IGES

Institute for Global Environmental Strategies

Sustainable Asia 2005 and Beyond

In the pursuit of innovative policies

IGES White Paper

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Foreword

"Sustainable Asia 2005 and Beyond – In Pursuit of Innovative Policies" is the first attempt of IGES to consolidate the primary outcomes of its policy research within a broad context of sustainable development in Asia. It aims to elucidate underlying challenges confronted by the region and to provide a framework of policy and strategic options to deal with them. Certainly issues associated with sustainable development in Asia are diverse and it is not possible to examine all their aspects. However, we have tried to capture the essential issues to promote sustainable development by focussing on several specific sectors. This publication is not intended to be provocative but efforts have been made to be frank with difficult issues.

The Institute for Global Environmental Strategies (IGES) was established in 1998 to undertake strategic policy research for environmental management and sustainable development in Asia and the Pacific. Since then, IGES has completed two phases of research: the First Phase (1998-2000), and the Second Phase (2001-2003). Basic ground work was made during the First Phase and based upon that, efforts were made during the Second Phase to identify effective policies to promote sustainable development in developing countries in the region. IGES is now in the Third Phase and is trying to deliver more policy-relevant outcomes in collaboration with governments, institutes and other stakeholders in the region. IGES has produced many tangible outputs in a few sectors on selected topics, but they are not integrated into broad and comprehensive policy messages. This is, therefore, the first attempt by IGES to put forward consolidated policy messages for policy-makers in the region based upon, among other things, the outcomes of past IGES research activities.

Asia has undergone various changes over the last decade. Overall, rapid economic growth has been recorded in many countries of the region. A few countries suffered from the economic crisis in 1997. Still other countries remain economically stagnant due to security and geo-political reasons. On the environmental front, although a range of new measures have been taken, many countries have seen more serious situations regarding the use of their natural resources and the deteriorating quality of the environment. Illegal logging is a serious issue in a few developing countries, particularly in the tropics; water depletion and contamination is prevalent throughout the region; air pollution is indeed a real threat to people living in the mega-cities of Asia; and land degradation is rampant in semi-arid areas in particular. Indeed, the natural resource base in Asia is becoming more and more depleted. Although some improvements have been made, poverty still remains high on the policy agenda. Entrenched poverty simply exacerbates a vicious cycle of environmental degradation and impoverishment in many of the rural areas in Asia.

Policy-makers have attempted to reinvigorate their efforts to tackle the underlying challenges to realise sustainable development. The Johannesburg Plan of Action has laid out a basic course for nations to undertake collective measures in the pursuit of better environmental management and sustainable development. The Kyoto Protocol has finally come into effect in February 2005. The effective implementation of such newly adopted policies hinges upon various factors that include: a choice of sensible policies, capacity-building, stakeholder involvement, and resource mobilisation, to name a few. Innovation must be sought in devising policies and their implementation mechanisms, drawing upon the lessons learned from past initiatives that were aimed at promoting a sustainability agenda.

Asia must play a critical role in the global endeavour to pursue sustainable development. Presently 3.8 billion people live in Asia, representing 60 per cent of the global population. This figure will grow to 5.2 billion by 2050. Oil demand in Asia's developing economies will surge sharply over the next decades and surpass that of the OECD countries in Europe by 2030. Likewise, Asia's intra- and inter-regional trade

volumes are expected to grow rapidly with the increasing economic integration propelled by bourgeoning free trade agreements. Asia must ensure its sustainability in the face of these mounting risks and challenges, not only for themselves, but also for the world as global sustainability hinges upon Asia.

This publication, referred to as the IGES White Paper within the institute, reflects the strategic policy research areas that we have been involved with until now. These specific sectors include: forestry, freshwater, climate change, urban environment, business, and environmental education. In order not to lose the broader perspective of sustainable development, however, Chapter 2 examined the overall policy trends and achievements made in the region. Based on its findings and analysis, the White Paper's final chapter recommends policy options and approaches aimed at promoting effective environmental management and sustainable development in Asia.

The production of this first White Paper required a significant amount of time and effort from the IGES staff. Since its inception, the White Paper's preparation entailed intensive and relentless discussions, followed by much redrafting. The work was undertaken collectively by many staff members from the various projects within IGES. This exercise was more challenging than originally thought as it involved a lot of coordination between and among the different project teams.

We are indebted to many partners in producing this White Paper. I would like to thank the members of the IGES Board of Directors for giving us useful guidance on this work. I would particularly like to thank, Dr. Keith Bezanson, member, IGES Board of Directors and former Director of the Institute of Development Studies of the University of Sussex, for giving us invaluable support and advice in leading the drafting process. I would like to specifically note his actual involvement in a number of face-to-face discussions with those IGES staff involved. Without his vigorous support and encouragement, we could not have accomplished this difficult task.

It is hoped that this White Paper will serve as a useful reference document for policy dialogues at various levels in Asia, aimed at improving environmental management and promoting sustainable development for the region. I would like our institute, IGES, to learn lessons from this process and further reinforce its efforts to undertake studies on policies relevant and useful to policy-makers and other important stakeholders in the region. It is hoped that this document establishes intellectual bridges between our institute and our partners to help forge more collaboration. Your candid comments and suggestions to assist us in better serving our partners in the region would be highly appreciated.

Hayama, Japan
18 October 2005

Akio Morishima
Chair,
IGES Board of Directors

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Abbreviations

ADB	Asian Development Bank
AEC	ASEAN Economic Community
AEEAP	ASEAN Environmental Education Action Plan
AEEID	ASEAN Environmental Education Inventory Database
ALGAS	Asia Least-cost Greenhouse Gas Abatement Strategy (ADB)
AMME	ASEAN Ministerial Meeting on the Environment
APEC	Asia Pacific Economic Forum
APERC	Asia Pacific Energy Research Centre
APF	UNDP Adaptation Policy Framework
APFC	Asia Pacific Forestry Commission
APFED	Asia Pacific Forum on Environment and Development
ARCBC	ASEAN Regional Centre for Biodiversity Conservation
ASEAN	Association of South East Asian Nations
ASP	Agriculture Sector Programme (ADB)
ASrIA	Association for Sustainable and Responsible Investment in Asia
AWGWRM	ASEAN Working Group on Water Resources Management
BAU	business as usual
BOD	biological oxygen demand
BOT	Build-Operate-Transfer
bpd	barrels per day
BRIK	Revitalization of Forest Industry Board (Indonesia)
CAC	command-and-control
CBFM	Community-based Forest Management
CBO	Community-based Organisation
CDM	Clean Development Mechanism
CEARAC	Special Monitoring and Coastal Environment Assessment RAC
CEE	Council for Environmental Education (United Kingdom)
CER	Certified Emission Reduction
CFUG	community forest user group
CG	Corporate Governance
CIFOR	Center for International Forestry Research
CO_2	carbon dioxide
CR	Corporate Responsibility
CSD	Commission on Sustainable Development
CSR	Corporate Social Responsibility
CalPERS	California Public Employees' Retirement System (United States)
DENR	Department of Environment and Natural Resources (Philippines)
DESD	Decade of Education for Sustainable Development
DFID	Department for International Development (United Kingdom)
DINRAC	Data and Information Network RAC
DJSI	Dow Jones Sustainability Index
DNA	Designated National Authority
DR	Deposit-Refund
DSK	Dushtha Shasthya Kendra (Bangladesh)
DSS	dust and sandstorms
DWASA	Dhaka Water Supply and Sewerage Authority (Bangladesh)
EANET	Acid Deposition Monitoring Network in East Asia

ECOASIA	Environment Congress for Asia and the Pacific
EE	environmental education
EIA	Environmental Impact Assessment
EJ	exajoule
EMEP	Cooperative Programme for the Monitoring and Evaluation of Long-Range Transmission of Air Pollutants in Europe
EMS	environmental management system
ESD	Education for Sustainable Development
ESD-J	Council on the UN Decade of Education for Sustainable Development (Japan)
ESI	Environmental Sustainable Index
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FOE	Friends of the Earth
FOIA	Freedom of Information Act (United States)
FSC	Forestry Stewardship Council
FTA	Free Trade Agreement
GCI	Global Compact Initiative
GDP	gross domestic product
GEF	Global Environmental Facility (UNDP)
GEOCC	Global Environmental and Outdoor Education Council
GHG	greenhouse gases
GIWA	Global International Water Assessment
GNI	gross national income
GPN	Green Purchasing Network
GTZ	German Technical Cooperation
GWA	Gender and Water Alliance
GWP	World Water Partnership
Gt	Gigaton
HABITAT	United Nations Human Settlements Programme
HFC	hydrofluorocarbon
IACCC	Inter-Agency Committee on Climate Change
ICARM	Integrated Coastal Area & River Basin Management
ICLEI	International Council for Local Environmental Initiatives
ICTEAP	Information and Communication Technology and the Environment in Asia and the Pacific
IEA	International Energy Agency
IGES	Institute for Global Environmental Strategies
IISD	International Institute for Sustainable Development
INDOEX	Indian Ocean Experiment
IPCC	Inter-governmental Panel on Climate Change
ISO	International Organization for Standardization
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature
IULA	International Union of Local Authorities
IWRM	integrated water resource management
JFM	Joint Forest Management
JPOI	Johannesburg Plan of Implementation
KAP	Kiribati Adaptation Programme
KICE	Kitakyushu Initiative for a Clean Environment (Japan)
kWh	kilowatt hour

Lao PDR	Lao People's Democratic Republic
LCA	life-cycle assessment
LDC	Least Developed Countries
LEIC	Local Environmental Information Centre (Thailand)
LOOPs	Locally-Owned and Operated Partnerships
MCED	Ministerial Conference on Environment and Development
MCPFE	Ministerial Conference on the Protection of Forests in Europe
MDG	Millennium Development Goals (United Nations)
MERRAC	Marine Environmental Emergency Preparedness and Response RAC
MONRE	Ministry of Natural Resources and Environment (Thailand)
MOSTE	Ministry of Technology, Science, and Environment (Thailand)
MRC	Mekong River Commission
MT	metric ton
MWSS	Metropolitan Waterworks and Sewerage System (Philippines)
NAPAs	National Action Plans on Adaptation
NDS	National Development Strategy
NEAPs	National Environmental Action Plans
NEASPEC	North East Asian Sub-regional Programme for Environmental Cooperation
NEDA	National Economic and Development Authority (Philippines)
NETTLAP	Asia Pacific Network for Tertiary Level Environmental Training
NFPs	national focal points
NGO	non-governmental organisation
NIAs	national implementing agencies
NOWPAP	Northwest Pacific Action Plan
NOx	nitrogen oxides
NPO	non-profit organisation
NSSD	National Strategies for Sustainable Development
NWRA	National Water Resource Authority (Sri Lanka)
NWRB	National Water Resource Board (Philippines)
NWRC	National Water Resource Committee (Thailand)
OAS	Organization of American States
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
ONWRC	Office of National Water Resource Committee (Thailand)
OPEC	Organization of the Petroleum Exporting Counties
PCAs	Pollution Control Agreements
PDCA	Plan-Do-Check-Act
PFI	Public Fund Initiatives
PM10	Particulates that are less than 10 microns in diameter
POMRAC	Pollution Monitoring RAC
ppm	parts per million
PPP	public-private partnership
PRB	Population Reference Bureau (United States)
PRSPs	Poverty Reduction Strategy Papers
PTFWRDM	Presidential Taskforce on Water Resources Development and Management (Philippines)
PV	photovoltaic
QMS	quality management system
R&D	Research and Development
RACs	Regional Activity Centres
RAP	Regional Action Programme for Environmentally Sound and Sustainable Development in Asia and the Pacific
RBC	River Basin Commission

RBO	river basin water resource management organisation
RBP	Regional Biodiversity Programme (IUCN)
RE	renewable energy
REACH	Registration, Evaluation and Authorisation of Chemicals (European Union)
RESA	Renewable Energy Sources Act
RHAP	Regional Haze Action Plan
RID	Royal Irrigation Department (Thailand)
RRCAP	Regional Resource Center for Asia and the Pacific
RoHS	Restricted use of certain Hazardous Substances in electrical and electronic equipment (European Union)
ROK	Republic of Korea
SAARC	South Asian Association of Regional Cooperation
SACEP	South Asia Co-operative Environment Programme
SACNET	South Asian Network for Taxonomy Capacity Building
SDM	Three Dimensional Model
SFM	sustainable forest management
SIF	Social Investment Forum (United States)
SLIMF	Small and Low Intensity Managed Forests
SMEs	small and medium enterprises
SOPAC	South Pacific Geoscience Commission
SOx	sulphur oxides
SPREP	South Pacific Regional Environment Programme
SRI	socially responsible investment
SWERA	Solar and Wind Energy Resources Assessment
SWIFT	Solomon Western Islands Fair Trade
TAC	Technical Advisory Committee
Taiwan POC	Taiwan Province of China*
TEEN	Tripartite Environmental Education Network for China, Japan and Republic of Korea
TEM	Thailand Environment Monitor (Thailand)
TERI	Tata Energy and Resources Institute (India)
TWh	terawatt-hours
UBA	Umweltbundes Amt
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP-FI	UNEP Finance Initiative
UNEP-WCMC	UNEP World Conservation Monitoring Centre
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organisation
UNU	United Nations University
WATSLA	Water Resources Sector Adjustment Loan (World Bank)
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development
WEEE	Waste Electrical and Electronic Equipment (European Union)
WEF	World Economic Forum
WHO	World Health Organization

WRI	World Resources Institute
WSSD	World Summit for Sustainable Development
WTO	World Trade Organization
WWC	World Water Council
WWF	World Water Forum
WWF	World Wildlife Fund

* Reference to the "Taiwan Province of China" follows the practice of the United Nations.

IGES White Paper

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Executive Summary

What is the IGES White Paper?

The White Paper "Sustainable Asia 2005 and Beyond—In the pursuit of innovative policies" has three specific objectives: i) to assess current environmental situations in Asia, ii) to review policy measures in place and, iii) to present a number of broad policy recommendations that promote sustainable development for the region. Asia presently faces formidable challenges and daunting tasks in achieving continuous economic growth, maintaining ecological integrity, and ensuring societal cohesion. What is required of Asia if it seeks to follow the path towards sustainable development? What is the scope for collective action? This White Paper explores these complex issues and intends to provide useful guidance in addressing these questions.

Where Asia stands in the pursuit of sustainable development

Driven by buoyant economic development and continuous population growth, Asia is exerting exponential pressures on natural resources and the environment. The rapid economic growth that Asia has achieved is inherently unstable due to its high level of resource inefficiency and dependence on a geometric rate of growth in fossil fuel consumption. A business-as-usual scenario will mean that Asia can neither attain the current level of production and consumption observed in developed countries nor sustain the economic and social gains made over the past three decades.

Measured against this situation, Asian responses to date have been entirely inadequate, although many important steps have been taken and a number of essential foundations for further actions established. For example, a number of initiatives have been launched at the regional level and these are helping to facilitate establishment of a common agenda and to forge consensus on at least some policy goals for sustainable development. Several sub-regional collaborative forums have made advances through concrete and institutionalised mechanisms to address challenges, such as acid deposition and dust and sand storms in Northeast Asia, haze control in Southeast Asia and trans-boundary air pollution control in South Asia. Yet, in the last quarter of a century, Asia has lost half of its forest cover and a third of its agricultural land has been degraded. Asia's rivers contain three to four times more pollutants than the world average. Of the world's 15 most polluted cities, 13 are in Asia. According to current trends, it is projected that 2.4 billion Asians will suffer from water stress by 2025, almost double the 1995 figure. Today, at least one in three Asians still has no access to safe drinking water, and one in two has no access to sanitation services. At least one-third of a billion tons of solid waste across Asia remains uncollected each year. At the same time, millions of tons of hazardous waste are placed untreated in dumpsites, threatening groundwater and local food supplies.

These are only some of the indicators of the attack that is underway on Asia's environment. While rapid economic growth has created dynamism and wealth, Asia has at the same time become dirtier, less ecologically diverse and more environmentally vulnerable. Unless urgent, concerted and sustained action is taken on a large scale, Asia will be unable to avoid a social, economic and political crisis of catastrophic proportions over the medium-term. Global sustainable development cannot be achieved without Asia.

What are the major conceptual challenges?

Sustainable development should, therefore, be the central policy principle for Asia 2005 and beyond. Yet, the concept of sustainable development remains very complex and fluid. It often requires significant trade-

offs between the economy and the environment, a reality that is compounded by methodological problems and the absence of a single mechanism to take full account of long-term economic costs and benefits. Sustainable development is, indeed, a concept that is not easy to operationalise and monitor, although attempts to achieve this have been and continue to be made in both developed and developing countries. The approaches that are available, (e.g., full cost accounting, policy mix analysis and multi-stakeholder processes) are not free of defects and careful consideration is always needed in applying them to individual countries, localities and situations. There is no "one-fit-for-all" solution. The "Three Dimensional Model" of sustainable development that combines economic, social and environmental dimensions is beguilingly simple and undeniably attractive. Yet, it is difficult to operationalise in real life situations. How to precisely define the notion of inter-generational equity remains contentious, for example. This conceptual difficulty does not negate, however, the importance of sustainable development as the guiding principle that underpins the conservation of the environment and the improvement of living standards. The development of specific policies that are new and effective is important in this vein.

As the nature of environmental issues becomes more complex, combinations of different policy instruments (i.e., policy mix) have been increasingly adopted to achieve various policy goals. Policy instruments can be divided into six categories: regulatory measures, framework approach, market-based measures, voluntary agreements, procedural measures and information measures. The rationale behind policy mix is the belief that the issue in question is more effectively dealt with. However, caution should be taken, particularly in the context of developing countries, that further complication of policy instruments will not overburden the already weak implementation capacity.

Many Asian countries place more and more emphasis on multi-stakeholder and participatory approaches. Such approaches are indeed essential as the increasing number of stakeholders is involved in environmental decision-making and implementation. However, they are not without problems. The scope and application require meticulous definition. They cannot operate without a framework of norms and standards and must not be used as a tool for manipulation in decision-making and policy implementation processes. Institutional strengthening and capacity development are thus important to ensure that the various stakeholders are effectively engaged in such processes for better environmental management and sustainable development.

What will make forest management in Asia more sustainable?

What are some of the major trends affecting forestry in Asia and the underlying causes of forest loss and degradation? Despite legislative reform and progress in developing criteria and indicators for sustainable forest management, the rates of deforestation remain high in many countries, increasingly sustained by illegal logging activities. Although commonly justified as necessary to promote 'development,' deforestation has often undermined the livelihoods and well-being of forest-dependent communities.

Fast-wood industrial plantations have been presented as an instrument that can meet the demands for timber of the rapidly growing Asian economies and earn much-needed foreign exchange. However, large-scale, mono-crop plantations remain highly contentious. Critics contend that the rights and concerns of local people are often ignored by plantation owners and governments, that natural forest is cleared to establish plantations, and that plantations require intensive irrigation and the application of pesticides which can both be detrimental to the surrounding ecosystems. Large-scale plantations must be made more socially acceptable, and smaller, locally-managed plantation models, such as outgrower schemes, should be considered possible alternatives.

Forest certification is introduced with reference to whether the market can succeed where the government

has failed to properly manage forests. New strategies are emerging that suggest ways of overcoming some of the obstacles that have constrained certification in Asia. Stepwise certification has been proposed as a means of gradually building the capacity of producers to achieve certification. Buyer groups have been formed to link producers with markets. Strategies to make certification more accessible to small-scale producers include simplified and less costly methods.

New policies to promote community forestry in Asian countries are another acknowledgement of the limitations of governments in managing forests. Lessons from throughout Asia reveal that for community forestry to succeed, individual schemes must be finely-tuned to reflect local circumstances. A successful community forest requires secure land tenure, a voice for marginalised groups in decision-making and strong institutional support.

Protected areas are also an increasingly important feature of forestry in Asia, gaining popularity as a policy instrument from the 1970s onwards. However, the early protected areas tended to exclude local people and uproot their livelihood. Protected areas are most likely to succeed when they incorporate buffer zones and enclaves that allow local people to fulfill their livelihood needs. New approaches that combine the protected areas with the creation of employment opportunities are also suggesting ways forward.

Trade liberalisation has a significant impact on forest management. In contrast to international trends, import and export tariffs can be an effective means to encourage regenerative forestry and discourage exploitation forestry, respectively. Non-tariff trade measures are also examined, especially bilateral and regional instruments that curb the flow of illegal timber.

How can the Asian water crisis be better dealt with?

Although Asia has a significant amount of fresh water resources in total, the per capita availability is limited to only about $4,000m^3$/year, which is less than half of the world average. Substantial variance exists among countries (Shiklomanov, 2000). South Asian countries, such as Pakistan and India, have the least water resources on a per capita basis. The quality of water is also deteriorating. Biological oxygen demand (BOD) and suspended solids in Asian rivers is respectively 1.4 times and 4 times higher than the world average (UNEP, 1999). Pollution with heavy metals, such as arsenic and lead, is also a serious threat in certain parts of Asia. Pollution has further reduced the already limited amount of water available. Asia is still the region where the largest numbers of people live without access to safe water and adequate sanitation. Health and economic costs associated with these problems are tremendous, and further population growth and economic development will exert increasing pressure on the already scarce water resource base in Asia.

A drastic shift in water management policy is considered necessary for countries to deal with the crisis situations over fresh water resources predicted in many parts of Asia. Truly cross-sectoral integration has to be in place, more decentralisation has to be promoted, and demand-driven management should be more extensively introduced. Stakeholder participation also holds the key to successful water resources management. In this age of globalisation, the interaction between international, national, and local stakeholders is essential to advance new approaches to effective water management. An initiative taken by the Global Water Partnership (GWP) to assist in preparing national/regional water vision proved that point.

Integrated water resource management (IWRM) is an attempt to change the fragmented water management currently in place. Countries such as Thailand, Philippines, and China have promoted a major reform in water resource management. A more strengthened water ministry has been established by combining water-related departments scattered throughout different ministries, and an apex body has been set up for

the overall coordination of water-related policies. At the same time, decentralisation has been promoted. River basin management has been more widely introduced in many countries in Asia. Consequently, local stakeholders began to participate more in river management and the national government has started to assume a more coordinating role.

Access to safe water has been among the top priorities in Asia. Given the huge investment necessary to address this issue, the public-private partnership (PPP) has been promoted for years as a promising solution. In this respect, Manila's success and failure provides useful lessons regarding both potentials and risks associated with PPP. The delegation of management responsibility to local communities and a strong commitment generated among local water managers by an incentive system proved to be a key to successful water supply under PPP. A water supply project in Dhaka indicated that NGOs could take a leading role in promoting community participation and raising their ownership of the project.

Certain technologies can provide solutions to deal with water scarcity, at least partially. Such technologies include those for water reuse and recycling, seawater desalinisation and water harvesting. Among them, water harvesting is an old practice, but it has attractive features, such as low cost and simple and easy maintenance. Consequently, water harvesting has gained popularity among an increasing number of developing countries such as Thailand and India.

How can climate change concerns be mainstreamed in Asia?

Climate change is a major global challenge but it is also an essential challenge for Asia to promote sustainable development. Since the 1970s, global, climate-related disasters have claimed over a half a million lives in Asia. While the annual per capita greenhouse gas (GHG) emissions in developing Asia (1-2 tons) is still ten to twenty times less than that of the industrialised countries, the total emissions from Asia, which currently account for 20 per cent of the world total, are increasing quickly due to rapid economic and population growth.

Asian policy-makers acknowledge that combating climate change is vital but they believe that such efforts should not prevent economic growth, poverty eradication and the improvement of local environmental quality. While many countries have begun to address climate issues in different ministries, climate change is not a high priority yet and is not mainstreamed in the development plans and policies.

Mainstreaming of climate issues in development planning can be done at both the policy and operational levels. Integrating climate concerns at an early stage of project planning can save enormous resources. A pilot study on integrating climate change in road design showed that climate-proofing could be highly cost-effective with an internal rate of return above ten per cent. On a national level, the mainstreaming process can be accelerated through the incorporation of climate concerns into important national strategies and plans such as those related to sustainable development, environment and poverty reduction. Strengthening local institutional networks and raising the capacity of policy-makers at all levels are crucial to making progress in this direction.

Renewable energy promotion, the clean development mechanism (CDM), and the adaptation to climate change, offer several opportunities for mainstreaming climate concerns in the Asian context. The promotion of renewable energy, for example, has several side benefits besides GHG mitigation. Countries such as China, India, Japan and the Republic of Korea (ROK) have established a policy framework for the promotion of renewable energy, while others have introduced measures to exploit renewable energy such as solar and wind. Although the slow pace of affordable technological development and the high investment costs currently limit the use of renewable energy in several Asian countries, recent high oil prices may pro-

vide the impetus to move forward in this area.

As the CDM is aimed at both GHG mitigation and sustainable development, it can be an effective tool for mainstreaming climate concerns in development. Currently, Asian countries are leading in CDM project development but several concerns related to its implementation have surfaced. Surveys and workshops by IGES revealed many barriers to implementation. They include a lack of coordination within government, a lack of financial incentives, and a lack of awareness, to name a few. Measures, such as the integration of the CDM in related sectoral policies, should be taken to address them.

In Asia, adaptation to climate change has become an urgent challenge because of the region's high vulnerability characterised by large and relatively poor populations. The challenges to mainstream adaptation concerns in the developmental plans at local and national levels are assessed and some options to overcome them are recommended. Mainstreaming adaptation in national planning, such as the one in Kiribati, could serve as a model for other small island countries.

Since the design of a future climate regime beyond 2012 has significant implications for sustainable development in Asia, it is recommended that Asian policy-makers be proactive in ensuring that such discussions consider the genuine concerns and developmental aspirations of the region. The discussions must facilitate synergies between climate-related measures and sustainable development, not only through the provision of necessary incentives, but also through the effective restructuring of the CDM and the encouragement of adaptation, especially in the vulnerable regions and communities. Raising the policy profile of climate change within the context of sustainable development, and the need for policy coherence in finding win-win solutions and preventing maladaptations in the region, are considered crucial in realising the vision of a sustainable Asia.

What approaches are effective to deal with the urbanisation environmental crisis in Asia?

Asian urbanisation is unprecedented in terms of size, speed and level of urban transformation. As a result, urban environmental problems have significantly deteriorated. The ambient air quality in many megacities far exceeds the World Health Organization's (WHO) standards, a significant number of urban dwellers are still without access to adequate water and sanitation services, wastewater treatment in Asian cities is grossly inefficient, and disorganised solid waste disposal has posed almost crisis situations in mega-cities in Asia.

The crux of the urban environmental problems lies in the insufficient capacity to deal with them. In many countries, local authorities lack the mandate and human resources to handle environmental problems. Appropriate policy measures are neither introduced nor implemented; financial resources are too small to cope with the problems; and, mobilisation of the stakeholders is still limited.

The financial constraint amongst them is the most critical issue confronting urban decision-makers. Imbalance in the sharing of financial resources between the central and local governments is one of the key barriers to expanding the urban environmental infrastructure. While decentralisation of environmental governance is slowly but steadily taking place in Asia, its true effectiveness will not be achieved without establishing a sound financial basis at the local level. At the same time, a number of Asian cities are competing with each other for foreign investment, often by compromising local environment standards and offering tax breaks. The consequence tends to be more pollution and less revenue, at least over the short-term. Thus, a common set of environmental standards and collective action among competing cities is considered necessary to prevent this downward spiral.

To fill the financial gap, burden-sharing through public-private partnership (PPP) has often been used in Asian cities. Past experiences with PPP indicates that success depends, in general, on clear rules and regulations, distinct demarcation of responsibility, mechanisms of risk mitigation and the appropriate consideration of size and type of the project in question. Community-based initiatives offer alternative or complementary solutions to deal with the financial constraints faced by many municipalities. Successful local initiatives require careful consideration of the local social context, clear roles for NGOs and other actors, a sense of ownership shared by community members, and the appropriate size and type of a project.

One cannot rule out the usefulness of the top-down regulatory approach for urban environmental management in Asia. Environmental regulations and standards have worked in many Asian cities, although they are not comparable to the scale of the problems of coping with solid waste, waste-water, transportation and air pollution. They seem to have been effective in cases where specific technologies are identified, targeted activities are focussed and well-defined, and major stakeholders are limited in number. In many other Asian cities, however, limitations of the regulatory approach seem to have arisen from inadequate institutions and enforcement mechanisms.

An increasing number of local initiatives have been conducted in Asia to deal with the urban environmental crisis. However, owing to the locally-specific conditions of individual cities, how far the lessons learned from one city can be generalised remains the question. They are driven by local context, and there is no "one-fit-for-all" solution for urban environmental issues. Still various international agencies and inter-city networks working in the region have helped to collect and disseminate successful cases implemented in many cities and to document effective policies and practices. One of the major drawbacks of these attempts seems to lie in too much attention to successful cases and less upon unsuccessful or failed experiences. Another drawback has been the weak mobilisation of available financial support, in particular, through inter-city cooperation networks. Still, it should be emphasised that direct communication among municipalities is essential and will be increasingly important in the future.

What steers business towards sustainability?

Business, as the engine of much of Asia's recent economic growth, plays an important role in achieving the environmental security in Asia. Voluntary initiatives have been taken by business in response to global environmental concerns, market-based measures have been more extensively adopted, and future innovative business models have emerged that lead society towards sustainability.

To date, as a voluntary initiative, Asia has responded relatively well to the requirements of the environmental management systems (EMS) that include the International Organization for Standardization (ISO) standards. The number of ISO certified companies in Asia is the largest in the world. Though such companies are still on the increase, the annual growth rate has slowed recently, indicating the difficulties faced by small and medium enterprises (SMEs) to join. There may be as many as 50 million SMEs in Asia and the EMS initiatives have captured only a fraction of them.

There is a steady increase in the number of environmental/sustainability reports prepared by companies in Asia as stated in the guidelines set out by the Global Reporting Initiative (GRI) and the Global Compact Initiative (GCI). Environmental and sustainability reporting is the foundation for information disclosure on the environmental performance of a company but attention to such reporting is still not high enough. Awareness should be raised even among national and local authorities regarding the importance and usefulness of such reporting. Government and business need to join forces in supporting voluntary initiatives and draw upon market mechanisms through the reconfiguration of national environmental policies and strategies.

In this respect, it should be noted that there is a conspicuous absence of major Asian financial institutions from the list of signatories to such global sustainability initiatives as the Equator Principles and the socially responsible investment (SRI). Environmental and sustainability reporting would be further promoted if more financial institutions in Asia responded proactively to SRI. Pension funds seem to have a great potential to engage in SRI because of the growing ageing population in Asia.

The market for environmentally-sound goods and services has expanded in many Asian countries. Now many economies are promoting environmental labelling programmes. But, the effectiveness of eco-labelling schemes in Asia needs to be improved further, not only by strengthening relevant policies but also by raising awareness on the part of consumers. Also important to note is the cost gap between eco-products and conventional products. Innovative policy measures, such as the promotion of green procurement and purchasing, are needed to reduce the cost difference.

Business has a key role to play in building a sustainable Asia and ensuring that economic growth can continue to promote environmental security. But the proactive business initiatives for social and environmental concerns are exceptions rather than the norm in most developing economies in Asia. Strong government leadership is necessary in this respect to create policy conditions to help implement more win-win solutions. Concerted efforts are necessary among business, governments, civil society and local communities to find innovative approaches to better deal with the social and environmental challenges that draw upon positive market forces and further promote voluntary initiatives and constructively reconfigure traditional environmental policies.

How should environmental education be transformed to be a part of the broader sustainable efforts?

Capable and well-motivated human resources are the most essential element to achieve sustainable development. A range of effective measures in relation to formal, non-formal and informal education is the primary tool to develop the human capacity required for sustainable development. Encouraging environmental education practices are abundant in Asia in various forms and such efforts are still expanding.

The contribution of environmental education to sustainable development is demonstrated in a number of cases at the local level. However, the impacts of educational measures on a much broader scale have not yet been clearly demonstrated with substantiated evidence. Therefore, considering the critical importance and urgency of realising the vision of a sustainable Asia, serious efforts are needed to reorient education policies and programmes and enhance their relevance and effectiveness in contributing to the attainment of sustainable development.

In response to the shift of focus towards the contribution to sustainable development, four important principles are emerging globally: 1) environmental education should readjust its focus from ecological concerns to interlinking relationships among socio-cultural welfare, economic livelihood and environmental quality; 2) an integrated approach should be employed to enhance inter-linkage and collaboration among educational programmes in different sectors, ranging from formal/non-formal education to training and public awareness-raising; 3) appropriate institutional arrangements should be introduced to best support the notion of education for sustainable development; and 4) an effective policy mix should be employed within the educational field and in the non-education field though the combination with other policy instruments.

In line with the above principles, proposed actions by countries in the region would include: 1) the establishment of a national multi-stakeholder process to develop a coordinating mechanism for education for sustainable development; 2) the development of a national master plan for education for sustainable devel-

opment; and 3) the development of an institutional arrangement to ensure the "whole-government" approach. Such an arrangement should draw a strong political commitment from the top-level leadership and facilitate the establishment of inter-ministry coordination mechanisms on policies and programmes to promote education for sustainable development. These actions are considered imperative to promote capacity-building for government officials in all sectors and to reorient existing policy instruments across all ministries concerned. Particular attention should be paid to governmental functions in terms of linking national and local activities to international initiatives through regional networking, for example.

What measures are necessary to move towards a sustainable Asia?

Conclusions and recommendations

- **Significant and immediate actions are required at all levels throughout Asia – the need for change is urgent.** Taken as a whole, Asia is committing ecological suicide. The environmental capital in Asia is already scarce and it is being eroded further by population and economic growth. Further decline of the environmental capital risks not merely a reversing of the economic gains made over the past three decades, but the more general undermining of the welfare of Asia's citizens and a social and political collapse. This is widely recognised by policy-makers in the region, but the actions and responses thus far are wholly inadequate to the needs of the situation and the magnitude of the challenge. The Ministerial Conference on Environment and Development (MCED) for Asia and the Pacific, held every five years, represents a very modest step in the right direction. The stark and foreboding realities of Asia's overall development trajectory call for an inter-governmental summit at the highest levels, such as the meetings that led to the establishment of the United Nations in 1946 and ASEAN in 1967. Shared regional policies and practices to promote renewable energy and resource efficiency are required immediately as an incentive to innovation and the emergence of relevant technologies.

- **Continued high economic growth rates are imperative for Asia to tackle the vicious cycle of poverty and environmental degradation.** Although the debates about economic growth versus the environment are old, they continue to exert considerable influence on policy discussions and policy choices. Within the global environmental movement is a school of thought that is strongly eco-centric and bio-centric and that prioritises ecological concerns and opposes economic growth. Such thinking is totally unrealistic, especially for Asia. In Asia, there are 700 million poor in more than 20 countries who have an income of less than US$1 per day. Without significant and sustained economic growth, they and their children will continue to be trapped in a vicious cycle of poverty. Thus, while economic growth remains an unequivocal necessity for Asia, it becomes equally important that this be combined with strategies, policies and measures to secure environmental sustainability. Achieving the combination is a daunting challenge. It is important to move beyond the endless glib talk of 'win-win' scenarios that have come to characterise much of the public discourse and which serves mainly to divert attention from the difficult choices, trade-offs and opportunity cost judgments that are required. It has become essential for Asia to establish the intellectual and institutional framework required to identify clearly those difficult choices, trade-offs and opportunity costs. This framework does not exist at the moment and establishing it should be a matter of highest priority, for it is only through such an approach that it will be possible to combine the twin imperatives of economic growth with environmental sustainability.

- **Policy goals and objectives must be accompanied by effective policy instruments to produce actual impacts.** In the past, Asian countries have developed many master plans and action plans

underpinned by specific legislation mainly in response to international initiatives. This trend still continues. For example, many Asian countries are in the process of formulating a national implementation plan for the Stockholm Convention on chemicals. Also, some Asian countries have started to develop basic policy documents on the Decade of Education for Sustainable Development (ESD). The same trend has been observed in the private sector as well. Although various voluntary measures, such as ISO 14000, have been developed and are being applied in many parts of Asia, Asian perspectives have not been fully incorporated. Asia should be more proactive in its participation in and launching of global initiatives for sustainable development.

• **Environmental policies should be integrated into sectoral policies because environmental issues are inherently related to many sectoral activities.** Forest management, for example, is closely related to land use policy, land tenure, agriculture and watershed management. Without policy integration, sustainable development cannot be promoted. However, the idea of policy integration itself is elusive and understood in a different way in different circumstances. Although policy integration is considered still marginal as far as climate change issues are considered, substantial integration has been taking place in many sectors. For example, fresh water management has now moved into integrated management by incorporating fully environmental implications which can be contrasted with the original narrow focus on water pollution. Likewise, the forest sector fully incorporates environmental factors. This is accepted by many consumers now who prefer environmentally-certified woods. In this case, more participatory and transparent policy formulation is considered necessary and involves a wide range of stakeholders.

• **A policy mix must be developed and applied in response to the changing surrounding conditions.** As environmental matters become complex, many stakeholders are involved in the policy formulation and implementation. To be effective in responding to such changing situations, policymakers must consider not only regulatory measures, in which government plays the dominant role, but also the programme approach, market-based measures, information and procedural measures, in which many stakeholders work together to achieve common goals. Already this has happened in various countries in Asia. Environmental impact assessment is now the norm rather than the exception and the use of economic instruments has become more and more popular. Voluntary agreements, for instance, in promoting air pollution control and GHG emission reductions that are already successful in Europe can be replicated in Asia.

• **Regulatory measures will continue to be vital in the promotion of environmental management.** Strong government intervention in the domain of environmental management is indispensable, particularly when there is a need to generate clear policy impacts immediately. Regulatory measures can be quite effective when they are introduced by local governments because the specific conditions that each company faces may be better reflected in the regulation. Also, it is important to point out that regulatory measures are also effective in facilitating technological development. The case of the emission controls of automobiles illustrates the correlation between regulatory measures and technological development.

• **The conduct of business and industry in Asia will determine whether or not economic growth and environmental sustainability can be jointly achieved.** This will happen only if market mechanisms are aligned to the production of environmentally-sound goods and services. Green procurement is already prevalent in Europe. Thus far in Asia, only Japan has adopted a green procurement act, but green purchase networks, or coalitions of consumers and producers, are now gaining

momentum elsewhere in the region, including the ROK, the Taiwan Province of China and Thailand. Voluntary ecolabelling programmes and consumer networks have been forging new markets for green products and services and enlarging existing markets. Such markets are beginning to include recyclable materials, biomass and other renewable energy sources. China's wind power concession approach and tendering system for developing mega-wind farms shows an interesting example of government intervention in creating market mechanisms for renewable energy development. China's Renewable Energy Law that will enter into force in 2006 warrants close monitoring to assess its impacts on developing market mechanisms. More generally, an Asian business for sustainable development framework should be constructed with reference to the following factors:

a. There are positive relationships between environmental regulation and technological innovation. Regulation is essential as a stimulus to those who are making slow progress.

b. Regulation will be increasingly required as an enabling framework which needs to encourage change rather than act as a rigid system of rules and procedures.

c. Early signals by governments about new regulations, flexible instruments and credible, long-term objectives can promote the development and adoption of new technologies.

d. Businesses and policy-makers must be made more aware that corporate environmental management not only offers opportunities but also poses problems.

e. Political intervention must not only provide economic incentives but also promote information exchange and learning among businesses. Such intervention needs to address explicitly the costs and benefits of environmental gains and seek appropriate policy instruments that address the needs of those marginalised—the so-called "losers."

f. The often-cited adage by industry that we should leave choices to consumers as the ultimate arbiters of consumer preference is flawed. The evidence indicates the need for incentives to support green consumerism.

g. Environmental policy has to look at the opportunities and barriers for greening production and consumption and identify points for strategic intervention.

- **Asian countries should assume a proactive role in advancing the architecture of the future climate change control regime beyond the first Kyoto Protocol commitment period of 2008–2012.** As Asian countries will have a great deal at stake in this issue in terms of GHG emission reductions, conserving/developing carbon sinks and adapting to climate change, they should assume a proactive role. Their goal should be to champion a global climate change control regime conducive to greater gains in rolling back carbon emissions and in generating the international political will required for sustainable development.

- **Building and supporting institutional arrangements for policy implementation remain vital tasks for Asian countries.** Policies that reflect noble philosophical principles carry no meaning if they are not implemented. Loopholes and discretionary enforcement of policies create suspicion among stakeholders and undermine the very foundation of policy implementation. Across Asia, there is an urgent need to strengthen the institutional capabilities that are prerequisite to effective policy implementation. This may be particularly true with the forestry sector. The proportion of

illegally harvested timber is still substantial and it is claimed that a lack of accountability and transparency in forestry management and administration is culpable. On the other hand, it is important to note that the institutionalisation of community-based forest management has been yielding positive results in promoting sustainable forest management. In the same vein, recent developments in river basin organisations underline the benefits that can flow from stakeholder participation in integrated river water and basin management.

- **The increased involvement of local stakeholders through appropriate institutional arrangements is considered desirable for enhancing the effectiveness of activities and compliance in all natural resource management issues.** While stakeholder involvement in the implementation phase has progressed steadily, their involvement in public dialogue and decision-making processes remains relatively limited and is still not widely institutionalised. In the past many attempts have been made to develop national Agenda 21s involving many stakeholders. A national multi-stakeholder dialogue process was called for in connection with the development of national master plans for ESD. With the exception of a few countries, the effects of such a policy dialogue in Asia have not proved durable. It is vital, having learned from past experiences, to develop a scheme that will optimise the representation of various stakeholders in policy dialogues and the formulation processes in emerging policy issues.

- **Institutions and mechanisms at regional and sub-regional levels must be further strengthened, given the fact that Asian trans-boundary environmental problems will increase with time.** In the public sector, regional/sub-regional collaboration might well start with collective data collection, analysis and monitoring arrangements. These might develop into financing pilot projects and subsequently facilitating the implementation of common policies. Inter-city cooperation would flourish if there were an effective institutional set-up that facilitated information exchange and dialogue and had a sound financial basis.

- **Although caution and prudence are required, public-private partnerships (PPP) and certain community-based initiatives show promise as models to ensure the financing required to deliver environmental goods and services.** Such arrangements are increasingly evident in water supply, solid waste and sewage management. Since the level of funding differs from one project to another and commitments from stakeholders are different, there is no single funding formula that instantly converts problems into opportunities. The continuous collaboration of stakeholders concerned is the basis for making partnerships successful. Governments, research communities and international aid agencies can bolster the replication of successful partnership arrangements through capacity-building that can include the preparation of handbooks and the undertaking of training.

- **Socially Responsible Investment (SRI), including the use of pension funds, should be further promoted in Asia.** It will be essential to explore ways for influencing individual and institutional investors to shift their investment into more environment-oriented or sustainable development-oriented projects and fund management. Again, these issues are interwoven with green market development, consumers' awareness-raising and international network development.

- **Asia must make the best use of the opportunities provided under the Kyoto Protocol for climate change mitigation.** The clean development mechanism (CDM) has been promoted as a way to enable developed countries and developing countries to collaborate to reduce GHG emissions and conserve/develop carbon sinks/reservoirs. By combining carbon sequestration with other socio-

economic benefits, the CDM can contribute to the promotion of sustainable development in developing countries and the enticement of investment. CDM activities, however, remain hampered by the weak state of policy guidance for the application of the CDM. Much clearer policy guidance is required and should be accorded a high priority by Asian countries.

- **Many technologies for renewable energy are already available but they have not yet reached localities where renewable energy sources could be best explored and applied.** Policies and mechanisms conducive to knowledge dissemination and technology transfer are clearly required. Such policies typically involve the protection of intellectual property rights and the creation of markets for such technologies. With respect to the latter point, international investment schemes, such as the CDM, have great potential to expand the use of environmentally-sound technologies for enhancing energy efficiency and reducing GHG emissions. Careful application of biotechnology may also bring about multiple benefits to local communities and investors for promoting the sustainable use of natural and genetic resources.

- **Simple technologies can make a significant difference in some sectors:** Rain harvesting and biogas digesters are examples. Catalytic, financial and technical intervention by the government or intermediaries can increase the success of these simple technologies and moreover, the financial requirements of such projects are not high. Stakeholders must assess the potential of technological interventions in tackling environmental challenges and explore ways for introducing such simple technologies.

- **A salient policy framework to facilitate the production and dissemination of reliable information on critical environmental and sustainable development issues is imperative for Asia and only governments can provide the required lead in this regard.** Proper modalities should be developed to monitor and ensure that the information is credible and provided in conformance with standards. The Freedom of Information Act (FOIA) has been promoted in other regions, but is not widely adopted in Asia. Paragraph 128 of the Johannesburg Plan of Implementation calls for ensuring access to environmental information and judicial and administrative proceedings. Asia does not have a regional policy framework like the Aarhus Convention.

- **The CDM and adaptation measures promoted in the context of climate change mitigation should be linked to the improvement of poor people's livelihood.** Agroforestry, coupled with watershed management, for example, could generate multiple benefits, such as income-generating opportunities while at the same time conserving carbon sinks/reservoirs. Adaptation measures could be made useful, if properly designed, to strengthen the preparedness for droughts, floods and other natural disasters and for reducing the vulnerability of communities to extreme climate conditions.

- **Illegal timber harvesting can be curbed through codes, standards and restrictions that are entirely compatible with World Trade Organization (WTO) rules.** In this respect, voluntary timber import licensing schemes between European countries and Asian timber exporting countries deserve close attention to see if they can successfully reduce Asia's illegal timber trade.

Towards a Sustainable Asia

Achieving a sustainable Asia is essential for the future of all humankind and for the natural environment it inhabits. Yet Asia finds itself today far more on a course towards human and ecological collapse than to

sustainability. To reverse this will require a renewed and intensified collective effort across Asia as a whole, beginning with the recognition that Asia's prospects for longer-term economic growth, social development and political stability depend directly on strategies, policies and actions to achieve environmental sustainability. Unless urgent, concerted and sustained action is taken on a large scale, Asia will be unable to avoid a social, economic and political crisis of catastrophic proportion over the medium-term.

There is no panacea for the promotion of sustainable development. It will take various forms in individual countries. Yet, there are shared patterns and a broad range of common problems and challenges that define the reality of Asia in the early years of the 21st century. There will be a need for shared strategic and policy agendas if Asian countries and communities are to successfully confront successfully these problems and challenges. It is hoped that this report will help to focus attention and political will on at least some of the shared agendas that will be required. Asia must take renewed and intensified collective measures to avoid ecological collapse. It must recognise that its prospects for longer-term economic growth, social development and political stability depend directly on strategies, policies and actions to achieve environmental sustainability.

CHAPTER 1

Introduction: Sustainable Asia 2005 & beyond – objectives, questions, conceptual challenges and structure

Providing policy analysis and advocating future actions for promoting better environmental management and sustainable development

Objectives of the IGES White Paper

The Institute for Global Environmental Strategies (IGES) was established in 1998 to undertake leading-edge policy research and to provide policy-makers and other stakeholders with up-to-date analyses of strategic and policy options for sustainable development with a particular focus on the Asia and Pacific region. This publication "Sustainable Asia 2005 and Beyond: In the pursuit of innovative policies" is broadly in the form of a policy document and, as such, is presented as a "White Paper." It represents a first attempt to consolidate some of the principal outcomes of IGES studies and to provide an initial framework of policy and strategic choices. IGES will aim to produce similar and updated products on a regular basis.

The specific objectives of the White Paper are:

1. To take stock of the current environmental and economic situation in Asia and to assess whether the current trajectory is approaching a sustainable course, given expected population growth and economic expansion;
2. To review major policy measures already in place in Asia that aim to bring about economic, social and environmental sustainability; and,
3. To present, specifically for Asian countries, a number of broad policy choices and directions to promote sustainable development.

The Asian context

At least since 1972, when the first global summit on the environment and development was held in Stockholm, Sweden, world leaders have regularly pledged commitments to bring together the interests of the environment with the interests of economic growth. The latest major pledge of this nature is to sustainable development and is found in the Johannesburg Plan of Implementation (JPOI) which was promulgated in August, 2002 at the World Summit on Sustainable Development.

Asia is the largest and most populous region in the world and the JPOI declaration clearly cannot be fulfilled without Asia. Asia, however, confronts daunting challenges for the achievement of sustainable development. In most parts of Asia, there are formidable pressures on policy-makers to achieve and maintain high rates of economic growth in order to ensure societal cohesion, to meet the needs associated with population growth and to address the tragedy of widespread poverty found throughout the region.

As will be seen in this publication, many response measures in the form of new policies and implementation strategies to address sustainability issues have been already taken in Asia. Although some of these have been measured as successes in environmental terms, most have been based on the "pollute first and clean up later" approach and their results have been mixed at best.

This situation raises a number of questions that are fundamental to the future of Asia and its citizens, especially given that over half the world's population lives in Asia.

- Can the already thin natural resource base in Asia sustain the combined pressures of continuing population growth and economic expansion?
- What is required to move beyond the currently dominant "wait and see" and "pollute first and clean up later" framework? To what extent can new measures be compatible with rapid economic growth?
- What is the scope for a new collective action? Can a common set of policies be successfully implemented throughout the region to promote sustainable development? Alternatively, are diversified policy sets necessary for each country and locality according to the different local economic, social and cultural conditions?

This publication explores these questions and the issues they raise and, while it does not purport to furnish definitive answers, it hopes to cast some light on the situation and provide a degree of utilitarian guidance in the form of strategic and policy measures to address the situation.

Conceptual challenges

Concerns surrounding sustainable development

The term "sustainable development" has become commonplace since the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992. The keystone documents of the UNCED (e.g., the Rio Declaration; Agenda 21) adopted the definition of sustainable development provided in the "Brundtland Report" in 1987, namely, development that "meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987)." But what exactly does this mean? According to Daly and Townsend (1993), the concept of sustainable development may evoke inspiration in many quarters but it is also derided by many as a bad oxymoron when applied to the economy.

There have been numerous attempts since the UNCED to give sustainable development[1] a more precise definition, especially in the academic literature which includes numerous efforts, mainly by economists, to introduce improved conceptual clarity (UNDP and OECD, 2002; Bell, 2004). An important attempt to formulate a pragmatic conceptual framework is found in the "Three Dimensional Model (SDM) (von Stokar et al., 2004)."[2] This basically postulates three bottom lines, i.e., environment, economy and society, all of which are assumed to be conducive to measurement, to which are added time and north-south dimensions (Fig. 1-1). It highlights the inter-linkage of economic, social and environmental dimensions. The model looks at the synergy among them and stresses that economic development must be achieved with social equity while promoting environmental protection. It has expanded geographical and temporal scales in which development is contemplated. Inter-generational and north-south equity have become major concerns.

The SDM is beguilingly simple and undeniably attractive in postulating that there are ample opportunities in which the three bottom lines may be simultaneously satisfied (UNEP, 2004). But such an assumption is debatable. The reality indicates that even the economic and environmental bottom lines, i.e., the "win-win" solutions, are most often very difficult to achieve in real life situations. Certainly there exist cases where cost savings are realised through environmental investments. However, such cases do not appear to represent the norm for individual companies. In fact, the reality often requires hard choices, identification of losers and winners and proactive measures to compensate the losers. For example, almost all countries in Asia are faced with requirements for fossil fuel-based power plants to meet the increasing needs of energy for economic and industrial growth.

A second difficult conceptual issue in sustainable development is the notion of inter-generational equity. When a project is designed, how far must one look into the future? Typical cost-benefit analysis may have its scope only up to 20-30 years, given the fact that the costs and benefits in the distant future are significantly discounted. This makes short-term economic gain more important than typically long-term environmental benefits. Although a range of different proposals has been made, this remains an intractable issue on which there is no agreement. The result is that evaluations of investment and development projects generally do not take into account long-term, inter-generational costs and benefits. Without reliable and agreed methodologies, the issues of inter-generational equity become largely rhetorical as non-existent future generations cannot negotiate with the present over resource use.

The idea of sustainable development raises a further conceptual challenge of scope and the problem of a spill-over effect or leakage. Sustainable development is so comprehensive a notion that it almost always demands holistic thinking and the kinds of inclusive analytical methodologies that generally do not exist. It may, for example, be possible to make a forestry project sustainable in one area, but that action may shift unsustainable practices to other areas, other countries or other continents.

Sustainable development, therefore, is a very difficult, problematic and elusive concept. But this does not mean that it should be abandoned. Rather, it is important to try to introduce greater clarity and precision into the concept, to work through the dilemmas and contradictions and not to fall into the trap of thinking that, because we cannot be sure that sustainability is possible, there is no point in doing anything to try to reconcile the imperatives of preserving the environment and improving living standards. It is equally important to recognise that there are appropriate policies that can address these critical concerns at least to a certain extent. What is required of Asia is innovative thinking to devise new and effective policies.

Fig. 1-1: Three dimensional model
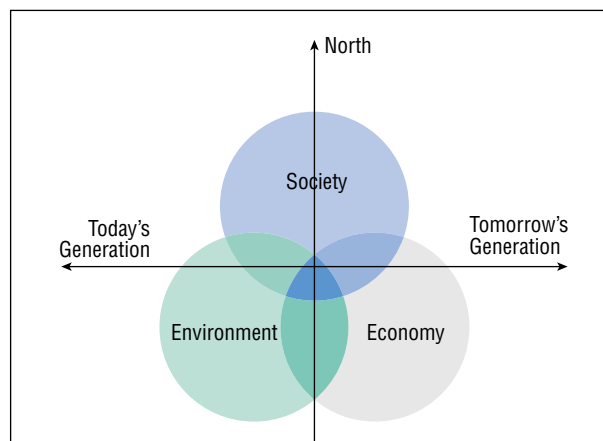
Source: von Stokar et al.

3

Concerns about policy mix: more complication or sophistication?

In general, it may be said that the initial emphasis of environmental policies in most countries has been on command and control measures of regulation and enforcement aimed at controlling and punishing excessive polluters and reckless developers. Environmental issues have now become so pervasive, however, that the command and control approach alone cannot begin to meet the magnitude of the challenges (Mirovitskaya et al., 2001). The scope of environmental policies has accordingly expanded dramatically from prohibition and control to a growing emphasis on the promotion of environmentally-desirable behaviour, on positive and market-based incentives and on self-regulation and voluntary approaches (Gunningham, 1998). Fig. 1-2 suggests a classification of six types of policy measures (i.e., regulatory, framework, market, voluntary, procedural and information). The features of each of the measures are summarised in Box 1-1 (Helm, 2000). These are not entirely mutually-exclusive categories and can be implemented in combinations, (i.e., in a policy mix), drawing upon strengths and constraints of each measure.

This diversification of policy measures is apparent in many countries in Asia and the evidence indicates that the choice of appropriate mixes is an important key in policy effectiveness. Examples are provided in this publication of both relatively successful and unsuccessful policy mixes and these underscore the importance of caution and selectivity and of learning lessons from experiences. According to N. Gunningham, certain policy mixes appear to work well in some settings but in other settings are counterproductive.

Fig.1-2: Recent development of policy mix for environmental management
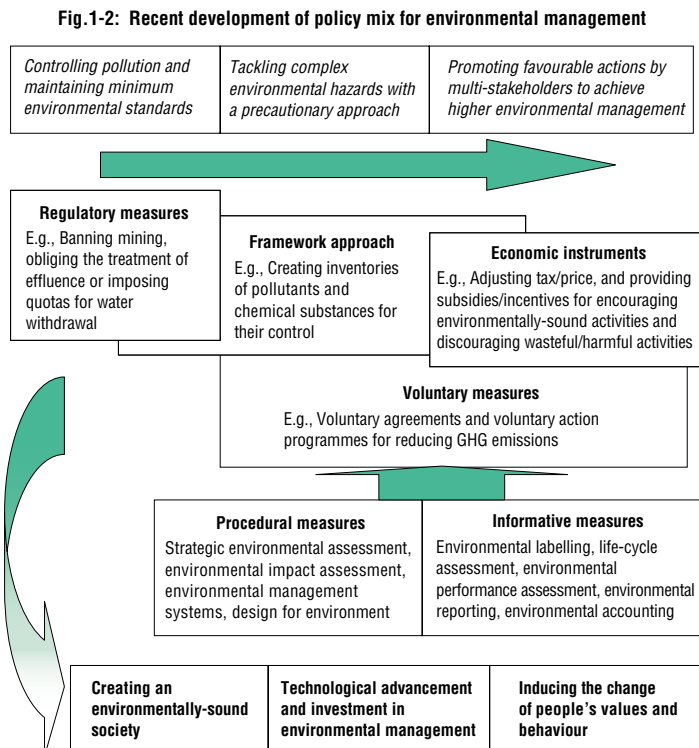
Developed from the MOEJ (2000)

A further important factor to consider when examining alternative policy mixes is capacity constraint. This is especially the case for poorer developing countries. As a general axiom, the more complex the policy mix, the more numerous are the environmental issues that need to be managed or coordinated at the same time. Experience across Asia suggests that some countries lack the required capacity for fully effective implementation of even command and control-type policies. This suggests that excessive diversification of different policy measures may make the whole operation confusing and ineffective.

Box 1-1: Features of different policy measures

Regulatory measures

Although this approach receives a lot of criticism, it is important to note the strengths of the regulatory measures. Usually regulatory measures are quick in producing impacts, suitable in controlling a small number of large enterprises, and easy to implement in certain cases (e.g., prohibition of production and use of toxic chemicals) (Durant et al., 2004). At the same time, the shortcomings of this approach should be clearly recognised. They include: constant monitoring and high implementation costs; vulnerability to corruption; and, no incentives for continuous improvements in environmental performance.

Framework approach

This typically takes the form of an introduction of a framework legislation, or preparation of various master plans and action plans. Usually a broad policy framework is established in which basic principles, long-term goals, and the roles of many stakeholders are presented. This approach has become the norm in many countries partly because both the central and local governments were requested to develop their Agenda 21s after the Rio Summit, but is considered essential to have mutual agreement amongst major stakeholders to achieve long-term goals in an effective manner. Under this framework approach, several programmes are developed and implemented for facilitating the achievement of common goals.

Market-based measures

Market-based measures include fiscal incentives and disincentives (e.g., taxes, charges, and subsidies) and market creation for environmentally-sound goods and services (Sterner, 1999). These measures have been used alone or in combination with other measures in many Asian countries. The government role is indirect in that it attempts to influence those concerned with economic incentives and disincentives. Compared to typical regulatory measures, cost effectiveness is expected to be high, and implementation costs could be low (Andersen et al., 2000). However, the visible impacts may not come immediately. It is important to note that the successful implementation of market-based measures depends upon market conditions, consumers' spending patterns and elasticity of the price for particular products and services.

Voluntary agreements

Voluntary agreements or initiatives have been concluded or announced in relation to the reduction of greenhouse gas emissions in several OECD countries. They take the form of an agreement concluded between the government and industry to achieve a common goal of environmental management when there is not yet a consensus on the introduction of regulatory measures. This approach gives flexibility to companies as to specific actions to be taken, whereas a question remains as to the belief that companies will not go far enough to take serious action involving significant trade-offs (Mol et al., 2000).

