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Interrelationships between Demographic Factors, Development and the Environment in the ESCAP Region

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It will take a long time to achieve minimum environmental standards required for maintaining human health

The population of the ESCAP region is currently growing at the rate of 1.6 per cent per annum. By the year 2010, the population of the region is projected to increase to 4.1 billion, or about 812 million people more than currently. This increase in the population will result in a considerable increase in the demand for food, water, fuel, shelter and naturel resources. In this region, which contains about 58 per cent of the world population, rates of population growth range from 0 to as high as 4.2 per cent per year (ESCAP, 1994). In South Asian countries such as the Islamic Republic of Iran, Maldives and Pakistan, the growth rates are approximately 3 per cent per annum. In South-East Asia and Central Asia, population growth is also higher than the ESCAP average. Thus, continued increases in the size of the regional population may be expected into the next century; this phenomenon will be especially marked in South Asia where rates remain high.

Table1: Population growth trends in ESCAP region, 1994

Region/subregion	Total population (thousands)	Per cent	Percentage annual growth		Population	
			Total	Urban	Projected to 2010	Doubling time (years)
East Asia	1,423,763	13.5	1.2	3.9	1,629,104	57
South-East Asia	477,008	14.5	1.8	3.8	609,898	39
South Asia	1,284,907	39.2	2.0	3.5	1,733,907	34
Central Asia	61,640	1.9	1.7	-	79,133	41
Pacific	28,370	0.9	1.6	2.0	35,461	44
ESCAP	3,275,688	100.0	1.6	3.7	4,087,503	42

Urbanization

In almost all countries of the region another population phenomenon is under way, and that is urbanization. Overall 32 per cent of the total population of the region live in urban localities. Among the various subregions in the ESCAP region, countries of the Pacific are highly urbanized, with 70 per cent of their populations living in urban areas. Central Asia is second with 46 per cent, South Asia is the least urbanized area. The level of urbanization ranges from a minimum of 6 per cent in Bhutan to 100 per cent and 94 per cent in Singapore and Hong Kong, respectively. The degree of urbanization and variations in levels in the ESCAP region are shown in tables 1 and 2.

Table 2: Percentage of total population living in urban areas (degree of urbanization) in ESCAP region, 1950-2000

Region/subregion	Degree of urbanization						
	1950	1960	1970	1980	1990	1994	2000
East Asia	16.8	25.0	24.7	27.4	39.4	34.0	51.4
South-East Asia	14.8	17.6	20.2	24.0	29.9	32.0	36.9
South Asia	16.0	17.3	19.5	23.1	27.3	27.0	32.8
Central Asia	-	-	-	-	-	46.0	-
Pacific	61.3	66.3	70.7	71.2	70.6	70.0	71.3

Source: 1994 ESCAP Population Data Sheet, and World Urbanization Prospects, 1990 (New York: United Nations).

From table 3 it is possible to classify countries and areas of the ESCAP region into the following categories: (a) very highly urbanized with 75 per cent or more of the total population living in urban areas, (b) highly urbanized with 51-75 per cent of the population being urban, (c) moderately urbanized with 26-50 per cent of the population being urban and (d) poorly urbanized countries where the share of urban population in the total is 25 per cent or less.

Table 3: Classification of ESCAP countries and areas by levels of urbanization, 1994

Percentage of urban population	No. of of urban countries/of urban areas	Name of countries or areas (% urban)
Poorly/low urbanized areas (up to 25%)	13	Bhutan (6), Nepal (12), Cambodia (12), Papua New Guinea (16), Solomon Islands (16), Bangladesh (17), Afghanistan (19), Vanuatu (19), Lao People's Democratic Republic (20), Viet Nam (20), Samoa (21), Sri Lanka (22), Myanmar (25)
Moderately urbanized areas (26-50%)	18	India (26), China (28), Niue (30), Tonga (31), Tajikistan (31), Maldives (31), Indonesia (32), Pakistan (33), Thailand (35), Kiribati (35), Guam (38), Fiji (40), Uzbekistan (40), Tuvalu (42), Malaysia (44), Philippines (44), Turkmenistan (45), American Samoa (48)
Highly urbanized areas (51-75%)	13	Azerbaijan (53), Commonwealth of the Northern Mariana Islands (53), Islamic Republic of Iran (58), Cook Islands (58), Kyrgyzstan (58), Kazakistan (58), Mongolia (59), Democratic People's Republic of Korea (60), French Polynesia (65), Marshall Islands (65), Republic of Palau (69), New Caledonia (70), Republic of Korea (74)
Very highly urbanized countries/areas (75% and above)	8	New Zealand (76), Japan (78), Australia (85), Brunei Darussalam (90), Hong Kong (94), Macau (99), Nauru (100), Singapore (100)

Source: 1994 ESCAP Population Data Sheet.

