast Asian subregion dealt with in this report consists of the People's Republic of China, Japan, Republic of Korea (Korea Rep.), Democratic People's Republic of Korea

(Korea DPR), and Mongolia, and covers 11.5 million square kilometres with a total population of 1.47 billion people. The subregion holds 24 percent of the world's population on 8.8 percent of total global land area. (population data are as of 2001 [World Bank 2003]). The geographical and climatic characteristics of the subregion are diverse, and its climate zones vary, from a frigid zone in Mongolia to a subtropical zone in southern parts of China and Japan. Fauna and flora vary as geographical and climatic conditions vary, hence a number of species unique to the subregion widely exist. By and large, it is reported that the subregion still maintains rich natural resources and biodiversity in its natural forests, grasslands, mountains, deserts, and wetlands, although biodiversity loss remains pervasive (ESCAP and ADB 2000).

At the same time, Northeast Asia is recognised as a subregion experiencing rapid industrialisation and economic growth. In particular, this trend is notable in China, which had actively started introducing a market economy in the 1990s. Mongolia has also followed with the introduction of a market economy, though its total economic activity is quite lower than other countries in the region. The Asian Development Bank reports that the East Asian subregion (Japan not included) posted a solid performance in 2002, with gross domestic product (GDP) growth averaging 6.5 percent, although performance varied considerably among countries. China continued its rapid expansion, bolstered by strong exports, surging foreign direct investment (FDI), buoyant domestic demand, and expansionary macroeconomic policies. A brisk recovery in Korea Rep. was underpinned by both strong external and domestic demand. After two years of stagnation, expansion in industry and services and a mild winter saw growth return in Mongolia (ADB 2003). An increasing trend of overexploitation of natural resources, accelerated by both economic and population growth, has been realised as a great

threat to sustainable development of the subregion as well as to that at the global level.

Environmental and socio-economic issues as well as challenges in tackling these issues in the Northeast Asian subregion have been identified through the regional and subregional preparatory process for the WSSD. Major opportunities to share issues of concern among countries in the subregion included the Ministerial Conference on Environment and Development (MCED) in 2000, the Intergovernmental Meeting, and the Stakeholders' Meeting for North-East Asia in Preparation for the WSSD. The major environmental issues identified include atmospheric pollution, degradation of freshwater resources, degradation of the marine environment, desertification, land degradation and deforestation, biodiversity loss, and natural disasters. The shared environmental problems of the subregion-atmospheric pollution and degradation of water quality due to rapid industrialisation and urbanisation (which occurred without adequate investments in social and environmental infrastructures), degradation of the marine environment, land degradation, and biodiversity loss-need to receive the highest priority (ESCAP and ADB 2000).

Atmospheric pollution due to inefficient industrial and power generation technologies and practices remains a problem in many major cities in the subregion, although certain improvements have been observed in some cities in China. Degradation of freshwater quality is severe, particularly due to municipal sewage. The lack of available freshwater resources is also becoming an emerging threat to maintaining agricultural practices as well for access to safe drinking water. Degradation of the marine environment is of major concern in several countries of the subregion, including China, Japan, and Korea Rep. Land degradation and desertification are particularly affecting China and Mongolia, and dust and

sand storms (DSS) threaten their local inhabitants. DSS sometimes causes crossboundary impacts such as the malfunctioning of airports and traffic systems of some cities in Korea. Deforestation has been a serious concern in Mongolia for the last decade, and visible and invisible biodiversity loss has gradually been caused by a variety of human activities. With the increasing vulnerability of ecological systems in the subregion, natural disasters such as floods, earthquakes, droughts, landslides, and volcanic eruptions have been increasing their impact on human activities, in particular on the poor.

The energy issue is a common concern in the subregion, because it exerts major pressure on the atmosphere and causes other types of environmental degradation. Measures such as increasing production efficiency and demand-side management, improving fuel quality, as well as developing renewable energy technologies and infrastructure have received the highest priorities, but further improvements are necessary.

Amongst the most serious social and economic challenges that developing parts of the subregion face are the prevalence of poverty, poor food security, and increasing population and urbanisation. The WSSD reaffirmed the need to change unsustainable patterns of production and consumption in Japan and Korea Rep., but the same issue has emerged as a major problem in other parts of the subregion, as their economies expand.

The following section will review the current state of environmental and socio-economic issues relevant to sustainable development in Northeast Asia, outline major achievements, and discuss relevant future challenges.

1 South Korea

1 North Korea

1 The Russian Federation is not included as the component country of the Northeast Asia in this paper due to the subregional coverage as defined by the United Nations Environment Programme (UNEP).



Chapter 2

Responses for sustainable
development during and beyond
the WSSD preparatory process

Chapter 2

Responses for sustainable development during and beyond the WSSD preparatory process

Since the United Nations Conference on Environment and Development (UNCED) in 1992, major achievements have been made in five countries of Northeast Asia to move the sustainable development agenda forward. Achievements include preparation of national strategies and action plans, strengthening of institutional and legislative arrangements, capacity building, participation of multiple stakeholders, reinforced financial mechanisms, as well as development and diffusion of technologies.

Development of national strategies and action plans

China, Japan, Korea Rep., and Mongolia, have prepared national and local Agenda 21 plans. In addition, a number of countries have developed national environmental plans or strategies: Amendment of the Basic Environment Plan in 2000 (Japan), Green Vision 21 (Korea Rep.), and the National Strategy for Conservation and Sustainable Use of Natural Resources (Korea DPR). China has integrated environmental and social priorities into its national development plans, the Ninth and Tenth Five-Year Plan for National Economic and Social Development (1996–2000 and 2001–2005), has Mongolia, with its Action Programme for the 21st Century (MAP-21). The Capacity 21 programme implemented by the United Nations Development Programme (UNDP) played a significant role in the preparatory process of the above-mentioned national strategies and action plans in some countries.

Major strategies, visions, and plans of each nation relevant to the promotion of sustainable development are shown in Annex 2 in the Annex below.

Establishment of institutional and legislative arrangements

Institutional and legislative arrangements in each country have progressed as well, although to different extents. Some countries have improved and strengthened institutional arrangements in their central governments by upgrading and restructuring relevant sections to deal with sustainable development issues. For example, in 1998 China upgraded its National Environmental Protection Agency to the State Environmental Protection Administration (SEPA), a ministerial level authority, and Japan upgraded its Environment Agency to the Ministry of the Environment in 2001.

As for legislative arrangements, China started full implementation of its Environmental Protection Law in 1989 (test run since 1979) and completed adoption and amendment of laws addressing environmental issues, such as atmospheric and water pollution, land, waste management, and desertification, in the 1990s. Amongst a wide range of environmental laws in China, the adoption of the Law of Environmental Impact Assessment (EIA) in 2002 strengthened the legal framework to further promote adequate EIA of construction and development projects by promoting public participation in EIA

processes. Other countries in the subregion also made progress in terms of establishing the necessary legislative arrangements. The highlights include, in Japan, the Basic Environment Law, amended in 2002, and the Basic Law for Establishing a Recycling-based Society adopted in 2000; the Basic Environmental Policy Law, adopted in 1999 in Korea Rep.; the Environmental Protection Law, set in 1986 in Korea DPR; and the Environmental Protection Law, which came into force in 1995 in Mongolia. Other major laws relevant to the promotion of sustainable development are shown in Annex 3 in the Annex below.

Response to multilateral environmental agreements

Ratification of most of the multilateral environmental agreements and conventions relevant to sustainable development by countries in the Northeast Asian subregion was completed prior to the WSSD in 2002. Such agreements and conventions include Convention on International Trade in Endangered Species (CITES) (1973), the International Convention for the Prevention of Pollution from Ships (MARPOL) (1973), as modified by the Protocol of 1978, the Vienna Convention for the Protection of the Ozone Layer (1985), the Montreal Protocol on Substances that Deplete the Ozone Layer (1987), Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989), United Nations Convention on Biological Diversity (UNCBD) (1992), United Nations Framework Convention on Climate Change (UNFCCC) (1992), and United Nations Convention to Combat Desertification (UNCCD) (1994). International conventions such as the Convention Concerning the Protection of the World Cultural and Natural Heritage (1972), the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (1979), and Convention on the Rights of the Child (CRC)

(1989), are examples of non-environmental conventions, but are closely related to sustainable development, which the countries have ratified. For detailed information on the status of ratification, see Annex 3 in the Annex below.

2.1 Environmental issues

2.1.1 Atmospheric pollution

Status

Major threats to the atmosphere include those posed by the increasing intensity of urban air pollution, high levels of energy consumption, and inefficient industrial and power generation practices. Compared to 1990 levels, the level of atmospheric pollution with respect to major pollutants has been either substantially decreased or stabilised in China and Korea Rep. as the result of more stringent regulations and installation of air pollution abatement facilities. While, in Ulaanbaatar city of Mongolia, there are three thermal power stations that use over 2.52 million tons of coal and produce 2509.6 million KW of energy. Approximately 63,000 families living in ger (small house) areas use small size ovens to produce heat, burn 350,000 tons of coal and releases a quite big portion

Figure 2.1: Emission from a thermal power plant and brown cloudover the city of Ulaanbaatar, Mongolia



© Takashi Otsuka, ICGE

of the capital's polluted air. Air particulate level in the city is estimated at 120-200 mg/m³. The atmospheric concentration levels of carbon dioxide (CO₂) and sulphur dioxide (SO₂) in the city exceed the rate that should have a negative influence on human health by 1.5-2.6 and 1.3-2.8 times respectively (IGES 2001).

Rapid economic development in many of the region's major cities is likely to increase vehicle-related air pollutants, which seriously affect the health of inhabitants. Therefore emission amounts of both nitrogen oxides (NO_x) and particulate matter (PM) have still been increasing in those countries, particularly showing high level concentrations of total suspended particulates (TSP) in China. To date, the transport sector has become one of the most troubling areas, and emissions associated with vehicle use are predicted to significantly increase in major urban areas of China, Korea Rep., and Japan due to rapid increases in the number of vehicles and population growth.

Moreover, the long-range transport of air pollutants, such as chlorofluorocarbons (CFCs), acid rain, etc., which are impacting land and marine environments across Northeast Asia, is a growing concern. In China, about half of all cities monitored had an average annual precipitation with pH values of less than 5.0, indicating relatively high acidity of rain, mainly due to sulphur dioxides (SO_x) and NO_x emissions from coal-fired power plants and industrial sources. In addition, in China, one of the largest regional producers and users of CFCs, consumption of ozone-depleting substances (ODS) increased more than 12 percent per year from 1986 to 1994.

The most serious regional and global concern is climate change due to the increase of atmospheric concentrations of greenhouse gases (GHGs) stemming from historic fossil fuel use in industrial nations in Northeast Asia, including industrializing nations, which plays

an important and growing role in climate change. Carbon dioxide (CO₂) emissions in the year 2001 in Japan were over 5.2 percent compared to the total amount of discharges in the base year (1990). According to the Kyoto Protocol, Japan's target for 2008 to 2012 is minus 6 percent of 1990 levels.

Major achievements

Momentum towards sustainable development has been gained in all countries due to efforts by the international community, and progress on improving air quality has been achieved in most countries to different extents, in particular through becoming parties to important international agreements and strengthening domestic standards and laws related to air quality conservation.

Regional and international

At the 3rd Expert Meeting for Long-range Transboundary Air Pollutants in Northeast Asia, held 22 to 24 August 2000, in Seoul, the schedule and terms of reference of the first research stage on monitoring and modelling of air pollution in the region, including emission inventory development, were decided by delegates from China, Japan, and Korea Rep. (Ministry of the Environment of Korea Rep. 2002a). Efforts that have been made in the region include the projects of NEASPEC (North-East Asian Sub-regional Programme of Environmental Cooperation) which promotes sub-regional environmental cooperation to examine problems of pollution associated with coal-fired stations and to measure and analyse the environmental impacts of pollutant emissions.

The First Intergovernmental Meeting on The Acid Deposition Monitoring Network in East Asia was held in March 1998 in Yokohama, Japan. At the meeting, delegates extensively discussed the fundamental characteristics of the Network (e.g., objectives, activities, establishment period, and institutional and financial matters) and

identified the tentative “Design of the Acid Deposition Monitoring Network in East Asia (EANET).” The Network consists of countries in the East Asian region, which includes Northeast and Southeast Asia, that expressed their intention to participate in the Network at the Second Intergovernmental Meeting. EANET began a preparatory phase of monitoring acid deposition in April 1998. In

October 2000, the Network decided to begin its regular monitoring programme from January 2001 (EANET 2003).

National

Most countries are beginning to use a mix of (1) command-and-control (CAC) policy to enforce emission standards and (2) economic

Box 1 Controls of emissions from motor vehicles in Beijing

In Beijing, China, sulfur dioxide (SO₂) emissions from coal burning used to be the primary source of air pollution until recent years; however nitrogen oxides (NO_x) emissions from motor vehicles emerged as the primary pollutants lately. Up to the early 1990s, the number of vehicles on roads in Beijing was not as large as in other cities of a similar size in the world. Rapid growth of the vehicle stock in Beijing without strict emission standards or other emission control measures had accelerated the air pollution in the city. According to monitoring reports of the United Nations Environment Programme (UNEP), Beijing was one of the top ten cities with the worst air pollution in the world in 1997 and the concentration of NO_x and total suspended particulates (TSP) is much higher than World Health Organization (WHO) guidelines.

In order to moderate the air pollution caused by motor vehicles, a series of actions were carried out starting in 1998. One of the actions is to implement more stringent tail-pipe emission standards. As a result, the Emission Standard for Exhaust Pollutants from Light-duty Vehicles (DB11/1-5-1998) was issued by the Beijing government on 25 August 1998, and went into effect on 1 January 1999. The first period after emission standards were introduced, all vehicles were classified into three classes: green label, yellow label and red label. The first class is deemed environment-friendly and all vehicles in this class are exempted from road and random inspections. Owners of vehicles in the second class are asked to make the necessary changes within a limited time period. When air pollution is severe, vehicles with red labels are not allowed to operate. Currently, all the vehicles in Beijing must pass annual inspections in order to get green labels, which are made visible in the front windshield of the vehicles. Vehicles that do not pass the inspections will not receive green labels and therefore are not to be driven.

The introduction of emission standards for vehicles in Beijing developed quickly and contributed to controlling air pollutants. The successful adoption of emission standards in Beijing depends on having the relevant instruments, such as high quality fuel standards, vehicle emission checking systems, and the availability of vehicles that meet standards, etc. The deterioration of air quality was moderated after 1998. Although the vehicle stock in Beijing increased rapidly during the three ensuing years, the concentrations of NO_x and carbon monoxide (CO) in the atmosphere did not increase correspondingly. In fact, their concentrations dropped by 16.4 percent and 21.2, respectively, between 1998 and 2001.

Source: APEIS/RISPO 2003a

incentives such as emission charges, tradable permits, etc. In Korea Rep., the government recently set a new quality standard for liquefied petroleum gas (LPG) fuel, with plans to control sulphur content and concentrations (Ministry of the Environment of Korea Rep. 2002b). It also announced its plan for the Special Measures on Seoul Metropolitan Air Quality Improvement (2003-2012). This plan includes the Total Maximum Loading System of Pollutant, the prohibition of vehicles violating the allowance level of emission, the change to low emission vehicles for business vehicles as well as the intensifying the fuel quality to the Seoul and major Kyonggi-do province area and would be mandatory for the large-scale factories and powerhouses to gradually decrease air pollutants such as SO_x, NO_x, semi-volatile organic compounds (SVOC) and SPM by 2005. Each of them are proposed to reduced 70% of SO_x, 50% of NO_x, 60% of PM₁₀ and 40% of volatile organic compounds (VOC), compared to 2000, with the aim of air quality improvement by 2012 (IGES 2003)

China revised the Law of Air Pollution and Control issued for enforcement in 2000 including the following amendments to solve the problems due to; (1) clear and define the fact that pollution discharge standards is a violation of the law; (2) establish the total control system and discharge permit system, (3) establish the charge rates based on total pollutant discharge; (4) focus on air pollution prevention and control in major cities; (5)strengthen the control of pollution from vehicle; (6) strengthen the control of urban dust pollution; and (7) intensify legal liabilities (IGES 2001). In addition, respond to the vehicle-related emissions which are becoming more severe in many mega cities in China, a list of automobile whose manufacture is to be restricted and a list of those which comply with the emission standards were issues by the State Environmental Protection Administration as administrative documents to local environmental protection bureaus and

relevant domestic automobile manufactures in 2001 (IGES 2001).

The Multilateral Fund of the Montreal Protocol and the Global Environment Facility (GEF) have been helping the region to meet the goals of the Montreal Protocol. China has made a commitment to phase out the consumption of ODS by 2010, and has already banned the establishment of new CFC- and halon-related production facilities and developed general and sector-specific plans with the help of the World Bank and the Multilateral Fund (UNEP 2002).

Future challenges

Reduction of ODS consumption is an urgent task to accomplish in the region. To date, the following subsequent adjustments to the Montreal Protocol have been adopted: the Protocol in London (1990), Copenhagen (1992), Vienna (1995), Montreal (1997), and Beijing (1999). Most countries are becoming party to the Protocol. The technological infrastructure has been established to develop innovative chemicals, such as trifluoroiodomethane (CF₃I), a leading candidate for the replacement of halon-based fire extinguishing agents. CF₃I is highly effective as a flame suppressant and has a short tropospheric lifetime and low ozone depletion potential, but the progress of replacement is quite slow.

In order to reduce vehicle-related air pollutants, such as PM and NO_x, the introduction of low-emission vehicles using compressed natural gas (CNG), electricity, and so forth, and implementation of energy and fuel policies are essential in the major cities of Korea Rep. and Japan. Korea Rep., in particular, has a plan to gradually introduce a domestic “tradable permits system” in 2005 for suspended particulate matter (SPM), NO_x, SO_x, and volatile organic compounds (Ministry of the Environment of Korea Rep. 2002b).

The Law Concerning the Promotion of Measures to Cope with Global Warming was revised in 2002 in Japan with a view towards full implementation of the Kyoto Protocol. The amendments include the following: (1) development of a national achievement plan to attain the national emission reduction targets set in the Kyoto Protocol, (2) development of the enforcement organisation to implement the plan, and (3) development of measures to control emissions of greenhouse gases. Curtailment of GHG emissions in the industrial sector is progressing; however, it is lagging behind in other sectors, especially, transportation and household sectors. Promotion of much more rigorous measures is required for Japan to achieve its commitment under the Kyoto Protocol.

Long-range transport of air pollutants, such as CFCs and acid rain-causing pollutants, are causing growing concern in the Northeast Asian region. Proactive efforts for regional cooperation are needed to monitor transboundary air pollution in the region and to build an information exchange system. It is important to note, however, that a careful approach should lead to greater confidence, mutual trust, and a cooperative spirit in developing solutions to difficult environmental

problems linked to rapid economic development. Facilitating the transfer of clean technology and promoting efforts to strengthen joint research among the countries are also needed.