Procedural measures

Procedural measures include strategic environmental assessment, environmental impact assessment, environmental management systems, and a design for the environment. By ensuring that the government and business follow standard procedures, improvements in environmental performance may result as consultations with top management and local communities are incorporated in the process. If the same procedure is taken on a regular basis, continued improvements are expected.

Information measures

Information measures include: environmental labelling, life-cycle assessment, environmental performance assessments, environmental reporting and environmental accounting. These measures are considered important for sound decision-making by relevant stakeholders based upon the accurate information provided. Eco-labelling is intended to provide consumers with information on, for example, what is contained in the products. Environmental reporting can provide essential information needed by financial institutions for their environmental performance evaluations.

The various policy channels and policy mixes indicated above provide a broad conceptual framework to examine policy options (Jeanrenaud, 1997). It underscores the importance of avoiding "one-fit-for-all" approaches and of tailoring policy mixes to local conditions and the nature of the issues in question. In subsequent chapters when we assess the policy tools aimed at environmental management and sustainable use of resources in connection with specific sectors, it is important to bear in mind a variety of policy options outlined and explore a suitable combination of policy mix components to achieve specific objectives in diverse circumstances.

Bottom-up and community-driven approaches to sustainable development: Potentials and problems with participation

As policy measures become more ambitious and more diversified as outlined above, the number of stakeholders involved and affected will generally increase as well and collaboration and coordination among different stakeholders will become more important. In addition, many environmental issues, such as haze pollution, climate change, forest management and the equitable use of shared water resources, pose a unique set of challenges to environmental governance (Dragun et al., 1997). These environmental problems involve a spatial variation in terms of their causes and effects over multiple levels – local, national, regional, and global. Some of these problems are local in terms of the source of the harm and the impact; others are local in source but trans-boundary in impact; yet others are trans-boundary both in source and impact. The factor of spatial variation highlights the need for decision-making processes that go beyond national borders and illustrate the necessity for creating mechanisms at the local, national and international levels.

It is because of these factors that Asian countries and their international development agency partners are today placing greater emphasis on "multi-stakeholder" and "participatory" approaches to development in general and to environmental issues in particular. In many cases, the words multi-stakeholder and participatory have become almost essential in the titles of environment and development projects (e.g., "participatory forest development," "participatory waste management," and "national participatory water resources framework.")

This growing emphasis is also a reflection of the changes brought about by the forces of globalisation, on the one hand, and of decentralisation, on the other. These have reconfigured environmental actors and

processes, expanding them simultaneously at both the local and international levels and driving a transition towards a multi-level structure of governance. In this evolving structure, the role of non-state actors has become more important at the local, national and international levels, while that of the central state has been altered. Such processes are already taking place, as discussed in the subsequent chapters, in several environmental areas, from forest conservation to water resource management where policy is emerging in the form of a complex mix of initiatives by local governments, communities, business and international institutions. Consequently, the role of central governmental agencies is progressively shifting from being a centre of authority to one of partnership. These shifts are challenging existing institutional arrangements. More than this, however, they also require entirely new arrangements for coordination and collaboration to ensure adequate and effective linkages among policies at the local, national and trans-national levels.

Multi-stakeholder and participatory arrangements and approaches, however, are not without problems or serious drawbacks. Four problem areas can be identified: Firstly, there are problems of definition and concept. As emphasis on participation has expanded, three fundamental questions have arisen. (i) What does participation actually mean and entail? (ii) Can methods to engage people through small groups be "scaled up" to the national and regional level? (iii) Especially important for governments, who has legitimacy and should be included in participatory processes? These questions have produced efforts to provide participation with a clearer conceptual framework, better definitions and a solid grounding in the social sciences, but have also been severely criticised as flawed and imprecise. For example, many efforts have been made to define exactly who are "stakeholders" and who are *primary* stakeholders." But these efforts usually begin by defining a stakeholder as just about anybody with an interest in a given programme or project. Primary stakeholders are then defined as those who will be positively or negatively affected directly by that programme or project. The problem with this is that its boundaries are not clear and its application is highly judgmental. The result of this imprecision has been a tendency to claim "the more participation, the better" and "the larger the group, the better."

There are serious definitional and conceptual difficulties with the notions of multi-stakeholdership and participation and these need to be addressed. Concern should be raised that participation operating without a framework of norms and standards could lead to not only a waste of time and effort, but also could be employed as a tool for manipulating a platform of decision-making and policy implementation.

Secondly, a multi-level and multi-stakeholder set-up may create less accountable responses. A national government may shift the responsibility of certain environmental problems to local governments or may claim that all global environmental issues should be dealt with by the international community. This tendency is more conspicuous with environmental issues because they are often regarded as problems rather than opportunities. A clear division of responsibility needs to be agreed upon among the stakeholders and sound monitoring mechanisms have to be established.

Thirdly, participatory and multi-stakeholder approaches often result in the creation of entirely unrealistic expectations, including demands that governments or companies provide services that are completely beyond the available financial and organisational resources.

Finally, the prospects for the success of multi-stakeholder and decentralised efforts have been shown to depend on a wide range of capacities at different levels of society. It has become clear that these required capacities either do not exist or are in very short supply in many instances, especially in poorer countries. For example, serious urban environmental problems highlight the importance of building regulatory, institutional, financial, technical, and social capacity for urban environmental management. Most local governments lack such capability. Thus, not only does simple devolution of environmental mandates to local gov-

ernments not improve policy implementation, in many instances its consequences are negative and even pernicious.

This indicates that, while new environmental stakeholders have been emerging and alternative processes to engage them have been multiplying, the creation of the institutions and the building of the capacities on which these depend have been lagging behind. During the last decade, national environmental institutions were established in virtually all countries. One of the most substantial problems that prevented the good performance of such institutes was a lack of capacity. Capacity-building of major stakeholders is likewise a key element in that respect.

Structure of this publication

Against this background of the conceptual framework, problems and challenges of "sustainable development," this publication offers a synthesis of work in progress at IGES in the form of possible policy responses, institutional frameworks and assessments of underlying challenges on different sectors and themes. The presentation does not always follow the aforementioned analytical methodologies although these are born in mind in synthesising and examining driving forces, analysing policies and their impacts and formulating recommendations for better environmental management and sustainable development in Asia.

Chapter 2 begins with an outline of the principal drivers, challenges and dilemmas that confront Asia in meeting its environmental needs while at the same time attending to the imperatives of economic and social development. It then presents a synopsis of overarching policies and institutional issues delineated by regional, sub-regional and national policy development, implementation and challenges.

Chapter 3 examines policy issues on forestry, including the major causes of forest destruction in Asia and existing and emerging alternatives to promote sustainable forest management. It explores the impacts of community organisation and mobilisation, certificate systems, community forestry, protected areas, trade restrictive measures for containing illegal logging and for buttressing sustainable forest management.

Chapter 4 addresses freshwater issues. After outlining the major trends of water use and the key policy agenda, various options for promoting sustainable use and management of freshwater resources are suggested. Such options include: inclusive and carefully structured multi-stakeholder policy dialogues, integrated water management, policy and institutional reforms, finance and market measures, public-private partnership, and water harvesting. The impacts of various options are analysed and linked in order to multiply the overall policy impacts for promoting sustainable water use and management.

Chapter 5 analyses the recent development and impacts of climate policies in Asia, particularly in the context of the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. It examines the status and significance of climate policies in Asia and their multifaceted linkages with other policies such as energy, transport, industry, forestry and agriculture. It analyses the impacts and future potential of renewable energy sources as substitutes for fossil fuel. The Clean Development Mechanisms of the Kyoto Protocol and adaptation measures are also addressed in this chapter. Finally, it provides perspectives for building an agreement on climate change control beyond 2012 under the so called "Post-Kyoto Climate Regime."

Chapter 6 examines urban environment management. It emphasises that the driving forces aggravating Asia's urban environment are air pollution, water depletion, shortage and sanitation and solid waste. It

gives an overview of the various initiatives and undertakings at the national, regional and international levels to promote effective urban environmental management.

Chapter 7 examines emerging issues and policy possibilities for the role of business for sustainable development. It analyses the implementation of various schemes such as ISO 14000 and corporate information disclosure. It also addresses environmental management by small and medium enterprises (SMEs), corporate social responsibilities (CSRs), and corporate behaviour, including production and investment.

Chapter 8 reviews the policy issues of education, public awareness and training for environmental management and sustainable development. It presents a theoretical framework of capacity-building and its linkages with education, public awareness and training. Then, it examines formal, non-formal and informal education, looking at various initiatives and undertakings at the national and international levels, such as the UN Decade of Education for Sustainable Development from 2005 – 2014.

Finally, Chapter 9 presents overall findings and conclusions.

It is hoped that this document will contribute to debates and discussions within Asia and beyond on strategic and policy needs and challenges that must be addressed successfully if a sustainable and prosperous Asia is to emerge in the 21st century. For policy-makers, especially in Asia, it is also hoped that this first White Paper effort by IGES may prove of assistance and value in furnishing insightful and simulative perspectives and as a provocative framework for policy dialogue.

CHAPTER 2

Sustainable development in Asia:
Dilemmas, achievements and challenges

Asia's dynamics and vulnerability

Asia's economic growth over the past twenty-five years has been impressive, considerably surpassing that of other regions of the world. While the annual world GDP growth rate since the 1980s has fluctuated between 2 – 3 per cent, Asia's has remained at over 6 per cent (ADB 2005). Moreover, growth in the Asia-Pacific region has continued at a robust pace during the first years of the 21st century (Fig. 2-1). Can this trend be expected to continue? The Asian Development Bank (ADB) is optimistic. It assumes that high investment levels and restrained inflation will continue and projects well above the global average annual GDP growth of 5.8 per cent and 4.7 per cent for 2005-2010 and 2010-2025, respectively (Fig 2-2).

Fig. 2-1: Annual GDP growth rate
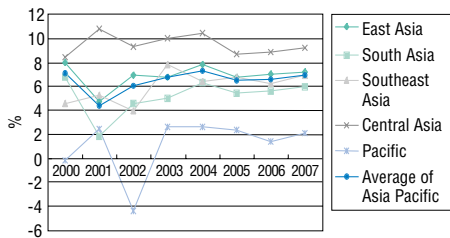
Source: ADB (2005)

Fig. 2-2: Annual GDP growth projections
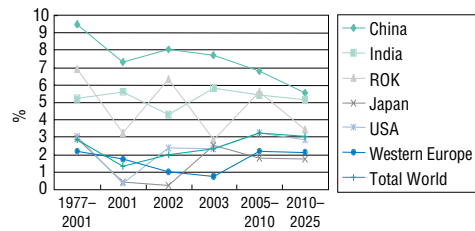
Source: EIA (2004)

Fig. 2-3: China - Direction of exports
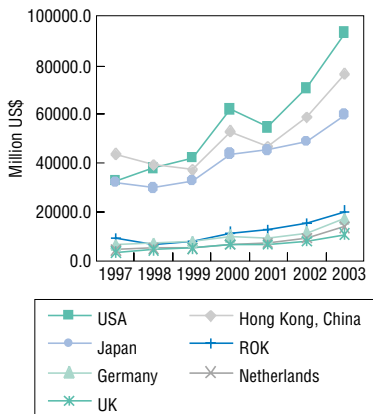
Source: IMF (2004)

Fig. 2-4: India - Direction of exports
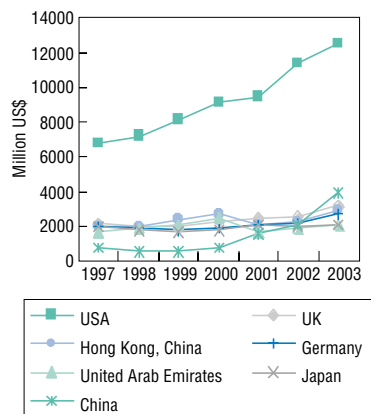
Source: IMF (2004)

Others are pessimistic and argue that the global economy is at the precipice of a major shock. They point to the extent and severity of the structural imbalances in the global economy, including the size of the current account deficit and low or negative levels of domestic savings of the United States, the fiscal deficit of Japan, the implications of Europe's rapidly aging population, the overheated and unsustainable growth levels of China's economy, and the increasing instability in the global energy supply (World Bank, 2004). There is no disputing these structural imbalances, but while the optimistic projections assume that these will be managed effectively, the pessimistic projections conclude that a major upheaval within the very near term is inevitable. What is clear is that if such an upheaval were to occur, it would have a negative impact on a highly interconnected world and would result in combinations of resurging inflation, "stagflation" and probably a new round of trade protectionism. Were this to occur, it would impact heavily on the Asian region and would reduce economic growth rates dramatically.

It is well beyond the scope of this paper to suggest either an optimistic or a pessimistic economic future of the Asia and Pacific region. What is clear is the current pattern of robust economic growth and the increasing interdependence of the economies of the region, both with each other and with the rest of the world (Fig. 2-3 and 2-4). As a result, major external economic shocks will inevitably impact on the region. A further trend within the region is towards increased economic integration and cooperation. The East Asian financial crisis of 1997 launched a process that culminated at the Ninth ASEAN (Association of South East Asian Nations) Summit held in Jakarta in 2003 with agreement to establish the ASEAN Economic Community (AEC) by 2020 as the first free trade area in Asia. In addition, in 2002 the ASEAN established the Framework Agreement on Comprehensive Economic Cooperation[3] with China. A year later, it concluded the Framework for Comprehensive Economic Partnership between the ASEAN and Japan.[4] In 2004, ASEAN leaders agreed with their counterparts from Australia and New Zealand to commence negotiations on a free trade agreement (FTA) in early 2005. The first East Asia Summit that took place in Malaysia in December 2005 bolstered East Asian cooperation on trade, transport, communication, monetary and financial matters in the future.

The pattern of robust economic growth in Asia is no longer limited to Southeast and East Asia, as was the case in the 1980s and 1990s. The major economies of South Asia have experienced rapid GDP growth over the past few years. India shares 78 per cent of the total gross national income (GNI) in the sub-region and recorded a 7.8 per cent GDP growth rate in 2003, followed by 6.5 per cent in 2004. India's trade volumes have also surged over the past years, recording a 22 per cent export increase in 2002, mainly to the USA. In 2004, the Associated Press noted that the South Asian Association of Regional Cooperation (SAARC) started negotiations on a free trade framework reached in the SAARC Summit held in Islamabad in January 2004 and agreed to strike a deal expeditiously in order to begin eliminating tariffs by 1 January 2006.

This is not to suggest that all countries in the Asia-Pacific region are benefiting equally from robust economic growth. Growth has varied significantly from country to country over the past years with some countries lagging far behind.

Demographic changes

Although the growth rate is declining, the population of Asia continues to increase and Asia's share of world population will remain high. It was roughly 60 per cent in 2004 and is projected at 58 per cent in 2050 (Fig. 2-5). Asia is also experiencing the most rapid and dramatic growth in urbanisation in history (PRB, 2004). Of the twenty-three cities world-wide with populations that exceed 10 million, nine are in Asia and these will soon be joined by four more. It is projected that more than 300 cities worldwide will exceed a million inhabitants by 2025 and the majority of these will be in Asia (UN-Habitat, 2003).

Fig. 2-5: World population projection
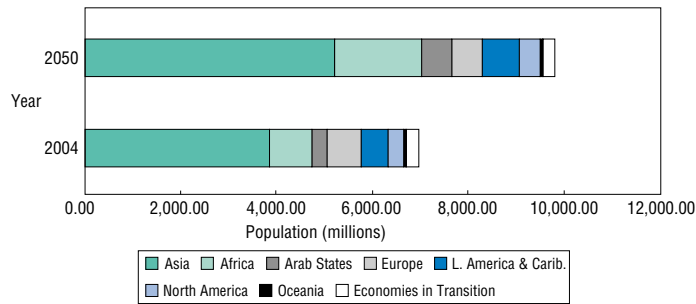
Source: UNFPA (2004)

It will inevitably increase the demand for natural resources on the planet. The limited Asian inter-governmental conferences and summits have drawn attention to the problems and challenges associated with these demographic changes, including environmental degradation and natural resource depletion, the inadequacy of access to social and reproductive health services and an explosive growth in urban poverty (UNDP, 2004). The number of people living in ghettos world-wide is estimated at about one billion —approximately one-third of the world's urban dwellers, and a sixth of all humanity (UNDP, 2005). The proportion of ghetto dwellers in the total urban population is 36.4 per cent for East Asia, 28 per cent for Southeast Asia and 58 per cent for South Asia (UNFPA, 2004).

Fig. 2-6: Urban population of slum dwellers
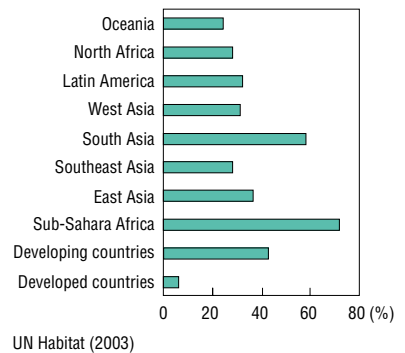
UN Habitat (2003)

In addition, for many countries in Asia with positive but modest economic growth rates population growth is impeding the prospects for poverty reduction. Despite the fact that Asia and the Pacific's share of the world's poor has been declining recently, it is still estimated to account for roughly two-thirds of the total world figure of 1.2 billion that live on less than one dollar per day (UNDP, 2005). Poverty and unmet basic human needs often drive people to environmentally-detrimental exploitation of natural resources.

Growing energy demand

The combined factors or economic growth and demographic change in Asia have resulted in a virtual explosion in energy consumption and energy demand (EIA, 2004). For instance, although OECD countries accounted for 58 per cent of total oil consumption in 2002, current trends and forecasts indicate that non-OECD countries will soon account for over half of global demand (IEA, 2005). China, for instance, will require a 3.4 per cent annual increment of oil supply over the next decade, while Indonesia and India will both need a 2.9 per cent oil supply increase. Indonesia, a major oil-producing nation, recently became a net oil importing country. Other developing Asian countries, on average, require a 3 per cent annual oil supply increase under the business as usual (BAU) scenario.

Across Asia as a whole, there is little indication of improvement in energy use efficiency. The carbon intensity of, for instance, China's economic growth is four times that of the US, and 10 times that of Germany. At the same time, in OECD countries, the reduction rate of carbon intensity has slowed over the past decades and it is expected that the reduction rate for the next few decades will be around one per cent, while developing Asian countries, such as China and India, are expected to reduce the carbon intensity by

around 2.2 or 2.6 per cent (IEA, 2004). Even with a higher pace of carbon intensity reduction, the carbon intensity of developing Asian countries such as China and India is likely to be more than two to three-fold that of developed countries.

Some key trends in Asia's ecology

Threatened forests, biodiversity and land resources

Asia covers about 24 per cent of the world land mass (Fig. 2-7). It has 14 per cent of the world's forest area, ranking it second from the bottom globally. However, Asia shares 62 per cent of the world's forest plantations, indicating that Asia is a major source of forestry products through forestry plantation and sustainable forestry management. At the same time, non-forest areas carry significant weight in promoting sustainable ecosystem management in Asia.

In Asia until 1992, green land and pasture accounted for almost twice as much area as forests and woodlands (Fig. 2-7). Over the past decade, there was a significant conversion of green land and pasture to cropland. While forest land conversions remained marginal, pastureland decreased substantially as pastureland was converted to cropland (Fig. 2-8). It is estimated that about 13 per cent of the land in Asia and the Pacific, or 850 million hectares, is degraded (UNEP, 2005). Large-scale clearance of forested land, coupled with slash and burn and excessive use of chemicals, has caused a decline in soil structure and fertility.

Overall, Asia has increased protected areas to conserve wild life and biological diversity (UNEP, 2003). However, there is a conflicting trend where some countries increase while other countries decrease the size of the protected areas at the national level in the Asian countries. There is also counter-pressure from the mining industry and the agricultural sector to expand areas for their activities. These conflicting interests should be carefully coordinated so that sustainable natural resource use is ensured.

Out of seventeen mega-diversity nations of the world, seven are located in Asia and the Pacific (UNESCAP et al. 2000). At the same time, these countries are also home to a significant number of threatened endemic species of which the habitat is called "hot spots." In addition to the loss of plant and animal diversity as a part of terrestrial diversity, marine ecosystem and freshwater ecosystem diversity is also threatened (WRI, 2005). The genetic diversity is also at a risk and the domesticated landraces have been in substantial decline in recent years. The biodiversity loss has been prompted by the habitat loss and degradation, overexploitation, international trade, population growth and poverty, and bio-invasion.

An extreme consequence of loss of pastureland is desertification and with it the increased frequency and intensity of sand and dust storms. In Northeast Asia, for instance, China has reported in recent years on the increased number of dust/sand storms. Mongolia's record also shows that there is an upward trend in the number of dust/sand storms in Ulan Bator, the capital city of Mongolia. The government of Mongolia issued a warning in the 1990s that the desert in the country's southern region may be advancing northward by as much as 500 m per year. Sand and dust storms have been destroying ecosystems and inflicting damage to human health and hindering ground and air transportation in China, Mongolia, the ROK, and Japan.

Fig. 2-7: Distribution of world land and forests

	Asia	Africa	Europe	North & Central America	Oceania	South America
Share of total forest plantation	4.3035	62.039	17.145	9.3893	5.5989	1.5252
Share of the total forests	16.795	14.157	26.858	14.196	5.1073	22.887
Share of the total land	22.799	23.613	17.299	16.358	6.4995	13.432

Legend: ■ Asia □ Africa □ Europe ■ North & Central America □ Oceania □ South America
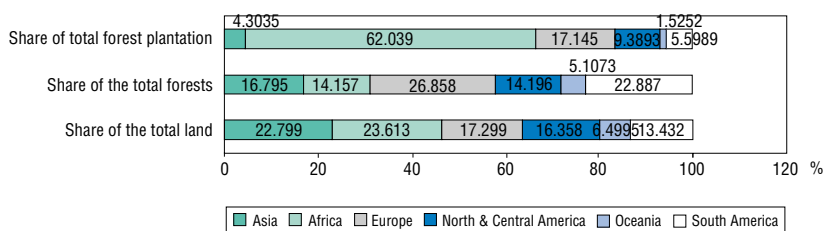
Source: FAO (2003)

Freshwater depletion and degradation

A number of Asian countries now face constant water shortages. Even for the countries with relatively high levels of precipitation, the annual rainfall is not distributed evenly over the regions, run-off is high and water harvesting very low. Many countries face floods and seasonally arid conditions which hamper land productivity and aggravate land degradation. Excessive extraction of underground water through wells often depletes the aquifer source thereby aggravating the water balance in the long term. The expansion rate of irrigated lands has significantly diminished over the past years.

Water resources in Asia are under threat, both in terms of quantity and quality, and they cast a shadow on sustainable development in the region. Water withdrawal for industry and households is projected to increase in most countries. Deterioration of water quality is recognised as one of the most serious environmental problems throughout the region. Biological oxygen demand (BOD) in Asian rivers is now 1.4 times higher than the world average. Also, the amount of suspended solids in rivers is four times higher than the world average (UNEP, 1999). Asian rivers also contain three times as much bacteria from human waste as the world average and more than ten times the safety level suggested by the OECD guidelines (UNEP, 1999). Water pollution has often seriously damaged local fisheries. Heavy metals and toxic chemicals contained in effluence from industry and agriculture have serious health impacts. It is reported that Asia's surface water contains 20 times more lead than the average of OECD countries (ADB, 1997). Arsenic pollution in groundwater has been a serious threat to the people of Bangladesh and some adjacent parts of India. Agricultural use of fertilisers and pesticides are causing growing concerns in China and countries of the South and Southeast Asian sub-regions.

Fig. 2-8: Trends in land-use changes in Asia and the Pacific (1850-1994)

Y-axis: Million hectares

X-axis: 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1992, 1994

ESCAP et al. (2000)

Legend: — croplands — forest and woodlands — grasslands and pasture
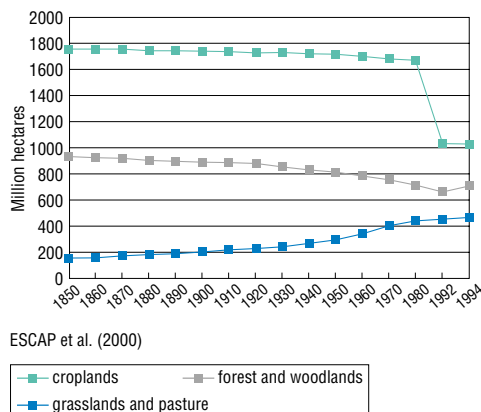
Table 2-1: Emissions in Northeast asia by country (mt/y) under BAS scenario

Country	SO$_2$			NO$_x$		
	1990	2010	2020	1990	2010	2020
Northeast China	11.9	25.3	32.5	6.9	N.A.	26.8
Japan	0.8	1.0	1.1	2.6	N.A.	4.6
ROK	1.7	4.1	5.6	1.1	N.A.	5.1
Democratic People's Republic of Korea	0.3	0.9	1.3	0.5	N.A.	2.4
Total	14.7	31.3	40.5	11.1	N.A.	38.9

N.A.= Values not calculated by van Aardenne (1996)

Source: IPCC (2000)

Such degradation of water resources negatively impacts both human health and natural ecosystems. For example, the economic loss caused by water pollution in the Yellow River is estimated at over US$500 million per year. It is important to recognise that water pollution reduces the volume of water resources available, since polluted water cannot be used for productive purposes.

Trans-boundary environmental impacts and the implications to the global environment in an interdependent world

Trans-boundary environmental problems are on the increase in Asia. They include: climate change, international rivers, marine ecosystem, and trans-boundary air pollution. In South Asia, monitoring activities have started to measure the trans-boundary air pollutant movement. In Northeast Asia, acid rain has been a contentious issue. The increased use of coal in Northeast Asia continues to pose the serious threat of acid rain and acidity deposits on the ground and marine ecosystems. SO_2 emission projections for Northeast Asia will continue to rise over the next few decades.

Dust and sand storms in Northeast Asia affect not only countries of origin, but also the neighbouring countries. Dust and sand storms threaten air and land transport systems, pose health hazards such as ophthalmic and respiratory disorders and adversely affect marine ecosystems in the sub-region of Northeast Asia.

Increases in agricultural trade are projected to pose stress on resource use in the region. Japan is traditionally highly dependent on food imports, while other Asian countries have, in general, maintained higher self-sufficiency. However, for the last few years China has become a food importing nation and, as such, an importer of "virtual water." "Virtual water" is defined as water embedded in commodities. It is the water resources that are used to produce the crops. When one looks at food imports, one can imagine the cubic metres of water resources used to produce such a commodity. If, for instance, a grain crop uses about one cubic metre of water to

Fig. 2-9: Virtual water flows

Imports
< −15
−15 to −5
−5 to 0

Exports
0 to 5
5 to 15
> 15
not estimated

Virtual Water Flows (1995) (Crop evapotranspiration equivalent in cubic kilometres)
Source: IUCN (2004)
Copyright: Crop Assessment of Water Management in Agriculture 2003

produce one kilogram of grain, it can be said that importing one kilogram of grain is approximately equivalent to importing one cubic metre of water. Virtual water flows, the flows of water embedded in commodities, have relevance to water stress, water scarcity and food security, as they reduce the need to use water for food production in the importing countries and increase water use in the exporting countries. Fig. 2-9 shows that countries, such as China and Japan, are the net importers of virtual water. The increasing dependency of food imports in the region could imply a change to water use in the trans-boundary context in an interdependent world.

The challenge of sustainable development for Asia and the Pacific

Asia faces enormous challenges and difficult choices in pursuing sustainable development. On the one hand, continuing high levels of economic growth are imperative if the region is to raise approximately 800 million of its citizens out of poverty. On the other hand, the current pattern of industrial and energy intensive economic growth,

coupled with continuous growth in population, widening income gaps, urban migration and natural resource depletion have placed Asia on a path towards unsustainable societies. The critical and urgent question is how the interests and needs for economic growth can be combined with the interests of the environment in order to achieve sustainability. The political, strategic and policy challenges involved in responding to this question are daunting, given that an adequate answer would require a fundamental epistemological shift in the application of economics to Asia's development. This would require efforts in three directions: (i) building and disseminating the conceptual framework and a convincing argument for the consideration of environmental linkages in development, including work on environment-economy linkages, and economic valuation and pricing of environmental goods and services; (ii) analysing and revealing the distributional implications of a more comprehensive approach to the treatment of environmental issues, and creating a strong argument showing the need to share the burdens; and (iii) advancing in the operationalisation of different aspects of the concept of sustainability.

This raises the same dilemmas that were confronted almost two decades ago in the Brundtland Report between the interests of the environment and the interests of economic growth, development and material well-being and these dilemmas remain unresolved. It is now imperative for Asia to work carefully through these dilemmas and to address a range of questions, including the following: What approaches to the relations between human activities and ecosystems should be adopted in specific locations and sectors? Is there a progression of approaches to be followed over time? How can natural capital be transformed into other types of capital? What are the most effective ways of incorporating environmental considerations into the design of economic policies? How can the real and apparent tradeoffs involved in poverty reduction and environmental conservation be made explicit and dealt with?

Many efforts are already underway and these provide an important foundation on which to build. The remainder of this chapter examines some of most important of these efforts, looks at their achievements to date, and identifies underlying challenges and a number of critical gaps in policies and institutional arrangements that require attention.

Regional actions for facilitating policy implementation and institutional arrangements

for achieving sustainable development in Asia and the Pacific

(i) Achievements

The "Regional Action Programme for Environmentally Sound and Sustainable Development: 2001-2005" adopted at the Ministerial Conference on Environment and Development (MCED) in Asia and the Pacific, held in Seoul, in March 2005, provides a renewed framework for regional collaboration on sustainable development in Asia and the Pacific from 2006-2010. It builds upon the preceding Action Plan for 2000 adopted along with the Kitakyushu Initiative for A Clean Environment in 2000. The Action Plan adopted in Seoul advocates a concept of "green growth" and calls for enhanced collaboration to pursue environmental sustainability. The Asia Pacific Forum on Environment and Development (APFED) established with twenty-six prominent personalities in the region, adopted the final report with 119 policy recommendations in December 2004 and provided it as an input for the 2005 MCED.

"Information and Communication Technology and the Environment in Asia and the Pacific (ICTEAP)" of the United Nations Environment Programme (UNEP) is intended to promote information sharing on the environment through information and communication technologies at the regional level. The UNEP Regional Resource Center for Asia and the Pacific (RRCAP) established in the Asian Institute of Technology, Bangkok in 1989, facilitates information dissemination, such as regional environmental outlook reports, national state of environment reports, indicator reports and land cover reports for the region. The Asia Pacific

Development Information Programme Network of the United Nations Development Programme (UNDP) facilitates monitoring and data dissemination on sustainable development-related issues at the regional level. For the Convention on Biological Diversity, the International Union for Conservation of Nature (IUCN) regional office in Bangkok promotes the Regional Programme for Biological Conservation in Asia and the Pacific, supporting capacity development and demonstration projects. Under the United Nations Convention to Combat Desertification (UNCCD), the Regional Action Programme to Combat Desertification and Mitigate Drought Impacts in Asia was adopted in 1997 with the thematic focus on (i) monitoring, (ii) agro-forestry, (iii) rangeland management, (iv) water management, (v) capacity-building, and (vi) local area development initiatives. The renewed action programme for 2003 – 2008 was adopted in 2003.

(ii) Underlying challenges

The UNESCAP sponsored Regional Action Programme has provided an overarching regional policy framework for promoting sustainable development and regional collaboration. It (coupled with its Implementation Plan and a number of related initiatives and declarations) addresses wide-ranging issues on sustainable development and furnishes sustainability concepts aimed at forging regional collaboration. Yet, compared to other regions, the countries in Asia and the Pacific still need to overcome several key challenges with a view to achieving sustainable development and forging regional collaboration.

Regional cooperation in Asia has traditionally relied on the building of consensus by means of a "soft law/programme approach," pursuing policy goals by declarations, initiatives and action programmes. This is in contrast to a "hard law approach," in which countries pursue shared policy goals by legally-binding treaties, conventions and agreements. The soft law/programme approach has the advantage of amalgamating the countries with different policy preoccupations and varying socio-economic conditions in a flexible framework. However, the soft law/programme also has the disadvantage of not usually having sufficient permanent institutional support mechanisms or appropriate financing mechanisms for implementing policy measures and activities that are collectively supported by the countries concerned within the region.

The setting of specific targets is always contentious in inter-governmental arrangements, a fact strongly underscored in the negotiations that led to the Kyoto Protocol. Yet on a vast range of environmental issues, the absence of specific targets that are agreed multilaterally makes progress difficult. On information disclosure, for example, despite the fact that some Asian countries have already enacted legislation on information disclosure related to environmental management, there has not yet been a region-wide uniform manifestation of policies that promote information disclosure and people's participation in the context of pursuing sustainable development. Europe implemented the 1997 Aarhus Convention that binds the governments concerned to disclose information on the environment and related issues. Latin American and Caribbean countries implemented the Regional Strategy on the Access to Environmental Information that was adopted in 2001 under the auspices of the Organization of American States (OAS). The region-wide policy document would orchestrate the national policy development and legislative reform for promoting information disclosure and people's participation in the process of pursuing sustainable development.

Part of the problem in Asia would appear to be that here is no formal, region-wide policy dialogue forum in Asia at the heads of state and governmental level. This is unlike other regions where summits take place under the framework of the European Union, the African Union and the OAS. The Asia Pacific Economic Forum (APEC) meets at the heads of government-level mainly to discuss trade issues. The ECOASIA meets at the ministerial level for discussing environmental issues each year. Given the fact that Asian countries will have much closer socio-economic relationships in the future, further efforts are necessary to strengthen policy dialogues for sustainable development among Asian countries.

Sub-regional actions for facilitating policy implementation and institutional arrangements aimed at sustainable development

(i) Achievements

Northeast Asia

The Northeast Asian Sub-regional Programme for Environmental Cooperation (NEASPEC), supported by the UNESCAP, has been steering the sub-regional collaboration for tackling environmental challenges in Northeast Asia. In addressing acid rain issues, the Acid Deposition Monitoring Network in East Asia

Fig. 2-10: Wet deposition monitoring sites (47 sites) of EANET

Participating Countries
- Cambodia
- China
- Indonesia
- Japan
- Lao PDR
- Malaysia
- Mongolia
- Philippines
- ROK
- Russian Federation
- Thailand
- Viet Nam
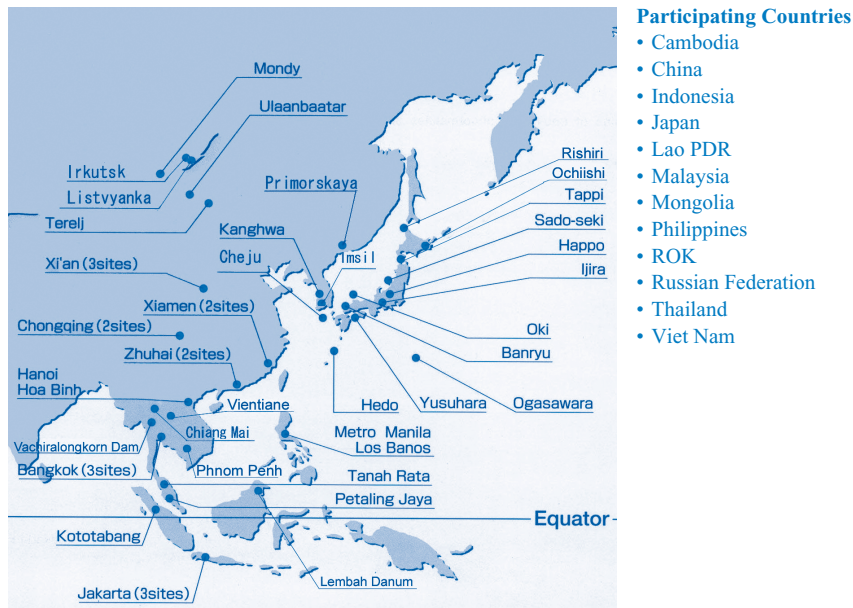
Source: Acid Deposition and Oxidant Research Center, Niigata, Japan

(EANET) was established with the participation of ten East Asian nations. The network monitors acid deposition for developing scientifically-supported countermeasures against acid rain and sulphur dioxide emissions in this region (Fig. 2-10). The EANET will enhance the harmonisation of monitoring methodologies and data analysis in collaboration with other international air pollutant monitoring networks such as the Cooperative Programme for the Monitoring and Evaluation of Long-Range Transmission of Air Pollutants in Europe (EMEP).

China, Japan, the ROK and the Russian Federation have collaborated under the framework of the Northwest Pacific Action Plan (NOWPAP) since 1994. The NOWPAP activities are supported by the network of four Regional Activity Centres (RACs) namely: the Special Monitoring and Coastal Environment Assessment RAC (CEARAC) in Toyama, Japan; the Data and Information Network RAC (DINRAC) in Beijing, China; the Marine Environmental Emergency Preparedness and Response RAC (MERRAC) in Daejon, ROK; and, the Pollution Monitoring RAC (POMRAC) in Vladivostok, Russian Federation (Fig. 2-11).

In response to the growing concern over dust and sandstorms (DSS) that cause enormous economic losses

Fig. 2-11: NOWPAP

Inter-governmental Meeting (IGM)

Regional Coordinating Unit (RCU)
Toyama Office — Japan —   Busan Office — ROK —

CEARAC (Special Monitoring & Coastal Environmental Assessment Regional Activity Centre) JAPAN Toyama Northwest Pacific Region Environmental Cooperation Center	**DINRAC** (Data & Information Network Regional Activity Centre) People's Republic of China Beijing Environmental Information Center/ State Environmental Protection Administration	**POMRAC** (Pollution Monitoring Regional Activity Centre) Russian Federation Vladivostok Pacific Institute of Geography of Sciences Russian Academy	**MERRAC** (Marine Environmental Emergency Preparedness & Response Regional Activity Centre) Republic of Korea Deajeon Korea Research Institute of Ships & Ocean Engineering/Korea Ocean Research & Development Institute
Focal Points Meeting (FPM)	FPM	FPM	FPM

WG3 Harmful Algal Blooms (HAB)	**WG4** Remote Sensing of the Marine and Coastal Environment (RS)	**WG1** Atmospheric Input of Contaminants into the Marine and Coastal Environment	**WG2** River Input of Contaminants into the Marine and Coastal Environment

Source: The Special Monitoring & Coastal Environmental Assessment Regional Activity Centre (CEARAC) at the Northwest Pacific Region Environmental Cooperation Center, Toyama, Japan

and serious public health concerns, China, Mongolia, the ROK and Japan collaborated and launched a sub-regional project for the prevention and control of dust and sand storms in Northeast Asia. The officials and experts reviewed the status of sand and dust storms, their impacts and counter-measures over the past three years. The countries then adopted the final report that took three years' work to complete and presented it at the 2005 Ministerial Conference on Environment and Development in March 2005. The report consisted of three volumes highlighting (a) a regional cooperation master plan, (b) a regional monitoring and early warning network, and (c) an investment strategy.

Southeast Asia

Haze control is a priority area in sub-regional collaboration among Southeast Asian countries. The ASEAN Agreement on Transboundary Haze Pollution[5] entered into force in November 2003 is the first legally-binding ASEAN regional environmental accord and is considered a model for tackling transboundary issues. It is contemplating the institutionalisation and enhancement of existing arrangements under the Regional Haze Action Plan (RHAP) and hopes to provide a legal framework to better facilitate regional and international cooperation. The Agreement calls for the parties to undertake, *inter alia*, (a) legislative and administrative measures to prevent and control activities related to land and forest fires; and (b) national and joint actions to intensify regional and international co-operation. The First Meeting of the COP to the Haze Agreement was held in November 2004 and the implementation of the Agreement was reviewed. In total, seven ASEAN member countries have ratified the Agreement and other member countries are expected to follow.

Biodiversity conservation is another major sub-regional collaboration area. The ASEAN Regional Centre for Biodiversity Conservation (ARCBC) was established in 1999 to undertake activities related to research, database management, training and networking. The ARCBC is to be further strengthened with the endorsement by the ASEAN Ministerial Meeting on the

Fig. 2-12: Mekong River and its basin
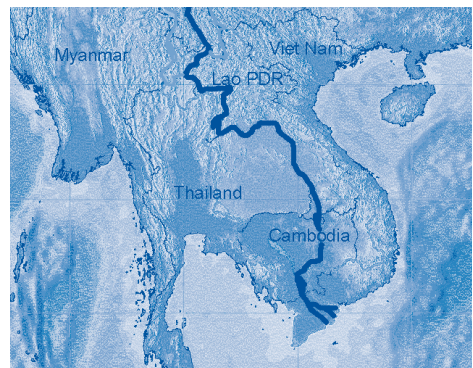
Developed from Mekong River Commission

Environment (AMME) and the support of the European Union, and will undertake strategic policy work on coordination activities.

The ASEAN Environmental Education Action Plan (AEEAP) for 2000-2005, adopted in October 2000, has made environmental education a priority. It provides the framework for concerted regional and national level activities on public awareness and environmental education and outlined four target areas, namely (a) formal education (b) non-formal education, (c) human resources capability-building, and (d) networking, collaboration and communication. The ASEAN Environmental Education Inventory Database (AEEID) was developed at the ASEAN Secretariat.

Mekong River basin in Southeast Asia

The Mekong River has an ecosystem-based inter-governmental body established by an agreement among the governments of Cambodia, Lao PDR, Thailand and Viet Nam (Fig. 2-12). The two upper states on the Mekong River Basin, the People's Republic of China and the Union of Myanmar, are dialogue partners. The Mekong Committee (the Committee for Coordination of Investigations of the Lower Mekong Basin), established in 1957, was transformed into the Mekong River Commission (MRC) by the Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin, signed in April 1995, with a new mandate "to cooperate in all fields of sustainable development, utilisation, management and the conservation of the water and related resources of the Mekong River System in reasonable and equitable manners." The MRC promotes a participatory process with the National Mekong Committees in each country to develop rules and procedures for water utilisation. The MRC monitors the quality of water resources, and is supporting joint basin-wide planning under the Basin Development Plan.

South Asian trans-boundary environmental challenges

Although non-binding and voluntary in nature, South Asian nations established as early as 1982 the South Asia Co-operative Environment Programme (SACEP) which aims to build collaborative multilateral partnerships in environmental protection and management. SACEP is an inter-governmental organisation whose Articles of Association have been ratified by eight countries, namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The SACEP addresses key environmental issues, such as land degradation and desertification, biodiversity, fresh water, solid waste management, air quality, environmental health, coastal and marine resources, natural disasters and their consequences.

Transboundary air pollution control is an area where notable progress has been made. In pursuance with the Malé Declaration on Control and Prevention of Air Pollution and its Likely Transboundary Effects for South Asia, adopted in April 1998 (Fig. 2-13), participating countries have been implementing activities in three phases: Phase I- awareness-raising; Phase II- capacity-building; and, Phase III- information management. In Phase II, implemented from 2001-2004, the countries developed the network of national focal points (NFPs), national implementing agencies (NIAs), the network for monitoring and the integrated assessment models. In Phase III, (2004-2007), the UNEP RRC/SP has been developing a database on pollutant emissions inventories and monitoring pollutant depositions and assessing the risk of impacts to health, crops, materials and ecosystems and suggesting mitigation options. The steering committee meets each year to review the progress made in implementing activities that liaise with the national advisory committees and other related initiatives, such as the Indian Ocean Experiment (INDOEX).

Marine environment protection and resource conservation are addressed in South Asia under the Action Plan of the South Asian Seas Programme adopted in March 1995. The SACEP serves as the secretariat of the Action Plan that promotes capacity-building and field projects in the areas of: (a) the Integrated

Coastal Area & River Basin Management (ICARM), (b) turtle conservation, (c) coral reef management, (d) oil spills, (e) Global International Water Assessment (GIWA) and biological diversity. It has proposed the establishment of regional activity centres for facilitating the implementation of the action plan.

With respect to biodiversity, several sub-regional bodies have been collaborating in South Asia. The South Asian Network for Taxonomy Capacity Building (SACNET) supports the activities to create taxonomic capacity. The IUCN Regional Biodiversity Programme (RBP) for Asia established in 1996 supports the technical cooperation network known as the Locally-Owned and Operated Partnerships (LOOPs) in South Asia. The SACEP houses the South Asia Biodiversity Clearing House Mechanism disseminating information on protected areas and legislative/policy measures for conserving biological diversity in South Asia.

Fig. 2-13: Malé Declaration—National implementing agencies
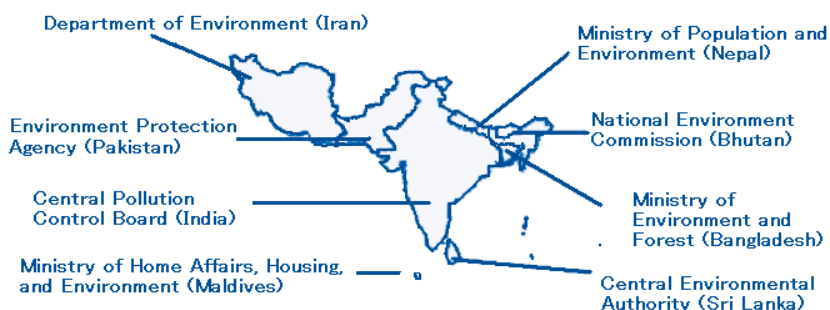
Source: UNEP Regional Resource Center for Asia and Pacific

(ii) Underlying challenges for promoting sub-regional collaboration aimed at sustainable development

In contrast to the regional level, sub-regional collaborative activities are generally geared more directly to tackle specific and concrete issues. Yet, successful schemes of collaboration to date at this level have not swiftly been replicated and applied to other areas.

The ASEAN Haze Agreement has made a major breakthrough to institutionalise the sub-regional collaboration on haze control under a legally-binding policy instrument. However, countries in Asian sub-regions in other cases continue to collaborate under soft law policy instruments, such as declarations and action plans. Acid rain in Northeast Asia and trans-boundary air pollutants in South Asia are examples. The ASEAN successes suggest that it is time for Northeast Asia to transform policy statements and programmes into solid, legally-binding policy instruments and institutionalise sub-regional collaboration for a more effective policy implementation. In this regard, the idea of creating a sub-region-based coordinating body for Northeast Asia has been proposed informally.

The Mekong River and basin management has set a prototype for effective ecosystem–based, natural resource management and an alternative sustainable livelihood development. There are several other important international rivers that could benefit from the experiences of the Mekong River Commission. Very few international rivers and water bodies in Asia have been governed by legally-binding agreements, and some are still under the dispute among the countries concerned. It would be beneficial for upstream and riparian countries to establish mutually agreed schemes of water and basin management, not only for environmental protection, but also for socio-economic development and political stability.

National level actions for sustainable development

(i) Achievements

National Agenda 21 and related policy instruments

National Agenda 21 or equivalent policy documents have been developed in most Asian countries for pursuing sustainable development in accordance with the Agenda 21 adopted at the Rio Summit in 1992. Table 2-2 summarises the preparation of Agenda 21s in Asia. The countries have prepared assessment reports on the implementation of their respective Agenda 21 in the preparatory process for the World Summit on Sustainable Development held in Johannesburg in 2002.

Table 2-2: National Agenda 21 and equivalent document in Asia

Country	Name of Visionary Document
Bangladesh	National Environmental Management Action Plan (1995)
Bhutan	National Environment Strategy (Middle Path)
Brunei	Sixth and Seventh National Development Plans
China	China Agenda 21
Democratic People's Republic of Korea	National Environment Plan for Implementing Agenda 21, 1995-2005
India	National Conservation Strategy; Policy Statement on Environment and Development
Indonesia	Indonesia Agenda 21; National Environment Action Plan 1998
Islamic Republic of Iran	National Environment Action Plan
Japan	Basic Environment Plan; Japan Agenda 21
Malaysia	Vision 2020; Seventh Malaysia Plan
Maldives	National Environment Action Plan, 1999-2005
Mongolia	National Action Programme for Sustainable Development for the 21st century (MAP-21, 1995)
Myanmar	Myanmar Agenda 21
Nepal	National Environment Policy and Action Plan I and II
Pakistan	National Conservation Strategy
Philippines	Philippine Strategy for Sustainable Development; Philippine Agenda 21
Republic of Korea	Green Vision 21
Singapore	Singapore Green Plan
Sri Lanka	National Environment Action Plan, 1998-2002
Thailand	Policy and Perspectives for Enhanced Conservation; the Sustainable Development Action Plan
Viet Nam	Environment Vision 2020; Environmental Protection Strategy, 2001-2010; National Environment Action Plan, 2001-2005

Source: UNESCAP (2002); UNEP (2005).

Constitutional provisions and legislation for the environment and sustainable development
Many Asian countries have enacted basic environmental laws, particularly after the Rio Summit in 1992. Table 2-2 summarises the current situation in Asia regarding basic environmental laws. These basic laws provide an enabling framework in which specific policies and laws concerning pollution control and nature conservation may be formulated.

Thematic action plans and policy integration
A wide range of thematic policy instruments have been formulated by Asian countries. These include forestry management action plans, national plans of action for biological diversity conservation, national action programmes for combating desertification and mitigating drought impacts. As a part of their international obligations, the countries have prepared national communication/reports on the implementation of national action plans and international agreements to the convention secretariats and related UN bodies.

National coordinating bodies for sustainable development
Asian countries have established national coordinating bodies for facilitating the implementation of Agenda 21 and sustainable development policy goals since 1992.

There are, however, different modalities of national coordinating bodies for sustainable development. In Thailand, the prime minister chairs the National Environment Board that works closely with the National Economic and Social Development Board. In the Philippines, the National Economic and Development Authority (NEDA) coordinates activities for sustainable development with the representatives from civil society organisations. In Sri Lanka, the Ministry of Environment and Forestry serves as the secretariat for the Inter-ministerial Coordinating Committee. There is an exceedingly wide variability in the functions, powers, authority, autonomy and effectiveness of these bodies (Box 2-1). The function of the national coordinating bodies for sustainable development is a determinant factor for the effectiveness of national level coordination of sustainable development policy implementation and international cooperation. The governments are still on the path for seeking the effective modalities of national level coordinating bodies for sustainable development.

BOX 2-1: Variations in National Coordinating Bodies

- Super-ministerial authority versus horizontal coordinating authority,
- Permanent secretariat and staff versus dependent on the ministry of the environment,
- Autonomous budget versus no budget,
- Decision-making authority versus no decision-making authority,
- Extensive issue coverage versus limited issue coverage,
- Representation by civil society organisations versus government agency representation only,
- Authority to coordinate international economic cooperation versus no authority.

Policy measures
(a) Regulatory Policy Instruments
At the early stage of environmental legislative development in Asia, the majority of policy instruments focussed on the point-source solution to mitigate the negative environmental impact of industrialisation. Various point-source pollution controls and emission standards were set and end-of-pipe types of solutions were promoted. Strict regulations and command-and-control (CAC) types of environmental policies have

been rapidly adopted in Asia.

Many of the nations have extensively developed their regulatory structures to include sector-specific laws relating to industrial pollution and environmental quality. In the Taiwan Province of China, legislation and regulations vary depending on the nature of the pollution: water pollution standards are based on the type of industry, while toxic pollution standards are the same for all industries.

(b) Environmental impact assessment

Environmental impact assessment (EIA) law is also important in legislative development in Asia since it has been used as a critical tool to integrate environmental considerations into development projects or into the industrial decision-making process. In Asia, an increasing number of countries are enacting laws that require EIAs for all major projects. Some countries in Asia have applied EIAs to existing and planned industrial activities as a part of industrial environmental pollution control methods. Table 2-3 summarises the development of environmental legislation in Asian countries.

(c) Economic instruments

In Asia, an increasing application of economic instruments[6] has emerged during the 80s and 90s. For instance, China first introduced a pollution charge system in 1982 and it has been an effective economic incentive for pollution control (Zhou, 2001). The use of economic instruments has been widely accepted due to the potential to achieve environmental objectives in a cost-effective way. The first implication of economic instruments in Asia was predominantly on an experimental and small-scale basis. They were primarily applied as end-of-pipe solutions and are designed to support existing regulations. While some limitations of CAC measures reveal a reduction of pollution levels in many countries, economic instruments became widely applied in Asia. Common economic instruments applied in Asia are various environmental taxes, subsidies, emission charges, user fees, custom exemptions and duties to promote clean technology. Other types of economic instruments, such as the deposit-refund (DR) system, strict liability, resource pricing and property rights, have been used in some countries in Asia. Table 2-3 summarises the application of major economic instruments in Asia. While a number of economic instruments have been implemented in Asia, it can be noted that they are applied in a very uneven manner. Table 2-3 states, for example, that measures in Indonesia and the ROK were ineffective. The number of examples of market-based instruments provided in Table 2-3 is deemed as limited. The limited and uneven application of economic instruments needs to be further assessed vis-à-vis the level of other related law and instrument implementation.

Table 2-3: Environmental legislation in Asia

Country	Environmental protection in a national constitution	Environmental framework laws	EIA: laws
Bangladesh	No provision on the environment	1995 Environmental Protection Act	1992 National Environmental Policy, 1994 Forestry Policy, 1995 National Environmental Management Action Plan, 1995 Environmental Conservation Act, 1997 Environmental Conservation Rules (ECR), 2000 Environment Court Act stimulate EIA
Cambodia	The Constitution of Cambodia, "the State shall protect the environment and balance of abundant natural resources and establish a precise plan of management of land, water, air, wind, geology, ecological system, mines, energy, petrol and gas, rocks and sand, gems, forests and forestry products, wildlife, fish and aquatic resources"	1996 Law on Environmental Protection and Natural Resources Management	1996 Law on Environmental Protection and Natural Resources Management, Articles 6 and 7 "An environmental impact assessment shall be done on every project and activity, private or public, and shall be reviewed and evaluated by the Ministry of Environment before being submitted to the Royal Government for decision."
China	1982 The Constitution of China, "the State protects the environment and its natural resources and prevents and eliminates pollution and other hazards to the public"	1979/1989 Environmental Protection Laws	1992 Managing ordinances on protecting environments of construction project.: Chinese government ensured to utilise EIA tool for construction projects
India	1950 The Constitution of India, "The State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country"	1986 Environmental Protection Act	1994 Notification on Environment Impact Assessment
Indonesia	No provision on environment	1982 Act no.4/1982 on the Basic Provision for Environmental Management 1997 Environmental Management Act	1986 Government Regulation no.29 established Indonesian EIA system, AMDAL (Analisis Menganai Dampak Lingkungan) 1999 Government Regulation no.27: Analysis on Environmental Impact Aspects of EIA

Japan	No provision on the environment	1993 Basic Environmental Law	1997 EIA Act
Lao PDR	1991 The Constitution of the Lao PDR: "All organisations, all citizens must protect the environment and natural resources: land, subterranean, forests, fauna, water source and atmosphere"	1999 Environmental Protection Law	No EIA law
Malaysia	No provision on the environment	1974 Environmental Quality Act	1987 Environmental Quality (Prescribed Activities) (EIA) Order
Mongolia	No provision on the environment	1994 Environmental Law of Mongolia	1998 Law on EIA
Nepal	No provision on the environment	1996 Environmental Protection Act	1996 Environmental Protection Act, 1997 Environmental Protection Regulation, 1992 National Environmental Impact Assessment Guidelines 1992 support EIA. Other measures supporting EIA include 1991 Forestry Act, 1995 Forestry Sector EIA Guidelines, 1992 Water Resources Act, and 1992 Electricity Act
Pakistan	No provision on the environment	1997 Environmental Protection Act	1992 National Conservation Strategy, 1997 Pakistan Environmental Protection Act (PEPA) support EIA
Philippines	The Constitution of the Philippines, "it is the duty of the State to protect and advance the right of the people to a balanced and healthful ecology." (This duty had earlier been codified in the Philippine Environmental Policy Presidential Decree no. 1151.)	1977 Philippine Environment Environmental Code-Presidential Decree no.1152	1978 Presidential Decree (PD) no. 1586 established Environmental Impact Statement (EIS) System; Section 7 of Executive Order no. 192/87, 1996 Revising Department Administrative Order (DAO) no. 21/92 (DENR AO no. 37) strengthened EIS/EIA system

Republic of Korea	1948 Korean Constitution, "All citizens have the right to a healthy and pleasant environment. The state and all citizens shall endeavour to protect the environment"	1990 Basic Environmental Act	1993 EIA Act
Singapore	No provision on the environment	No environmental framework law	No EIA law, but EIAs are required on an ad hoc basis at the discretion of the Ministry of Environment
Sri Lanka	No provision on the environment	1980/1988 National Environmental Act	1988 National Environmental (Amendment) Act no. 56, 1981 Coast Conservation Act, 1993 Fauna & Flora Protection Ordinance (Amendment), 1996 National Policy on Industry and Environment support and stipulate EIA
Thailand	1997 Thai Constitution, "the government shall conduct public hearing and seek the views of local communities before it embarks on development projects that will have an effect on the environment."	1975 Improvement and conservation of national environmental quality act 1992 Enhancement and Conservation of National Environmental Quality Act	1992 EIA Notification (issued under Sec 46-47 of the Enhancement and Conservation of Nation of National Environmental Quality Act 1992)
Viet Nam	1992 Constitution of the Socialist Republic of Viet Nam, "State organs, units of the armed forces, economic and social bodies and all individuals must abide by state regulation on the rational use of natural wealth and on environmental protection. All acts likely to bring about exhaustion of natural wealth and to cause damage to the environment are strictly forbidden."	1994 Law on Environment Protection	1994 Government Decree no. 175/CP on Providing Guidance for the Implementation of the Law on Environmental Protection requires submission of EIAs; 1996 Decree no. 26/CP on Sanctions against Administrative Violations in Environmental Protection supports EIA implementation

Source: UNESCAP (1997), IDE-JETRO (2003), UNESCAP (1992), TERI. (website), Legislative Department of India (website), Helplinelaws (website), Mekong Region Law Center (website), South Asia Regional Environmental Assessment Association (website), APCEL (2002). JICA (1999d).