Very highly urbanized countries are commercially, technologically and industrially advanced and per capita income is relatively high. In low or poorly urbanized countries of the ESCAP region, the great majority of people are still engaged in various types of subsistence or semi-subsistence agriculture; in most cases, industrialization has not yet begun. Although the process of urbanization has been increasing in these countries, they will still be less urbanized in 2025 compared with the more developed countries of the region.

Growth of urbanization

Currently, the urban population of the ESCAP region is growing at 3.7 per cent per annum. The highest urban growth, i.e. 3.9 per cent per annum, was recorded in East Asia, followed by South-East Asia and South Asia at 3.8 and 3.5 per cent, respectively. The lowest growth rate, i.e. 2 per cent per annum, has been recorded in the Pacific. The urban population of the ESCAP region increased from 224 million people in 1950 to 1 billion by 1990 (excluding Central Asia), a more than three-fold increase. The urban population of the region is expected to reach almost 1.45 billion by the year 2000, an increase of 48 per cent over the 1990 level. Table 4 shows urban populations and the percentage of decennial variation/growth from 1950 to the year 2000. It indicates that the urban population will continue to grow very rapidly in the less developed countries as compared with developed countries where urban growth is already slowing down.

Table 4: Growth of urbanization in ESCAP region, 1950-2000

Regions/subregions	Urban population (thousands)					
	1950	1960	1970	1980	1990	2000
East Asia	112,473	198,210	243,952	322,215	526,784	776,832
South-East Asia	26,937	39,487	57,894	86,571	132,824	197,214
South Asia	76,916	103,306	147,441	218,757	328,157	490,473
Pacific	7,754	10,458	13,673	16,226	18,700	21,480

ESCAP (excluding Central Asia)	224,080	351,461	462,960	643,769	1,006,465	1,485,999
Regions/subregions		Percentage urban population variation or change				
		1950-1960	1960-1970	1970-1980	1980-1990	1990-2000
East Asia		76.20	23.07	32.08	63.48	47.47
South-East Asia		46.59	46.60	49.43	53.42	48.47
South Asia		34.31	42.72	48.36	50.00	49.46
Pacific		34.87	30.74	18.67	15.24	14.86
ESCAP (excluding Central Asia)		56.80	31.70	39.05	56.30	47.64

Table 5 classifies countries and areas by percentage annual urban growth for 1994: (a) very high urban growth of 4.1 per cent and above; (b) high growth ranging from 3.1 to 4 per cent; (c) moderate growth from 2.1 to 3 per cent and (d) low growth at less than 2 per cent. The table shows more or less the same trends as in the case of the degree and level of urbanization discussed above. Urban growth is very high in poor countries such as Afghanistan, Bangladesh, Bhutan, India, Nepal and Pakistan as compared with developed countries in the region. Natural growth and rural urban migration are the major factors responsible for rapid urban growth in less developed countries of the region.

Table 5: Classification of countries and areas in the ESCAP region by percentage annual urban growth, 1994

Percentage annual growth	No. of countries/ areas	Countries and areas (annual growth rate: per cent)
Very high growth rate (14.1% or higher)	14	Indonesia (4.2), Malaysia (4.2), Commonwealth of the Northern Mariana Islands (4.2), Pakistan (4.3), China (4.3), Cambodia (4.5), Papua New Guinea (4.6), Maldives (5.5), Bangladesh (5.9), Lao People's Democratic Republic (6.1), Bhutan (6.1), Solomon Islands (6.5), Nepal (6.9), American Samoa (8.2), Afghanistan (8.6)
High growth (3.1-4%)	10	Democratic People's Republic of Korea (2.4), Myanmar (3.3), Philippines (3.4), Mongolia (3.6), Vanuatu (3.6), Thailand (3.9), Islamic Republic of Iran (3.9), Marshall Islands (4.0), Tuvalu (4.0)
Moderate growth (2.1-3%)	12	Australia (1.4), New Caledonia (2.1), Sri Lanka (2.2), Republic of Korea (2.3), Republic of Palau (2.3), Cook Islands (2.4), Tonga (2.5), Brunei Darussalam (2.6), Kiribati (2.7), Viet Nam (2.9), India (2.9), French Polynesia (2.9)
Low growth (less than 2%)	10	Nieu (0), Japan (0.6), Samoa (0.6), Hong Kong (1.0), Nauru (1.2), New Zealand (1.3), Fiji (1.7), Macau (1.7), Guam (1.9), Singapore (2.0)

Source: 1994 ESCAP Population Data Sheet.