The World Bank estimated in 1995 that by 2020, if present energy and environmental policies remain unchanged, sulphur dioxide emissions in this region would be almost triple the 1990 level (Ministry of the Environment of Japan 2003a). The adverse effects of acid deposition will become a critical problem in the near future. At the present, however, it is difficult to evaluate the state of acid deposition using available monitoring data because monitoring methods and analytical techniques differ greatly among the countries in the region. Monitoring data are pre-requisite to assess the state of acid deposition as well as its impacts on ecosystems (such as forests) in East Asia. In order to secure appropriate monitoring data, proactive collaboration should be promoted with other international monitoring networks and programs, such as the Cooperative Programme for the Monitoring and Evaluation of Long-Range Transmission of Air Pollutants in Europe (EMEP) of the United Nations Economic Commission for Europe (UN/ECE), Global Atmosphere Watch (GAW) of the World Meteorological Organization (WMO), etc.

Figure 2.2: Compressed Natural Gas-bus (centre) has been widely introduced in Beijing, China



2.1.2 Freshwater quality

Status

In Northeast Asia, freshwater resources are unevenly distributed due to the region's diverse geographical and climatic conditions. The areas of Korea Rep., Korea DPR, and eastern China that are located in the monsoon region have comparatively abundant water resources, replenished by seasonal heavy rains; however, due to seasonal variations in rainfall and in absence of satisfactory social infrastructure, both water shortages in the

dry season and floods in the rainy season frequently occur. Western China and Mongolia are in a dry region and have quite limited freshwater resources because of low precipitation levels.

Freshwater is a precious and finite resource central to sustainable development, economic growth, social stability, and poverty alleviation; however, due to population growth and expansion of economic activities in Northeast Asia, as mentioned above, how to realise sustainable water supplies to meet increasing water demands is a critical issue. Moreover, excessive intake and inappropriate outflow of water resources have brought about serious degradation of water quality and soil. In northern China and Mongolia, especially, salinisation and aquifer destruction caused by overexploitation of ground water are serious problems, and water supplies in Mongolia are becoming insufficient compared to demand because of dropping ground water levels.

Water quality in urban areas is becoming more degraded by increasing volumes of household wastewater and toxic substances, in addition to industrial wastewater. China and Korea Rep., both experiencing rapid economic development, are facing serious water quality problems, and their situations are becoming worse, especially in urban areas. In Mongolia, financial problems have caused a serious situation at wastewater treatment facilities because they cannot be maintained properly. In addition, water pollution due to run-off from non-point pollutant sources such as farms, land reclamation areas, and built-up areas is an emerging issue of concern.

The Tumen River, an international river that crosses the borders of China, Korea DPR, and Russia, has suffered regional socio-economic and environmental impacts due to degradation of water quality. In order to conserve the river's watershed area, the use of an integrated water resources management approach has been called for, with

international cooperation among not only the neighbouring countries but also others as well as international organisations.

Major achievements

Regional and international

There is presently no multilateral cooperation scheme regarding freshwater resource management in Northeast Asia, although a bilateral agreement between Mongolia and China in terms of utilisation and conservation of water resources across the border of the two countries exists.

For example, there is an international cooperation scheme called the Tumen River Area Development Programme (TRADP), sponsored by the UNDP, which is in charge of economic development of the Tumen River area. This is intergovernmental economic cooperation scheme financially supports countries such as China, Korea DPR, Korea Rep., Mongolia, and Russia, and aims at enhancing economic development of the river area. The activities of Northwest Pacific Region Environmental Cooperation Center (NPEC), an international cooperation mechanism mainly focusing on marine

Figure 2.3: Compressed Natural Gas-bus (centre) has been widely introduced in Beijing, China



environmental issues, as explained in the section of “degradation of marine environment” below, include water quality monitoring of the rivers flowing into the Yellow Sea.

National

China and Korea Rep. each developed a legal system concerning water pollution control in the 1990s, which has helped to implement concrete measures to reduce water pollution. As a result, China has succeeded in extensive water quality improvements of its main rivers and lakes.

Korea Rep. established the Special Comprehensive Programmes for Water Quality Improvement for major rivers, including a pollution quota system, designation of riparian zones and forest buffer zones, as well as a new water-use charging system. The water-use charging system has been implemented step-by-step as a method for enforcing water quality and supply management policies, and as a result the water quality in its major tributaries is gradually improving (Ministry of Environment of Korea Rep. 2002b).

In Japan, Water Pollution Control Laws have been in force since the late 1960s in

Box 2

Quantity aspects of freshwater resources: rainwater harvesting - an environmentally sound approach for sustainable urban water management

Growing demand for freshwater resources in growing urban areas in Northeast Asia is one of the major concerns in these days. One of the environmentally sound approaches for sustainable urban water management is rainwater harvesting that has been traditionally practiced and abandoned in the process of urbanisation in many cultures. This practice is revived in the modern context and promoted in a numbers of cities/towns in Japan with multiple objectives including mitigation of water shortage in summer, prevention of sewage floods caused by heavy rain, and reservation of fire-fighting water, etc.

Sumida-ward is a small administrative district located in the eastern part of Tokyo with a total land area of 13.75 km² surrounded by the Sumida and Arakawa Rivers inhabited by about 226,000 populations. The ward became involved in rainwater utilization projects in 1982, then, the municipal Government started taking a leading role amongst other cities/towns in promoting rainwater utilization in collaboration with its citizens. To date, 300 rainwater large and small scale tanks have been installed in public and private facilities in Sumida City, achieving a total rainwater reservoir capacity of 9000 m³.

In 1996, the Sumida City Government organized the Rainwater Utilization Liaison Council for Local Governments. Over hundred local governments in Japan have joined this council in order to exchange policy ideas and experiences related to rainwater utilization. Sumida City's rainwater utilization projects were selected as an example of “best practice” by the G8 Environmental Futures Forum 2000, and also received an excellence “local initiatives” award from the International Council for Local Environmental Initiatives (ICLEI) in 2000.

Source: UNEP-IETC 2002

order to reduce the contamination of surface and ground water by household wastewater and industrial wastewater, including hazardous chemical substances. Drastic expansion of the public sewerage system and water conservation efforts by stakeholders, including industry as well as citizens, have contributed to the improvement of water quality in many water bodies. But in 1998, in response to the fact that dioxin pollution in surface and ground waters had become a social problem, it instituted the Law Concerning Special Measures Against Dioxins. Since then the quality of water and soil has been regularly monitored. Because soil pollution by toxic substances is often observed in redeveloped areas, especially when replacing old factories, the Soil Pollution Prevention Law was enhanced in 2003.

Since the 2nd World Water Forum in 2000, numerous actions designed to address the looming global water crisis have been undertaken. At the international and regional level, several of these activities have focused on raising awareness, sharing information, and the creation of partnerships. At local levels, the actions undertaken reflect the more specific nature of water-related challenges that affect local communities and smaller water basins. The 3rd World Water Forum, recently held in Japan in 2003, in recognising that fresh water is a precious and finite resource central to sustainable development, economic growth, social stability, and poverty alleviation, recommended more effective governance, improved capacity, and adequate financing at various levels. In particular, it emphasised that community-level public participation is fundamental in order to achieve water management goals.

Future challenges

Water-environment management now requires a synergetic viewpoint, particularly considering catchment water budgets and watershed management. In order to implement

such management effectively and extensively, participation by a wide range of stakeholders, including government officials, should be secured, along with sufficient budget allocation and intra-governmental coordination and collaboration at local and national levels.

Water supply and water treatment facilities can help to insure effective environmental management, but they require considerable initial investment and operational funding. How to manage such costs is a key issue in water management. In China, it has been observed that inadequate facilities cannot meet the needs of dramatically growing populations in many urban areas, mainly due to insufficient budget allocation. In such cases, besides governmental investment, private sector investment or international funds need to be utilised.

In rural areas where populations are drastically decreasing, such as in some districts in Japan, some public facilities in these areas may suffer from budget allocations that are insufficient for their maintenance. National population is expected to decrease from 2006 in Japan and from 2023 in Korea Rep. (National Institute of Population and Social Security Research of Japan 2003; Korea National Statistical Office 2001).

Considering the socio-economic situations projected for the future, water supply systems with networks that require huge investment may not be the most efficient. Water supply systems might be better designed as a rather distributed structure, and due consideration should be applied for most effectively meeting geographically uneven water demand.

2.1.3 Degradation of the marine environment

Status

Japan and both Koreas have long coastlines. Japan is especially unique in Northeast Asia,

being surrounded by ocean and having the longest coastline, measuring 13,685 kilometres, of all the countries in the region. It also has a large exclusive economic zone surrounding the country with 200-nautical-mile, and its economy depends very much on marine and coastal activities.

Most of the major cities of a number of countries in the subregion are concentrated along their coasts, which are focal points of fishery activity, maritime transportation, etc.; Japan, Korea DPR, and Korea Rep., for example, have only narrow strips of flat land along their coasts. Due to such concentration of activities and the fragility of coastal ecosystems, conflicts between protection and development often occur. The surrounding ecosystems of marine environments are also very vulnerable to the coastal activities of adjacent nations, making this is a very crucial issue.

Degradation of the marine environment and pollution and depletion of marine resources result from various factors such as coastal development, outflow of pollutants through freshwater courses, eutrophication, over-fishing, and degradation of the marine ecosystems. The disruption of coastal fishery resources by extensive land reclamation projects, industrial water effluents, waste disposal, and oil spills has had significant negative effects on the sustainable development of coastal fisheries, and causes further coastal environmental degradation as well.

The increased use of agrochemicals on land and the discharge of chemicals into seawater is a common problem. In the Sea of Japan, a survey has revealed high concentrations of mercury, the source of which may have been wastewater from chemical plants (MSA 1997).

Despite decreased discharges of nutrients with the development of sewage systems, red and blue tides have been observed in many closed water bodies, harming fisheries and

damaging swimming spots. Red tides have become a major concern in Japan, Korea Rep., and China. For example, eutrophication has occurred in semi-closed ocean areas such as Tokyo Bay, Ise Bay, and the Seto Inland Sea. The damage to fisheries from red tides in coastal areas was estimated at \1.6 billion (equivalent to about 14 million US Dollar) in 1990 (OECD 1997).

Major achievements

Regional and international

The major multilateral effort aimed at marine and coastal environmental protection at the regional level is UNEP's Regional Seas Programme, which was initiated in 1974. In 1995, 108 governments across the world adopted the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. Many countries have also introduced national legislation and projects to address marine pollution (UNEP 2002).

In order to protect coastal and marine resources, the Northwest Pacific Action Plan (NOWPAP), focusing on the Sea of Japan and the Yellow Sea, was adopted in 1996 by four countries—Japan, Korea Rep., China, and Russia. The activities of NOWPAP are still being developed. In addition, its 2002/2003 work plan and budget was set to cover development of marine environment data, sea monitoring, and countermeasures for oil pollution accidents.

The Northwest Pacific Region Environmental Cooperation Center (NPEC) was founded under the initiative of the Ministry of Environment of Japan in order to conserve the marine environment of the Sea of Japan and the Yellow Sea. This organisation promotes information exchange and mutual cooperation among countries and regions so that all the countries concerned may move forward with their marine environmental protection plans, voluntarily and cooperatively.

The International EMECS Center endeavors to strengthen ties with efforts to preserve the environments of enclosed coastal seas in Japan and other countries. In order to make an active contribution to such efforts, the Center strives to make effective use of personnel and knowledge networks and, with the participation of the various organizations and researchers working to preserve the environments of enclosed coastal seas in the Northeast Asia, will promote operations aimed at creating “a society capable of sustainable development in which human beings coexist with the diversity of the natural world” (EMECS 2003).

National

A total allowable catch (TAC) system was introduced in Japan in 1997 to maintain sustainable use of its marine environment and resources. Seven main fish stocks are being managed under the TAC system, and fishery regulations based on the Fishing Law and the Law for Conservation of Fishery Resources are in effect (Fishery Agency of Japan 2003b; Ministry of Agriculture, Forestry and Fisheries of Japan 2003c). In addition, the Setonaikai Environmental Preservation Master Plan, established in 2000 by the Ministry of Environment, sets out countermeasures that include control of total amount of chemical oxygen demand (COD) and promotion of comprehensive measures for conservation of water quality for recovering degraded marine environments of the Seto Inland Sea, in addition to using conventional anti-eutrophication measures that centre on the command-and-control approach, along with broad cooperation and participation of national and local governments, residents, entrepreneurs, etc.

Korea Rep. has been pursuing various policies for an integrated management of coastal area which is an important basis for systematic management of various marine pollution sources. Enacting the Control Zone

Management Act and amending the Marine Pollution Prevention Act in 1999, the Integrated Coastal Zone Management Plan was established in 2000. This plan includes designation of protected areas to facilitate the implementation of effective and integrated protection measures. As a result, the total designated area amounts at 4,791 km² (Ministry of Environment of Korea Rep., 2002b).

Future challenges

Many countries have adopted the two major existing international agreements on marine pollution—the London Convention of 1972 and the International Convention for the Prevention of Marine Pollution from Ships (MARPOL) of 1973, with its 1978 Protocol. Beyond these, the coastal nations of Northeast Asia need to cooperate proactively with the Food and Agriculture Organisation (FAO) and other regional and international bodies in abatement activities of ocean environmental problems. Red tides are increasing in frequency, and hence land-based activities should be addressed as well, in particular, those addressing total nitrogen or phosphorus releases.

Figure 2.4: Vulnerable dry land in Inner Mongolia Autonomous Region, China



2.1.4 Land degradation and desertification

Status

Land degradation, which includes desertification, is considered to be one of the major concerns in Northeast Asia, particularly in China and Mongolia. United Nations Convention to Combat Desertification (UNCCD) defines desertification as land degradation in arid, semi arid and dry sub humid areas resulting from various factors, including climatic variations and human activities. Human activities contributing to land degradation include unsuitable agricultural land use, poor soil and water management practices, deforestation, the removal of natural vegetation, frequent use of heavy machinery, over-grazing, improper crop rotation, and poor irrigation practices. Natural disasters, including droughts, floods, and landslides, also contribute to land degradation (UNEP 2002). By and large, land degradation leads to a significant reduction of the productive capacity of the land. The situation in China and Mongolia needs special attention, where the decreasing quality and quantity of arable land is resulting in reduced productivity and economic losses.

China and Mongolia have been severely affected by land degradation and desertification. For example, it was reported in 2000 that in China the total land area affected by desertification had reached 2,622,300 square kilometres, which is about 27.32 percent of the country's total land area (CCICCD 2000). In Mongolia, 30 percent of grasslands have been damaged due to inadequate protection from human activities such as clear-cutting of forests and over-grazing of grasslands. It is reported that Mongolia's sandy areas have increased by 380,000 square kilometres in the past forty years and 70 percent of its territory has been degraded. Compounded by inappropriate forest management and heavy demands on

vulnerable forest resources, such as cutting trees for firewood, desertification is increasingly becoming a threat to the livelihoods of many Mongolians (UNEP 2001).

Degradation of arable land

Preventing the degradation of arable land is key to maintaining sustainable agricultural practices. In China, it is reported that a significant area of arable land has been degraded due to a number of factors, especially inadequate investment in organic fertilizers and the unbalanced use of fertilizers, which has led to the thinning of fertile topsoil, poor conditions for cultivation, and decreased capability of water and fertility conservation (SEPA 2000). With regard to the quantity of arable land, there was net decrease in 2001 alone of 617,300 hectares, which is roughly equivalent to 0.5 percent of the entire arable land existing in the whole country (SEPA 2001). In Mongolia, major causes of land degradation include those both human-induced and natural, but pressure from human activities—rapid development of farm land, the mining industry, changes in traditional livestock husbandry, and over-grazing (especially around settlements and water bodies)—are especially notable. As a consequence, crop yields have been severely affected. For example, wheat yields are half what they were in the 1980s because of losses in soil fertility and the large amount of farm land abandoned (UNEP 2001).

Dust and sand storms

Locally, desertification affects rural people's habitats by causing severe damage, in particular affecting their agricultural practices. It also affects people in rural and urban areas far away from deserts because of the deposition of small particles of sand—known as yellow sand—transported by strong winds. It is well known that cities such as Beijing,

Ulaanbaatar, Seoul, and Fukuoka often experience this problem. The Meteorological Agency of Japan reports that the frequency and areas of sand deposition in Japan has significantly increased since 2000. In March 2002, yellow sand blanketed major cities in Korea Rep., and roughly 70 domestic flights had to be cancelled.

Major achievements

Regional and international

The increasing frequency and volume of sand deposition in Japan and Korea Rep. from dust and sand storms (DSS) in recent years have brought subregional attention to the desertification problem in China and Mongolia. A number of programmes to tackle desertification in the subregion have emerged at the subregional, bilateral, and national levels. Amongst those, a subregional initiative was launched in 2003 based on an agreement made at the Tripartite Environment Ministers Meeting (TEMM) among China, Korea Rep., and Japan. With the participation of the Mongolia's government and the other three countries, study projects have been developed and implemented to monitor and analyse the mechanism of DSS and to seek effective measures to moderate/prevent the generation of sand storms, with international financial support from the Global Environment Facility (GEF) and the Asian Development Bank (ADB).

National

China has been quite active in working to halt the trend of desertification, and on 1 January 2002, the Law of Anti-desertification of the People's Republic of China was put into force. Recent major national programmes planned or already launched include the National Programme on Three Northern Shelter-belt Forests Development and the National Programme on Combating Desertification around the Wind and Sand

Sources Affecting Beijing and Tianjin. Moreover, regional programmes to combat desertification are in progress along the Yangtze River, the Yellow River, and the Huaihe River. Through these anti-desertification campaigns China intends (1) to curb the expansion of desertification by 2010, (2) reduce the total area of sandy soil by 2030, and (3) construct a comparatively sound ecological system in decertified areas by 2050 (IGES 2002).

Mongolia signed the UN Convention to Combat Desertification in 1996 and ratified it in 1997. In accordance with the ratification of the Convention, Mongolia developed its National Plan of Action to Combat Desertification (NPACD) in 1996, and efforts to combat desertification to various degrees are reflected in the Ecological Concept, Mongolian Action Program for the 21st Century (MAP-21), National Water Program, Natural Disasters Reduction, and Government Action Program 2000–2004. Major achievements so far include the establishment of the National Center to Combat Desertification at the Institute of Geo-Ecology; prohibition of commercial logging in the Gobi region, where desertification is severe due to over-cutting of saxaul (a kind of tree common in

Figure 2.5: Sand-fixation technique called wheat straw checkerboard barriers in Xinjiang Uygur Autonomous Region, China



Mongolia) for firewood; and several studies and projects on vegetation cover of desert areas, ecosystem features, climate-related factors, and water supply (UNEP 2001).