Table 2-4: Market-based instruments in Asia and their environmental effects

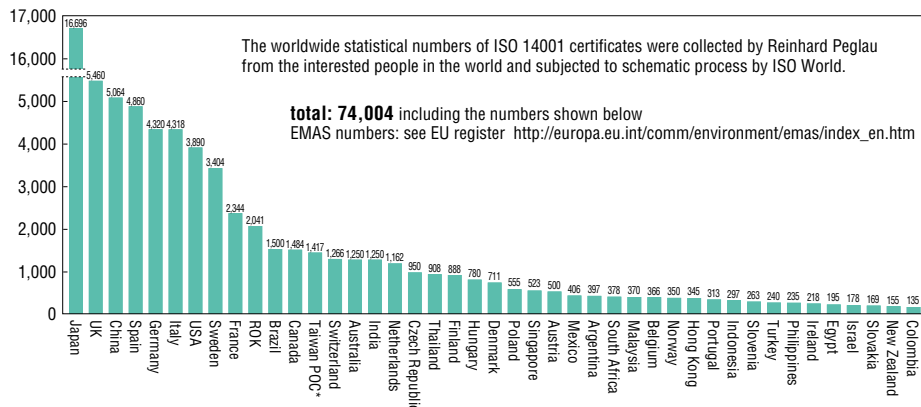|	Instruments	Remarks on Effectiveness
Fees, prices and subsidies	Elimination of pesticide subsidy (Indonesia)	
	Volume-based waste fees (ROK)	
Environmental charges and taxes	Emission taxes on industrial emissions and fuels (Taiwan Province of China).	
	Charges on a wide range of emissions, including pollution charge (China).	A significant decline in pollution, for example a reduction of 80 per cent in SO_2.
Subsidies and environmental funds	Concessions on depreciation for investments in environmental technology and low waste production processes/ No capital assets tax on environmental technology plant investment (Japan).	Japan is leading in cleaner production technology development.
	Tariff reduction on imported environmental protection plants (Thailand).	
	'Environmental Fund' (Thailand)	
	Pollution Control and Abatement Fund (Sri Lanka)	
Deposit-refund systems and performance bonds	Deposit-refund system on packaging (Taiwan Province of China)	
	Recycling performance bond (ROK)	The deposit value per product was lower than actual recycling costs, the system did not create any motivation for industries to recycle their end-products.
	A performance bond for re-afforestation (Indonesia)	The value of the deposit per hectare was well below the re-afforestation costs, the charge was simply passed on without having any effect.
Liability laws	Strict liability laws (80's, Japan)	It motivated companies to reach agreements at local level on environmental protection measures which went far beyond the statutory minimum requirements.
	'Public Liability Insurance Act' requires all companies using hazardous substances to take out liability insurance which will pay provisional compensation to victims of accidents (1991, India).	

| Property rights | 5-25 years non-transferable exploitation rights for farmers (Thailand) | Previously, a further 47 per cent of agricultural land is subject to exploitation rights for a limited period only. In many areas, the risk of eviction leads farmers to neglect investment in soil improvement and erosion protection. Since the new exploitation rights for farmers was introduced, farmers increase ownership and improve their land protection. |
| | In the *Phani Panchayat* model, exploitation rights for irrigation among farmers were agreed which set upper limits on the cultivation of water-intensive sugar cane and quantities of water per hectare (India). | Hectare yields were increased for all farmers, at the same time, the water shortage has been decisively reduced. |

(d) Information-based instruments

Many Asian countries have increased their use of information-based instruments. One good example is the eco-labelling schemes that are emerging in many of Asian countries. The eco-labelling schemes in Japan, the ROK, and Thailand are applied to various products, including organic food products. Environmental auditing, reporting, and award and recognition programmes are also emerging information-based tools. Many Asian countries have practiced awarding and recognition programmes.

Environmental management systems (EMSs), especially ISO 14001, have been promoted in many Asian countries. ISO 14001 and other types of EMSs provide a standard for industry to learn how to monitor and evaluate their environmental performance, thus encouraging a strong commitment, in theory, to improve it. According to Fig. 2-14, the number of ISO certified companies in Asia, especially Japan, China, and the ROK, dramatically increased. With recognition of the importance of clean technology and cleaner production concepts, the regional interest in ISO 14000 standards has been amplified. National organisations to certify these standards have been established in Malaysia, Singapore and Thailand.

Fig. 2-14: The numbers of ISO14001 certificates in the world
October 2004

The worldwide statistical numbers of ISO 14001 certificates were collected by Reinhard Peglau from the interested people in the world and subjected to schematic process by ISO World.

total: 74,004 including the numbers shown below
EMAS numbers: see EU register http://europa.eu.int/comm/environment/emas/index_en.htm

Source: ISO World Inc. (2005)

(e) Voluntary and social pressure measures

Voluntary approaches taken in various environmental policy measures have expanded in Asia. For instance, in Japan, between local governments and businesses, voluntary agreements at the local level have been widely used for pollution control for many years. At present, more than 30,000 local Pollution Control Agreements (PCAs) are in use in Japan (OECD, 2003). Factory-by-factory emission levels are decided in detailed written agreements after intensive discussions among business, local governments and residents. The potential for enforcement also was considered so that these voluntary agreements function as if they are legally-binding. As a result, pollution levels have been significantly reduced and behaviours have been changed. Environmental performance and activities by Japanese business have improved through strong support from environmentally-conscious local governments and communities (World Bank, 2002). It is not at all clear, however, that these voluntary and social pressure measures would transfer easily or effectively from Japan to other countries in the region.

(f) Financing

The ADB has warned that environmental degradation is still accelerating and that neglecting the environment will cost the Asian economies around 8 per cent of their national growth. China is believed to be losing as much as 10 per cent of its national income due to pollution and India 5 - 6 per cent. The direct cost of water and air pollution alone in India is believed to be as high as US$10 billion annually (Boyd, 2002). Direct government spending on environmental protection, on the other hand, is generally very modest, especially for the poorer developing countries of the region. For instance, Japan's average annual outlay is around 1.8-2 per cent of GDP, which has been spent mostly on environmental protection, followed by the ROK with 1.3-1.6 per cent, Singapore with 1.2-1.5 per cent and the Taiwan Province of China with 1-1.2 per cent of GDP. However, in most of the developing countries of Asia, it amounts to less than 1 percent of GDP. Viet Nam spends only about 0.1-0.3 per cent of GDP, and China, Indonesia and the Philippines 0.5-0.7 per cent. Malaysia and Thailand both invest about 1 per cent of GDP on the environment (Boyd, 2002). National environmental funds were established in the 1990s in several Asian countries, but most of these have remained chronically underfinanced. In other Asian countries, such funds have not yet materialised.

(g) Local governments and other stakeholders in environmental policies and management - decentralisation and local governments in environmental management

A significant, emerging trend in the Asian political arena is the "decentralisation" movement. Around the 90s, many Asian countries which had long histories of highly-centralised governance systems, attempted to introduce decentralisation. For instance, the Philippines stipulated decentralisation in its 1987 Constitution, and a law concerning local autonomy was enacted in 1991. Indonesia promoted decentralisation and legislated "regional governance" and the "fiscal balance between the central government and the regions" acts in 1999. Thailand passed the "Tambon Administrative Act" (1994), allowing Tambons (subdistrict) to draw up a local development plan that covered various policy areas, such as education, natural resource management, welfare, and infrastructure by establishing "Tambon Administrative Organisations."

Decentralisation is applied to the environmental area as well. In principle, decentralisation may be a sound policy, as many environmental issues require solutions suitable to local conditions. However, in many cases decentralisation involves local governments and other local authorities that lack the required human resources, institutional, and financial capacities to function effectively. The results are often a deflection and diffusion of responsibility and a lessening of policy effectiveness over environmental matters.

(h) Civil society empowerment

Partly supported by more flexible legal arrangements and governmental financial measures like tax exemptions, donations, grants and loans, the number of NGOs and community-based organisations

(CBOs) in Asia is rapidly growing. The NGO/CBO involvement in policy implementation is broadly directed at increasing societal capacities and improving socio-economic conditions. Civil society is increasingly active in information access, press freedom, radio and information/communication technologies and these constitute a part of the policy and institutional framework conducive to promoting sustainable development. Other related governance issues are also salient to the creation/reinforcement of the policy and institutional framework that enable individuals and communities to achieve common policy goals (WRI, 2003).

(i) Public-private partnership

Recently different configurations of PPP have been receiving considerable attention in Asia. In the water and sanitation sector alone, the ADB reported 215 recent initiatives in water and sanitation partnerships involving the private sector. Given the recent nature of these initiatives, it would appear to be too early to judge the extent of their effectiveness and benefits. In some cases at least, positive outcomes have been reported in the form of better quality services at lower prices.[7] But it is also noteworthy that, of the 215 projects reported by the ADB, 56 remain in the planning stage and 14 have been postponed or cancelled (ADB, 2002).

(ii) Underlying challenges

While there is evidence of considerable and important progress in Asia in exploring, enacting policies and applying environmental instruments, this is uneven across countries and in the quality and thoroughness of the instruments chosen. In some respects, this is to be expected, as Asian nations struggle to balance the multiple demands of economic growth and material well-being with dramatic shifts in demography and with the long-term needs of the environment. Yet as we have seen in this chapter, while many Asian countries are members of multilateral environmental conventions, have enacted environmental legislation and undertake EIAs as a matter of standard practice, implementation and follow-through remain very problematic. Enacting legislation that mandates EIAs is one thing; enforcement of EIA and the disclosure of the EIA's outcome information are often entirely different matters. The overview provided in this chapter also suggests that adequate progress towards sustainable development in Asia will require an intensification of efforts, including further diversification and broadening of policy measures, especially those involving economic/incentive instruments and information-based measures.

To achieve this would seem to require a considerable strengthening of and increase in the status of national coordinating bodies for sustainable development. As a first step, these might be attached directly to the offices of heads of state with their own permanent staff and sufficient fiscal support to ensure leverage with economic line ministries.

A further measure that is suggested on the basis of the analysis in this chapter would entail increasing the solvency and scope of national environmental funds, perhaps in new partnership arrangements with non-governmental organisations and the private sector.

CHAPTER 3

Sustainable forest management in Asia: Trends and prospects

Introduction

Forests in Asia play critical roles in accounting for most of the terrestrial plant biomass and in regulating global temperature by sequestering carbon. As a public good, they contribute to stable, fertile landscapes for human settlement, provide numerous timber and non-timber resources and are places of recreation. For indigenous peoples they are often places of important spiritual significance. However, the natural forests of Asia remain in a state of crisis, threatened by a complex array of forces that undermine their ability to fulfill vital ecological and societal functions.

In this chapter we examine the current state of forests in Asia and the underlying causes of loss in forest cover and quality (ecological integrity). The concept of sustainable forest management is introduced as a broad conceptual instrument to assess solutions to forest loss and degradation. This chapter is concerned with the strengths and weaknesses of new instruments that promote sustainable forest management. These instruments are discussed under the headings of fast-wood industrial plantations, certification, community forestry, protected areas and trade measures. The chapter concludes with sets of recommendations to improve forest management practices.

Forests in Asia: Recent trends

Asian countries share the fact that their forests serve important ecological, environmental, social and economic functions. Similarly, Asian countries have a common interest in dealing with the serious threat to forest cover and quality and share similar underlying causes of forest loss and degradation.

The total forest cover in the region was estimated by FAO (2001) at 585 million hectares, approximately 14 per cent of the global forest cover. Twenty-five per cent of the total landmass is covered in forests, though this figure differs widely from country to country: China (25.7 per cent), India (22 per cent), Indonesia (58 per cent), Japan (64 per cent), the Republic of Korea (63 per cent), Malaysia (59 per cent), Philippines (19 per cent), Thailand (29 per cent), Viet Nam (30 per cent), Cambodia (56 per cent), and Lao PDR (54 per cent) (UNEP/IUCN, 1998). The largest natural forests are found in China, Australia and Indonesia and two of the world's largest plantation programmes are located in China and Viet Nam.

Most natural forests lie in the tropical belt that form the Malay Archipelago, through the Philippines, the coastal lowlands of Southeast Asia, and the eastern Himalayan foothills to the southwestern coasts of Myanmar, India and Sri Lanka. Dense, moist, evergreen forest prevails in the tropical zone; the world's two largest mangrove forests are also found here. That over half the world's flowering plants are located in this belt is indicative of its significance to global biodiversity. Tropical, moist, deciduous forest is predominant in parts of South Asia, Indo-China, China and the Pacific Islands. Subtropical forests are found in western Asia, while a belt of subtropical mountain systems extends from Turkey to southern China. Dry, subtropical forest is confined to the Near East, whereas temperate, continental forest is found on the other side of Asia in China, Japan and the Korean Peninsular. Boreal, coniferous forest survives in the harsh climate of northeastern China. Evergreen, tropical rainforests are prominent in the Pacific Islands and dry forests are a feature of the Australian landscape.

While countries in Asia exhibit a diversity of forest types, many share a rapid expansion of planted forests. These include small homestead forest plots and strip plantations along roadsides and embankments, but it is the rapid expansion of large-scale, industrial timber stands that are prominent in the region. In 2001, 61 per cent of global plantations were in Asia (Brown and Durst, 2003), with around 34 million hectares of new plantations established in the 1990s (APFC, 2004). At 16 per cent, the proportion of the total forest estate in Asia accounted for by plantations is much higher than the global average of about five per cent (Brown and Durst, 2003). Moreover, this figure is rising rapidly as the coverage of natural forest continues to decline and because many states have begun to pursue ambitious plantation policies.

Wood from fast-growing trees, such as acacia and eucalyptus destined for pulp processing, is increasingly preferred. Because of their growing manufacturing sectors and rising consumer demand, Asian countries have become both major producers and consumers of timber, paper and other reconstituted wood products such as fibreboard. China, India, Indonesia, Japan, Malaysia, the Philippines, the Republic of Korea (ROK), Thailand and Viet Nam are now responsible for over 30 per cent of total global pulp imports (Tachibana, 2002), with Indonesia being the region's major exporter. The import of timber and pulp to be processed into finished products for export has become a feature of trade in the region. For example, in 2003 China imported 6.9 million tons of pulp and exported 1.2 million tons of printing and writing paper (faostats, 2005). China's surging export-oriented furniture industry, which increased in value by 30.6 per cent in the first half of 2003 (IISD, 2004), is another example of this "import-process-export" trend.

In addition to the common fast-wood varieties, FAO (2005) reports that rubberwood, oil-palm and bamboo are rapidly becoming important sources of timber and fibres for forestry industries in Asia. Rubberwood plantations cover approximately nine million hectares, with harvests in Southeast Asia estimated to exceed 6.5 million cubic meters per year (ibid.). Rubberwood is being used increasingly in reconstituted products, such as particle board, and continues to have an important role in furniture manufacturing. Five million hectares of oil palm in Asia are cultivated to produce food, soaps and cosmetics, and new technologies allow oil palm to be used for the production of particle board. Bamboo is used to produce paper in India, China, Bangladesh, Viet Nam, Thailand and the Philippines, and bamboo flooring and furniture are enjoying increased market share.

Overall steady economic growth has impacted on the trade in timber and wood products. China has overtaken Japan as the world's largest importer of tropical hardwood, with imports that more than doubled from 1997-2002 (Sun et al., 2004). One prediction suggests that this upward trend will continue through to 2010, though at a slightly slower rate (IISD, 2004). A ban on the harvesting of natural forests in China imposed in 1998 after devastating flooding, a rapidly expanding wood processing export industry, and a gradual reduction in tariff and non-tariff trade barriers, have fueled this growth. The Asian financial crisis of 1997 had a strong, depressive impact on trade in timber and wood products, but the region appears to have recovered. For example, Thai imports of wrapping and packing paper and board, much of which is used to pack export goods, declined by 44 per cent between 1996-1998, but almost doubled in the following two years (faostats, 2005).

The destruction of natural forests in Asia continues to be the greatest challenge to forestry. FAO (2001) estimates that the net forest cover declined by just over 1 million hectares per year during the 1990s. Once the expansion in plantations is subtracted, the actual loss of natural forest is calculated at closer to 2.5 million hectares (Brown and Durst, 2003). As Fig. 3-1 reveals, the rate of tropical forest loss has been significantly higher in Asia than in any other region.

Fig. 3-1: Percentage of the world's tropical forest cleared between 1960 and 1990
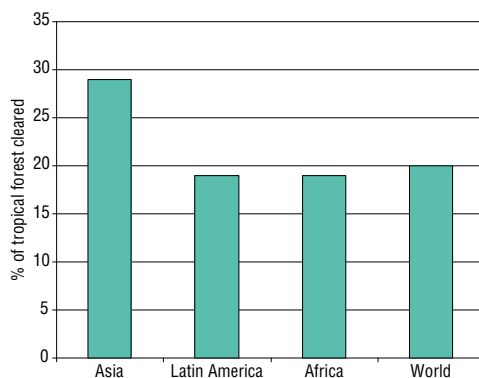
Source: Bryant, Nielsen and Tangley (1997)

Rates of total forest loss differ significantly amongst sub-regions. In North Asia, the total forest cover has actually increased because of massive afforestation programmes in China. The highest rate of forest loss generally occurs in the tropical forests of Southeast Asia, where countries are affected by illegal logging and human-induced forest fires, and where conversion to agriculture is driven by the needs of expanding populations. The following figures for forest loss were recorded between 1990-2000: Indonesia (1.2 per cent), Malaysia (1.2 per cent), Philippines (1.4 per cent), Myanmar (1.4 per cent), Philippines (1.4 per cent) (FAO, 2005). Forest loss has also been rapid in South Asia: Nepal (1.8 per cent), Sri Lanka (1.6 per cent) (ibid.).

Causes of loss in forest cover and quality

The proximate causes of forest loss vary widely among Asian countries, though conversion for agricultural purposes is common. Natural forests also have been cleared to establish more lucrative industrial monocrop plantations. Selective logging beyond sustainable rates has reduced the ecological integrity of many natural forests. Infrastructure development, transmigration and inadequate management plans have been identified as major proximate causes of forest loss (Yamane, 2003). Most forest fires in the region are started by people and in 2000 affected 20 countries (Brown and Durst, 2003). Table 3-1 lists the recent major proximate causes of forest loss in selected Asian countries.

Illegal logging, which is now rampant in many Asian countries, deserves special mention. In 1998, the G8 formally recognised that "illegal logging robs national and sub-national governments, forest owners and local communities of significant revenues and benefits, damages forest ecosystems, distorts timber trade markets and forest resource assessments and acts as a disincentive to sustainable forest management." The following statistics provide snapshots of the extent of this problem in Asia: between 20-50 per cent of logging in the Russian Federation is estimated to be illegal, with China (16 per cent) and Japan (17 per cent) being the major importers of Russian timber (Toyne, O'Brien and Nelson, 2002); nearly half of the total timber exported from Burma in 1999 was undeclared – China accounts for 42 per cent of Burma's export market (ibid.); recent estimates suggest that 88 per cent of logging in Indonesia is in some way illegal (Marijnissen, Ozinga, Richards and Risso, 2004); EIA/Telapak (2005) estimates that as much as 44 per cent of Chinese timber imports are illegal at source, making China the "largest buyer of stolen timber in the world."

Table 3-1: Recent major proximate causes of forest loss in selected Asian countries

Country	Proximate causes of forest loss
Philippines	Export-oriented unsustainable commercial logging; the failure of industrial plantations; frequent forest fires caused by local people; mining operations; forest conversion for agricultural expansion; upland farming; government projects such as dams and land clearing for the landless.
Indonesia	Export-oriented unsustainable commercial logging; logging for the domestic plywood industry; transmigration projects and paddy field development projects; non-traditional shifting cultivation; industrial tree plantations; frequent large-scale forest fires; oil-palm plantation development.
Thailand	Logging; forest clearance for cash crops; shifting cultivation; rubber plantations; shrimp farming.
Lao PDR	Direct and indirect impacts of the civil war and the Second Indo-China War; land clearance for rice self-sufficiency; shifting cultivation; hydropower development; commercial logging.
Viet Nam	Direct and indirect impacts of the Second Indo-China War; land clearance for rice self-sufficiency; in-country migration; coffee plantations; shifting cultivation; financial resources for the military from logging.
Cambodia	Land clearing for crops; logging under the protection of powerful people and the military.
Southern Russian Far East	Export-oriented unsustainable commercial logging; large-scale forest fires.

Source: Modified from Yamane (2003)

A failure of governance has been recognised as the basis of illegal logging and this recognition partly pushes the decentralisation of forestry administration in a number of Asian countries. FAO (2005) has noted that 30 countries in Asia, Latin America and Africa have reported some degree of decentralisation in the forestry sector. Decentralisation has been spurred by international development organisations concerned that centralised forest administrative systems were failing to control illegal and destructive logging. Decentralisation has appealed to forestry agencies struggling with small budgets as a means to reduce their overheads. Regardless of motivations, the outcomes of decentralisation have at best been mixed. Illegal logging may have in fact accelerated in some countries, particularly Indonesia, where local forestry agencies lacked the capacity to successfully carry out their new responsibilities; decentralisation has shifted corruption in the forestry sector from the capital to the districts (Djogo and Syaf, 2004).

The proximate causes of forest loss discussed above tend to obscure deeper underlying causes shared by countries in the region. IGES has identified the following key underlying causes of forest loss and degradation in Asia.

1. Lack of recognition of the real value of forests

Many of the functions that forests serve are not recognised in the value that the market place ascribes to forest products. For free trade in forest products to have a positive impact on overall human welfare, the full costs of the production of logs must be internalised. The full costs of production include externalities of forests such as a range of cultural, social and ecological functions. If such costs were reflected in the

prices of timber and wood products on the domestic and international market, then prices would be many times higher and the pressure on natural forests significantly reduced.

2. A development paradigm that stresses industrialisation

Under the modernisation paradigm, the exploitation of forests is seen as one means of providing the capital required to invest in infrastructure and industry. Land conversion is supported as a means of feeding a growing population and of gaining foreign revenue through the sale of export crops. Urban and industrial development is prioritised relative to rural development and natural resource conservation. Under this paradigm, natural forests are largely viewed as unproductive places.

3. Powerful actors with a vested interest in forest exploitation

Those who directly rely on the sustainable use of forests for their livelihoods - forest dwellers and others living on the border of forests – are for the most part politically marginalised. Elements of the ruling elite (traditional, local, political, military and business elites) in some countries of Asia, on the other hand, base their wealth and power on the exploitation of forest resources. Under-priced forest concessions become a form of patronage for the ruling party to extend its power base. Those who hold power are removed from the immediate consequences of forest loss and degradation, while those with little power are most vulnerable to such destruction. Systems to improve forest management become obstructed by powerful actors who have an interest in maintaining the status quo.

4. Lack of livelihood options and insecure land tenure

Poverty and a lack of alternatives can lead local people to exploit forest resources in an unsustainable fashion. Landowners might accept royalty payments for the unsustainable logging of their forests as they have few other opportunities to earn cash. In areas where shifting agriculture is practiced, growing population pressure might force a reduction in fallow periods, leading to a decline in soil fertility and the need to clear new forest. Insecure land tenure can lead forest users to engage in destructive forestry practices in order to maximise short-term benefits. In some countries, land tenure is secured by 'improving' the land, which requires the clearance of forest. When forest-dependent communities have insecure tenure, they are less likely to oppose outside groups that are seeking to exploit forest resources at unsustainable rates.

5. Political disorder

Political disorder may occur as countries change from strong, authoritarian rule to weaker democratic regimes characterised by instability and a precarious hold on power. Examples include post-Communist Russia, the Philippines after Marcos and Indonesia after Suharto. Weak governance at the national level, coupled with an inability to enforce forest regulation at the local level, results in an acceleration of unsustainable and illegal logging.

6. National debt

Debt pressure can have a significant impact on forest decisions. Governments with onerous debt obligations may be tempted to allow exploitation of natural forests and under-priced concessions as a means of attracting foreign investment. The public revenue gained from concessions may at best keep the country financially afloat for a period of time, but the unsustainability of this process limits its potential to contribute to long-term national development.

Sustainable forest management

Urgent attention is needed to address the causes of forest loss and degradation listed above. In order to examine instruments that tackle these causes, a conceptual anchor is needed to describe what might be considered an ideal state of forest management. The ideal state provides a frame of reference to gauge improvements in forest management. "Sustainable forest management" (SFM) is used for this purpose.

Since the 1990s, SFM has been at the forefront of international deliberations on forestry issues and is now widely embraced by inter-governmental, regional, national and sub-national conservation and development institutions. At the Second Expert Meeting on Harmonizing Forest-Related Definitions for Use by Various Stakeholders organised by the FAO and the IPCC in 2002, several definitions of SFM were presented. Of these, the definition developed by the Ministerial Conference on the Protection of Forests in Europe (MCPFE) best captures the multiple functions of forests. The MCPFE definition, though not formulated specifically with Asian forests in mind, does embrace the variety of critical forest functions in the region. MCPFE (1993) defines sustainable forest management as the:

> *Stewardship and use of forests and forest lands in such a way, and at a rate, that maintains their pro-*
> *ductivity, regeneration capacity, vitality and their potential to fulfill now and in the future, relevant eco-*
> *logical, economic, and social functions, at local, national, and global levels, and that does not cause*
> *damage to other ecosystems.*

SFM has been the conceptual basis of an international movement to develop criteria and indicators to assess the state of forests and their management, in which a number of Asian countries participate. Because of the variety of forest types in Asia described earlier, it is not possible to present a region-wide specific set of criteria for assessing forestry practices. However, the concept of SFM can be used loosely to assess new policies and instruments of forest management and is employed for this purpose in the remainder of the chapter.

Instruments to promote sustainable forest management [8]

(i) Fast-wood industrial plantations and some alternatives

As noted above, the rapid spread of fast-wood plantations is a defining characteristic of forestry in Asia. Planted trees are found on a variety of scales in the region with functions ranging from primarily industrial to multiple uses. In addition, planted trees occur on a small scale as shelter belts, strip plantings along embankments and roads, recreational areas, stands owned by villages or individual households, and as components of agroforestry or homestead forestry. Partly because such plantings often involve and are more likely to benefit local communities, they are less contentious than the extensive industrial monocrop stands that are rapidly becoming a feature of the forest landscape in many countries of the region.

Asian countries often operate state-owned plantations and/or offer incentives to encourage private investment including tax exemptions, soft loans and low cost seedlings (Enters et al., 2003). Since banning the harvesting of natural forests in 1998, the Chinese government has implemented four new planting programmes to control erosion, combat desertification, and establish shelterbelts and high-yield timber plantations. In Viet Nam, the government plans to re-establish or rehabilitate 5 million hectares of forests by 2010, one million of which are expected to be fast-growing plantations. In India, the National Afforestation Program launched in 2002 has set a national target of 25 per cent tree/forest cover. India's plantations are dominated by fast-growing varieties, especially eucalyptus and acacia.

The new industrial plantations primarily consist of fast-growing trees, in particular varieties of eucalyptus, rubber, acacia, teak and pine. Use differs according to species, but much of the timber is destined for reconstituted products such as paper and fibreboard. The market value per unit of "fast-wood" is low compared to hardwoods and to non-plantation softwoods, but is compensated for by high annual growth rates. Tropical countries have a comparative advantage in growing fast-wood because of favourable climates and low labor costs.

The spread of large-scale industrial timber plantations is a source of much contention. Proponents argue that such plantations provide higher economic rates of return than natural forests, provide much needed employment and foreign exchange, take pressure off existing forests, can have positive environmental and ecological impacts, and can play an important role in sequestering carbon (Cossalter and Pye-Smith, 2003). Critics counter by contending that: the rights and concerns of local people are often ignored by plantation owners and governments; plantations are responsible for the clearing of large swathes of natural forest, loss of biodiversity, lower water tables, depleted soils and are prone to pest invasion; large-scale, industrial plantations create little employment relative to the land and resources consumed; and that when governance is weak, large-scale industrial plantations facilitate corruption and cronyism (Lohmann and Carrere, 1996). Both sides of the debate are liable to generalisation and over-exaggeration; interpretation of these claims requires circumspection.

Despite vocal opposition, including street protests in India and Thailand, it appears that industrial plantations are here to stay. The challenges are: a) to develop new instruments to maximise the benefits of existing industrial plantations, b) to find ways of minimising their social and environmental costs, c) to search for alternatives, and d) to reduce unnecessary consumption of timber and wood products.

Because of the competing claims to land and natural resources in developing countries, a comprehensive framework must be used to gauge the potential value of plantations against existing land uses and other alternative uses. In 1993, the International Tropical Timber Organization (ITTO) presented guidelines for the establishment and sustainable management of planted tropical forests. In 2000, the Center for International Forestry Research (CIFOR) published a set of criteria and indicators specifically for sustainable forestry plantation in Indonesia and India. Aimed at the forest management unit, these guidelines and criteria provide a basis for forest managers and administrators to identify systems to promote the sustainable management of plantations. Principle 2 of the ITTO guidelines affirms that "the creation of plantations must be balanced with the needs for protection of the site and the environment, the conservation of biological diversity of all types, the needs and aspirations of the present people and the potential demands of future generations" (ITTO, 1993). Industrial plantations must be placed in a broader integrated land-use framework that supports SFM by recognising the multiple functions, future value and public good aspects of forests.

Prior to the advent of the nation state, forests in Asia were often managed under communal land tenure systems. After independence many governments appropriated all natural forests within their borders, some of which were sold to plantation companies. Conflicts have often arisen between plantation owners and local communities over land tenure and these have proven difficult to resolve because of the fundamental differences of competing claims. In Sumatra, for example, plantation owners pointed out that they were granted the right to establish plantations by the state (APRIL, 2004). Local communities, however, argued that they originally owned the land and that their rights were recognised in international law (Wieting, 2004). Some plantation companies have attempted to mitigate community grievances by sponsoring infrastructure, alternative livelihood and educational programmes. In addition, local communities can be given preference for employment and industrial plantations can be modified to be more acceptable to communi-

ties by allowing intercropping and incorporating fuelwood and fruit trees (ITTO, 1993). However, outstanding community grievances, especially in relation to land tenure, are unlikely to be resolved successfully without government intervention, including formalised procedures to involve local communities in decisions regarding existing and new plantations.

Box 3-1 discusses an alternative to the more typical large scale industrial plantations that have been introduced in China. This Chinese programme (*tui geng huan lin*) can be commended for supporting the planting of native species to recover degraded land and involving local families in managing the plantations. However, the sustainability of the programme has been jeopardised by not adequately reflecting the concerns and aspirations of local families in the overall design of the planting programme.

Box 3-1: *Tui geng huan lin*: A need to reflect the concerns of local families in programme design

In 1999, just a year after the catastrophic flooding of the Yangtze River, the Chinese government initiated the world's largest afforestation programme, namely *tui geng huan lin* (Land Conversion Programme from Farmland to Forest). *Tui geng huan lin* aims to convert farmlands in ecologically sensitive areas, such as sloping land with an inclination of 25 degrees or more, to forests. Farmers who support the programme receive compensation and subsidies from the government for a maximum of eight years. Compensation is calculated according to the value of grain that would have been harvested from the original farm.

Tui geng huan lin is not a monoculture plantation programme, making it distinct from the fast-wood industrial plantations that are increasingly a feature of the Asian forest landscape. Rather, the programme aims to recover ecologically adaptive mixed vegetation through supplying various native species. Another positive aspect of the *tui geng huan lin* programme is that the plantations are managed by local families.

The Chinese government reports that 19 million hectares were planted under *tui geng huan lin* from 1999 to 2004 (State Forestry Agency, 2005). China's forest cover ratio has rapidly increased from 16.6 per cent in 1999 to 18.2 per cent in 2004, according to the national forest resources survey (ibid.). The government hopes to reduce what it views as China's excessive dependence on imported timber and timber products in the near future by a supply from the domestic plantations.

Research supported by IGES has found that farmers who participate in *tui geng huan lin* are not as optimistic. This is especially true in the western mountainous areas, where eight years of compensation is not enough incentive for farmers to preserve plantations. In a research village in Guiju province, 43.8 per cent of farmers stated that they will have no alternative but to re-cultivate the land under plantation once compensation is ended (Xiang and Seki, 2003).

Our research reveals that while the Chinese government prohibits intercropping, illegal intercropping actually improves plantation quality. *Tui geng huan lin* should thus be amended to allow intercropping and other forms of appropriate agroforestry to provide further incentive for farmers to maintain plantations, and to improve the quality and growth rate of trees (Xiang and Seki, 2003).

In addition to land tenure, issues of financing pose difficulties to industrial plantations. Large initial outlays, long rotations and the costs of compound interest make plantations unattractive to investors.

Governments have provided subsidies, tax concessions and grants as incentives to the private sector, but perhaps too enthusiastically. The World Wide Fund for Nature (WWF) and the World Conservation Union (IUCN) argue that at times incentives have acted perversely to reduce the cover of natural forest and to destroy local livelihoods (WWF/IUCN, 2000).

International financial institutions and development agencies play a critical role in enabling the establishment of new plantations by now usually requiring rigorous, not merely perfunctory, environmental and social impact assessments, as an integral part of their loan pre-assessment processes. In Indonesia, exceptionally large pulp mills were set up next to natural forests with the intention that natural timber would be "mined." The mills could thus operate while waiting 10 years for the plantations to reach maturity. Because of the vast over-capacity of the pulp mills, extensive tracts of natural forest were cleared, and continue to be cleared: FOE (2001) estimated that a Singaporean held company had cleared 220,000 hectares of natural forest in Sumatra by 2001, with the company announcing plans to clear a further 147,000 hectares by 2008. This process was facilitated by international financial institutions that were previously indifferent to social and ecological impacts of the plantations they were financing. A number of mills are in serious financial difficulty, providing an opportunity for the banks now to demand improved social and environmental practices as part of their refinancing arrangements.

Many alternatives to large-scale industrial plantations exist and may offer better prospects for promoting local development and conserving forest resources. Box 3-2 presents an example of how such benefits have been realised by involving local people in the management of teak forests in Java. Another alternative is for forest companies to enter into agreements with local people for timber production. Known as outgrower schemes, these programmes vary from local people leasing land to companies, to arrangements where local people are fully responsible for production. Outgrower schemes are particularly popular in India where government policy limits the amount of land that can be owned by an individual. Here, the companies commonly provide growers with improved seedlings and technical assistance, while growers plant and maintain the trees (Desmond and Race, 2000). Examples of outgrower schemes can also be found in the Pacific Islands. In the Solomon Islands, one company provides seedlings and silvicultural advice to growers who plant trees in small wood lots averaging two hectares. In Vanuatu, another company runs a similar programme allowing growers to keep lower grade timber, in addition to paying the market price for timber purchased. Future initiatives could draw upon the various guidelines for outgrower schemes that have been proposed by FAO (Desmond and Race, 2000), CIFOR (Nawir and Calderon, 2001) and IIED (Mayers and Vermeulen, 2002).

As a strategy to directly tackle poverty alleviation, household forestry has more to offer than large-scale corporate, capital-intensive investments. Household fruit trees have begun to play an important role as a substitute source of timber, especially in countries that have enacted logging bans on natural forests. In Sri Lanka, 40 per cent of timber is supplied by home gardens, a figure that rises to 83 per cent in the Indian state of Kerala (FAO, 2005). Household forestry can be further supported with technical training, credit and marketing schemes.

Box 3-2: Farmer groups participating in the management of teak forests, Java

Teak forests were first planted by the Dutch in Java at the end of nineteenth century. The state-owned forestry enterprise *PN Perhutani* (later renamed *Perum Perhutani*) became responsible for the management of forests after Indonesia won independence. Illegal cutting became prominent from the 1960s, leading to the collapse of the teak plantations.

The situation changed significantly in 2001 when a new regulation on forestry enterprise declared a new paradigm of state-owned plantation forest management. "Collaborative forest management," involving various interest groups such as local government, local communities, private companies, aid institutions and educational institutions, was advocated. Under the previous regulation, ad hoc farmer groups were formed to undertake planting on a periodic basis. In contrast, the current groups are permanent and are engaged directly in forest management; they are not merely a means to provide labour. Gadjah Mada University and a local NGO supported farmer groups to establish self-reliant decision-making systems, supported capacity-building of the groups, and constructed a mechanism for sharing benefits.

IGES research has shown that the new system of forest management was successful in increasing awareness of forest conservation. By allowing continuous intercropping, cultivation under trees, and benefit-sharing from thinning or final cutting, the new regulation offered incentives for local people to preserve the forests. This further motivated them to participate in forest patrols and farmer group meetings. Furthermore, collaborative forest management was successful in building mutually beneficial relationships between local people and *Perum Perhutani*. Growing recognition in *Perum Perhutani* that collaboration with local people was vital to reduce illegal cutting led to in-depth discussions and improved communication with the farmer groups, and greater respect of the opinions of group members. In return, the positive attitudes of *Perum Perhutani* staff improved the local people's perception of the forest enterprise.

Source: Harada (2004a)

(ii) Forest certification

Certification has emerged as a leading instrument in the international dialogue on SFM. Certification was originally envisioned by the Forest Stewardship Council (FSC) as a means of improving the management of the world's largest tropical forests.[9] Expectations have been high: the World Commission on Forests and Sustainable Development (1999) described certification as "perhaps the most powerful 'soft policy' instrument to be designed and implemented outside government."

Certification was developed as a market-based, voluntary instrument under which a third party evaluates performance against minimum standards of forest management. While the concept of certification based on independent forest monitoring using consistent standards has considerable merit, the amount of certified timber in Asia compared with the total timber output remains very low. In Indonesia, despite the advent of a national certification scheme, since 1998 only 14 of 300 forest management units have undergone certification processes, four of which failed altogether, and only one of which fully complied with certification standards (Muhtaman and Prasetyo, 2004). Certification has thus far favoured developed over developing countries, temperate over tropical forests (Fig. 3-2) and large-scale plantations over smallholders and community forests.

Despite the relatively small coverage of certified forests, the rate of expansion in coverage has been rapid.

From its beginnings in 1993, FSC had certified 45 million hectares of forests by 2004. Various innovations to make certification more accessible to producers and growing consumer demand also provide reason for optimism.

Fig. 3-2: Coverage of FSC certified forests in the Asia-Pacific region (2004)
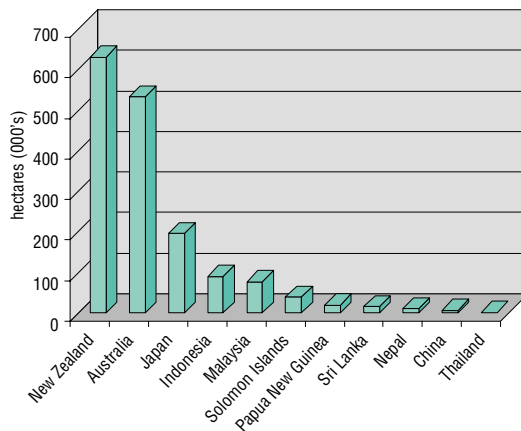
National certification schemes have been established, or are in the process of being established, in several countries in Asia. This is a welcome development that could contribute significantly to SFM. In Papua New Guinea, a national working group was formed in 1997 to develop a national certification scheme. In 2000, the group successfully delivered a set of National Forest Management Standards to FSC for review. A certification working group was also established in Indonesia, leading to the foundation of the Indonesian Ecolabeling Institute in 1998. To gain international recognition for its standards, the Institute signed a Joint Certification Protocol with FSC in 2000.

These schemes, however, need to be placed in perspective and treated cautiously. National standards have not been free of criticism, especially with regards to the claims of indigenous people. For example, although the certification scheme established by the Malaysian Timber Certification Council was based on the ITTO criteria and indicators for sustainable forest management, denial of indigenous people's rights in the Malaysian states of Borneo has a long history and appears to be continuing under the national certification scheme.[10]

Concern has also been expressed that a multiplication in national certification schemes will confuse consumers and procurement agencies. Harmonisation is not desirable, however, as this would compromise the flexibility that underpins the argument for national standards. It is preferable that national standards be developed with the intention of receiving FSC recognition.[11] "Mutual recognition" is another option and can be sought through the global Program for the Endorsement of Forest Certification.

A common complaint from timber producers is that FSC certification standards are too high; the costs incurred in meeting these standards far exceed the higher prices certified timber can command. Stepwise certification has been proposed as a means of inducing producers to make gradual improvements in their harvesting practices. Stepwise approaches involve an assessment of how present practices differ from certification standards, creation of a step-by-step system to improve forest management, and an independent means of verifying progress. Incentives to producers can include the labelling of "transition timber,"

grants, tax-breaks and credit.

Stepwise certification has generally been well received by the logging industry and would appear to have considerable potential to meet the shortfall in supply of FSC certified timber. The Global Forest and Trade Network established by the World Wildlife Fund successfully employs a stepwise approach and now accounts for 53 per cent of the total global trade in certified forest products (Tacconi, Obidzinski and Agung, 2004). However, stepwise models must be treated carefully. A permanent market could develop for 'transition timber' that inhibits progress towards fully certified timber, effectively resulting in a lowering of standards. Timber producers may also be rewarded through government incentives and by the market place for certain improvements in harvesting, while they continue to ignore legitimate claims and grievances of forest-dependent communities.

Other innovations have been directed at making certification more accessible to smallholders and communities. Under "group certification," a local institution acts as an intermediary between the certifying organisation and small-scale timber producers. The intermediary institution provides support necessary for the individual producers to meet certification requirements and, ideally, secures a reliable market for the certified timber. A group certification scheme has been successfully established in East and West New Britain, Papua, New Guinea by the EU funded Eco Forestry Program. Group certification should be strongly promoted as the benefits for producers and the environment can be significant (Box 3-3).

Certification for community-based forestry has proven particularly challenging because of rigidity of the schemes as well as the financial and administrative costs involved. Recognising the need for a certification system suitable for small-scale producers, FSC established the Small and Low Intensity Managed Forests (SLIMF) initiative. Auditing, monitoring and methodologies have been altered to reduce the financial and administrative burden borne by small-scale and intermittent producers. The Indonesian Ecolabeling Institute, working closely with FSC, has established a certification system specifically for community-based forest management. Two villages in central Java received certification for teak and mahogany forests in October 2004. Although the SLIMF and Indonesian Ecolabeling Institute initiatives are positive developments, compliance with all criteria may still be a daunting task for many communities. Communities have expressed a desire to see greater flexibility in the SLIMF initiative that would allow them to draw upon indigenous systems of forest management and in making organisational choices (Molnar, 2003). Some indigenous groups see certification almost as a continuation of the colonial legacy in which outsiders force alien systems upon them. Hence, certification of community-based forestry needs to be approached carefully and weighed against alternative, less demanding strategies to place forest products on the international market place.

Box 3-3: Group certification in the Solomon Islands

The Solomon Western Islands Fair Trade (SWIFT) programme was established in 1994 to enable landowners to resist the approaches of logging companies, as well as provide them with an adequate income. SWIFT was successful in recruiting 250 family, clan and tribal groups as 'producer groups' to supply timber under an "eco-timber" label. SWIFT assisted the groups to formulate management plans, provided credit and technical training for the sustainable harvesting of timber, and established a subsidiary company in the Netherlands to purchase the timber. SWIFT also monitored the producer groups to ascertain whether they were meeting the standards demanded of the "eco-timber" label.

Producer groups received the same income by felling only two trees per year under the SWIFT scheme as they would have received from royalties for allowing loggers to fell between 70-100 trees (SWIFT Netherlands Foundation, 1996). Sustainable harvesting also meant that producer groups could continue to source a variety of resources from their forests. Moreover, selective harvesting did not compromise the environmental functions of the forests.

National producer groups are also being promoted in Asia as an instrument for expanding the coverage of certified forests. The World Wildlife Fund's Global Forest and Trade Network consists of buyer groups - retailers, distributors and specifiers of forest products - and producer groups - forest owners/managers, processors and manufacturers that have achieved, or have displayed commitment to achieving, certification. Two producer groups in Southeast Asia have been established, and further groups are in the process of development. The producer groups are attractive to members as they are able to access international markets while in the process of improving their environmental record. In Japan, a Forest Trade Network was established in 2002 by the World Wildlife Fund to promote credible forest certification. Its members include forest owners/managers, timber processors, forest product retailers, furniture manufacturers and architects. Efforts are needed to expand the number of such buyer and producer groups and their membership, as well as to raise public awareness of their purpose.

In addition to the above innovations, NGOs have an important role to play in advocacy, monitoring, research and public education if certification is to spread more rapidly. Consumer demand for certified timber products in Asia is generally very weak but appears to be growing.[12] Corporate sensitivity to the potential demand for 'green labels' has been heightened by the activities of the NGO sector. A few Japanese companies have made declarations to no longer procure woodchips from old-growth forests in Tasmania in order to avoid potential legal battles with international NGOs such as Greenpeace and the negative public imagery that would result. After pressure from Japanese NGOs, one of those Japanese companies announced it would take steps to source all products from responsible operations and a Japanese paper mill company has recently stated it will introduce certification into all its overseas and domestic forests. Important relationships are developing between NGOs in importing and exporting countries concerned about the global trade in wood products. Japanese NGOs are working closely with their Indonesian counterparts to encourage Japanese importers to reject wood products from several corporations.

(iii) Towards well-adjusted community forestry [13]

The increase in plantation forestry in Asia discussed earlier has been paralleled by a trend towards greater community involvement in forestry over the past three decades. As with plantation forestry, however, the history of community forestry has not been smooth.

During most of the 20th century, forest management in tropical countries developed largely under the paradigm of sustainable timber yields. Cooke (1999) observed that "the aim was to produce a steady supply of timber (sustained yield) by cultivating even-aged plantations; the tenets also promoted conversion of natural forests (viewed as low-productivity) into high-productivity plantations." This focus on economic gain excluded communities from forest management and resulted in social unrest. A growing number of foresters came to acknowledge that the traditional concepts of industrial and scientific forestry did not provide adequate models for SFM. By the late 1970s, the concept of "social forestry" had begun to gain prominence in international forestry dialogue, spurred by the World Forestry Congress held in Jakarta in 1978 with "Forests for People" as its central theme. The social forestry movement was further propelled by the FAO report *Forestry for Local Community Development* released in the same year. The FAO emphasised that forest conservation and management should be devolved and that local participation should be encouraged. Reflecting popular sentiments of the time, community forestry was defined very broadly as forestry that includes any situation which intimately involves local people in a forestry activity (FAO, 1978).

It seems probable that official adoption of social forestry occurred first in India.[14] In 1970, the Indian National Commission on Agriculture was constituted to look into the problems of the forestry sector. In order to free forest lands for commercial forestry, it suggested that local communities' needs should be met by a social forestry programme on non-forest lands, such as village commons, government wastelands and farmlands. The two components of the Social Forestry Program were the reclamation of degraded lands for fuelwood plantations and farm forestry to supply timber to processing factories. However, these were not as successful as anticipated. The conversion of agricultural land to farm forestry reduced the long-term demand for rural labour and mainly benefited wealthier farmers who could afford to wait the seven years for trees to mature. The fuelwood plantations also did not receive the expected local support as the species chosen were inappropriate and as local communities had already developed strategies to cope with shortages (Cooke, 1999).

By the mid-1980s, it was apparent that the strategy suggested by the National Commission on Agriculture was not working. Forests were continuing to be degraded and there were increasing conflicts between the local communities and the forest department. A new forest policy was issued in 1988 that completely reversed the objectives of forest management. The new policy stressed management of forests for conservation and meeting local communities' needs and made commercial exploitation and revenue generation subsidiary to these objectives. In 1990, based on the new forest policy and encouraging results from some pioneering experiments in community-based forest management, the government initiated Joint Forest Management (JFM). Under JFM, the forest department and the village community enter into an agreement to protect and manage jointly forest land adjoining villages and to share the responsibilities and benefits. The village community is represented through a body specifically formed for the purpose, most commonly referred to as forest protection committees. Currently, 27 states have adopted JFM and by September 2003, there were 84,632 JFM groups protecting and managing over 17 million hectares of state forest lands (Bahuguna et al., 2004).

The Philippines also experienced a similar progression in community forestry. Under the Integrated Social Forestry programme that was introduced in the 1970s, 25-year stewardship contracts are offered to upland forest dwellers. 25 per cent of the land under the agreement must be planted in trees, and the remainder can be used for livestock rearing or agriculture. Community-Based Forest Management was introduced officially in 1995 and is based on NGO-community partnerships to replant degraded lands. Three years after the plantations are established, the NGOs withdraw and the community is awarded a 25-year contract to manage the afforested land. The communities are entitled to use the forested land and gain a percentage of earnings from harvesting. The government plans to assign 900 million ha (58 per cent of the entire forest of the Philippines) under community schemes by 2008.

Other examples of government policy to involve local communities in forest management can be found in most countries of the region, but it is beyond the scope of this chapter to describe and assess all of these. The discussion of social forestry in India above, however, is indicative of a lesson that many countries share; that is, simply involving local people in forestry will not necessarily improve forest management.

The example of forest user groups in Nepal presented in Box 3-4 highlights that for community forestry to succeed, individual schemes must be finely-tuned to reflect local circumstances. Well-organised local communities aware of the need to preserve natural resources have an important role to play in SFM. Problems, however, do exist in these communities. Conflict, factional rivalries, unequal access to resources and unequal power relations within communities can impact negatively on community forestry.

Box 3-4: Community forestry in Nepal

Nepal was the first country in Asia to pass legislation supporting community-based forest management. Under the Panchayat Forest and Panchayat Protected Forest Rules of 1978, bare forest land and forests were handed over to the smallest political unit, the *panchayat*. Communities in the *panchayat* were responsible for sowing seeds, protecting and maintaining forests and implementing a scientific forestry management plan. The achievements of community forestry can be seen in terms of better forest condition, social mobilisation and income generation for rural development (Kanel, 2005).

Panchayats proved to be too large as social units for community forestry, however, as forests and land were not handed over to actual users. The new Forest Act (1993) and Forest Rules (1995) gave absolute right to local people in managing their community forests. Under this legislation, local community forest user groups (CFUGs) were institutionalised as independent self-governing entities. The CFUGs are voluntary, independent and self-governing organisations legitimised by the District Forest Offices. Approximately 25 per cent of existing national forests has been handed over to 13,300 CFUGs, constituting about 35 per cent of the total population.

A study commissioned by IGES concluded that thus far the decisions of CFUGs are not as conducive to the poor, women and lower castes as anticipated (Kanel, 2005). Elites and the wealthy capture many of the benefits from community forests. In order for decision–making to be more effective and equitable, the Joint Technical Review committee, 2001 recommended two members from each household, one woman and one man, be included in the CFUG committees. At present, 25 per cent of the executive members of the CFUGs are women. Such representation is a step forward, but disadvantaged groups still find it difficult to participate at meetings. Local people consider their position on the committees to be prestigious and are reluctant to surrender these to disadvantaged groups (Mahajan et al., 2004). The next challenge thus lies in building the confidence of the poor, lower castes and women to express their concerns at public meetings.

IGES research on community forestry in the Philippines (Pulhin and Pulhin, 2003) has delivered a number of strong messages. The Philippines experience has highlighted the importance of secure land tenure for community development. Until recently, forest occupants, including indigenous people, were treated as "squatters" or "encroachers" in forestlands. This situation has been largely corrected under Community-Based Forest Management (CBFM) and its early predecessors. Six different types of tenure instruments

have been developed since 1983 that recognise the vested rights of forest occupants, both migrants and indigenous people, to access and enjoy the benefits of forest resources.

The Philippines experience suggests that community forestry will succeed only if communities can build sustainable livelihoods through a combination of forest-based and non-forest-based activities. An innovative source of capital for livelihood projects under CBFM has come from limited use of forest products such as timber and rattan. This applies particularly to those projects that have been given a resource-use permit to utilise forest products to augment participants' incomes. The scheme is based on the principle of "borrowing from nature to finance community and forest development." Part of the income from the sale of legally harvested products from natural forests is invested in existing plantations to finance livelihood projects, reforestation and related forestry activities to ensure forest sustainability. Despite such innovations, the inability to provide sufficient levels of employment and sustainable livelihoods remains one of the greatest challenges to CBFM projects.

In addition, CBFM requires that forestry personnel see their roles as facilitators in catalysing SFM, rather than primarily as regulators. Most forestry personnel responsible for the implementation of CBFM projects in the Philippines have found it difficult to make this transition. CBFM requires strong institutional support, which in the Philippines has been hampered by advocates of corporate forestry and the competing interests of the different actors including NGOs, local government units, project organisers and those from various layers of the bureaucracy.

(iv) Protected areas: Melding biodiversity conservation with livelihoods

The histories of community forestry and protected areas are markedly different, though both arose in response to the failure of industrial forestry to conserve forest resources. Community forestry sought to actively engage local people in forestry, whereas the protected area movement sought to establish boundaries to keep local people out of forests. However, just as community forestry has progressed as lessons have been learnt, so too has the design and management of protected areas.

While Asia is broadly recognised as rich in biodiversity, the recent acceleration of biodiversity loss has become a critical issue in SFM. Indonesia, Malaysia and the Philippines are listed among the world's biodiversity hotspots (Yoshida, 2003) and under the World Conservation Union's 'red list' of threatened species, 4,103 species in Asia (excluding Oceania) are labelled as critically endangered, endangered or vulnerable (IUCN, 2004).

Conservationist groups have stressed that Asian governments must respond to the growing threat to biodiversity by setting aside protected areas under strict regulations. This argument led to a rapid increase in the number of protected areas, especially from the 1970s onwards (Harada, 2005a). In 2000, 9.7 per cent of natural forests in the Asia-Pacific region were classified as protected areas, only slightly less than the 10 per cent target set by the World Conservation Union (IUCN) (FAO, 2001). Bhutan, Brunei Darussalam, Cambodia and Lao PDR have all set aside 20 per cent or more of their forests as protected areas, compared with Russia where the figure falls below 4 per cent (ibid.).

Protected areas have succeeded in promoting SFM by enabling forests to serve a variety of traditional and newer functions: conservation of watersheds and ecological processes; the protection of biodiversity; the creation of recreation/tourism possibilities; as well as providing resources for education and research. However, the conventional model of protected areas has excluded local people from forests with detrimental consequences for their livelihoods and in some instances the ecological integrity of the protected areas themselves. The administration of protected areas has focussed primarily on ecological issues, disregarding

the needs of local populations and often thrusting them into difficult circumstances where their livelihoods are undermined and they are labelled as law-breakers. In Southeast Asian countries, local people commonly ignore forest policies that prohibit them from entering protected areas as these encompass localities where they have lived and constructed their livelihoods for many generations (Box 3-5). Mistrust and misunderstanding between local people and park authorities associated with the fundamental concept of national parks have further marginalised local people and forced them to resort to destructive forestry practices.

Box 3-5: Gunung Halimun National Park, West Java

In Indonesia, forest laws of protected areas explicitly prohibit local communities from dwelling inside national parks. Local people living nearby are also strictly prohibited from accessing forest resources within the parks. Problems arise as local communities have no alternative but to enter the parks and extract resources.

Gunung Halimun National Park, designated as a national park in 1992 in West Java, exhibits these problems. Administration was based on the zoning management system - core zone, wilderness zone, intensive use zone. Buffer zones and enclaves were established around and inside the park, respectively, to allow people to pursue livelihood-related activities.

Local people have resided inside and near the park from long before it was established. IGES research has found that while local people acknowledge the importance of conserving forest ecosystems to some extent, they continue to utilise the land for agricultural purposes with traditional techniques such as swidden cultivation, paddy fields and gardens. They continue to depend heavily on the forest resources within the park. The borders of the buffer zones and enclaves, which regulate the geographical scope of their activities, are not clearly identified leading to encroachment into the park.

Local government authorities have adopted a policy of strictly adhering to official policies, disregarding the livelihood needs of local people. Latent conflict between local people and park authorities has the potential to trigger the further destruction of forests.

Source: Harada (2003, 2004b, 2005b)

Protected area management appears to be moving beyond the policy of exclusion. For example, buffer zones are located around many national parks in Southeast Asia, usually permitting local people to undertake a range of economic and subsistence activities. In Cambodia and Lao PDR, forest policies allow indigenous people to gather non-timber forest products from buffer zones. Enclaves, on the other hand, are located geographically inside of national parks, but are not administered by the park. Local people can cultivate crops and use resources within enclaves. If protected areas are to play a role more successfully in sustainable forest management, further innovative measures, such as those described in Box 3-6, will have to be found to meld biodiversity conservation with the livelihoods of the people.

When establishing protected areas, Harada (2005a) has found that consideration should be given to gaining a thorough knowledge of traditional land tenure systems, of how forest resources are used, and boundaries must be carefully determined. Many boundaries of protected areas in Southeast Asia are delineated on maps, but these boundaries cannot be identified on the ground. Outsiders can use poorly identified boundaries to their advantage by crossing over into protected areas and logging illegally or converting forests to

plantations and other agricultural uses.

Box 3-6: Jiuzhaigou Biosphere Reserve, Western China

In the Jiuzhaigou Biosphere Reserve, resident Tibetan communities host more than a million Chinese tourists per year. The administration of the park was established not only with conservation in mind, but also to serve the needs of the local Tibetan communities. To restore the ecology of the park, local people were asked to cease farming, yak rides for tourists and other activities inside the park boundary that were damaging the environment. Strict controls were placed on the numbers of tourists visiting the park. "Green buses," using clean burning fuel, now transport tourists on roadways through the park - they stop only at designated spots where tourists can stroll on boardwalks. No overnight stays in the park are allowed.

Local people were offered a variety of compensation measures for halting business activities within the park. In addition to a lump sum cash payment, every local is entitled to employment, either waged or sales-dependent. The types of work range from bus-drivers, tourist guides, rubbish collectors, environmental protectionists, tree planters, costume-renters and photo sales, to fire wardens. Those who wish to run their own business can request a site in the park's business centre. Unemployed local residents can apply to the park administration which is obliged to find them work. The park also has one restaurant in which each family is entitled to purchase shares the equivalent of a ¥20,000 maximum. Local people own 49 per cent of shares, the park owns the remainder. Almost all tourists eat here – an average of 6,000 visitors per day - making this a lucrative investment.

According to members of the Tibetan village Panyazhai, their well-being has been enhanced through their association with the park. The success of the park is based on appropriate regulation achieved through partnerships between local communities, the tourism industry and the State as represented by the county government and the reserve administration.

Source: Dombroski (2005)

Even if protected areas are well-designed taking into account the local livelihood needs, governments often do not provide sufficient resources for their protection and administration. Entrance and user fees can be charged as a means of gaining revenue to better finance protected areas, though visitor numbers and activities must be controlled in order to minimise the negative impact on the natural environment. An additional common problem is that administrative officials may have insufficient knowledge of protected area management and lack a firm grasp of world trends. It is vital that governments provide responsible personnel with the right training and, when involved parties alone cannot properly manage protected areas, further reinforce their management systems by involving outside parties, such as development agencies, domestic and foreign NGOs and researchers.

(v) Trade measures for sustainable forestry: a new agenda

As a result of a broad movement towards the relaxing of import controls and the lowering and removal of tariffs on timber and wood products, international trade has become increasingly significant to SFM. A unique feature of the trade in forest products is that natural resources and man-made resources compete in the same market. This competition is advantageous for the former because in man-made forests (regenera-

tive forestry) planting and maintenance costs must be met, whereas these costs are absent in logging from natural forest (exploitation forestry).

The exploitation of natural forests gives some countries a strong, albeit unsustainable, competitive advantage. Other countries seeking to establish or preserve their own forest industry find that timber from local regenerative forestry cannot compete in the domestic market with wood imports from exploitation forestry. For example, in Japan, at US$73 per square metre of wood produced, planting and maintenance costs of man-made forests are the world's highest (Shimamoto, 1998). Increasing numbers of plantation owners in Japan are abandoning their forests (Endoh, 2000). Mountainous communities, dependent on the sustainable management of forest plantations, have been impoverished due to their inability to compete with imported natural forest products. The unregulated market place, in which natural forest products of Southeast Asia compete with man-made forest products of Japan, has resulted in over-cutting in the former and the abandonment of sustainable management of the latter.

Many Japanese scholars have presented the above circumstances as a problem unique to Japan. However, research supported by IGES has found that unequal competition between man-made forest and natural forest products is reflected in inter-South trade.

Shimamoto, Ubukata, and Seki (2004) analysed the timber trade of the Philippines, Thailand, and Indonesia, finding that ASEAN countries can be divided into two categories: the first consists of timber importing countries where large expanses of natural forest have already been lost partly due to commercial logging in the past. For such countries, reforestation and supplying timber from domestic plantations are now an important component of the forestry agenda: the Philippines and Thailand are examples. The second category is represented by timber exporting countries, such as Indonesia, that enjoy a competitive advantage in forest products as they still have large expanses of natural forests to exploit.

