IV ENVIRONMENT-POVERTY NEXUS REVISITED: LINKAGES AND POLICY OPTIONS

INTRODUCTION

Rapid economic growth is a necessary condition for poverty eradication. However, fast economic growth is often accompanied by adverse environmental consequences

The eradication of poverty is a major development challenge. Among the millennium development goals contained in the Millennium Declaration in General Assembly resolution 55/2 of 18 September 2002, adopted by 147 heads of State and Government and 189 Member States, the eradication of extreme poverty and hunger was underscored as the paramount goal.[1] Rapid economic growth is often seen as the key foundation for achieving poverty reduction. Recent findings by the World Bank provide additional evidence which strengthens this assertion.[2] While the linkage between economic growth and poverty reduction is generally obvious, the relationship between economic growth and improvement in the environment remains unclear.[3] In recent times, the fast economic growth in many countries, including developing countries of the Asian and Pacific region, where two thirds of the world's poor live, has often been accompanied by a range of adverse environmental impacts.[4] Apparently, there is a trade-off between

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[1] United Nations, "Road map towards the implementation of the United Nations Millennium Declaration", report of the Secretary-General (A/56/326), p. 56.

[2] A World Bank study found that over the course of the 1990s, the 24 developing countries that increased their global trade and investment the most also increased income per person, much more than those that did not, by six percentage points more. In those countries, the number of people living on less than $1 per day dropped by 120 million between 1993 and 1998. See Colin Powell, "Only one Earth", *Bangkok Post,* 18 August 2002.

[3] Environment relates to the biophysical environment which provides goods (natural resources) and ecosystem services used in producing agricultural, energy and other intermediate inputs, receives waste products from economic and human activities and provides recreation and beauty to mankind.

[4] Asia's economic development over the past decades has come at a high environmental cost. See ADB, "New approach needed to halt Asia's rapid environmental decline", News Release No. 057/01, 18 June 2001 <http://www.adb.org/Documents/News/2001/nr2001057asp.>, 5 November 2002.

economic growth and environmental improvement; achieving both of these goals simultaneously may not be easy, especially in the early stage of development.[5]

Developing countries have adopted policies and programmes to mitigate adverse environmental consequences, thereby strengthening the beneficial impact of economic growth on the poor, who are extremely vulnerable to environmental changes

For many developing countries, the enhancement of economic growth is often the major macro-objective of economic development although the associated adverse environmental impacts are recognized. It is expected that sustainable poverty reduction will take place through a trickle-down of economic growth: the benefits of economic growth will percolate down to the poorer section of the population and increase their income. Under this premise, the tempo of economic growth is maintained as much as possible in order to maximize the pace of poverty reduction. In certain cases, policies and programmes are formulated to mitigate the adverse environmental impacts of economic growth and reverse environmental degradation. Against the background of possible positive linkages between the livelihood income and health of the poor and the environment, such action would lead to a reduction in poverty. In addition, there are certain poverty reduction policies which have a beneficial impact on the environment and certain environmental interventions targeted at the poor which enhance their livelihood income and health status. The aim of this chapter is to review and analyse the poverty-environment nexus against the background of the linkages between economic growth and the environment and the associated policies. An attempt is also made to identify modalities for strengthening the impact of the policies and to draw the attention of policy makers of the Asian and Pacific countries to the fact that environmental improvement strengthens the impact of economic growth on poverty reduction and that improving the environment is an important element of a pro-poor economic strategy.

This chapter has three specific objectives. First, an attempt will be made to identify, classify and analyse the major linkages between growth and the environment and between the environment and poverty (income and health of the poor). This will serve as a framework for understanding the objectives and impact of the relevant policies and programmes. Second,

[5] Deterioration of the environment could turn to improvement as economic development progresses and income increases up to a certain level. From a historical observation of trends in industrialized countries, this appears to be true; the achievement of both GDP growth and improvement in certain environmental indicators, such as air and water quality as well as a reduction in resource intensity, has been possible. It is seen that economic growth is gradually "de-coupled" with growth in energy demand. The above phenomenon might reflect progress towards less-polluting and more resource-efficient technologies as economies develop. It may also indicate a shift in industrial structure from resource-intensive industries to more knowledge-intensive industries as well as an increase in the relative importance of the service sector, which is less material resource-intensive compared with manufacturing sectors. Furthermore, industrialization and the rising incomes of these countries may be accompanied by increased awareness of and education on the benefits of improving local environmental quality, such as urban air quality.

policy options will be presented, elaborated and analysed, giving examples from Asian and Pacific countries. The conclusion will focus on suggestions for enhancing the effectiveness of policies and programmes in the context of achieving the millennium development goals following the Plan of Implementation of the World Summit on Sustainable Development.[6]

Against the background of growth-environment and environment-poverty linkages, policy options for improving the environment and reducing poverty are analysed and conclusions on improving the effectiveness of policies presented

Although absolute poverty in the Asian and Pacific region is predominantly a rural phenomenon, rapid urbanization and the expansion of urban-based economic activities have recently led to very substantial rural-urban migration. The migration process has, to some extent, helped to reduce population pressure on agricultural land and contributed to increasing agricultural productivity and reducing rural poverty. However, the migration has put pressure on housing and other services, leading to the development of slums, thus having an impact on the environment. The nature of poverty-environment interlinkages in urban areas is therefore somewhat different from that in a rural setting. The policies, especially those associated with the environment, also address different phenomena and issues. For example, vehicular pollution is an urban environmental problem while land degradation affects the lives of the rural poor. Rural-urban differences will be highlighted in appropriate places in this chapter and linkages and policies differentiated accordingly.

It is not possible to incorporate every aspect of the environment-poverty nexus in this limited review. For example, climate change is not dealt with, despite the realization that it has a major adverse impact on the poor, especially in the island developing countries. The review is selective and based on observations with regard to the broad priority issues and constraints faced by the member countries in formulating and implementing relevant policies for improving the environment, which contributes to the reduction of poverty.

THE LINKAGES

Economic growth-environment

There is little doubt that the fast economic growth in the region has contributed to the reduction of poverty in recent decades. Poverty in the region has declined dramatically since the 1970s, despite explosive population growth.[7] This fast growth, however, was achieved at the cost of environmental degradation, such as the depletion of natural resources,

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[6] *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (A/CONF.199/20), resolution 2, annex.

[7] ADB, *Asian Environment Outlook 2001,* box 1-1 (<www.adb.org/documents/books/AEO/2001/aeo2001.pdf>, 14 January 2003).

Increasing the production of agricultural and industrial goods, energy and services to cope with the increasing demand for human consumption has well-known detrimental impacts on the environment

atmospheric pollution, the depletion of biodiversity, the drying-up of aquifers, the pollution of aquatic and marine ecosystems and the increasing production of wastes. The extent of the damage, however, varied from country to country and depended on a number of factors, including the state of economic development, industrial structure and technologies. Linkages between economic activities and the environment can be illustrated through the following observations:

- *Observation 1.* Most traditional economic activities comprise the transformation of resources into products and services useful to human beings. Thus, regardless of the income level or stage of development, practically any economic activity would alter the state of the environment in one way or another and has the potential to cause a number of negative impacts in the form of unsustainable depletion of resources and deterioration in the quality of resources and the environment. For example, agricultural activities for producing food and generating employment and income in rural areas are the major sources of methane flow to the atmosphere. Commercial energy is the most crucial input which enables economic activities to take place but is the major source of carbon dioxide emissions into the atmosphere and, together with manufacturing and other user sectors, contributes significantly to atmospheric and aquatic pollution.

- *Observation 2.* The environmental impacts of household consumption activities are no longer negligible. The use of resources such as freshwater and the production of wastes are examples of two such impacts. The consumption of various forms of energy, including the increasing use of fossil fuels by private vehicles, increases direct and indirect environmental stress through the burning of fuel.

- *Observation 3.* In the agricultural sector in the region, particularly in Asia, pressure to increase production and improve the yield to cope with the growing population has led to the intensive use of fertilizers, pesticides and water for irrigation. There is no doubt that this process has contributed to the substantial increase in agricultural production and associated beneficial effects, including the reduction of rural poverty. However, such resource-intensive agriculture has also posed various environmental problems which, in turn, have an adverse effect on agricultural productivity. For instance, the overexploitation of freshwater resources has in some cases resulted in the drying-up of spring-fed rivers; the intensive use of fertilizers and pesticides has contributed to water pollution; and the overuse of surface water for irrigation has resulted in aquifer depletion, land subsidence or sea-water/saline intrusion.