Future challenges

Collecting the necessary information and making appropriate land-use plans with a long-term vision are the keys to addressing the land degradation and desertification issues. Creating desertification-monitoring capacity, including utilisation of satellite monitoring technology and study on focal issues, is the one of the most urgent tasks. Some international scientific research activities, such as the Integrated Environmental Monitoring (IEM) of the Asia-Pacific Environmental Innovation Strategy Project (APEIS) that applies satellite- and ground-based monitoring, is expected to be utilised as an early warning system of DSS and other types of environmental degradation.

Strengthening collaboration between central and local government organisations is also a key for effectively responding to these issues. Policy coordination among national and local governments undergoing decentralisation needs to be effectively accomplished.

Figure 2.6: Forest in Mongolia is under various pressures such as forest fires, pests and diseases, as well as inappropriate exploitation of timber products



2.1.5 Deforestation and biodiversity loss

Status

Deforestation

Deforestation and forest degradation are serious issues critically threatening biodiversity, ecosystem stability, and the long-term availability of forest products, as well as depleting the natural resource base underpinning many national economies (UNESCAP and ADB 2000). The state of deforestation in Northeast Asia, in terms of the amount of forest area lost, differs in each country of the region. For example, between 1990 and 2000, China has seen an increase of 18,063 square kilometres of forest area annually, with an average annual increase of 1.2 percent, while Mongolia has lost 600 square kilometres of forest area annually, with an average annual decrease of 0.5 percent (World Bank 2002).

Major pressures causing deforestation in Mongolia in the past decades include natural and artificial causes, such as forest fires, which were severe in 1996 and 1997, pests and diseases, and inappropriate and illegal exploitation of timber products. Economic and environmental impacts due to the loss of forest resources are quite significant. The wood-based industry in Mongolia was once an important economic sector, which, at its peak level in 1985, employed more than 20,000 people and produced 6 percent of GDP. By 2000, the sector had collapsed, producing only 0.32 percent of GDP, and employed only 3,000 people. Due to the harsh climate, with a dry, windy, low temperature, and short growing season, the recovery of lost forest area is quite challenging (UNEP 2001). Deforestation in Mongolia is also considered to be the critical force driving desertification and biodiversity loss, as well as the declining amount of freshwater resources.

Biodiversity loss

Biological resources in the Northeast Asian subregion are still quite rich, but they under increasing threat. It is reported that China is ranked third in the world for its wealth in biodiversity, with more than 30,000 species of higher plants and 6,347 types of vertebrates, which account for 10 percent and 14 percent of the world total, respectively (SEPA 2001). The rich biological resources of the subregion are being increasingly exploited by a variety of human activities such as direct harvesting and export of natural products, particularly timber and fish; expansion of agriculture into primary forests, wetlands and grasslands; construction of dams; and the replacement of traditional native crops with high-yielding exotic species. Such activities are compounded by socio-economic factors such as urbanisation, industrialisation, mining, tourism, illegal trade in endangered species, and lack of proper management (UNEP 1999).

For example, poaching and the illegal harvesting and trade of medicinal plants and animals have increased in Mongolia and Korea Rep. because of increasing export to the lucrative black markets of neighbouring countries. The crested ibis, a bird species that once widely existed in Japan, the Korean peninsula, and the Russian Federation is now threatened with extinction due to over catching in the past (UNEP 1999; ESCAP and ADB 2000).

Major achievements

Regional and international

Several collaborative efforts have been launched among governments, non-governmental organisations (NGOs), and local peoples to promote biodiversity conservation at the regional level, including in the Northeast Asian subregion. Such initiatives include the Asia-Pacific Migratory Waterbird Conservation Strategy, developed in the

1990s, which has been promoting networking and participation of stakeholders.

National

In order to moderate and reverse the trends of deforestation and biodiversity loss, there has been a wide variety of attempts taken in the Northeast Asian subregion. Preserving and increasing the size of forest area in China, for example, could not have been achieved without a number of projects on afforestation, reforestation, and rehabilitation of forest areas. Major programmes include a series of the Shelterbelt Development Programmes, which were launched back in 1978, and the Natural Forest Protection Programme launched in 1998. The afforestation strategy in China was set on course, along with the formulation of the Forestry Action Plan for China's Agenda 21, and its implementation was enhanced by the Forest Law, promulgated in 1984 and amended in 1998, which stipulates the establishment of a financial mechanism—the Compensation Fund for Forest Ecological Benefits—to be used for silviculture, tending, protection, and management of forest resources, including shelterbelts and forests for special purposes that provide ecological benefits (United Nations 2002a). As a consequence, forest cover has risen from 13.92 percent of China's total territory in 1993 to 16.55 percent in 2001 (State Forestry Administration of China 2002).



As for biodiversity conservation, the Convention on Biological Diversity has played a key role in encouraging each nation to develop its own national strategy, by and large, during the 1990s. In the Northeast Asian subregion, China's Action Plan identifies priority projects and elaborates its country studies; Japan's National Strategy adopted in 1995 and revised in 2002 provides guidelines and administrative framework for conservation; the Republic of Korea's National Strategy identifies priority concerns; and Mongolia's Action Plan provides for sustainable use of biological resources and their natural restoration (ESCAP and ADB 2000).

Among the most effective measures to promote biodiversity conservation, establishing protected areas is the most essential. Three countries in Northeast Asia, namely, Mongolia, China, and Korea DPR, have significantly increased the number and size of areas designated as protected areas in the last decade. Mongolia, in particular, gave high priority to biodiversity conservation in the 1990s, and adopted the Law on Special Protected Areas and the Law on Buffer Zones of Special Protected Areas in 1994 and 1997, respectively. The total amount of protected area in Mongolia reached 195,200 square kilometres in 2002 (according to the World

Conservation Monitoring Centre's [WCMC] definition), which is roughly equivalent to 11.5 percent of the country's total land territory and about four times as much as in 1990.

Future challenges

Although some achievements have occurred, biodiversity in the subregion is facing increasing threats due to expanding human activities. It should be noted that further efforts need to be made to protect biodiversity and prevent further losses. Formulating effective ways to manage and monitor biodiversity in the subregion that involve the participation of government at all levels and major groups will be an important step in this process. Through such activities, quantitative data to objectively keep track of biodiversity change should be appropriately collected. At the same time, raising public awareness on this issue should be promoted through all available channels, including the mass media.

Deforestation in Mongolia should be given the highest priority, and supporting financial mechanisms to quickly restore deforested areas should be put in place. Investment in renewable energy and/or other types of energy resources to replace unsustainable firewood use by local inhabitants would contribute to mitigating deforestation due to human activities, not only in Mongolia but in other countries in the subregion as well.

Figure 2.8: Above and Bottom: Large-scale afforestation effort near Yanan City, Shanxi Province, China



2.1.6 Natural disasters

Status

People and the environment in the subregion are increasingly suffering from the effects of natural disasters, and a number of direct and indirect reasons for this includes human activities such as high population growth and density, migration and unplanned urbanisation, environmental degradation and

possible global climate change (UNEP 2002). By and large, vulnerability to natural disasters is increasing, and the capacity to cope with them needs to be further improved.

A great deal of attention and effort is required to deal with natural disasters in the Northeast Asian subregion. Incidents such as floods, droughts, earthquakes, volcanic eruptions, landslides, tsunamis, and typhoons have been commonly observed in the countries in the region. For example, the 1995 Kobe earthquake in Japan resulted in over 5,000 deaths, over 26,000 injuries, left one-fifth of the city's population of 1.5 million homeless, and caused colossal damage to buildings,

transportation means, and other infrastructure. In China, the flooding of the Yangtze River in 1996 resulted in 2,700 deaths, two million people homeless, tens of thousands of animals drowned, and crops on over 20 million hectares of farmland destroyed. The 2000–2001 zud (severe winter) in Mongolia, the worst one in recent history, led to over 820,000 livestock dead and over one third of the country in a state of emergency, with over 45,000 families struggling to survive. Dust and sand storms (DSS)—depositing sand in distant places (mentioned in the land degradation and desertification section above)—have recently drawn region-wide attention as well.

Box 3 Asia-Pacific Migratory Waterbird Conservation Strategy

The Asia-Pacific Migratory Waterbird Conservation Strategy is an international framework to promote the conservation of migratory waterbirds and wetlands - nesting areas and critical stopover sites along their flyways where they stop to rest and feed. The migratory routes of these birds cover wetlands in many countries transcending national borders on a regular basis from the arctic to the southern hemisphere. The Strategy is supported by Governments of Japan and Australia, coordinated by Wetlands International, and jointly carried out by governments of the Asia-Pacific region, NGOs including Wetlands International, Bird Life International, World Wide Fund for Nature, technical experts and local communities.

Under the framework of the Asia-Pacific Migratory Waterbird Conservation Strategy: 1996-2000, significant progress has been made across a wide range of actions. Three international networks of sites (for Anatidae, cranes and shorebirds) have been established. These Networks have been built by people for people and sites. Training courses, dissemination of wetland awareness and technical material in many languages, have been undertaken. Regional and national meetings have been organised to share experiences and expertise in such areas as conducting research and managing wetlands. All this has been possible through the active participation and cooperation of the peoples of the region.

Based on the success of the phase 1 (1996-2000) activities, the Strategy extended and enhanced its activities for the period of 2001-2005. It is an ongoing process offering a sound framework for governments, local people, NGOs, the corporate sector, donor agencies and international conventions to continue to work together in a common cause to save wetlands and migratory waterbirds. It offers the opportunity for greater participation to build on a successful programme and to achieve conservation on the ground, and at a national and international level.

Source: MWCC 2001

Major achievements

Regional and international level

The United Nations declared the 1990s as the International Decade for Natural Disaster Reduction (IDNDR), and risk reduction related to natural disasters was given high priority on the political agenda. Based on the experience gained during this decade, the UN established in 2000 the International Strategy for Disaster Reduction (ISDR), a global platform aimed at enabling all societies to become resilient to the effects of natural hazards and related technological and environmental disasters, in order to reduce human, economic, and social losses. Major activities that the ISDR emphasised for disaster risk reduction include increasing public awareness, obtaining commitment from public authorities, stimulating interdisciplinary and inter-sectoral partnership, expanding risk reduction networking at all levels, and improving further the scientific knowledge of the causes and effects of natural disasters, including the development of early warning systems.

National level

The United Nations campaigns on the risk reduction of natural hazards have changed the focus of disaster-related policies in some countries. For example, it is reported that China is shifting its disaster policies from improving response capabilities to reducing hazards and risks, based on developing a comprehensive plan for its national economy and social development that incorporates disaster-related risk reduction (UNEP 2002).

Future challenges

In order to combat the increasing damages caused by natural disasters, it is necessary to address two major issues. One is the urgent need to strengthen monitoring and assessment of natural disasters and establish early warning

systems by further promoting subregional cooperation on studying the causes and effects of natural disasters. The other is to further strengthen national and local efforts to elaborate social and economic development plans that incorporate the views to minimise the risks of natural disasters.

2.1.7 Energy/renewable energy

Status

In the Northeast Asian subregion, a number of countries have high energy consumption, namely, China, Japan, and Korea Rep, and the subregion's energy consumption level as a whole is one of the highest in the world. This subregional pattern of high energy consumption is expected to increase further, in particular in the countries with high economic growth rates such as China and Korea Rep. With regard to the energy supply side, Japan and Korea Rep. are poor in domestic energy resources, thus their dependence on overseas resources is very high. And although China is rich in a variety of natural energy resources, its dependence on overseas oil and natural gas is increasing due to the expanding energy demand exceeding the domestic production. By and large, securing a stable energy supply under the increasing trend of dependence on overseas energy resources has become one of the most prioritised issues for attaining future economic development in the subregion.

As for the energy resources structure, dependence on coal is high in China, Korea DPR, and Mongolia; and dependence on oil is high in Japan and Korea Rep. In Japan, measures for introducing renewable energy, such as solar power and wind power, are making some progress in realising energy resource conversion from fossil fuels in response to the greenhouse gas curtailment target set in COP3. In China, hydro power is one of the main sources of power supply, and plans are being made to utilise its vast

quantity of potential hydro power resources in the future. Moreover, introduction of suitable renewable energy including hydro power is being considered in China or Mongolia to respond to diverse demands in each locality, in particular in remote places.

Conventional and unsustainable energy consumption often creates burdens on the environment, and atmospheric pollution and global warming are considered to be major consequences. The emission of SO_x or NO_x from energy consumption is causing problems such as degradation of air quality and acid deposition. In the Northeast Asian subregion, such air pollution is most serious in urban and industrialised areas of China, and also in Ulaanbaatar, the capital of Mongolia. Major factors resulting in the serious air pollution problem in China include the country's great dependence on coal, utilisation of outdated equipment, and insufficient installation of desulphurisation equipment, although some improvement has been reported. There is some evidence that the contaminants discharged in China are being transported by westerly winds and causing damage in Korea Rep. and Japan.

Discharge of greenhouse gases, such as CO₂, due to energy consumption is contributing to climate change—a global warming problem. Japan, which had emission reduction targets on greenhouse gases set in UNFCCC/COP3 in 1997, is required to promote further energy saving and energy conversion from conventional fuels to those with lower greenhouse gas emissions. Although other countries in the subregion do not have international obligations as per emissions reduction, in all countries, in particular in China, which has the second largest amount of CO₂ emissions after the United States, appropriate measures to improve their environmental performance should be undertaken.

Major achievements

Regional and international

With regard to the environmental problems derived from high and increasing energy consumption in the subregion, the adverse effects of acid deposition received crossboundary attention in the 1980s, and a series of expert meetings have been held since 1993. Beyond such efforts and after two years of a preparatory phase, the Acid Deposition Monitoring Network in East Asia (EANET) launched formal operations in 2001 with the participation of ten East Asian nations, including China, Japan, Korea Rep., and Mongolia.

National

Natural gas has attracted attention as an energy source with a lower environmental load than some of other conventional energy sources. In Japan and Korea Rep., with their high dependence on oil, fuel conversion from oil to natural gas and atomic power, as an alternative energy source, is advanced. China, rich in natural gas, is increasing the quantity of its production. Presently, natural gas is mainly consumed in localities around its production sites due to prohibitive large transportation costs; however, plans for developing a long-distance natural gas pipeline

Figure 2.9: Large-scale wind power plant with 42 wind-mills in Tomamae, Hokkaido, Japan



in the Northeast Asian subregion have been discussed with enthusiasm, and it is predicted that the demand for natural gas will greatly increase if the plans are realised.

In Japan, in order to respond to greenhouse gas emission targets set in UNFCCC/COP3 in 1997, measures to accelerate the utilisation of renewable energy such as photovoltaic power and wind power are being promoted. In addition, an integrated strategy to promote the utilisation of biomass resources—the Biomass Nippon Strategy—was developed under an initiative of the Ministry of Agriculture, Forestry and Fisheries of Japan, and multiple nationwide activities were launched in 2002.

Future challenges

In the Northeast Asian subregion, it is expected that energy consumption will increase, in particular in China and Korea Rep., along with their continuing high economic growth, as will the import of energy resources from countries beyond the subregional border. In order to secure a stable energy supply to meet the increasing demand for energy in the subregion, it is and will become even more crucial to develop concrete reliance and cooperation mechanisms both within and beyond the subregion among countries both rich and poor in energy resources.

Coal is likely to continue to serve as a major energy source in the future in China, Korea DPR, and Mongolia, although it is a resource with a large environmental burden such as the discharge of SO₂ created by combustion. Therefore, the emission control of gases that result from coal use will remain a priority issue in the future. Policies to effectively address and improve the dissemination of desulphurisation equipment and renovation of outdated firms need to be further elaborated.

Northeast Asia and its surrounding subregion are rich in reserves of natural gas resources. In order to take advantage of natural gas in terms of its lower environmental load compared to other types of conventional energy sources, promoting its utilisation and fuel conversion from other types of fossil fuel is necessary. Development of a natural gas pipeline network covering a vast area to connect production and consumption sites will play key role, thus multilateral cooperation mechanisms should be established to address obstacles ahead, such as fund-raising, sharing and utilising advanced technologies, and establishing markets.

As for renewable energy, potential of such energy should be further explored and better utilised where it is applicable. Sustainable use of all available renewable energy such as solar, wind, biomass, geothermal and small-scale hydraulic power needs to be further promoted to simultaneously address increasing demand for energy and climate change mitigation. Advantage of small scale and off-grid power generators utilising such energy – by and large, require less infrastructure – needs to be well considered and appropriate investment should be made for their research and development as well as for their dissemination.

2.2 Social and economic issues

2.2.1 Poverty

The countries in Northeast Asia have achieved substantial progress in reducing poverty over the last three decades. As a result, the number of people living in absolute poverty (income of no more than one dollar a day) has dramatically decreased in terms of number and ratio against the total population, especially in such countries as China. However, poverty, inequality, and lack of access to basic needs still remain in the

Box 4

Promoting household photovoltaic systems in remote areas of China through international funding and establishment of effective mechanisms

China is a country with a large territory and over 1.3 billion people. Although its power-grid covered over 90 percent of the whole country in the year 2000, there were still 40 million people living without access to a power grid. Most of them were in the northwest and southwest regions. The Chinese government is committed to supplying electricity to these areas by every technology possible. One important way is by photovoltaic (PV)/Solar technology. In the western regions of China, there are abundant resources of solar energy. The annual sunshine hours in western China are from 3000 to 3300, and the total annual solar radiation is 1.6-2.3 kWh/m², thus placing these regions in a favorable position for solar energy exploitation and utilization.

In order to solve the energy problems in western remote regions, the Chinese government has always encouraged the search for various financing sources as well as to apply for several programs and plans such as Electrification Village by Village, Brightness Program, TV Connection Village by Village etc., for the development of the PV industry and its application in remote areas. On this basis, the State Economic and Trade Commission began to apply for a project entitled China Renewable Energy Development Project, from the World Bank and Global Environmental Facility since the year 1995. The project was implemented starting in December 2001, and included two parts, wind and PV. For the PV portion, a direct grant would be provided to PV system companies to assist them in marketing, selling and maintaining some 300,000 to 400,000 systems of 10 MWp capacities in six target provinces.

During the six-year preparation stage and one year of actual implementation, the impact of the project is quite evident. During the project preparation stage, most of the promotion work was done to encourage the development of PV engineering companies, especially in the western regions. In the early 1990s, there were about 10 PV companies in the western regions, but in the year 2000, the numbers of PV companies in these same regions reached 60. The production industry is being strongly promoted. Throughout the project, the price for PV modules and other components has been reduced, and the positive impact is that more and more farmers and livestock producers in remote areas are now able to purchase a PV household system.