Growth of cities

The big cities play a major role in transforming resources into useful goods and services that contribute to national economic production. They affect both local and regional environments by consumption of goods and the generation of residuals. In many countries and territories of the ESCAP region, the rapid growth of the urban population has resulted in the formation of mega-cities, defined by the United Nations as cities with 8 million or more inhabitants (United Nations, 1991:23). Currently, more than half of the world's 30 largest urban agglomerations are located in the ESCAP region. In 1950, there were only two cities with a population of more than 5 million, namely Tokyo and Shanghai (table 6). Ten years latter, the number increased to five cities, with Beijing, Osaka and Calcutta being added to the list; by 1990, the number reached 18 cities.

Table 6: Largest urban agglomerations in ESCAP region, ranked by population size, 1950-2000

City	1950	1960	1970	1980	1990	1995	2000
Tokyo	6.7	10.7	14.9	16.9	18.1	18.5	19.0
Shanghai	5.3	8.8	11.2	11.7	13.4	15.1	17.0
Calcutta	4.4	5.5	6.9	9.0	11.8	13.6	15.7

Beijing	3.9	6.3	8.1	9.0	10.8	12.3	14.0
Osaka	3.8	5.7	7.6	8.3	8.5	8.6	8.6
Bombay	2.9	4.1	5.8	8.1	11.2	13.1	15.4
Tianjin	2.4	3.6	5.2	7.3	9.4	11.0	12.7
Jakarta	2.0	2.8	3.9	6.0	9.3	11.4	13.7
Hong Kong	1.8	2.6	3.4	4.5	5.5	5.8	6.1
Metro Manila	1.5	2.3	3.5	6.0	8.5	10.1	11.8
Delhi	1.4	2.3	3.5	5.6	8.8	10.9	13.2
Bangkok	1.4	2.2	3.1	4.7	7.2	8.6	10.3
Madras	1.4	1.7	3.0	4.2	5.7	6.7	7.8
Seoul	1.0	2.4	5.3	8.3	11.0	12.2	12.7
Tehran	1.0	1.9	3.3	5.1	6.8	7.5	8.5
Karachi	1.0	1.9	3.1	5.0	7.7	9.5	11.7
Bangalor	0.8	1.2	1.6	2.8	5.0	6.5	8.2
Dhaka	0.4	0.6	1.5	3.3	6.6	9.1	12.2

Source: World Urbanization Prospects, 1990 (New York: United Nations).

Mega-cities in industrially advanced countries such as Japan grow relatively slowly. However, owing to a large population base, the mega-city of Tokyo, for instance, will reach 19 million population by the year 2000. The city of Osaka will reach 8.6 million at the turn of the century. Shanghai, Bombay and Calcutta, which are located in developing countries, are each expected to grow to 15 million or more by that time. Beijing, Tianjin, Jakarta, Delhi, Seoul and Dhaka are projected to exceed 12 million each, while Karachi and Metro Manila will exceed 11 million each.

Owing to the rapid development of these mega-cities, the environmental repercussions will be profound. They will place enormous burdens on the infrastructures of these cities in terms of demand for sewage disposal, transportation and general utilities. Except for the developed countries of Japan, Australia and New Zealand, the developing countries of the region will find it difficult to tackle the problems of urban degradation, industrial pollution, waste generation and general congestion. Ultimately mega-cities will place huge stress on the urban environment which in many cases has already grown beyond carrying capacity. None the less big cities continue to attract more and more people, even though those cities are the least capable of meeting the basic needs of their populations.

Rural-to-urban migration

Although rural-to-urban migration is not the only, nor necessarily the main, cause of urban population increase in the ESCAP region, it is often singled out as the main contributor to urban problems. In the case of Pakistan, 70 per cent of urban population growth is from natural increase while only 22 per cent is due to migration; the remaining 8 per cent is due to reclassification or upgrading of rural settlements into urban areas. Many Governments in the region attempt to reduce the growth of their respective primate cities, primarily by curbing rural-to-urban migration. But economic opportunities for the people appear to be better in the urban areas, as compared with the rural areas. Therefore, urban areas become magnets attracting people from less advantageous regions of a country, creating problems in big cities that most Governments find difficult to solve.