- *Observation 4.* In industry, the adverse environmental impacts of production activities are well known. For instance, the use of energy is essential for undertaking almost all industrial activities and operating transport infrastructure and services, but the production and use of a major part of the energy consumed in industry and transport have a detrimental environmental impact. However, the process of industrialization and economic development could entail improvement in resource efficiency and relative shifts into less resource-intensive industries, as well as the adoption of clean technologies and incremental improvements in the enforcement of environmental regulations, which have beneficial mitigating impacts. Nevertheless, rapid industrialization in the region, the resulting increase in energy production and consumption and the associated pollution have often outweighed such benefits.

Environment-poverty

The poor are disproportionately affected by environmental deterioration because of their locational disadvantages, higher dependence on environmental resources and insufficient assets for coping with environmental hazards

Four observations highlight the strength and importance of the interlinkages between the environment and poverty:

- *Observation 1.* The poor live in places which are ecologically more vulnerable and are forced to earn their living from low-productivity natural resources.[8] The rural poor often live in low-lying, flood-prone areas, on steep mountain slopes or on dry land and possess low-productivity marginal land devoid of any irrigation facilities. The number of the rural poor in developing countries living on "marginal" land could be twice the number found on better-developed land.[9] The urban poor are found in the shanty towns of big cities, which are often built on flood-prone, low-lying areas or around city drains; many of the poor earn their livelihood from environmentally hazardous scavenging. Environmental deterioration in the form of land degradation, frequent flooding, increased pollution and other hazards reduces the income of both the rural and urban poor and worsens their health disproportionately by comparison with the rich.

[8] Fifty per cent of the poor in Asia are found in fragile ecosystems and mainly remote and ecologically vulnerable rural areas. See International Fund for Agricultural Development "Combating environmental degradation", (<http://www.ifad.org/events/past/hunger/envir.html>, 5 November 2002).

[9] Department for International Development, United Kingdom, European Commission, UNDP and World Bank, "Linking poverty reduction and environmental management, policy challenges and opportunities", January 2002, p. 5.

- *Observation 2.* It is commonly observed that poor households, especially in rural areas, derive their livelihood income from natural resources, for example, land resources for agriculture and water resources for fishing. It is also found that the poorer the household, the greater is the share of its income from environmental resources.[10] In addition to providing a livelihood, the environment plays a very significant part in influencing the health of the poor; while the incidence of disease in poor countries is about twice that of rich countries, the disease burden from environmental risks is 10 times greater in poor countries.[11] Environmental degradation has a disproportionate negative impact on both the livelihood and the health of the poor.

- *Observation 3.* It is apparent that the intensity of suffering of the poor from the adverse impacts of environmental shocks is much higher than that of the rich. However, because of the lack of proper assets, the poor are less capable of coping with those impacts. The vulnerability of the poor to environmental shocks is much higher than that of the rich in both rural and urban areas.

- *Observation 4.* Against the background of the observation that the poor, especially in rural areas, derive a large part of their livelihood income from environmental resources, especially land resources used for agriculture, some of the practices they follow can be damaging to the environment. Clearing forest areas to create land for agricultural use, including slash-and-burn practices, is an example showing that the poor are responsible for environmental degradation. Certain consumption practices of the poor, such as damaging the forest to acquire firewood to be used for cooking and heating could also be detrimental to the environment. The urban poor, most of whom live in shanty towns and ghettos, often create unhygienic sanitary conditions because of their lack of access to formal toilet facilities. However, there is overwhelming evidence[12] to show that the

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[10] It may be worth mentioning that a similar situation exists even at the level of countries; the shares of GDP (and exports) originating from sectors whose production is directly connected with environmental resources in poor countries are higher than those in rich countries.

[11] "Linking poverty reduction ...", op. cit., pp. 5 and 8.

[12] As much as 70 per cent of the world's consumption of fossil fuels and 85 per cent of its chemical products are attributable to 25 per cent of the world's population who are not poor. The consumption pattern of forest products and many other commodities has the same direct inverse proportion to the size of the population of the top 20 per cent of the richest societies. See International Fund for Agricultural Development, op. cit.

impact of poverty on the environment is weak compared with the damage to livelihood and health which the poor suffer owing to environmental degradation not caused by them. Against this background, the impact of poverty on the environment will not be taken up explicitly in the present discussion and analysis.

It can be seen from the above arguments that the environment has strong linkages with the livelihood, health and vulnerability of the poor. These linkages need to be identified in some detail before options for appropriate policy interventions to benefit the poor can be studied.

"Environmental goods and services" which are crucial to all, particularly the poor, can be classified into three broad categories: natural resources, environmental conditions, including environmental stresses, and the ecosystem. The nature and extent of their linkages with poverty, encompassing the livelihood income and health of the poor, are somewhat different. These are discussed below.

Natural resources

Degradation of agricultural land, depletion of forests and fish stocks and the lack of access to safe drinking water have a major adverse impact on the income and health of the poor

Natural environmental resources can be atmospheric, land-based or sea-based. Of these, the resources which have a major bearing on the poor's livelihood and health are the following:

- Land used for agricultural operations, including grazing land for animal husbandry, provides an important (often the only) source of rural livelihood. Land degradation, either natural or due to the overuse of chemical fertilizers, and the mechanization or depletion of groundwater, which increases soil salinity, could erode the most important modality of livelihood of the rural population, especially the rural poor, who do not possess the means to counter such adverse impacts.

- The widespread use of chemical fertilizer, pesticides and other chemicals for farming poses a formidable health hazard to the rural poor. Illiterate farm labourers who lack appropriate training in the use of poisonous chemicals are unable to read the instructions written on them and cannot afford protective devices can easily fall prey to a number of associated diseases.

- The poor, in both rural and urban areas, often do not have the luxury of access to safe drinking water. They have to rely on water sources which are frequently contaminated for various reasons. Water-related diseases such as diarrhoea and cholera kill a large number of people every year in the developing

countries.[13] Any improvement in water quality is likely to yield rich dividends in terms of improving, the health standards and productivity of the poor.

- Fishing provides income and protein for the poor living near the sea, rivers, marshy lands and swamps. However, in many developing countries fishing sources are commercially over harvested in an unsustainable manner, which has a negative effect on the livelihood of the poor. Many commercial fishing ventures result in a number of adverse environmental impacts which could constitute health hazards for the poor who are associated with them. Coordinating policies and programmes at the regional and subregional levels aimed at the conservation and sustainable development of fisheries forms an important element of the Plan of Implementation of the World Summit on Sustainable Development, of which poverty reduction to achieve the relevant target is a major objective. Other areas highlighted in the Plan of Implementation that have implications for poverty are given in box IV.1.

- Forest products often provide livelihood income to the rural poor. Twigs and wood collected from forests provide a major part of the energy used by the poor for cooking and heating. Forests prevent soil erosion, flooding and mud slides in hilly areas during heavy rains. The unsustainable destruction of forests causes much misery to the poor, both directly and indirectly.

Environmental conditions

Deterioration of the environment in the form of increased indoor air pollution due to the use of biomass fuels and gradual as well as sudden atmospheric changes affect the income and health of the poor

Worsening of the quality of atmospheric resources could be extremely harmful to the poorer sections of the population. There are two major environmental conditions which affect both the livelihood and health of the poor:

- Indoor air pollution due to the use of biomass fuels (e.g., wood, crop residue) for cooking and heating in poor households affects the health of a large number of people, causing various respiratory diseases. The incidence of this type of health hazard is higher in women and children as they face primary exposure. Nearly 2 million women and children die every year from indoor pollution.[14]

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[13] A large number of people (2.1 million) die every year from diarrhoeal diseases (including cholera) associated with inadequate water supply, sanitation and hygiene. According to WHO, the majority are children in developing countries.

[14] "Linking poverty reduction ...", op. cit, p. 9.

Box IV.1. Environment-poverty linkages and the Plan of Implementation of the World Summit on Sustainable Development

The Plan of Implementation of the World Summit on Sustainable Development specifies that the three components of sustainable development, economic development, social development and environmental protection, are interdependent and mutually reinforcing pillars. It also explicitly recognizes that poverty eradication and protecting and managing the natural resource base are overarching objectives of sustainable development. Against the background of the environment-poverty linkages discussed in this section and the large extent of the exposure of the poor to the degradation of environmental resources, which affects their livelihood income and health, the following areas and actions highlighted in the Plan of Implementation assume importance.