So far, the grants for the first half of the year 2002 have been allocated. A total of 15,578 systems (261 kWp) were provided direct grants with \$1.5/Wp (for totals of \$392,026.5), thus solving the energy needs of about 60,000 people. It is expected that 350,000 units will be installed with the GEF grant, and about 1.4 million people may gain access to electricity by PV.

Source: Source: APEIS/RISPO 2003b

subregion and there is a few marginalized members of society.

In Mongolia, extensive poverty has emerged since 1990 in the context of fundamental policy reform in its shift from a socialist to a market economy. Despite efforts made at national and subregional levels to fight poverty in collaboration with outside institutions, such as the implementation of the National Poverty Alleviation Program (NPAP) during 1996 to 2000 and the National Household Livelihood Capacity Support Program, average income has fallen, and inequality in income distribution has increased as well. Mongolia's poverty ratio is still high; it stood at 35.6 percent at the end of 2000 (UNEP 2001).

Negative factors affected the region in terms of poverty include the Asian economic crisis of 1997/1998. The crisis reversed the trend of progress that had been achieved in eradicating poverty and resulted in new forms of social vulnerabilities. In addition, an economy emphasising heavy industry reduced productive capacity of the poor in the middle of a vicious cycle, which has made poverty reduction difficult.

Major achievements

Regional and international

In the past, export-oriented industries in Northeast Asia expanded and prospered, benefiting from cheap labour as an asset for transforming economies and reducing poverty. Manufacturing has now become less labour intensive, and it now acts as a major instrument of poverty reduction. The service industry is becoming a major source of employment, though it is also introducing a new form of illiteracy for those countries and people without access or ability to use information technology, thus creating a new gap between the rich and the poor.

National level

The strategy of Korea Rep. for combating poverty lies in eliminating absolute poverty in the short run and alleviating relative poverty in the long run, with due consideration for both economic growth and the environment. With the establishment of the National Basic Livelihood Security Act in 2000, the basic livelihood of the low-income class earning less than the minimum cost of living is institutionally secured, along with various poverty counter-measures for those able to work and earn money.

In Japan's Official Development Assistance Charter, revised in 2003, poverty alleviation is positioned as an important problem to address, on a par with efforts for sustainable development, global environmental problems, and peace building. Regional and international cooperation in the fields of education, medical care, welfare, water, health, and agriculture is emphasised.

Future challenges

Efforts that consider the connections and balance of interrelated problems—including environment, economy, and society—are required towards the realisation of sustainable development. In other words, in addition to individual management of each problem, a comprehensive approach is required, where curtailing the serious situation of poverty stemming from various social and environmental factors requires multilateral international cooperation in the areas of energy, environment, and economy, etc.

Despite the decrease in income poverty in Northeast Asia, other dimensions of poverty still remain challenges. Although the countries in the region are expected to meet and even surpass the 2015 Millennium Development Goals (MDG) with regard to income poverty, it is estimated that with regard to the MDGs

for certain social development indicators, such as infant mortality, the rate of reduction in East Asia appears too slow to meet the MDG for 2015 (a two-third reduction over 1990 levels).

Lack of education is considered one of the background factors that contribute to the reproduction of poverty. Raising awareness and providing education opportunities for children is very important. These issues should receive the highest level of political attention, and such a necessity should be widely shared among citizens.

2.2.2 Population and urbanisation

Status

The Northeast Asian subregion covers a vast area and is home to the country with the largest population, namely, China, with 1.26 billion people (as of 2000), and it is estimated that its population will increase to up to 1.39 billion by 2015. The total population of five countries in the subregion, namely, China, Japan, Korea DPR, Korea Rep., and Mongolia, was 1.46 billion in 2000—about one quarter of the entire world population. By 2015, population in the subregion is expected to have gradually increased, with the exception of a slight population decrease in Japan, and it is estimated that the total population of the subregion will be 1.59 billion by then (World Bank 2002).

Some of the major changes with regard to population demographics include an increase in life expectancy, reduction in population growth rates, and a greater emphasis on maternal and children's health. For example, in Mongolia life expectancy increased from 61 to 65 years for men and 64 to 68 year for women between 1990 and 1998; in China, the maternal mortality rate decreased from 94.7 per 100,000 live births in 1990 to 56.2 in 1998 (ADB 2000). Some exceptional

changes are projected for Japan: its population growth trend will shift in 2007 (based on the latest medium variant projection) and the national total population will start decreasing, along with an increasing ratio of aged population (over 65 years old).

Population growth in and around cities—urbanisation—as a result of mass migration of people from rural to urban areas in search of economic opportunities, is a concern, combined with total population growth. Although levels of urbanisation are relatively lower than those in other parts of the world, the urban population in the subregion has grown more than those in the rural areas. Currently, more than 50 percent of people in Northeast Asia live in urban areas, and in 1994 four of the world's fourteen megacities (cities with more than ten million residents), namely, Tokyo, Beijing, Seoul, and Osaka, were in the subregion (UNEP 1999).

Increasing population has put significant burdens on the environment, in particular in urban areas. These include the unavailability of clean drinking water, overexploitation of ground water, increasing traffic congestion and the resulting deterioration of air quality and greater noise pollution, significant increase in solid wastes, and sanitation problems.

Major achievements

Regional and international

Partnerships and initiatives such as the International Council for Local Environmental Initiatives (ICLEI), established in 1990, and the Kitakyushu Initiative for a Clean Environment, adopted at MCED 2000 and included as a Type II initiative in the WSSD in the 2002 Plan of Implementation, are part of a worldwide movement to share information among local governments on responses to attain sustainable development. Both activities in the Northeast Asian subregion have been enhanced during and

beyond the preparatory process of the WSSD, and partnership and information sharing are being accelerated.

National

Some achievements with regard to the improvement of urban environmental issues such as air quality were observed in several cities in the subregion. For example, new restrictions on automobile manufacture and emissions, mainly targeting vehicles with diesel motors, were set in China as well as in Japan (Tokyo area) in 2002 and 2003, respectively. In Beijing, hosting of the 2008 Olympic Games has become one of the strong incentives to combat air pollution and to construct its environmental infrastructure in order to realise the objective of a “Green Olympics.” Beijing drafted its Tenth Five-Year Plan for Municipal Environmental Protection with a focus on checking the quality of coal, controlling SO₂ emissions, shutting down some cement plants, and issuing stricter emission limitations on boilers and automobiles (IGES 2001).

Future challenges

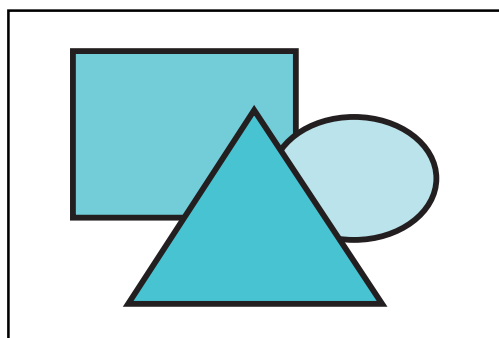
Population growth and changes of lifestyle towards mass consumption are a major burden to the environment in the subregion, and these issues cannot be solved easily. To provide the growing population in the subregion, including urban dwellers, with sufficient services and a clean environment, it is crucial that

appropriate national and urban environmental management is promoted at all levels. Responses to the above issues by municipal authorities are particularly important to appropriately manage environmental issues in urban areas.

Major challenges to attain sustainable urban development include efforts to increase the environmental management capacity of municipal authorities. Policies and legislative and institutional arrangements suited to the locality need to be well established, and financial arrangements also need to be strengthened. In close collaboration with national and international initiatives to attain sustainable development, each city needs to develop its ability to cope with issues of concern in their local context.

Many cities are faced with urgent environmental problems that need to be solved, in particular atmospheric and water pollution. Investment in manufacturing facilities to minimise the emissions of air and water pollutants by methods such as switching fuels to environmentally friendly ones, replacing old equipment with new technology, and careful relocation of firms with renovation of manufacturing facilities remains a priority issue for urban environments, but urban planning for sustainable land use should receive the highest priority at the same time to ensure long-term sustainability.

Raising public awareness on the quality of the urban environment, health issues, and appropriate urban infrastructure is also important. Information disclosure of issues, such as potential pollutants, pollution levels, as well as urban planning, plays a key role in the active participation of civil societies to monitor and enhance municipal activities to tackle urban environmental issues. Proposing and accepting a wide variety of lifestyles in order to moderate urbanisation itself is important, as well. Application of new technologies such as information technology



Urbanisation and industrialisation associated with air quality degradation in Ningbo, Zhejiang Province, China

may hold great potential for producing working opportunities in remote areas.

2.2.3 Food security

Status

Japan, Korea Rep., Korea DPR, and eastern China are located in a monsoon region; there is much precipitation, and agriculture consisting mainly of rice crops or other types of cultivation is practiced. Western China and Mongolia are dry areas with little precipitation, and raising livestock is the major agricultural activity.

The food self-sufficiency rate as of 2000 is diverse in countries in the subregion: it is 94 percent in China, 54 percent in Korea DPR, 46 percent in Mongolia, 33 percent in Korea Rep., and 28 percent in Japan. Except for China, the rate is relatively low in the other four countries (numbers calculated by the Ministry of Agriculture, Forestry, and Fisheries of Japan based on Commodity Balances by FAO). Except for Korea DPR, countries in the subregion have not encountered serious shortages of food supply in recent years.

Serious food shortages in Korea DPR are caused by several reasons, such as economic aggravation and irregular weather in recent years, and efforts to raise agricultural productivity continue. The country is facing difficulty in being self-sufficient in food supply; thus there is an urgent need to develop international cooperation for providing food aid. As for long-term objectives, promotion of technology transfer and diffusion to increase domestic food productivity and strengthening and increasing the amount of trade of food products are essential.

In many parts of the subregion, as a consequence of having used chemicals to boost agricultural productivity, serious pollution of soil and water and degradation

of farmland have emerged. Learning from such incidents, people have started to recognise the necessity of introducing sustainable agricultural practices. Activities to make the best use of natural ecosystems to conduct environmentally friendly agriculture have been promoted, and the use of agricultural chemicals has been reduced in some areas.

The Northeast Asian subregion has the largest population in the Asia-Pacific region, and it is expected to continue to increase, particularly in China. Therefore, the food security issue in the subregion will continue to increase in importance.

Major achievements

Regional and international

As for multilateral and bilateral cooperation mechanisms, there is still no concrete arrangement on food security in the Northeast Asian subregion.

National

In Japan, a regulation regarding food security to prepare for unexpected events—based on people's anxiety over the state of the declining trend of the food self-sufficiency rate, reduction of domestic farmland area, and aging agricultural labour force—was incorporated in 2000 in the Basic Law on Food, Agriculture and Rural Areas. The Renovation Plan on Food and Agriculture was then adopted in 2002 to reform administration of agriculture, forestry, and fisheries to better insure the safety of and trust in food products in reaction to a series of incidents, such as the Bovine Spongiform Encephalopathy (BSE) issue, also known as mad cow disease, and the false labelling of some food products. The plan is intended to promote closer communication between consumers and producers, as well as cities and farm villages, in order to ensure the safety

of food products and revive consumer confidence in domestic agriculture products.

In Korea Rep., the Agriculture and the Farm Village Organic Act was adopted in 1998, setting an agricultural policy direction to promote eco-friendly agriculture, direct trading between consumers and producers rather than through markets, and enhancing and utilising multiple functions.

In Mongolia, the Green Revolution State Project, aimed at improving nutritional balance, providing stable incomes, and creating employment opportunities by introducing kitchen gardens, has been carried out since 1997. As a consequence, production of agricultural products such as potatoes and other types of vegetables has shown a sharp increase in recent years. Moreover, at a livestock research institute run by the Ministry of Agriculture and Food, remarkable research outcomes have been seen in the fields of technology to improve the reproduction of sheep and cows by applying embryo transplant techniques, immunity genetics, and artificial insemination.

In China, at The 9th National People's Congress in March 2000, the basic design of China's Western Development Plan was determined. The plan emphasises the conservation of natural forests in western China, gradually returning arable lands on slopes to forests and grasslands, and strengthening agricultural infrastructure.

Future challenges

The Northeast subregion requires additional food production to compensate for its continuing trend of a growing population, which is particularly keen in China. But potential farmland and water resources available for agricultural use are limited, and factors such as urbanisation, land degradation, and desertification are making the situation more severe, so risks to food security are

expected to increase. Integrated economic and environmental policies that take such risks into consideration need to be elaborated in each country in the subregion.

Food security can barely be achieved by improving domestic production itself or just increasing food imports. Therefore, each country in the subregion should aim at strengthening its food security through a combination of enhancing domestic production, imports, and stockpiling. In order to strategically address these issues, subregional cooperation mechanisms need to be established, and study of risks and necessary responses should be collaboratively sought.

Agricultural products, by their nature, vary in available quantity due to natural causes such as annual and seasonal weather fluctuations. The trade in agricultural products in terms of food security also contains unstable factors; for example, a small number of countries almost monopolise the international trade market by importing a large amount of major agricultural products. Through competition in the market mechanism, agricultural activities in less competitive countries could decline and the multiple functions of agricultural land, such as preservation of ecological systems, could be weakened. Therefore, trade liberalization of agricultural products needs to be carefully pursued with sound consideration of the multiple functions of agricultural land as well as national food security at national and international levels.

2.2.4 Sustainable consumption and production patterns

Status

The economies of countries in Northeast Asia, including Korea Rep., China, as well as Japan, have developed rapidly over the last 30 years. China, in particular, has attracted international attention, since it may lead the world economy in the future because of its

rapid growth and future potential of its economy. Export-oriented industries have developed in these countries, and international specialisation in the business field has been expanding, accompanied by economic globalisation, deregulation, and privatisation.

In the 1990s, key industrial sectors emphasised the intensive use of chemicals, resources, and energy, causing serious environmental problems in the air and water. Moreover, rapid economic development brought about extensive urbanisation and industrial pollution. Furthermore, across the countries in Northeast Asia, treatment of diverse and massive amounts of solid wastes has become a common problem because of the shift in their economies to ones rooted in mass production and consumption. Therefore, the quantity and quality of both industrial wastes and municipal solid wastes have changed drastically, especially due to changing lifestyles. This has made it even more difficult to treat solid wastes without causing additional environmental burdens.

Most of the countries in Northeast Asia have similarly diverse waste-related problems such as dioxin contamination from incineration, inadequate and insufficient numbers of landfill sites, and proper safety controls. In particular, illegal dumping of industrial wastes also poses a serious problem. For example, in Teshima, Japan, no less than 500,000 metric tons of waste, such as shredder dust derived from the disposal of vehicles, were dumped over a decade, causing soil and water pollution.

The lack of landfill sites, the growing volume of solid wastes, and incrementally increasing disposal costs are common problems that most countries in Northeast Asia face. The first response to these problems is to reduce and recycle the waste generated. Although recycling systems are being promoted and expanded at local and national levels, countries still face the problem of sheer waste volumes, which cannot be solved using only existing

technologies. Therefore, industry is required to change existing production processes to ones that are environmentally friendly, which, at the same time, reduce waste in production as well as consumption processes.

Japan and Korea Rep. have instituted policies based on life cycle assessment (LCA) that encourage industry to change their production processes to reduce environmental burdens. Through these demand-side countermeasures, they are helping to formulate an environmentally-friendly consumer market that provides incentives for consumers to purchase recyclable and environmentally-friendly goods, including the introduction of an eco-label system and green purchasing system.

Major achievements

Regional and international

There is no concrete multilateral cooperation mechanism on waste or an eco-friendly commodity market in place in Northeast Asia.

National

Japan established the Basic Law for Establishment of a Recycling-based Society in 2000, accompanied by sectoral laws such as the Waste Management and Public Cleaning Law, the Law for Promotion of Effective Utilisation of Resources, the Container and Packaging Recycling Law, and the Law on Promotion of Green Purchasing. In addition, the Automobile Recycling Law was passed in 2002 as one of the companion laws, which defined the responsibilities and roles of automobile manufacturers and related agencies.

Moreover, since 1997, Japan's Ministry of Economy, Trade and Industry and the Ministry of Environment have been implementing the Eco-Town Project, which aims to create industrial complexes for recycling and the

cascade use of recyclable materials through interlinking firms in the localities. It also aims to provide enterprises with opportunities to further develop their advanced technologies for recycling, which can be enhanced by being linked to each others. As of year 2001, 13 areas have been certified.

Most plastic waste is not biodegradable and produces dioxin pollution when incinerated. It is therefore mainly disposed of in landfill sites. Many countries in Northeast Asia have started to control the production and use of plastic because of these problems. Japan established the Containers and Package Recycling Law in 1995, and Korea Rep. has policies in place to reduce the use of plastic for certain goods, such as plastic bags. In China, production and use of plastic goods are restricted and/or prohibited in some cities in order to reduce the amount of litter on roads and in rivers.

Korea Rep. has two major systems contributing to the promotion of recycling—the Deposit-Refund System (1992) and Waste Production Charges (1993). The former places the burden of responsibility for waste recovery on the producers and import traders, and it provides incentives that promote the recovery of recyclable materials. The latter is a system aiming at suppressing the consumption of products with high waste treatment costs and difficulties for recycling.

Future challenges

Development of recycling technologies, promotion of recycling industries, and formation of a market for recycled materials and products are key elements for the effective promotion of recycling and creation of recycling-based society. Some policies such as “Green Procurement,” with which governments commit to purchase products made from recycled materials with certain ratio of their total purchasing, would contribute to the growth of such markets.

Introduction of an eco-labelling system that encourages preferential purchasing of “green products” is also effective to raise awareness among consumers. As for technology development and diffusion, it is important to widely share the basic technologies under the international collaboration; at the same time, each country is encouraged to develop its domestic industry as a basis to create a recycling-based society.

A considerable amount of funding is needed to maintain waste disposal facilities. Moreover, the technology is needed to control dioxin emissions generated by incineration. Another urgent issue is to ensure that there are designated areas where large volumes of solid waste can be properly treated, because the availability of land for this purpose is shrinking due to rapid and extensive urbanisation. This will require investment as well as technical assistance from private sectors and international funding agencies for further development.

Box 5 **Introducing Volume-Based Waste Fee system in Korea**

In 1995, the Government of Korea, Rep. introduced the Volume-based Waste Fee (VBWF) system in order to reduce waste generation and to maximize waste recycling. Unlike the traditional way of collecting fixed fee for waste collection services, households and small business are required to purchase and use designated VBWF bags for appropriate waste treatment. The public are expected to generate less waste since they pay for waste treatment in proportion to the amount they dispose. By providing a free collection mechanism for recyclable materials at the same time, VBWF aimed to encourage the public to further waste separation and recycling.