The Philippines has been a net importer of timber since 1986, though in the 1960s it was one of the world's biggest timber exporting countries. In the 1990s, timber trade liberalisation accelerated in response to the request by ASEAN and the WTO. The Philippine government reduced its tariffs on plywood imports from 50 per cent in 1995 to 20 per cent in 1997. The outcome was an increase in total forest product imports at the expense of local regenerative forestry.

Philippine domestic timber industries, such as plywood companies, secured supplies of timber from small-scale upland tree farmers. This encouraged Philippine upland farmers to plant fast-growing tree species. However, domestic plywood companies predicted that if tariffs fell further, domestic plywood would no longer be competitive with imported plywood. Further liberalisation of international timber markets is likely to lead to the abandonment of tree plantations by upland farmers.

In Thailand, market-driven, small-scale reforestation has been successful only for eucalyptus destined for pulp. The planting of indigenous species including teak has stagnated. Domestic sawn wood and plywood producers have already forsaken the domestic wood supply and now rely on imported logs including illegally harvested timber from neighboring countries. In contrast, with its vast primary forests and a cheap, largely unprotected labour force, Indonesia can still produce natural forest products competitively. Rampant illegal logging, and a policy of promoting the export of forest products to secure much needed foreign currency, has accelerated the degradation of natural forests.

Shimamoto, Ubukata and Seki (2004) conclude that the conventional wisdom of free trade in forest products as consistent with SFM when the government has adequate administrative capacity is not persuasive.

They argue that the control of trade in forest products should be considered under international rules from the viewpoint of forest sustainability. For countries where domestic primary forest has already been lost, import tariffs can be an effective way to encourage regenerative forestry. In countries where primary forests are under threat, export tariffs can be effective to discourage unsustainable, exploitation forestry.

Assuming this to be correct, then it would follow that to achieve the interests of SFM specific trade measures for forest products should be permitted. At present, the WTO recognises only two categories of trade commodities - industrial and agricultural goods. Forest products are classified as the former. A new sub-category of natural resources specifying logs and roughly processed forest products could be introduced under "industrial commodities." Opposition to such a proposal would doubtless arise, given that it runs counter to the precepts of full trade liberalisation. In this regard, the Japanese government has resisted further tariff reductions in forest products, but its position remains relatively isolated internationally. If breakthroughs are to occur on this issue through a reshaping of the current WTO position, then new arrangements and agreements between both developed and developing countries will be required.

Non-tariff trade measures will be critical in moving towards more sustainable forestry. The need for a comprehensive response to illegal logging was spelt out at the first meeting of G8 Environment and Development Ministers in March 2005. The G8 Ministers resolved to take steps to halt the import and marketing of illegally harvested timber, for example, by giving appropriate powers to border control authorities through voluntary bilateral and regional arrangements or other arrangements consistent with WTO rules.

Regional responses are necessary when dealing with the trade in illegal timber and wood products. The consequences of unilateral state responses to illegal logging highlight the importance of regional co-operation: bans on logging in Thailand and China have to some extent relocated logging sites to other countries. A regional initiative should be taken, with possible guidance sought from the Forest Law Enforcement, Governance and Trade Action Plan presented by the European Commission in 2003. The Action Plan is centred on voluntary timber import licensing schemes applicable on a product-by-product basis under bilateral arrangements. Indonesia and Malaysia have already joined in discussions with the Commission. However, the Action Plan has been criticised by international NGOs as lacking the compliance and enforcement regimes required to successfully combat illegal timber imports. Voluntary arrangements alone will not stop illegal timber imports from countries outside the arrangements, or from illegally harvested timber being processed in a third country before re-export. Legislation is required for officials to seize what they suspect to be illegal timber at the point of import for voluntary licensing agreements to be successful. Coordination between customs agencies, including a system of prior notification, is required to identify shipments of timber transported under forged documents. Though solutions appear relatively straightforward, communication among customs agencies in Asia is very poor and it is rare for shipments of illegal timber to be seized.

Bilateral agreements between Japan and Indonesia, and China and Indonesia have yet to yield significant results in stemming the tide of illegal timber imports, and are unlikely to do so in their present form. The Japanese government has forged a bilateral arrangement with Indonesia for procurement of timber favouring the Indonesian BRIK (Revitalization of Forest Industry Board) scheme. This scheme has been criticised however for lacking transparency, independent auditing and traceability (Royal Institute of International Affairs, 2004). In a recent study of 16 Indonesia mills, including several recognised by BRIK, all failed to meet minimum criteria of legality (ibid.). For bilateral agreements to be successful, independent monitoring of timber harvesting, processing and transportation is required. Credible systems, such as FSC chain of custody certification, already exist and could be used by Japan under its bilateral

agreement with Indonesia. To meet Japan's timber needs, efforts would have to be directed at building the capacity of Indonesian suppliers to achieve chain of custody requirements.

Public procurement can be used as a catalyst to promote legal timber imports; roughly 18 per cent of global trade in timber, pulp, paper and furniture is to satisfy government procurement demands (Toyne, O'Brien and Nelson, 2002). Japan has made progress through establishing a green procurement law in May 2001, with the Ministry of Environment setting annual targets for a range of products including paper, stationary and construction goods. However, the guidelines do not deal adequately with issues of the legality of wood products and an independent study of one construction project commissioned by the Ministry of Environment found no checking of the legality of the timber used (Nakazawa, 2005). Reform of the green procurement law is thus required to include the legal status of all wood products and construction materials.

Initiatives outside the region may offer instruction for improving public procurement practices in Asia. The UK established an interdepartmental working group in 2000 to coordinate wood purchasing policy across all departments. A Central Point of Expertise on Timber was established in June 2004, initially focussing on definitions for legal and sustainable timber. The UK approach envisions that preference for public contracts will firstly be given to sustainably harvested timber, and secondly, to timber that can at least meet minimal standards of legality. Asian countries should closely monitor progress in the UK and other states with more advanced procurement policies, with a view to reforming their own timber and wood product requirements in public contracts.

Conclusion: Meeting the challenges for sustainable forest management in Asia

Broad appreciation of the need for SFM now exists within Asian countries. Unfortunately, this recognition has not been translated into practice on a large scale, though new innovations discussed in this chapter are signs of progress. The following key strategic messages can be drawn from the preceding discussion:

(i) Forestry must be positioned within a broader inter-sectoral approach to rural development

First, as many of the underlying causes of forest loss and degradation cut across all sectors of the national economy, forestry must not be viewed in isolation; rather, forestry must be positioned within a broader inter-sectoral approach to rural development. In this chapter, the discussion on instruments to tackle the ongoing depletion and degradation of natural forests was necessarily restricted to the forestry sector. Yet, solutions to the forest crisis must also be sought in policy reform outside forestry. For example, agricultural policy has an important role to play in reducing pressure on remaining natural forests. Agricultural research and policy can mitigate the demand of expanding populations for land by improving the productivity of existing agricultural land, by providing land-use opportunities to the landless and by creating off-farm employment opportunities. The call here is for a second "Green Revolution" in which new agricultural technology is not just made available to larger landholders, but also to smallholders with little capital, as well as to the landless.

(ii) Reform of governance structures is critical

Second, governance mechanisms that hold decision-makers accountable and reflect the legitimate concerns and aspirations of all social groups, not merely those with influence, are critical. The mixed experience with decentralisation of forest management in the region indicates how difficult a task this is. The manner in which forests are governed in the Asian region is being shaped by the interplay of a complex and often competing set of dynamic global, national and local forces and an increasingly diverse array of actors. Many of these forces, if left unchecked, are clearly not conducive to SFM.

(iii) Ecological concerns must be melded with sustainable livelihoods

Third, to achieve SFM ecological concerns must be melded with efforts to build sustainable and adequate livelihoods. Living standards are said to have generally improved in many Asian countries, but poverty remains widespread and the challenge remains how to improve livelihoods without irreparably damaging the natural resource base. Clearly, ecological policies that do not pay heed to the livelihood needs of resource poor communities are not only unjust, but, as spelled out by the experience of some national parks, are likely to be ineffective. Conventional interventions to build livelihoods through the sustainable use of natural resources such as agro-forestry and homestead forestry have considerable potential for expansion. Newer approaches, such as involving local communities in providing services to tourists visiting national parks and small forestry enterprise certification, must also be pursued to their fullest potential.

(iv) Innovative market and trade instruments needed that promote and reward sustainable forest management

Fourth, consumers and producers, as well as developed and developing countries, must be brought together to support trade practices that prioritise the conservation of forest resources. Globalisation is often described as a contraction of both time and space; due to advances in communications and transport technologies, goods can be transported rapidly around the globe from the site of production to that of consumption. While this phenomenon is usually viewed in positive terms, the contraction of space removes consumers from the immediate impacts of production processes. A teak chair manufactured from timber in Indonesia that finds its way to a furniture store in Europe may be associated with illegal harvesting processes, unsatisfactory working conditions and the destruction of local livelihoods. How is the consumer to know this? Forest certification offers one means of altering production processes and consumption patterns to more sustainable ones. The reflection of SFM concerns in public procurement policies might also act to catalyse trade in sustainably harvested timber. Bilateral arrangements could likewise play an important role in curbing trade in illegal timber and may be an important step towards a regional trade mechanism. Given the extent of illegal and destructive logging practices in Asia, as well as the involvement of powerful interest groups, the challenge remains immense.

CHAPTER 4

Water resource management in Asia:
Integration and interaction for a better future

Water is an essential resource for human beings to sustain life. It is also a critical resource to attain sustainable economic and social development. As population growth and economic expansion accelerated over the past few decades, water use expanded. As a result, the gap between water availability and water demand has increased, bringing about a serious water crisis in many regions of the world. The water crisis included widespread water scarcity, water quality deterioration, and the destruction of natural aquatic ecosystems. It is projected that about 3.5 billion people, approximately 6.5 times as many people as in the year 2000, will populate water-stressed countries by 2025 (Cosgrove et al., 2000). Water resources in Asia have already been threatened, both in terms of quantity and quality, and they cast a shadow on sustainable development in the region.

The fundamental objective of water management is to supply water where and when it is needed. However, past water management often emphasised "how to increase the water supply to meet the increasing demand" and paid little consideration to water resource conservation. Water management governance has often been fragmented, and coordination among water-related agencies has been weak. The centralised decision-making system has often been criticised because it could not reflect the local needs and conditions regarding water. It is often pointed out that weakness of such a centralised yet fragmented water management system is one of the root causes of the current water crisis. In view of this, a consensus has emerged at the international level. A fundamental paradigm shift is urged for countries towards the sustainable management of water resources. The proposed paradigm is often characterised by the following: cross-sectoral integration, decentralisation, and demand-driven. Since the late 1990s, water has attracted a lot of international attention as one of the priority issues to promote sustainable development.

Asia has the largest population in the world and as such it has faced most of the problems mentioned above in a more serious manner. To counter this situation, substantial efforts have been made in various parts of Asia to address the problems and there have been some positive achievements. This chapter examines the positive developments made in the region for better water resources management, with particular focus on participation and interaction of the various stakeholders in water management. Stakeholder participation is not a panacea for sound water management, but it certainly is one of the most essential approaches as it addresses the need for a more decentralised and demand-driven water management.

Water-related issues are broad, but there are two conspicuous issues that have commanded significant international attention. They are the supply of safe drinking water and the promotion of integrated water resources management. As a matter of fact, both were included as "international goals" in the UN Millennium Declaration and the Johannesburg Plan of Implementation. This chapter focusses mainly on these two issues.

The state of water resources in Asia

Water resources in Asia

The absolute volume of water resources in Asia is 13,500 km^3 per year or 32 per cent of world's freshwater resources which is larger than any other continent of the world (Fig. 4-1). However, the region is the

home to approximately 60 per cent of the world's population, but water availability per capita is only about 4,000m^3/year, the smallest in the world and less than half of the world average (Shiklomanov, 2000). The population in the region is predicted to increase to 4.8 billion by 2030 (UN, 2004), therefore the situation is likely to deteriorate in the future unless appropriate action is taken.

Fig. 4-1: Regional distribution of water resources
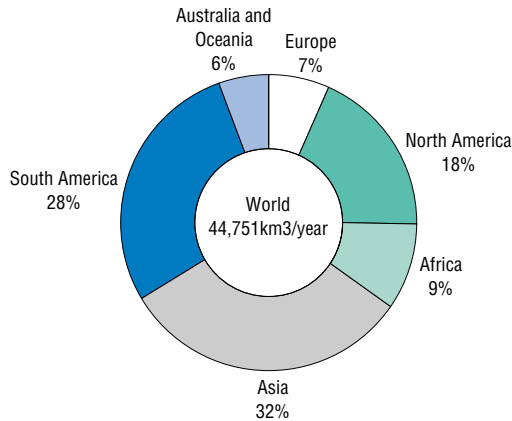
Source: Igor A. Shiklomanov, Summary of the Monograph
"World Water Resources at the Beginning of the 21st Century"
(http://webworld.unesco.org/water/ihp/db/shiklomanov/summary/html/
summary.html#Renewable%20water%20resources)

It should be noted that there is substantial variance in the availability of water resources in the region (Fig. 4-2 and 4-3). In general, Southeast Asian countries have higher water availability than other sub-regions, and South Asian countries have the least water resources. The absolute volume of water resources in China is large (Fig. 4-2). However, on a per capita basis, it is only 2,000m^3/year which is close to the figure generally accepted as the water shortage level (1,700m^3/year). South Asian countries accommodate large populations, but the water resources available are limited. Naturally water shortage in these countries is very serious.

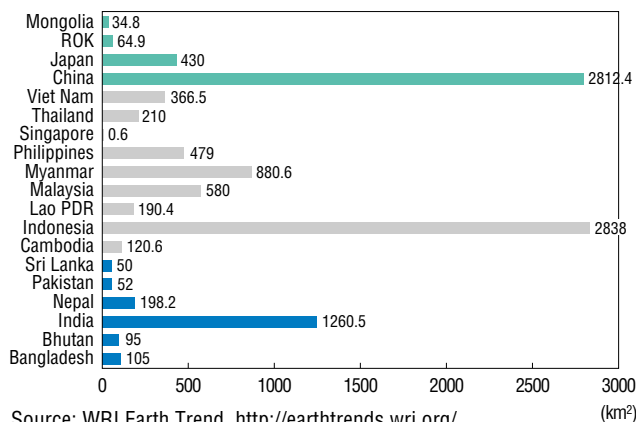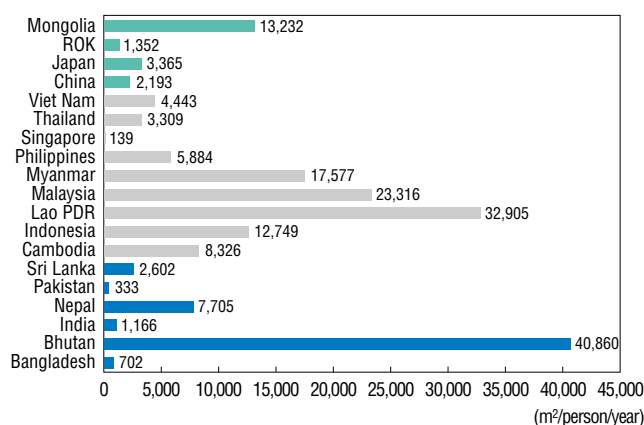**Fig. 4-2: Renewable water resources by country**

Source: WRI Earth Trend. http://earthtrends.wri.org/   (km^2)

Fig. 4-3: Water availability per capita by country

Country	m²/person/year
Mongolia	13,232
ROK	1,352
Japan	3,365
China	2,193
Viet Nam	4,443
Thailand	3,309
Singapore	139
Philippines	5,884
Myanmar	17,577
Malaysia	23,316
Lao PDR	32,905
Indonesia	12,749
Cambodia	8,326
Sri Lanka	2,602
Pakistan	333
Nepal	7,705
India	1,166
Bhutan	40,860
Bangladesh	702

Source: WRI Earth Trend. http://earthtrends.wri.org/

Also noteworthy is the seasonal variations of water availability. For example, Tianjin in China receives approximately 65 per cent of its annual rainfall (about 550mm/year) from June to August (Xu et al., 2004). In the dry season, even countries with relatively abundant rainfall face water shortages, which often cause conflicts among water users. On the other hand, in the rainy season, people often suffer from flooding. Especially in areas under the influence of monsoons, people suffer both from water shortage and floods.

Growing demands and increasing of social and environmental pressure

Water demand has increased in Asia with population growth and economic expansion. Securing water for agriculture, the biggest water-use sector, has been a challenge for many countries of the region, especially because increasing the volume of water has been simultaneously necessary for industries and households. The issue is also closely related to food security in the region. There has been some progress in the reduction of agricultural water usage because of more water-efficient irrigation technologies such as drip irrigation (Cosgrove et al., 2000), and traditional practices such as "subak" in Bali - a collaborative and participatory local water allocation system of irrigation. Rice paddy fields not only provide food, but play an important role in flood control and groundwater recharge. In the Asian context this fact deserves full recognition.

Water withdrawal for industry and households is projected to increase in most countries. In China, industrial water use accounted for 10 per cent of the total water usage in 1980. It rapidly increased to 25 per cent by 2000. In Malaysia, it expanded from 10 per cent in 1990 to 21 per cent in 2000 (FAO AQUASTAT). Industrial water withdrawal in Asia is projected to increase to 9.5 per cent of the total by 2025, from 6.9 per cent in 1995. During the same period, domestic water withdrawal is expected to increase from 9.9 per cent to 15.2 per cent (Shiklomanov, 2000). The rate and absolute volume of increase in water consumption in Asia has been and continues to exceed substantially other regions in the world (Fig. 4-4). It is projected that 2.4 billion people in the region will suffer from water stress in 2025, almost double the 1995 figure (Cosgrove et al., 2000).

Fig. 4-4: Increase of water consumption by region
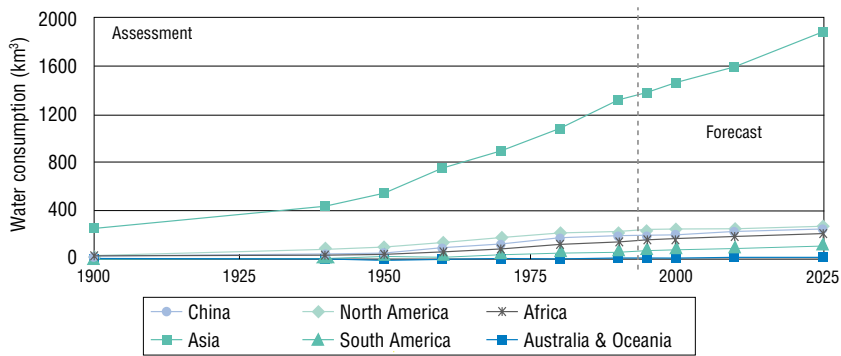
Source: Igor A. Shiklomanov, Summary of the Monograph
"World Water Resources at the Beginning of the 21st Century"
(http://webworld.unesco.org/water/ihp/db/shiklomanov/summary/html/
figure_8.html)

As demand for water further increases, conflict over limited water resources among different water users is likely to exacerbate. Conflict between up-stream users/countries and down-stream users/countries could be more frequently observed in the region. Asia has as many as 53 international rivers. As urbanisation proceeds, water use in cities will increase, which is likely to intensify competition over water resources between urban and non-urban areas.

Over-exploitation and the inappropriate development of water resources could result in significant environmental degradation. For example, over-intake of water and the construction of dams could significantly affect river ecosystems. Overexploitation of groundwater could cause a lowering of the water table that often results in land subsidence. Land subsidence is essentially irreversible and could increase the likelihood of flooding during high tides and vulnerability to natural disasters, such as a tsunami.

Degradation of water resources

Deterioration of water quality is recognised as one of the most serious environmental problems throughout the region. Biological oxygen demand (BOD) in Asian rivers is now 1.4 times higher than the world average. Also, the amount of suspended solids in rivers is four times higher than the world average (UNEP, 1999). Asian rivers also contain three times as much bacteria from human waste as the world average and more than 10 times the safety level suggested by the OECD guidelines (UNEP, 1999). Deterioration of water quality causes water-borne or "dirty-water" diseases such as hepatitis A and E, typhoid, cholera and diarrheal disease. It should be noted that globally an estimated 4 billion cases of diarrheal disease occur each year, causing 3 to 4 million deaths, mostly among children (www.infoforhealth.org). Water pollution has often seriously damaged local fisheries. Heavy metals and toxic chemicals contained in effluent from industry and agriculture have serious health impacts. It is reported that Asia's surface water contains 20 times more lead than the average of OECD countries (ADB, 1997). Arsenic pollution in groundwater has been a serious threat to the people of Bangladesh and some adjacent parts of India. Agricultural use of fertilisers and pesticides are causing growing concerns in China and countries of the South and Southeast Asian sub-regions.

Such degradation of water resources negatively impacts both human health and natural ecosystems. The economic loss caused by water pollution in the Yellow River is estimated at over US$500 million per year (Changming Liu et al., 2002). It is important to recognise that water pollution reduces the volume of water
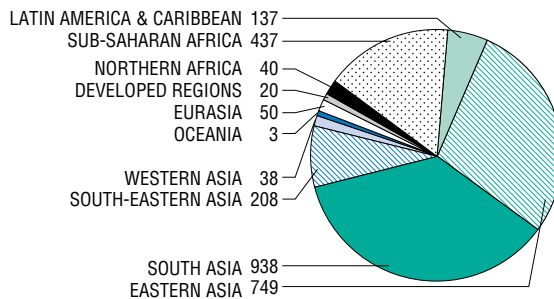
resources available, since polluted water cannot be used for productive purposes.

Safe drinking water and adequate sanitation - meeting international goals

Access to safe drinking water and adequate sanitation have been among the priority global concerns for decades. The Millennium Development Declaration and the Johannesburg Plan of Implementation (JPOI) in 2002 included quantitative targets regarding water supply and sanitation, i.e., to halve the proportion of the population that do not have access to a safe water supply and adequate sanitation by 2015. How to achieve these two targets remains a daunting challenge. The rate of access to the water supply has increased in the region over the last two decades, but still two-thirds of the 1.1 million people without access to safe water live in Asia (WHO and UNICEF, 2004). Those without access to safe water in China alone is equal to those with access to safe water in all African countries combined (WHO and UNICEF, 2004). Obtaining water for the household is often the job of women and children. The amount of labour spent by women drawing water for household use is estimated at about 150 million work days per year in India, the equivalent to a national loss of income of about US$208 million (UN-Water, 2004).

The absolute number of people receiving adequate sanitation has increased between 1990 and 2002 in the region, with a 13 per cent increase in Southeast Asia, 17 per cent in South Asia and 21 per cent in East Asia (WHO and UNICEF, 2004). However, many people in these sub-regions still do not have access to adequate sanitation systems. For example, one third of the population in South Asia live without adequate sanitation (WHO and UNICEF, 2004). As shown in Fig. 4-5, more than 60 per cent of the world's population without improved sanitation live in Asia. The rural and poor populations have even less access to a safe water supply and sanitation systems. This has serious health implications.

Fig. 4-5: Population without improved sanitation by region in 2002 (in millions)

LATIN AMERICA & CARIBBEAN	137
SUB-SAHARAN AFRICA	437
NORTHERN AFRICA	40
DEVELOPED REGIONS	20
EURASIA	50
OCEANIA	3
WESTERN ASIA	38
SOUTH-EASTERN ASIA	208
SOUTH ASIA	938
EASTERN ASIA	749

Source: WHO and UNICEF. Meeting the MDG drinking-water and sanitation
        target: A mid-term assessment of progress
        http://www.who.int/water_sanitation_health/monitoring/
        jmp2004/en/ (15 November 2004)

International water dialogues and their implications to Asia

Development of international water dialogues

Policy dialogue at the international level has influenced significantly national and local policies, as far as water issues are concerned. In fact, international political pledges have been a driving force to mobilise political, financial and human resources at the national and local levels. International and regional organisations have served as catalysts to mobilise financial support and other assistance for developing countries. For example, the Mar del Plata Action Plan in 1979 requested that countries develop national plans regarding water supply and sanitation at the community level. Subsequently, the United Nations initiated its International Drinking Water Supply and Sanitation Decade in the 1980s. With the support of relevant international organisations, the decade stimulated development of water-related infrastructure. Asia achieved a significant increase in water supply infrastructure during that decade.

Fig. 4-6 indicates the change in the international agenda regarding water. With time, issues have become more diversified. The International Conference on Water and Environment in Dublin in 1992, set the recent trend on water resources management. At the Dublin Conference, the economic value of water resources was highlighted and water pricing issues received attention. Environmental services provided by water resources became an important point for discussion. The Dublin Conference identified "integrated water resource management (IWRM)" as the most important concept for sound water management.

Fig. 4-6: Development of international dialogues in the water sector

1st Period: 1970-the early 1980s: Human health issues ignited international discussion of water
- The Mar del Plata Action Plan in 1979 calls countries to develop national plans and programmes regarding the provision of water supply and sanitation systems at the community level.
- United Nations International Drinking Water Supply and Sanitation Decade in the 1980s

2nd Period: 1980s-the early 1990s: Growing recognition of water as an element of sustainable development
- Negative social and economic impact of water issues became highlighted. Such negative impacts include water pollution, water disputes, destruction of natural ecosystems.
- Dublin Principles in 1992 that refer to the economic value of water, and the importance of "integrated water resource management."
- Chapter 18 of Agenda 21 at UNCED in 1992 shows various agendas related to water.

3rd Period: 1992-2000 Water issues jumping to priority issues
- World Water Vision presented at the 2nd World Water Forum greatly promoted awareness of the critical conditions of water to international community.
- In the Millennium Development Goals, a goal for safe water supply was included (to halve the portion of the population without adequate water supply.
- Johannesburg Plan of Implementation in 2002 reaffirms the water supply goal of the Millennium Development Goals and also set a sanitation goal. It also requests countries to formulate integrated water resources management and water efficiency plan by 2005.
- The 3rd World Water Forum was held in Kyoto, Japan as the first major international conference on water in Asia.
- The UN Commission of Sustainable Development (CSD) reviews the progress of implementation on water and sanitation sectors during 2004-05 as biennial thematic review.

Non-governmental bodies as emerging players in the international dialogues on water

UN agencies, international financial institutions, and regional organisations provided the lead in international agenda setting regarding water, until the Dublin Conference. Since then, the international water agenda has been further developed by the two major international bodies, i.e., the World Water Council (WWC) and the Global Water Partnership (GWP) that were both established in 1996. While both have maintained close relationships with their main founders (the World Bank and UN agencies, as well as academia and other stakeholders related to water), they have also broadened their constituency by institutionalising a democratic decision-making structure.[15] The WWC intends to be an "international non-profit umbrella organisation" that brings key stakeholders together. On the other hand, the GWP would like to act as a facilitator for implementation. Both the WWC and GWP enjoy a considerable membership worldwide, ranging from NGOs, public and private sectors, and international organisations.

In 1997, the WWC initiated World Water Forum (WWF), a triennial international conference on water. The WWF was designed to provide a platform for open discussions on water among various stakeholders, and to channel voices of stakeholders to high-level political processes. The World Water Vision developed in 2000 by the WWC became a driving force in making water one of the top priorities among the sustainable development agenda. The World Water Vision was a comprehensive assessment of world water situations, and approximately 15,000 persons, at local, national, and international levels, participated in the development process. The GWP formulated through a participatory process the "Framework of Action," which included a summary of regional, national and local strategies, and recommendations for actions to deliver "tangible results." Both the World Water Vision and the Framework of Action were presented at the 2nd World Water Forum (WWF2) in 2000. Involvement of various stakeholders in both processes helped raise public awareness of water issues, and laid a basis for future collaboration among different stakeholders. The 3rd World Water Forum (WWF3) and Ministerial Conference was held in Kyoto, Japan. It was the first major water conference held in Asia (Box 4-1).

Local actors have increasingly voiced their views in the international arena. Representatives of local NGOs and community groups expressed diverse views, taking local interests into account, which range from water supply issues to the conservation of the aquatic environment. Networks of NGOs have been established, which include the International River Network, Public Service International, and the Water and Gender Alliance. NGOs serve as watchdogs in the international scene and as providers of information for local people. They represent local communities, the poor and the marginalised in general. They were astute in pointing out the risks associated with the privatisation of water supply services.

In Asia, NGOs and their networks have been active in the promotion of local activities and convey the voices of local communities to regional and international policy forums. NGOs and their networks have been instrumental in bridging international funding institutions and local communities. For example, the Gender and Water Alliance (GWA) is working together with the ADB in promoting gender mainstreaming into ADB's water sector programmes since 2003.

Box 4-1: Implications of the Third World Water Forum for Asia

The Third WWF (WWF3) held in Kyoto, Japan in 2003, was the first major international conference held in Asia exclusively devoted to water issues. Excluding those from Japan, as many as 1,647 people from Asia and the Pacific participated (Secretariat of the WWF3 and WWC, 2003). WWF3 was an opportunity to raise awareness of water issues, and to promote more public participation in local water initiatives. WWF3 was considered significant in that it successfully incorporated the "Asian" perspective more in international dialogues, and it further enhanced participation of stakeholders.

Before WWF3, there was criticism that WWF did not reflect "Asian perspectives." Issues important to Asian monsoon areas and multiple functions of rice paddies had not been properly covered. For example, the Action Plan produced at the 1992 Dublin Conference recognised the importance of agricultural water from the food control viewpoint, but it also stated that water should be saved for other sectors. Participants from Asia insisted that rice paddy farming in Asia did not waste water although it used a lot. They argued that the multiple functions of rice paddy farming, such as flood control and groundwater recharge, should be fully recognised. To reflect this concern, the Ministerial Declaration of the WWF3 stated that "a diverse array of agricultural practices and agricultural economies have evolved in the world." Flooding was a major concern to many Asian countries, and at WWF3, flooding issues were highlighted more than before.

Another criticism against the WWF was the participation of stakeholders. To counter this, WWF3 was made fully open to the public. The secretariat of WWF3 collected "water voices" from various stakeholders and accepted all the requests to organise various sessions. As a result, as many as 351 sessions were organised under 31 themes (Secretariat of WWF3 and WWC, 2003). The most controversial session on public-private partnership was co-organised by two opposing organisations that could not come to an agreement. Such openness of WWF3 was welcomed by NGOs, who were strongly opposed to private sector participation in water services. On the other hand, WWF3 was a disappointment to the private sector that had expected the WWF to promote private sector participation.

WWF3 provided an opportunity for Asia to promote people's awareness of water and consolidate relevant activities in the region through a series of regional and sub-regional preparation meetings. Key participants in the preparation meetings gradually established networks and facilitated mutual understandings. Such development of regional networking could be a key factor in promoting further regional actions for water issues.

Interaction of international actors in water management in Asia

As Fig. 4-6 indicates, water issues have become more diversified with time. This, in turn, has increased stakeholders at all levels. Coordination among stakeholders and strategies to generate synergies has become essential.

In Asia, there are some joint programmes between the United Nations and regional financial institutions. "Water for Asian Cities" is one such example in which the ADB and the UN Habitat are involved. However, the dominant form of collaboration in Asia seems to be initiatives between international organisations and NGOs. For example, the ADB has developed many partnership projects with NGOs, including the GWP, the Water Gender Alliance, the Water and Sanitation Programme, and Network of Asian River Basin Organizations. The UNDP has promoted a programme called "CapNet," capacity-building for countries in the region in which the GWP is involved. This trend may be a reflection of the fact that NGOs have closer contacts with local stakeholders and thus act as facilitators of more effective project implementation.

The partnership approach taken by the Global Water Partnership seems effective in promoting linkage between international initiatives and local/national actions. The GWP has lead discussions on "good water governance" and "practices of integrated water resource management." It developed a database of good practices in integrated water resources management named "Tool Box." The GWP also actively provides expertise to developing countries through its regional technical advisory committees (regional TAC). In Asia, there are three TACs, namely, South Asia TAC (SA-TAC), Southeast Asia TAC (SEA-TAC), and China TAC. TAC members are often close to those directly involved in national water policy planning in each country, and therefore their activities often have a direct impact on national policies. The sub-regional TACs played a prominent role in the formulation of regional and national water visions for the WWF2. Sub-regional TACs organised workshops and training to build capacity for each country. Sub-regional TACs also facilitate the translation of the international water agenda into action at the local level. For example, in China, a water partnership in Heibi Province was launched in 2003. In Southeast Asia, the partnership among water stakeholders catalysed by the TAC resulted in the establishment of the Association of Southeast Asian Nations (ASEAN) Working Group on Water Resources Management (AWGWRM), which was expected to be transformed into a sub-regional water partnership by 2004.

The GWP itself is an international non-governmental organisation, but it has set up regional and national GWPs and TACs. These regional, and national GWPs have provided services customised to national situations, which have made the GWP an influential body in policy-making and implementation in developing countries in Asia. Currently, the GWP, in partnership with the ADB and ESCAP, plays a key role to support preparation of integrated water resource management strategies for countries in the region.

To transfer current water management to effective and efficient ones, some countries in Asia have been promoting sector-wide water reform,[16] and we can see some promising developments in the following sections. The World Bank and the ADB have been major contributors to the success of the development of water sector reform in several Asian countries. For example, water sector reform in Indonesia, including the institutionalisation of river basin organisations, was originally based on the World Bank's Water Resources Sector Adjustment Loan (WATSLA) (Ministry of Settlements and Regional Infrastructure of Indonesia, 2003). Bangladesh's Ministry of Water Resources was established and the Water Resources Law was formulated under the support of the World Bank and the ADB. Besides Bangladesh, the ADB financially and technically assisted water sector reform in Cambodia, China, Lao PDR, Sri Lanka, and Viet Nam by conducting comprehensive studies of strategic options available for the water sector. One conclusion of the study in Sri Lanka, for example, recommended the establishment of the National Water Resource Authority (NWRA) which plays a central role in policy formulation for water management in the country.

The modalities of the assistance provided by international financial institutions are now a major driving force to promote water sector reform in the region, but they often result in conflict with local communities. An example of such conflict was brought about by the ADB's Agriculture Sector Programme (ASP) in Thailand that aimed at achieving sustainable growth of the agriculture sector through agricultural sector reform. The ASP required an increase in productivity, enhancement of production of commodity crops, reduction of subsidies and the introduction of a cost-recovery system. In the Water Act drafted under the ASP, water charges to all water users, including farmers, were introduced as a measure to promote efficient water use as well as to recover the cost of water supply services. The draft act was strongly opposed by farmers on the grounds that it would have negative impacts on small farmers who could not afford to pay for sufficient water for their production. A major controversy over the water-use charges erupted across the country with outcries from farmers, NGOs, and academia. The ADB gave up on the cost-recovery scheme contained in the ASP. A draft of the country's water act dropped the section on charging farmers for water use. One of the other contentious issues in the draft legislation was the definition of owner-

ship of water. The draft act stated that water belonged to the government. There was no clear definition of ownership of water in any form and local people have often followed local rules of ownership, and there was anxiety that such a definition of ownership of water could deprive existing water use rights to small farmers and poor communities. Similar requirements to introduce water charge systems and ownership of water had been included for other countries in the region as a condition of financial support by international financial institutions. Such countries included Sri Lanka and Indonesia, and popular protests took place in these countries as well.

Many countries in the region depend on international financial institutions for funds for development and confront a difficult and dynamic tension in trying to reconcile local and national political realities with the requirements stipulated by institutions such as the World Bank or the Asia Development Bank. Such financial resources come with conditions that influence the water sector reform of recipient countries and may bring social conflicts as described above. However, water sector reform is originally an attempt to change existing piecemeal or ad hoc management, and also to introduce demand control by introducing an appropriate legal framework and economic instruments (e.g., charge for water use) for more rational water use. Such a reform often brings conflict with the existing rules and vested interests in specific water beneficiaries. The current controversy over water sector reform issues is not always based on rational discussions. Current efforts to involve stakeholders in water policy-making will help, however, to promote mutual understandings over water management and to promote water sector reform in the long run.

Development in integrated water resource management in Asia

Integrated Water Resources Management (IWRM) aims to take into account the multiple nature of water resources and is an important concept of water management. According to the baseline document of IWRM prepared for WWF4, integration should be realised in ways such as between groundwater and surface water; land and water; the river basin and its adjacent coastal and marine environment; upstream and downstream interests. The concept was based on the reflection of the failure of sectoral management of water resources. The Johannesburg Plan of Implementation in 2002 included an international target that countries should prepare an IWRM plan by 2005. In recognition of the importance of the integrated approach for water management, many countries in the region have embraced the concept.

Institutional arrangement for integration

It is common in Asia to have a number of ministries responsible for various aspects of water resource management, including water supply, sanitation, irrigation, industry, and the environment. First attempts to implement IWRM have often been manifested by the integration of such fragmented and sectoral institutions.

In countries such as China, India, Thailand, and Viet Nam, some of the water-related ministries/agencies were restructured and integrated into new ministries to improve the effectiveness and efficiency of water resource management. In general, there are two types of integration. The first type is the creation of a "ministry of water resources" after the integration of water-related departments/sections in different ministries. India, Bangladesh, and China have made this type of integration. The integrated water resource ministry is responsible for activities such as formulating water resources development policies, managing allocation and conducting scientific research. Usually water quality and environmental conservation issues remain the domains of the Environmental Ministry. With coordination by the Water Resource Development Ministry and the Environmental Ministry, sustainable water management both in quality and quantity is pursued.

The second type of integration is the creation of a ministry that is responsible for water resource development with the exception of those responsible for irrigation and environmental conservation. This type is relatively new and based on the concept of natural resource conservation. Thailand and Viet Nam took this path in 2002. Both counties restructured their ministries of Science, Technology, and Environment, and created a ministry of natural resources and environment. This type of integration holds great potential for realising the comprehensive management of water resources in both quantity and quality. However, the responsibility for water management of the agricultural sector, which consumes the most water among other sectors, is still with the ministry of agriculture. How to facilitate effective coordination between the ministry of natural resource management and the agricultural ministry remains an unmet challenge (Box 4-3).

It will take time to see the positive effects of the creation of a new ministry for more coordinated policy-making and implementation in the water sector. However, such institutional reform, in both types of integration, can help facilitate information flows among water-related departments. Institutional arrangements in support of this will require further and more concerted attention if successful outcomes are to be realised.

Box 4-2: Examples of institutional attempts at improved integration

In Asia, many countries have established a national coordination body for that purpose, which in many cases is chaired by the head of state, with ministers of the water-related ministries serving as its members. A water-related ministry (department) that has taken the lead role in water resource development, such as the ministry of water resources, often implements the decisions of these bodies.

For example, Thailand's National Water Resource Committee (NWRC), established in 1989, is independent from water-related ministries. The NWRC is chaired by the Deputy Prime Minister and consists of representative of water-related agencies. Its Office of National Water Resource Committee (ONWRC) is an independent secretariat under the Prime Minister's Office. Such an independent secretariat could contribute to the strengthening of the coordination capacity of the apex body, although it was pointed out that the ONWRC is less effective than expected because it could not work well with an insufficient budget and a limited staff (Pattanee et al., 2003). Currently, the Department of Water Resources, created as the result of institutional reform in the water sector, plays the secretariat role for effective coordination.

In the Philippines, there are two coordination bodies: the National Water Resource Board (NWRB), established under the Water Code in 1974, and the Presidential Taskforce on Water Resources Development and Management (PTFWRDM), established under Executive Order no. 374 in 1996. The NWRB is chaired by the secretary of the Department of Public Works and Highways. On the other hand, PTFWRDM's chairperson is the secretary of the Department of Environment and Natural Resources (DENR). The vice-chairperson is the chair of the NWRB. It appears that some functions are duplicated in the two bodies and need to be clarified. In Sri Lanka, the Water Secretariat was created to formulate water policy and coordinate water-related institutions. However, there is still fragmentation of water-related institutions and coordination among institutions is not enough. For example, there are two main institutions of water management, namely the Water Supply Board and the Water Resource Board, both of which were created by a decision of parliament. The former organisation is in charge of the water supply and promotes surface water use. The latter is in charge of water resource development and focusses mainly on groundwater resources. The difference of focus areas between the two organisations is not considered significant, and it seems to have formed a barrier to the sustainable use of available water resources in the country.

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Box 4-3: Institutional reform in Thailand

In October 2002, Thailand experienced a major reform of the public sector. The establishment of the Ministry of Natural Resources and Environment (MONRE) was significant in terms of water management administration in the country. It was developed from the Ministry of Technology, Science, and Environment (MOSTE) and is composed of four clusters, namely, coordination, environment, natural resources, and inland water resources. The responsibility of managing inland water resources that once belonged to the Ministry of the Interior was reassigned to the new Department of Water Resources. The responsibility of groundwater management is now transferred to the Department of Groundwater Resources of MONRE from the Mining Department of the Ministry of Industry. By incorporating the inland and groundwater water clusters, MONRE is to play an important role in water management in the country, both in quantity and quality - ranging from water resource development, water resources rehabilitation and water crisis prevention to pollution control. Government policy on the management of natural resources, including water, is expected to be more effective and efficient under the new ministry. Before the restructuring, the budget of 6.65 billion baht was split up between seven departments in six ministries. Water resources management is now the responsibility of MONRE, which intends to furnish a comprehensive, cost-saving water resource control policy. As well, communication between the environment cluster and the inland water resources cluster under it is to be facilitated both formally and informally.

As the ministry that has the comprehensive responsibility for water resources, MONRE faces a lot of challenges. One of the most important is the coordination with the agricultural development sector under the responsibility of the Royal Irrigation Department (RID). The Bangkok Post reported that there were conflicts between RID and the Department of Water Resources of MONRE over small irrigation ("Ministries in battle over jurisdiction." Bangkok Post, 2 February 2003). The DWR asserted that they had responsibility for small irrigation for more comprehensive river basin management. On the other hand, RID insisted that all responsibility of irrigation belonged to it. Such conflicts with the agricultural sector may happen in the implementation stage.

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Integration of Stakeholders at a Basin Level

Many countries have been trying to incorporate the integrated approach in river basin management. This includes assigning high importance to involving local people directly in river basin management through the adoption of participatory approaches. In most cases, the national government takes the lead by setting up river basin organisations and provides them with support.

In Indonesia, river basin management is promoted by the Water Sector Adjustment Policy of the World Bank. In 1989 the national government of Indonesia identified 90 river basins, and then in 1990 specified authority for their management. The river basins were divided into three categories based on their administrative bodies. The majority of 73 river basins are under the responsibility of the provincial governments, 15 are under the national government, and two are under public corporations. More then 40 river basin water resource management organisations (RBOs) have already been set up. The RBOs rely on finanacing from the national and provincial budgets and several RBOs received loans from the World Bank. In practicing management at the basin level, many constraints have been identified, such as conflicts between national and local laws, overlapping authorities among the institutions concerned, shortage of human resources and their capacity, lack of hydrological data and monitoring activities, and insufficient participation of stakeholders (Helmi, 2003).

In Thailand, the national government divided up its 25 river basins. Under the National Water Policy, the RBOs or river basin commissions (RBCs) are to be organised for each river basin. According to the draft water act, which is being considered at the national assembly, each river basin commission is to have its own juridical mandates to set policies on the management of water resources and the planning, development and operation of water related facilities, to deal with water allocation, and to oversee all related activities in the river basin including conflict resolution between different users (Pattanee et al., 2003). The commission is to consist of qualified persons from the public and private sectors. Under the Chao Phraya Water Resources Management Strategy, the Chao Phraya Basin Organisation was established in 1997 with the financial support of the World Bank. The Office of National Water Resource Committee (ONWRC) was made responsible for the project. The ONWRC took the bottom-up approach and established RBCs in eight sub-basins. Major water-related agencies, water users, NGOs, farmers' cooperatives, academics, and local governments participated in the RBC activities. Besides the Chao Phraya basin, the ONWRC established three RBCs for the Upper and Lower Ping River and Pasak River basins in 1999 and has launched a number of pilot case studies. Through pilot studies in four RBCs, experiences and expertise will be accumulated and utilised for the establishment of RBCs in the rest of the basins (Pattanee and Aekaraj, 2003). Anukularmuphai concluded that the river basin approach was not successful in the initial stage because there are "no real drivers" to lead effective management due to diversity of members of various agencies and "little input" from local stakeholders (Anukularmuphai, 2004). He submitted that there is still "a long way to go with respect to perfection," but substantial progress was made in basin management from 1999 to the present in terms of stakeholder participation for improving basin management. Some reasons for the improvement include: a) the introduction of a simple and flexible coordination approach to motivate stakeholder participation; b) better institutional arrangements, i.e. the establishment of working groups with infrastructural working groups at sub-basin, district, sub-district and village levels; c) the development of ownership of stakeholders through a series of consultative and working group meetings; d) the emergence of leaders from stakeholders as drivers of discussion; e) the introduction of election or popular consent system to select representatives which contributed to maintain transparency and representation of local interests; f) the support of expertise from donor agencies (the World Bank and ADB) and consultants. It took some time to realise the effectiveness of RBCs. There were many difficulties to overcome in order to make RBCs effective: the fragmentation of governmental responsibility; the limitation of administrative boundaries; less motivation of the local stakeholders; and, tensions among different water beneficiaries. However, the involvement of local stakeholders as direct users of water has the potential of changing current water management by awareness and behavioral changes.

In addition to the establishment of RBCs, partnerships between NGOs and national and local governments in water environment conservation have become popular in Thailand. In the Tachin River basin in Thailand, local people are actively engaged in water conservation activities and the national government supports their activities by providing expertise (Simachaya, 2002). An agreement with local community leaders on the conservation of the Tachin River was concluded and has become the legal basis for local activities. In Kudnamsai, located in Kohn Kaen Province in northeast Thailand, a water-quality monitoring initiative was developed by the collaborative efforts of local academic groups, NGOs, and village leaders during 1999 to 2001. Under the initiative, the Local Environmental Information Centre (LEIC) was established, and community volunteers played a key role in monitoring activities and collection of monitoring data on the Pong River. A series of workshops were held to enhance knowledge and know-how on water-quality monitoring for local people. The monitoring data collected was made available to the public on a local web site. The local initiative promoted local awareness of water-quality issues and also developed the capacity of local people to monitor water quality and take action themselves. It is also notable that the initiative provided a good scientific basis for community leaders and government officials to resolve local water conflicts and realise pollution abatement (Inmuong et al., 2003). In Japan, collaboration between local governments and

citizens has emerged in a few river basins. In the Sagami River Basin, Agenda 21 was developed after long but constructive discussions among local governments, private sectors, NGOs and local community.

The river basin approach is fairly new to many countries in the region. It is a challenge as it proposes to change the river management from the current sectoral mode without the involvement of stakeholders to a more integrated and participatory one. The Network of Asian River Basin Organisations, a new initiative to exchange experiences in the region first proposed by the Japanese government at the WWF3, was launched in 2004 in collaboration with the ADB. The initiative is expected to provide expertise and support regional efforts.

Notwithstanding its relative newness, it is possible to extract from river basin management efforts to date some general lessons and guidelines that may be helpful for future efforts. These would include the following:

- In practicing river basin management, the national government should be responsible for developing local capacity, coordinating institutional arrangements suitable to local situations, and providing financial resources.
- Local governments should enhance their capacity to practice the river basin approach and should take over the coordinating role of the national government as much as possible, because they have direct connection to the local people and are in a better position to facilitate the local people's welfare.
- Involvement of local stakeholders enhances awareness and capacity. Nakagami pointed out that effective river basin management required equality among stakeholders and consensus-building and flexible policy-making mechanisms to meet the actual needs of stakeholders to the extent possible (Nakagami, 1991). He also pointed out that voluntary actions of the local people could be generated when their needs and values were appropriately incorporated into the river basin management plan.
- Transparency of policy-making and ownership by the local people are also important elements to encourage voluntary participation of local stakeholders.

Box 4-4: Implication of river basin management for international water courses

In Asia, many rivers are running through more than two countries, and conflicts over water in these international rivers, such as the Ganges-Brahmaputra-Meghna (shared by India, Bangladesh, Nepal) and the Indus (by India and Pakistan), were historically observed. Riparian countries tried to solve and prevent potential conflicts through bilateral/multilateral agreement over shared water resources. Asia can use the Mekong River Commission (MRC) as a good example of a mechanism that promotes the collaborative management of international water courses. Under the MRC, various activities took place including: the monitoring of water quality, the assessment of water resources, capacity-building and researcher exchanges. Similar collaborative mechanism could be replicated in other international river basins. Like river basin management at the national level, the local people's participation could facilitate more effective management and problem-solving in the international river basins. Partnership projects, such as participatory monitoring, could be a starting point of participation for local people.

Interaction of stakeholders in the enhancement of water supply and sanitation

Improved access to a safe water supply and appropriate sanitation has been an international political issue for more than three decades. In Asia, the development of water infrastructure, such as dams and sewage systems, has usually been emphasised but not always well-operated and maintained because of inappropri-

ate technical and economic capability of local entities. In recent years, construction of large dams and sewage systems has become recognised as not always being an appropriate solution because they frequently brought about negative impacts on the environment and local people. In particular, the poor often could not receive benefits from infrastructure development and continue to live in unsanitary conditions.

Achieving the goal of safe water and sanitation for all is a complex issue. To improve the current situation, it is necessary to introduce appropriate technologies that communities can afford and manage themselves. There is also a need to set up institutional and financial mechanisms to introduce and manage such technologies. National and local governments should be strengthened to take primary responsibility in implementing and maintaining water-related services.

In Asia, a safe water supply and adequate sanitation should be considered in two contexts: namely, rapid urbanisation, and, large populations in rural areas. In urban areas, large water infrastructure is considered efficient, because of the scale of the economy in providing water service to an increasing population. In this context, the generation of financial resources should be considered as a priority and the opportunity for private sector participation should be investigated but with the condition that consideration be given to the needs of the urban poor. Water pricing is a good policy option to rationalise water use, but it should be designed to take into account the affordability of the poor in particular. On the other hand, in rural areas small-scale water supply services or community-level water supply systems are considered suitable, utilising simple technologies.

Public-Private Partnership – Is it an option for the urban water supply?

At the WWF3, a report entitled "Financing Water for All" by the World Panel on Financing Water Infrastructure was presented. The report stated that current spending on new water infrastructure in developing and emerging countries is roughly US$80 billion annually and that over the next 20 to 25 years this will have to be more than doubled to around US$180 billion. One of the most challenging and controversial issues was how to finance this huge water infrastructure need. The private sector had a strong interest in the water business and contemplated the liberalisation of the water market, including the water supply and sanitation services. Private sector participation, it is often said, will realise effective and efficient water management. At the WWF2 in The Hague in 2000, "privatisation" and "full-cost pricing"[17] were the keywords in the context of financing.

On the other hand, some NGOs expressed strong opposition to the involvement of the private sector because water was considered indispensable to human security, and the introduction of the market mechanism will interfere with people's right to access water. To secure equal access to water for all, "public-private partnerships (PPPs)" is often the way forward rather than privatisation.[18] There are some different modes of private sector involvement and they are selected based on local political, economic and social situations. PPPs themself are an evolving concept, and the following experiences in Asian countries could give some improvements for future PPPs in the region.

Experience of private sector participation in metro Manila

In Manila in 1995, it was reported that the poor spent up to 20 per cent of their income on water from vendors who sold lower quality water at 7.4 times the basic rate charged by the government-owned waterworks company (ADB, 2004). Problems existed in the water supply systems, such as illegal connections and leakage from aging water mains. To improve the water services, the operation of the water supply network was replaced by two companies in 1997 with a 25-year concession. The Manila Water Company took over the east zone of Metro Manila, while the Maynilad Water Services administered the west zone.

The initial result was that water tariffs decreased and supply areas increased after the two companies took over the water services. More people could access piped water, and areas with a 24-hour supply were expanded. Manila's experience was often cited as a successful case of private sector participation. Later, however, both companies raised the tariff gradually and the current rate now exceeds the original price charged by the state-owned company before privatisation. Although due perhaps, at least in part, to the unusual weather (El Niño) and the financial crisis brought on by the crash of the peso in 1997, the tariff increase became the target of harsh criticism by NGO and advocacy groups. This situation was further compounded in 2003 when the Maynilad Water Services announced that it would turn over its concession to the government-run Metropolitan Waterworks and Sewerage System (MWSS) because of heavy financial debt. This meant that not only the operation and management but also the debts incurred by the company would be returned to the state-owned agency. The net result is that the entire Manila privatisation of water is now widely cited as a typical failure of private sector participation with especially pernicious consequences for the socially-marginalised and the poor.

Table 4-1: Comparison of water tariffs (Philippine Peso)

	Manila water	Maynilad water
1997 (Pre-privatisation)	10.76	10.76
1997 (Post-privatisation)	4.02	7.22
1998	4.02	7.22
1999	4.26	8.23
2000	4.55	8.63
Jan-Oct 2001	5.1	9.17
Nov-Dec 2001	6.32	14.27
2002	9.38	19.92
2003	13.38	24.28

Community participation in public-private partnership – a more participatory option

The Manila experience has served to reinforce a negative viewpoint in some developing countries such as the Philippines and Indonesia with regard to wholesale privatisation of urban water supply. As a result, the new emphasis is on the concept of "partnerships" between the private and public sectors in which the public sector retains ultimate responsibility and provides a safety net for the water supply services. The problem is that, in many cases, national and local governments in developing countries do not have enough financial and institutional capability to provide the safety net. When promoting PPP, capacity-building of the public sector (government) to designing PPPs and adequate legal and institutional structure are clearly necessary.[19] Encouragement of private small-scale water providers can be more facilitated. In Dhaka and Delhi, for example, they play an important role in supplying water for poor areas, although some of them are illegal (McIntosh, 2003). Such a mix of formal and informal mechanisms could enhance private sector participation in a more sustainable way.

Following the failure of Maynilad, new arrangements with another company appears to be achieving positive social benefits. These arrangements may point to future directions in public-private partnerships. The first element is the provision of incentives to the employees. Area managers of the company have a responsibility for the day-to-day management of the water supply to the area assigned, and those who per-

form better will be financially rewarded (Llorito et al., 2003). This system created the right incentives to area managers and enhanced the efficiency and effectiveness of the services. The second element is the fact that almost the entire staff (95 per cent) of Manila Water transferred to the public-owned company, MWSS. With proper training and motivation, human resources with experience in local water services had been mobilised. The third element is the partnership with local communities. The company promoted new lines to poor communities to provide cheaper water for the poor and also promoted partnership projects with the local (Box 4-5). Flexible and participatory schemes, developed in partnership with local communities and rendered more suitable to local situations, could bring more water to poor end-users.

Box 4-5: Community participation in public-private partnership in Manila
– *Tubig para sa Barangay* –

Manila Water promoted "*Tubig para sa Barangay*," a project that means "water for the community." The project puts the responsibility of water management on a group of households or community group leaders, and promotes efficiency and effectiveness of the water supply by strengthening the sense of responsibility among group members. By the middle of 2002, 61,000 households had received new connections through the project. Basically, the company investigates the status of the target area, identifies community leaders and decides appropriate supply methods in communication with community members. There are three schemes available to local communities. In the first scheme, each household pays for an individual metered connection. In the second, 2-5 households share one metered-connection, for which payment is made as a group. One household acts as the leader and collects the payment from the rest of the group. The third option is the community-managed water connection, in which community leaders are responsible for meter reading, billing and collection of fees from all household members. The leaders can cut the connection if someone does not pay the fee. If a member does not pay the bill, other members of the group will suffer. Such group pressure encourages timely payment and also strengthens the sense of responsibility among community members for water supply services. Leakage and illegal connection are now reported to Manila Water by the community members. This has helped the company to reduce non-revenue water.

Source: ADB, Bringing Water to the Poor –Selected ADB Case Studies

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Potential roles of communities and local NGOs - a case in Dhaka

The role of communities and NGOs in water services has been recently highlighted in terms of sustainability of the services. The Dhaka case (Box 4-6) shows that local NGOs can be facilitators between the poor and the public sector in water supply. As Dhaka's case indicates, NGOs can often promote the access of local communities to water services better than public or private sectors. Better communication skills and a more flexible and transparent project management style could be the reasons for NGOs' better performance.

The Dhaka case also suggests that it is important for those working for water services operated either by public or private sectors to keep all stakeholders informed about the choices in technology and financial and other significant matters. Important information should be shared among major stakeholders in a transparent and timely manner.

Box 4-6: Intermediate role of NGOs in the water supply to the poor in Dhaka

The Dushtha Shasthya Kendra (DSK), an NGO in Bangladesh, succeeded in increasing the access to the public water supply and sanitation systems for some squatter settlements in Dhaka by playing an intermediary role between the poor residents and the Dhaka Water Supply and Sewerage Authority (DWASA). Thirty-two water points and five latrines were installed in two years (1996-1998), and the success encouraged other NGOs to follow the DSK model.

Before the DSK introduced the public water supply, residents of the squatter areas, mostly women, had to obtain water from nearby factories, offices, and illegal water providers. Poor residents even took water from a waste-water pool at a chemical company. Safe water is necessary for these poor residents. To provide safe water for the poor, DSK tried to persuade DWASA to construct public water and sanitation utilities for those who did not have legal tenure. In principle, DWASA policy did not provide connections to households without legal tenure of their plot. However, it agreed to provide the water service for the poor areas on condition that DSK guaranteed security deposits and bill payments. DSK tried to enhance the capacity of the poor community to operate and maintain the new facility by themselves. A few water management committees were set up, which were responsible for the management of water points and the collection of fees. Committee members were selected among individuals of poor communities, or in some cases, all members of the community participated. Regular group meetings helped monitor the status of water services. In some cases, water management committees generated savings and promoted hygienic activities.

Source: Rokeya Ahmed. 2003. NGO Intermediation: A Model for Securing Access to Water for the Urban Poor.
http://www.wateraid.org.uk/in_depth/in_depth_publications/1503.asp (15 November 2004)

Water Harvesting – An option for more water

In the face of limited water resources availability, one of the ways to create "usable" water is by water reuse and recycling. In Singapore, highly treated waste-water of drinkable quality was introduced as "NEWater." Because of technological advances that have reduced costs, seawater desalination has recently become an affordable option for some areas in the region, such as Singapore. Rainwater harvesting is another way to provide reasonably-priced water. Rainwater harvesting, which is the collection and storage of rainwater, can be practiced on rooftops, land surface or rock catchments. Water harvesting has a long history in Asia dating from ancient times, but in most areas it was abandoned as modernisation proceeded. However, as water shortage has become more serious, water harvesting has been gaining greater attention as a major source of drinking water, especially in rural areas. For example, in China, it is said that rainwater harvesting projects improved the domestic water supply for about 21 million people by the end of 1999. In the semi-arid areas such as Gansu, Shanxi, the artificially treated rainwater collection fields were built in an area of about 400 million square metres, to make rainwater collection more efficient (Qiang, 2004).