Water

One of the major aims in this area is to launch a programme of action, with financial and technical assistance, to achieve the millennium development goal concerning safe drinking water, that is, to halve, by the year 2015, the proportion of people who are unable to reach or to afford safe drinking water.

Other action includes intensifying water pollution prevention to reduce health hazards and promoting ecosystems by introducing technologies for affordable sanitation and industrial and domestic waste-water treatment, by mitigating the effects of groundwater contamination and by establishing monitoring systems and effective legal frameworks at the national level. The need for prevention and protection measures to promote sustainable water use and to address water shortages is also emphasized.

Energy

Governments, as well as relevant regional and international organizations and other relevant stakeholders, are required to implement, taking into account national and regional specificities and circumstances, the recommendations and conclusions of the Commission on Sustainable Development concerning energy for sustainable development adopted at its ninth session. These include integrating energy considerations, including energy efficiency, affordability and accessibility, into socio-economic programmes, especially into the policies of the major energy-consuming sectors, and into the planning, operation and maintenance of long-lived energy-consuming infrastructures, such as the public sector, transport, industry, agriculture, urban land use, tourism and construction. The development and dissemination of alternative energy technologies with the aim of giving a greater share of the energy mix to renewable energies, improving energy efficiency and placing greater reliance on advanced energy technologies, including cleaner fossil fuel technologies, were also recommended.

Health

The objectives in this area include strengthening the capacity of health-care systems to deliver basic health services to all, in an efficient, accessible and affordable manner, aimed at preventing, controlling and treating diseases, and to reduce environmental health threats, in conformity with human rights and fundamental freedoms and consistent with national laws and cultural and religious values. Another objective is the implementation, within the agreed time frames, of all commitments made in the Declaration of Commitment on HIV/AIDS adopted by the General Assembly at its twenty-sixth special session, held in June 2001, emphasizing in particular the reduction by 2005 of HIV prevalence among young men and women aged 15 to 24 by 25 per cent in the most affected countries and by 25 per cent globally by 2010. Recognizing that many communicable diseases spread because of the existence of unhygienic and crowded living conditions, the Plan of Implementation aims at the achievement by 2020 of a significant improvement in the lives of at least 100 million slum dwellers, as proposed in the "Cities without Slums" initiative.

Agriculture

Recognizing that sustainable agriculture and rural development are essential to poverty reduction, the implementation of an integrated approach to increase food production and enhance food security and food safety in an environmentally sustainable manner assumes importance. The Plan of Implementation emphasizes the need to achieve the Millennium Declaration target of halving by the year 2015 the proportion of the world's people who suffer from hunger. The relevant action includes the development and implementation of integrated land management and water-use plans based on the sustainable use of renewable resources and on integrated assessments of the socio-economic

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and environmental potentials. Strengthening the capacity of Governments, local authorities and communities to monitor and manage the quantity and quality of land and water resources and the adoption of policies and the implementation of laws that guarantee well-defined and enforceable land and water-use rights and promote legal security of tenure are important steps to be undertaken by Governments. Technical and financial assistance should be provided to developing countries as well as countries with economies in transition that are undertaking land tenure reform in order to enhance sustainable livelihoods.

***B**iodiversity*

Biodiversity, which plays a critical role in overall sustainable development and poverty eradication, is currently being lost at an unprecedented rate owing to human activities. Several measures have been suggested to reverse this trend. These include the promotion of concrete international support and partnership for the conservation and sustainable use of biodiversity, including in ecosystems, at World Heritage sites and for the protection of endangered species, in particular through the appropriate channelling of financial resources and technology to developing countries and countries with economies in transition, and the provision of financial and technical support to developing countries, including capacity-building, in order to enhance indigenous and community-based biodiversity conservation efforts.

- As many of the poor live in ecologically vulnerable places (e.g., lowlands, mountain slopes, dry areas), atmospheric changes, both gradual (climate change) and sudden (disasters), can cause severe damage to the livelihood and health of the poor. Disasters, which include hurricanes, cyclones, floods and earthquakes, have been known to have a devastating impact on the poverty situation, giving rise a large number of "new poor" almost overnight. These concerns and the extent of such damage have been highlighted in a recent publication.[15]

Ecosystem

Forests, grasslands and the coastal ecosystem, including coral reefs, provide a wide variety of services which contribute to the continuation of economic activities in both rural and urban areas. One important activity which exploits the existence of the natural ecosystem is ecotourism. Ecotourism is often labour-intensive and employs persons from the most vulnerable groups in rural areas, including those in remote and isolated areas and islands. Some examples of other ecosystem services include the provision of natural habitat for wild pollinators that are essential to food crops; watershed protection and the maintenance of hydrological regimes (recharging of water tables) by natural processes, including rainfall; and the natural breakdown of waste products and pollutants. It is apparent that the livelihood and health of a large number of the poor are intimately related to the activities facilitated by the ecosystem and its services, and any deterioration in their availability on quality could be detrimental to the reduction of poverty.

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[15] M.H. Malik, "The new poor", ESCAP, *Bulletin on Asia-Pacific Perspectives 2001/02* (United Nations publication, Sales No. E.02.II.F.2), pp. 67-72.

Conservationists have shown concerns on this aspect. For example, it was indicated that the tourism development plan under the Government's economic stimulus scheme for the archipelago of Koh Chang in Thailand could threaten its rich biological diversity and genetic resources. Most of the projects under the tourism master plan are likely to cause damage to the island's ecosystem. A study has found that the island is home to 1,513 species, including ferns, mosses, algae, lichens, fungi, flowering plants and various insects. It is alleged that efforts to develop the area for tourism without addressing environmental concerns adequately, could destroy these rare species.

It has been found in another study that the construction of tourism facilities in Koh Chang would definitely drive away rare insects, particularly fireflies, which are a huge source of income for the local people.[16] Firefly watching is one of the island's most popular ecotourism activities. This perpetuates the dilemma of whether to develop a resort to generate income opportunities or to put greater emphasis on the protection of the natural ecology. Such trade-offs could occur in a range of other similar concerns.[17]

While damage to the ecosystem owing to the promotion of growth-enhancing economic activities could take away the direct livelihood income of the poor, the trade-off between growth and environmental objectives often creates dilemmas

POLICY OPTIONS

Against the background of the linkages detailed in the previous section and the thrust of the chapter, environmental policies can be classified into two broad groups: those which aim at reducing the adverse environmental impacts of economic growth, leading to an improvement in the environment in general and a consequent beneficial impact on the poor, and those which are targeted specifically at the poor and have a positive impact on the environment. These are discussed below.

Enhancing environment-friendly economic growth and development

At the United Nations Conference on Environment and Development, held at Rio de Janeiro in 1992, Governments committed themselves to adopting strategies for sustainable development (needs).[18] The challenge has been to achieve convergence between the growth and environment objectives of development through the integration of economic, social and environmental dimensions by the use of appropriate policies. These policies can be broadly classified as economic policies and institutional policies.

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16 Kultida Sanabuddhi, "Rush to boost tourism puts island in peril, say scientists", *Bangkok Post,* 28 November 2002.

17 Raj Kumar, *The Forest Resources of Malaysia: Their Economics and Development* (Singapore, Oxford University Press, 1986), p. 79.

18 Rio Declaration on Environment and Development (<http://www.unep.org/unep/rio.htm>, 9 November 2002).

Economic policies

National long-term planning mechanisms, strategic plans and sustainable development plans: the need for coordination

Achieving economic, social and environmental objectives for a country requires coordination between many agents, namely, government, producers, consumers and domestic and foreign investors; policies, namely, sectoral, fiscal and monetary, and trade policies; and institutions, including regulatory agencies and the judiciary. There are various subdivisions within each group, for example, the Government consists of many ministries which deal with many areas, from finance to construction and the environment; and producers may be big corporate entities, SMEs or self-employed. It is only natural that there should be conflict between the objectives of so many entities. Bringing harmony into the functioning of these groups to enhance a country's welfare (of which poverty reduction and improving the environment are major components) calls for the recognition and identification of various trade-offs and the realignment of individual goals and policy instruments under a "win-lose as little as possible" framework.

National planning mechanisms which constitute the articulation of such a framework spell out the objectives, concerns, goals, policy options and strategies of various agents, groups and organizations. Whereas elaborate plans for socio-economic development have a long history, those which deal explicitly with environmental concerns and sustainable development issues are relatively recent and came into being to a considerable extent after the adoption of Agenda 21 at the Rio Conference.