After 8 years of implementation, VBWF has proved to be very successful in curbing the municipal solid waste generation in Korea. Between the periods of 1994-2001, a total waste generation from households, commercial sectors, small business and office buildings has decreased by 16.6 percent by weight, and at the same time, increased the overall recycling rate of paper, cans, bottles, metals, and plastics, etc. from 15.7 percent in 1994 to 43 percent in 2001.

Source: Government of Korea, Rep. and KEI 2003

Box 6 Eco-town Project in Japan: cases of Kawasaki and Kita-Kyushu cities

Eco-town Project launched in 1997 in Japan is town planning effort committed to producing “zero emissions” i.e. creation of a resource-recycling industrial society by eliminating waste through such methods as converting all the waste from one industry into raw materials for others. As of the end of 2002, Ministry of Economy, Trade and Industry and Ministry of Environment has approved eco-town businesses in 17 municipalities nationwide. The cities of Kawasaki and Kita-Kyushu took on the distinction of being the first local governments to begin work on the Eco-town Project. Both cities have long been two of the nation’s leading urban centers and littoral industrial zones; large industrial cities that have made significant contributions to Japan’s economic development. In launching their respective Eco-town Projects, both cities have aggressively applied environmental technologies to their heavy industrial base by capitalizing on their experiences overcoming the severe pollution that resulted from the rapid industrialization drive of the 1960s.

Kawasaki city

The city of Kawasaki has designated approximately 2,800 hectares of waterfront property as its Eco-town Project site, housing everything from a cluster of distribution and energy facilities to every variety of environmental business, not to mention proximity to blue-chip companies such as IBM Japan and Dell Computers. Construction is already in progress for three recycling facilities close to the Kawasaki Zero Emissions Industrial Park, in operation since the fall of 2002, including one that manufactures panels from waste plastics for use in concrete molds, and another that converts waste plastics to raw materials. 12 companies have set up operations in the Park, including a metal processing and paper manufacturing plants.

Kita-Kyushu city

Kita-Kyushu’s Eco-town Project covers an area of approximately 2,000ha of reclaimed land on its eastern Hibikinada Coast. The Eco-town Project’s most defining quality is its full-scale development program, known as the “Kita-Kyushu 3-item set” of 1) education and basic research, 2) technological and experimental research, and 3) business application conversion. With the Eco-town 1st Phase having been completed ahead of its original 2005 schedule, Kita-Kyushu has moved forward and formulated a 2nd Phase plan as of August, 2002. This phase calls for expansion of the business area, attraction of recycling, reuse and rebuild businesses to further advance its zero emission concept, and strengthening research and training functions, such as the creation of a R&D support system. Kita-Kyushu city envisions becoming a central “international resource recycling and environmental industry hub” in Asia.

Source: JETRO 2003



Chapter 3

Actions to further promote
sustainable development in
the subregion

Chapter 3

Actions to further promote sustainable development in the subregion

The World Summit on Sustainable Development (WSSD) held in 2002 created a wide variety of opportunities for over 200 countries in the world to develop their national capacity to promote sustainable development. Many countries established national commissions on sustainable development, prepared their country profiles, country reports, and Type II partnership/initiatives documents in response to the request advocated by the United Nations during the preparatory process of WSSD. As “Making it happen!” was the central message of the Johannesburg Declaration on Sustainable Development, the WSSD created new momentum to shift the focus from planning to implementation. The WSSD also emphasised the need for further collaboration between governments and all major stakeholders. At the same time, the Johannesburg Plan of Implementation reaffirmed the importance of elaborating national strategies for sustainable development to further promote coherent and coordinated actions at the national level. In light of these new developments that evolved around the WSSD, an attempt is made in the following sections to discuss ways to promote more integrated approaches towards sustainable development and enhance implementation mechanisms for the Northeast Asian subregion.

3.1 Development of integrated national strategies

As reviewed in Section III, above, countries in the Northeast Asian subregion have made significant efforts to shift their development patterns to being more sustainable, but a number of challenges still remain. Perhaps the most basic challenge for each country in the subregion is the development of a national sustainable development strategy (NSDS), with the intention of harmonizing various economic, social, and environmental policies and plans, as well as ensuring mechanisms to put their strategies into practice. The need for countries to develop an NSDS was already stated in Agenda 21 (Chapter 8, Section 7) prepared in 1992. Subsequently, the 1997 Special Session of the United Nations General Assembly requested that nations prepare their NSDS by 2002, in time for the WSSD. Once again the WSSD Plan of Implementation, urged nations to take immediate steps to formulate their NSDS and begin implementation by 2005.

The global picture or map of NSDS, prepared in 2002 by the United Nations Division for Sustainable Development, classified China and Mongolia as countries in which NSDS development is in progress. Japan and Korea Rep. are classified as countries in which components of sustainable development are in place. It should be noted that the purpose of the map is not to single out countries that have not initiated or

completed the process of developing a national sustainable development strategy, but rather to encourage those countries that have not yet completed the process to proceed in their efforts to meet the goal of 2005 (United Nations 2003).

As repeated by many declarations, action plans, and reports, there is an urgent need to elaborate integrated strategies for sustainable development at national and subregional levels. Although many strategies and action plans were developed in the subregion, as mentioned in sections above, they mostly focus on sectoral environmental issues, such as atmospheric pollution and water pollution, rather than overarching issues, such as sustainable production and consumption integrated with other socio-economic and environmental issues, in depth. Difficulty seems to have been experienced in a few countries to develop truly integrated sustainable development strategies based on comprehensive ecological viewpoints that fit into their national contexts, taking both long-term environmental and socio-economic implications into account.

The following factors are considered important for the preparation of an NSDS:

- It should not be a strategy simply created for the sake of saying there is a strategy. It should be feasible, with clear overall goals, sound implementation mechanisms, and a proper evaluation process;
- It should obtain strong political commitment by stimulating national-level discussions involving all relevant government sections and major groups;
- Strategic and pragmatic visions should be developed as the basis of the strategy and fully shared with the public through an NSDS preparatory process;
- Long-term, mid-term, and short-term goals should be identified, and these goals should be interlinked to each other.

- Existing strategies and action plans on a wide variety of issues at various levels should be integrated as part of the NSDS, in the most holistic manner possible, so that overall goals are met in the most effective way and the use of limited available financial resources is maximised.
- Partnership and participation need to be ensured throughout NSDS processes, from preparation through to implementation and evaluation.
- Sound financial mechanisms need to be devised for proper implementation of the NSDS.
- Informed decision-making should be the norm during the NSDS preparatory process, by fully utilising information on current states of the environment and development as well as that on emerging technologies.
- The NSDS should be implemented in a flexible manner in accordance with changing environmental and socio-economic circumstances, and modified, when necessary, based upon regular monitoring and evaluation.

3.2 Major challenges in enhancing the implementation mechanism

Implementation needs to be strengthened to realise the overall goals of the strategies, step-by-step. The following sections discuss the major challenges that need to be addressed in order to ensure effective NSDS implementation in the subregion.

3.2.1 *International cooperation*

The Northeast Asian subregion consists of countries with different political systems and economic regimes. This fact, together with historical incidents, has made their international relationships rather complicated. Thus, a strong subregional identity has not

yet developed among the countries concerned, and hence multilateral cooperation schemes were not common until the 1980s. Transboundary issues, however, that have emerged in the last decade regarding environment and development have clearly called for substantial subregional collaboration.

Against this background, the 1990s saw a few multilateral cooperation mechanisms developed in the subregion to address a variety of transboundary environmental issues. Among them, the North-East Asian Subregional Programme of Environmental Cooperation (NEASPEC) deserves special mention as the very first comprehensive cooperation mechanism among the governments in the subregion. Since 1993, it has been providing an official forum and the basic framework for subregional environmental cooperation. Based upon its achievements during the last decade, NEASPEC envisages extending its agenda to cover integrated environmental cooperation, including the development of a comprehensive institutional arrangement and the establishment of financial mechanisms.

Also developed in the 1990s were multilateral cooperation mechanisms such as the Tripartite Environment Ministers Meeting (TEMM) among China, Japan, and Korea Rep., the East Asia Acid Rain Monitoring Network (EANET), the Northwest Pacific Action Plan (NOWPAP), and the Northeast Asian Conference on Environmental Cooperation (NEAC). The number of other multilateral and bilateral cooperative efforts addressing a variety of environmental issues in the subregion at different levels significantly increased in the same period as well.

TEMM enables high-level political dialogues every year among the environment ministers of China, Japan, and Korea Rep. to explore possible cooperation to address environmental issues at subregional, regional, and global

levels. Projects regarding environmental education and environmental industry have been developed under TEMM and implemented with close collaboration among the three nations. In addition, a Global Environment Facility (GEF) project on dust and sand storms (DSS) was developed recently under the initiative of TEMM. What is noteworthy is the fact that the project involves Mongolia, as well as key international organizations. This implies a potential for TEMM to function as a central subregional mechanism to address crossboundary environmental issues.

EANET, with 12 East Asia nations participating, has successfully developed an extensive acid rain monitoring system that launched full operation in 2001.

NOWPAP, established in 1994, addresses marine environmental issues under the initiative of UNEP. Participating countries include China, Japan, Korea Rep., Korea DPR, and the Russian Federation.

NEAC provides opportunities for government officials and researchers in the environment field to discuss a range of environmental issues, to help promote domestic environmental policies, as well as to facilitate bilateral and multilateral collaboration.

Multilateral environmental cooperation schemes in Northeast Asia are diverse and still on the increase. Such a diverse approach has its own merits. For example, it is considered more flexible in responding to different circumstances in which each environmental issue takes place. But the fact remains that the relationships between existing cooperation schemes are not necessarily clear. Thus, the need to strengthen a more comprehensive approach for the whole region has been pointed out. Furthermore, most of the environment cooperation schemes do not yet have sound financial mechanisms. This has

weakened implementation of activities proposed under the existing schemes. In order to avoid overlap and to ensure effective use of limited financial resources, closer coordination among different environmental schemes should, at the least, be called for. Since environmental problems are interrelated to each other—their root causes are in many cases closely related—an integrated and comprehensive approach is indeed essential.

Furthermore, considering the characteristics of environmental problems in Northeast Asia and future socio-economic trends, cooperation schemes on the following issues could emerge as a priority in the subregion: (1) extensive and efficient use of natural gas; (2) food security and sustainable agriculture; and (3) effective water use and water resources management.

3.2.2 Capacity building for sustainable development

During the preparatory process of the WSSD and beyond, the capacity to address sustainable development issues in each country of Northeast Asia, although to a different extent, was strengthened through a variety of activities such as the establishment of the National Commission for Sustainable Development (NCSD) and preparation of national profiles and country reports with support from international organisations such as UNEP and the UNDP. In particular, Capacity 21 and Capacity 2015 programmes carried out by the UNDP provided significant support for some countries in the subregion to promote the participation of multi-stakeholders, to integrate economic, social and environmental priorities within national and local policies, and to disseminate information about sustainable development to help people make better decisions.

Drawing upon the achievements made so far by each country in the subregion, further capacity building for sustainable development

needs to be pursued. Priority capacity-building issues include (1) improving national capability to integrate environmental factors in sectoral policies, (2) strategic information gathering and analysis to enable informed decision-making, and (3) training for various stakeholders and awareness-raising campaigns for the general public.

Improving national capability to integrate environmental factors in sectoral policies

There has been major progress in the Northeast Asian subregion with regard to establishing the legislative systems and institutional arrangements necessary to address sustainable development. As reported in the sections above, a wide variety of laws on issues such as atmosphere, land, water, and forests have been adopted and/or amended, and relevant institutional arrangements have been established in most of the countries in the subregion. But the real challenge in the future is proper implementation of these legislative and institutional measures taken. In addition, the following issues are raised for consideration as further steps towards building sustainable societies:

Integrated approach at a national level

- All existing or newly adopted laws with regard to social, economic, and environmental issues need to be further elaborated, possibly through carefully estimating their consistency with national sustainable development goals.
- Intra-governmental coordination (domestic policy coordination) among all relevant government sectors including ministries of the environment, economy, industry, social affairs, and others as well as collaboration at local and national levels should be further promoted.

Local Governance

- Capacity building of local authorities must be actively supported and ensured in order to enable them to address sustainable development issues at the local level, maybe through further devolution of responsibilities currently held by the central government.

International collaboration

- Collaboration with regional and international capacity development initiatives such as UNDP's Capacity 2015 Regional Strategy for Asia-Pacific should be further promoted.

Strategic information gathering and analysis to enable informed decision-making

Information is the basis for proper agenda-setting and informed decision-making regarding sustainable development. Besides information gathering, capacities to accumulate, analyse, evaluate, and synthesize information are very much needed at local, national, and international levels. Particularly noteworthy are the sound developments that have occurred with regard to acid rain and DSS, in which countries in the subregion worked together to develop their capacities with regard to information. Collaboration to collect and share good practices to respond to common issues should be further promoted in the subregion. Cooperative activities, such as the Kitakyushu Initiative for Clean Environment, should be further utilised by national and local authorities in the subregion. In order to further strengthening these types of activities, the following issues should be considered:

Science and technology

- Cooperation between policy making and the science and technology

community should be strengthened.

- Collaborative research activities addressing sustainable development issues should be further promoted at international, regional, and subregional levels.
- In particular, monitoring networks of trans-boundary pollutants, biodiversity, natural disaster and early warning systems such as APEIS/IEM should be strengthened.

Information and knowledge management

- Information disclosure should be further promoted to engage civil society in multi-stakeholder actions.
- Information exchange and knowledge management systems for further effective decision-making should be established and strengthened.
- It is also important to make information for sustainable development available in local languages to overcome language barrier in information dissemination.

Training for various stakeholders and awareness-raising campaigns for the general public

The focus of capacity building should shift from core experts within governments to other stakeholders, as increased participation is critical in the process of sustainable development. In this respect, areas requiring more attention include awareness raising, education for sustainable development for the general public, and informed decision-making skills, and social and engineering training for NGOs. Also important will be capacity building aimed at staff of local governments and private companies. Opportunities to participate in such capacity-building activities need to be created and widely available, not only for civil societies but also for people involved in decision-making. Small grants by local and national authorities to support a wide

variety of activities can be essential in further promoting capacity building for multiple stakeholders. Measures to be considered include:

Public awareness, education, training

- Raising public awareness through all available channels, including mass media and various low cost information and communication technologies;
- Re-orienting formal education for sustainable development through developing national strategies of education for sustainable development taking the United Nations initiative Decade of Education for Sustainable Development into account;
- Developing and providing appropriate curricula for sustainable development in higher education including one for business administration;
- Strengthening a “life-long learning” approach to capacity development through multi-stakeholder cooperation of academia, government, NGOs and the private sectors; and
- Promoting internet-based learning and training for sustainable development, as well as considering a regional level eLearning initiative such as eEurope and eASEAN.

3.2.3 Partnership and participation

Partnership among different sectors and participation of multiple stakeholders are important elements to further promote sustainable development. In many Northeast Asian countries, participation by multi-stakeholders took place in the preparatory and implementation processes of national plans for sustainable development. In view of the need to reflect a wide range of perspectives and experiences in order to develop visions

and strategies for sustainable development, many experts from different sectors and major groups constituted each country’s National Committee for Sustainable Development. This trend needs to be maintained and further strengthened in the future, for example, in the preparation and implementation of the National Sustainable Development Strategy (NSDS) of each country.

Management of natural resources such as freshwater, forests, land, and biodiversity also requires strong partnership among subregional, national, and local authorities, as well as industries, civil societies, and local inhabitants. In particular, local inhabitants play a significant role in natural resource management. In fact, there have been many cases, for example, in which local inhabitants have been involved in the protection and conservation of migratory birds and their habitats. Such activities need to be applied to other issues confronting the subregion.

At the same time, the quality of partnership and participation must be improved to obtain maximum benefit from the involvement of multiple stakeholders. Partnership mechanisms developed for natural resource management sometimes face difficulties in making progress beyond mere information sharing. To make partnerships more effective, it is necessary to have a sound financial basis, clear objectives, and effective implementation arrangements.

As for the participation of stakeholders, it is important to recognise that ensuring that decision-making that incorporates different views is not at all an easy task. Appropriate methods to ensure participatory decision-making should be developed in collaboration with all sectors of societies. For this purpose, the distance between governments and civil societies must be kept close but healthy enough for each party to provide and accept constructive critiques of each other. Future

actions to be considered include:

National and local level

- Partnerships among all sectors in central governments, as mentioned in capacity building section above, need to be strengthened for further promotion of coherent policy at national level.
- Partnerships between government and private sectors should be further promoted in particular to advance sustainable production and consumption patterns.
- Partnerships among local authorities, local inhabitants and NGOs should be further strengthened in particular to elaborate local/community sustainable development plans that suit for each locality: especially the voice of indigenous and/or marginalised needs to be well respected.

International level

- Partnerships for technology development and diffusion, in particular for cleaner technologies and management mechanisms, should be further promoted
- Natural and cultural heritages as well as future perspectives of the sub-region should be further pursued and shared, so that subregional identity could be strengthened and play as a basis for further collaboration.

3.2.4 Financial mechanisms

There are two categories of financial flow to developing countries: (1) official development assistance (ODA), which includes financial support from international organizations, and (2) foreign direct investment (FDI) by the private sector. A decrease in ODA since 1992 due to stagnant

economic activities in donor countries made recipient countries become less dependent upon ODA. Consequently, private investment increased during the 1990s and the total amount of FDI currently exceeds that of ODA.

According to the ADB, the investment necessary to fund sustainable development in the Asia-Pacific region is estimated at about U.S.\$40 billion per year. In addition, the total cost to rehabilitate the degradation of land, water, air, and biodiversity that has occurred in the region is estimated at about \$25 billion per year. Despite this huge need for investment, the amount of funds available for the region is limited to \$30 billion per year (ESCAP 2001), representing a substantial financial gap.

Public funds alone cannot fill this huge financial gap. Thus, aside from the introduction of more private funds, there is a need to create new financial mechanisms, such as economic incentives, to promote environmentally-friendly production and consumption patterns.

The introduction of private funds and the above-mentioned economic incentives are mechanisms that generate funds in the market economy. Thus, such measures are viable only in middle-income countries where a market economy is already developed. On the other hand, in least developed countries where the market economy is still in a rudimentary stage, public investment is the only option to fill the financial gap. Furthermore, it is important to understand that proper role demarcation between public funds and private-sector funding should be considered, since private sector funding tends to focus on short-term, financially-viable projects, and not on long-term and financially risky investment, as is the case with many environmental resource conservation projects. In any case, appropriate funding sources should be selected in accordance with the different

socio-economic conditions of each country and the issues to be addressed.

In Northeast Asia, Japan and Korea Rep. have already built full market economies, while China is in the process of developing a huge market economy through its economic liberalisation policies. Mongolia is also in transition to the market economy. Therefore, Northeast Asia has a much higher potential to utilise private investments and economic incentives than other subregions.