Water harvesting needs only simple technology and the initial and maintenance costs are not high. Therefore, local people can use and maintain water harvesting systems by themselves. Many success stories regarding water harvesting have been reported in many parts of Asia. One successful example is Thailand's "National Jar Programme" which was launched in response to the United Nations Water Supply and Sanitation Decade (1981-1990) (UNEP, 2002). The programme promoted the use of jars for rainwater collection in rural households with the involvement of local people. In the initial stage, the Thai government provided financial support for the selection of suitable technology, training, and construction

materials to local people because they could not afford the initial and maintenance costs and did not have the technical capacity. All the could provide was in-kind labour. Government interventions had been phased out over the course of the implementation period. Operation and maintenance costs, thereafter, had to be paid by the users themselves. However, many people gradually realised that water harvesting was quite beneficial to them. Demand for jars increased and a market for jar production was created. Eventually this rendered the government's subsidies unnecessary. A resent survey revealed that the rainwater harvesting reduced the costs that a typical household spends for clean drinking water to $8.50/m^3/year, which is more than 75 times cheaper than bottled water (UNEP, 2002).

Another success story took place in Gandhigram, India, where rainwater harvesting was introduced since 1995 (rainwaterharvesting.org). Necessary infrastructure such as a distribution system was constructed with support of the Shri Vivekanand Research and Training Institute, an NGO, government of India and private donors. Rainwater harvesting proved effective in providing water for the local people and also in increasing the recharging capacity of streams and groundwater. The distribution of harvested water was managed by a local body, and a water charge of Rs3 per month from each household was collected to cover the operation and maintenance costs. It was reported that villagers preferred paying the fee in return for a stable water supply rather than depending on the government's unreliable water supply. Harvested water is also used for irrigation. A village institution was established to monitor the water quantity harvested and to discuss irrigation plans with local farmers. Farmers pay Rs250 per ha for irrigation water and fees collected are used for the maintenance of the infrastructure. This community-based and participatory water management promoted the rational use of water and even increased the crop yield. The increase in yield, then, resulted in an opportunity to grow new crops, such as wheat and onions, which in turn created additional jobs for landless farmers (Centre for Science and Environment, 2004).

As these examples indicate, water harvesting can increase water availability and enhance the community involvement in water management. In India's case, the village institution for irrigation water management plays a critical role in realising reasonable and equitable use through information-sharing and consensus-building. The participation of local people in the operation and maintenance of water harvesting systems can promote sustainability of the project, because local people clearly see the benefits of good management. It can be said that people increase their willingness to pay once they are convinced of the benefits from rainwater harvesting. Water harvesting is a promising option for water supply. It could also facilitate the participation of local people in water management and enhance the sustainability of the local water supply.

When water harvesting is promoted, health risks associated with by harvested water need proper attention. Rainwater is originally pure and drinkable but it could be contaminated by pollutants in the air. In storage, it can easily become contaminated and a source of vector borne diseases. In the promotion of water harvesting, a system is necessary to minimise the health risks associated with harvested water. Technically, simple methods of water treatment should be introduced. These include boiling, slow sand filtration and solar disinfection.

For further promotion of rainwater harvesting, communities should be informed of up-date information on technologies available to maximise efficiency. To secure the water quality of harvested water is also important. In this regard, national or local governments could help the local communities by providing technical information and by facilitating a regular check on water quality. International actors could also act as an important facilitator of water harvesting as they may be able to provide technical and modest financial support. There is an initiative to set up an international water harvesting technology network. Such a network should be strengthened by regional and sub-regional networks.

Conclusion: Light at the end of Asia's tunnel

From the overview of water availability and the projected water demand curve of Asia, it is obvious that the region will face an increasingly serious water crisis in the near future and it is inevitably linked to development in the region. Indeed, without major new efforts, a catastrophic scenario of human misery, economic reversal and political unrest is likely. To avoid this it will not be enough to continue to seek technical solutions for short-term gains. Rather more attention should be accorded to demand control and to more integrated and strengthened water management systems.

As this chapter has shown, traditionally, regional water resources have been managed by the national government. However, government mismanagement, such as pro-development water policies and the neglect of local water needs have often caused conflicts with local people such as a large dam construction. The fragmented management approach has also contributed to mismanagement of water resources. These past failures highlight the importance of employing integrated and participatory approaches in water management.

To improve the current management of water, national governments in the region have tried to re-arrange water-related institutions which are often fragmented by sectors. National committees were established in many countries in the region for integrated water management. In today's global community, interaction between the international and national actors has been intensifying and national water policies have been developed under the interaction with international actors such as the GWP. Through financial assistance, international financial institutions have had a great impact on water policy-making. Sometimes such interventions by international actors have caused conflicts at the local level.

Local governments and other non-state actors are beginning to play a new role in water management, partly supported by decentralisation. NGOs and community groups have entered into the mainstream of water policy-making and implementation, in particular at the local level. Water is closely related to local social and economic conditions and there are many different interests over how water is utilised. To sustainably manage water resources, individual stakeholders at all levels should recognise their respective roles, and strengthen their capacity to meet their roles. Synergies among them should be enhanced through continuous discussion and collaboration for better management of water resources. Thailand's experience with river basin commissions showed that the involvement of stakeholders is not always accompanied with "efficiency" but the series of consultation and adequate arrangement of participation can promote awareness and enhance a sense of ownership by the local stakeholders and result in active participation in collaborative management at basin level. The Thai experience also shows the effectiveness of appropriate input by experts from international and local actors in supporting the promotion of basin management.

Private sector participation is an option to introduce an adequate water supply especially to urban areas, but Manila's experience suggests that this needs to be accompanied by partnership arrangements, including prudent public sector management. Manila's experiences showed the risks that can come with complete privatisation and also that it may be possible to minimise such risks by introducing an adequate legal and institutional framework through the appropriate regulatory body.

To further accelerate the positive changes over water management in the region, the following actions are recommended. Involvement and mobilisation of all stakeholders at various levels should be promoted, in principle. Such involvement sometimes will be time-consuming and may seem ineffective, but without the involvement of key stakeholders, implementation would face difficulties. Some examples in Asia in this chapter indicate that collaboration among different stakeholders and the development of trust and mutual understandings through successful experiences could bring more sustainable solutions.

(i) Provide adequate knowledge and information for decision-making

To facilitate sound discussion and decision-making on water management, adequate knowledge and information should be provided by both local and international experts.

At both national and local levels, access to information, including data on hydrology and water-quality, as well as the financial status of the water project in question, should be provided in a timely manner. Both international and national bodies should help improve access by employing adequate mechanisms of information dissemination. International and regional cooperation should play a role in providing consultation and facilitate the smooth flow of information.

It should be also noted that the Millennium Ecosystems Assessment, led by the World Resources Institute (WRI) and the United Nations University (UNU), has now been completed and presented cutting-edge scientific research output to policymakers. To maintain the momentum of this international effort a mechanism of scientific assessment should be internalised in the international community and a regional committee on scientific assessment should be established under such a mechanism.

(ii) Institutionalise local stakeholder participation in river basin management

At the river basin level, the participation of local actors is crucial. River basin organisations should ensure the participation of all relevant stakeholders. Through activities conducted by river basin organisations, local actors transform themselves from passive observers as watchdogs of national or local governments into active players in implementing actual projects. This bottom-up approach facilitates their sense of ownership and promotes voluntary actions.

Local actors, including local governments, NGOs, and local communities, need more strengthened capacity to cope with problems in their locality. Capacity-building is necessary and implemented in a way that suites the needs of local actors. Capacity-building for local governments should have a focus on general management, accounting and technical knowledge so that they can assume an effective role to promote integrated and participatory water management.

To ensure the process, the legal and institutional foundation should be strengthened. The same approach could be extended to international river basins.

(iii) Promote more private sector participation incorporating past lessons

To attain the targets of the MDGs, adequate funds should be raised and more substantial discussions should take place on how to finance water-related infrastructure. Dependence on international donors has limitations and some NGOs and communities are now presenting counter-arguments to the introduction of private sector participation. If there is no coordination on the issue, the discussion may follow parallel courses of action without reaching agreement. The existing experience of private sector participation in the region shows some alternative options such as community participation in public-private partnership. To meet the basic needs of those who do not have water services, intensive discussions to develop realistic solutions should be facilitated with the participation of all the stakeholders concerned.

In relation to private sector participation, water pricing issues should be studied further. It can be a good instrument to control water demand, but equity concerns should be properly addressed.

(iv) Apply simple and easy technologies that can enhance the participation of local people

Water harvesting is an example of simple and easy technologies that are effective and at the same time

enhance community participation in water management. Other technologies could include technologies for waste-water reuse and recycling, and water storage in wetlands. To maximise the use of water resources available, specific water quality guidelines for different uses, such as drinking, washing, producing products, and agricultural use, should be introduced to further promote simple technologies.

For the agricultural sector, drip irrigation, static irrigation and small scale irrigation promote water conservation. The application of such technologies should be promoted by international organisations and national/local governments to provide adequate information and initial financial support. Adequate legislative measures, for example, for the installation of roof top water harvesting equipment on new buildings, should be taken by national/local governments.

(v) Establish participatory assessment and monitoring systems

The current development of water sector needs to be assessed properly and then adjusted to reflect the actual situation in individual countries. An apex body, or an independent secretariat for water resources management, should take the initiative of conducting the assessment. The assessment should be a learning process and should be designed to contribute to the capacity development of government staff. Civil society's participation should be ensured in the assessment process. In assessing and monitoring an on-going project, the participatory approach should be taken wherever possible, because diversified views held by stakeholders involved will be useful in improving the project, particularly in terms of project sustainability and strengthened local support. It could greatly contribute to promoting the transparency of information.

CHAPTER 5

Mainstreaming climate change concerns in development:
Issues and challenges for Asia

Introduction

Climate change is perhaps the most critical global challenge of the 21st century. Many Asian countries are facing impacts of climate change in the form of frequent extreme events such as droughts, floods, cyclones, and heat waves. In addition, the ecosystems of island and low-lying coastal countries are increasingly threatened by rising sea levels. As Asian countries cover a vast area and are highly diverse with respect to population, size, altitude, climate and economic development, impacts of climate change in each country and among different regions will obviously be diverse. The high vulnerability is related to the heavy dependence of countries on climate-sensitive sectors such as agriculture, forestry, fisheries, and tourism. Indeed, according to one source, Asia bears the brunt of 90 per cent of global climate-related catastrophes with over a half a million lives directly lost in major climate events since the 1970s (DFID, 2004). Future climate change can exacerbate such trends, with catastrophic consequences for Asia's citizens in, for example, food insecurity through disruptions in agriculture from possible shifts in growing seasons, water shortages due to changing monsoon patterns, and poor health due to rapid spread of tropical diseases. Because of this, Asian policy-makers cannot afford to ignore climate change risks in development. Designing and implementing appropriate climate change policies across Asia is, therefore, essential for a sustainable Asia (World Bank, 2003; Simms et al., 2004; Reid and Alam, 2005).

While some uncertainties remain, the collective evidence indicates that the observed changes in temperature and precipitation over the past 50 years can be mostly attributed to human-induced changes in atmospheric greenhouse gas (GHG) concentrations and aerosols (IPCC, 2001). Before the industrial revolution in the eighteenth century, the carbon dioxide (CO_2) level in the atmosphere was steady at around 280 parts per million (ppm) but has increased to 379 ppm in 2004. Successful strategies for the mitigation of and adaptation to climate change will require, however, substantial changes in technological and energy infrastructure, and human behaviour and lifestyles throughout the world. Moreover, rapid economic changes including the globalisation of markets, privatisation and internationalisation of the energy sector, the ascending role of the private sector, and the increasing influence of non-governmental organisations (NGOs) are changing the context in which climate change must be addressed. Many development agencies have asserted that integrating climate issues in the development agenda is a major challenge to be addressed at local, national, regional and global levels (World Bank, 2003). A prerequisite however, is the identification of key entry points for such integration by considering the diverse national circumstances in relation to energy needs, GHG emission profiles and development challenges.

In this chapter, we assess the energy and GHG emission outlook for Asia and examine climate change as a priority issue for policy-making. We provide some background on mainstreaming climate change at both the policy and operational levels with practical examples. We then explore some options to integrate climate concerns in developmental policy with emphasis on both mitigation (with respect to renewable energy promotion and the Clean Development Mechanism [CDM]) and adaptation, and on ways to build a future climate regime that is responsive to Asian aspirations and development goals.

Outlook for energy demand and GHG emissions in Asia

Energy is an essential prerequisite for economic and social development. Various agencies (IPCC 2000, APERC 2002, IEA 2002) agree that energy demand in the Asia-Pacific region is escalating due to the rising population, rapid economic and social transformations characterised by urbanisation, and industrialisation. IPCC projections, for example, show that the global primary energy demand in 2030 could be 895 exajoules (EJ), with Asia accounting for almost one-third of this demand (Fig. 5-1).

Fig. 5-1: Primary energy projection

Source: IPCC, 2000 Emission Scenario
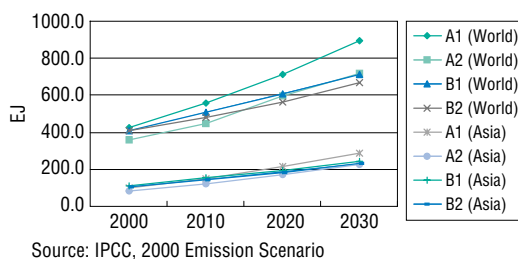
The electricity consumption in Asia, for example, is expected to more than double by 2020, while oil consumption is forecast to rise from 19 million barrels per day (bpd) in 2000 to 35 m bpd by 2020. As for individual countries, China's power consumption rose by 15 per cent in 2003, sharply higher than its 9 per cent economic growth. Projections by the Energy Information Administration (EIA, 2002) indicate that oil demand by China, Japan and the Republic of Korea will reach 10.5, 6.4 and 3.0m bpd respectively in 2020. Likewise, The Energy and Resources Institute (TERI) predicts that India's oil demand will rise from 2.1 m bpd in 2004 to 5.6m bpd in 2030, roughly a fifth of OPEC's current output (Financial Times, July 2004). Therefore, the real challenge for sustainable development of Asia is to improve access to reliable and affordable energy services through diversifying energy sources, improving energy efficiency and supporting the transition to the cleaner use of fossil fuels.

While per capita GHG emissions in developing Asia (1-2 tons) are currently much lower than the world average and 10 to 20 times less than that of the industrialised countries (Fig. 5-2), the total emissions from Asia (which currently account for 20 per cent of the world total) are increasing rapidly. IPCC projections show that Asia may contribute as much as 3-5 giga tons of CO_2 (as carbon) by 2030 (Fig. 5-3). For example, India's GHG emissions are projected to increase from 139 in 2000 to 780 million tons of CO_2 by 2020 (ALGAS, ADB). The use of poor quality fuels such as coal with a high sulphur content, inefficient methods of energy production and use, poor automobile and road conditions, and increasing use of high-energy transportation methods are also contributing to the rise in GHG emissions from the region.

Fig. 5-2: Per capita emissions and GDP projections in selected countries Asia and the world

So rce: Müller. 2001

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Fig. 5-3: CO₂ emission projection in Asia and the world
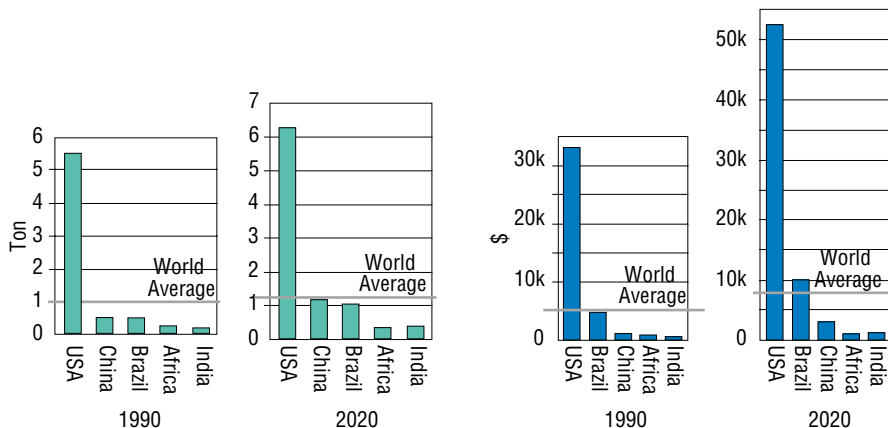
Fig. 5-3: CO$_2$ emission projection in Asia and the world
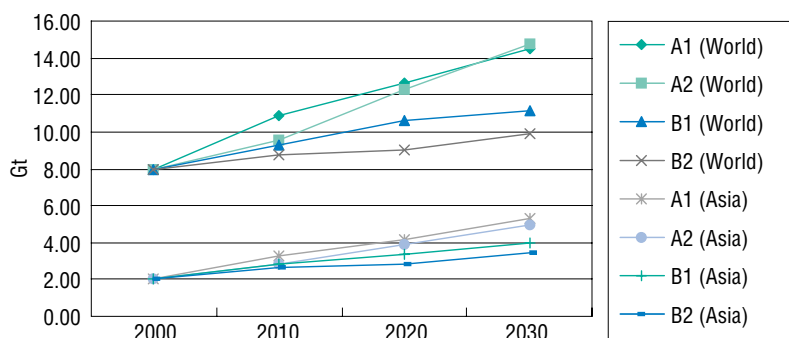
Source: IPCC Emission Scenario

In order to decouple the current direct linkage between economic output and energy consumption, the development of infrastructure that is less dependent on fossil fuels is often advocated as one of the means to tackle climate change. Such infrastructure obviously requires innovative technologies (e.g., a further shift to natural gas, nuclear energy, renewable energy, carbon capture and storage, advanced vehicle technologies), energy efficiency measures and policy frameworks. Although the Asia-Pacific region hosts several global hubs of technological innovation, development and deployment of climate-friendly technologies has been limited so far due to political, technical, financial and other structural barriers.

In most Asian countries, people continue to rely on biomass for cooking and heating, which is a major source of GHG emissions (as biomass has not been replenished properly). Despite some indications of a switch to alternative fuels in recent years, projections by IEA indicate that biomass use would continue to dominate in the region in 2030. In South Asia, for example, the share of biomass use is expected to remain high, at nearly 70 per cent in 2030 (IEA, 2002). Biomass scarcity due to urbanisation and industrialisation will worsen living conditions in poor neighbourhoods, by forcing residents to use lower-quality waste as cooking fuel, which in turn will enhance GHG emissions. Indeed the non-sustainable use of biomass worldwide in 2000 added 1Gt of carbon emissions to the atmosphere, for the production of only 50EJ of non-commercial final energy (WBCSD, 2004). Development of more efficient biomass technologies with reduced GHG emissions is, therefore, vital.

Competing policy priorities: Is climate policy a marginal issue?

Policy-makers in most Asian countries acknowledge that combating global climate change is vital but they believe that such efforts should not prevent the achievement of other objectives for development, most notably, economic growth. A series of climate policy dialogues held by IGES in India, China, the ROK, Thailand, Viet Nam and Cambodia revealed that climate change is not yet a high priority as compared to the pressing issues of food security, poverty, natural resource management, energy access, and urban transport (IGES, 2002). In China, for example, climate change is not included in the top 10 priority projects for funding in the National Environment Action Plan of the tenth five-year plan. Similarly, climate change is not explicitly considered in the Poverty Reduction Strategy Papers (PRSPs) of several Asian countries such as Cambodia, Lao PDR, Pakistan and Viet Nam (Bojo and Reddy, 2003).

Many Asian countries have recently begun to create institutional mechanisms to address climate issues in different ministries, such as the environment, agriculture, energy and industry. In order to utilise international market mechanisms such as the Clean Development Mechanism (CDM) of the Kyoto Protocol, sev-

eral countries have established a Designated National Authority (DNA) comprised of representatives from various ministries. However, these institutions face many constraints due to inadequate funding and lack of qualified human resources, which, in turn, is due to the lack of adequate attention to climate issues by decision-makers in high-ranking ministries such as finance, external affairs, trade and industry and education. In view of this, it would be fair to conclude that climate change is not yet mainstreamed in the development plans and policies of different Asian countries irrespective of their economic status and potential adverse impacts of climate change on their development.

Mainstreaming climate concerns in developmental policy

Despite the fact that several key drivers of economic and social development in many Asian countries are adversely impacted by climate change, policy-makers in the region have not yet paid much attention to climate change as a priority topic. Indeed many Asian policy-makers appear to have not yet realised that climate change impacts will undermine long-term economic well-being, increase poverty and damage human security. Moreover, current policies (e.g., land use policies that encourage or force the poor to live on flood plains and fragile coastal zones, and water or forestry policies that reduce access of the poor especially in times of extreme climate events) in several countries are unknowingly exacerbating vulnerability to climate change. In view of this, climate policies must be "development-oriented," if they are to receive the necessary political support. How to identify and design incremental interventions to integrate climate concerns in development, and then implement them across many sectors is a serious challenge for Asian policy makers.

Mainstreaming of climate issues in sectoral development planning (land use planning, natural resource management, energy, transport, coastal management, building codes, etc.) can be done at both the policy-level and operational-level to achieve the objectives of climate change mitigation and adaptation. Both "top-down" institutional mainstreaming and "bottom-up" community-level mainstreaming are possible. Policy-level mainstreaming refers to the incorporation of climate concerns into other development policies, sectoral plans and programmes, managements systems or decision structures that are not necessarily concerned with climate change. Developing water management policies based on projected impacts of climate change on precipitation in 20 or 50 years is an example of policy-level mainstreaming. Germany's policy of enhanced focus on renewable energy (RE) as a means to reduce GHG emissions and create new jobs may offer a good model for policy-level mainstreaming in Asian countries (Box 5-1), as such measures can benefit both the environment and development.

Some efforts are underway in Asia to mainstream climate issues in development planning at the policy level. In India, for example, the federal government's decision to create an exclusive ministry for renewable energy sources that would enable the development of climate-friendly technologies may be considered as one way to mainstream climate issues. In Bangladesh, the formation of a new Climate Cell in the Ministry of Environment with the support of the UNDP and the DFID is another example for mainstreaming at the policy level. The objective of the Climate Cell is to work closely with other ministries, NGOs and communities to raise awareness of climate change issues and to develop tools to help various agencies to take climate change into account. The concept of mainstreaming climate change has recently emerged as a crucial element of ADB's operations in the region (ADB, 2003). However, much more needs to be done.

To achieve policy-level mainstreaming, strengthening local institutional networks and raising capacity of policy-makers at national and local levels are crucial. Strengthening the links and coordination between government departments and other stakeholders working on sustainable development and climate change policies is also vital to ensure effective policy level mainstreaming.

Box 5-1: The shift of policy control on renewable energy in Germany

Backed by the resounding victory at the federal elections in September 2002, the Greens gained negotiating power in the coalition government with the Social Democratic Party and succeeded in shifting the policy control of renewable energy (RE) from the Ministry of Economic Affairs and Labour to the Ministry of Environment, Nature Protection, and Nuclear Safety. This enabled the government to revise and strengthen the Renewable Energy Sources Act (RESA).

Germany promoted RE through the Electricity Feed-in Act of 1991, which set feed-in tariffs for electricity from RE sources not owned by utilities and an obligation for grid operators to purchase electricity from RE sources. Together with direct subsidies provided by the federal government, the Act contributed to an increase of wind power capacities by a factor of around 42 times from 1990 to 1998. Policies to promote RE also contributed to the conservation of resources and improved air quality besides creating new jobs and offering prospects for trade and industry. RESA was enacted as a revision of the Feed-in Act on March 29, 2000, which in turn led to an increase in gross electricity generation from RE sources from 25049 Gwh in 1990 to 56856 GWh in 2002 (IEA 2003) and the creation of around 120,000 jobs (UBA 2004). In August 2004, the RESA was again revised so as to increase the share of RE in total electricity supply to at least 12.5 per cent by 2010, and to at least 20 per cent by 2020. To achieve this, significant improvements were made to the policy framework. The revised RESA is expected to avoid emissions of over 40 million t CO_2, and around 80 million tonnes in total. In 2003, RE sources contributed 44 terawatt-hours (TWh) and the RE share increased from 5.4 per cent in 1998 to 7.9 per cent.

Source: BMU, 2004

Operational level mainstreaming, on the other hand, refers to the process of critically analysing and addressing climate concerns in actual implementation of activities that national and local governments plan to conduct. It is often referred to as "climate-proofing" of development. "Climate-proofing" does not mean to suggest that whole communities and countries can be completely protected against the impacts of climate change; instead it refers to the need for increased resilience to be at the heart of development work. "Climate-proofing" of infrastructure development, for example, is not only beneficial to improve economic efficiency but also the long term sustainability of a project. A pilot study on mainstreaming climate change in the road design in Kosrae Island of the Federated States of Micronesia showed that climate proofing of road design could be highly cost-effective with an internal rate of return above 10 per cent (Box 5-2).

Likewise, the construction of dams and other water works by adequately considering the near and distant future impacts of climate change can save enormous resources in several Asian countries. Incorporating long-term risks such as sea level rise and changes in cyclone intensity in coastal zone management plans conducted in the Philippines and Bangladesh is another form of operational-level mainstreaming.

Many of the changes required in the transition to mainstreaming may not be costly in financial terms but require changes in existing institutions, policies, and infrastructure design. Currently, several political (inter-departmental conflicts, issues of "territoriality," lack of guiding principles and understanding by policy-makers), technical (lack of understanding of cross-sectoral issues, information, impact assessments etc.), and cultural factors act as barriers to achieve mainstreaming in Asia. In many Asian countries, synergies between climate change and sectoral development have not been identified or built on, partly since climate change policies tend to come under environmental or natural resource protection ministries, and due to the lack of climate change expertise in development-oriented ministries. Institutional divisions are also reinforced by the

fear that climate change policies will prejudice economic development. Measures to overcome such barriers through more effective international and institutional support in the short to medium term would be vital.

Other mechanisms for mainstreaming climate change include the incorporation of climate concerns into the National Strategies for Sustainable Development (NSSD), National Environmental Action Plans (NEAPs), National Action Plans on Adaptation (NAPAs) and national Poverty Reduction Strategy Papers (PRSPs). A survey of PRSPs of several Asian countries revealed that climate change is not discussed adequately (Bojo and Reddy, 2003), although Cambodia's PRSP includes a significant component devoted to disaster risk management. It is, therefore, vital that PRSPs should explicitly mention basic social services (e.g., energy supply, education, drinking water, health) necessary to achieve poverty reduction goals and potential means to overcome impacts of climate change. Improving the management of climate change knowledge, especially the dissemination of good practice tools and methodologies to policy-makers, civil society and other stakeholders, is also vital.

**Box 5-2: "Climate-Proofing": A Road infrastructure project
in Kosrae, Federated States of Micronesia**

The infrastructure development plan for Kosrae includes the completion of a sixteen kilometre gap in the circumferential road to provide all-weather land access to the remote Walung community in the southwest. Completion of this link allows easier access to the presently undeveloped interior of the island along the western coast, providing scope for agriculture and new settlements. There are also plans to construct power lines along the road. The road construction will convert the present 'radial' configuration of the power distribution system in Kosrae to a more reliable ring-main, with benefits for the whole island. The drainage works for the original road design (both built and yet-to-be-built sections) were based on an hourly rainfall of 178 mm, intended to be the hourly rainfall with a return period of twenty-five years. An analysis of more reliable data indicated an hourly rainfall with a return period of twenty-five years is 190 mm. But by 2050 the hourly rainfall with a twenty-five-year return period will have increased to 254 mm as a consequence of climate change.

A recommendation that the design of the road be modified so the drainage works could accommodate an hourly rainfall of 254 mm was accepted by the state government of Kosrae and a "climate-proofed" design was prepared with cost estimates by state employees. The incremental cost of "climate-proofing" the road design and construction for the yet-to-be-built section is in the vicinity of US$500,000. While the capital cost of the "climate-proofed" road would be higher than the case in which the road was constructed to the original design, the accumulated costs, including repairs and maintenance, would be lower after only about fifteen years. This is due to lower repair and maintenance costs for the "climate-proofed" road. The internal rate of return was found to be 11 per cent.

A 3.2 kilometre portion of the road section has already been constructed, including the drainage works. The design for these was also based on an hourly rainfall of 178 mm for a twenty-five year recurrence interval. Analyses show that it is more costly to "climate-proof" retroactively - US$776,184 for a 3.2 kilometre section of existing road (US$243,000 per km) as opposed to US$511,000 to "climate-proof" 6.6 kilometre of new road (US$77,000 per km). But a cost benefit analysis revealed that the retroactive "climate-proofing" is still a cost-effective investment, with an internal rate of return of 13 per cent. In any case, "climate-proofing" during early stages of planning can save enormous resources.

Source: Hay et al., 2004.

Opportunities for mainstreaming climate concerns in Asian development

In several Asian countries, efforts are underway to mitigate climate change through measures such as improvements in energy efficiency and introduction of climate-friendly technologies and advanced forms of renewable energy. To tackle climate change comprehensively while promoting development more proactive efforts are necessary. In this section, some opportunities for mainstreaming climate concerns are discussed in relation to mitigation, adaptation and future regime. Insofar as mitigation is concerned, renewable energy (RE) promotion and the Clean Development Mechanism (CDM) are considered appropriate means to integrate climate change in developmental policy.

Renewable Energy Promotion

Many communities in Asia lack access to reliable energy services. For instance, more than 50 per cent of India's population does not have access to a reliable supply of electricity. The provision of energy based on fossil fuels, however, increases GHG emissions. From this perspective, RE promotion is one of the most promising policy options which would contribute to GHG mitigation in developing countries with several co-benefits, such as job creation and reduced dependence on fossil fuels, and the creation of a decentralised energy system (Sawin, 2004). According to an analysis submitted to the Californian Public Utilities Commission, ancillary benefits of solar photovoltaic (PV) systems can be worth as much as 22.4 US cents per kWh. However, these benefits will be much higher if the international standard ISO 13602-1 for the calculation of all external effects is applied, as this includes an assessment of the full costs of health hazards, bio degradations and global warming. An assessment of the full cost picture of all options proves that mineral energy systems with their inefficiencies are much less competitive than clean RE systems (ISEO, 2005). RE can also provide a cost-effective way of electrifying remote villages where a grid connection would be impractical.

Asia shared only 23.7 per cent of the world's total primary energy supply in 2002 but 46 per cent of the world's RE supply is from Asia. From that viewpoint, Asian countries are already leading suppliers of RE. However, the largest RE sources in Asia are combustible wastes including solid biomass, which is mainly used for heating and cooking, and most of the biomass is often inefficiently used.

Current status and barriers for renewable energy promotion in Asia

While some Asian countries such as Japan, the ROK, India, and China have already established policy frameworks for RE promotion, others are yet to develop such frameworks, including setting targets for RE development and utilisation, and the creation of incentives and institutions. For example, the share of renewable sources in the ROK's primary energy supply is expected to be increased from 1.5 per cent in 2003 to 5 per cent in 2011, while Japan has set an annual target of 12.2 Twh of power from RE in 2010, and a national Renewable Portfolio Standard of 1.35 per cent by 2010. Thailand has set the target of increasing RE share from 0.5 per cent in 2002 to 8 per cent in 2011. Four Asian countries (China, Indonesia, Japan and the ROK) formulated RE laws while countries such as India, the Philippines, Thailand, Mongolia and Viet Nam are considering the introduction of such laws. Several Asian countries, such as Sri Lanka, Thailand, Indonesia, India (3 states) and the ROK, adopted a feed-in tariff policy. On a sub-regional basis, the 22nd ASEAN Ministers of Energy Meeting decided to increase the share of RE in power generation in ASEAN to at least 10 per cent by 2010. In view of increasing urbanisation and associated waste disposal issues, Asian cities must be proactive in recovering energy from landfills, which can simultaneously reduce GHG emissions. Utilising solar, wind and geothermal energy (in volcanic islands of the Philippines and Indonesia) are other options with significantly lower CO_2 emissions than fossil fuels. In Sri Lanka, for example, rural solar home systems have become an explicit part of the RE promotion strategy.

Despite such positive developments, there are many institutional, information, technical, financial and market obstacles to promote RE in Asia. The lack of a comprehensive regional policy framework on RE is one major factor. On a country level, barriers include the inertia of institutional and fiscal infrastructures, lack of access to the grid at reasonable prices, high initial cost compared to conventional energy sources, widespread lack of awareness about the scale of resources available, slow pace of technological development, lack of coordination between organisations in technology dissemination, and economic disadvantages of RE as compared with fossil fuels. Insofar as RE technologies are concerned, several of them are immature and costly. Technological development has not focussed so far on the efficiency of conversion and the stability of systems for the delivery of electricity. Moreover, technology packages for site-specific conditions and their demonstration are lacking. The lack of technical know-how and trained manpower is also serious in countries such as Cambodia. The current status and major barriers for RE promotion in selected Asian countries are given in Table 5-1.

Recommended policy options for renewable energy promotion in Asia

Table 5-2 lists suggested policy measures for promoting different types of RE. An example of biomass-based energy project from India suggests how community-based initiatives are crucial in the promotion of RE (Box 5-3).

Box 5-3: Biomass energy project in rural India

The assessments of the bioenergy potential in India show that a biomass strategy based on "sustainable forestry – biomass gasifiers – biogas systems" can meet all rural energy needs with significant local and global environmental benefits. Based on the UNDP surveys on energy demands conducted in a group of villages in Karnataka, three biomass energy technologies – leaf litter-based biogas, dung-based biogas and biomass gasifiers – were identified for meeting the villagers' energy needs. Although the proposed technologies are technically feasible, they could not be propagated without active participation of local communities. Four components of the biomass energy project are:
1. Demonstration of the technical feasibility and financial viability of bio-energy gasification technologies,
2. Capacity-building and development for appropriate mechanisms for project implementation,
3. Development of financial, institutional and marketing incentives and strategies, and
4. Dissemination of bio-energy technology information packages.

The project has been implemented since 2003 based on India's Tenth Five-Year Plan (2002-2007) and the Electricity Act (2003), which stresses the need for expansion of local energy supply options.

Source: UNDP, 2004

Table 5-1: Current status and barriers for the promotion of renewable energy sources in selected Asian countries

	National policies and targets	Major barriers
Japan	• Special measures law concerning the use of new energy by electrical utilities (RPS [Renewable Portfolio Standards] Law) was enacted in June 2002 and came into effect in April 2003. • It is aimed at furthering the use of RE by annually imposing an obligation on electricity retailers to deliver a certain amount of electricity from RE based on the amount of their retailing electricity in order to ensure the stability and suitability of energy supply.	• Limited availability of space to build new RE power stations. • Lack of incentives to reduce energy consumption and/or to shift to RE. • Lack of policy coordination, e.g., between building/housing construction sector and RE promotion.
China	• Established the Renewable Energy Law (feed-in tariff) in 2005, which will enter into force in January 2006. • The national RE development target is to ensure that 10 per cent of all electricity to come from RE by 2020. • Wind power concessions approach including tax incentives for project developers.	• High cost as compared with conventional fuels such as coal. • Lack of clear, consistent and streamlined framework for RE promotion. • Inadequate regulatory conditions and absence of political support. • Lack of effective investment incentives for large scale RE commercialisation.
India	• Establishment of an independent Ministry of Non-Conventional Energy Sources in 1992, and India Renewable Energy Development Agency for RE promotion and development • Formulation of the Renewable Energy Policy containing foreign investment policy, industrial policy, state government policy, and financial/fiscal incentives. • A target of 10 per cent share for RE or 10,000 MW in power generation capacity was set for 2012.	• Low awareness of benefits of RE and high cost of RE as compared with conventional sources due to high subsidies for the latter. • Inadequate financial resources and incentives for commercialisation of RE. • Complex institutional arrangements for RE promotion and lack of market-support infrastructure. • Slow progress in rationalisation of tariff structure for fossil fuels and RE sources.
Indonesia	• Ministerial Decree no. 0002 of 2004 concerning policy on RE development and partnership programme. • Feed-in law was passed and small Independent Power Producers (IPP) programme was launched in 2002 to create small power purchase tariff and pre-electrification programmes, and promote local manufacturing capability.	• High investment cost and lack of competitiveness of RE. • Lack of sense of urgency and synergies among governmental organisations dealing with RE. • Limited RE market support infrastructure. • Lack of adequate financial incentives to promote RE.
Philippines	• RE Power Programme (1993) provides financing for Independent Power Producers (IPPs). • The 2003 Philippines Energy Plan set a long-term goal to double the installed capacity from RE sources to approximately 4,700MW by 2013. • The Plan provides tax duty redemption/ reduction, investment priority incentives, and commitment to the Green IPPs (e.g., Mini-hydro Electric Power Incentive Act).	• Complex topography and geography for development of RE infrastructure. • Lack of market awareness and acceptance. • Absence of a one-stop-shop market service centre for RE. • Inadequate incentives and investment in RE.

Table 5-2: Recommended policy options for promoting renewable energy sources

Energy Type	Policy Options	Examples
Solar	Provision of financial/fiscal incentives for developers/users/manufacturers Support for further technical development for stable power supply	India has one of the largest solar photovoltaic markets, driven by government programmes of subsidies, tax and financial incentives that began in 1980s. Loans and financing schemes supported the private sector sales, while subsidies were provided for installation of solar home systems.
Wind	Provision of financial/fiscal incentives for developers/users/manufacturers Investigation of potential wind energy (Wind Power Mapping) Support for further technical development for stable power supply	The Chinese government introduced a wind power concessions approach in late 2001. The local government invites international and domestic investors to develop 100 MW wind farms on a potential wind farm site, through a tendering procedure so as to bring down the cost of wind-power generation. A new concept of mega-wind farms owned by the private sector is being tested in India to increase the penetration of wind power, and invite greater participation from the private sector.
Biomass	Policy measures for effective biomass conservation, management & utilisation such as long-term feed-in tariffs, grants and subsidies Support for further technical development for efficient use of biomass energy	The Energy Conservation Law of 1992 in Thailand mandated the RE Small Power Producers Programme, which gives power purchase assurance, price assurance and subsidies. Under this programme, a Thai company is developing power plants using rice husk as a biofuel.
Hydropower	Investigation and development of hydropower resources Water resource management including appropriate sharing rights with other sectors Policies for addressing social issues (resettlement, compensation, etc.) Support for further technical development for efficient power generation by small/micro scale generators	Lao PDR is developing a hydroelectric power plant in collaboration with Thailand. As Thailand needs a large quantity of electricity at competitive rates; both Lao PDR and Thailand are expected to benefit from sharing available RE.
Geothermal	Investigation, development and management of geothermal resources	The government of Indonesia bears the risk of geothermal resource development, and prepared a standard form of "Take-or-Pay" based steam supply agreement and energy purchase contract.

The general policy imperatives to promote RE in Asia include the following:

1. Establishing a general RE policy and legal framework for its implementation,

2. Setting binding, significant and growing targets for each type of RE resource,

3. Setting high priority to integrate RE development into the national development policy,

4. Providing stable and predictable investment/financial/technological incentives and creation of other market development mechanisms,

5. Providing subsidies and/or governmental equity for RE while reducing subsidies for fossil fuels (other measures may include creating market mandates, granting soft loans, giving direct producer payments, tax incentives and tax exemptions and encouraging capital offset) (Charey et al., 2003),

6. Promoting the utilisation of RE for rural on-grid/off-grid electrification, and

7. Building local RE industry capacity through promoting community commitment and support.

In addition, the role of private power sector companies is crucial in issues such as:

➢ Standards for power purchase agreement for RE sources,

➢ Grid access assurance in case of on-grid connection,

➢ Power price assurance, and

➢ Fuel supply assurance in the case of geothermal energy.

Overseas agencies can play a catalytic role in promoting RE through creating energy market funds in Asia. For example, the Renewable Energy and Energy Efficiency Partnership, together with its Finnish partner Emerging Power Partners, has recently set up the 50 million Euro Private Energy Market Fund 2, which aims to reduce between 20-30 MT of CO_2 emissions in the ASEAN nations, India and China, through mobilising equity financing for 10-15 RE projects with a total cost of 200-400 million Euro. Likewise, international organisations like the UNIDO and the UNEP are playing a critical role in establishing an international bioenergy network and creating data archives for the Solar and Wind Energy Resources Assessment (SWERA). Similar efforts are necessary at both the regional and national levels in Asia.

Notwithstanding the number of co-benefits, desirable policy options to promote RE may vary with each country, considering the diversity in energy resource endowment and development situation. Therefore, policy-makers need to develop a RE strategy with some quantitative targets based on a least-cost and employment maximising supply model. In addition, various financial, legal and regulatory instruments must be worked out as part of the enabling framework to support the promotion of RE, with full consideration of the country's economic, social and resource situations.

Clean Development Mechanism (CDM)

The entry into force of the Kyoto Protocol on 16 February 2005 raised expectations for flexibility mechanisms, such as the CDM in Asia. The CDM has the dual objective of GHG emissions reduction and sustainable development in developing countries, while enabling flows of technology and finance from developed countries in return for the acquisition of carbon credits by them. If the CDM is effectively implemented, it has the potential to be one of the effective tools to mainstream climate change concerns in development policy in Asia.

Of late, however, serious concerns have been expressed about the CDM implementation (e.g., ineffectiveness of the CDM Executive Board, lack of streamlined procedures, and uneven geographical distribution of projects). Several people argue that the CDM in its current form is not meeting its mandate of promoting sustainable development in developing countries, as it failed to finance projects related to the energy sector of developing countries in their long-term transition towards RE technologies. A large share of the projects approved to date, accounting for nearly 75 per cent of the Certified Emission Reductions (CERs) in the pipeline, relate to landfill methane recovery, capture or destruction of gases with high global warming potential like methane, nitrous oxide and hydrofluorocarbons (such as HFC-23) at existing facilities. The fear is that such an enormous supply may drive down CER prices such that CDM projects with higher sustainable development benefits will be difficult to implement.

There is also a concern about the lack of CERs from sectors such as energy efficiency and small-scale CDM projects. Of the 25 large scale methodologies approved by the CDM Executive Board by October 2005, only five address energy efficiency while 10 address fugitive methane emissions. As of April 2005, the RE projects are generating only about 11 per cent of all carbon credits through the CDM, which amounts to around 32 million CERs in total. This is less than the credits resulting from the two HFC-23 projects amounting to 40 million CERs and about one half the credits that will be generated by a nitrous oxide project in the ROK which is 70 million. Likewise, up to 2012, fifteen landfill gas projects are claiming 28 million credits while 52 RE projects are claiming 25 million credits (Pearson, 2005). Another concern about the current CDM is its poor geographic representation. Among the thirteen least developed countries in Asia as defined by UNFCCC, only three (Bangladesh, Bhutan and Cambodia) have one registered CDM project each. Besides addressing the above concerns, several barriers need to be overcome for effective CDM implementation in Asia.

Current status, barriers and countermeasures for CDM implementation in Asia

As of May 2005, 19 countries in Asia established the Designated National Authority (DNA) to implement the CDM. All countries in the Pacific except Fiji are yet to establish a DNA. Since the DNA must ensure that the proposed CDM projects have accommodated stakeholder comments, some countries included NGOs in their DNA membership. In the Philippines, for example, the Inter-Agency Committee on Climate Change (IACCC) was formed and included representatives from an NGO called "the Philippine Network on Climate Change." In Indonesia, on the other hand, a special meeting of a stakeholder forum with representatives of local governments, the private sector, NGOs and local communities is arranged by the National Commission on CDM only when necessary (Fig. 5-4).

Fig. 5-4: Structure of Designated National Authority (DNA) for CDM in Indonesia
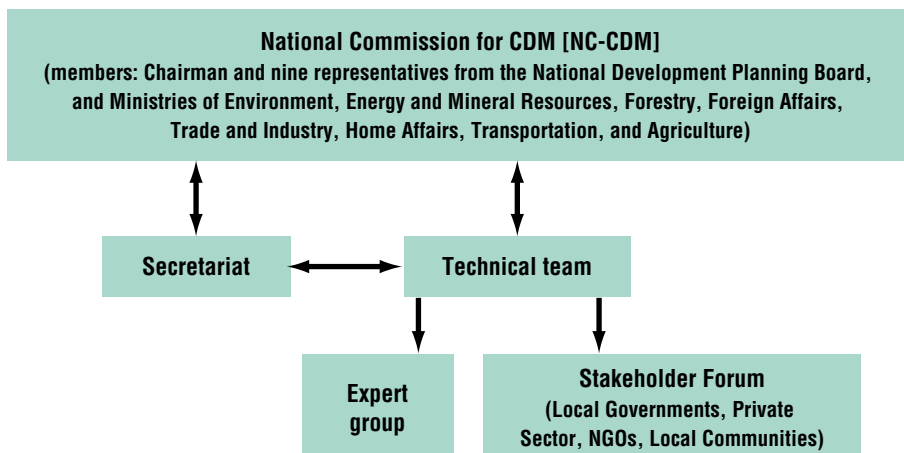
In Malaysia, the National Committee on CDM consists of an NGO (Currently, the Centre of Environment, Technology and Development), and a few representatives from the private sector. In countries such as China, Thailand and Viet Nam, however, no such formal representation of NGOs exists in the DNA but stakeholder views on potential CDM projects are taken informally.

Despite rapid progress in establishing institutional structures, capacity for identifying and designing sustainable development-oriented CDM projects and for mainstreaming the CDM into other sectoral develop-

ment policies seems to be still limited in many countries. The major region-wide and country-specific barriers identified through IGES surveys and workshops (IGES-UNESCAP, 2004) are summarised below:

- *Political and Institutional barriers*: Major differences in expectations of Annex 1 and developing countries, and the lack of strong political will in both groups seem to impede the progress of the CDM in Asia. In China, for example, the CDM is considered secondary to attracting FDI, while in India, CDM has been looked suspiciously in some circles that it might be used by developed countries as a ploy to enforce binding commitments on developing countries. In many Asian countries, the approval process of CDM projects is lengthy and not transparent enough to attract private investments. The lack of a legal framework and poor institutional capacity to support the CDM at the local level are other barriers to be overcome, especially in large countries such as Indonesia. While several countries indicated that they use sustainable development criteria for approving a potential CDM project, relevant guidelines are not yet clear to many project proponents. The CDM project approval process by the DNA within host countries and by the CDM Executive Board in the international arena is also considered bureaucratic and complex.

- *Technical barriers*: In several Asian countries, the limited understanding on how to set baselines and prove additionality of CDM projects is a major barrier to be overcome in realising CDM projects. While the CDM is intended to promote technology transfer, very few projects to date involved transfer of technologies due to concerns such as lack of adequate protection of intellectual property rights in host countries and other risks.

- *Financial and legal barriers*: High transaction costs of CDM projects are a major barrier to be addressed all over Asia. Since sustainable development-oriented CDM projects tend to be small and have lower paybacks, high transaction costs may disproportionately penalise such projects. While it is generally agreed that ODA funds will not be directly used for purchasing CERs in CDM projects, ODA may be used to lower transaction costs to some extent. The low price of CERs is also unattractive to many project developers at this stage. Limited awareness of the legal risks of CDM projects and limited institutional means to deal with such risks are also barriers in several Asian countries.

Besides the general barriers, each country has its own barriers for implementation of the CDM. Through organising an Expert Level Training on the CDM in cooperation with the UN-ESCAP, IGES identified such barriers and potential measures to overcome them in selected Asian countries (Table 5-3). It seems that information exchange or establishment of a platform among Asian DNAs in terms of decision-making structure, basic issues such as additionality, baselines and methodologies, and practical issues, such as bundling and financing, are beneficial to maximise the probability of CDM implementation in Asia.

Developed countries, and bilateral and multilateral development organisations can support Asian countries in building their capacities to attract CDM projects by providing underlying finance while upholding environmental and development standards. In addition, they can assist project proponents by bearing transaction costs upfront.

Table 5-3: Major barriers for CDM implementation and options to overcome them in selected Asian countries

Country	Barriers	Recommendations
India	• Lack of integration of CDM policy in different sectors, • Lack of policy and fiscal incentives for project developers, • Lack of coordination between different ministries; Limited awareness of other relevant ministries, municipality and local governments, • Lack of awareness of financial institutions, India-specific carbon fund is yet to become operational, and • Energy Act does not require businesses to report GHG emissions.	• Planning commission should ensure each ministry to prepare annual action plans on the CDM; Income from the CDM may be treated as income from exports and policies for tax exemption may be extended. • Ensure adequate representation of all ministries in DNA. • Strengthen capacity of financial institutions and local governments. • Expedite the process of designing IDFC (Infrastructure Development Financing Company) as a base institution for operating carbon funds. • Amend energy act to ensure obligatory reporting of GHG emissions.
Indonesia	• Outdated national framework on climate change with inadequate arrangements for stakeholder consultations, • Lack of policy framework to promote the CDM, • Lack of coordination of CDM policy within energy sector, and • No financial incentives for project developers (especially to assist with high project transaction costs).	• Update the national framework on climate change to respond to actual and current issues. • Design a national policy for the CDM. • Ensure better coordination of CDM policies across important sectors. • Create incentives (Both Annex 1 and host countries can do so by making upfront payments to cover part of transaction costs).
Cambodia	• Lack of national action plan on the CDM and inability to integrate the CDM in the existing development programmes, • Lack of awareness of the CDM among policy-makers of ministries other than the focal point government agency, and • Poor coordination among agencies.	• Promote cooperation by involving other ministries in the formation of action plan and integrate CDM projects into National Investment Policy. • Strengthen capacities of stakeholders through CDM campaigns and high level policy dialogue to promote inter-ministerial collaboration. • Integrate experience of other countries with established DNA.
Thailand	• Lack of comprehensive policy on the CDM and weak linkages of the CDM to the national development plan, • Low level of awareness on the CDM and lack of information dissemination mechanism, • Unclear structure of DNA with weak sustainable development criteria/indicators, and • Poor coordination among agencies and stakeholders.	• Strengthen capacity to integrate the CDM into national development plan. • Formulate policy framework and translate CDM guidelines, methodologies and other documents into local language; Establish networks to disseminate information. • Develop clear terms of reference for DNA with clear mandate of relevant agencies; Develop sustainable development criteria for CDM project approval. • Establish a coordination body involving diverse stakeholders.
Philippines	• Lack of national action plan on the CDM and weak linkages of the CDM to the national development plan, • Low level of awareness on CDM policies and procedures among policy-makers and stakeholders, and • Poor coordination among agencies.	• Encourage cooperation by involving other ministries in the formation of action plan and integrate CDM projects into a national investment policy. • Strengthen capacities of stakeholders through CDM campaigns and high level policy dialogues to promote inter-ministerial collaboration. • Integrate experience of other countries with established DNA.

Source: IGES-UNESCAP Expert Level Group Training on Clean Development Mechanism, 2004

Adaptation

Climate policy dialogue has so far focussed on mitigating GHG emissions, with relatively limited discussion of policies to facilitate adaptation to climate change. Adaptation refers to adjustments (through policies, actions or other initiatives) in ecological, social, and economic systems in response to impacts of actual or expected climatic stimuli. Indeed adaptation, sustainable development and equity are mutually reinforcing (IPCC, 2001). In Asia, adaptation has become an urgent challenge because of the region's high vulnerability characterised by large and relatively poor populations with low adaptive capacity besides technological, resource and institutional constraints. Although some adaptation measures, such as building flood defences in low-lying areas of Bangladesh, refugee planning for island states such as Maldives, improved water management practices, changing crop types and location, are now taken up, more needs to be done to cope with future climate change. Asian countries will have to individually and collectively facilitate adaptation at both local and national levels in order to promote sustainable development. Some challenges and potential ways to facilitate adaptation in Asia are discussed below.

Local level:

Adaptation measures are largely site-specific with substantial benefits to individuals and communities. For example, restoration of mangroves along the cyclone-battered coasts of Viet Nam not only re-establishes degraded ecosystems and increases physical protection against storms, but also enhances aquaculture production which generates income for local communities. Such a combination of a secured natural resource base, along with reduced exposure to natural hazards and diversified livelihood activities increases adaptive capacity. Moreover, it is clear that individuals and communities have been adapting to climate change throughout history and accumulated valuable knowledge that helps in understanding human-environment relationships for optimum utilisation of resources and to regulate human environmental impacts (Kempton, 2001).

Adaptation plans in Asia, however, largely neglected the micro-spatial scale in favour of national and regional scales. Vulnerability assessments in many countries, for example, are based on top-down scenario-based approaches rather than bottom-up community approaches. It is vital to promote the latter, which start by identifying key vulnerabilities of communities to climate, consider local adaptive strategies, and then link adaptive management options to decision processes already in place. Adaptation strategies built on community-based approaches and local knowledge and based on active involvement of local stakeholders are likely to succeed better than those followed using top-down approaches.

Several community-based initiatives to cope with climate extremes exist in various Asian countries (Hossain, 2005). For example, using salt-tolerant germplasm of trees, fodder and vegetables and community-level pond protection schemes in sea level-prone areas of Bangladesh are common adaptation strategies. Likewise, strong reciprocal obligations among people from the same areas – the Wantok system of Papua New Guinea, the Solomon Islands and elsewhere, - help people cope with climatic and other disasters (Handmer, 2003). In Bangladesh, efforts are underway to learn from past and current indigenous flood coping strategies (Box 5-4) and integrate such knowledge in disaster management plans so as to minimise adverse impacts of floods. Using information collected across flood-prone districts of Bangladesh, a field manual on community-based flood management strategy was recently prepared (Bangladesh Unnayan Parishad, 2004).

Based on a perusal of case studies collected by IGES across the Asia-Pacific region, the following general recommendations may be made to facilitate adaptation at the local level:

(a) All countries in the region need to step up their efforts to facilitate proactive micro-adaptation through the creation of an enabling policy environment and the promotion of dynamic adaptation measures (as it is unlikely that there will be one solution for all time).

(b) Key adaptation strategies by local communities are developed largely in response to climate variability and

extreme climate events rather than climate change. Therefore, strategies to cope with variability provide a good starting point for addressing future adaptation needs in the context of sustainable development.

(c) It is impractical to specify adaptation practices without detailed knowledge of the community or locality for which the adaptation is intended. Focussing on vulnerability as seen by the vulnerable communities leads to approaches that are relevant and context-specific.

(d) Current mechanisms for adaptation funding (except the Small Grants Programme of GEF) do not support community-based initiatives. Development agencies and donor governments can play a catalytic role through preferential allocation of funds to adaptation measures at local level.

(e) Improving adaptive capacity and building social capital (the networks and relationships between individuals and social groups that facilitate adaptation) through appropriate capacity-building of local policy-makers and communities to integrate climate concerns in local development plans are crucial.

Box 5-4: Community level adaptation strategies in Bangladesh

Bangladesh is a prime example of a country that is extremely vulnerable to climate change. With a low-lying coastline, high population density, and an economy highly dependent on agriculture, the lives and livelihoods of people are threatened by frequent floods, cyclones and the associated effects, such as salt-water intrusion that render agricultural lands unproductive. The IPCC Report mentioned that half a metre sea-level rise will permanently inundate about 11 per cent of its territory. Between 1974 and 2004, the country experienced as many as 10 major floods.

Participatory rural appraisals, focus group discussions, inter-generational dialogues and semi-structured interviews with local people and key informants in the Mankiganj district of Bangladesh showed that indigenous coping strategies remain the dominant form of response to floods. The frequency of use of different local coping strategies in various flood years is shown in the table below. It appears that raising the plinth of homes is the most common form of response in terms of improving housing conditions, and dietary changes accompanied by reduced food intake and using local methods of dry food storage were the most common strategies to survive in periods of flooding. As most people don't own boats, the main form of transport is rafts lashed together with trunks of banana trees. The planting of reeds, known as catkins (*Saccharum spontaneum*), an indigenous species well suited to sandy soils, is another local coping strategy to prevent soil erosion. While these methods appear inadequate and primitive, they are still considered the most effective by local people. Therefore, the local governments in Bangladesh are beginning to integrate such knowledge in disaster management plans.

Historical matrix of coping strategies in times of flood, Manikganj, Bangladesh

Coping strategy	2002	1998	1988	1981
1. Improvement of housing conditions				
(a) raising the plinth of homes	OOO	OO	OOOO	OOO
(b) constructing "*manchans*"	OO	O	OOO	O
(hanging bamboo platforms inside houses)				
2. Taking shelter in elevated grounds	O	O	OO	O
3. Selling land	O		OOO	O
4. Fuel storage	OO	O	OO	OO
5. Storing dry foods	OOO	OOO	OO	OO
6. Diet changes and reducing food intake	OOO	OO	OOOO	OOO
7. Banana plantation and bamboo propagation				
(to be used as floating platforms and rafts for movements)	OO	O	OOO	OO
8. Growing catkin in sandy lands to prevent erosion	OOO	OO	OO	OO

Key for frequency: OOOO very high, OOO: high, OO: moderate, O: low, Blank: not used

Source: Srinivasan, 2004.

National level:

Despite widespread recognition that adaptation is a necessary policy response even with a strong and cohesive mitigation strategy, many Asian countries have undertaken limited efforts to date largely due to the lack of adequate and reliable information on the vulnerability and capacity of communities to adapt to climate change. The lack of practical knowledge on adaptation options is another reason. The National Communications submitted by Asian countries to the UNFCCC, for example, refer to vulnerability and adaptation but discussion on policies to facilitate adaptation to cope with current and future climate change is extremely limited. The UNDP National Communications Support Unit, therefore, designed the Adaptation Policy Framework (APF) to provide guidance for developing and assessing adaptation policies and measures, and to facilitate the incorporation of adaptation into national development strategies. Despite the lack of the APF at the national level, several Asian countries have begun to facilitate adaptation in various sectors with varied success. In Bangladesh, for example, efforts to mainstream adaptation to climate change into national planning and activities have been relatively successful for the agricultural sector but not in other sectors (e.g., water resources) (Huq et al., 2003).

While many Asian policy-makers recognise the need to mainstream adaptation concerns in national development plans, they face several challenges. The limited insight into the economic ramifications of climate change impacts as well as the cost-benefits of adaptation measures and limited awareness of ways to mainstream adaptation at national level are some barriers. However, a few examples of mainstreaming adaptation in national planning, such as the one in Kiribati (Box 5-5), can become models for other Asian countries to follow.

Box 5-5: Kiribati National Adaptation Programme

Kiribati is one of the most vulnerable countries to the effects of climate change and sea level rise. Most of the land is less than three metres above sea level; the island has an average width of only 450 meters, rendering retreat adaptation options untenable. The islands are exposed to periodic storm surges and droughts, particularly during El Niña years, although they lie outside the cyclone path. Kiribati is becoming increasingly vulnerable to climatic events due to its high population concentration, accelerated coastal development, shoreline erosion, and rising environmental degradation. By 2050, if no adaptation measures are undertaken, Kiribati could face economic damage of US$8-$16 million a year, equivalent to 17-34 per cent of its 1998 GDP due to climate change and the rise of the sea level.

Using established risk management tools developed by the South Pacific Geoscience Commission (SOPAC), the Kiribati Adaptation Programme (KAP) held two major national consultations which gradually built awareness of, and commitment for adaptation and climate change. The National Consultations were closely coordinated with the formulation of the 2004-2007 National Development Strategy (NDS). Meetings on adaptation were immediately followed by discussions on the NDS, involving many stakeholders. As a consequence, adaptation issues are well integrated into the NDS. In national consultations, representatives from each island identified key challenges over the past 20-40 years, and proposed coping mechanisms. Adaptation options are classified into four categories and options for which government assistance was necessary were allocated to the responsible ministries. Adaptation options were then divided into five groups according to the nature of the response required (viz., changes to government policies, changes to laws and regulations, information to communities, formal engineering and construction works and informal works by households and communities). Mainstreaming at the operational level in each ministry is being enhanced, therefore, on the basis of outputs of the national consultations.