Sustainable development plans aim to minimize the adverse environmental impacts of economic growth through the promotion of conservation measures, the reduction of pollution and the use of clean production technologies

A number of countries have formulated elaborate sustainable development plans. For example, in 1995, the Republic of Korea prepared Green Vision 21, which integrated long-term environmental policies with development needs. Under this broad vision, the relevant ministries, especially the Ministry of Environment, the Ministry of Commerce, Industry and Energy and the Ministry of Construction and Transportation, developed their own annual plans and strategies for action. Viet Nam's Environmental Vision 2020, National Strategy for Environmental Protection, 2001-2010 and National Environmental Action Plan, 2001-2005 address long- medium- and short-term issues of environment and economic growth. Official environment protection visions, integrating economic development and the environment, exist in at least 37 countries of the Asian and Pacific region.[19] Some examples of these are China's

[19] ESCAP and ADB, S*tate of the Environment in Asia and the Pacific 2000* (ST/ESCAP/2087).

Agenda 21, Vision 2020 (Malaysia), the Singapore Green Plan, 2012 National Conservation Strategies (India), the National Policy on the Environment (Uzbekistan), the National Strategy for Ecologically Sustainable Development (Australia) and the National Environment and Development Strategies, 1993 (Samoa). As examples, the major features of three selected sustainable development plans, the Singapore Green Plan, Australia's National Strategy for Ecologically Sustainable Development and China's Agenda 21, are given in table IV.1. The objectives of the plans are to ensure that economic growth and development take place with minimum damage to the environment. They emphasize the conservation of natural resources and the reduction of environmental pollution. The adoption of clean technologies has often been explicitly considered as a major modality for balancing growth and environment objectives. Strategies for achieving these objectives include raising environmental awareness and education and promotion of the 3P (people, public sector and private sector) partnership. Implementation methods incorporate a broad range of initiatives from the inclusion of environmental issues in school curricula to the formulation of legislation and laws to induce environmental protection. Financial resources for implementing environmental plans come primarily from Governments, and are augmented by bilateral and multilateral donors.

Sectoral policies

Visions and strategies of sustainable development must be supported by sectoral action plans that fulfil national obligations under global environmental conventions such as the need to contain greenhouse gas emissions, the conservation of biodiversity and the phasing-out of ozone-depleting substances, while ensuring adequate growth of the sector.

Sectoral policies and plans, including those which help to counter deforestation and river pollution, benefit the poor directly and help to fulfil national obligations under global conventions

Sectoral plans and policies have also been developed to address concerns about agricultural land and water. Against the background of the importance of these sectors in the environment-rural poverty linkage, the associated policies require special mention. For example, forest land is often used to augment agricultural land and trees are cut indiscriminately to satisfy the growing demand for wood. In order to counter deforestation, which has a negative impact on the livelihood and vulnerability of the poor, especially in rural areas, a shift towards plantation forestry is a policy option which can be pursued. This type of shift will relieve the pressure on national forests and at the same time enable the development of reliable sources of industrial raw material and contribute to strengthening the income-earning potential of the persons associated with this sector.

Table IV.1. Selected sustainable development plans

	Objectives	*Strategies*	*Implementation*	*Resource requirements*
Singapore Green Plan 2012	• Aiming for an environmentally conscious nation, through promoting resource conservation and clean technology to protect both the local and global environments • Aiming at strengthening environmental consciousness to promote personal responsibility for and civic commitment to the environment	• Key modalities for achieving the objectives include promoting waste management, conserving nature, ensuring clean air, increasing water supply, improving public health, forging and strengthening strategic partnerships with the private sector, enhancing international collaboration and encouraging, through incentives, the innovation of clean technology for environmental sustainability	• Government level: - Strengthening the message of environmental sustainability among communities (employers, employees, civic groups, labour unions, educators and the media), through training in environmental skills and management, providing incentives and fostering greater collaboration among the communities - Implementing nationwide initiatives such as public transport using compressed natural gas - Including environmental issues in the school curricula to increase awareness - Formulating and enforcing legislative measures to encourage environmental sustainability - Complying with international agreements on the matter • Partnerships: - Between government agencies, non-governmental organizations, educational institutions, private and international organizations - Close partnership among the 3Ps (people, public sector and private sector) to create environmental awareness and responsibility	• Government funding for public utilities development and training
National Strategy for Ecologically Sustainable Development (Australia)	• Enhancing individual and community well-being and welfare by following a path of economic development that safeguards the	• Ensuring that decision-making processes integrate both long- and short-term economic, environmental, social and equity considerations • Incorporating the global dimensions of the	• Government level: - Development of detailed environmental policies to be adopted at all levels of government - National-level strategies on forests, waste management, biodiversity	• State and local government resources

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Table IV.1 *(continued)*

	Objectives	*Strategies*	*Implementation*	*Resource requirements*
	welfare of future generations • Providing for equity within and between generations • Protecting biological diversity and maintaining essential ecological processes and life-support systems	environmental impacts of actions and policies in national policy formulation • Developing a strong, growing and diversified economy which can enhance the capacity of environmental protection • Maintaining international competitiveness in an environmentally sound manner	and rangeland management - Legislation and government programmes stress environment and sustainable development objectives and principles, such as waste minimization and cleaner production - Land-use and transport planning and natural resource management to be entrusted to State and local-level authorities - Adopting cost-effective and flexible policy instruments, including valuation, pricing and incentive mechanisms • Decisions and actions should provide for community involvement	
China's Agenda 21	• Rapid economic growth and gradual improvements in the quality of development through relying on scientific and technological advances and improvements in the quality of labour • Promoting the overall development and progress of society and establishing the social basis for sustainable development • Controlling environmental pollution, improving the	• Focusing on economic development and the deepening of reforms and openness • Strengthening the foundation for building capacity for sustainable development by: - Establishing a policy framework for developing social and economic norms for sustainable development - Developing planning, statistics and information support systems for social and economic development - Improving education and raising awareness of sustainable development issues throughout the country • Gradually popularizing sustainable agricultural	• Government level: - Environmental protection has been included in annual and medium-term plans for national economic and social development, such as the five-year plans - The Government has formulated and implemented a series of laws and policies concerning environmental protection - Support from ministries, departments and local governments - Bilateral and multilateral cooperation with countries and regions through consultation and dialogue, transfer of environmentally sound technologies and environmental protection agreements	• China's own resources to cover roughly 60 per cent of total funding while the remaining 40 per cent is to be covered from international funding; foreign Governments and international organizations have shown willingness to support this Agenda and its associated priority programmes

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Table IV.1 *(continued)*

Objectives	*Strategies*	*Implementation*	*Resource requirements*
environment and protecting the resource base for sustainable development	techniques, while giving consideration to local situations • Vigorously promoting cleaner production technologies, working hard to minimize the production of wastes, encouraging recycling, resource and energy saving and increasing efficiency of production • Arranging for the development and popularization of important environmental pollution control techniques and equipment through technological skills training, establishing demonstration projects, raising fees for the discharge of pollutants and providing incentives such as preferential taxes for socially beneficial undertakings to control environmental pollution • Emphasizing protection of water resources and treatment of waste water by preventing the spread of desertification and developing water-saving technologies that produce little or no waste • Emphasizing protection and rational utilization of natural resources to protect species and improve environmental quality by disseminating scientific findings on environmental problems to raise awareness and promoting the production of "green products" and the use of renewable resources • Working hard to improve land productivity and reduce the impact of natural disasters	- Establishment of a comprehensive natural resources and environment monitoring and management system	

Several countries of the region are pursuing the development of plantation forests and simultaneously withdrawing national forests from the production of wood, which is used as industrial raw material. For example, China has one of the most extensive plantation forestry programmes in the region. It is planned to plant some 26 million hectares of forest in the Yangtze and Yellow river basins by 2030. In India, farmers in three states established a total of 26,000 ha of poplar plantations in 1990 which are now used to provide raw material for industries such as match boxes and plywood.

There have been changes in the policies and strategies for protecting and improving the quality of available freshwater resources. Instead of expanding the supply of freshwater, emphasis has been put on demand management and water-use efficiency, conservation and protection. An integrated approach to water resources management in line with Agenda 21 has been accepted as an effective policy option.