Environmental problems and concerns

There is increasing concern that urban areas should be made more environmentally sustainable. In this context, sustainability involves a reduction of both the urban use of natural resources and the urban production of waste and pollution. The concern here is how to reduce these problems and hence improve the prospects for urban sustainability.

Land loss

In the ESCAP region, productive activities such as manufacturing are becoming increasingly concentrated in towns and cities at the expense of the rural areas. Economic forces have been a major determinant of land use in and around urban areas. The conversion of natural and agricultural ecosystems to provide urban infrastructure, such as housing, roads, factories and other facilities, is a typical example of the increasing use of land for developmental purpose. Most susceptible to urban encroachment is high quality agricultural land and open spaces. In Pakistan, for example, it is estimated that on average about 60,000 hectares (ha) of agricultural land and open spaces are lost every year owing to urban expansion (Khan, 1989). A similar situation prevails in India where more and more agricultural land is steadily being converted to urban uses; the rate has been estimated at about 75,000 ha per year.

Long-term land use change records show that the areas built-up with human settlements in countries of the ESCAP region increased from more than 2.5 times in the case of Pakistan to more than 11 times in the case of Brunei Darussalam between the 1950s and the 1980s, when building and infrastructural development increased rapidly. The projected increases in the built-up urban areas of selected cities in the region vary from 180 ha annually for Hong Kong to 2,900 ha annually each for Bangkok and Karachi. During the past three decades, China has utilized about 6 million ha of land largely for the construction of factories, public building, housing and roads. In Japan, build-up areas constitute 4 per cent of the total area of the country. In the Republic of Korea, 2 per cent of the total land area is devoted to residential purposes alone.

A unique features of land use in urban areas of many countries within the ESCAP region is the existence of pockets of agricultural land and open spaces within city boundaries. For instance, a survey of 407 towns and cities in India by the Town and Country Planning Organization revealed that about half of the land within cities is either vacant or still used for agriculture. This situation is indicative of the fact that urban expansion in the initial phases either surrounded or leap-frogged fertile agricultural lands, which often are maintained as such for speculation.

Deforestation and loss of habitats

There is now increasing concern about the threat to flora and fauna posed by the development of natural habitats. Agricultural practices which affect vast areas of land can be equally damaging. The threat from development must, therefore, be put into perspective. In the ESCAP region, the evidence is that considerable damage in being done to forests in the areas surrounding big cities. Between 1972-75 and 1980-82 the forested area within 100 kilometres of India's nine largest cities collectively diminished by one-third owing to the energy demands of those cities. Delhi imports some of its fuel-wood from Assam State, which is about 1,000 km away. Owing to deforestation in and around urban areas, the habitats are also under pressure. Thus, the importance of "green-belts" in and around cities is being emphasized increasingly as a means for creating or preserving natural habitats. Closely related to the question of habitats is that of urban "greening". There is a growing conviction that cities must be planted with more trees and other vegetation for aesthetic and ecological reasons. Lusser (1991) and Khan (1991) argued that trees and parks act as important pollution filters and absorbers, as well as havens for wildlife (DOE, 1993).

Transport in cities

There is now recognition, which is clearly stated in "This Common Inheritance" (DOE, 1990), that towns and cities are major contributors to the world's environmental problems. Metropolitan areas are simultaneously enormous consumers of natural resources and producers of waste and pollution. Inextricably bound up with urban areas are transport systems. Transport is a major contributor to energy depletion and pollution problems. All the indications are that, unless corrective action is taken, mobility will increase, journeys will become more complex and urban land uses more dispersed. Hence, all the problems associated with energy consumption and pollution will get worse in the future, particularly in the less developed areas of the ESCAP region.

It is now recognized that urban settlements are a major determinant of travel patterns and hence energy consumption. The implications are that, by guiding urban development efficiently into more appropriate forms in the future, planners could contribute to a reduction of energy consumption and emissions. ECOTEC (1993) pointed out that over the longer term more efficient urban forms could have a major influence on transport usage and hence energy efficiency and reducing the problems of air pollution. A Department of Energy (1990) report on energy use and efficiency in the transport sector over the next 20 years concluded that decentralized forms of urban development might produce lower levels of energy consumption than centralized forms and ultimately reduce the level of emissions and pollution.