Source: Teem, 2004.

Strengthening adaptive capacity directly contributes to sustainable development. Adaptation policies at the national level, therefore, must be made sensitive to culture- and place-specific characteristics of adaptive capacity. Efforts are also necessary to ensure that adaptive capacity is more equitably distributed within the nation in terms of both sharing and transfer of technologies for adaptation.

Post-2012 Climate Regime

With the entry into force of the Kyoto Protocol in February 2005, the attention of the international community has moved to a discussion of steps to address climate change beyond 2012. The future international climate regime has significant implications for Asia for at least two reasons. Firstly, the future regime should include far deeper and broader efforts of mitigation than provided for under the Kyoto Protocol. It means that the new regime is likely to necessitate deeper GHG emission cuts by Annex 1 countries and new emission control pledges by major developing countries. Secondly, since the design of any future regime has significant implications for sustainable development in the region, Asian countries must be proactive in shaping it so that their genuine concerns are adequately addressed. Major concerns on the future climate regime from an Asian perspective can be classified into five categories: economic, developmental, negotiation-related, market mechanisms, and adaptation (Table 5-4). Specific concerns obviously vary reflecting diverse national circumstances.

In order to make the future climate regime sensitive to the above concerns and aspirations, the following aspects deserve attention. They are mostly related to: (i) synergies between climate-related measures and sustainable development, (ii) ways and means to promote GHG mitigation, (iii) restructuring of the CDM, and (iv) facilitation of adaptation.

(i) Synergies between climate-related measures and sustainable development
- Discussions on the future regime must be in the context of sustainable development framework, taking into account diverse national circumstances regarding energy access, food security, etc.
- Annex 1 countries should consider supporting the initiation of policy networks among Asian countries, aimed at facilitating information exchange and improved understanding of climate change issues in relation to sustainable development.
- Since climate change affects all aspects of development, discussions on policies at the national level and negotiations at the international level must include representatives from ministries and agencies of climate-sensitive sectors, besides the focal agency for the environment. Especially, synergies of climate policies with other sectoral development policies must be fully exploited.
- Future national communications should attempt to evaluate potential co-benefits (e.g., reduction in air pollution, employment generation) of mitigation and adaptation policies and their contributions to local sustainable development.

(ii) Ways and means to promote GHG mitigation
- In order for the global climate regime to be successful and convincing to most, if not all, parties to the UNFCCC, Annex 1 countries should take the lead in demonstrating the progress in GHG mitigation efforts and in meeting the commitments made to date in financial and technological transfers.
- The Annex 1 countries, which refused to ratify the only international agreement to curb GHG emissions due to various economic and equity-related concerns, should show leadership in designing GHG mitigation strategies that would directly address those concerns. Major developing countries, which share similar concerns, can then be convinced to be involved more comprehensively.
- Necessary mechanisms should be set up to objectively register and document efforts of developing countries in climate and development. Simultaneously, a formal UNFCCC process (e.g., voluntary

Table 5-4: Major concerns on the post-2012 climate regime from an Asian perspective

Concerns	Description
Economic	• Fear of harm to economic development and loss of market competitiveness due to additional costs from climate mitigation measures • Perception of the private sector in industrialised countries regarding technology transfer as a costly process with potential risks to intellectual property rights • Concern of developing countries about institutional and financial barriers for effective transfer of climate-friendly technologies
Developmental	• Belief among many Asian developing countries that tackling climate change diverts attention/resources from more urgent priorities on economic and social development • Concern that climate regime does not adequately address issues such as energy access, food security, etc. within the framework of sustainable development. • Lack of effective synergies with other conventions concerned with sustainable development (e.g., biodiversity, desertification) • Inadequate attention to reconciling pressures from globalisation and climate change
Negotiation-related	• Inadequate consultations with developing countries in climate negotiations, especially in decisions on emission reduction allocations • Lack of progress in procedural equity (e.g., limited participation and contributions of NGOs from Asia) (Ashton and Wang, 2003) • Lack of demonstrable progress by Annex I countries in emissions reduction, technology transfer, and financial support • Refusal of major Annex 1 countries (e.g., United States and Australia) to ratify the Kyoto Protocol, the only international agreement to reduce GHG emissions • Inadequate recognition of developing countries' efforts (e.g., emissions growth in China was reduced by about 250 MtC per year over the past 3 decades – Chandler et al. 2002)
Market Mechanisms	• Predominance of CDM projects based on landfill methane recovery and destruction of gases with high global warming potential, which contribute little to local sustainable development • Complex bureaucratic approval process of the CDM • Poor geographic representation of CDM projects from LDCs • Limited domestic institutional capacity in many countries to effectively engage in market-based approaches (Srinivasan, 2003)
Adaptation	• Inadequate discussions on adaptation in current negotiations • Lack of adequate international mechanisms to address adaptation (funding, technology transfer, capacity-building) • Complex bureaucratic approval process for funding (in terms of requirements to demonstrate "global environmental benefits" and "incremental costs") of adaptation projects • Concern that countries that contributed least to the climate change problem (SIDS and LDCs) are the ones that need to adapt foremost • Limited domestic capacity for adaptation • Complex procedural linkages between adaptation and adverse impacts of mitigation measures (e.g., impacts of reduced demand of fossil fuels on oil exporting economies)

pledge and review mechanism) of crediting mitigation policies by developing countries may be developed.

- Incentives (e.g., favourable financing terms) for effective transfer of climate-friendly technologies, which are most relevant to Asian circumstances, must be designed. Such technologies include, but are not limited to, clean coal technologies, wind power, solar power, biofuels and carbon capture through effective forest management. Simultaneously, measures to protect intellectual property rights in cooperation with the World Intellectual Property Rights Organization are necessary.
- More proactive efforts to use project-based mechanisms that contribute to local sustainable development are necessary. In this connection, prospects for designing new mechanisms, like debt-for-nature swap (an agreement in which a proportion of a country's debts are written off in exchange for a commitment by the debtor country to undertake climate mitigation and adaptation policies), must be explored.
- Subsequent to the launch of the EU emissions trading system, there is growing interest in domestic emission trading schemes, especially in Japan and the ROK. Prospects for allowing companies in non-Annex 1 countries to participate in international emission trading schemes may be explored as a way to promote their understanding of market mechanisms and GHG reduction policies. At the beginning, multinational companies located in Asian developing countries can initiate such efforts.

(iii) Restructuring of the CDM

- Restructuring of the current CDM, for example, through enhancing its scope by including sector-based and/or policy-based CDMs, is crucial to promote sustainable development benefits of CDM projects in the future regime. The criteria for the additionality of small-scale projects and projects with significant development benefits may be relaxed.
- The relationship between ODA and CDMs should be further explored, especially in support of projects that provide clear sustainable development benefits. Options for creating innovative risk management specifically targeted for CDM investors in Asia must be examined.

(iv) Facilitation of adaptation

- Given the growing importance of adaptation, the future regime should make adequate provisions for facilitating adaptation, including the negotiation of an optional protocol on adaptation, if necessary.
- Prospects for increasing the share of the CDM proceeds (currently 2 per cent) to support adaptation in the most vulnerable countries must be explored without reducing the attractiveness of CDMs.

The way forward

Climate change considerations have been transformed from a predominantly long-term and global issue to include immediate and local challenges as its implications are more specifically understood than before. Since climate change affects virtually all aspects of development and as the Asia-Pacific region is highly vulnerable to its impacts, policy-makers in the region need to consider climate change more seriously than before and begin to integrate concerns of climate change in development policy through the identification of both *strategic* (areas/sectors through which such integration is achieved) and *operational* (instruments, mechanisms and tools to achieve integration) entry points. Failure to integrate climate risks in development policy can indeed thwart sustainable development and attainment of the Millennium Development Goals (MDGs) in Asia. Raising the policy profile of climate change within the context of sustainable development is a crucial first step in this direction. Further, national and local policy-makers must be informed of the importance of policy coherence (within climate policies, between climate and other environmental policies, and between climate and development policies) in finding "win-win" solutions and preventing "mal-adaptations."

Mainstreaming options:

While mainstreaming climate change in all developmental programmes is vital in the long run, it is important to initiate such efforts first in sectors that are most sensitive to climate change. These include agriculture, water resources, tourism, etc. As there are several technical, institutional, social and political and economic challenges associated with mainstreaming, considerable capacity-building and creation of incentives are crucial. Future efforts in Asia must utilise both policy-level and operational-level mainstreaming options by making changes in existing institutions and infrastructure. Inter-ministerial task forces at national and provincial levels could make a significant contribution towards mainstreaming. Mainstreaming climate concerns in the daily practices of business, NGOs and donor agencies is also crucial.

Sustainable ways to meet to energy demands in Asia:

Owing to growing energy and fossil fuel needs, GHG emissions in the region are expected to grow considerably. Considering that large populations across the region do not have adequate access to affordable energy, it is important for policy-makers to look at win-win options that would reconcile growing energy demands without substantially enhancing GHG emissions from the region. One of the key pillars of future energy strategies for Asia, therefore, must be cost-effective energy efficiency improvements and energy savings particularly through employing RE sources, which are abundant in Asia, and effective use of other non-fossil fuel technologies. Development, adoption, and transfer of technologies for the effective use of RE are considered crucial, and should be promoted through policy frameworks that can sustain inter-institutional linkages in the region.

It is important to bear in mind, however, that RE promotion alone is not going to solve the problem of energy demands in Asia, or for that matter, any region in the world. Consideration must be given to using nuclear and other forms of energy in countries such as India and China where the capacity to handle nuclear power plants is moderate to high. As transportation is a growing sector in virtually every Asian country, efforts to reduce GHG emissions through strengthening public transport by means of, for example, public-private partnerships are critical. Since deforestation continues to be the main source of GHG emissions from countries such as Indonesia, CDM projects aimed at forest conservation must be preferentially approved in view of their considerable global benefits. In addition, attention to responsible tree planting across the region to enhance carbon capture is vital.

As air pollution is a major concern in many Asian cities, opportunities for structural integration of air and climate policies must be assessed. In this connection, prospects for designing an "Asian Partnership on Sustainable Energy and Climate and Air Policy" may be explored. In the long run, major Asian contributors to GHG emissions should consider taking certain mitigation obligations in return for target-oriented financial and technology transfers from Annex 1 countries. Such obligations could be in the form of both quantitative and non-quantitative approaches, which could involve: fixed binding targets, dynamic binding targets with price caps, technology agreements, and carbon taxes.

Restructuring of the CDM:

As mentioned earlier, there are serious concerns about the current form of the CDM in relation to its sustainable development benefits. Experiences to date suggest that a large and rapidly growing portion of the CDM project portfolio has few direct environmental, economic and social benefits other than GHG mitigation. Indeed non-CO_2 CDM projects involve opportunistic end-of-pipe reduction in non-energy related sectors. Appropriate restructuring of the CDM in the future regime is vital to support CDM projects capable of delivering more environmental and developmental benefits. Premium quality CDM projects with wide-ranging benefits for sustainable development should be considered to accumulate double or triple the normal amount of credits, mainly as an incentive for private investors from both Annex 1 and developing

countries to initiate such projects. If necessary, innovative financial and technology transfer mechanisms besides the CDM must be designed to facilitate transfer of climate friendly technologies. It is recommended that Annex 1 countries apply much stricter project selection criteria to favour projects that have a strong sustainable development orientation. Such restructuring can indeed make the CDM an effective tool to mainstream climate issues for sustainable development in Asia.

Adaptation:

Future emphasis in adaptation must be given to the livelihoods, places and sectors that are highly vulnerable, and to national strategies that affect large numbers of people, such as poverty alleviation policies. Efforts to mainstream adaptation in development planning must be encouraged at both the local and national levels. On an international level, donors and development agencies must ensure that their investments in infrastructure in the vulnerable regions of Asia are based on a comprehensive assessment of climate risks. The effectiveness of delivery of ODA must be improved especially in programmes aimed at facilitating adaptation. Since adaptation to climate change requires enormous resources, opportunities for funding adaptation must be explored both within and outside the framework of the UNFCCC. If adaptation issues are to be dealt with effectively under the UNFCCC, it is important for Asian negotiators to argue for the creation of sufficient institutional flexibility.

Design of a future climate regime:

As the design of a future climate regime beyond 2012 has important implications for sustainable development, Asian policy-makers and negotiators must actively engage in designing the climate regime to reflect their countries' aspirations and concerns on equity, economics and development. Asian negotiators must be prepared to propose "a variable geometry" in the future regime that would permit emissions control approaches that would vary from one country to another based on national circumstances. The capacity strengthening of climate negotiators from the region is necessary through, for example, creation of mechanisms for facilitating mutual learning and regular policy dialogues. Furthermore, options to increase the policy coherence between the future climate regime and a number of climate relevant policy areas and sectors (the so-called "non-climate policy track") must be explored. Bottom-up mitigation and adaptation policies and measures are likely to become more important in the post-2012 climate regime discussions. Asian countries, having accumulated rich experiences in such approaches, must be proactive in discussions that would ultimately contribute to realising the vision of a sustainable Asia.

CHAPTER 6

Strengthening urban environmental management in Asia

Urbanisation and its implications to the urban environment

Cities play a central role in the evolution and advancement of society. They serve as focal points for technological innovation, economic growth, societal change, politics and culture. Cities are also the places where concentrated demands for various services (e.g. trade, consumption, and production) emerge, which in turn generate employment. The prevailing wage-gaps with neighbouring areas and disparities in employment opportunities trigger a population flow into cities. This influx of people speeds up the urbanisation process further. It essentially creates a self-reinforcing cycle generating more demand for services. As a result, the urbanisation in developing countries is often described as "compressed urbanisation" with an over-concentration of economic, political and cultural functions in primary cities and the inflow of population that exceeds the limit that a city can productively absorb (Tasaka, 1998).

While urbanisation itself is a global phenomenon, that of Asia for the last five decades has been characterised by an unprecedented speed and size (UN, 2002). Yet, only about 30 per cent of the population in the Asia-Pacific region live in cities (in the year 2000). The other feature that has to be remembered is the significant regional variations in the rate of urbanisation, for example, the rate in East Asia is the highest, followed by Southeast Asia and then South Asia. The share of urban population in Japan, the Republic of Korea (ROK) and China has increased from 63 per cent, 28 per cent and 16 per cent to 79 per cent, 82 per cent and 36 per cent respectively from 1960-2000. In Southeast Asian countries, urbanisation started at slower rates but gained momentum during the 70s and 80s. In South Asian countries, rapid urbanisation is under way at about 3 to 6 per cent per year since the 1960s (World Bank, 2004). One study predicts that by 2015 Asia will host 153 out of 358 cities globally with populations over one million. The same estimate shows that 15 out of 27 mega-cities (over 10 million) by 2015 will be in Asia (HABITAT, 2001).

Asian urbanisation, as in Europe two centuries earlier, has been driven by industrialisation and financial liberalisation. This tendency is particularly noticeable in East Asia and Southeast Asia. Since the 1980s, the economic growth of cities has been helped by increases in foreign direct investment. In some countries, like China, cities themselves have been competing aggressively with one another to attract business and foreign investment.

Rapid urbanisation in Asia has resulted in metropolitan expansion, high-density central business districts, and urban sprawl, especially in the larger cities. It has greatly stretched already limited urban management capabilities and has had to contend with the demands and implications of a large and steady influx of migrants. It has also faced and continues to face the rapid emergence of unplanned settlements and slums. The percentage of urban population living in slums[20] has been rapidly increasing in Asia except for West Asia (from 36.4 per cent in 1990 to 41.1 per cent in 2001 in East Asia, from 59 to 63.7 per cent in South Asia, and from 28 to 36.8 per cent in Southeast Asia (UN, 2004). One recent study concluded that 20 per cent of houses in Jakarta, Bangkok and Kuala Lumpur are illegal and that the figure rises to about 50 per cent in Mumbai and elsewhere in India (ESCAP/ADB, 2002).

The rapid and uncontrolled urbanisation in Asia has exerted tremendous pressure on the urban infrastructure. The increased volume of waste-water, rapid motorisation, rising amounts of waste generated, and growing energy demand all require expansion of the urban infrastructure. Against this context, the following

section reviews the major urban environmental problems that Asian cities confront and some key approaches to deal with them.

## Key urban environmental issues and challenges in cities

Air pollution

Among the main drivers of Asia's economic growth are new industries, automobiles and construction of all kinds, all of which are major contributors to air pollution. The defining characteristics of air pollution in Asian cities may be summarised as follows:

- The ambient air concentration of particulate matter now generally exceeds WHO health safety norms, often by dramatic margins (ADB, 2003).
- The trends in some cities are moving in opposing directions. For example, in several Asian cities, industry-related pollutants are decreasing while transportation-related pollution is spiraling out of control. This is true in Japan, in North Asia cities such as Beijing and Shanghai, and in Southeast Asia cities that include Ho Chi Minh, Bangkok, Jakarta and Manila (IGES, 2004).
- Especially in the largest cities, slow but steady industrial relocation to the periphery or beyond the city limits is taking place. The net effects of this may be an improvement in quality in city centres, but only at the cost of transferring the pollution to the suburbs.
- To at least some extent, the composition of Asian urban industrialisation may be shifting towards the service sector. One study, for example, reported evidence of a consistent rise of the tertiary sector and a fall of the primary industry in twenty-two East Asian cities (Dhakal and Kaneko, 2002).

Asian efforts in recent years to mitigate air pollution have involved both demand and supply side responses, including the use of clean coal in the industrial sector, increasing use of natural gas, the development of mass public transportation infrastructure and the introduction of regulations, fees and targeted subsidies. Results thus far have not been encouraging, especially with regard to measures aimed at reducing demand, due principally to generalised institutional weaknesses and capacity constraints and to severe inadequacies in public finances.

Fig. 6-1: Annual average air pollution concentrations in Asian cities (1999)
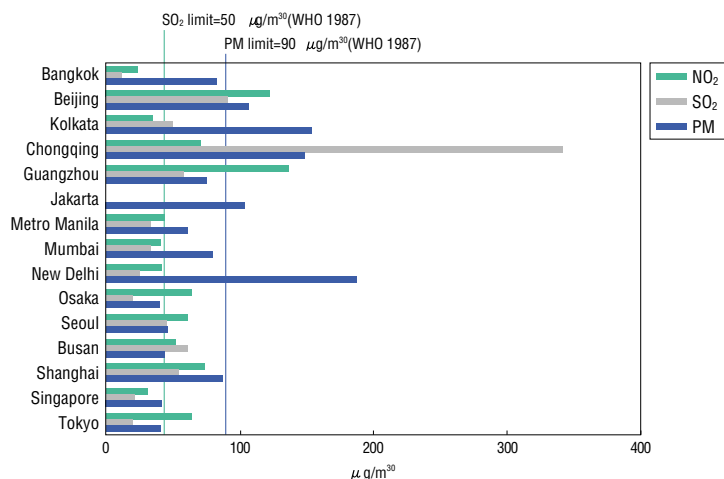

Source: World Bank (2004)

Water supply and sanitation

Many Asian urban dwellers are still without access to adequate water and sanitation services. The WHO/UNICEF Global Assessment 2000 Report indicates that over 1,916 million people in Asia do not have access to adequate sanitation. Although the absolute number of people now served by a water supply has increased in recent years, the rate of coverage has dropped due to the rapidly increasing urban population (WHO/UNICEF, 2000). Fig. 6-2 shows the high degree of variability that exists in coverage and availability of water supplies in some of the major cities in Asia. In Pacific coastal cities in the ROK and China, the coverage in 1997 was nearly 100 per cent and water was available twenty-four hours a day. This contrasts sharply with Southeast and South Asian cities where coverage rates are much lower. For example, the coverage in Jakarta was only 27 per cent and the availability was eighteen hours a day. In Mumbai and Chennai (India), the coverage is 100 per cent and 97 per cent[21] respectively, but the water availability is only for five and four hours, respectively.

Fig. 6-2: Coverage and water availability in Asian cities
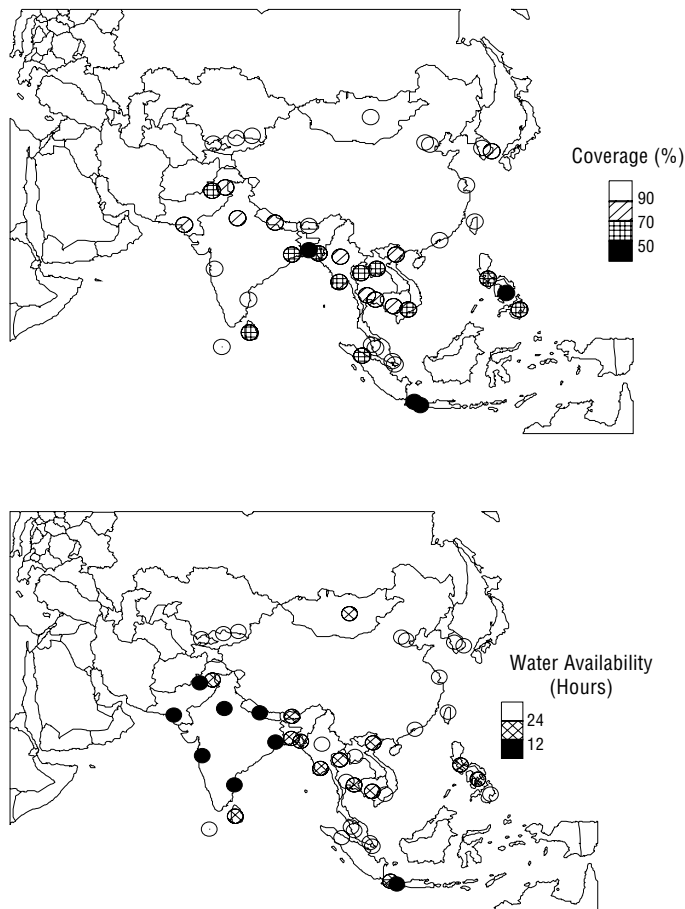
Source: McIntosh and Yñiguez (1997)

Asian also suffers from a severe lack of and poor systemic efficiency of waste-water treatment. In China, for example, only 16 per cent of waste-water is being treated (Song, 1997). Though countries like India and Thailand enjoy a high percentage of treated waste-water, (83 per cent in Bangalore, India and 70 per cent in Chiang Mai, Thailand), the efficiency of waste-water treatment plants is very low. Other countries

in this region viz., Indonesia (Bandung – 23 per cent), Malaysia (Penang – 20 per cent) Pakistan (Karachi – 10 per cent) suffer from a serious lack of waste-water treatment (UN-HABITAT, 2003).[22]

The following represent some major and immediate barriers to achieving greater coverage and sustainability of water supply and treatment in Asia:

- Severe capacity problems arising from extensive operational and management inefficiencies.
- In many instances, very low tariffs that act as pernicious subsidies and that encourage the wasteful use of water (McIntosh, 2003).
- Major under-investment relative to other areas of the world.

According to the Global Water Supply and Sanitation Assessment Report 2000 (WHO/UNICEF, 2000), the annual investment in Asian urban water supply is about US$3 billion, of which, US$2 billion is national investment and about US$1 billion is from external support. For sanitation, the total investment is about US$1 billion, where 90 per cent is from national investment. Looking at the share of water supply and sanitation as a percentage of total infrastructure investment, it is lower in Asia that in other regions of the world (i.e., it is 3.6 per cent in Asia compared to 5.3 per cent in Africa and 8.3 per cent in Latin America and the Caribbean).

Municipal solid waste

The combination of population growth, rapid urbanisation and intensified economic activity have combined to increase greatly the volume of waste in Asian cities. Fig. 6-3 shows the increase in waste generation per capita against the increase in income in Asia. In cities of Japan, the ROK, and Malaysia, the quantity of waste generated (in excess of 1 kg/person/day) is similar to that found in the most advanced countries. In the large cities of the poorer, developing countries of Asia, the figure is roughly half that amount (i.e., around 0.5 kg/person/day) (IGES, 2001). In addition to the volume difference, the composition of solid waste from the cities in Asia's more advanced countries poses different challenges in comparison to those that relate to the solid waste from the cities of Asia's developing countries. Most of the waste from the more advanced countries is highly inorganic and non-recyclable. In the cities of developing regions of Asia, solid waste is generally organic and recyclable with waste management characterised by inefficient collection and with waste treatment and disposal usually consisting of open dumps (although some cities are gradually adopting controlled dumps and partially engineered landfills, with composting and recycling now receiving more attention) (Enayetullah and Sinha, 1999). Due to its high costs, incineration is usually not practiced, except for hospital waste.

Fig. 6-3: Relationship between waste generation rates and per capita GDP in Asia
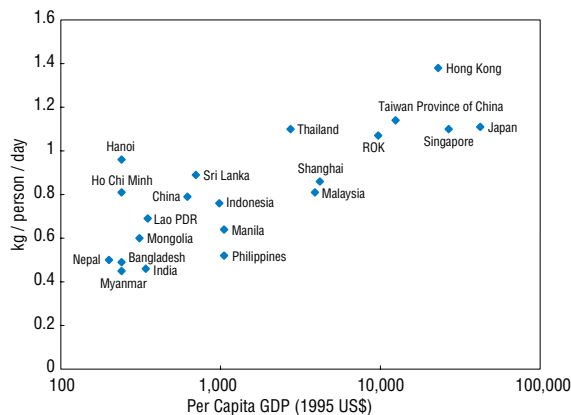
Source: World Bank (1999)

In developing countries, waste management suffers from weak institutional and regulatory capacities and this is further exacerbated by poor communication and a lack of public participation (Ogawa, 1996; IGES, 2001; Zurbrugg, 2002). The largest and most immediate constraint, however, appears to be the lack of financing. At present, waste management services account for a high percentage of municipal budgets in many cities of the region. In some Asian cities, expenditures on solid waste management can reach 40 per cent of the municipality's operating budget and out of this, 70-90 per cent is spent on waste collection.

Although there are also examples of recycling activities promoted by communities, non-governmental organisations (NGOs), and the private sector, these activities are informal in nature and are not supported by the municipal authorities in Asian developing countries.

Financial issues for developing urban environmental infrastructure

To build an environmentally-sound urban infrastructure would require very large-scale capital investments. Access to appropriate technologies for waste treatment is generally not regarded as a problem as these can be obtained quite easily in the international marketplace. The financing that they require, however, is a major barrier, as the financial resources at the disposal of the national and local governments are limited. This is especially the case at the municipal government level which, throughout Asia, is required to assume more and more of the responsibility for urban capital investment and for the management of the urban environment.

A number of factors explain the weak financial base of most Asian municipalities. In the first instance, there are structural factors that impose imbalances in the sharing of tax revenue between central and municipal governments and that pose major barriers to municipal financing. In Asia, the bulk of taxes is usually collected by central governments and relative small percentages are then assigned to municipalities. This continues to occur in spite of the fact that the trend over the past decade has been to decentralise and to assign greater and greater responsibility to the municipal level. In addition, the types of taxation that can be applied directly by municipalities is often restricted by law and this leaves very little margin available to local authorities.

In addition, municipal revenues suffer in Asia as a direct result of intense competition between cities and multinational companies to attract foreign investment. As linkages of cities to the global economy have increased, cities have increasingly looked to multinational companies and foreign direct investment for better employment and economic growth. This is especially true for cities in China and other East Asian countries, a few countries of Southeast Asia (such as Viet Nam and Malaysia) and South Asia (Bangalore and Hyderabad in India). To attract foreign investment, a common practice of cities in these countries has been to provide tax breaks (including extended tax holidays) and direct subsidies in the form of land, utilities and other services.

Finally, financial constraints at the municipal level in Asia are also attributable to very low tariffs and inappropriate fee systems with regard to utilities, including the pricing of energy. Tariffs are low because they are usually highly subsidised and fee collection systems are very weak. Most cities cannot recover the operational costs let alone generate the capital required for new construction costs.

The constraints and limitations summarised above have propelled a recent and increasing emphasis on obtaining new capital investment financing directly from the private sector through Public-Private Partnerships (PPP). The results from such arrangements, however, appear to be mixed (see following section and also Chapter 4, page 69). There is also evidence that PPP may not function well in low-income

cities where widespread poverty is found (Kidokoro, 1998). Finally, there is yet other evidence that local governments in developing countries lack the capacities required to establish the legal and operational frameworks required for effective public-private partnerships (Chang et al., 2001).

The above discussion summarises some of the infrastructure challenges that must be met in the interests of sustainable development in Asia. In addition to financial barriers, attention should focus on how to change the tariff structure so that users have incentives to save resources, how to improve tariff collection systems and how to make regulations workable.

Experiences of public-private partnerships for urban environmental infrastructure

Several types of PPPs may be differentiated as a function of the key responsibilities assigned to or assumed by the private sector. Table 6-1 offers a typology, outlining the characteristics of the each partnership. For example, in the case of the service contract, companies have a responsibility only for the operation and maintenance which poses a relatively low risk for them. By contrast, in the case of divestiture, companies have to bear all of the responsibility. Build-Operate-Transfer (BOT) is the most popular form of concession contract in East Asia for the establishment of sewage pipe systems and sewerage treatment plants (Chang et al., 2001). A survey carried out by the Japan Development Finance Institute shows that there were 162 Public Fund Initiatives (PFIs)[23] for water supply and sewage projects worldwide in February 1999 and most of these were in the form of concession contracts (Kitano et al., 2000).

Table 6-1: Allocation of key responsibilities for private partnership options

	Service Contract	Management Contract	Lease/ Affermage	Concession	BOT-type	Divestiture
Asset ownership	Public	Public	Public	Public	Private/Public	Private
Capital investment	Public	Public	Public	Private	Private	Private
Commercial risk	Public	Public	Shared	Private	Private	Private
Operations/maintenance	Private/Public	Private	Private	Private	Private	Private
Contract duration	1-2 years	3-5 years	8-15 years	25-30 years	20-30 years	Indefinite

Source: Budds and McGranahan (2003)

Note: Role of private sector is shown by shaded area

Private sector participation in the provision of infrastructure in the Asia-Pacific region reached its peak in 1997. The annual investment in infrastructure projects with private participation in East Asia and the Pacific was US$41.3 billion in 1997, which sharply declined due to the Asian financial crisis, and it is recovering slowly with about US$17 billion in 2001 (Fig. 6-4).

Fig. 6-4: Investment in projects with private participation in East Asia and the Pacific region
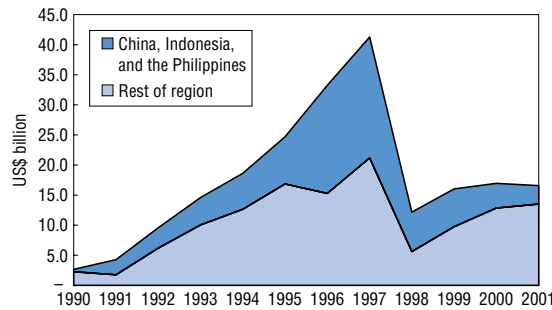
Table 6-2 shows the activities and policies of PPP in a number of East and Southeast Asian countries. The evidence that is available often uses different measurements and indicators of success and this makes it difficult to provide an overall assessment. There appears, however, to be little doubt that, although results have been mixed, there have been a number of significant successes as measured against services improvements. The evidence also suggests that: (i) PPP works especially well with large infrastructure projects (this suggests that issues of economy of scale and relationships between volume and financial rates of return are critical); (ii) sound policies and regulatory authorities are essential components, and (iii) equity considerations should be agreed upon and built-in from the outset. The problem, as some recent research has shown, is that Asian developing countries are generally in need of considerable capacity strengthening (e.g., appropriate laws and regulations, functioning enforcement systems and institutions, and environmental regulatory and management capacity) before PPPs can be expected to function effectively (O'Conner, 1994). Therefore, despite growing interests and many useful experiences, PPP does not offer a panacea; its success is subject to local conditions, including regulatory environments, and, the technical, managerial and professional capacities of national and local governments.

The applicability of PPP further diminishes in cities that are poor, where user charges are difficult to collect. In such cases, small-scale community-oriented environmental projects are considered more feasible than large infrastructure projects because poverty is intrinsically linked to the activities that contribute to urban environmental problems. Also, it is a well-accepted fact that the private sector has difficulties providing environmental services to low income communities. For example, in Phnom Penh, a part of waste collection and street cleaning was contracted out to a private company. The only source of income for the company was the collection of fees from urban households and small businesses. While the urban poor were often unable to pay the fee, the company served only two-thirds of the municipal area where the fee was paid, and it had no incentive to serve the rest of the area (Memon et al., 2004).

Experiences of community partnerships in urban environmental infrastructure and services

As indicated previously, a significant proportion of Asia's urban population live in squatter areas.[24] In such settings, low financial rates of return limit the potential for public-private infrastructure partnerships and a range of community partnership arrangements are emerging to address urgent problems. Examples that are cited as successful include the Orangi Pilot Project in Pakistan (Box 6-1) for developing a wastewater system with full community participation facilitated by an NGO, and the Kampung Improvement Program in Indonesia.

The community partnership as a mechanism to improve urban environmental infrastructure is not limited

Table 6-2: Major PPP activities and policies in Asia

Experiences in East Asia
In China, three national Build-Operate-Transfer (BOT) pilot projects and more than fifty local projects in the form of BOT, Build-Operate-Own (BOO), Transfer-Operate-Transfer (TOT) and others were in progress in the year 2000 (Chang et al. 2001). A number of sewerage plants were constructed using BOT as the financial mechanism, and joint-stock companies in the construction and operation of sewerage and garbage disposal works are increasing. China has issued three ministerial regulations concerning foreign investment in infrastructure projects. The BOT law is now being prepared. China's local governments are more active than the central government in introducing PPP projects. Public Construction - Private Operation and BOT are expected to be the main trend of PPP in urban environmental infrastructure in China.
In Hong Kong, relevant regulations promoting BOT are available. Under standard Design-Build, and Operate (DBO) contracts, the private sector may collect garbage and dispose of it in landfills. In Macao, garbage collection and disposal facility operations are consigned to private contractors.
In the ROK, private sector participation in the construction and operation of environmental facilities and power generation is increasing. In recent five year plans, the role of the private sector is emphasised. Fundraising for environmental infrastructure began to shift to PPP in about 1996. It aims to increase the share of private financing for infrastructure development by over 40 per cent.
Japan introduced the Law Concerning Public Facilities Construction by Use of Private Capital in 1999. A PFI promotion committee was established to provide policy consultations and suggestions. In June 2001, water regulations were revised to give the private sector a greater role in the sewerage business. The revised regulations allow the private sector to participate in water treatment and purification. However, despite this, only a few domestic PFI cases can be found in waste management and sewerage plants.
Experiences in Southeast Asia
In Malaysia, privatisation policy was adopted in 1983 to reduce the government's financial and administrative burdens. It created the Privatization Master Plan in 1991 and launched large-scale privatisation of government enterprises before 1994. The whole country has been divided into four regions for privatised garbage disposal. The regulations regarding PFI are relatively well developed in Malaysia. PFI projects cover many areas such as power generation, communication, transportation, water supply, sewerage works, solid waste management and even air and water pollution monitoring.
In Thailand, the "1992 National Environmental Protection Act" and the "Royal Act of Private Participation in State Affairs" have set the trends for PPP. The legal system for construction and operation of infrastructure by the private sector was developed and within that legal framework, PPP for sewerage and industrial wastewater treatment were implemented. During 1995-2000, the government, getting assistance from multilateral financial agencies, increased the amount of investment for environmental infrastructure substantially. Thailand created the Privatization Master Plan in 1998. Bangkok has made major improvements in its water supply systems along with the construction and upgrading of waste-water treatment facilities under a public-private partnership initiated by the Bangkok Metropolitan Administration and the Metropolitan Waterworks Authorities.
In Indonesia, the government has high expectations for PFI because of significant public debt and the decrease in ODA since the 1990s. This has given way to private sector participation and it has formulated relevant regulations and policies for promoting PFI in many areas. The major activities include a BOT projects for drinking water in Jakarta.
In the Philippines, the first BOT law was established in 1990. A BOT centre was established under the Department of Treasury for the implementation of BOT projects. However, risk prevention policies, government guarantees for BOT projects, and long-term plans for the introduction of PFI are generally not in place. Privatisation of the municipal water supply and sewerage treatment started in 1997. Through BOT it has succeeded in securing funds for some environmental infrastructure projects. PFI projects are also promoted in areas such as power generation, communication, transportation, and garbage-fuelled power plants.
In Singapore, the collection of municipal solid waste is consigned to the private sector.
In Viet Nam, BOT laws were issued in 1993 and significant foreign capital inflow was observed. Current BOT projects cover areas such as water supply, port development and power generation.

Source: Chang et al. (2001)

to only squatter areas. In many Indonesian cities, the local community plays a key role in solid waste management. In Dhaka, community-based waste management programmes have been reported successful. Community partnership programmes aimed at improving the livelihood of the community, such as the Community Mortgage Program in Philippines (Porio et al., 2004) and the Urban Community Development Office in Thailand (Boonyabancha, 2004) are often cited as successful. Although all projects are often termed as community partnership projects, the partnership characteristics and the role of the local communities vary greatly from relatively passive information-sharing campaigns to full empowerment in planning, execution and management of projects.

To what extent might community partnerships, such as the ones mentioned above, provide solutions to the urban infrastructural needs of Asian communities including squatter settlements? Caution is needed in answering this question as the potentials and limitations of this model remain very unclear. The examples of 'successes' are few and time will be required to judge their true effectiveness, sustainability and durability. In several cases, there are already indications that the levels of community participation have been exaggerated. Gardner (2002), for example, carried out a detailed study on Indonesia and found that community meetings were often cited as community participation and that, while apparent successes were documented and highlighted, failures and limitations were not. Neither were the reasons for failures and shortcomings investigated. There is clearly a need for both deeper and more extensive time-series analysis before the community-based environmental infrastructure modality can be claimed as a general success and a basis for replicability.

Box 6-1: Provision of public goods by community: Orangi Pilot Project (OPP) in Pakistan

The Orangi Pilot Project (OPP) is based in Karachi, Pakistan. Orangi is Karachi's largest informal settlement, extending over some 4,160 hectares, and it had a population of 1.2 million in the late 1990s (Alimuddai et al., 2004). The project was established in 1980 as a community-based programme for waste-water management with the cooperation of an NGO.

The OPP introduced a low-cost sanitation programme, targeting low-income families to construct and maintain an underground sewage system with their own funds (Alimuddai et al., 2004). The NGO developed several low-cost technologies, such as a sewage pipe with a diameter that was smaller than usual, and supported community organisation activities. Residents interested in this project elected their representatives, and contracted and maintained sewage systems while getting advice from the NGO.

As a result, in 1991, 94 per cent of households had a lavatory connected to the sewage system. Infant mortality declined from 130 per thousand in 1980 to 37 per thousand in 1991 (Hosaka, 2002). The main factors for success of this project were:
• The technological aspect: adoption of a simple design for the sewage system using standardised technologies.
• The economic aspect: cost-cutting utilising the power of the residents for the construction and maintenance.
• The social aspect: organisation of residents by lanes, effective size of the organisation (20 to 40 households), and transparency of the organisation.

This programme is being replicated in seven cities in Pakistan by NGOs and CBOs, and in 49 settlements in Karachi by the Sindh Karachi Abadi Authority (Alimuddai et al., 2004).

Beyond infrastructure: Tackling the demand side

The rise in income in Asian cities has produced dramatic increases in per capita car ownership, per capita waste generation, per capita levels of water use, energy consumption, sewerage and industrial waste. Effective and environmentally well-targeted supply-side responses to this may be essential, but there is overwhelming evidence that the net result of such responses is mainly to create more demand and yet further environmental stresses. For this reason, any prospects for longer-term success will require interventions that constrain and reduce demand. This is particularly obvious in the case of urban transport where more roads create more demand and a concomitant increase in urban energy use and air pollution.

In this regard, top-down approaches, including regulations and standards, are proving effective in at least some Asian urban settings. The case of urban transportation in Singapore has attracted interest world-wide. Singapore exercises tight controls through a combination of measures such as high taxation and tariffs on new vehicles and a vehicle quota system that allows people to bid for a limited number of licenses to own vehicles. Singapore has also introduced an electronic road pricing system which automatically charges fees for vehicles entering core business districts (Dhakal, 2002). Although there has been extensive debate on whether Singapore's approach would function in other urban settings in Asia, there appear to be no compelling arguments as to why this should not provide effective elsewhere. A second regulatory, top-down approach seems already to be working well in controlling air pollution in Delhi. The Delhi programme derives from a decision of the Supreme Court of India on the grounds of protecting public health which mandates the use of compressed natural gas in heavy-duty diesel buses and trucks. Other Asian cities have also recently introduced new regulatory measures. Shanghai now has a Singapore-style vehicle cap[25] and has also introduced regulatory measures that prohibit the installation of new coal-fired boilers in core cities. Beijing has announced a range of new and strict regulations to bring air quality to acceptable levels and to meet the immediate milestones set for the 2008 Olympic Games (IGES, 2004). Similarly, South Asian cities such as Kathmandu, Delhi and Dhaka have banned two-stroke and diesel three-wheelers successfully to control air pollution.

Box 6-2: The case of Singapore

Singapore's transport policy is characterised by following major instruments:

Fiscal measures: Fiscal measures for restraining car ownership in Singapore include import duties levied through the Customs and Excise Department, a tax on goods and services, a registration fee, the Additional Registration Fee (ARF), and road/fuel taxes. A tax on diesel fuel was lifted in late 1998. The annual road tax varies from 70 cents (Singapore) per cubic centimetre (cc), for cars with 1000 cc engines, to 175 cents per cc for vehicles with engines exceeding 3000 cc. To ensure that the high registration fee promotes new and better vehicles, a preferential ARF was launched in 1975. In this scheme, the government reduced ARF rates for the registration of new vehicles when owners simultaneously scrapped older vehicles of the same class and size.

Electronic Road Pricing (ERP): ERP was implemented in September 1998, replacing the Area Licensing System (ALS). ERP is an innovative scheme for implementing congestion pricing. The basic idea of ERP is similar to ALS, but ERP is technologically-sound so that charges can be varied over time and location, reflecting the true cost of vehicle use in central business districts. In this system, all 33 ALS "gantries" (entry points) were replaced with ERP gantries for the 720 ha core area and each vehicle to enter into the restricted zone must be fitted with an "In-vehicle Unit" (IU). At the moment, charges do not fluctuate depending on the traffic conditions in Singapore. ERP charges are subject to review every three months to suit changing traffic conditions, and the charges are basically tied to prevailing speeds with the aim of maintaining traffic speeds around 45-65 km per hour on expressways and 20-30 km per hour on arterial roads.

Public transportation system: Efforts to organise public transportation were made by the government by the forceful merger of many service providers in 1973 into a single company held by the government, which floated its shares on the Singapore Stock Exchange in 1978. To introduce competition, the government later allowed one more bus company and today two bus companies and four taxi companies are operating in Singapore in parallel with the rail-based MRT services.

Vehicle Quota System (VQS): The VQS was announced in February 1990 with the intent to cap the number of newly registered vehicles. The VQS is an innovative mechanism to limit the number of vehicles and uses a market-based approach. In the VQS, the government fixes the number of allowable vehicles and prospective vehicle owners must obtain a Certificate of Entitlement (COE) through open bidding to allow ownership of a vehicle for 10 years. The bidding is opened each month and a list of bidders is arrayed in descending order. The bid quoted by the last bidder of a designated quota is called the "quota premium," which is then levied on all successful bidders to obtain a COE. Beyond 10 years of COE ownership one should either de-register or acquire a new COE at the price of the 12-month moving average quota premium of that category.

Source: Dhakal (2002)

With regard to vehicle emissions, new emissions standards have recently been adopted in several locations in Asia. EURO-I standards (or similar standards adapted to national circumstances) for new vehicles have already become the norm in many of the Asian developing countries. In a number of countries, standards stricter than EURO-I have been introduced to selected cities. In five metropolitan cities of India, the EURO-II fuel quality standards have been implemented. In Beijing, Environmental Protection Bureau has formally adopted EURO-III (150 and 350 PPM sulphur for gasoline and diesel respectively from July 1 2005). The State Environmental Protection Administration of China has adopted EURO III and IV for light duty vehicles for 2007 and 2010 respectively for the entire country. The adoption of standards is one thing, but their effective implementation is quite another. A recent study confirmed that in many cases imple-

mentation has been quite ineffective due to the prevalence of old and inefficient vehicles, low penetration rate of new vehicles, poor inspection and monitoring systems, and widespread institutional problems related to the enforcement of in-use vehicles-emission-standards (Dhakal and Schipper, 2005).

Box 6-3: Major orders of Supreme Court of India in 1998 for measures to improve air quality in Delhi

- Augment public transport to 10,000 buses by 1 April 2001.
- Introduce unleaded petrol in New Capital Territories Delhi by 1 September 1998.
- Convert all pre-1990 autos and taxis to clean fuel by 31 March 2000.
- Financial incentives for post-1990 autos and taxis by 31 March 2001.
- Ban on buses aged eight years or older except for those adapted to use clean fuel by 1 April 2001.
- Entire city bus fleet to be converted to CNG by 31 March 2001.
- Expand Indraprastha Gas Limited's CNG network to 80 by 31 March 2000.
- Comprehensive I&M programme to be started by 31 March 2000.
- Central Pollution Control Board to set up new air quality monitoring stations by 1 April 2000.

Source: Mehta (2001)

Towards better urban environmental management

Discussions in earlier sections indicate that Asian urbanisation is unprecedented in terms of size, speed and level of urban transformation and that this is pushing the social, environmental and political ingenuity of policy-makers to its limit. Historically, measures to contain urban growth and associated problems have not been successful in Asia, except in very few unique instances. Asia, therefore, has no clear model or prescription to follow but must find its own solutions. New and appropriate technologies will play an important part, but the main problems and barriers are not technological. They are institutional, organisational and matters of policy. Far from resolving problems and generating effective responses, the devolution and decentralisation of environmental responsibilities from national to regional to local levels serves in many instances to underscore capacity weaknesses, both in policy formulation and, most often, in execution and follow-through. The constraints of endemic management weaknesses and the economic disincentives of subsidy distortions, non-economic tariffs and environmentally-perverse user charges are not resolved by decentralisation alone. The crux of Asia's urban environmental problems lie in improving the governance base for the formulation and management of appropriate policies and practices, whether at the local, municipal, regional, national or trans-national levels. The evidence from Asia and elsewhere also confirms that, however valuable the notions of inclusion and full citizen participation, the "top-down" role of regulations, standards and norms is essential to the prospects for success. Finally, the issue of adequate finance for urban environmental infrastructure is critical and will need to be addressed on a case by case and situation-specific basis. While the exploding cities of Asia can and should learn from one another, the variations in Asia's urban reality are such that there are no "one-fit-for-all" solutions.

CHAPTER 7

What steers business towards sustainability?
Evidence, lessons and policy implications for Asia

Introduction

Business has been the engine of much of Asia's recent economic growth, but it also has become a main source of environmental damage. With modernisation and globalisation in Asia, business has become more influential in society. It is important, however, to recognise that business provides technologies and other solutions to environmental problems. From the environmental perspective, business is often portrayed as the cause of the problem, but in fact "Business is at worst only part of the problem, and at best can be only part of the solution. But within a multi-stakeholder framework, facilitated by the public sector, great opportunities exist to make use of the energies of the private sector to a far greater extent than has been contemplated" (World Economic Forum, 2005 (WEF)). Especially for the matters that require complex and collaborative solutions, "it is increasingly in the interests of business to be part of the solution rather than part of the problem." (UNDP, 2003)

Nevertheless, the market economy cannot become environmentally-sound unless environmental externalities are incorporated. To make it more environmentally-sound, various adjustments and improvements are necessary. Innovation is the most important element for companies to deliver goods and services in a competitive market. To make innovation contribute to sustainable development, however, market conditions require significant modification. Trade-offs between industrial development and environmental conservation will also be essential, as there are major limits to the availability of win-win scenarios. Monopolies, corruption and perverse subsidies exist for reasons and addressing these barriers in the interests of sustainable development will require trade-offs, many of which will be difficult and politically challenging (SustainAbility, 2004).

What might be the future directions for sustainable business in Asia? In an attempt to address this question, this chapter surveys voluntary initiatives taken by business in response to global environmental concerns, examines market-based innovations, including regulations and economic measures, and identifies future directions for business that will lead the society towards sustainability. It suggests choices and actions for governments and business to support voluntary initiatives drawing upon market mechanisms through the reconfiguring of its environmental policies and strategies.

Global sustainability standards and the Asian corporate response by voluntary initiatives

Sustainability indicators and country clusters

Issues concerning sustainable development are complex, differing greatly from country to country. Different aggregated indicators have been suggested to measure a company's efforts for attaining sustainability. This section summarises the status of private sector responses in Asia through voluntary initiatives.

Various types of indicators have been proposed to measure sustainability. A WEF (2002) study suggested that countries can be classified into different clusters based on environmental systems criteria, including reducing stress, reducing human vulnerability, social and institutional capacity and global stewardship. It also developed the Environmental Sustainability Index (ESI), which provides a performance ranking and evaluation of 142 countries. This integrated index consists of sixty-eight indicators, five of which

come under "private sector responsiveness."[26] Among the five are the number of ISO 14001-certified companies per gross domestic product (GDP) and the percentage of eligible companies in the Dow Jones Sustainability Group Index (DJSGI).

Fig. 7-1 shows the relationship between "private sector responsiveness" (P-rank) and the Environmental Sustainability Index (ESI) for major Asian countries. The smaller the P-rank and the ESI values, the better the performance of the country's business sector. In this way major economies of the region were categorised into three groups: the Philippines, India and Indonesia; the Republic of Korea (ROK) and China; and, Japan, Malaysia and Thailand. With regard to the first group, voluntary activities in the private sector appear as limited, whereas they appear as considerably higher in the ROK, China, Japan, Malaysia, and Thailand. However, Fig. 7-1 also suggests that overall environmental situations, such as industrial pollution, energy use and emissions, remain relatively severe in the ROK and China.

Fig. 7-1: Environmental Sustainability Index and ranking of major Asian countries

P-Rank: Rank based on Private Sector Responsiveness Indicator
ESI: Rank based on environmental sustainability
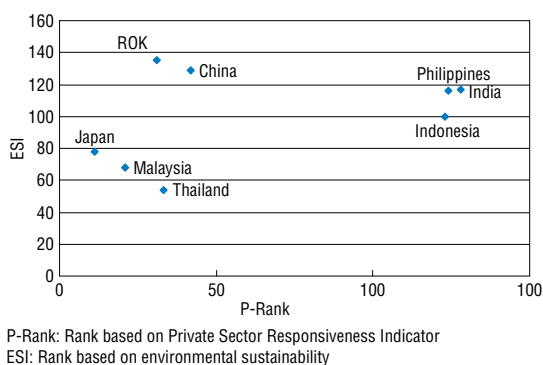
Corporate management systems for sustainability

In recent years, a large number of ideas and proposals have emerged to bring corporate management systems into better alignment with notions of sustainable development. Although there is considerable overlap and the categories are not mutually exclusive, these may be grouped under four broad headings:

(i) Environmental management system (EMS) focusses mainly on natural environment issues.

(ii) Corporate Governance (CG) has tended to emphasise economic and accountability factors. The corporate financial scandals (e.g., ENRON, Arthur Andersen and Worldcom) of recent years triggered not only significant media coverage but also focussed public and governmental attention as never before on corporate corruption and corporate governance issues. The Organisation for Economic Co-operation and Development (OECD) developed a set of guidelines (OECD, 2000; OECD, 2004) for corporate governance.

(iii) Corporate Social Responsibility (CSR) emerged from the philanthropic sector. It may be seen as expanding the initial emphasis of CG from correcting and avoiding corruption to much broader non-financial issues. The emphasis in CSR differs from country to country. It tends to centre mainly on "human rights" in the United States, "employment" in Europe, and "safe working conditions" in Japan.

(iv) Corporate Responsibility (CR) differs slightly from CSR in that its origin was mainly in consumers' movements and its principal emphasis is on consumer protection. ISO has begun the standardisation process of CR in its Consumer Policy Committee.

Table 7-1: Basic concepts of corporate management systems

Concept	Major aspects concerned
Environmental Management Systems (EMS)	Natural Environment
Corporate Governance (CG)	Economic Corruption
Corporate Social Responsibility (CSR)	Social Adherence
Corporate Responsibility (CR)	Consumer Protection

An integrated index has been developed based upon the evaluation of companies according to the four management systems elaborated in Table 7-1. Of the four categories, the emphasis in Asia to date has been mainly on EMS, as we will see in the next section.

Table 7-2: Chronology of TBL integration and corporate management

Year	Events
1976	OECD Multinational Enterprise Guidelines (1st Version) developed (Revised '84, '91, '00)
1992	UNCED (Earth Summit) held
1996	ISO14001 (1st Version) issued and revised
1997	Global Reporting Initiative (GRI) began
1999	OECD Corporate Governance Principles (1st Version) issued; Dow Jones Sustainability Indexes (DJSI) started (Revised in 2004)
2000	GRI Sustainability Reporting Guidelines (1st Version) developed, and United Nations Global Compact started. (Revised in 2002)
2001	EC green paper on CSR issued FTSE4Good Index started.
2002	World Summit on Sustainable Development - Johannesburg Summit held
2004	ISO started developing CR guidelines.

In addition to the integrated index referred to above, two financial market indices have been developed to measure corporate sustainability: the "Dow Jones Sustainability Index" (DJSI) which derives from the New York Dow-Jones market indicator and the "FTSE4Good" which links to London's financial market. Table 7-2 describes the chronology of the development of those indices, while Table 7-3 shows the number of companies for which these indices are calculated. It reveals that, except for Japan, only a few Asian companies have thus far been included in these evaluations. With over 50 million business enterprises, this indicates that Asia has a long way to go in order to catch up with what has already become a widespread, if not a general practice in North America and in Europe (Heeswijik, 2004).

Table 7-3: Number of constituencies of corporate sustainability indexes

Index	Hong Kong	Japan	Malaysia	Singapore	Total	World Total
DJSI	4	35	2	0	41	317
FTSE4Good	4	184	0	3	191	932

Environmental management system for industries

The environmental management system (EMS) is predicated on a variety of standards and guidelines and a number of important measurement instruments aimed at the continuous improvement of the environmental performance of companies. Among the main instruments are life-cycle assessment (LCA), environmental reporting, and environmental accounting and the application of ISO 14001 which has become the most commonly used EMS. Fig. 7-2 shows that EMS is growing in Asia. Japan is well ahead of other Asian countries with 13,416 ISO 14001 certificates issued. It is followed by China (5,064) and the ROK (1,495), but all three countries rank in the top ten world-wide in the number of certificates issued. In addition, the Taiwan Province of China, India and Thailand have increasing numbers of ISO-certified companies (ISO, 2003). Although the number of companies with ISO certification is still on the increase, the annual growth rate of the world's total has slowed recently. The latest data for the period 2002-2003 (Fig. 7-3) shows an increase of 34 per cent which is lower than those for the two previous years. Still growth rates of Asian countries tend to be higher than the world total. Japan and China have had a dramatic growth period, and other countries appear to be following that trend.

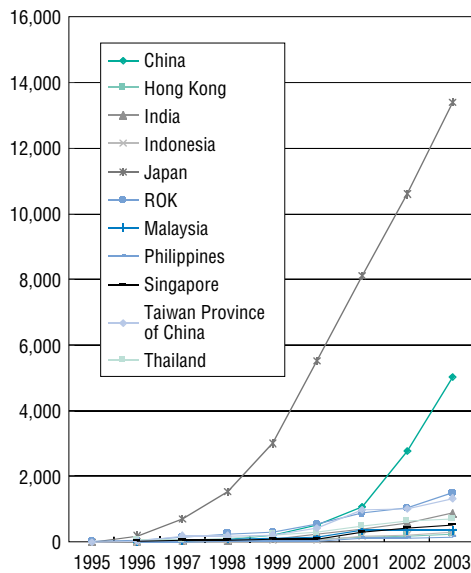**Fig. 7-2: Number of ISO certified companies in Asia**

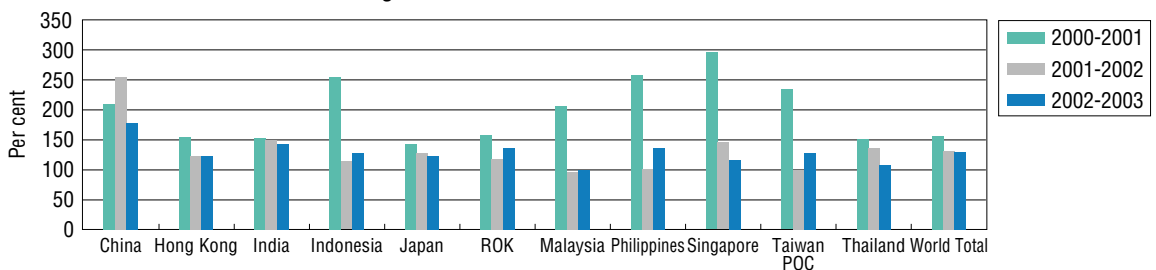**Fig. 7-3: Growth rate of ISO 14001 certificates**

Fig. 7-4 indicates a marked divergence in the adaptation ratio between the number of ISO 14001 certificates, an environmental management system (EMS) and of ISO 9001 - a quality management system (QMS), in major Asian countries and in some western countries. Although the number of ISO 14001 certified companies drastically increased in recent years, there is still a huge gap between the two. This suggests that Asian countries could narrow the gap by adopting both the EMS and the QMS. Even Japan, the top EMS country, has the potential to triple its number of companies with ISO 14001.

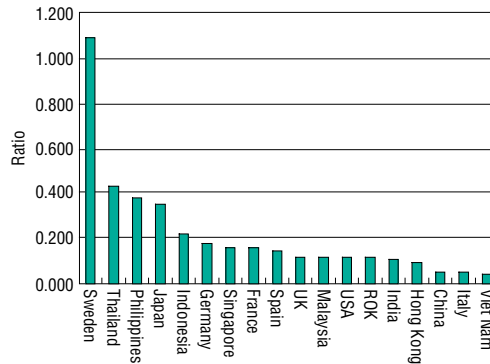**Fig. 7-4: Ratio of ISO 14001 to ISO 9000: 2001 certified companies**

Fig. 7-5 suggests a strong relationship between the level of economic development and the adoption level of the environmental management system. This trend could also be interpreted as indicating a relationship between the extent to which a country has integrated into global markets through globalisation and ISO certificates per capita. Of course, caution should be taken in interpreting Fig. 7-2 through 7-5 in view of the fact that there are various types of EMS besides ISO 14001, and there are companies that have "multiple certifications."[27]

Fig. 7-5: Relationship between GDP and ISO certification
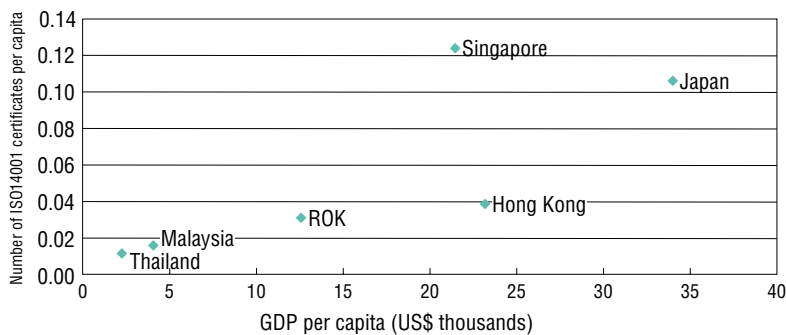
Although developed countries have a higher rate of EMS certified companies, this does not necessarily mean that companies in developed countries of the region have responded more to global issues. Table 7-4 illustrates this point. The number of companies in Japan and the ROK participating in the Global Compact Initiative (GCI) is relatively low compared to the Philippines, India and Sri Lanka. This may be due to the nature of the initiative itself, which is voluntary and less rigorous, or it may be that many companies in Japan and the ROK are thinking that it is less useful.