Multisectoral and multidisciplinary approaches are needed to rehabilitate degraded water quality and ensure the provision of a safe drinking water supply. In many countries of the region, this need has been translated into action plans for cleaning up rivers, canals, lakes and other water bodies: the Murray Darling Basin Agreement (Australia), the pollution control plans for three rivers (China), the Ganga Action Plan (India) and the Love Our Rivers Campaign (Malaysia) are some examples. The reduction of pollution loads through proper waste-water treatment, reuse and recycling of domestic sewage and industrial waste water, the introduction of appropriate low-waste technologies and strict control on industrial and municipal effluents are essential elements of these action plans.

Instruments for implementing policies: command and control and market-based instruments

Command and control-based mechanisms utilize the power of the State in forcing the agents, that is, producers and consumers, to adhere to environmental standards. For example, the management of forest resources in many countries uses a system of awarding licences for logging with the threat of cancellation as a penalty mechanism. In another sector, fishing, in which many of the poor earn their livelihood, a quota system is applied to keep the catch within sustainable limits. A number of countries have used command and control mechanisms to regulate effluents, emissions and disposable wastes.

Command and control measures utilize the power of the State in forcing consumers and producers to adhere to environmental norms and good practices

Command and control measures have often focused on particular sectors which are of primary importance to the poor. For example, Indonesia's PROKASIH Programme, started in 1989, aimed at ensuring that industries install waste-water treatment systems. Initially, attention was focused on the worst industrial pollution occurring near 24 highly polluted rivers with the goal of reducing their pollution load by 50 per cent.[20] The objective was subsequently expanded; more rivers were brought within the purview of the control measures and the pollution standards were also increased. Command and control measures have also been applied to control air pollution. For example, a unique Vehicle Quota System to control the number of vehicles is in operation in Singapore, thereby reducing traffic congestion and emissions from fossil fuel. Under this system the number of new vehicles allowed for registration is predetermined annually. The quota for new vehicles takes into account the prevailing traffic conditions and the number of vehicles taken off the road permanently, while the supply-demand condition of the market determines the price of new vehicles.[21]

Market-based fiscal incentive-disincentive systems influence the behaviour of producers and consumers by providing them with a choice as to the extent and nature of responses for reducing environmental damage, and are easy to administer

The requirement for the success of the command and control system is the ability to use the power of the State to identify violations by continuous policing and then to enforce the associated penalties. These actions require substantial financial and human resources and a well-functioning judicial system. In most countries, resources are scarce and the judicial system is slow in handling non-criminal cases. A market-based fiscal incentive, a disincentive system which seeks to influence the behaviour of producers and consumers by enabling them to choose the most appropriate measures based on their own assessed cost and benefit, is considered a viable and often preferable alternative to the direct command and control system and is implemented in various countries of the region. In contrast to command and control measures, these are self-regulatory in nature and require less policing and fewer court actions. As these instruments are often administered at the local level, like other fiscal instruments, they result in increased revenue/savings for local governments and municipalities. Some of the popular market-based instruments are user charges, an increase/decrease in targeted subsidies and a deposit refund system. These are described in table IV.2 below.

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[20] ESCAP and ADB, op. cit., p. 265.

[21] D. Goh, "Certificates of entitlement" (<http://www.geocities.com/MotorCity/Pit/8858/singapore/taxes.htm>, 9 November 2002).

Table IV.2. Market-based instruments for environmental management[a]

Instrument	*Modus operandi*	*Examples*
Environmental tax	Charged to polluters as the cost of neutralizing pollution and environmental damage	Industries in Singapore are allowed to discharge effluent (containing biodegradable pollutants) directly in public sewage on payment of a tariff which allows the recovery of the additional cost of sewage treatment. In the Philippines, the polluters are required to pay a fee for every unit of pollution they discharge. The emission tax structure consists of 4,500 pesos/ton of particulate matter emitted in excess of the allowance limit and 14,200 pesos/ton of sulphur dioxide emitted for manufacturing industries. Taxes for power-generating plants are 1,750.86 pesos/ton of particulate matter and 40,725 pesos/ton of sulphur dioxide emitted. The nominal rates are adjusted periodically for inflation to maintain the deterrent impact in "real terms"
User charges	Charges are levied on the use of public good and natural resources for reducing environmental damage	Road pricing is practised in Singapore to reduce air pollution and congestion; peak hour road use in the city centre is taxed. To implement the road tax system efficiently, an electronic road pricing arrangement has been introduced; the system is designed to automate the pay-when-you-use principle. Charges are levied on a per-pass basis and vary according to the time and congestion levels. Indonesia plans to charge ecotourists for the use (enjoyment) of protected areas for the sustainable management of ecosystems
Increase/decrease in targeted subsidies	Eco-friendly actions are encouraged by providing subsidies/tax exemptions and these are reduced to curb environmentally damaging activities	Examples of incentives include a preferential low-interest loan for desertification control (China); incentives for wood substitution and subsidies to encourage the use of fuel-saving devices and alternative sources of energy supply, such as biogas and solar energy (India). Examples of disincentives include reduction of the domestic subsidy on coal from 61 per cent in 1984 to 11 per cent in the late 1990s to deter its use (China)
Deposit (fee) refund system	Used to encourage recycling activities; a deposit on the product is levied initially to be refunded to the consumer on the return of the recyclable waste	Examples include a deposit refund system for beer bottle recycling in Japan. The beer makers levy a fee on the beer bottles and containers, which is ultimately passed on to the consumer. A refund is provided when the bottles and containers are brought back for recycling. A similar system is used for soft drink bottles in India

[a] ESCAP and ADB, *State of the Environment in Asia and the Pacific 2000* (ST/ESCAP/2087), p. 269.

Institutional policies and institutions

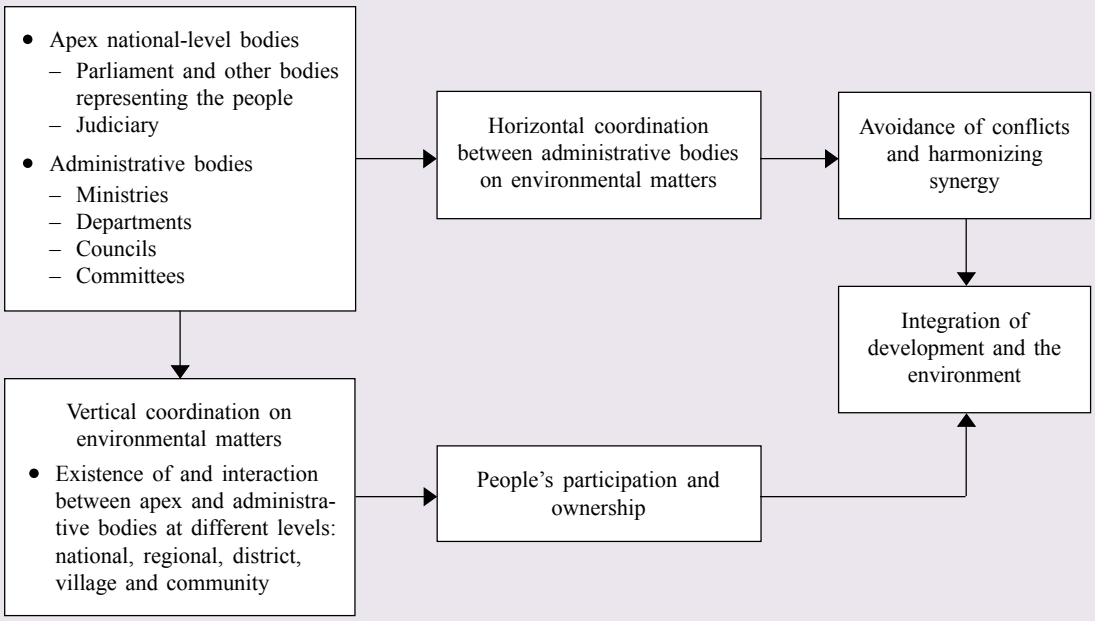
The existence of functioning institutions and the horizontal and vertical linkages between them are crucial for formulating and implementing effective environmental plans and policies

Policies and programmes, whether economic, social or environmental, cannot be implemented effectively without the support of an interconnected network of institutions at different levels national, subnational and local. In addition to the apex institutions for example, parliament and the judiciary, institutions include administrative bodies, such as ministries, departments, councils and committees, which, in general, deal with policies and programmes belonging to specific areas. Institutional policies refer to the legal, normative and regulatory framework which enables the policies to generate the intended impact. For example, the environment ministry, the institution which is primarily responsible for implementing environmental policies, cannot carry out pollution control programmes (either through command and control or by using a market mechanism) without clearly defined pollution norms and legal penalties for not adhering to the norms.