In view of the decrease in ODA funding, public funds need to be strategically allocated to priority issues. A new public financial mechanism could be created by taxing private investment and financial markets in the developing countries to strengthen the financial basis for sustainable development. Utilisation of the Clean Development Mechanism (CDM) under the Kyoto Protocol, enhancement of socially responsible investments, and creation of investment markets for environmental industry are viable and concrete examples of increasing private funds and economic incentives.

There is also a strong need for financial sources to promote civil societies engagement in multiple actions towards sustainable development. Currently, grants to support such activities are quite limited, thus effective and flexible financial mechanisms that NGOs and other stakeholders can apply for should be further promoted.

3.2.5 Technology development and diffusion

The promotion of cleaner technologies in developing countries not only helps prevent pollution but also brings about higher productivity and economic efficiency in the industrial sector. Research and development (R&D) of technologies suitable for diverse natural and socio-economic conditions, and transfer of such technologies, continue to be

critical for developing countries in Northeast Asia to move towards sustainable development.

Research, development, and diffusion

To accelerate research, development, and the diffusion of cleaner technologies, the following key measures are considered essential: (1) joint technology development between public and private institutes; (2) tax incentives on R&D expenditures; (3) subsidies for technology development; (4) networking to catalyse collaboration between experts from developed and developing countries; and (5) technology transfer through international cooperation schemes such as overseas development assistance (ODA).

The reasons why such technologies have not yet been developed in countries in the subregion include (1) the high initial cost of introducing cleaner technologies, (2) aversion to using unfamiliar technologies, and (3) lack of information. Networking via the Internet could break such information barriers by providing easy and quick access to the latest technological information.

Removal of barriers

Many barriers actually exist to the adoption and diffusion of cleaner technologies in countries of the subregion. These include insufficient understanding on the part of decision-makers regarding the potential benefits associated with such technologies, lack of enforcement of environmental standards and regulations, and, in particular, lack of transparency, since very few firms report publicly on their operations. Technical assistance to promote technology transfer and education and training regarding such technologies could help break such barriers. In addition, legislative measures to protect intellectual property rights are often an important prerequisite for fostering

technology development and transfer by private investors.

Areas in need of cleaner technologies

The following areas require cleaner technologies in Northeast Asia:

- Renewable energy, in particular, in remote areas of western China and Mongolia;
- CFCs substitution technologies, particularly in China;
- Technologies to decompose CFCs;
- State-of-the-art desulphurisation facilities, especially in Mongolia and China;
- Clean coal technologies in Mongolia and Korea DPR; and
- Technologies to rehabilitate degraded agricultural land.

Traditional/indigenous knowledge

Potential values of traditional/indigenous knowledge enabling sustainable utilisation of natural resources in such fields as herbal medicine, water harvesting, and soil conservation should be further realised and better utilised where they are applicable. Many practices based on such knowledge are abandoned and/or vanishing in rapid trend of economic growth in the subregion, thus their conservation is urgent. At the same time, it should be well noted that the issues of property rights that should belong to local/indigenous people need to be properly addressed to avoid inappropriate exploitation of such knowledge.

3.2.6 Governance, institutional settings, and policies

In the post-UNCED period, most of the countries in Northeast Asia have articulated their visions and reinforced governance for sustainable development in the process of developing their NSDS, through, among

other things, the formulation of environmental laws and the establishment of ministries and agencies to implement strategies and laws. There has, however, been a varying degree of success in countries of the subregion in conserving the environment, natural resources, and human health. In order to improve governance, institutional settings, and policies towards sustainable development at local, national, and subregional levels, the following are considered necessary:

Decentralisation for improved governance

Decentralisation of central government responsibilities has taken place in most countries in the subregion to some extent. Such decentralisation is considered instrumental in addressing the issues of agility, transparency, and accountability. In view of the fact, however, that local government officials and staff often do not have the capacities to deal with increased responsibilities, it is necessary to provide them with capacity-building opportunities. Decentralisation has increased the opportunities available for stakeholders to participate in many aspects of decision-making and implementation of sustainable development policies by empowering, for example, local communities and NGOs. Further efforts must be made to realise the potential benefits that can be brought about by decentralisation.

Integration and coordination

Institutional and legislative frameworks must be strengthened for effective implementation of sustainable development policies. Particular areas requiring further improvements include enforcement mechanisms, removing overlaps of functional responsibilities, improvement of coordination among decision-making or implementing bodies, and integration of environmental principles into economic development policies.

Given the complex nature and often crossboundary scale of many environmental problems, sound coordination is necessary between relevant ministries dealing with a wide range of natural resources and, where necessary, with international organisations and other countries. The latter case is exemplified by the conservation efforts of the Tumen River flowing across China, Korea DPR, and the Russian Federation.

3.3 Major subregional challenges with regard to attain MDG and JPOI

Millennium Development Goals (MDG) agreed by world leaders at the Millennium Summit in September 2000 and Johannesburg Plan of Implementation (JPOI) adopted at the WSSD in September 2002 include ambitious agenda to take necessary steps to attain worldwide sustainable development. Agenda items in both initiatives focus on urgent and significant issues such as poverty, educational opportunity, gender equity, health and sanitation, HIV/AIDS, environmental sustainability, as well as changing unsustainable patterns of consumption and production. Most of these challenges were already touched upon in the sections above, but some selected issues that require higher priority in Northeast Asian subregion will be underlined once again in the following section.

3.3.1 Tackling poverty, sanitation, and health issues

Eradicate extreme poverty and hunger

Multiple indicators for MDG set by the United Nations show that poverty and hunger situation is still significant or even worsening in Korea PDR and Mongolia. For example, the proportion of population below minimum level of dietary energy consumption increased

from 18 % from 34 % in Korea PDR and from 34 % to 42 % in Mongolia between 1991 and 1999. China has drastically reduced its poverty population ratio and surpassed one of the MDG targets by halving, between 1990 and 2015, the proportion of people whose income is less than one dollar a day - from 31.3 % in 1990 to 15.3 % in 2000; however this also means there remains a large number of populations close to 200 million people who are still living under the above mentioned standard (ESCAP 2003).

In order to improve the situation of poverty and hunger, these issues should receive higher political, as well as public, attention in above mentioned countries. In addition to domestic efforts such as stabilisation of macro-economy, introduction of micro-credit, providing educational opportunities for the poor, enhancing social welfare to assist them and enhancing cross-sectoral linkages to address the marginalised ones, international mechanisms such as promotion of further effective aid programmes as well as widely accepting principles for fair-trade to promote poverty alleviation should be sought out.

Access to safe drinking water and sanitation

Access to safe drinking water and sanitation has been receiving the highest global attention recently and it is one of the top-priority issues in Northeast Asia as well. MDG targets include a challenge on this issue as halving proportion of people without access to safe drinking water and sanitation by 2015. In general, lack of access to safe water and sanitation is more significant in rural area rather than in urban area in some countries in the subregion. For example UNICEF and WHO reported that only 30 % of rural population in Mongolia has an access to improved drinking water sources and only 2 % of it has an access to improved sanitation in 2000 (WHO and UNICEF 2000). Limited access to safe drinking water and sanitation

in rural Mongolia is an extreme example, but China and Korea, Rep. share the similar condition.

Access to safe drinking water in urban area in China and Mongolia also requires further attention. Statistics shows that urban water coverage in China dropped from 99 % to 94 % between 1990 and 2000 (WHO and UNICEF 2000.); and experts in Mongolia claim the water quality degradation in the suburb of Ulaanbaatar . Insufficient infrastructure of waterworks and inadequate management of increasing volumes of household wastewater and toxic substances, in addition to industrial wastewater, are considered to be the major causes of urban water quality degradation.

Child mortality and maternal health

Reducing by two thirds, between 1990 and 2015, the under-five mortality rate is another ambition of MDG. Child mortality in Northeast Asian subregion is relatively lower compared to other subregions in Asia and the Pacific; however requires continuous monitoring on it. China and Mongolia has improved their under-five mortality rate in 1990's but further efforts are required to meet MDG targets by 2015. Child mortality reduction should be addressed with integrated approach with the combination of poverty reduction, safe water and sanitation access improvement, increasing opportunities to receive immediate and skilled medical attention, and so forth. Improving maternal health is also the important MDG that should be dealt in conjunction with the child mortality.

Countries in Northeast Asia such as Korea Rep. and Japan have attained significant economic developed over the last 30 years. China has also introduced market mechanism in their economic policy and been recording

high growth ratio in the last decade; hence a gigantic market for goods and services with 1.2 billion people is emerging. It is quite apparent that whether consumption and production patterns of the subregion could shift towards sustainable ones or not has significant impacts on sustainable development at a global level.

Changing unsustainable patterns of consumption and production

Many responses to accelerate such change are widely observed in above mentioned countries and efforts have been enhanced before and after the WSSD. They include reducing energy and material consumption for production, facilitating reuse when it is appropriate rather than promoting disposable goods, and furthering recycling of goods as well as cascade use of energy and materials by, for example in Japan, establishing facilities so-called "zero-emission industrial complex." Japan and Korea Rep. have instituted policies to encourage business and industrial sectors to change their production processes to reduce environmental burdens by emphasising the life cycle assessment (LCA) of goods and services, introducing environmental accounting methods, as well as promoting "green procurement" by governmental organisations through which markets for products made from recycled materials or made with less environmental burdens could be enlarged.

Although many initiatives and efforts have been launched and made, they are still not enough to set a concrete pass towards building societies with sustainable consumption and production patterns. Once unsustainable patterns of consumption and production are embedded in domestic development plans, in such countries as Japan and Korea, Rep., a considerable amount of funding and efforts are required to alter the direction. Some countries in Northeast Asia such as China and Mongolia maintains a great potential to

quickly introduce sustainable consumption and production patterns as the mainstream policy in their development process; thus further international cooperation to exchange key elements to enable such development should be enhanced. Future challenges include dissemination and transfer of environmentally appropriate technology, sharing strict environmental standards among countries in the subregion, creating larger markets for

recyclable and recycled materials, as well as sharing all other lessons learned at all levels.

1 Interviewing by the authors at Expert Group Meeting on Environment and Development in Mongolia (21 August 2003, Ulaanbaatar, Mongolia) held prior to the Fourth Asia-Pacific Forum on Environment and Development (APFED).

Box 7 Millennium Development Goals and Johannesburg Plan of Implementation

The Millennium Development Goals (MDG) are an ambitious agenda for reducing poverty and improving lives that world leaders agreed on at the Millennium Summit in September 2000. Each goal is associated with one or more quantitative targets, most for 2015, using 1990 as a benchmark year. Goals include the following components.

- Goal 1: Eradicate extreme poverty and hunger
- Goal 2: Achieve universal primary education
- Goal 3: Promote gender equality and empower women
- Goal 4: Reduce child mortality
- Goal 5: Improve maternal health
- Goal 6: Combat HIV/AIDS, malaria and other diseases
- Goal 7: Ensure environmental sustainability
- Goal 8: Develop a global partnership for development

The Johannesburg Plan of Implementation (JPOI) adopted at the World Summit on Sustainable Development (WSSD) in September 2002, along with actions taken since the United Nations Conference on Environment and Development (UNCED) in 1992, aims to expedite the realisation of the remaining goals towards global sustainable development. Major challenges reaffirmed in JPOI include the following items.

- | | |
|--------------|--|
| Chapter II: | Poverty eradication |
| Chapter III: | Changing unsustainable patterns of consumption and production |
| Chapter IV: | Protection and managing the natural resource base of economic and social development |
| Chapter V: | Sustainable development in a globalizing world |
| Chapter VI: | Health and sustainable development |
| Chapter X: | Means of implementation |
| Chapter XI: | Institutional framework for sustainable development |

Source: UN 2000, 2001, 2002b and 2004

References

ADB (2000). Key Indicators of Developing Asian and Pacific Countries 2000. ADB, Manila, Philippines

<http://www.adb.org/documents/books/ado/2003/default.asp>

ADB (2003). Asian Development Outlook 2003. Oxford University Press, Hong Kong, China

<http://www.adb.org/documents/books/ado/2003/default.asp>

ADB/ESCAP/UNDP/UNEP (Task Force for the Preparation of WSSD in Asia and the Pacific) (2001). North-East Asia sub-Regional Report for the World Summit on Sustainable Development <http://www.rrcap.unep.org/wssd/documents/01NEA%20Report.pdf>

APEIS/RISPO (2003a). Emission controls in Beijing: a case reviewed by Zhu Songli and Jiang Kejun for Good Practices Inventory of APEIS/RISPO.

<http://www.iges.or.jp/APEIS/RISPO/inventory/db/pdf/0013.pdf>

APEIS/RISPO (2003b). Promoting household photovoltaic systems in remote areas of China through international funding and establishment of effective mechanisms: a case reviewed by Shi Jingli for Good Practices Inventory of APEIS/RISPO.

<http://www.iges.or.jp/APEIS/RISPO/inventory/db/pdf/0039.pdf>

CCICCD (2000). China National Report on the Implementation of United Nations Convention to Combat Desertification and National Action Programme to Combat Desertification <http://www.unccd.int/cop/reports/asia/national/2000/china-eng.pdf>

EANET (2003). Acid Deposition Monitoring Network in East Asia (EANET)

<http://www.adorc.gr.jp/index.html>

EMECS (2003). Fiscal 2002 International EMECS Center Business Plan

<http://www.emecs.or.jp/englishver2/center/2002plan.htm>

ESCAP (2000). Promoting the Millennium Development Goals in Asia and the Pacific: Meeting the Challenges of Poverty Reduction (ST/ESCAP/2253). United Nations, New York, United States

ESCAP (2001). Regional Platform on Sustainable Development for Asia and the Pacific, High-level Regional Meeting for the World Summit on Sustainable Development, 27-29 November 2001, Phnom Penh, Cambodia.

ESCAP/ADB (2000). State of the Environment in Asia and the Pacific (ST/ESCAP/2087). United Nations, New York, United States

Government of Japan (1997). Report of Marine Pollution. Maritime Safety Agency (MSA). Tokyo, Japan

Government of Japan (2003a). Acid Deposition in the East Asian Region: Chapter 2 of Acid Deposition Monitoring Network in East Asia (EANET) Implementation of Preparatory-Phase Activities. Ministry of the Environment of Japan, Tokyo, Japan
<http://www.env.go.jp/en/topic/acid/eanet/ch2.html>

Government of Japan (2003b). What is TAC? (in Japanese). Fishery Agency of Japan, Tokyo, Japan
<http://www.jfa.go.jp/tac/whattac.htm>

Government of Japan (2003c). Summary of TAC Law (in Japanese). Ministry of Agriculture, Forestry and Fisheries of Japan, Tokyo, Japan
http://www.maff.go.jp/www/public/cont/20030924pb_2s.htm

Government of People's Republic of China (2000). Report of the State of Environment in China 2000. State Environmental Protection Administration (SEPA), Beijing, China

Government of People's Republic of China (2001). Report of the State of Environment in China 2001. State Environmental Protection Administration (SEPA), Beijing, China

Government of People's Republic of China (2002). Forestry Development in China. Volume 3 of China's Organizing Committee for WSSD series. State Forestry Administration, Beijing, China

Government of Republic of Korea (2002a). Green Korea 2002. Ministry of Environment of the Republic of Korea, Gyeonggi-do, Republic of Korea

Government of Republic of Korea (2002b). National Assessment Report on the Implementation of Sustainable Development. Seoul, Republic of Korea

Government of Republic of Korea and KEI (2003). Volume-Base Waste Fee System, Korea Environmental Policy Bulletin, Issue I, Vol. I. Ministry of Environment of the Republic of Korea and KEI, Gyeonggi-do, Republic of Korea

IGES (2001). Top News on Environment in Asia 2002. IGES, Hayama, Japan

IGES (2002). Top News on Environment in Asia 2001. IGES, Hayama, Japan

IGES (2003). Top News on Environment in Asia 2002. IGES, Hayama, Japan

JETRO (2003). From Heavy Industry Littoral to Zero Emissions Regions: A Tale of Two Large "Eco-town Project" Cities, Invest in Japan (Active Sectors: Environment). JETRO, Tokyo, Japan
<http://www3.jetro.go.jp/iv/cybermall/attractive/env.pdf>

Korea National Statistical Office (2001). Summary Results of Population Projection in 2000. News Release
http://www.nso.go.kr/eng/releases/e_svpr2001

MWCC (2001). Asia-Pacific Migratory Waterbird Conservation Committee Strategy: 2001-2005, Wetlands International - Asia Pacific. Kuala Lumpur, Malaysia
<http://www.wetlands.org/IWC/awc/waterbirdstrategy/STRAT1-1.PDF>

National Institute of Population and Social Security Research of Japan (2003). Population Projections for Japan: 2001-2050
<http://www.ipss.go.jp/English/ppfj02/top.html>

OECD (1997). Environmental Performance Reviews: Korea. OECD, Paris, France

UNEP (1999). Global Environment Outlook 2000. Earthscan Publications, London, United Kingdom

UNEP (2001). Mongolia: State of the Environment 2002. UNEP, Nairobi, Kenya

UNEP (2002). Global Environment Outlook 3. Earthscan Publications, London, United Kingdom

UNEP-IETC (2002). Rainwater Harvesting and Utilisation, An Environmentally Sound Approach for Sustainable Urban Water Management: An Introductory Guide for Decision-Makers (IETC Urban Environment Series, No. 2). UNEP, Osaka, Japan
<http://www.unep.or.jp/ietc/Publications/Urban/UrbanEnv-2/12.asp>

United Nations (1992). Agenda 21: Programme of Action for Sustainable Development, United Nations, New York, United States

United Nations (2000). United Nations Millennium Declaration (A/RES/55/2).
<http://www.un.org/millennium/declaration/ares552e.pdf>

United Nations (2001). Road map towards the implementation of the United Nations Millennium Declaration: Report of the Secretary-General (A/56/326).
<http://www.un.org/documents/ga/docs/56/a56326.pdf>

United Nations (2002a). Country Profile of China prepared for Johannesburg Summit 2002. Division for Sustainable Development, Department of Economic and Social Affairs (DSD/DESA), New York, United States
<http://www.un.org/esa/agenda21/natinfo/wssd/china.pdf>

United Nations (2002b). Plan of Implementation of the World Summit on Sustainable Development. United Nations, New York, United States
http://www.johannesburgsummit.org/html/documents/summit_docs/0409_plan_final.pdf
(Advance unedited text as of 4 September 2002)
http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf

United Nations (2003). National sustainable development strategies: The global picture 2002. Division for Sustainable Development, Department of Economic and Social Affairs

(DSD/DESA), New York, United States
<http://www.un.org/esa/sustdev/natlinfo/nsds/nsds2002.pdf>

United Nations (2004). UN Millennium Development Goals (MDG)
<http://www.un.org/millenniumgoals/>