Table 7-4: Number of companies participating in the Global Compact Initiative

China	India	Indonesia	Japan	ROK	Malaysia	Nepal
45	93	2	29	0	1	11
Pakistan	Philippines	Singapore	Sri Lanka	Thailand	Total	World Total
5	116	1	36	14	353	1,983

Source: www.unglobalcompact.org

Environmental Performance of Small and Medium Enterprises

The evidence above indicates that many Asian corporations already recognise the benefits of EMS. But there exist millions of small and medium enterprises (SMEs) in the Asia-Pacific region. How to encourage SMEs to adopt EMS will be a challenge. Even in Japan the number of ISO 14001 certified companies has increased at an accelerated pace, but participation by SMEs is limited. In order to cope with this, several initiatives are being undertaken by national and local governments. In Japan, the Ministry of Environment has developed a set of guidelines for SMEs and formulated a registration and certification programme called "Eco-action 21." The Institute for Global Environmental Strategies (IGES) – Centre for Sustainability (http://ea21.jp) is the nodal body to operationalise the programme.

As a region-wide effort to assist and encourage Asian small and medium-size enterprises (SME) to move toward sustainability, the Asia Development Bank, 2005 (ADB) has suggested a "greening" of the supply chain strategy. This is at least in part a response to pressures on Asian suppliers from corporations in the USA and Europe to improve environmental performance. ADB strategy is based on the establishment of environmental objectives and a programme of regular monitoring. While costs for meeting goals and conducting monitoring could represent a substantial burden on Asian SMEs, their client corporations in the advanced economies can assist SMEs by providing hardware, such as pollution abatement technologies, specific guidance on moving up the value chain and other professional services.

There is evidence that at least some SMEs in developing Asia may be applying aspects of CSR without being familiar with the concept itself. In local economies, businesses get to know each other and, in addition to capital gain, seek collectively a longer and stable relationship within the local community. A report by the United Nations Industrial Development Organization calls this "silent responsibility"[28] (UNIDO, 2002) and points to the importance of turning CSR debates from a northern preoccupation into a global agenda that includes developing Asia.

Information Disclosure and Sustainability Reporting

Environmental or sustainability reporting is the foundation for information disclosure on the environmental performance of a company. They evaluate companies based upon information collected by various means, which include questionnaire surveys or interviews. They are important for the public and local authorities, for example, to know the progress made by a company in meeting its voluntary environmental goals. These reports are vital for promoting market-based eco-initiatives such as green products and green investment funds.

At the international level, the Global Reporting Initiative (GRI) has emerged as a widely-accepted best practice. The GRI is a multi-stakeholder process and independent institution whose mission is to develop and disseminate globally applicable Sustainability Reporting Guidelines. These guidelines are for voluntary use by organisations for reporting on the economic, environmental, and social dimensions of their activities, products, and services. The GRI incorporates the active participation of representatives from

business, accountancy, investment, environmental, human rights, research and labour organisations from around the world. Started in 1997, GRI became independent in 2002, and is an official collaborating centre of the United Nations Environment Programme (UNEP) and works in cooperation with UN Secretary-General Kofi Annan's Global Compact.

The GRI is being used throughout Asia, although still on a very modest scale (see Table 7-5). Asian companies have thus far not been very responsive to these initiatives, compared to their European and American counterparts. This may be due to a general lack of awareness. Nevertheless, Asian companies are likely to become increasingly aware of the initiative because of the pressure from transnational enterprises.

**Table 7-5: Number of sustainability reports registered at the GRI reports database**

Time, as of	China	India	Japan	ROK	Malaysia	Thailand	Total	World Total
9 Aug. 2004	4	3	88	5	2	2	104	507
28 Mar. 2005	5	6	122	6	2	3	144	645

Source: www.globalreporting.org

Some Asian companies, especially in Japan, have introduced their own systems of "environmental accounting" as a management tool to identify costs and effects of environmental conservation and to measure them quantitatively as much as possible. There is no single methodology and certain diversities are clearly required to take account of the circumstances of individual companies. The absence of a single methodology or universally agreed normative framework, however, raises questions of objectivity and trustworthiness. In response to this, the use of third party verification (Box 7-1) is increasing in countries like Japan.

Indeed, Japan is well ahead of other Asian countries in the field of information disclosure and sustainability reporting. The Ministry of the Environment developed environmental reporting guidelines in 1997, and revised them in 2001 and 2004. The Ministry for Economy, Trade and Industry also issued similar guidelines in 2001, which include specific guidelines for small and medium-sized enterprises (SMEs). Fig. 7-6 indicates a steady increase in the number of environmental reports prepared in Japan.

Fig. 7-6: Increase in the number of companies that publish environmental sustainability reports in Japan
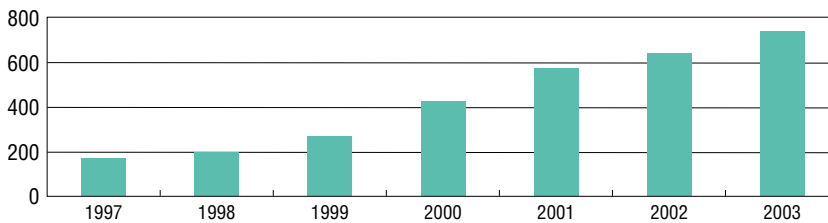
Third-party verification is a globally accepted system as far as corporate financial reports are concerned. Auditing companies check financial details of the report and issue a certificate. A similar verification system may be developed for environmental/sustainability reports, however there are a few issues to be addressed. Firstly, unlike financial reports, readers of environmental/sustainability reports are not limited to shareholders. Target readers include government officials, media, NGOs, general public, and company employees. This fact has resulted in having multilateral functions of environmental/sustainability reports, i.e., to meet company's accountability; to raise the company's brand image; to promote communication with stakeholders; and, to educate employees. Secondly, indicators to measure environmental/sustainability performance of a company are not well-established. Global and national guidelines on environmental/sustainability reporting have been developed, but there is still a need to improve ways to calculate scores.[29] Despite these problems, third-party verification is on the increase in Japan. There seem to be two directions in which third-party verification is heading. One is to assure the accuracy of the report, and the other is to make comments on the performance of the company. This indicates a need to standardise the basic rules regarding the third-party verification.

The above discussions suggest that voluntary initiatives are likely to become an important and internationally-accepted tool for integrating the economy and the environment. Asia, however, has barely begun to integrate into this trend. One reason is that voluntary initiatives are not yet accepted by the millions of small and medium enterprises in the region. In Asia only a small number of big businesses have committed themselves to voluntary initiatives. The second reason is a lack of strong incentives. Hence there is a need for developing national systems so that companies that have provided information on their environmental and social performance are rewarded with incentives. Moreover, information plays a critical role in the market. Financial institutions require an objective evaluation of companies in order to make investment decisions. Balance sheets are a basic information source but additional information is clearly necessary to evaluate environmental performance. In view of this, some companies have introduced "environmental accounting" as a management tool to identify costs and effects of environmental conservation, and to measure them quantitatively as much as possible. Evaluating a company is like evaluating a person. There is no one methodology to conduct company evaluation, and certain diversities should be always allowed. In this regard, third-party verification (Box 7-1) is also getting popular in countries like Japan.

Market-based innovations and national public policy frameworks

Development of green product markets in Asia

Originally introduced in Germany in 1978, the environmental labelling scheme has played an important role for the expansion of this market. Now many countries are promoting environmental labelling in accordance with the basic standards set out by ISO 14020s, developed in late 1990s. There are three types of environmental labelling, but the most familiar scheme for consumers is the Type I,[30] because Type I schemes are designed articulately by individual countries with a symbol that is easily recognisable by consumers. As shown in Table 7-6, the environmental label programme is being widely promoted in many Asian countries, but has yet to gather momentum and certification has thus far been very limited. Advances in this area will require both increased consumer awareness and a strengthened policy instruments that encourage and/or require eco-labelling.

Environmentally-sound products usually cost more than conventional ones because additional costs are

Table 7-6: Environmental label programmes in Asian countries

Location of managing organisation	Programme(s) delivered	Voluntary standards/criteria sets	Licenses issued to companies	Certified products/services
Japan	Eco Mark Programme	64*	1,867*	5,391*
India	Ecomark Scheme of India	16*	2*	3*
ROK	Environmental Labelling Programme	84*	221*	441*
Singapore	Singapore Green Label Scheme	35**	–	130**
Taiwan Province of China	Green Mark	77*	381*	1,557*
Thailand	Thai Green Label Programme	33*	34*	200*
China	Environmental Labelling	–	700**	8,000**
Hong Kong	Hong Kong Green Label	37*	3*	7*
Philippines	Green Choice Philippines	5**	–	200*

* As of end of 2002, ** As of April 2004
Source: GEN (2002)

incurred making the products. The additional cost of these products reflects the "external cost."[31] The barrier is that consumers often demonstrate a strong reluctance to purchase environmentally-sound goods because of their higher cost. Studies in Europe and in North America indicate that cost considerations often cause even very environmentally-conscious consumers to choose environmentally-unfriendly products. One possible theoretical response to this would be to consider the incremental cost incurred in producing an environmentally-friendly product as a "social cost" and to provide a publicly financed subsidy to cover the difference. This, however, would be entirely unworkable and unsustainable. Instead of subsidising environmentally-sound products, some of the preferred policy options would include the elimination of perverse subsidies, especially those applying to raw materials and energy supplies and the use of government purchasing powers to create markets for environmentally-friendly products.

A few countries in Asia have introduced government policies to encourage the purchase of environmentally-friendly products. Japan enacted the Law on Promoting Green Purchasing[32] in 2000. This law targets the consumption power of public entities and requires the national government, its affiliated organisations and local governments to purchase more environmentally-sound products by establishing annual procurement plans. Companies and people are also encouraged to choose environmentally-sound products as much as possible. The list of environmentally-sound products is prepared by the national government, consolidating information from manufacturers and environmental labelling organisations. The list ranges from typical goods and services, such as recycled paper and renewable energy, to certain types of public works.[33] The Korean government is in the process of legislating the "Green Purchase Act" (Sook, 2003). Prior to that, the Seoul Metropolitan Government enacted its own initiative starting from 2004 (KELA, 2003).

At the same time, consumers' awareness does seem to be growing, especially in Japan. The Green Purchasing Network (GPN) was established in 1996. GPN consists of corporations, local governments and consumer organisations, and provides information on environmentally-friendly products through printed

materials, a web-based database and by holding seminars. The membership has now grown to 2,889 organisations, and local GPNs are emerging in some parts of Japan. The ROK formed a GPN in 1999, and Malaysia established one in 2003. The Taiwan Province of China and Thailand are making preliminary arrangements for setting up a Green Purchasing Networks (GPN). Networking of national GPNs, such as the recently established international GPN, is underway, which is expected to further accelerate the GPN movement in Asia.

The above evidence indicates a range of policy measures that are emerging in Asia to promote environmentally-sound products, although it also underscores the limited nature of efforts to date.

Potential for green investment in Asian countries

The structuring of investment funds against criteria and standards of Socially Responsible Investment (SRI) is an important policy instrument that could hold considerable potential for Asia. In general, SRI funds aim to exclude investments in companies and countries with poor environmental and/or social performance and to reward "good performance" in these areas. In the USA and Europe SRI has been practiced mostly by mutual funds, institutional funds, such as pension funds, and insurance funds (SIF, 2003).

In Japan, there were twelve SRI mutual funds as of November 2003: seven funds targeting domestic corporations and five funds that target international corporations. The first Japanese SRI fund started its operation in 1999, and the number of SRI funds gradually increased between 1999 and 2001, but little progress has been made since then. Total asset of SRI is 71 billion yen (ASrIA, 2004), which accounts for less than 0.01 per cent of the Japanese market. This figure is small compared to 15 per cent in the USA and 12 per cent in the UK (SiRi, 2004).

Across Asia as a whole, the number of SRI funds remains small, although six have been established in Hong Kong. However, awareness seems to be growing in Asian countries. Table 7-7 indicates the extent to which financial institutions in Asia have specifically committed financial investment regimes to sustainable development under the UNEP-finance initiative. The UNEP started its financial institutions initiative by adopting the "UNEP Statement by Banks on the Environment and Sustainable Development" in 1992, and its insurance industry initiative in 1995 by adopting "UNEP Statement of Environmental Commitment by the Insurance Industry." These statements expect the signatories to conduct internal reviews and measure their activities against their environmental goals and share information with customers and other stakeholders.

Table 7-7: Signatories of the UNEP-Finance Initiative

Initiative	China	India	Japan	Philippines	ROK	Thailand	World Total
Financial Institutions Initiative	1	1	9	8	2	1	163
Insurance Industry Initiative	0	0	6	0	1	1	68

Source: www.unepfi.org (2004)

Pension funds in Asia have a great potential because of the rapidly ageing population in Asia. In the US, the California Public Employees' Retirement System (CalPERS) takes into account social and environmental performance of a company in its fund management. In the UK, SRI became active after the government revised the Pension Act so that trustees of pension funds disclose information on the extent to which

social and environmental considerations are taken into account in the selection of investments. In Japan some pension funds have also started the same practice for its fund management by setting up a shareholder voting right policy and an investment policy. Other Asian countries, Japan excluded, have not experienced this kind of development. Caution should be taken, however, to compare the behaviour of pension funds between countries, as the pension systems vary greatly from one country to another.

Policy instruments for enhanced environmental performance

Conventional wisdom holds that environmental regulation acts as an impediment to business by imposing additional costs. There is, however, a range of studies (Lopez, 2004) that has provided evidence where environmental regulations have strengthened competitiveness by stimulating technological innovation. Although all regulations do not contribute to innovation, there are innovation-friendly policies (Porter, 1995). Governments are encouraged to take a leadership role in providing an effective policy environment in which innovation for sustainability is promoted.

When regulation impacts on international trade, the results can bring about innovations internationally and exert multiplier effects. In recent years, for example, the EU tightened its regulation on chemical substances. The directive on waste electrical and electronic equipment (WEEE), and the directive on the restricted use of certain hazardous substances in electrical and electronic equipment (RoHS) were adopted in 2003. Those directives required all new electric and electronic products consumed in Europe to be free of toxic substances, such as lead, mercury, cadmium, starting from 1 July 2006. This led directly to a major technological innovation in Japan which is fast becoming the new industry standard (Box 7-2).

Box 7-2: An example of innovation through WEEE regulation

Soldering is a technique that has been in use for over 5,000 years. Solder contains lead and is used in the production of over 12,000 electrical and electronic items used today. In June 2000, the Matsushita Corporation of Japan launched a project to eliminate the lead in the soldering process. Less than three years later, on 31 March 2003, Matsushita was successful in eliminating solder from all Panasonic and National brand products manufactured around the world. For Matsushita this meant that its entire manufacturing process had to be totally adjusted in order to accommodate WEEE regulations – a revolutionary achievement.

Source: Matsushita Electric Group (2003)

In Asia, countries like China have also started introducing similar directives. The EU introduced another regulation in the same year, i.e., REACH (Registration, Evaluation and Authorisation of Chemicals) in order to produce sufficient information about the effects of chemicals on human health and the environment and at the same time, to promote research and innovation of EU chemical industries. Although these are non-Asian-based regional regulations, their impacts are felt by many manufactures in Asian countries.

Although regulation can bring about the prescribed results, it requires substantial funding for effective implementation. Partly because of this and because of changes in the nature of environmental issues, new policy instruments were gradually introduced globally. They include "economic measures" and "voluntary approaches." These new instruments have been shown to be effective in dealing with certain environmental problems, but to have limitations. Therefore, an appropriate mix of various policy instruments becomes important.

Voluntary approaches include "voluntary agreement," usually a contract between a company and the government, either local or central. The voluntary agreement commits a company to taking voluntary actions to reduce emissions, in many cases, beyond compliance. Both voluntary agreement and regulation are based on the relationship between the government and the private sector, therefore, they are considered close: a voluntary agreement can be easily changed to a regulation. The debate on the effectiveness of voluntary agreement is active (Box 7-3).

Box 7-3: Voluntary approaches in environmental policy-making

Voluntary actions by firms and households for the environment should be welcomed and there is a considerable literature indicating that business can profit from taking such voluntary action. There are four distinguished types of approaches: (i) unilateral commitment made by polluters, (ii) private agreements between polluters and pollutees, (iii) environmental agreements negotiated between industry and public authorities, and (iv) voluntary programmes developed by public authorities to which individual firms are invited to participate.

However, opinions differ concerning the usefulness of policy-makers to rely on voluntary approaches to achieve environmental targets. Some see such approaches as offering a chance to address environmental problems in a flexible manner at a low cost based on consensus building between the different stakeholders. Others believe such approaches provide few environmental improvements beyond what would have occurred anyway. Based on an analysis of several case studies, the OECD concluded that voluntary approaches were seldom used as 'stand alone' instruments. Instead they tended to form a part of policy packages involving one or several other instruments, such as regulations, taxes, and tradable permits.

The performance of many voluntary approaches would be improved if there were a real threat of other instruments being used if appropriately set targets were not met. Based upon initial pollution control in Japan, voluntary agreement would be effective if it were backed by strong social pressure. This type of voluntary agreement is similar to one used in Denmark to reduce CO_2 emission and may be applied to the Asia-Pacific in promoting biomass energy supply.

Source: RISPO (2005)

There are many impediments in Asia to the effectiveness of both voluntary and regulatory measures. The Asian Development Bank recently examined these and concluded that governments of developing countries in Asia have often found it difficult to make firms comply with existing regulations, due mainly to a range of factors such as: (i) the lack of regulatory resources to enforce standards, (ii) uncertain laws with few penalties for non-compliance, (iii) corruption, and (iv) inadequate infrastructure and human resources to collect evidences for non-compliance by industries (ADB, 2005). These impediments notwithstanding the ADB also reaffirmed the centrality of industry-led "new regulations" as one of the policy focusses on improving environmental sustainability in Asia. Clearly, however, if success is to be achieved, the capacity and policy constraints identified by the bank will need to be addressed systematically, both on an individual country basis and through shared regional efforts.

In addition to voluntary and regulatory instruments, there are also the market mechanisms which entail the removal of subsidies and the adoption of policies that internalise environmental costs—so-called "full cost accounting."

Globalisation and environmental regulations

One of the most contentious issues debated today is whether the pollution-intensive industries from rich countries are relocating their factories to poor countries with weaker environmental standards thereby turning the poor nations into "pollution havens." An empirical study (Dean et al., 2005) done with 2,866 manufacturing joint venture projects in China showed that environmental stringency does affect location choice. Low environmental levies are a significant attraction for foreign direct investment (FDI) in highly polluting industries.

The findings of the study have important policy implications. If foreign business investment from industrial countries provides cleaner technology and seeks rather than avoids high regulatory standards, investment by the high income countries in developing Asia has the potential to improve the environmental outcomes in the host countries.

The export of environmentally-damaging products and practices is not new. Concerns about "pollution haven" were raised in the early 1970s (World Bank, 2000). Companies that operated in developed countries where strong environmental policies were introduced tended to relocate to developing countries where environmental standards were lax in order to save investment for the environment. "Pollution haven" concerns were especially high among the heavy-industries, such as iron and steel, non-ferrous metals, industrial chemicals, pulp and paper, and non-metallic minerals.

In the 1980s, "exporting harm" became a big issue (BAN, 2002). Waste produced in developed countries sometimes caused environmental problems in developing countries. Against this backdrop was the 1989 Basel Convention - the international agreement on the trans-boundary movements of hazardous wastes and their disposal. As of 2005, 162 countries and the EC have ratified the treaty, which includes most Asian countries. The Basel Convention functions as a barrier to the international trade of recyclable material. This has become more conspicuous as globalisation proceeds and demand for recyclable items sharply expands in countries such as China. The Basel Convention distinguishes hazardous materials from non-hazardous, and regulates only hazardous materials. Recyclable products such as used computers, for example, often contain hazardous materials. An innovative mechanism is called for to prevent the pollution that results from the trans-boundary movement of hazardous wastes while the trade in recyclable products will be promoted. (Box 7-4)

Box 7-4: Networking international recycling zones for improvement of resource efficiency in developing Asia

Since Asia began its rapid economic growth period, it started consuming more materials and had an increase in the cross-border movement of recyclable material. Illegal dumping has become a serious environmental concern. In order to establish a sound region for recycling, IGES proposed an innovative policy of the networking of international recycling zones. The proposed policy has three components: (i) the introduction of a governmental system to certify national companies and traders conducting international trade, (ii) the establishment of international zones composed of designated ports and industrial areas, and (iii) the formulation of a network of international recycling zones through international agreement. Six expected outcomes of this innovative policy proposal include: the reduction in illegal dumping activities; the transformation of the informal sector; technological innovation by participating companies; the mitigation of negative environmental impacts; and, the reduction of barriers to the international flow of recyclable material; and simplification of the Basel Convention approval process. Possibilities exist for this to be implemented on a pilot study basis for later adaptation by regional free trade regimes.

Source: Hashi and Mori (2005)

Conclusions and recommendations

The overview and evidence presented in this chapter demonstrate the central role that business must play if Asia is to achieve the twin goals of a sustainable environment and the economic growth required to meet the needs of its citizens. A range of policy instruments are presented in the chapter as guidelines to further action. The main conclusion is that a vastly enhanced effort is required and that in all areas, whether involving voluntary, regulatory or market instruments, Asia is lagging far behind in establishing best practices and in achieving sustainability. Increased and concerted efforts are called for on the part of business, government and the local community to respond to the positive market forces, promote voluntary initiatives and reconfigure traditional environmental policies. In broad terms, the strategic actions required can take place only with partnerships among national and local governments, civil society groups and business. Based on the above discussions the following recommendations are suggested as inputs to developing appropriate policy measures:

(i) Concerted efforts are needed to implement more win-win solutions so that economic development can take place with environmental security. There will be more trade-off situations in the short run because voluntary initiatives are not pervasive in most parts of developing Asia. In order to further promote sustainable corporate practices, governments should provide tangible inducements through such measures as tax incentives, public-private partnership arrangements that are consistent with the public interest and do not distort markets and the targeted application of public bidding and public procurement. Even stronger motivation could be given to companies if these incentives are linked to quantitative targets in attaining energy and resource efficiency. In addition, being the largest consumers, governments of Asia must find new ways to respond to the positive market forces, such as green purchasing and green investment regimes. Traditional environmental polices should be reconfigured to expand the green procurement of business to government, business to business, and business to consumer relationships.

(ii) While it is important to seek out win-win options where they exist, the complexities of difficult choices, trade-offs and opportunity costs must be directly confronted in the policy arena. The evidence shows conclusively that double and triple bottom line claims must be treated with circumspection as they can create expectations that cannot be fulfilled and can divert energies away from the essential challenge of coming to terms with and building partnerships around the complex and often contradictory relationships between the environment and economic gain and from understanding and deciding policies based on the difficult trade offs that are required. Effective and adequate policy and strategy responses in Asia must take into account the following:

a. Although there are potentials for cost-effective environmental improvements, economic development does not 'automatically' promote clean production.

b. There are positive relationships between environmental regulation and technological innovation. Regulation is essential as a stimulus to those making slow progress.

c. Regulation is increasingly seen as an enabling framework which needs to encourage change, rather than act as a rigid system of rules and procedures.

d. Early signals by governments about new regulation, flexible instruments and credible long-term objectives can promote the development and adoption of new technologies.

e. Businesses and policy-makers must be made more aware that corporate environmental management offers opportunities as well as difficulties.

f. Political intervention needs not only to provide economic incentives, but also to promote informa-

tion exchange and learning amongst businesses. Such intervention needs to address explicitly the costs and benefits of environmental gains and to seek appropriate policy instruments to address the needs of 'losers.'

g. The often cited adage by industry that we should leave the choices to consumers as the ultimate arbiters of consumer preference is flawed. The evidence indicates the need for incentives to support green consumerism.

h. Environmental policy has to look at the opportunities and barriers for greening production and consumption and identify points for strategic intervention.

(iii) As a region-wide effort to make business move toward sustainability, the 'greening' of the supply chain, should take place to improve the environmental performance of small and medium enterprises in Asia. While costs for meeting such goals could be a substantial burden on SMEs, their counterpart corporations in the advanced economies can help by providing hardware, such as pollution abatement technologies, or specific guidance to help identify win-win situations.

(iv) It is essential for Asian business to participate actively in the development of global guidelines and standards for environmental management, corporate governance, corporate responsibility, and sustainability reporting. If more companies had participated, their concerns could have been more properly reflected. This would make industries in the region more committed to developing standards and guidelines. Incidentally, active participation needs capacity-building and awareness-raising on the part of Asian business. Likewise, companies in Asia need to respond substantially to global voluntary initiatives such as the Global Compact or the UNEP-FI, as they provide opportunities for Asia to demonstrate to the world its proactive stance on the environment and sustainable development.

(v) Asian governments must develop national guidelines on corporate environmental/sustainability reporting so that companies that have provided information on their environmental and social performance are appreciated by society and rewarded accordingly by the market. A few global guidelines developed so far have not appropriately reflected the business environment unique to each country. Therefore, country-specific guidelines that are more relevant to companies operating in their jurisdiction become essential.

(vi) Government interventions are requested to promote more holistic corporate evaluation. For example, the possibility exists that a company producing eco-labelled products might be selling environmentally-destructive products as its core business. This may indicate the need to move from product-based approaches to company-based ones and from environmentally-based approaches to sustainability-based ones. Government interventions of this kind will be more effective if they are linked to partnerships with other non-governmental actors.

CHAPTER 8

Redirecting education, public awareness and training for sustainable development

Introduction

If sustainable development is to be achieved, it will require the appropriate development of human capacity. Agenda 21, adopted at the UN Conference on Environment and Development, held in Rio de Janeiro in June 1992, acknowledged that the ability of a country to pursue sustainable development is determined by the capacity of its people. Any policies for environmental conservation, natural resource management or sustainable development, require the public and policy-makers to be sufficiently sensitised to environment and development implications and their significance in the national policy agenda. Implementation of such policies also requires administrative, managerial and technical knowledge, expertise and skills, and the public's support. Awareness and understanding of environmental issues provide a basis and rationale for commitment and meaningful action by all stakeholders towards environmentally-sound and sustainable development. Human resources are the key agents to achieving sustainable development.

It is important to recognise that human capacity for sustainable development is currently insufficient, particularly in developing countries. Further efforts for development are clearly needed. It is widely discussed that human capacities can be developed and enhanced through a broad range of educational means, such as formal and non-formal education, training and public awareness raising. Pertinent practices are widespread in various forms of education in the Asia-Pacific region and in other parts of the world. Significant emphasis has been placed on environmental education addressing sectoral concerns, such as forest conservation, water efficiency, waste management, energy efficiency and corporate management. The philosophy, critical players and targets, specific subject focusses and operational methodologies have been discussed over decades for these educational measures. Yet, questions still remain as to whether, or to what extent, these educational measures have contributed to the overall efforts towards attaining sustainable development, and which policy measures should be introduced and applied to improve such a contribution. The purpose of this chapter is to provide a preliminary assessment on both the scope and the current status of educational measures as a tool to achieve an environmentally-sustainable Asia, and based on this assessment, to put forward primary recommendations on the policy interventions to improve the performance of such educational measures in the Asia-Pacific countries.

Regional trends and experiences

Global and regional consensus – A primary tool for achieving sustainable development

As broadly discussed in Chapter 1, environmentally-sustainable development will be best achieved through the adoption and implementation of an appropriate policy mix for environmental management, which essentially includes the elements of capacity development. The role and function of the educational measures, including various forms of education, public awareness and training, has been widely discussed in various forums, and their importance has already been well recognised at global and regional levels.

Agenda 21, first emphasised that education is linked to virtually all areas of sustainable development issues and concerns, and educational measures, including formal education and public awareness training should be recognised as critical for promoting sustainable development and improving the capacity of the

people to address environment and development issues (United Nations, 1992).

The International Conference on Environment and Society: Education and Pubic Awareness for Sustainability, organised by UNESCO in Thessaloniki, Greece, in 1997, elaborated the function of education in contributing to achieving sustainable development. It equated education to the driving force or the most effective means that society possesses for confronting the challenges of the future and articulated that the goal of education is to make people wiser, more knowledgeable, better informed, ethical, responsible, critical and capable of continuing to learn. It furthermore stated that "education serves society by proving a critical reflection on the world, especially its failings and injustices, and by promoting greater consciousness and awareness, exploring new visions and concepts, and inventing new techniques and tools. Education is the means for disseminating knowledge and developing skills for bringing about desired changes in behaviours, values and lifestyles, and for promoting public support for the continuing and fundamental changes that will be required if humanity is to alter its course, leaving the familiar path that is leading towards growing difficulties and possible catastrophe and starting the uphill climb towards sustainability. Education, in short, is humanity's best hope and most effective means in the quest to achieve sustainable development" (UNESCO, 1997).

The Johannesburg Plan of Implementation (JPOI) adopted at the World Summit on Sustainable Development, held in Johannesburg, South Africa in September 2002, emphasised that education is critical for promoting sustainable development, in particular, in eradicating poverty, improving health and protecting and managing the natural resource base for economic and social development. The plan called for actions essential to mobilise necessary resources, including financial resources at all levels, to complement the efforts by national governments to pursue their goals and actions (United Nations, 2002a).

At the regional level, environmental ministers of countries in Asia and the Pacific adopted the Regional Action Programme for Environmentally Sound and Sustainable Development in Asia and the Pacific (RAP) 2001-2005 at the fourth Ministerial Conference on Environment and Development (MCED2000) in Kitakyushu, Japan in September 2000. This Regional Action Programme strongly affirmed the critical importance of environmental education, public awareness and training in promoting sustainable development in Asia and the Pacific, and called for further intensifying all levels of educational efforts, not simply targeting environmental protection, but also focussing on broader issues of sustainable development, such as the importance of human dignity; the removal of illiteracy; the improvement of the quality of life and the environment while promoting a culture of peace, solidarity and international understanding; the diversity of life and the balance between reasonable human activities and the need to preserve natural ecosystems; and building overall human capacities promoting participation and cooperation among people and institutions (UNESCAP, 2000a). These views have been reinforced by the Phnom Penh Regional Platform on Sustainable Development for Asia and the Pacific, adopted at the High-level Regional Meeting for WSSD, held in Phnom Penh, in November 2002, referring to the capacity-building across all sectors as a cornerstone in the achievement of sustainable development in the region, using better education and training and the creation of public awareness. Particular importance was placed on the common needs in developing countries in the region, of capacity for self-empowerment of local communities and for understanding and articulating the increasing number of national legal and institutional measures and international conventions/agreements, and securing better compliance and enforcement of these laws and conventions (UNESCAP, 2002).

Progress in the efforts and practices of environmental education

Together with the increasing recognition of education as a critical driving force for sustainable development in Asia and the Pacific, education efforts and practices have been progressively promoted and expanded in both quantitative and qualitative terms in the region. It is clear that a new surge of enthusiasm

and activities is underway on many fronts to place education, public awareness and training higher on the public agenda in different parts of the region, in particular, in the field of environmental education (UNESCAP and ADB, 2000).

An IGES report, "Environmental Education in the Asia-Pacific Region – Status, Issues and Practices" (Bhandari and Abe, 2001), provided for the first time a comprehensive review of the overall status of ever-growing environmental education sectors and their practices in the countries of the Asia-Pacific region. The review was based on status reports from thirty-four countries and two special areas in the region, in which most countries reported the development of the environmental education sectors and programmes at the national and the local levels. The review illustrated that the countries of the region showed significant interest in incorporating environmental concerns into formal, non-formal and other educational programmes, and that governments, NGOs, educational institutions, communities and the media of the region had gained remarkable competence in delivering environmental education programmes, despite a number of difficulties, such as resource constraints, persistent poverty, rising populations and social development problems. Box 8-1 illustrates some highlights of the country status reports from the 2001 review and subsequent IGES research.

As for the regional trend, UNESCAP analysed that in Asia and the Pacific efforts to promote environmental education focussed on upgrading school education, development and networking of non-formal education groups, and training in environmentally-sound technology. The analysis also highlighted that numerous reference and resource materials, curriculum structures, learning sequences and corresponding training outlines were becoming increasingly available. Such materials are developed by a range of governmental, educational, scientific and socially-active organisations, and directed to different groups, for example, schoolchildren, teachers, university students and lecturers, organisers of non-formal environmental education activities, various government officials, government planners, engineers, industrial managers and the general public (UNESCAP, 2000a, 2000b).

Recognition is growing that many environmental issues and challenges are common to more than one country and that countries and communities can learn from each other in their responses to similar situations and problems. Transboundary cooperation in the field of environmental education has demonstrated impressive progress in the past decade. Examples at the sub-regional level include SPREP's Action Strategy for Environmental Education and Training in the Pacific Region 1999 - 2003, ASEAN Environmental Education Action Plan 2000 – 2005, SACEP's South Asia Environmental Education and Training Action Plan 2003 – 2007, Tripartite Environmental Education Network for China, Japan and the Republic of Korea (TEEN). At the regional level, the Asia-Pacific Network for Tertiary Level Environmental Training (NETTLAP) can be referred to as a pioneering initiative which has been operational since 1993, contributing to human resource development and the strengthening of tertiary institutions in the entire Asia-Pacific region.

Box 8-1: Highlights of environmental education (EE) development in selected Asia-Pacific countries

Japan – Following an increase in public protests against severe industrial pollution (*kogai*) in the 1950s and 1960s, the Ministry of Education revised the "Course of Study," or the basic national guidelines for school education in 1967 to first include the concept of pollution and public nuisance in the school education curriculum. Its 1989 revision saw the introduction of a new subject called "Life Environmental Study" in the primary school curriculum, following the drive of naturalist movements and the escalation of environmental education in late 1980's. Another revision in 1998 announced the creation of a new course subject "Period of the Integrated Studies" (*Sogo Gakushu no Jikan*) and provided an institutional basis to incorporate an NGO and community-based, non-formal environmental education into the school curriculum. This, together with the Environmental Education Promotion Law, put into effect in 2003, bestowed a new momentum to environmental education in formal education in Japan. EE activities by NGOs have steadily increased and intensified since the late 1970's and are gaining partnership with other sectors, such as business and the media, in addition to the formal education sector as stated above.

Australia – Environmental education is considered a crucial part of ecologically sustainable development in Australia. The Australian government developed a National Action Plan for Environmental Education in 2000 after consultation with stakeholders and has since implemented all the plan's major initiatives. Under the plan, a National Environmental Education Council was formed, consisting of eminent persons and EE experts from all sectors. The council provides advice on EE to the federal minister for the environment and its work is supported by specialist sub-groups. The plan also acknowledges the need for further research on EE. This has been addressed through the establishment of the Australian Research Institute in Education for Sustainability (ARIES). A function of ARIES includes feeding information to environmental education initiatives, and federal policy brings about change towards sustainability through an action research approach. Environmental education and more recently, education for sustainable development in Australia has extended beyond formal education to encompass higher education, industry and business, communities, government and special interest groups.

Indonesia – Environmental education began in the early 1960s and is being used to increase public knowledge, attitudes and skills on environmental issues and matters. Environmental study centers (ESCs) have been established to help teachers, principals and educators become environmentally competent. The "greening" of the curriculum has become important to environmental education pioneers. The government views environmental education as fundamental in all forms of learning. After the economic crisis of 1997, the government began to provide block grants to the poorest 40 per cent of primary and junior secondary school students, and scholarships to high-risk junior secondary school students.

Bhutan – Bhutan's Five-Year Plan (1998-2002) emphasises environmental education and awareness in the national environmental curriculum. A new approach to primary education (NAPE) has been developed for Bhutanese children using a national curriculum oriented towards the observation of nature, conservation and sustainable use of renewable resources. This national curriculum contains a unit on environmental studies. Upper primary and secondary curricula build on the base created by a lower primary curriculum, are oriented towards the goal of sustainable development.

Source: Bhandari and Abe (2001) with supplementary updates by authors

Box 8-2: Sub-regional cooperation in promoting environmental education - A case of SPREP action strategy

In 1998, the South Pacific Regional Environment Programme (SPREP) developed the "Action Strategy for Environmental Education and Training in the Pacific Region: 1999-2003." Reflecting the thematic focus of environmental issues in this sub-region, the Action Strategy put emphasis on marine and coastal resources management. A review has been conducted since 2003 to determine the extent to which the Action Strategy has been implemented, and to establish the future direction of environmental education and awareness in the sub-region, with particular reference to the UN Decade of Education for Sustainable Development. The review noted the potential in the majority of Pacific island countries and territories (PICTs) for development and production of education and awareness resource material. However, it also pointed out that there is a need for training in appropriate techniques/methodologies that will lead to attitudinal and behavioural change. Attitudinal and behavioural changes have seldom been used as indicators of success in environmental education and awareness projects in the past. The review proposes the need for further development of the strategy so as to be better aligned with the concept of ESD. It also proposes a continuing focus on the implementation and monitoring of the current strategy rather than expending resources on a major revision of the strategy.

Source: SPREP (2003)

## Progress in improving access to primary education

With the perspective of "education for all," it carries a particular importance in providing basic education to the majority of the population, which is no doubt the key to a nation's ability to develop and achieve sustainability targets, particularly through the improvement of literacy and numeracy. Improving access to primary education has been a critical challenge to a number of the developing countries in the region. It has been observed that efforts during the past three decades have brought about a remarkable improvement in people's access to education in Asia and the Pacific. The rate of access to primary education, itself as a direct target of the Millennium Development Goals (MDG), has been improved with more than 95 per cent of children between 6 and 11 years of age now attending school, including those in the three most populous countries of China, India and Indonesia (UNDP, 2003). East Asia and the Pacific has demonstrated a reasonable advance despite some stagnation associated with the Asian financial crisis in late 1990's, and will have a fair chance to achieve the MDG target by 2015. South Asia, however, is experiencing more difficult challenges. On the other hand, as gender is also a MDG target, particular attention should be paid to the gender gaps in primary and secondary education. Gender gaps in many countries still require urgent improvement. Despite drastic improvement during the last two decades, school enrolment rates for girls are significantly behind those of boys, which resulted in a literacy rate of only 55 per cent in 2002 for women in South Asia which is notably lower than other sub-regions (APFED, 2005).

Positive impacts of education in advancing to sustainable development

With significant improvement in the access to educational opportunities, a constantly improving literacy rate has been observed in all sub-regions. Literacy, together with other common curricula like mathematics, science, health and physical education and social studies, should certainly serve as the basis of subsequent capacity development aiming at the attainment of sustainable development, as a country's "basic intellectual infrastructure."

Research has shown that basic education provided in primary and secondary schools effectively improves

Fig. 8-1: Literacy rates of adults by Asian sub-region
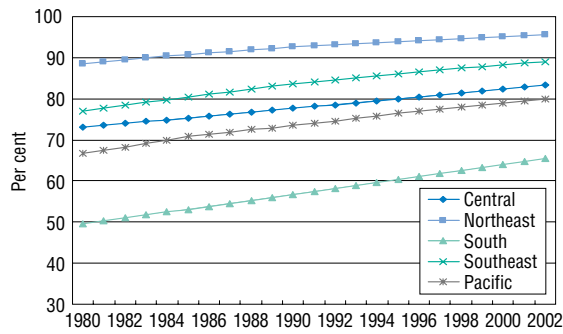
Source: APFED (2005)[34]

agricultural productivity, enhances the status of women, reduces population rates, enhances environmental protection and generally raises the standard of living. For example, four to six years of education is the minimum threshold for increasing agricultural productivity. Literacy and numeracy allow farmers to adapt to new methods, cope with risk and respond to market signals. An average of six to eight years of public education for women is required before the birth rate drops and infant health and children's education improve. Nine to twelve years of education is required before industrial productivity increases nationally (Heyn, Lythgoe and Myers, 1997).

On the environmental education front, the impacts can also be seen not only as enhancing awareness of participants or enhancing their knowledge level, but also formulating of concrete actions leading to, inter alia, the improvement in environmental quality, bettering the management of institutions and the promotion of participatory decision-making for natural resource management, in particular, at the local level. A number of reported practices of environmental education provide encouraging signs of the positive outcomes from education, in terms of concrete contributions to achieving sustainable development. Boxes 8-3 and 8-4 illustrate exemplar cases from the Asia-Pacific region, while the McKenzie-Mohr and Associates database provides a number of success stories, mainly from the United States, on the application of educational measures for achieving improvement in environmental performances at the local level (McKenzie-Mohr and Associates, 2005).

**Box 8-3: Enhanced awareness promoted household waste recycling and reduction
of waste generation - Thailand**

The municipality of Nonthaburi, located on the outskirts of Bangkok, has experienced the rapid expansion in consumption associated with significant increases in household waste generation, which led to numerous problems, such as the shortage of final disposal sites, high cost of treatment and disposal, and deterioration in environmental hygiene due to imperfect collection and the scattering of waste. Within the framework of the Kitakyushu Initiative for a Clean Environment under the auspices of the UN Economic and Social Commission for Asia and the Pacific (ESCAP), and with technical assistance of the Institute for Global Environmental Strategies (IGES), the municipality carried out a pilot project to reduce household waste and promote recycling in two villages, primarily through non-formal education and a public awareness campaign.

With an overall objective of increasing recycling rates by 20 per cent and reducing solid waste by 30 per cent, Nonthaburi conducted various activities to promote public participation, including the organisation of seminars and workshops, and production and distribution of pamphlets providing clear explanation of the scope and objective of waste recycling and practical guidance for waste segregation in plain language. Transparent plastic bags were distributed to promote public consciousness on proper waste segregation. These activities have been carried out with significant enthusiasm and distinctive ingenuity by the municipality staff, who were inspired and motivated by successful experiences of other cities in the region (e.g., City of Kitakyushu, Japan), that they learned through the international training events organised as a function of the Kitakyushu Initiative.

The pilot project resulted in an apparent increase in the level of environmental awareness among the residents. An investigation conducted six months after implementation indicated that recycling has increased from 5.3 per cent to 22 per cent, and waste underwent a 32 per cent decrease from 0.95kg/day to 0.65kg/day. Income from recycled materials, e.g., metals and plastics, amounted to 1630 baht/month provoked further awareness of multiple benefits of waste recycling among the citizens.

Source: Nonthaburi Municipality (2003)

**Box 8-4: Informal learning promotes participation of villagers in
marine resource management – Vanuatu**

In Vanuatu, a local drama group, Won Smolbag, is showing how difficulties encountered in disseminating information can be overcome in a way well accepted by local people. They engage people in drama workshops and the novel experience of watching live theatre.

Literacy and education levels in Vanuatu are low, and many of its villages are unable to access information through the media. Following dramas practiced by participants, workshops allow participants to share their concerns and knowledge about a range of social, environmental and health issues in both an entertaining and engaging way.

Won Smolbag is helping villages not only to build knowledge, but also to take action by connecting them with the government and NGOs to deal with important and often controversial issues like marine exploitation through the illegal trade of marine species. In this way, the innovative programme is helping to build their capacity for participation in the change toward sustainability.

Source: Tilbury and Wortman (2004)

Problems of environmental education

Along with the proliferation of environmental education practices throughout the region, information and knowledge-based on practical experiences are progressively exchanged and fed back to the discussion for further improvement of education programmes and their delivery. An IGES workshop on the Regional Strategy on Environmental Education in the Asia-Pacific Region, held in December 1999, was a landmark event where experts from the entire region gathered and discussed the issues and problems related to the delivery of environmental education at different levels (IGES, 2002). Most of the major problems of environmental education, in particular those encountered at the operational level, were already raised in the workshop. Some of those problems included:

Inadequate educational infrastructure – A lack of appropriate infrastructure is very common in the education sector in developing countries in the region. School buildings are often dilapidated and lack minimum facilities, such as furniture, classroom, laboratories, library, materials, tools and equipment. Because of a lack of designated space, non-formal classes are being operated in shifts.

Inadequate curriculum development – Existing curricula, in particular, in school education, are mostly knowledge-based and inflexible in incorporating additional subjects or activities to involve students in a broader perspective of leaning on ecological sustainability in locally-relevant contexts. In most EE programmes, curricular components are often dominated by the natural sciences and do not reflect the multi-disciplinary characteristics of environmental education, nor are they constructed around accurate scientific or ecological concepts.

Lack of trained teachers – There is a great shortage of trained and competent human resources, especially environmental educators and facilitators. The lack of training opportunities that focuss on content and methodology of environmental education, as well as incentives to motivate teachers to enhance their competency, is significant.

In fact, these were considered the areas where policy intervention and support are definitely required. In effectively addressing these problems, the workshop discussion and subsequent IGES studies have identified the needs of overall policy intervention, in particular, for:

(i)   Enhancing the integrity of national policy/strategy for environmental education, which provides a basic principle for guiding the broad range of environmental education activities in a country in an integrated and coordinated manner;

(ii) Improving the institutional coordination among different educational sectors and the governmental agencies to ensure that financial, technical and human resources are appropriately mobilised and allocated to support the sound development of an education infrastructure and curricula as well as training/capacity-building activities targeting different sectors; and,

(iii) Enhancing the availability of, and facilitating access to, relevant data and information, especially on environmental trends, conditions, solutions and alternatives.

Most of these problems and policy requirements are not specific to environmental education. The findings in the EE field are largely relevant to the cases of thematic education in other subject areas addressing the important components of sustainable development, such as poverty, health, social cohesion, and local development, and thus can be applied to the further promotion of those thematic education efforts.

A fundamental question - education and sustainable development at society scale

As previously mentioned, positive signs of the contribution by educational efforts to the promotion of sustainable development can be observed in a number of specific initiatives and practices. However, for cases of environmental education in particular, their impacts are observed mainly at the individual, group, community and local levels, and their influence on society-wide change is still unclear.

A survey conducted by the government of Japan in 2001, provided an insightful analysis about the outcome of environmental education. As the survey was designed to canvass inter-generation differences in people's attitude towards global environmental issues after more than 30 years of history of environmental education (EE) activities, the results show that the older generation, in particular "pre-EE generation" from 50 to 58 years old, still have a greater concern for global environmental issues than younger generations, including the "EE generation" from 20 to 29 years old (Fig. 8-2).

Recent research in Australia similarly focussed on the relative lack of concern expressed by younger Australians with the need to protect the natural environment. New polling data showed that young Australians were among the least concerned group in the country (Denniss, 2005).

The result can be interpreted in many ways. It is, however, interesting to see that in the two most advanced countries in EE development in the Asia-Pacific region, EE may not necessarily be producing environmental awareness effectively for its target audience. With respect to environmental protection or the rational management of natural resources, behavioural change cannot be expected when environmental awareness is not sufficiently raised.

Fig. 8-2: Inter-generation comparison of the levels of concern for global environmental issues
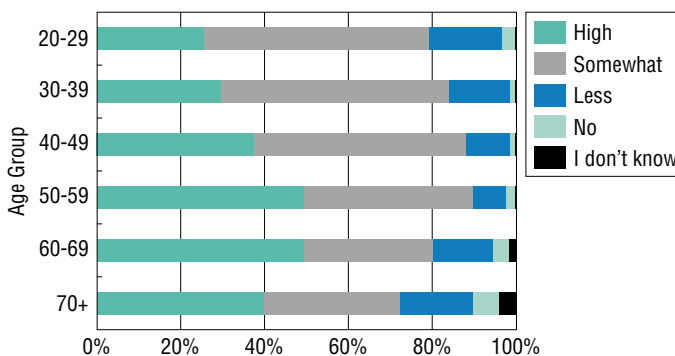
Source: Cabinet Office, Government of Japan (2001)

In its national efforts to comply with the Kyoto target (6 per cent reduction of GHG emissions), Japan has put significant emphasis on education, training and public awareness as a tool to control GHG emissions from residential sources, as clearly presented in Japan's Third National Communication under the United Nations Framework Convention on Climate Change (Government of Japan, 2002a). Substantial media coverage has been evoked by this subject while a number of media campaigns follow the government's initiatives that call on the general public for energy-consciousness and energy-saving behaviour in everyday life. In line with the above provision, Japan's "Guideline for Measures to Prevent Global Warming" (2002) proposed that CO_2 emissions from residential sources should be reduced by 2 per cent by 2010 (compared with the emissions in the base year 1990), particularly through the expanded application of energy-saving and

energy-efficient equipment supported by accelerated R&D in industry and the environmentally-conscious consumers (Government of Japan, 2002b). However, following the steady increase of CO_2 emissions from residential sources, e.g., +33.0 per cent in 2002 compared with the baseline value in 1990, the 2005 revision of the guideline saw the setting of a "realistic" goal of CO_2 emissions from residential sources, which will be a 15.1 per cent increase by 2010, instead of a 2 per cent reduction (Government of Japan, 2005).

The revision may also be interpreted in many ways, but one possibility would be that the government of Japan has given up on the idea that GHG emissions from residential sources can be reduced by intensively applying educational measures as a tool to provoke consumers' behavioural change. Or, in the first place, energy-saving behaviour/practices at the personal level were not regarded even in the 2002 guideline. It is apparent that the government implicitly admitted that such measures cannot be expected to work out as much as previously expected.

Table 8-1: Outlook of Japan's sectoral emissions of CO_2 from energy sources in 2010

By sector	Base year emission (1990)	Reduction goal set by the 2002 guideline	2002 actual emissions	Reduction goal (revised) set by the 2005 guideline
Industry	476 million t-CO_2	-7%	-1.7%	8.6%
Residential	**273 million t-CO_2**	**-2%**	**+33.0%**	**+10.7%**
Transportation	217 million t-CO_2	+17%	+20.4%	+15.1%

Source: Government of Japan (2005)

Challenges in reassessing relevance and effectiveness

Discussions so far illustrate that education, public awareness and training measures may be effective in improving environmental quality and natural resource management, and thus in promoting sustainable development, mainly at the local level. However, fundamental questions remain on how educational efforts should effectively produce tangible impacts on values and behaviours of the target audience that explicitly relate to the promotion of sustainable development at the societal scale. Yet it has to provide factual evidence on whether, how and how much educational measures can contribute to achieving sustainable development in concrete terms, e.g., attainment of MDG targets in 2015.

It has been claimed that human resource development is the key to achieving sustainable development. Despite sovereign philosophy and mounting expectations, if there is no evidence to support the actual contribution of education, public awareness and training measures to this societal challenge at tangible levels and scales, it must imply that the orientation of environmental education for a past decade needs a serious re-examination. Maybe the efforts were not sufficient to realise a visible change, or perhaps more resources should be allocated to intensify, expand and upgrade the current initiatives. The current policies focus and direction of environmental education might need some readjustments. Thorough reassessment of the methodology, contents and magnitude of delivering environmental education, or education for sustainable development in broader terms, would be worth further research in terms of defining its concrete contribution to sustainable development.

Reorientation towards sustainable development

In response to the problems and challenges described in the previous section, it is certain that redirection is needed in applying educational measures in the societal efforts to achieve sustainable development, and new approaches and initiatives are desired. This section will present selected responses emerging globally, as well as in the region, and present several important principles in forming a new direction for education, public awareness and training for sustainable development in Asia and the Pacific.

Beyond environmental education

With growing recognition of unavoidable interaction among environmental, economic and social concerns, environmental issues have been more progressively discussed in the broader context of sustainable development. The Johannesburg Declaration on Sustainable Development, adopted at the World Summit on Sustainable Development in 2002, explicitly highlighted the collective responsibility of all mankind to advance and strengthen the interdependent and mutually-reinforcing three pillars of sustainable development – economic development, social development and environmental protection – at the local, national, regional and global levels (United Nations, 2002b). This notion essentially implied a need for significant change in scope and orientation for environmental education, and for the emergence of a new vision of education for sustainable development.

A report of the UN Secretary-General to the Commission on Sustainable Development (CSD) in 2001 expressed a particular concern about the continuing misconception that sustainable development is mostly about the environment and that education for sustainable development is therefore perceived simply as a new twist to the notion of environmental education (United Nations Economic and Social Council, 2001). Experts viewed that environmental education, while remaining as an important and essential component of a newly emerging education for sustainable development, was required to drastically evolve itself from its naturalist, apolitical and scientifically-oriented into a focus on a broader agenda and a further understanding of the inter-linking relationships among environmental quality, social welfare and economic livelihood, as well as the political threads that underlie these matters (Tilbury, 2000). This evolution will help environmental education to better address a more practical solution to the actual environmental problems in the existing socio-cultural and economic conditions and to enhance its relevance to promotion of sustainable development at the society scale.

In 2002, the proposal for establishing the Decade of Education for Sustainable Development (DESD) was endorsed at the World Summit for Sustainable Development (WSSD) in Johannesburg. The UN General Assembly later adopted the decade by consensus, designating the years of the decade as 2005-2014. The decade provides an opportunity for a concerted effort to integrate the various values inherent in sustainable development into every aspect of learning, through all forms of education, training and public awareness-raising, to encourage changes in behaviour that allow for a more sustainable society. Internationally collaborative work is under way aiming at the development of the International Implementation Scheme and subsequently the Regional Implementation Strategies (UNESCO, 2005a, 2005b).

Education for sustainable development covers far broader range of issues than the conventional scope of environmental education, reflecting the fact that sustainable development is a complex undertaking with connections to every aspect of life. Such issues include human rights, peace and human security, gender equality cultural diversity and intercultural understanding, health, HIV/AIDS, governance, poverty reduction, corporate responsibility and accountability, and market economy, in addition to environment-related sectoral subjects, i.e., natural resources (water, energy, agriculture, biodiversity), climate change, rural development, sustainable urbanisation, and disaster prevention and mitigation. However, the current discussion about education for sustainable development concentrates on a common approach and underlying principles

for dealing with a variety of issues, rather than discussing the operational components of educational programmes addressing specific topics. The key values to promote, key capacities to develop, and key operational features of education for sustainable development are being discussed by experts, education practitioners, academics and officials in different arenas. For example, the draft International Implementation Scheme for DESD proposed a list of key features of education for sustainable development (UNESCO, 2005a):

- *Interdisciplinary and holistic:* learning for sustainable development embedded in the whole curriculum, not as a separate subject;
- *Values-driven:* it is critical that the assumed norms – the shared values and principles underpinning sustainable development – are made explicit so that they can be examined, debated, tested and applied;
- *Critical thinking and problem solving:* leading to confidence in addressing the dilemmas and challenges of sustainable development;
- *Multi-method:* word, art, drama, debate, experience, … different pedagogies that model the processes. Teaching that is geared simply to passing on knowledge should be recast into an approach in which teachers and learners work together to acquire knowledge and play a role in shaping the environment of their educational institutions;
- *Participatory decision-making:* learners participate in decisions on how they are to learn;
- *Applicability:* the learning experiences offered are integrated in day to day personal and professional life;
- *Locally relevant:* addressing local as well as global issues, and using the language(s) that learners most commonly use. Concepts of sustainable development must be carefully expressed in other languages – languages and cultures express things differently, and each language has creative ways of expressing new concepts.

Obviously, these features are closely linked to the responses to the current problems of environmental education discussed in the previous section. The emerging thrust of education for sustainable development momentum for further development of environmental education through strengthening cross-sectoral collaboration with thematic education initiatives dealing with other subject issues of sustainable development. Such collaboration will be particularly useful in improving planning and the operation of education programmes through exchanging information and experiences, in enriching their multi-disciplinary contents in holistically addressing individual issues in the overall socio-cultural and economic contexts, and in mobilising fresh resources by synergetically fostering public support.

Box 8-5: DESD in Asia and the Pacific

The regional implementation of DESD in Asia and the Pacific has officially been launched by the ceremonial UNU/UNESCO International Conference: "Globalisation and Education for Sustainable Development," June 28-29, 2005, Nagoya University, Nagoya, Japan. To lead and facilitate the substantial activities by the various stakeholders throughout the region, UNESCO, in collaboration with the United Nations University, has developed "A Situational Analysis of Education for Sustainable Development in Asia-Pacific Region," and "A Working Paper: Asia Pacific Regional Strategy for Education for Sustainable Development" as basic guidance. Preliminary findings in these documents indicated that ESD is still predominantly conceptualised in the context of environmental education (EE) by many key stakeholders and decision-makers in the region. The analysis emphasised that "although much can be learned from the experience of successful EE initiatives, especially at the grassroots level, it is imperative that stakeholders understand the unique holistic and cross-cutting nature of ESD. Moving from EE to ESD will be a key challenge for the decade."

Source: UNESCO (2005b, 2005c)

Box 8-6: Tongji Institute of Environment for Sustainable Development addresses a broader perspective of sustainable development in the regional training programme

Tongji University, Shanghai, established with the assistance of the United Nations Environment Programme (UNEP), the Tongji Institute of Environment for Sustainable Development, which serves as a regional hub for high-level education and research on the environment and sustainable development. The institute provides a platform for inter-university cooperation, as a part of a collaborative effort of the Asia Pacific Regional University Consortium on Sustainable Development for, inter alia, exchanging information and experience, providing education and training opportunities and coordinating joint studies in pertinent fields, e.g., environmental and sustainable development policies, applicable teaching theory and practices, environmental management at universities and students' environmental activities in society.

As a regional initiative to respond to the emerging notion of education for sustainable development, in 2004, the Institute launched an annual training programme for leadership development targeting mid- to senior level officials from a wide range of stakeholders in government, civil society, private sector and the media in the Asia-Pacific countries. It was designed to deliver a deeper and more profound understanding of sustainability by highlighting a broader perspective of human, environmental and socio-economic implications of sustainable development as well as an imperative need for integrating them in a harmonised development agenda.

Source: UNEP (2004)

Responding to the comprehensive needs of human capacities for sustainable development

If sustainable development is to be attained and education is to function as a tool to achieve this ultimate goal, the relevance between education initiatives and their contribution to the promotion of sustainable development, as well as their effectiveness and efficiency should be seriously reconsidered. Since education fulfills this function, primarily through the development and enhancement of human capacity, it might be worthwhile to define key requirements for the human capacity that are critical for pursuing sustainable development.

Based on earlier works, such as the Tbilisi Declaration in 1977 and subsequent research, including Hopkins and McKeown (2002), the following four basic categories of capacity requirements essential for sustainable development are proposed:

(i) Capacity to communicate

Communication among people and, in particular, between different stakeholders, is the foundation for any democratic society and is essential for informed and participatory decision-making for sustainable development. Sharing common information and exchanging views are important elements for carrying out consultative and participatory approaches in all fields.