Agenda 21 emphasizes the important role of institutions and institutional policies in underscoring the critical importance of reshaping the decision-making process in order to integrate environmental and

Diagram

Institutional coordination for integrating development and the environment



developmental concerns into decision-making.[22] To achieve this aim, the institutions and policies (which have a bearing on the environment) of various sectors/areas need to be well coordinated not only horizontally but also vertically. Horizontal coordination between institutions will avoid conflict and exploit complimentarities, thus enhancing the impact of policies. Vertical coordination requires the existence of institutions at different levels from the national to the community level, and interaction between them. It ensures people's participation and ownership, without which all policies, especially environmental policies, will not be effective (see diagram).

Although there is room for improvement in the coordination mechanisms, the modalities for horizontal coordination on environmental matters already exist in many Asian and Pacific countries. For example, in Tonga, the Development Coordination Committee is the paramount economic planning and coordinating body.[23] Its standing members are the Deputy Prime Minister and senior representatives of selected ministries. In Fiji, the National Planning Office is required to have discussions with all ministries during the preparation of policy. If policies have economic or financial implications, the Economic Strategy Committee, chaired by the Prime Minister and comprising such ministers as the Minister of Finance, reviews the policies. In Malaysia, the National Planning Council is the highest planning body in the country and is in charge of the coordination and implementation of development programmes.

The success of vertical coordination between institutions dealing with environmental matters depends on the emphasis given to decentralized decision-making and the creation of decentalized institutions as well as the linkages between them. Effective vertical coordination ensures that environmental issues and concerns at the local level, especially in small towns and rural areas, are given due consideration in designing policies and programmes. The involvement of local institutions in formulating and implementing policies is essential as they are directly in touch with problems in their areas of operation and may have useful insights as to appropriate solutions. Local institutional structures can comprise many forms, from municipal councils or commissions in urban areas to village councils in rural areas.

The role of subnational institutions and local governments in the formulation, implementation and monitoring of policies and programmes on matters related to the environment has expanded in the post-Rio era. In many countries, provincial-level environmental agencies have been set up

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[22] Sections 1 and 2 of Agenda 21 (<http://www.un.org/esa/sustdev/agenda21text.htm>, 9 November 2002).

[23] ESCAP, *Integrating Environmental Considerations into Economic Policy Making: Institutional Issues,* Development Papers, No. 21 (ST/ESCAP/1990).

Decentralization of institutions to the provincial and local levels is an important precondition for the success of environmental plans and policies

and local governments have been given the responsibility for formulating and implementing local environmental protection plans (local Agenda 21). For example, in Japan, local authorities are involved in the implementation of environmental laws, regulations and guidelines and the measurement and control of pollution. Out of a total of 248 local governments in the Republic of Korea, 159 are formulating local environmental plans. Provinces, autonomous regions and municipalities in China have also formulated their own local Agenda 21 plans regarding management of the environment. Similar efforts have been made in many other countries, including Indonesia, Malaysia, the Philippines, Thailand and Viet Nam.[24]

The local municipal governments are in principle closest to urban environmental problems, such as air and water pollution and the lack of industrial waste disposal facilities. They are capable of participating effectively in the administration of control measures. In China, there are municipal environmental protection commissions consisting of local leaders, other commissions and bureaucrats. These commissions are responsible for implementing policies and coordinating activities at the local level; these, in turn, are assisted by the environmental protection departments of municipal governments. In Fiji, the Suva City Council is the largest local government entity and deals with environmental issues; in terms of implementation, it relies on different departments to carry out its plans. The Health Services Department in Fiji plays an important role as it is in charge of garbage collection, waste disposal and drainage control. The problem of squatters, with its serious environmental implications, is also addressed by the Health Services Department.

Village councils and committees are common in the rural areas. They can play a significant role in monitoring rural environmental problems, such as soil degradation, deforestation and depletion of fish stocks.

In Samoa, the traditional Polynesian decision-making system is reflected in the structure of most political and social organizations. Village councils decide on all matters pertaining to the village and its land and sea resources. One of the important features of this decision-making system is the emphasis placed on consensus. People avoid conflict by consensus agreement among peers. Meetings involve as many stakeholders as possible. In the villages, the village council discusses all matters concerning village life, especially when there are conflicts over resource use.

In Nepal, there are various district and village development committees. As a result of the decentralization policy, these committees are empowered to undertake village and district development activities. These activities have had a tremendous positive impact with regard to new road construction, irrigation, drinking water, forest management, etc.

[24] ESCAP and ADB, op. cit., pp. 260 and 261.

For instance, areas of degraded and semi-degraded forest land are allocated to these local bodies for management, controlled exploitation and reforestation. This has improved the quality of land and prevented the massive destruction of forests. The Annapurna Conservation Area Project in Nepal is an illustration of the successful decentralization of planning and decision-making.[25]

Although there have been several attempts to enhance the importance of local institutions, their role has been mostly confined to participating in environment-related activities in some specific sectors. There are very few mechanisms enabling local institutions to participate and provide inputs, directly or indirectly (through regional institutions), into the formulation of overall development policies and to voice their concerns on environmental matters. In order to overcome the limitations mentioned earlier, the creation of an apex local (urban or rural) council with representation from various local government departments would be beneficial and it could present local views in a regional council. In this way, local issues and concerns, including those related to the environment, would be directly presented at the regional level and indirectly in national policy-making bodies (through the regional entity).

Legislation, laws, rules and guidelines (norm-setting) aimed at improving the environment and conserving natural resources fall under the general rubric of institutional policies. A very good description of the subject can be found in an ESCAP publication[26] and is not reported here.

Policies directed at the reduction of poverty as well as improvement of the environment

A large number of policies and programmes are available which address both poverty reduction and environmental improvement. These can be classified into two broad groups: the first group refers to those policies that strengthen the asset base of the poor and also help to protect the environment and the second includes those related to the improvement of governance, especially in the management and monitoring of the environment, and strengthening the coping mechanisms of the poor.

In the first group, major policies include ensuring the property rights of the poor, supporting rural community-based projects, especially social forestry, and giving the poor access to environmentally clean technologies.

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25 ESCAP Virtual Conference, "The Annapurna Conservation Project (ACAP)" (<http://www.unescap.org/drpad/vc/conference/ex_np_125_acp. htm>, 11 November 2002).

26 ESCAP and ADB, op. cit., chap. 11.

Property rights of the poor

Conferring property rights on the poor could increase their income as well as provide the motivation for resource conservation

The property rights to resources, that is, land, water and trees, play an important role in the environment-poverty linkage, especially in the rural areas. As the rural poor often rely on customary and informal arrangements, they are deprived of formal private property rights and, at times, exploited. Uncertain ownership conditions have a negative impact on agricultural productivity by inhibiting investment and reducing incentives for resource conservation. The situation can be reversed by ensuring property rights through policy interventions. For example, the formal issuance of legal titles in Thailand in 1984 was beneficial for agricultural productivity and thus provided the necessary incentive and financial resources for investing in soil and water conservation. A large number (15.5 million) of land titles were distributed to 2.2 million households, of which 35 per cent were below the poverty line. A study has shown that this action has resulted in an 8-27 per cent increase in agricultural output.[27] In India, tenancy reforms, the enactment of land ceiling legislation and the distribution of surplus (over ceiling) land to the poor was very successful in the State of West Bengal. The tenancy reform programme which began in the late 1960s through Operation Barga, a movement to register sharecroppers and provide them with tenurial security through legal enactment and social mobilization, was very beneficial to the landless poor. A large number of sharecroppers (1.5 million) were formally provided with security of tenure.[28] Of these, 38 per cent belonged to the downtrodden class ("dalits" and "scheduled castes", who are the poorest of the poor).

Although, by and large, providing ownership of land to the poor should enhance their income-earning capabilities and their interest in resource conservation, Governments have to make sure that the land does not end up with rich persons or speculators, which would defeat the objective of this policy.[29]

Social forestry

Social forestry is a very effective modality for poverty eradication and improvement of the environment

Social forestry is the sustainable management of trees and forests by farmers, landowners, industries or community-based organizations in order to provide forest products and services to meet local needs. It is distinguished from commercial forestry by the extent of stakeholders' involvement, their decision-making powers and the benefits that accrue to them. The principal stakeholders in social forestry are the people who live in the local communities located close to the forest. Such communities often

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27 "Linking poverty reduction ...", op. cit., p. 20.