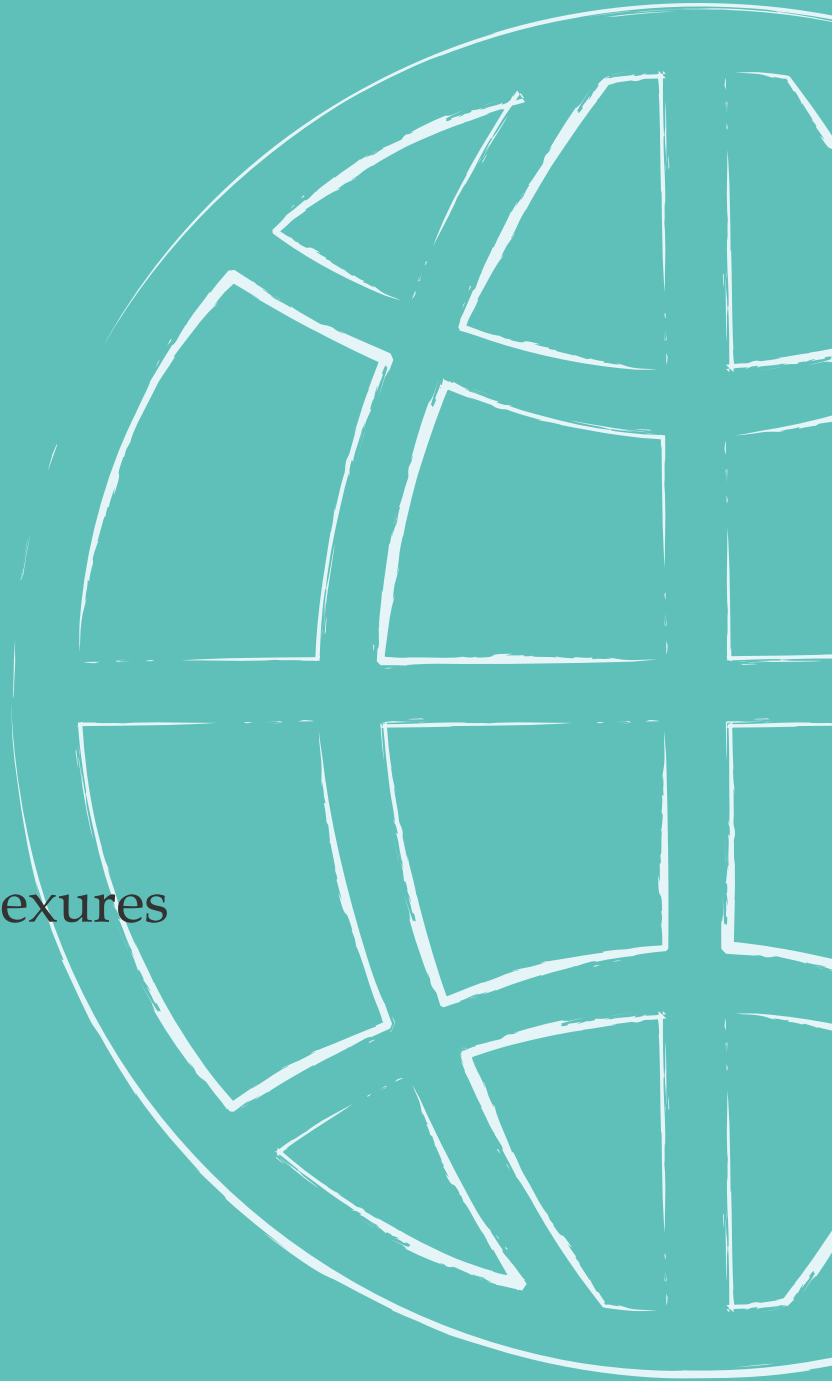
WHO/UNICEF (2000). Global Water Supply and Sanitation Assessment 2000 Report. WHO, Geneva, Switzerland, and UNICEF, New York, United States
http://www.who.int/water_sanitation_health/monitoring/globalassess/en/

World Bank (1997). Clear Water, Blue Skies: China's Environment in the New Century. China 2020 Series. World Bank, Washington DC, United States

World Bank (2002). World Development Indicators 2002. World Bank, Washington DC, United States

World Bank (2003). World Development Indicators 2003. World Bank, Washington DC, United States

Annexures



Annex: 1. Acronyms and Abbreviations

ADB	Asian Development Bank
APEIS	Asia-Pacific Environmental Innovation Strategy Project
APEIS/RISPO	Asia-Pacific Environmental Innovation Strategy Project, Research on Innovative and Strategic Policy Options
APN	Asia-Pacific Network for Global Change Research
BSE	Bovine Spongiform Encephalopathy
CAC	Command-and-control
CCICCD	China National Committee for the Implementation of the UNCCD
CDM	Clean Development Mechanism
CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
CF3I	Trifluoroiodomethane
CFCs	Chlorofluorocarbons
CITES	Convention on International Trade in Endangered Species
CNG	Compressed natural gas
CO	Carbon monoxide
CO ₂	Carbon dioxide
COD	Chemical oxygen demand
CRC	Convention on the Rights of the Child
DSS	Dust and sand storms
EANET	Acid Deposition Monitoring Network in East Asia
ECO ASIA	Environmental Congress for Asia and the Pacific
EIA	Environmental Impact Assessment
EMECS	International Center for the Environmental Management of Enclosed Coastal Seas
EMEP	Cooperative Programme for the Monitoring and Evaluation of Long-Range Transmission of Air Pollutants in Europe
FAO	Food and Agriculture Organisation
FDI	Foreign Direct Investment
GAW	Global Atmosphere Watch
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHGs	Greenhouse gases
ICLEI	International Council for Local Environmental Initiatives
IDNDR	International Decade for Natural Disaster Reduction
IEM	Integrated Environmental Monitoring
IGES	Institute for Global Environmental Strategies
ISDR	International Strategy for Disaster Reduction
JPOI	Johannesburg Plan of Implementation
JETRO	Japan External Trade Organization
Korea Rep.	Republic of Korea
Korea DPR	Democratic People's Republic of Korea
LCA	Life Cycle Assessment
LPG	Liquefied petroleum gas
MAP-21	Mongolian National Action Program for Sustainable Development for the 21st Century

MARPOL	International Convention for the Prevention of Marine Pollution from Ships
MCED	Ministerial Conference on Environment and Development
MDG	Millennium Development Goals
MWCC	Asia-Pacific Migratory Waterbird Conservation Committee
NAPEP	North Asia-Pacific Environment Partnership
NCSD	National Commission (Council) for Sustainable Development
NEAC	Northeast Asian Conference on Environmental Cooperation
NEASPEC	North-East Asian Sub-regional Programme of Environmental Cooperation
NGOs	Non-governmental organisations
NOWPAP	Northwest Pacific Action Plan
NO _x	Nitrogen oxides
NPACD	National Plan of Action to Combat Desertification
NPAP	National Poverty Alleviation Program
NPEC	Northwest Pacific Region Environmental Cooperation Center
NSDS	National Sustainable Development Strategy
ODA	Official Development Assistance
ODS	Ozone-depleting substances
PCSD	Presidential Commission on Sustainable Development
PM	Particulate matter
PV	Photovoltaic
R&D	Research and development
SEPA	State Environmental Protection Administration
SO ₂	Sulphur dioxide
SO _x	Sulphur dioxides
SPM	Suspended particulate matter
SVOC	Semi-volatile organic compounds
TAC	Total allowable catch
TEMM	Tripartite Environment Ministers Meeting
TRADP	Tumen River Area Development Programme
TSP	Total suspended particulates
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UN/ECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNEP RRC.AP	United Nations Environment Programme Regional Resource Centre for Asia and the Pacific
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
UNEP-IETC	United Nations Environment Programme, International Environmental Technology Centre
VBWF	Volume-based Waste Fee
VOC	Volatile organic compounds
WCMC	World Conservation Monitoring Centre
WMO	World Meteorological Organization
WSSD	World Summit on Sustainable Development

Annex 2. Strategies, Visions, and Legislative/Institutional Arrangements Integrated Response towards Sustainable Development at National Level

	Integrated Response		Note
	Strategy/Vision	Legislative/Institutional Arrangements	
China		Environment Protection Law was amended (1989)	
	China's Agenda 21 (1994)		
	The Ninth Five-Year National Master Plan on Environmental Protection and Long-term Tenets in 2010 (1996)		Program of Total Volume of Pollution Control and China's Green Project Program were proposed (1996)
		The National Environmental Protection Agency was upgraded to the State Environmental Protection Administration (1998)	Upgraded to the ministerial level institution.
	The Tenth Five-Year National Master Plan (2001)	Law on the Promotion of Clean Production (2003)	Environmental Impact Assessment (EIA) Law (2002)
Japan	National Agenda 21 Action Plan (1993)	Japan Council for Sustainable Development was established (1996)	
	Basic Environment Plan (1994) was amended (2000)		
		The Environmental Agency was upgraded to the Ministry of the Environment (2001)	
		The Basic Environment Law (1993) was amended (2002)	
	Basic Plan for Establishing a Recycling-based Society (2003)	Basic Law for Establishing a Recycling-based Society (2000)	
Korea Rep.	National Agenda 21 for Action Plan (1993)		
	Basic Environmental Policy Act (1999)		
	Green Vision 21 (2001)	ECO-2 Project (2001)	Presidential Commission on Sustainable Development (PCSD) was launched in 2000

	Integrated Response		Note
	Strategy/Vision	Legislative/Institutional Arrangements	
DPRK		Environmental Protection Law (1986)	
Monglpa	Mongolia Mongolian National Security Policy Concept (1995)		
		Environmental Protection Law (1995)	
	The Mongolian National Development Concept (1996)	National Council for Sustainable Development (NCSD) (1996)	NCSD in Mongolia chaired by the Prime Minister was launched with thirteen high level government officials and extended its membership to representatives from parliament, NGOs, local and private sector, and scientific community by 2002.
	Ecological Policy of the Mongolian State (1997)		
	Mongolian National Action Program for Sustainable Development for the 21st Century (MAP-21) (1998)		

Annex 3. Achievements made with regard to Environmental Issues Responses to Major Environmental Issues: Strategies, Legislations, and Program/Projects

Atmosphere

	Policy		Program/Project	Note
	Strategy	Legislation		
		Law on Prevention and Control of Atmospheric Pollution was adopted in 1987 and amended in 1995 and 2000.		Decrease in the main air pollutants (SO ₂ , gas and dust, and industrial ashes and powder [104 tons]) by 15.8, 33.2 and 36.9% respectively between 1995 and 2000
				Among the 47 key cities for environmental protection, 27 have met the national air quality standard of Grade II; 7 met the standard of Grade III and 13 had the air quality worse than Grade III
				The scope and frequency of acid rain remains unchanged affecting still 30% of the total land area of the country
			National Programme of China for Phasing Out of Ozone Layer - Depleting Substances (1993)	
		Law concerning the promotion of the measures to cope with global warming (1998), its basic guidelines (1999)		

Atmosphere

	Policy		Program/Project	
	Strategy	Legislation		
Japan		Law concerning the promotion of the measures to cope with global warming (1998) was amended (2002). Then, policies to deal with Kyoto Protocol target were provided. Efforts by business and industries to the introduction of the Kyoto Mechanism.		
		- Air pollution control law amended (1997)	Equipment developed to remove up to 95% of sulphur dioxide and 80% of nitrogen oxide from the combustion emissions of flue gas	
			Fuel-efficient and low-emission automobile models developed and promoted	
			Efforts by business and industries to reduce atmospheric SO ₂ and CO emission levels by enforcing the world's most stringent standards for automobile exhaust emissions and by controlling smoke emissions from factories and other facilities	
		Law concerning the reduction of Nox from automobile (1996) was amended (2003). (PM was added as a target material. The regulation measure by car model was added.)		

Atmosphere

	Policy		Program/Project	Note
	Strategy	Legislation		
Japan		Law concerning the collection and destruction of Freon gas in particular equipments(2001)	Efforts to collect Freon gas in Refrigerator, air conditioner, etc.	
		Ozone layer protection law amended		
	Nagoya Statement on Environmentally Sustainable Transport in the Asia region (2002)			
Kore Rep.	Blue Sky 21 Special Comprehensive Plan (2002):	Act on the Control, etc, of Manufacture of Specific Substances for the Protection of the Ozone Layer”		The ozone level in large cities grew worse every year with the number of ozone warning episodes climbing from 24 episodes in 1997 to 41 in 1999, and up to finally 52 episodes in 2000.
		Noxious Pollution Prevention Act		
	Special Mid- to Long-term Measures to Improve Air Quality in the Metropolitan Area (2003-2012)			Decrease in air pollutants from 5,169,119 tons/ year (1990) to 3,709,190 tons/year (1999)
		Air Quality Preservation Act (Dec. 2002)	Blue Sky 2002 campaign by private sector -Networks for Green Transportation -Korean Federation for Environmental Movement -Citizens Movement for Environmental Justice	

Atmosphere

	Policy		Program/Project	Note
	Strategy	Legislation		
Kore Rep.		Special Measures on Seoul Metropolitan Air Quality Improvement (2003-2012)		In Seoul, the annual average pollution level in 2000 rose to 0.034ppm from 0.030ppm in 1990. The ozone level in large cities grew worse every year with the number of ozone warning episodes climbing from 24 episodes in 1997 to 41 in 1999, and up to finally 52 episodes in 2000.
			Enforcement of the total maximum loading system of pollutant	
			Adoption of low emission vehicle	-5000 buses are expected to be in service in 2002. -20000 diesel powered intercity buses will be replaced with CNG buses between 2000 and 2007.
			Enforcement of energy and fuel policies to improve air quality	
DPRK			Act on the Promotion of the Development and use of Alternative Energy,	
		Environmental Protection Law (1986)		
Mongolia	National action plan on the protection of air quality (1999)	Air Quality Protection Law (1995) National Climate Change Action Plan to protect air quality (2000)	National action plan on the protection of ozone layer (1999)	
	National action plan on the protection ozone layer (1999)		National action programme on climate change (2000)	

Freshwater

	Policy		Program/Project	Note
	Strategy	Legislation		
China		Water Law (1988) was amended (2002)		Water pollution prevention and control efforts achieved substantial results, particularly in the three major rivers and lakes. Systems of automatic monitoring of water quality in key river basins such as Huai River and Tai Lake resulted in the establishment of 40 automatic monitoring stations, by the end of 2000.
		Law on Water and Soil Conservation (1991)		
		Law on Prevention and Control of Water Pollution (1996) - Rules for Implementation (2000)		
		Privilege law on measures of reduction of dioxin (1999)	National Comprehensive Water Resources Plan revised (1999)	
Japan		Law on measures against soil contamination(2003)		
Kore Rep.	Comprehensive Measures for Water management	Water Supply Act (1961)		
		Water Quality Preservation Act		Water Quality Improvement Task Force (1996) was founded by the Office of the Prime Minister
		Drinking Water Management Act (1995)		As of the end of December 2001, 87.8% of the Korean population received drinking water from 905 water supply areas (82 cities, 204 cups and 619 myeons).

Freshwater

	Policy		Program/Project	Note
	Strategy	Legislation		
Kore Rep.	Comprehensive Water Quality Improvement Measures for the Four Major Rivers (1998-2000)	Special Act on Nakdong River's Watershed Management (2002) Special Act on Geum River's Watershed Management (2002) Special Act on Yeongsan and Seomjin River's Watershed Management (2002) Special laws pertaining to the Han River		
		water-shed (August 1999)		
		Acts Relating to Water Resource Management and Community Support for Three Major (Nakdong, Geum and Yeongsan) Rivers (2001)		
DPRK		Environmental Protection Law(1986)		
Mongolia		Law on Water (1995)		Bilateral cooperation agreement signed with China to protect and use transboundary waters
	National Action Plan on Water Resources (1999)			

Marine Environment

	Policy		Program/Project	Note
	Strategy	Legislation		
China		Law on Marine Environment Protection (1983)		
		Law on Fisheries - (1986)	National Contingency Plan for Preparedness and Response to Oil Pollution (1995)	Measures to promote sustainable use of marine resources taken
Japan			Policy of Reduction of quantity of pollution (COD, nitrogen, phosphorus)(2001)	Plan of Reduction of quantity of COD, nitrogen and phosphorus in related prefecture(2002)
	National Marine Strategy: Ocean Korea 21 (2001-2030)	Framework Act on Marine Development	Integrated Coastal Zone Management Plan (2000)	Designation of nine marine areas totaling 4,791 km ² as marine protected areas
Kore Rep.		Marine Pollution Prevention Act??(1999/ amended)	Comprehensive Marine Environment Master-Plan (2001- 2005)	Red tides has been increasing each year since 1992
		Coastal Zone Management Act (1999)		Decrease in coastal area pollution from 2.4 mg/l (1990) to 1.2 mg/l (1999)
DPRK		Fishery Resources Protection Act		
		Act on Management of Fishing Grounds		
Mongolia		Environmental Protection Law(1986)		

Land management

	Policy		Program/Project	Note
	Strategy	Legislation		
China		Law on Grasslands (1985)		Between 1991 and 2000, the number of nature reserves has been increased from 708 to 1 227, accounting for 9.85% of the total land area
		Law on Mineral Resources (1986)		
		Land Management Law (1986) was revised (1999)		
		Law on Water and Soil Conservation (1991)		
		National Land Use Planning Law (1974)		
	National Program for Preventing and Controlling Geological Disasters (2001-2015)			
Japan	National Land Use Plan			
	Comprehensive Land Use Plan			
		Framework Act on the National Land		Nature conservation zones account for 7.1 % of the total land as of 2001
Kore Rep.		National Land Planning and Utilization Act		
		Act on The Acquisition of Land		

Land management

	Policy		Program/Project	Note
	Strategy	Legislation		
Kore Rep.		Soil Environment Preservation Act (1995, 2001 amended)		-National monitoring network: 1500 points are designated as of 2001 -Amendment in 2001 includes Soil Environmental assessment
	National Land Use Zoning System (1972)			
DPRK		Land Pertinence Assessment System (2001)		
		Land Law (1977)		
	State Policy on Ecology 1996-2000	Land Planning Law(2002)		
	Mongolia's Action Program for the 21 st Century (MAP-21) (1998)			Major land management issues in Mongolia includes: combating desertification and sand movements; and rehabilitation of land resources affected by mining operations
Mongolia		Law on land adopted (1994) and amended (1999 and 2002)		
		Law on Land Payment (1997)		
		Law on Mineral Resources (1997)		
		Law on Environmental Impact Assessment		
		adopted (1998) and amended (2001)		

Desertification

	Policy		Program/Project	Note
	Strategy	Legislation		
China	National Action Program to Combat Desertification (1996)	Law of Desertification Prevention and Control 2002		
Japan				
Kore Rep.	Basic Forest Plan	Work against Land Erosion or Collapse Act		
Kore DPR				
Mongolia	Mongolian Action Program for the 21st Century (MAP-21) (1998)	National Plan of Action to Combat Desertification (1996)	National Water Program, Natural Disasters Reduction, Government Action Program (2000 – 2004)	