(ii) Capacity to understand

No actions can be adopted or implemented without the appropriate recognition of the implications or significance of specific measures in terms of social, economic and environmental well-being. Enhancing awareness and understanding on not only environmental matters and their socio-cultural and economic implications is critically important. Knowledge about relevant natural and social systems should be complemented with skills to actively collect, comprehend and analyse quantitative and qualitative information with appropriate world views, values and perspectives.

(iii) Capacity to make decisions

Decisions for sustainable development require understanding and critical thinking for multidimensional and multidisciplinary complexities. Skills are needed for the formulation of alternative options, study on socio-cultural and environmental implications and trade-offs among those specific options, and application of sustainable development principles, values and priorities in the decision-making. Capacity for facilitating partnerships and coordination among stakeholders with different views and perspectives is also critical to enhance the responsibility for decisions effecting a shared future.

(iv) Capacity to take actions

Ultimately, all values and decisions have to be interpreted into actions at different levels and scales. Actions may take the form of legislation and policy-making; application of economic and financial instruments; reform of institutions and enforcement processes; scientific and technological interventions; or more direct actions and behavioural changes at the grass-roots level, each of which requires specific implementation capacities and skills.

Fig. 8-3: A conceptual path – from education to the attainment of a sustainable society
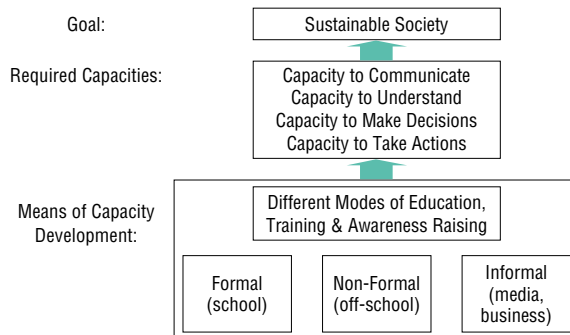
Box 8-7: The Region's challenges in human capacity development for global environmental action

In 2000, the UNDP and the GEF Secretariat published a report advocating a comprehensive approach for developing the capacities needed at the country level to meet the challenges of global environmental action. The regional report "Capacity Development Initiative – Country Capacity Development Needs and Priorities," while placing a significant emphasis on the institutional aspects, identified the following areas for primary challenges for human aspects of capacity development in the Asia-Pacific region:
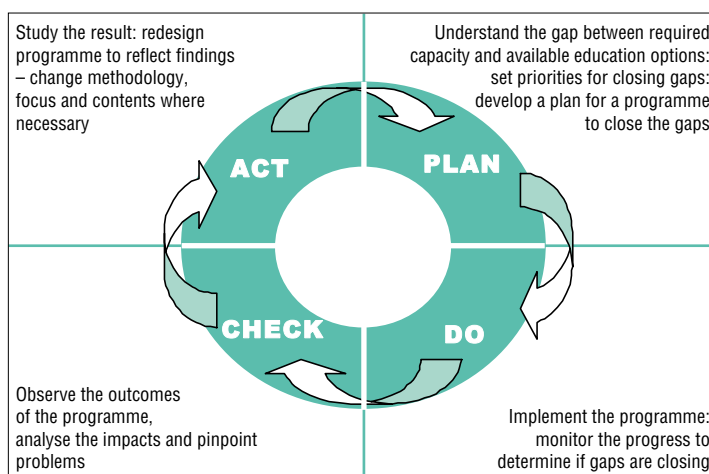
(a) Human resources across most environmentally related institutions are inadequate for effectively carrying out operations. There is generally a lack of technical staff in most institutions. Due to budgetary constraints and unattractive incentives, there is difficulty in retaining well-trained staff.

(b) There is a shortage of specialists in the required technical fields. For example, taxonomists and meteorologists.

(c) The key areas where training programmes should be enhanced include, research on socio-economic impacts, policy implications, and vulnerability studies.

Source: Zakri, Singh and Villarin (2000)

All educational programmes need to be planned, designed and implemented with a clear reference to the desired target, i.e., the development of key capacities as identified above. In order to facilitate this process, an introduction of an evaluation process in the project cycle of any education programme is encouraged. A number of management tools and instruments are available for this purpose.

For example, the Plan-Do-Check-Act (PDCA) cycle is a commonly-used management tool that provides a framework for the improvement of a process or system. The cycle involves a four-step cyclic process consisting of Plan, Do, Check and Act stages, which enables the completion of one turn of one cycle to flow into the beginning of the next. A conceptual chart for the possible application of a PDCA cycle for an educational programme is presented in Fig. 8-4.

Fig. 8-4: PDCA cycle for an educational programme[35]

Study the result: redesign programme to reflect findings – change methodology, focus and contents where necessary

Understand the gap between required capacity and available education options: set priorities for closing gaps: develop a plan for a programme to close the gaps

Observe the outcomes of the programme, analyse the impacts and pinpoint problems

Implement the programme: monitor the progress to determine if gaps are closing

ACT   PLAN   CHECK   DO

As mentioned, evaluation should offer a powerful way to improve education programmes and enable them to succeed in accomplishing more of their goals and objectives, moving values, changing behaviours and developing necessary human capacities in the direction of sustainability and environmental conservation. Despite the long debate on the difficulty of measuring the success of environmental education, outcome-based evaluation is rapidly growing in popularity and use among pioneering education practitioners, non-governmental organisations and funding institutions. Among other efforts, the Canadian Parks and Wilderness Society, Sierra Club of Canada and Global Environmental and Outdoor Education Council (GEOCC) jointly proposed an evaluation scheme that flows from a programme-logic model, together with a suggestion of a set of outcome indicators (Thomson and Hoffman, 2003). Table 8-2 presents some examples of such quantitative/qualitative indicators. The Council for Environmental Education (CEE) in the United Kingdom also published a guide for evaluating the effectiveness in education for sustainable development (CEE, 2004).

Table 8-2: Measuring the shifts in values

Measurement Instrument	Pre/Post Test *	Outcome Indicator **
Questionnaires (Likert Scale or multiple choice)	✓	Quantitative shift in individuals/group for questions pertaining to values.
Interview		Student responses reveal a higher appreciation of natural values.
Focus Group		Unprompted, at least 15 per cent of students will comment that their values are more supportive of the environment.
Review of Peers		Students comment on changes in the values of their peers through formal and informal interviews and assignments at both the individual and team level.
Journals	✓	Students make written reference to changes they feel have occurred in their own beliefs, attitudes, or values.
Student art work	✓	Students' drawings of their schoolyard give more emphasis (using colour and perspective) to natural objects.
Feedback form		Unsolicited, students comment on how the programme influenced/changed how they feel about an aspect of nature.

* Pre/Post. Often, an objective measurement of a change in values requires a baseline, pre-and post-programme measurement. A check mark is used to indicate if this is necessary.

** Outcome Indicators. These are quantitative or qualitative statements that result in the desired results we get after using the relevant measurement instrument.

Source: Thomson and Hoffman (2003)

Integrated approach involving all forms of education

Sustainable development is a complex undertaking with connections to every part of life. Capacities required for sustainable development are enormous and can only be enhanced by engaging all possible measures of education, training and awareness-raising opportunities. In fact, education for sustainable development should take place within a perspective of lifelong learning, encompassing all modes of education initiatives; formal, non-formal and informal, from early childhood to adulthood. Available educa-

tional opportunities should not be equated with schooling or formal education alone, nor can they be conceived to limit non-formal environmental education (EE) activities provided by NGOs or advocacy groups. A lifelong learning perspective sees all the different modes of education as a continuous and interactive process, to collectively promote the societal changes towards sustainable development. Roles by different modes of education can be outlined as follows:

Formal education - With the perspective of "education for all," it carries a particular importance in providing basic education to the majority of the population, which is key to a nation's fundamental development, particularly through the improvement of literacy and numeracy. Common curricula like mathematics, science, health and physical education and social studies serve to develop a nation's intellectual infrastructure which is basic to promoting economic and social development. Higher education also responds to societal needs for trained professionals as well as to the leadership required for the construction of modern institutions in various sectors and for improving the standard of living. Subjects of law, economics, science, engineering, agriculture and medical science all contribute to supporting the process of sustainable development.

Non-formal education – In the past, non-formal education demonstrated an impressive development in its scope and magnitude of delivery, in particular, in the field of environmental education (EE). It was developed in response to local needs and priorities, and thus closely linked to the development of the required human capacities within the local context. Non-formal education has advantages, e.g., its curricula are flexible and can be designed relatively quickly, participatory and interactive approaches are inherently adopted in its education methodologies, and it readily reaches a broader audience, i.e., the general public, beyond that of the formal education system. NGOs and community-based organisations have been widely recognised as the primary providers of non-formal environmental education and are gaining greater responsibilities and influence in the development of education of this particular mode.

Informal education - This mode of learning takes place in the family, community, workplace and social interaction, as well as through the media (e.g., newspapers, television and radio) and a diversity of indigenous methods and processes, such as religions, informal beliefs, cultural activities, popular art, theatre and music. Informal learning generally raises public awareness on socio-economic and environmental implications of human activities, and shares relevant information for important decision-making. In particular, vocational training addresses a range of business operations, including technical and managerial aspects, and thus enhances the participant's skills in directing those operations more compatible with sustainable development, while a number of religions in Asia and the Pacific, such as in Buddhism and Hinduism, promote respect and cultural belief related to nature conservation and sustainability issues.

A range of efforts and initiatives were taken for decades to strengthen the roles of different modes of education and to enhance the effectiveness and efficiency of their delivery in response to their respective weaknesses and problems identified from the past experiences. However, these efforts are mostly promulgated on an ad hoc basis and lack appropriate linkage across the sectors as well as inter-agency coordination in a consistent framework.

Synergy among different modes of educational efforts must be created, and an integrated approach needs to be employed. Formal, non-formal and informal education should be recognised as indispensable components of education for sustainable development, a strategic framework to ensure that they work in tandem to collectively cover all skills and expertise, values, and behavioural changes indispensable for sustainability.

Pioneering initiatives are being observed in many parts of the region. Linking literacy education to health, environmental awareness and other sustainable development concerns is progressively undertaken, *inter alia,* by community education groups in India (*Uttarakhand Seva Nidhi*, 2004). Initiatives for strengthening the collaboration between formal and non-formal sectors are under way in Indonesia where the formal education sector created "Local Study" as a subject in the school programme, and NGOs and universities work together to develop and disseminate environmental education materials for use in the subject course across the nation (Hans Seidel Foundation, 2005). In Japan, the 1998 revision of the "Course of Study," or the basic national guidelines for school education set by the Ministry of Education, Culture, Sports and Technology, stipulated the introduction of a new course subject, "Period of the Integrated Studies" (*Sogo Gakushu no Jikan*) in the school curriculum, which provided a window for bringing NGO programmes and community-based, non-formal environmental education into an integral part of school education (Box 8-1). Innovative materials, textbooks and tools, such as Kids-ISO, developed by non-formal sectors including NGOs, business and academia are progressively used in this course. Effective coordination and specialisation according to differentiated roles and effectiveness of education modes attracts special attention (Box 8-8). This viewpoint is particularly important if education for sustainable development is to be promoted effectively within the limited available resources.


Box 8-8: Differentiated roles and effectiveness of different modes of education

In designing the most effective combination of education measures for achieving the desired goals and objectives, one can always consider the comparative advantages and disadvantages of different measures in a specific socio-cultural background.

A survey in Japan indicated that the people's awareness on environmental issues is more effectively promoted through the media rather than through school education (Fig. 8-5). The contribution of non-formal education as a source of environmental information was not even considered in this survey.

The results suggested that the media is the most effective channel for disseminating basic environmental information, and the allocation of further resources for strengthening the role of the media should be rationally promoted. This would be true in countries where the development of an aware, conscious and independent media sector is sufficiently achieved, although such development is still a challenge in a number of the Asia-Pacific countries. On the other hand, education (formal and non-formal) can better play its role by concentrating on the promotion of higher levels of knowledge, skills or action, rather than the transfer of textbook type of basic information, provided that the basic information is primarily disseminated through the media.

Fig. 8-5: Sources from which people receive information on global environment issues and environmental conservation – A Japanese survey
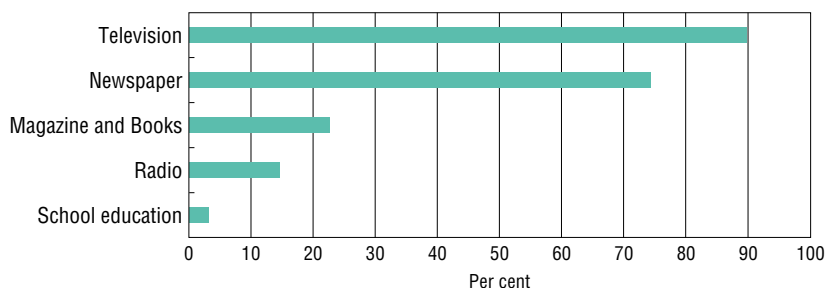
Source: Cabinet Office, Government of Japan (2001)

Developing institutions for promoting education for sustainable development

It is again emphasised that education is considered as one of the primary tools to achieve sustainable development and education initiatives and programmes need to be more closely linked to national goals and priorities. In this perspective, national education systems and policies can no longer be discussed in the small circle of sectoral stakeholders, such as education ministries, schools, teachers, academics and some NGOs. Rather, the discussion should involve an entire spectrum of stakeholders, including financial, development, environmental ministries, local governments, community groups and scientists in different disciplines, as well as a whole range of NGOs active on socio-cultural, economic and environmental aspects of sustainable development. In addition, it should be noted that communities, NGOs, business and other civil society groups are increasingly gaining competence in providing education programmes, in particular, non-formal education on environmental and development concerns, and therefore, the engagement of these stakeholders in formulating, implementing, and monitoring education policies and programmes is deemed essential in order to ensure a holistic and integrated approach.

A national coordinating mechanism should be established in each country for strengthening the multistakeholder dialogue, facilitating the participatory formulation of the national policy framework and action plans, ensuring harmonisation and partnership in their implementation, and enhancing the public support and commitments for the promotion of education for sustainable development This mechanism provides an opportunity to identify and acknowledge the roles of all relevant stakeholders, and engage them as partners in establishing a national system for developing and delivering the services of education for sustainable development. Among other steps of multistakeholder dialogue, a collective exercise for sharing a vision for sustainable development define their respective roles in contributing to achieving the common goals and the formulation of policies, programmes and actions is considered particularly important and useful for enhancing the ownership and responsibility of all relevant stakeholders in the promotion of education for sustainable development.

Efforts to establish such national coordination mechanisms are being initiated in a number of countries in the region. The Japan Council on the UN Decade of Education for Sustainable Development (ESD-J) was founded in June, 2003, as a non-governmental networking organisation dedicated to promoting education for a sustainable society in Japan. Being primarily a gathering of NGO/NPOs, but also of individuals including teachers and other education practitioners, researchers, academics, businessmen and even government officials, who are actively involved in broad-based social issues such as the environment, development, human rights, peace and gender, ESD-J provides a thorough platform for sharing views and forging new collaborations for further promotion of education for sustainable development in Japan. ESD-J also coordinates interfaces with the government, local authorities, companies and educational institutions (ESD-J, 2005). The New Zealand National Commission for UNESCO has taken a leading role in assembling a New Zealand Coordinating Committee for UNDESD, to plan and implement the national response to the Decade. The Committee is comprised of representatives from government, business and civil society who are committed to education for sustainable development. Initiation of this type of coordinating mechanism at the national level is highly encouraged in the course of the implementation of UNDESD (UNESCO, 2005c).

The national coordination mechanism will provide a platform for developing a national policy framework that provides basic guidance for all stakeholders to join forces to promote their respective activities in an integrated manner towards the attainment of the common goal of sustainable development. In this respect, the framework, essentially supporting the notion of education for sustainable development and addressing the holistic and integrated approach to be applied, should explicitly include definitions of the respective roles of different groups, their commitments and an action agenda to ensure the engagement of all stake-

holders in relevant initiatives and programmes at the national scale. Ultimately, the national education policy should be revised in its entirety so that the provision of education for sustainable development becomes central to the interests of the entire education sector and sets basic principles for the further development of the national education system.

There is no doubt that governments and groups at all levels have a significant role to play in contributing to the successful promotion of education for sustainable development. However, the governments' role as providers of education should be viewed with caution. This is because education for sustainable development is on many occasions discussed as a bottom-up exercise in a process of decentralisation, and above all, historical reviews demonstrate that the governments' intervention, especially on the contents of educational programmes, does not provide impartiality for the successful implementation of education in any field of study. An ADB research report on education and national development underscored skepticism on the effectiveness of governments' top-down control and intervention on school organisation and curricula. The report, "coupled with reviews of practice, provided sufficient insights for planning effective schooling if the planning and implementation processes include opportunities to modify inputs and processes as evidence of effectiveness is acquired" (ADB, 2001). In this context, the government functions for the promotion of education for sustainable development are defined as "enablers" or "facilitators." A UNESCO working paper (UNESCO, 2005c) provided the following list of major functions of governments:

- Policy-making and framework setting;
- Promotion of public consultation and input;
- National and international public campaigns;
- Restructuring of educational systems; and,
- Initiation of demonstration/pilot projects involving relevant stakeholders.

Box 8-9 presents further ideas on prospective policy measures in the "enablers" context that can be applied by governments at different levels, in addition to enhancing the overall access to and quality of the country's education system, in general, and directly providing exemplar education programmes on a demonstration basis. The list has been developed mostly on the basis of the experiences in the delivery of environmental education programmes during the past decade. In order that the government can better discharge these "enabler" functions, the institutional and human capacity development in the governmental sector is essential. Also fundamental is the development of a national policy framework through multistakeholder partnerships and participation before adopting and operationalising any policy measures.

Box 8-9: Selective list of governmental policy options in the "Enabler" context

De-regulation on the curriculum setting and contents
De-regulation on the curriculum setting and contents is urged to allow educators at different levels to employ maximum flexibility in incorporating sustainable development concerns in socio-cultural, economic and environmental aspects in locally-specific contexts.

Develop provisions to facilitate the inter-sectoral collaboration
In order to provide a rationale, a (de) regulatory basis and necessary support that will encourage optimal interaction among formal, non-formal and informal education sectors in planning and implementing education programmes, (e.g., application of education materials developed by NGOs, lectures by non-teacher personnel, linking classroom and sites for practical experiences,) is necessary. Specific examples include the creation of "Sogo Gakushu no Jikan (Box 8-1).

Enhancing public access to educational resources
Measures for enhancing public access to educational resources include, accumulation and dissemination of relevant information, such as existing educational facilities, courses, competent tutors, course materials, educational grants and scholarships. Development of a local inventory of educational resources, often undertaken by local governments, is well-known as an effective option.

Support networking
Networking among different education initiatives effectively facilitates the exchange of information and experiences for improving their programmes and promoting further inter-sectoral collaboration. Museums and other social education facilities specialised in different sustainable development subjects, in addition to schools, universities and natural science facilities, such as zoos and botanic gardens, may join the network. Governments could provide incentives and support for forming such platforms in a number of ways. The channelling of national/local undertaking with international resources may also by facilitated by governments.

Establishment of local centres
Local centres for education for sustainable development may have multiple functions. They may be established, or designated from among existing facilities, such as eco-museums, as a "more visible" gateway for the public to education for sustainable development, providing hubs for local networking, constantly-accessible information base and permanent forums to facilitate dialogue and information exchange among relevant stakeholders.

Support to enhancing educational capacity
Providing or enhancing opportunities for training in terms of up-to-date and scientifically accurate sustainable development is an important area of government intervention. Teacher re-training may also be conducted in collaboration with appropriate education institutions, such as universities.

Promoting public access to information and assessment tools
Data and information, especially on socio-economic and environmental trends, their interrelated natures, encountered problems, available alternatives and their respective impacts are always critical components of learning sustainable development. It is crucial to enhance the availability of, and to facilitate access to such relevant information which is often retained by the government sector. Promoting diffusion of analytical and managerial instruments, such as "*environmental management systems*"[36] and "*ecological footprints*,"[37] is also effective in promoting capacity development in the pertinent aspects.

Financing education for sustainable development – Redirection of existing financial resources addressed for educational purposes would be undertaken in the first place, while mobilising fresh and additional resources would also deserve significant attention given the importance of education in achieving the ultimate goal of sustainable development.

Pursuing an effective policy mix

It has been repeatedly emphasised that human capacity development is an essential factor for achieving sustainable development. However, it should be recognised that education alone cannot be a panacea for all the problems of sustainable development. As Box 8-10 illustrates, one such failure in relation to natural resource management is that capacity enhancement by awareness-raising has not provided a solution to immediate problems on countless occasions.

Box 8-10: Education, training and public awareness addressing the "tragedy of the commons"

Management of fisheries is often described as the ultimate example of the common dilemma – "tragedy of the commons." The resource is fleeting, and the fish one does not catch today may be caught by someone else tomorrow. It is difficult to see the fisher's incentive to conserve rather than catch as much as possible as quickly as possible. Since each fisher operates with the same rationality, the users of the fishery are caught in the inevitable process that leads to the destruction of the very resource on which they all depend. Because each user ignores the costs imposed on others, individually, rational decisions accumulate and result in a socially irrational outcome. Fishers are seen as trapped in a situation they cannot change, where education or awareness-raising on resource scarcity hardly has any effect as they are already taking rational decisions. The "tragedy" analysis was applied in shaping fisheries policy in Atlantic Canada in particular, and played a central role in the government's decision to intervene and privatise.

However, findings from a large number of cases covering a range of resource types, geographical areas, and cultures have revealed the existence of local and traditional management systems and common institutions. A number of fishing societies and other community-based management bodies elsewhere, in particular, in East Asia and the tropical Pacific, have demonstrated their capacity to make rules to manage resources on which their livelihoods depend. Such rules include: territorial controls, access limits, seasonal limits, technology restrictions, breeding stock protection, protection of juveniles and size limits. The challenge lies with establishing appropriate institutional arrangements that minimise transaction costs and counteract opportunistic behaviour such as free-riding. To facilitate this process, the fishery manager needs experience of collective action in fishery management and the building of institutions. Capacity-building, in particular through training, can play a vital role in this context.

With the "awareness" and "knowledge of experience" of user groups as the basis, fishery resource management can eventually be made more effective by engaging governmental interventions in the "co-management" framework. Measures of such intervention include: the provision of a legal basis for the local rules and for apprehending rule violators; policing to enforce laws and rules; devising economic instruments to mitigate impacts of fishing restrictions; promotion to develop local enterprises designed to diversify livelihood sources of fishing communities; mediating conflicts between local and outside resource users; and, providing a political environment that allows for the pursuit of community-based initiatives.

Source: Adapted and summarised from Berkes, Moahon, McConney, Pollnac and Pornery (2001)

In order to ensure that capacities developed through education, training and public awareness campaigns have concrete impacts on the tangible improvement in social, economic and environmental sustainability, combination and synergy with other policy measures is essential. It is emphasised that policies for the promotion of education for sustainable development should work most effectively if the education policies are

appropriately integrated in the overall national policy framework for sustainable development and optimally teamed with other provisions of regulatory, market-based and voluntary instruments, including their enforcement/implementation stipulations.

It should be noted that the effects of education measures and other policy instruments are always mutually reinforcing. While impacts of education programmes can be multiplied with optimal combination with other policy measures, education contributes to smooth adoption, as well as to effective enforcement of and compliance to any policy measures by increasing public support through awareness-raising and sensitisation of the general public.

Conclusions and recommendations

Human resource development is the key to successfully achieving sustainable development, and a range of educational measures, including formal, non-formal and informal education and learning in broad terms is the primary tool to develop the human capacity required for sustainable development. Pertinent practices, including in particular, those in environmental education, are widespread in various forms and efforts are ever expanding and their contribution to sustainable development is demonstrated in a number of cases, mainly at individual, group, community and local levels. However, despite their potential and expectations, the impacts of educational measures on society-wide changes have yet to be demonstrated with substantiated evidence. Considering the critical importance and urgency of realising the changes for shaping the sustainable future in the region, serious efforts are needed to reorient education policies and programmes and enhance their relevance and effectiveness in contributing to the attainment of sustainable development.

In response to this challenge, four important response principles are emerging globally:

1) Environmental education should readjust its focus from ecological concerns to interlinking relationships among socio-cultural welfare, economic livelihood and environmental quality in a broader agenda of sustainable development. This evolution will help educational initiatives to better address practical solutions to actual environmental problems in the existing socio-cultural and economic conditions and to enhance its relevance to the promotion of sustainable development at the society scale.

2) An integrated approach should be employed to enhance interlinkage and collaboration among educational programmes in different sectors, ranging formal/non-formal education, training and public awareness-raising. The optimum combination of different educational opportunities may be pursued within a perspective of lifelong learning.

3) Appropriate institutional arrangements should be introduced to best support the notion of education for sustainable development. A policy framework strongly addressing a holistic and integrated approach to education for sustainable development and a coordination mechanism involving not only governmental agencies but also all relevant stakeholders should be established at the national level. Governments can play an "enabling role" by introducing a range of innovative policies to facilitate and support the education initiatives and programmes by all stakeholders committed for sustainable development.

4) An effective policy-mix should be employed among educational measures and other policy instruments in the non-education field. Such policy instruments would include regulatory, voluntary and market-based measures. Sustainable development cannot be achieved by education alone.

In line with these recommended principles, immediate actions that countries in the region can take are recommended as follows:

A national multistakeholder process to deal with education for sustainable development should be initiated as a first step to establish a coordinating mechanism for education for sustainable development. The process essentially involves: a) definition and recognition of a broad range of relevant stakeholders for education for sustainable development, including, in particular, representatives of government agencies, schools, universities, education institutions, NGOs, business, religious groups and community-based organisations, b) improvement of communication among those groups, and c) establishment of a national forum or council for multistakeholder consultation. A media campaign for general sensitisation on education for sustainable development would also be conducted to facilitate the process.

Once such an organisational foundation has been put established, the development of a national master plan for education for sustainable development should be undertaken, with the participation of all stakeholders as a prerequisite. This master plan will provide an overall policy framework and action strategy for all stakeholders in the country to join forces to promote their respective activities in an integrated manner towards the attainment of the common goal of sustainable development. It should include definitions of the respective roles of different groups, their commitments and an action agenda to ensure engaging all stakeholders in relevant initiatives and programmes. Proposals on enabling policy measures for promoting such initiatives and programmes may also be addressed in the master plan.

In order for governments to appropriately discharge the enabling functions, i.e., formulate and implement a range of enabling policies, and provide appropriate support and necessary resources in facilitating the national multistakeholder process, an institutional arrangement to ensure a "whole-government" approach should be provided. Such an arrangement should include: a) the securement of a strong political commitment with top-level leadership, and b) the establishment of a mechanism for inter-ministry coordination on ESD policies and programmes. A core group, such as an inter-ministry task force, should be designated with appropriate authority and responsibility. An important mandate of the core group will be capacity-building for government officials (in all sectors), and reviewing/reorienting existing policy instruments across all ministries concerned, including stocktaking from other international initiatives addressing education issues (Education for All, UN Literacy Decade, etc.). Particular attention should be paid to government functions in terms of channeling of national/local undertaking with international initiatives, such as regional networking, and with external financial resources.

The United Nations Decade for Education for Sustainable Development, 2005-2014, is very timely as it provides an indispensable opportunity to boost the concerted efforts at national, regional and global levels and mobilise the necessary resources to comprehensively respond to the major challenges of education, public awareness and training in achieving sustainable development that were addressed in the past decade. Nevertheless, the challenges are enormous as education for sustainable development has to meet the broad expectation that it should play an principal role in achieving the Millennium Development Goals, the target year of which has been set in 2015, just after the completion of the decade.

CHAPTER 9

Towards a sustainable Asia

Sustainable development: A popular catchphrase, but difficult to operationalise

In the last quarter century, Asia has lost half of its forest cover and a third of its agricultural land has been degraded. Asia's rivers contain three to four times more pollutants than the world average. Of the world's 15 most polluted cities, 13 are in Asia. Current trends project that 2.4 billion Asians will suffer from water stress by 2025, almost double the 1995 figure. Today, at least one in three Asians still has no access to safe drinking water, and one in two has no access to sanitation services. At least one-third of a billion tons of solid waste across Asia remains uncollected each year. At the same time, millions of tons of hazardous wastes are placed untreated in dumpsites, threatening groundwater and local food supplies.

These are only some of the indicators of the attack that is underway on Asia's environment. While rapid economic growth has created dynamism and wealth, Asia has at the same time become dirtier, less ecologically diverse, and more environmentally vulnerable. Unless urgent, concerted and sustained action is taken on a large scale, Asia will be unable to avoid a social, economic and political crisis of catastrophic proportions over the medium-term.

Sustainable development should, therefore, be the central policy principle for Asia 2005 and beyond. Yet, the concept of sustainable development remains very complex and fluid. It often requires significant trade-offs between the economy and the environment, a reality that is compounded by methodological problems and the absence of a single mechanism to take full account of long-term economic costs and benefits (Chapter 1). Sustainable development is, indeed, a concept that is not easy to operationalise and monitor, although attempts to achieve this have been and continue to be made in both developed and developing countries. The approaches that are available (e.g., full cost accounting, policy mix analysis and multi-stakeholder processes) are not free of defects and careful consideration is always needed in applying them to individual countries, localities and situations. There is no "one-fit-for-all" solution.

Recapitulating where Asia stands in the pursuit of sustainable development

Driven by buoyant economic development and continuous population growth, Asia is exerting exponential pressures on its natural resources and the environment. The rapid economic growth that Asia has achieved is inherently unstable due to its high level of resource inefficiency and dependence on a geometric rate of growth in fossil fuel consumption (Chapter 2). A business-as-usual scenario will mean that Asia can neither attain the current level of production and consumption observed in developed countries nor sustain the economic and social gains made over the past three decades.

Measured against this situation, Asian responses to date have been entirely inadequate, although many important steps have been taken and a number of essential foundations for further actions established. For example, a number of initiatives have been launched at the regional level and these are helping to facilitate the establishment of a common agenda and to forge consensus on at least some policy goals for sustainable development (Chapter 2). Several sub-regional collaborative forums have made advances through concrete and institutionalised mechanisms to address challenges such as acid deposition and dust and sand storms in Northeast Asia, haze control in Southeast Asia and trans-boundary air pollution control in South Asia (Chapter 2). At the national level, several countries have been working to develop a more coherent policy

mix, combining regulatory measures, the framework approach, market-based measures, procedural and information measures.

This White Paper has examined specific sectors in some detail. Chapter 3 has looked at forestry and forestry-related issues. The greatest challenge to forestry in Asia is to formulate and implement the policies and practices necessary to ensure that forest resources are used judiciously in a manner that promotes both local and national development. The first step is to reverse widespread and uncontrolled loss of natural forest cover and quality. In this setting, the policy instruments and practices for sustainable forest management that have emerged over the past two decades are recognised as critical. Among the policy instrument approaches explored and summarised in Chapter 3 are plantation forestry, certification, livelihoods and community forestry. Plantations are becoming a central element of forestry in many countries, and if properly managed, can reduce pressure on natural forests and provide an important source of revenue. Certification schemes for both planted and natural forests are being pursued as a means of encouraging and rewarding good forest management. Many countries have set aside protected forest areas, though melding livelihood needs with forest conservation remains a difficult challenge. Community forestry methods are receiving increasing attention throughout most of the region. While facing its own set of peculiar challenges, community forestry can offer improved prospects for sustainable forest management. The increasing trade in illegal timber and wood products is a disturbing trend that ultimately will have to be dealt with at the regional and/or international levels.

Chapter 4 has looked at water as an increasingly endangered commodity in the 21st century that poses particular and immediate risks for Asia. Water availability in Asia over the next several years will become more uneven and erratic while water quality degradation and deficient sanitation will accelerate. There are concepts and instruments for integrated water resource management (IWRM) that can provide at least partial responses to this situation and can help to foster a shift to more sustainable water management, and these are examined in Chapter 4.

Chapter 5 examined issues of climate change, the challenges it poses for Asia and policy responses that have emerged or that are suggested. Even though there is no Asian country besides Japan that currently has GHG emission reduction obligations under the Kyoto Protocol, Asia will need to find common ground and a much more closely integrated policy framework in order to address the needs for climate change mitigation and adaptation. However, as discussed in Chapter 5, climate policies remain on the margins of other sectoral policies in many Asian countries and while the Kyoto Protocol provides an international policy framework conducive to realising the common interests of Annex 1 and non-Annex 1 countries, it fails to cultivate the full potential of boosting renewable energy development, the CDM and adaptation measures. The urgent challenge for Asian countries is to regard Kyoto as a first step only (that was its original intention) and to build an international regime for climate change after the first Kyoto Protocol commitment period. The political dynamics and uncertainty that surround this issue are analysed in Chapter 5.

Asia is experiencing a rate and intensity of urbanisation that is of historical precedent and the environmental aspects (e.g., solid waste generation per capita, air quality, high concentrations of poverty) of this pose vast risks to human security and well-being. Chapter 6 examined this situation with particular attention to management policy challenges and the policy responses that are available. The chapter looked into successful policy responses that may offer prototypes for more widespread application (e.g., the Build-Operate-Transfer (BOT) public-private partnerships in funding urban infrastructure, different configurations of community partnership and inter-city learning that may enable Asian cities to learn from one another and to promote collaboration for successful urban environmental management.

Chapter 7 looked at the current emerging role of Asian business as a facilitator and participant in sustainable development. It reviewed a range of corporate environmental responsibility initiatives by multinational corporations and contrasts these with the generally limited number and scope of initiatives undertaken by the Asian business sector in environmental management systems (EMS), environmental reporting, and green funds/socially responsible investment (SRI). The chapter also examined the difficulties and barriers associated with the greening of supply chains, including those associated with Asia's small and medium enterprises. Newly emerging trends of business involvement in the market for environmental goods and services were also noted.

Chapter 8 explored questions and issues in human resources development and education against the needs and challenges of sustainable development in Asia. It provided an overview of the major thrusts and challenges of ongoing efforts in the field of education, awareness-raising and training, and environmental education and catalogues a number of significant accomplishments through initiatives at individual, group, community and local levels. This chapter indicated the vast gaps that remain if tangible and sustainable gains are to be realised at the societal level.

Pathways towards a sustainable Asia: Conclusions and recommendations

Conclusion 1: Massive and immediate actions are required at all levels throughout Asia – the need for change is urgent

Taken as a whole, Asia is committing ecological suicide. The environmental capital in Asia is already scarce and it is being eroded further by an increasing population and rapid economic growth. Further decline of the environmental capital risks not merely a reversing of the economic gains made over the past three decades, but the more general undermining of the welfare of Asian's citizens and a social and political collapse. This is widely recognised by policy-makers in the region, but the actions and responses thus far are wholly inadequate to the needs of the situation and the magnitude of the challenge. The Ministerial Conference on Environment and Development (MCED) for Asia and the Pacific every five years represents, at best, a very modest step in the right direction. The stark and foreboding realities of Asia's overall development trajectory call for an inter-governmental summit at the highest levels, such as the meetings that led to the establishment of the United Nations in 1946 and ASEAN in 1967. Shared regional policies and practices to promote renewable energy and resource efficiency are required immediately as an incentive to innovation and the emergence of relevant technologies.

Conclusion 2: Continued high economic growth rates are imperative for Asia to tackle the vicious cycle of poverty and environmental degradation

Although the debates about economic growth versus the environment are old, they continue to exert considerable influence on policy discussions and policy choices. Within the global environmental movement is a school of thought that is strongly eco-centric and bio-centric and that prioritises ecological concerns and opposes economic growth. Such thinking is totally unrealistic, especially for Asia. In Asia, there are 700 million poor in more than 20 countries who have an income of less than US$1 per day. Without significant and sustained economic growth, they and their children will continue to be trapped in a vicious cycle of poverty. Thus, while economic growth remains an unequivocal imperative for Asia, it becomes equally imperative that this be combined with strategies, policies and measures to secure environmental sustainability. This White Paper acknowledges throughout that achieving the combination is a daunting challenge. Equally, the paper has eschewed glib talk of endless 'win-win' scenarios that is sadly a defining characteristic of much of the public discourse and which serves mainly to divert attention away from the difficult choices, trade-offs and opportunity cost judgments that are required. It has become essential for

Asia to establish the intellectual and institutional framework required to identify clearly those difficult choices, trade-offs and opportunity costs. This framework does not exist at the moment and establishing it should be a matter of highest priority, for it is only through such an approach that it will be possible to combine the twin imperatives of economic growth and environmental sustainability.

Conclusion 3: There is no panacea for effective environmental management – it requires sophisticated control and trade-offs

It follows from the second conclusion that there is no panacea for the promotion of sustainable development. What is important is to make this fact explicit. Sustainable development will take various forms in individual countries according to their local conditions. In this world of rapid globalisation, there are a few dominant policy directions, such as the prevalence of market mechanisms, the spread of democracy, and smaller governments. But these broad policy directions will prove beneficial and enduring only to the extent that they take adequate account of local political, cultural, economic, social and environmental conditions. There will be no uniform market mechanisms and no uniform democracy, although the underlying basic principles may be maintained. Likewise, there will be no uniform sustainable development. Sustainable development in Asia will be achieved only through multiple and diverse approaches adapted to individual circumstances, to the needs for security, poverty reduction, disaster prevention and the democratic wishes of different communities and reflect rich cultures, economic and social characteristics, and environmental endowments.

Recommendation 1: Policy goals and objectives must be accompanied by effective policy instruments to produce actual impacts. In the past, Asian countries have developed many master plans and action plans underpinned by specific legislation mainly in response to international initiatives. This trend still continues. For example, many Asian countries are in the process of formulating national implementation plans for the Stockholm Convention on chemicals (Chapter 2). Also, some Asian countries have started to develop basic policy documents on the Decade of Education for Sustainable Development (ESD) (Chapter 8). The same trend has been observed in the private sector as well. Although various voluntary measures, such as ISO 14000, have been developed and are being applied in many parts of Asia, Asian perspectives have not been fully incorporated (Chapter 7). Asia should be more proactive in its participation in and launching of global initiatives for sustainable development.

Recommendation 2: Environmental policies should be integrated into sectoral policies because environmental issues are inherently related to many other sectoral activities. Forest management, for example, is closely related to land use policy, land tenure, agriculture and watershed management (Chapter 3). Without policy integration, sustainable development cannot be promoted. However, the idea of policy integration itself is elusive and understood differently according to the circumstances. Although policy integration is considered still marginal as far as climate change issues are considered (Chapter 5), substantial integration has been taking place in many sectors. For example, fresh water management has now moved into integrated management by incorporating fully environmental implications (Chapter 4), which can be contrasted with the original narrow focus on water pollution. Likewise, the forest sector fully incorporates environmental factors. This is accepted by many consumers now who prefer environmentally-certified woods (Chapter 3). In this case, more participatory and transparent policy formulation is considered necessary and involves a wide range of stakeholders. Extensive rumination is required to devise policies that further promote meaningful integration.

Recommendation 3: A policy mix must be developed and applied in response to the changing surrounding conditions. As environmental matters become complex, many stakeholders are involved in the policy formulation and implementation. To be effective in responding to such changing situations, policy-makers

must consider not only regulatory measures, in which the government plays the dominant role, but also the programme approach, market-based measures, information and procedural measures, in which many stakeholders work together to achieve common goals. Already this has happened in various countries in Asia. Environmental impact assessment is now the norm rather than the exception and the use of economic instruments has become more and more popular (Chapter 2). Chapter 6 underscored the usefulness of voluntary agreements, for instance, in promoting air pollution control and GHG emission reductions that are already successful in Europe and are replicable in Asia. Although caution must be taken when introducing a policy mix that does not incur unnecessary complications, governments should provide a broad policy framework to promote the use of various policy instruments.

Recommendation 4: The need for such a policy mix, however, does not negate the fact that regulatory measures continue to be vital in the promotion of environmental management. Strong government intervention in the domain of environmental management is indispensable, particularly when there is a need to generate clear policy impacts immediately. Chapter 6 underlined that the governments must continue to play an important role in implementing regulatory measures. Regulatory measures can be quite effective when they are introduced by local governments because the specific conditions that each company faces may be better reflected in the regulation. Also, it is important to point out the fact that regulatory measures are effective in facilitating technology development. The case of emission controls of automobiles (Chapter 6) illustrates the correlation between regulatory measures and technology development.

Recommendation 5: The conduct of business and industry in Asia will determine whether or not economic growth and environmental sustainability can be jointly achieved. This will happen only if market mechanisms are aligned to the production of environmentally-sound goods and services. Green procurement is already prevalent in Europe. Thus far in Asia, only Japan has adopted a green procurement act, but green purchase networks, or coalitions of consumers and producers, are now gaining momentum elsewhere in the region, including the Republic of Korea, the Taiwan Province of China and Thailand (Chapter 2). Voluntary eco-labelling programmes and consumer networks have been forging new markets for green products and services and enlarging existing markets. Such markets are beginning to include recyclable materials, biomass and other renewable energy. China's wind power concession approach and tendering system for developing mega-wind farms shows an interesting example of government intervention in creating market mechanisms for renewable energy development (Chapter 5). The impacts of China's Renewable Energy Law that will enter into force in 2006 warrants close monitoring to assess its impacts on developing market mechanisms. More generally, an Asian business for sustainable development framework should be constructed with reference to the following factors:

a. There are positive relationships between environmental regulation and technological innovation. Regulation is essential as a stimulus for those who are making slow progress.

b. Regulation will be increasingly required as an enabling framework which needs to encourage change, rather than act as a rigid system of rules and procedures.

c. Early signals by governments about new regulation, flexible instruments and credible long-term objectives can promote the development and adoption of new technologies.

d. Businesses and policy-makers must be made more aware that corporate environmental management offers opportunities as well as difficulties.

e. Political intervention should not provide only economic incentives but should promote information exchange and learning among businesses. Such intervention needs to address explicitly the costs and benefits of environmental gains and to seek appropriate policy instruments to address the needs of "losers."

f. The often cited adage by industry that we should leave choices to consumers as the ultimate arbiters of consumer preference is flawed. The evidence indicates the need for incentives to support green consumerism.

g. Environmental policy has to look at the opportunities and barriers for greening production and consumption and identify points for strategic intervention.

Recommendation 6: The architecture of the future climate change control regime beyond the first Kyoto Protocol commitment period of 2008–2012 is still subject to inter-governmental negotiations. As Asian countries will have a great deal at stake in this issue in terms of GHG emission reductions, conserving/developing carbon sinks and adapting to climate change, they should assume a very proactive role. Their goal should be to champion a global climate change control regime conducive to much greater gains in rolling back carbon emissions and in generating the international political will required for sustainable development (Chapter 5).

Recommendation 7: Building and supporting institutional arrangements for policy implementation remain vital tasks for Asian countries. Policies that reflect noble philosophical principles carry no meaning if they are not implemented. Loopholes and discretionary enforcement of policies create suspicion among stakeholders and undermine the very foundation of policy implementation. Across Asia, there is an urgent need to strengthen the institutional capabilities that are prerequisite to effective policy implementation. This may be particularly true with the forestry sector. The proportion of illegally harvested timber is still substantial and it is claimed that a lack of accountability and transparency in forestry management and administration is culpable (Chapter 3). On the other hand, it is important to note that the institutionalisation of community-based forest management has been yielding positive results in promoting sustainable forest management. In the same vein, recent developments in river basin organisations underline the benefits that can flow from stakeholder participation in integrated river water and basin management (Chapter 4).

Recommendation 8: The increased involvement of local stakeholders through appropriate institutional arrangements is considered desirable for enhancing the effectiveness of activities and compliance in all natural resource management issues (Chapter 3). While stakeholder involvement in the implementation phase has progressed steadily, their involvement in public dialogue and decision-making processes remains relatively limited and is still not widely institutionalised. In the past many attempts have been made to develop national Agenda 21s involving many stakeholders. A national multi-stakeholder dialogue process was called for in connection with the development of national master plans for ESD (Chapter 8). With the exception of a few countries, the effects of such a policy dialogue in Asia have not proved durable. It is vital, having learned from past experiences, to develop a scheme that will optimise the representation of various stakeholders in policy dialogues and the formulation processes in emerging policy issues.

Recommendation 9: Institutions and mechanisms at regional and sub-regional levels must be further strengthened, given the fact that Asian trans-boundary environmental problems will increase with time. In the public sector, regional/sub-regional collaboration might well start with collective data collection, analysis and monitoring arrangements. These might develop into financing pilot projects and subsequently facilitating the implementation of common policies (Chapter 2). Inter-city cooperation would flourish if there were an effective institutional set-up that facilitated information exchange and dialogue and had a sound financial basis (Chapter 6).

Recommendation 10: Human resource development is essential for the effective promotion of sustainable development. The need for human resource development encompasses wide-ranging stakeholders, includ-

ing government officials, the private sector, NGOs, scientific communities and local communities. A range of approaches to education and training through schooling, the media and capacity development linked to specific policies appear to be cost-effective and these merit serious and sustained attention (Chapter 8). Such capacity-building can be linked to policy formulation, monitoring, enforcement, information sharing, and partnership building.

Recommendation 11: Despite the difficulties in measuring the impacts of human resources development, further efforts must be made to promote an outcome-oriented approach in human resources development that can be measured against certain benchmarks on behavioural change and institutional development (Chapter 8).

Recommendation 12: Finance always emerges as a difficult public policy matter. Yet, various schemes have been developed to overcome financial challenges. Although caution and prudence are also required, public-private partnerships (PPP) and community-based initiatives have been increasingly adopted as a means of ensuring the financing required to deliver environmental goods and services. Such arrangements are increasingly evident in water supply (Chapter 4), solid waste and sewage management (Chapter 6). Since the level of funding differs from one project to another, and commitments from stakeholders are different, there is no single funding formula that instantly converts problems into opportunities. The continuous collaboration of stakeholders concerned is the basis for making partnerships successful. Governments, research communities and international aid agencies can bolster the replication of successful partnership arrangements through capacity-building that can include the preparation of handbooks and the undertaking of training.

Recommendation 13: Socially responsible investment (SRI), including the use of pension funds, should be further promoted in Asia as the current portfolio is still limited (Chapter 7). It will be essential to explore ways for influencing individual and institutional investors to shift their investment into more environmentally-focussed or sustainable development-oriented projects and fund management. Again, these issues are interwoven with green market development, consumers' awareness-raising and international network development.

Recommendation 14: Asia must make the best use of the opportunities provided under the Kyoto Protocol for climate change mitigation. The clean development mechanism (CDM) has been promoted as a way to enable developed and developing countries to collaborate to reduce GHG emissions and conserve/develop carbon sinks/reservoirs. By combining carbon sequestration with other socio-economic benefits, the CDM can contribute to the promotion of sustainable development in developing countries and the enticement of investment (Chapter 5). CDM activities, however, remain hampered by the weak state of policy guidance for the application of the CDM. Much clearer policy guidance is required and should be accorded a high priority by Asian countries.

Recommendation 15: Many technologies for renewable energy are already available, but they have not yet reached localities where renewable energy sources could be best explored and applied. Policies and mechanisms conducive to knowledge dissemination and technology transfer are clearly required. Such policies typically involve the protection of intellectual property rights and the creation of markets for such technologies. With respect to the latter point, international investment schemes, such as the CDM, have great potential to expand the use of environmentally-sound technologies for enhancing energy efficiency and reducing GHG emissions (Chapter 5). Careful application of biotechnology may also bring about multiple benefits to local communities and investors for promoting sustainable use of natural and genetic resources.

Recommendation 16: Simple technologies can make a significant difference in some sectors. Rain har-

vesting and biogas digesters are examples (Chapter 4). Catalytic financial and technical intervention by the government or intermediaries can multiply the impacts, although the financial requirements of such technologies are not high. Stakeholders must assess the potential of technological interventions in tackling environmental challenges and explore ways for introducing such simple technologies.

Recommendation 17: Information measures were highlighted as one of the essential components of the policy mix required for sustainable development (Chapter 1). Information enables policy-makers and stakeholders to make sound decisions and promote behavioural changes. In this respect, Asian countries should support the wider application of, for instance, forest/timber certificates (Chapter 3), eco-labelling and environmental reporting (Chapter 7).

Recommendation 18: The number of environmental reports by private companies is still limited in Asia and the release of such reports should be extended beyond the shareholders to the public domain (Chapter 7). Consequent changes in behaviour of informed consumers and financial institutions should influence operations of private companies to be more compatible with the objectives of environmental management and sustainable development.

Recommendation 19: Governments should play a role in providing a salient policy framework for facilitating information measures. Proper modalities should be developed to monitor and ensure that the information is credible and provided in accordance with standards. The Freedom of Information Act (FOIA) has been promoted in other regions, but has not been widely adopted in Asia. Paragraph 128 of the Johannesburg Plan of Implementation calls for the ensurance of access to environmental information, judicial and administrative proceedings. Asia does not have a regional policy framework like the Aarhus Convention (Chapter 2).

Recommendation 20: Policy ingenuity, supported by participatory policy dialogues and planning, will be essential if Asia is to improve the conditions of its exploding population of ghetto dwellers (projected to reach 100 million by 2020). In this regard, concrete options are presented in Chapter 4 and 6 for the provision of water supply and access to sanitation.

Recommendation 21: In order to halve the number of poor by 2015, rural development is imperative as two-thirds of the poor reside in rural areas. Granting local people access to natural resources, such as forest, cropland and pastureland, under certain conditions, suggests a prospective solution to promote participatory sustainable natural resource management (Chapter 3). Legislative reforms and capacity development activities are essential to allow the local people to improve their livelihood with better access to, and increased use of natural resources in their communities.

Recommendation 22: The CDM and adaptation measures promoted in the context of climate change mitigation should be linked to the improvement of poor people's livelihood. Agroforestry, coupled with watershed management, for example, could generate multiple benefits, such as income-generating opportunities, while at the same time, conserving carbon sinks/reservoirs. Adaptation measures could be made useful, if properly designed, to strengthen the preparedness for droughts, floods and other natural disasters, and for reducing the vulnerability of communities to extreme climate conditions.

Recommendation 23: As the global economy evolves to be more interdependent with the increasing import-export volumes, trade-related environmental measures assume increasing importance. For instance, Asian countries must develop and implement national implementation plans for the Rotterdam Convention to control the trade of hazardous chemicals. At the same time, Asian countries must be vigilant on the con-

trol of trade in hazardous waste under the Basel Convention as the volume in trade of recyclable materials has been increasing in some countries (Chapter 2). Trade-related measures must be reinforced in a way that is compatible with the objectives of environmental management and sustainable development.

Recommendation 24: Illegal timber harvesting can be curbed through codes, standards and restrictions that are entirely compatible with the WTO rules. In this respect, voluntary timber import licensing schemes between European countries and Asian timber exporting countries deserve close attention to see if they can successfully reduce Asia's illegal timber trade (Chapter 3).

Towards a sustainable Asia

Achieving a sustainable Asia is essential to all of humankind and for the natural environment it inhabits. Yet today, Asia finds itself more on a course towards human and ecological collapse than to sustainability. To reverse this will require a renewed and intensified collective effort across Asia as a whole, beginning with the recognition that Asia's prospects for longer-term economic growth, social development and political stability depend directly on strategies, policies and actions for achieving environmental sustainability.

IGES is an international strategic studies institute that aims to contribute directly to the formulation of strategies and policies that will build a sustainable Asia in the 21st century. This IGES publication is a modest, first attempt to summarise and present the recent work and efforts of IGES. This is very much a work in progress. Many of the recommendations contained in this document have limitations and are initial steps only, but it is hoped that this first publication may contribute to the promotion of honest and constructive discourse on the future of the region and alternative choices available to its citizens. IGES will continue to produce similar publications on a regular basis and in the process further refinements will be made.

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CHAPTER 2

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Endnotes

CHAPTER 1

1   There had been some traditional or philosophical concepts similar to the idea of sustainable development in Asia dating back hundreds of years. A fourteenth century Zen temple had an inscription on a water basin that read "I learn only to be contented" - advocating spiritual richness and rebuffing materialistic greed. Mahatma Ghandi (1869-1948), India's legendary figure, left a proxy that the Universe has enough for everyone's need, but not enough for everyone's greed.

2   Other than the Three Dimensional Model, the "capital stock model" (which illustrates the accumulation of economic, social and environmental capital stocks) was also occasionally referred to.

CHAPTER 2

3   Framework Agreement on Comprehensive Economic Co-operation between the Association of South East Asian Nations and the People's Republic of China, 4 November 2002.

4   The Framework for Comprehensive Economic Framework between the Association of Southeast Asian Nations and Japan, 8 October 2003, Bali, Indonesia.

5   All ten ASEAN member countries signed it in June, 2002 and it entered into force on 25 November, 2003 following the ratification by six ASEAN member countries: Brunei Darussalam, Malaysia, Myanmar, Singapore, Thailand and Viet Nam.

6   The ADB (1997b) defines market-based instruments (or economic instruments) as "all instruments of environmental policy that—directly or indirectly—use prices to alter incentives and, through them, the environmental outcomes" (ADB 1997b: 12). It includes: property rights, market creation, fiscal instruments, charge systems, financial instruments, liability systems, deposit-refund systems, and guarantee bonds.

7   According to ADB sources, many of the poor in Asia often formulate squatter settlements and do not pay municipal taxes. Thus, often the public deliberately denies them waste collection services. Another reason for depriving the poor of the service lies in their not being politically acceptable. If a public authority provides public waste service, the authority must officially recognise their existence, which is politically not acceptable. For squatter groups, the solid waste collection services in areas of low-income groups are inferior by comparison to those of more prosperous groups. Low-income groups often live in congested areas, where access ways are labyrinthian, narrow, unpaved, obstructed and poorly drained. Normally people in these areas lack storage space for waste inside their homes, so they throw their garbage onto the street. This makes it more difficult to be collected. As a result, poor and low-income groups are often denied adequate waste service, although these areas require it more than others.

CHAPTER 3

8   The chapter presents a limited analysis of selected instruments to improve forest management that have at various times been subjects of research of the Forest Conservation Project.

9   The FSC was founded in 1993 as a non-governmental, independent, non-profit organisation. Its membership consists of environmental/conservation groups, the timber industry, the forestry profession, indigenous peoples' organisations, community forestry groups and forest product certification organisations.

10 In January 2005 Penan people and headmen of the Upper Ulu Baram area in Sarawak delivered a letter of protest

over a certificate granted to Samling Plywood. They claimed that "Many of us have suffered due to the Samling logging operations: our rivers are polluted, our sacred sites damaged and our animals chased away by people who deprive us of our livelihood and culture" (Rengah Sarawak, 2005).

11 The credibility of FSC has been underlined by a recent UK government study which concluded that the FSC certification system provides assurance that timber and wood-based products are both legal and sustainable.

12 One sign of growing consumer awareness is the attention customers appear to be giving to FSC labelled wood products in Mitsukoshi's flagship department store in Nihonbashi, Tokyo (4 September 2003: Japan Times Online).

13 Community forestry is used in this discussion as an umbrella term to embrace strategies that involve local communities in forest management.

14 The discussion on social forestry and JFM in India is partly based on a recent study commissioned by the Forest Conservation Project (Saigal, 2005).

CHAPTER 4

15 For instance, decision-making in the WWC is carried out by the board of governors, who are elected and appointed by its general assembly of members. The GWP's Steering Committee, its decision-making body, is composed of individuals selected by their consulting partners that are elected from among the members.

16 Water sector reform refers to "the whole of a country's policies, planning, implementation, and supporting activities to develop and manage its water resources and deliver water services to all users in its society," which includes river basin management, water supply and sanitation, waste-water management, flood control, pollution control and other water related activities [http://www.adb.org/Water/CFWS/Water-Sector-Reforms/default.asp].

17 "Full-cost pricing" is a concept in which all costs for development, operation, and maintenance of water infrastructure and services are recovered from users. The concept can be applied to all water-related services such as drinking water supply, provision of agricultural and industrial water and waste-water treatment.

18 PPP and privatisation are often discussed together especially in the context of protest against private sector involvement. On the other hand, the OECD Briefing Paper defined PPPs as "any form of agreement (partnership) between public and private parties" and emphasised that PPPs "should not be misunderstood as privatisation - where the management and ownership of the water infrastructure are transferred to the private sector (OECD 2003).

19 For example, Rivera pointed out that an appropriate regulatory body and clear rules and guidelines such as in operation obligation and measurement of compliance, should have been established in Manila's case (Rivera 2004).

CHAPTER 6

20 Definition of "slum" varies from country to country depending upon the socio-economic conditions of society. Several local definitions of slums include minimum thresholds concerning the size of the area, the number of structures in a settlement cluster, the number of households or people or the density of dwellings units in an area. A durable structure is part of the key components of the definition of slum (UN 2004).

21 There is the possibility that this figure does not include the slum area (Satterthwaite 2003).

22 Information on wastewater treatment facilities and other water related indicators for major cities in the region can be found in "UN-HABITAT (2003), The challenges of slums."

23 Public Fund Initiative (PFI) is a mechanism by the Government to raise money for infrastructure services. The PFI is one form of the PPP.

24 Squatter area is characterised by poor service and often inadequate infrastructure and housing conditions.

25 In 1998, a cap on the annual registration of new cars and trucks was set at 50,000.

CHAPTER 7

26 In this paper, ranking of the private sector responsiveness is expressed as "P-rank."

27 Both on ISO 14001 and ISO 9001, organisations with multiple sites have a choice to make on whether they get a single-site certificate for each site or a multi-site certificate for multiple sites.

28 'Silent responsibility' is more paternalistic in nature and more characteristic of the CSR in developing countries. It is also closely linked with how a business operates on a day-to-day basis.

29 The GHG protocol, an initiative of WBCSD and WRI etc, has developed guidelines on corporate greenhouse gas accounting and reporting and is disseminating it. However, national guidelines on corporate greenhouse gas is underdeveloped.

30 ISO 14020 defines Type I as "a voluntary, multiple-criteria based, third party programme that awards a license that authorises the use of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations."

31 External cost is the cost imposed on society which is not internalised by the producers for utilising natural resources. The aesthetic cost of strip mining, health risks associated with stream water pollution are examples of external costs. The conventional market has been ignoring the external cost assuming that natural resources are abundant and private goods.

32 Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities.

33 The environmentally-sound products that are designated by law are categorised into the following fifteen items: paper, stationery, machinery, OA appliances, home appliances, air conditioners, water heaters, lighting apparatus, motorcars, uniforms, interior, working gloves, other textiles, facilities, public work.

CHAPTER 8

34 The data is based on the World Population 1950-2050 (1998 Revision), United Nations Population Division.

35 Developed on the basis of Hari Srinival (2005).

36 *EMSs* often involve energy/waste audit procedures that help an entity (industry, school, household, etc.) to understand the impacts of its performance and define areas for possible improvement. Such a system also includes, in many cases, provisions for training/re-training of the entity's constituent members for ensuring better management.

37 The concept of "ecological footprints" provides a means of quantitatively measuring the environmental effect/impact of a particular action or projects etc., by hypothetically calculating the biologically productive area required to produce the food and wood consumed, to supply space for necessary infrastructure, and to absorb the greenhouse gas carbon dioxide (CO_2) emitted from energy consuming activities. This instrument is progressively used in environmental education and training to help the participants adopt actions to create more sustainable practices.