28 Venkatesh Athreya, "A creditable record", *Frontline,* vol. 19, Issue 04 (<http://www.flonnet.com/f11904/19040810.htm>, 2 August 2002).

29 "PM's title deeds proposal panned", *Bangkok Post,* 3 December 2002.

encompass a large number of poor people who cannot afford to live in better places. Fundamental to social forestry is the employment of these people to manage the trees so as to improve their economic and social condition.

Social forestry includes a wide range of activities, such as tree-planting, agroforestry, management of natural forests, watershed management and the collection of non-wood forest products. At times, social forestry touches upon other sectors, such as the energy sector, when families plant and harvest fuelwood for domestic cooking and heating, or the agricultural sector, when farmers use trees to enrich soil, produce fodder to feed livestock and plant windbreaks to protect crops. The importance of the sustainable development of forestry has been highlighted in the Plan of Implementation of the World Summit on Sustainable Development (see box IV.1).

A large number of countries in the Asian and Pacific region have adopted social forestry as an important modality for improving the environment and providing a livelihood income to the rural poor (see box IV.2.).

Box IV.2. Social forestry in a Chinese village[a]

Nongla village of China, located in a bare limestone area, had been traditionally underdeveloped. Harsh living conditions and the shortage of water have hindered economic growth and perpetuated poverty. As a result of the efforts of villagers in afforestation over the past 10 years, about 72 per cent of village-owned land has now been planted with Chinese medicinal herbs and fruit trees. As a consequence, the land under forest cover in and around the village reached 90 per cent and villagers' per capita annual cash income rose to 3,180 yuan ($383) in 2001, a big increase from 100 yuan ($12) 20 years ago.

Before social forestry was introduced, the villagers thought that their land could only be used to plant corn, the growth of which was frequently damaged by flooding. With the help of extension services provided by township, country and autonomous regional level governments, the villagers have acquired the skill to grow medicinal plants.

The village is an example of success in both poverty reduction and sustainable development through the sensible development of local resources as well as protection of the environment.

[a] Paper prepared by Wang Tong, Senior Research Fellow, State Council Economic Restructuring Office, Beijing (unpublished).

In recognition of its great benefits, the Government of Indonesia has given social forestry considerable importance in its official five-year development plans and has actively supported projects in this area.[30] The Kaltim social forestry project in Indonesia aims at generating local capacity in social forestry through professional development research,

[30] Forestry Profiles, Indonesia: Kaltim Social Forestry Project (<http://www.rcfa-cfan.org/english/profile.14.html>, 3 November 2002).

curriculum development and training-extension activities. Greater capacity in social forestry facilitates greater community participation in the management of East Kalimantan's forests. The project has the following major objectives:

- Protecting and managing the environment by limiting resource degradation and expanding the environmental benefits of trees through the introduction of agroforestry systems to enhance farm and pasture productivity, protecting of household and community food and fuelwood supplies, conserving natural forests, expanding the area of protected areas under joint community-Government management and using trees in the conservation of soil and water resources
- Supporting private sector development by increasing the sustainable output of economic products from tree and forest resources, expanding the development of forest industries on an appropriate scale to expand cash incomes on a locally sustainable basis, creating professional opportunities for local social forestry and natural resource management and expanding the knowledge base regarding sustainable economic uses for natural forest products in the tropics
- Developing sustainable infrastructure services by initiating self-sustaining education programmes in social forestry at the community, technical and professional levels by increasing the capacity of the educational infrastructure in the following areas: practical soil conservation; forest management; family fuelwood supply and use; agricultural and pastoral fire management; watershed management; extension and communication skills in participatory needs assessment; planning, monitoring and evaluation; resource monitoring; integrated resource management and protection; and soil and water conservation

In India, 16 social forestry projects, under which 2.6 million ha have been brought under forest cover, were completed from 1979 to 1999. Currently there are 18 ongoing projects aiming to cover 2.6 million ha for tree planting of land.[31]

Access of the poor to environmentally clean technologies

One of the areas in which simple technology could bring immediate benefit to the poor as well as to the environment is an improvement in cooking stove technology to reduce air pollution and associated acute

[31] National Forestry Action Programme India, "Completed projects" (<http://envfor.delhi.nic.in/nfap/complete-project.html>, 13 November 2002).

respiratory infections. It has been pointed out that such diseases are largely responsible for the dismal health standards of the poor. In the Asian and Pacific region, India has long been engaged in designing, producing and marketing improved cooking stoves in rural areas. Its experience has shown that the task of improving the health of the poor by introducing redesigned cooking stoves should focus not only on the engineering side of the technology but also on the social, cultural and financial aspects.

The provision of environmentally clean technologies to the poor can go a long way towards improving their health

The objectives of improving cooking stoves have been to conserve and optimize the use of fuelwood, especially in the rural and semi-urban areas, help to alleviate deforestation, reduce the drudgery associated with cooking, especially for women, and the health hazards caused by smoke and heat exposure in the kitchen and bring about improvements in household sanitation and general living conditions.

A multimodal and multi-agency approach was adopted to popularize the use of the stove. State government agencies, autonomous bodies and voluntary organizations have taken part in the process. A pool of self-employed workers was created and given the responsibility for installation and maintenance. The Government's strategy also placed emphasis on providing the poor with subsidies for purchasing improved stoves based on geographical and indicator targeting, the introduction of incentive schemes for field-level functionaries and wider publicity through radio, television and other local media.

Two major policies which have a direct bearing on environmental resources are the implementation of anti-corruption measures and the incorporation of elements of the environment-poverty nexus in environmental monitoring systems. Last, but not least, plans, programmes and policies to minimize the adverse impacts of natural disasters are expected to go a long way in benefiting the poor. These are discussed below.

Implementing anti-corruption measures

Anti-corruption measures and disaster management plans and policies have a strong beneficial impact on the poor

Corruption is directly related to the unsustainable management of natural resources, especially forestry resources. According to *State of the Forest: Indonesia* released early in 2002, corruption and lawlessness had been fuelling illegal logging in Indonesia, resulting in a doubling of the countries' deforestation rates in the late 1990s.[32] The report concluded that such massive deforestation was the result of a corrupt political and

[32] World Resources Institute, "Corruption, lawlessness fuel epidemic of illegal logging in Indonesia" (<http://www.wri.org/press/indoforest.html>, 8 August 2002).

economic system that regarded natural resources as a source of private revenue. Echoing similar concern, a recent report by FAO identified corruption and illegal forest practices as the biggest threat to successful forest management.[33]

Corrupt practices can be reduced by providing quality information on the state of natural resources, effective publicity concerning corruption practices and anti-corruption laws, the agencies responsible and the penalties applied and by ensuring that violators are punished. With regard to the forestry sector, strict law enforcement, including deterrent punishment in tandem with a programme to address corruption within the enforcement agencies, is essential and urgently needed if corruption in this sector is to be controlled.

Disaster management plans and policies

The poor are disproportionately vulnerable to environmental shocks in the form of natural disasters. Natural calamities such as cyclones, typhoons, flood and mud slides occur fairly regularly and affect many countries. The Asian and Pacific region has been one of the worst hit in terms of natural disasters, accounting for 50 per cent of the world's major emergencies. During the rainy season of 2002, more than 20 countries in the region suffered serious flooding, resulting in the deaths of 2,300 people and forcing 16 million people from their homes.[34] In Thailand alone, floods affected 7 million hectares of farmland and 80,000 people needed treatment for water-borne, flood-related diseases. While not all natural disasters can be predicted or prevented, policies and programmes can be formulated and implemented to mitigate the loss of life and property of the affected people and avoid destitution. A plan of action for disaster management can be formulated and periodically updated. In India, the elements of such a plan are forecasting and operating warning systems; maintaining uninterrupted communication between potential disaster-prone communities/areas and the Government; giving wide publicity to warnings of impending calamities and disaster preparedness and relief measures through all channels of communications (including television, radio and the press); arranging for transport, with particular reference to evacuation and the movement of essential commodities; making essential goods and services available at reasonable prices (or for free) in disaster-struck

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[33] "Corruption threatens forests: FAO", *Dawn,* 4 October 2001 <http://www.dawn.com/2001/10/04/int13.htm>, 3 November 2002).