Agriculture

	Policy		Program/Project	Note
	Strategy	Legislation		
China		Land Management Law (1998)		Regulations on Agriculture Environment protection
Japan		Agriculture Law (1993/2003)		
		Basic law on food, agriculture and rural areas (1999)	Effort made to optimize the multiple-functions of agriculture	
		Law concerning the introduction of Technology for Sustainable Agriculture(1999)	Expansion of Number of farmer who incorporates Sustainable Agriculture	

Agriculture

	Policy		Program/Project	Note
	Strategy	Legislation		
Japan	Comprehensive Strategy for the utilization of biomass resources (2002)	Law concerning promotion of the use of new energy (1997) was amended (2002), in which the use of biomass energy and ice energy was promoted.	Development of technology for utilization of Biomass resources	Regulations on Agriculture Environment protection
	National Plan for food and agriculture(2002)	Basic Law on food safety(2003)	Introduction of the Traceability system for ensuring food safety(2002)	
Kore Rep.	Act on the Special Measures for Development of Agricultural and Fishing Villages	Agrochemicals Control Act Farmland Act Plant Protection Act Rearrangement of Agricultural and Fishing Villages Act	Promotion of sustainable agriculture and rural development by placing priority on environmentally friendly agricultural policies and measures	
	Act on the Prevention of and Countermeasures against Agricultural and Fishery Disasters			
Kore DPR		Agriculture Law(1999)		
Mongolia				

Forest

	Policy		Program/Project	Note
	Strategy	Legislation		
China	Forestry Action Plan for China's Agenda 21	Forestry Law was enacted (1984) and amended (1998)	Shelterbelt Development Programme (1978-) Natural Forest Protection Programme(1998-)	Financial mechanism for enhancing afforestation "Compensation Fund for Forest Ecological Benefits" was established Under the government's afforestation campaigns, the forest increased from 12% in 1980s to almost 14% by 1996. A forest network has been established under China's Agenda 21 in order to increase forest cover to 17% of total land area
Japan		The Forests and Forestry Basic Law (1999)	Promotion of Forest Environmental Education(1999) Conservation program of the forest as source of CO2 absorption for global warming prevention(2003-2012)	Efforts made to optimise multiple functions of forests Efforts made to conserve forest appropriately Promotion of utilization of wood and biomass from wood
				Promotion of conservation of forest by participation of the nation Verification of the volume of CO2 absorption
Kore Rep.	Asia Forest Partnership (AFP) (2003)			

Forest

	Policy		Program/Project	Note
	Strategy	Legislation		
Kore Rep.	Forth Basic Forest Plan (1998-2007)			During the Third Basic Forest Plan (1988-1997) 330,000 ha of commercial forests were established and silvicultural practices were applied to over 3 million ha of forests
		Forestry Development and Promotion Law (1997)	National Forest Programme	amended forestry tax system
		Basic Forest Law (2001)	Preservation Measures for DMZ & Transboundary Areas	Increase in wildlife density in forest (from wildlife population of 18.76 per 100 ha in 1987 to 21.3 per 100 ha in 1997) as a result of designating 372 wildlife sanctuaries
		Environmental Protection Law (1986)		
DPRK		Ministry of forest was established (1980)		
		Forestry industry have been developed, and enhanced.		
		Law on Forests passed (1995) and amended (2000)		This Law has created economic incentives to protect forest resources.
Mongolia	National Action Plan on Forestry (1998)			
				Bilateral cooperation agreements signed with Russian Federation and with the Republic of Korea on forests

Biodiversity

	Policy		Program/Project	Note
	Strategy	Legislation		
China	Biodiversity Conservation Action Plan	Law on the Protection of Wildlife (1988)	National Program for Ecological Conservation (2000)	Country Study conducted
				Between 1991 and 2000, the number of nature reserves has been increased from 708 to 1 227, accounting for 9.85% of the total land area
Japan		National strategy on biological diversity formulated (1995)		
		New National strategy on biological diversity formulated (2002)		
		Law on nature regeneration(2003)	Project of nature regeneration	
	National biodiversity Strategy	Natural Environment Conservation Act (1997/amended)		
	Nature Environment Conservation Plan (1999)	Cultural Heritage Protection Act	Preservation Measures for DMZ & Transboundary Areas	
		Wildlife Protection and Hunting Act	Protection of Ecologically Outstanding Areas	
Kore Rep.			Master plan on National Ecology Research	Increase in national protected areas from 4.8% (1985) to 6.9% (1997)
			Development of National Ecological Network	

Biodiversity

	Policy		Program/Project	Note
	Strategy	Legislation		
Kore Rep.			Policy Forum on Ecological Network Establishment	The network was set in March 2002 to set the groundwork for the ecological network policies and devise implementation strategies.
Kore DPR		Environmental Protection Law (1986)		80% of the land is mountain and upland in North Korea. The status of biodiversity has been unknown.
		Law on Special Protected Areas (1994)	National programme on protected areas (1998-)	Mongolian environmental laws adopted on special protected areas, natural plants and hunting
Mongolia		Law on Natural Plants (1995), Law on Hunting (1995)		
	National Biodiversity Conservation Action Plan (1996)			A network of protected areas established for the conservation of ecosystems, the protection of habitats of endemic plants, endangered species and the protection of watersheds now takes up 13% of total land area, up from 5.6% in 1992
DPRK				The 80% of energy supply in North Korea depends on coal. Urgent need for additional energy supply.
Mongolia		Petroleum Law of Mongolia? 1991		
		Energy Law 2001		

Toxic Chemicals

	Policy		Program/Project	Note
	Strategy	Legislation		
China		Regulation on Agricultural Chemicals Administration (1997)		
Japan		Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances revised (1993)		
		Law concerning special measures against dioxins enacted (2000)		
		Law concerning the Pollutant Release and Transfer Register system (1999)	Pollutant Release and Transfer Register System introduced(2000)	
Kore Rep.		Law on measures against soil contamination(2003)		
		Soil Environment Preservation Act		
		Toxic Chemicals Control Act		Chemical substance safety management center set up
DPRK		Environmental Protection Law (1986)		
Mongolia		Law on Protection from Toxic Chemicals (1995) was amended (2000)		Ratified Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (1997)

Waste and Hazardous Materials

	Policy		Program/Project	Note
	Strategy	Legislation		
China		Law on the Prevention and Control of Solid Wastes Pollution to the Environment (1996)		
Japan		Basic law for establishing recycling-based society (2000)	Business and industries promoting recycling of automobile parts	
	Three-Stage Environmental Engineering Technology Development Programme	Law concerning the promotion of appropriate treatment of PCB (2001)	Plan of Building the facility of treatment of PCB(2001)	
	National Comprehensive Waste Management Plan (1996-2001)			
		Act Relating to the Establishment and Operation of Sudokwon Landfill Site Management Corporation (2000)		
		Act Promotion of Waste Treatment Facilities and Local Community (1995)		
		Promotion of Saving and Recycling of Resource Act (1992)		
Kore Rep.			Deposit-Refund System for Waste Disposal (1992)	Decrease in domestic waste generation from 75,100 ton/day (1992) to 45,600 ton/day (1999)
			Volume-based Waste Fee System (2002) :enforced nationwide in January 1995	Per capita waste amount fell from 1.33kg in 1994 to 0.98kg in 2000. The recycling rate also jumped from 15.4% to 41.3%, while the landfill rate dropped from 81.1 % to 47%.

Waste and Hazardous Materials

	Policy		Program/Project	Note
	Strategy	Legislation		
		Basic Plan for Food Waste Recycling (1998- 2002)	Extended Producer Responsibility (EPR) System (2003)	
			Food Waste Reduction and Recycling (2002)	The amount of food waste generated each day in Korea reached 11,434 tons in 2000, accounting for 25% of the total waste.
		Toxic Chemicals Control Act	Dioxin measurement project by MOE on the industrial sector since 2001	Decrease in hazardous industrial waste from 21,400 ton/day (1992) to 7,700 ton/day (1999)
DPRK		Environmental Protection Law (1986)		
Mongolia		Law on Hazardous Wastes (2000)	Action Plan on Waste Management (1999)	

Annex 4. Ratification of Multilateral Agreements and Conventions Vienna Convention Montreal Protocol Basel Convention

	Vienna Convention	Montreal Protocol	Basel Convention	UNCBD	CITES	UNFCCC	UNCCD	MARPOL	CEDAW	CRC	World Heritage Convention
China	Accessed 1989	Accessed 1991	Ratified 1991	Ratified 1993	Accessed 1981	Ratified 1993	Ratified 1985	1983	Ratified 1980	Ratified 1992	Ratified 1985
Japan	Accessed 1988	Accessed 1988	Accessed 1993	Accessed 1993	Accessed 1980	Ratified 1993	Accessed 1998	1983	Ratified 1985	Ratified 1994	Accepted 1992
Korea Rep.	Accessed 1992	Accessed 1992	Accessed 1994	Ratified 1994	Accessed 1993	Ratified 1993	Ratified 1985	1984	Ratified 1984	Ratified 1991	Accepted 1988
Mongolia	Accessed 1996	Accessed 1996	Accessed 1997	Ratified 1993	Accepted 1996	Ratified 1993	Ratified 1985		Ratified 1981	Ratified 1990	Accepted 1990
DPRK	Accessed 1995	Accessed 1995		Accepted 1994		Ratified 1994		1985	Accepted 2001	Ratified 1990	Accepted 1998

Notes:

- Vienna Convention for the Protection of the Ozone Layer (1985)
- Montreal Protocol on Substances that Deplete the Ozone Layer (1987)
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989)
- United Nations Convention on Biological Diversity (UNCBD) (1992)
- Convention on International Trade in Endangered Species (CITES) (1973)
- United Nations Framework Convention on Climate Change (UNFCCC) (1992)
- United Nations Convention to Combat Desertification (UNCCD) (1994)
- International Convention for the Prevention of Pollution from Ships (MARPOL), 1973, as modified by the Protocol of 1978
- Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), (1979)
- Convention on the Rights of the Child (CRC) (1989)
- Convention Concerning the Protection of the World Cultural and Natural Heritage (1972)

Annex 5. Subregional Institutional Arrangements

Mechanism	Content	Year Established	Promoting/Hosting Organization	Countries Involved
NEASPEC (North-East Asian Subregional Programme of Environmental Cooperation)	Comprehensive and intergovernmental programme for environmental cooperation on: <ul style="list-style-type: none"> • energy and air pollution • ecosystem management, in particular deforestation and desertification • capacity building 	1999	UN/ESCAP	China, Democratic People's Republic of Korea, Mongolia, and Republic of Korea
NEAC (Northeast Asian Conference on Environmental Cooperation)	Forum for governmental officials and environmental experts to: <ul style="list-style-type: none"> • exchange information • explore possibilities for cooperation amongst countries involved 	1999	Environment ministries/agencies of member countries	China, Japan, Mongolia, and Republic of Korea
NOWPAP (Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region)	Intergovernmental programme for protecting and managing transboundary marine environment issues: <ul style="list-style-type: none"> • Regional data collection • Survey of national legislations • Marine pollution monitoring and preparedness • Response strategies 	1999	UNEP	China, Japan, and Republic of Korea
TEMM (Tripartite Environment Ministers Meeting)	Annual meeting of tripartite environment ministers	1999	Environment ministries/agencies of member countries	China, Japan, and the Republic of Korea
TRADP (Tumen River Area Development Programme)	Promotes economic cooperation to develop effective long-term strategy to deal with international water pollution and biodiversity loss	1999	UNDP	China, Democratic People's Republic of Korea, Japan, Mongolia, and Republic of Korea

Mechanism	Content	Year Established	Promoting/Hosting Organization	Countries Involved
North-East Asian Crane Network Center	To protect migratory waterbirds based on the Asia-Pacific Migratory Waterbird Protection Strategy <ul style="list-style-type: none"> • Links sites important for survival of cranes 1997 	1999	Wetlands International – Asia Pacific China,	China, Democratic People's Republic of Korea, Japan, Mongolia, and Republic of Korea
NAPEP (North Asia-Pacific Environment Partnership)	A non-governmental network of NGOs and experts to promote information exchange and expertise between environmental NGOs	1999		China, Japan, and Republic of Korea

Annex 6. Mechanisms for Cooperation not limited to the Subregion

Mechanism	Content	Year Established	Promoting/Hosting Organization	Countries Involved
ECO ASIA (Environmental Congress for Asia and the Pacific)	Forum for ministers and high-level government officials and international organisations to discuss environmental policy in Asia and the Pacific region	1991	Environment Agency of Japan	Over 20 countries, including: China, Japan, Mongolia, and Republic of Korea
EANET (Acid Deposition Monitoring Network in East Asia)	Intergovernmental network for acid deposition monitoring to: <ul style="list-style-type: none"> • Establish uniform monitoring techniques • Share data and information • Create common understanding of the state of acid deposition • Provide inputs for decision making 	1998	Government of Japan (after 2002, UNEP)	10 countries, including: China, Japan, Mongolia, Republic of Korea and the Russian Federation
APN (Asia-Pacific Network for Global Change Research)	Intergovernmental network which: <ul style="list-style-type: none"> • Supports research on global environmental change and conducts a range of regional cooperative activities • Provides scientific knowledge to the public and input to decision makers • Developing appropriate mechanisms for technology transfer 	1994	Environment Agency/Ministry of Environment of Japan	21 countries, including: China, Japan, Mongolia, Republic of Korea and the Russian Federation

Note:

Table 1 through 5 are developed based on information provided in "Northeast Asia Subregional Report for the World Summit on Sustainable Development" prepared by IGES in 2001. Structure and contents are modified and updated incorporating recent responses and progress relevant to sustainable development in the Northeast Asia.

Annex 7. Lists of contributors and reviewers

1.	Hideyuki Mori, Project Leader, Long-Term Perspective and Policy Integration Project (LTP), Institute for Global Environmental Strategies (IGES), Japan
2.	Akira Ogihara, Project Manager/Research Fellow, Long-Term Perspective and Policy Integration Project (LTP), Institute for Global Environmental Strategies (IGES), Japan
3.	Toru Hashi, Research Fellow, Long-Term Perspective and Policy Integration Project (LTP), Institute for Global Environmental Strategies (IGES), Japan
4.	Takashi Otsuka, Researcher, Long-Term Perspective and Policy Integration Project (LTP), Institute for Global Environmental Strategies (IGES), Japan
5.	Takahiko Hiraishi, Member of the Board of Directors, Institute for Global Environmental Strategies (IGES), Japan
6.	Andrea Deri, Programme Manager, Capacity Building Programme, Institute for Global Environmental Strategies (IGES), Japan
7.	Kimihiko Hyakumura, Researcher, Forest Conservation Project, Institute for Global Environmental Strategies (IGES), Japan
8.	Yoshiki Seki, Visiting Researcher, Forest Conservation Project (FC), Institute for Global Environmental Strategies (IGES), Japan
9.	Naoko Matsumoto, Policy researcher, Long-Term Perspective and Policy Integration Project (LTP), IGES, Japan
10.	Taeko Takahashi, Representative of Project Office in Bangkok, Institute for Global Environmental Strategies (IGES), Thailand
11.	Christine Pearson, Division Chief, Kitakyushu Office, Institute for Global Environmental Strategies (IGES), Japan

12.	Wakako Ichikawa, Project Secretary, Long-Term Perspective and Policy Integration Project (LTP), IGES, Japan
13.	Hiroya Yamano, Senior Researcher, National Institute for Environmental Studies, Japan
14.	Kazuhiko Takada, Chief Engineer, Tomamae Town Office, Hokkaido, Japan
15.	Naoyuki Sakumoto, Deputy Director-General, Development Studies Center, Institute of Developing Developing Economies, Japan External Trade Organization (IDE-JETRO), Japan
16.	Choudhury Rudra Charan Mohanty, Environment Programme Officer / Coordinator, United Nations Centre for Regional Development (UNCRD), Japan
17.	Tokiharu Okazaki, Executive Director, Friends of the Earth, Japan
18.	John Tivnan Brinkman, Maryknoll Ecosoc NGO, Commission on Ecology & Religion, Japan
19.	Feng Jia, Deputy Director, Center for Environmental Education and Communications, State Environmental Protection Administration, China
20.	Lijian Zhao, Development Director, Global Village of Beijing, China
21.	Tsedendash Batkhishig, Economist, Researcher, Environmental Education & Research Institute ECO ASIA, Mongolia
22.	Borjigidkhan Tsohio Adyasuren, President, Environmental Education & Research Institute ECO ASIA, Mongolia

23.	Chooney Kim, Chief, International Affairs, Korean Federation for Environmental Movement, Republic of Korea
24.	Joo Won Seo, Secretary General, Korean Federation for Environmental Movement, Republic of Korea
25.	Sang-Hun Lee, Executive Director, Green Future, Republic of Korea 23. Choudhury Rudra Charan Mohanty, Environment Programme Officer / Coordinator, United Nations Centre for Regional Development (UNCRD), Japan
26.	Jae-Bum Kim, Secretary-General, UNEP Committee for the Republic of Korea, Republic of Korea
27.	Mi Hee Moon, Coordinator, KFEM of Cheju, Republic of Korea
28.	Danbee Song, UNEP Committee for the Republic of Korea, Republic of Korea
29.	Mr. Surendra Shrestha Regional Director and Representative UNEP/ROAP Tel : (662) 288-1870 Fax : (662) 280-3829 Email : surendra.shrestha@rrcap.unep.org
30.	Mr. Timothy higham Regional Information Officer UNEP/ROAP Tel : (662) 288-2127 Fax : (662) 280-3829 Email : higham@un.org
31.	Mr. Mahesh Pradhan Environmental Affairs Officer Tel : (662) 288-1801 Fax : (662) 280-3829 Email : pradhan@un.org
32.	Ms. Piyachatr Pradubraj UNEP/ROAP Information Assistant Tel : (662) 288-1873 Fax : (662) 280-3829 Email : piyachatr.pradubraj@rrcap.unep.org or unep-information-assistant@un.org

33.	Tim Kasten Chief Policy Branch, UNEP Headquarter, P.O. Box 30552, Nairobi, Kenya Tel : 254-20-623861 Fax : 254-20-624749 Email : Tim.Kasten@unep.org
34.	Denis Ruysschaert UNEP headquarter Email : Denis.Ruysschaert@unep.org
35.	Subrato Sinha RRC.AP Email : Subrato.sinha@rrcap.unep.org
36.	Achira Leophairatana RRC.AP Email : Achira.Leophairatana@rrcap.unep.org
37.	Twinkle Chopra RRC.AP Email : Twinkle.Chopra@rrcap.unep.org