[34] "Effective disaster management needed in Asia and Pacific", Press release No. G/35/2002 (United Nations Information Service, Bangkok).

Box IV.3. Disaster relief plan of Thailand[a]

Nationwide, 1,408 villages in 34 provinces have been identified as being at high risk for floods and mud slides. Local authorities in these areas have been instructed to be on high alert since the rainy season began. While the Interior Ministry focused on disaster relief, other agencies, including the Forestry Department, were busy restoring areas at risk with a view to reducing their vulnerability to disasters.

Flood-related disasters have been brought under the National Civil Disaster Relief Committee. Information centres, early warning systems and disaster relief drills have been introduced in high-risk areas. The 24-hour alert system is operated from the Interior Ministry's information centre. With help from the Meteorological Department, the Ministry monitors weather conditions.

Evacuation procedures are also part of the plan. Drills have been held in 14 of 16 target provinces. Local authorities have been told to exercise precautions. Safe places have been identified at each spot in the event of an emergency. About one billion baht was set aside for the evacuation process.

[a] *Bangkok Post*, 12 August 2002.

areas; and ensuring the availability of medicines.[35] In Thailand, the disaster relief plan has recently been overhauled to increase its effectiveness (see box IV.3).

Strengthening environment-poverty monitoring

There are substantial lacunae in the availability of data that capture environment-poverty interlinkages. In many cases, environmental data focus on environmental changes without measuring their impact on the poor, and poverty data do not capture environmental concerns. This situation can be remedied by devising appropriate environment-poverty indicators. Indicators such as deaths from acute respiratory infection by income class could quantify the state of environmental health. Similarly, the extent of dependency indicated by the proportion of income generated by using primarily natural resources can be an indicator of poverty; a reduction in the extent of dependency can indicate a possible reduction in poverty. Substantial research has already been done to identify effective environment-poverty indicators.[36] However, efforts to collect country-level data on these indicators are not really adequate. Institutional mechanisms are also needed through which the information on these indicators could be analysed and used for designing policies to improve the environment and reduce poverty.

[35] National Disaster Management, Ministry of Home Affairs, Government of India, "Contingency action plan" (<http://www.ndmindia.nic.in/manageplan/intro.html>, 9 August 2002).

[36] "Linking poverty reduction ...", op. cit., p. 17.

CONCLUSION

The relatively intangible nature of environmental costs, negative externalities associated with such costs as well as the existence of free-rider problems are reasons for market failure

The aim of this chapter has been modest. An attempt has been made to review the interlinkages between the environment and poverty and selected policies and programmes which can minimize the adverse environmental impacts of economic growth. Against the background of the positive linkage between improvement in the environment and the reduction of poverty it can be argued that policies and programmes for improving the environment could form an important element of a pro-poor economic strategy to strengthen the impact of economic growth on poverty reduction. It is also found that certain policies (such as providing resource rights to the poor) centred directly on the poor people can improve the environment, and environmental interventions such as the prevention of land degradation and controlling indoor smoke pollution from cooking can improve the income and health of the poor.

Despite the existence and application of a large number of policies and programmes, the track record for improving the state of the environment in the Asian and Pacific region does not denote the success of such instruments.[37] The limited success of environmental policies is due to the economic aspects of the environment, which make the associated policies difficult to implement.

Conceptually, there are three aspects associated with the environment which have an impact on the extent of environmental degradation, especially that created by human activities, and on the effectiveness of the policies for reversing such damage.

First, a significant part of the environmental costs of human activities is intangible and thus difficult to quantify in monetary terms. Environmental impacts often occur over the long term, even beyond the generation of those responsible. Thus people (polluters) do not fully realize the costs (environmental degradation) of their actions. Second, the environment has negative externalities, that is, the social costs of environmental degradation are always much higher than the private costs. It is difficult to design deterrent policies and instruments which reflect the true social costs. Third, the environment is a typical public good. It is non-rival in type: the quantity available for other people does not fall when someone consumes it. It is also non-excludable; it is prohibitively costly to provide a "good environment" only to those who pay for it and prevent or exclude others from obtaining it. This is responsible for the "free-rider phenomenon" in the area of the environment: other agents are allowed to benefit, at no cost, from the effort of one agent to improve the environment. Under these circumstances, it is very difficult to provide a "good environment" through the market, where private motives are the major driving force.

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[37] ESCAP and ADB, op. cit.

The Government's role in designing and ensuring the success of policies and programmes for improving the environment cannot be exaggerated. In this regard, on the basis of the issues discussed in the previous paragraphs, certain broad observations can be made on the modalities for improving the effectiveness of environmental policies and programmes.

Securing stakeholders' ownership through vigorous awareness-building campaigns, decentralizing responsibilities for designing and implementing environmental policies and programmes, ensuring coordination between agents, policy makers and institutions and the maintenance of good governance are expected to improve the effectiveness of environmental policies

First, the role of awareness-building of various agents, that is, consumers, producers, government bureaucrats and politicians, concerning different aspects of the environment is essential in securing stakeholder ownership in designing and implementing environmental policies. The use of all available media and means of communication, such as newspapers, television and the Internet, to focus group discussions/seminars for disseminating information on the various social costs of environmental degradation and the benefits achievable from improvement, is highly recommended.

Second, the decentralization of the responsibilities for designing and implementing environmental programmes and policies is required for success. In formulating policies and programmes concerning the environment, the local-level state of the environment within a national environmental plan should be considered. The national plan is required to mainstream environmental issues and concerns, many of which have long-term implications, in the national development strategy, which often incorporates specific targets for economic growth.

Third, the crucial importance of coordination needs to be highlighted in both the design and implementation of environmental policies. Environmental issues are cross-cutting and involve a large number of sectors and a variety of agents, sometimes with conflicting interests. Broad consensus-building through proper coordination is required to ensure the equal commitment of various stakeholder groups to environmental causes.

Fourth, maintaining good governance in executing policies and programmes in the area of the environment is of prime importance. Policies need to be designed in a participatory and transparent manner. Keeping in mind the public-good nature of environment, including natural resources and the high negative externalities (the social cost being much higher than the private cost) associated with environmental degradation, environmental policies require a corruption-free administration in order to ensure their success.

Improvement of the environment is beneficial to everybody, to those currently living and those who are yet to be born. However, compared with the rich, the poor are more exposed to various types of environmental damage and thus stand to gain more from the improvement of the

environment, which makes the associated policies truly pro-poor. Designing and implementing environmental policies are complex tasks; the multiplicity of agents with conflicting interests and the high negative externalities make the tasks these more difficult. The commitment of national Governments in this difficult area is of crucial importance. With respect to the Asian and Pacific countries, there is need for a periodic review of the environment policies and programmes and environmental situation of various countries, along with the strategies to reduce poverty. Through this exercise, Governments will be able to take stock of the situation and, if needed, readjust their priorities so as to achieve real sustainable development and poverty reduction.

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- **Despite the weakening of the global economy for a large part of 2002, developing economies in the ESCAP region performed surprisingly well, achieving growth of around 5 per cent during the year. This expansion, which was 2 percentage points higher than the 2001 rate, owed much to surging intraregional trade, fiscal stimulus and monetary easing.**

- **The developing economies of the ESCAP region could expect a modest improvement in 2003, barring a major eruption of geopolitical hostilities. The prospects for development also depend to a considerable extent on the sustainability of enhanced intraregional trade and a supportive domestic policy stance. All in all, however, GDP growth in the region is still several percentage points below the pre-crisis level. This translates into fewer job opportunities and puts greater pressure on government budgets, including allocations for poverty reduction.**

- **The positive impact of education and health care on the economic development and well-being of individuals is enormous. Moreover, the provision of education and health care is key to reducing poverty in developing countries. While the public sector is still a major provider of education and health care, more resources should be raised using multiple channels, including the public and private sectors, communities, non-governmental organizations, bilateral donors and multilateral organizations. An integrative approach using multiple sources for the provision of education and health care is recommended. Moreover, the effective and efficient utilization of resources is also important to achieve better results.**

- **The achievement of fast economic growth, which is essential for sustainable poverty reduction, is often accompanied by environmental degradation. This affects the poor adversely and disproportionately. An analysis of the linkages between the environment and poverty and the policies adopted by the Asian and Pacific countries to mitigate their adverse impacts yields important conclusions regarding stakeholder ownership, decentralization and the maintenance of good governance for increasing the effectiveness of those policies.**