Shelter and the environment

Slums and squatter settlements

Owing to rapid increases in population in countries of the region, many people are being drawn to cities by the prospect of finding jobs and making a better life. But in the cities, they find themselves facing a host of obstacles, many man-made, that effectively deny them any kind of permanent decent shelter with a minimum of basic amenities: clean drinking water, lighting, sanitation and waste disposal. Most migrants, therefore, gravitate to squatter colonies where they build some kind of shelter for themselves. As a result, many countries and territories of the ESCAP region suffer from the spread of slums and marginal human settlements. The urban population inhabiting such settlements range from a low of 15 per cent in Singapore to over 50 per cent in Bombay and Delhi. Bombay's slum dwellers increased from 3.25 million in 1976 to 4.2 million in 1981. In 1994, the situation has become even worse, with the outlook for the future being bleak. The proportion of slum dwellers in the total metropolitan population increased from 41 to 51 per cent during the same period and is likely to reach 75 per cent by the year 2000. Slums and squatter settlements are generally characterized by the absence or severe lack of a basic infrastructure with services such as sanitary water supply, sewerage and drainage, roads, health care and education. Dwellings are generally made of discarded materials such as scraps of used wooden planks, bits of plastic, corrugated metal, asbestos sheeting and even cardboard. Population densities in such communities are high and malnutrition is often widespread. Inadequate water supply and sanitary facilities result in a high incidence of environmental diseases, the most recent being the outbreak of plague in India during 1994.

In many cases, the squatters encroach upon lands which are hazard-prone, such as active flood plains. Each time a flood strikes, squatters occupying the flood-prone banks of the Lyari River in Karachi suffer from loss of life and property. In some cities in the Pacific subregion, such as Nuku'alofa in Tonga and Ponape in the Federated States of Micronesia, land shortages have led to encroachment into mangrove and other swampy areas where public health risks are high.

Inner-city slums are usually rental tenements which have deteriorated owing to lack of proper and regular maintenance or repair. These are located in the older sections of cities and are characterized by a low standard of infrastructure and high person-to-floor space ratios. A significant number of urban residents in some cities of the ESCAP region have no shelter at all. Numerous pavement dwellers sleep on the roadside and in public parks in the cities of Calcutta, Bombay and Dhaka. A majority of these pavement dwellers have lived in the same situation for more than a decade, although a number are only recent migrants from the rural areas who have not yet consolidated their positions in cities.

There are three critical components in confronting the urban shelter problem. These are, firstly, the availability of low-cost urban land which could be utilized for housing the poor; secondly, the provision of access to affordable financing to help the poor to improve their housing; and thirdly, the organization and participation of the community in planning and implementing low-income housing. The most critical limiting factor in the acquisition of shelter is its non-affordability, i.e. the poverty of those who need shelter.

According to various estimates, the incidence of urban poverty in most countries of the ESCAP region ranges anywhere between 15 and 86 per cent. More importantly, the absolute number of urban poor in the Asian and Pacific region is expected to increase by 20 million before the year 2000 (Lee, 1987).

Water supply and sanitation

Within each city there are trunk infrastructural networks, such as water supply, sanitation, solid waste collection, roads and transit systems. Most countries of the ESCAP region have been experiencing deficits in their existing infrastructural networks in spite of the significant investments made over the last 20 years. For the rapidly growing urban populations in low-income countries, it is difficult to meet the requirements for expansion that would be needed to service more people and to support economic development. The reasons for this are well known: the large capital investments required, inadequate cost-recovery from previous investments, the use of inappropriately high standards and technologies, and poor maintenance and operation (Huyck, 1987).

Having access to safe drinking water and sanitation facilities is a basic human right without which people cannot achieve a quality of life consistent with human dignity. Recognizing this, the International Drinking Water Supply and Sanitation Decade was proclaimed by the United Nations General Assembly in November 1980. Among individual countries, the availability of water supply connections in urban areas varied from 24 per cent in Bangladesh to 100 per cent in Singapore, with the sanitation status ranging from 5 per cent coverage in Afghanistan to 100 per cent in Singapore and Tuvalu.

Regarding access to safe drinking water and sanitation services in the ESCAP region, many Asian capital cities, such as Jakarta, Manila and Bangkok, have been and currently are implementing sizeable water supply and/or sewerage projects, and the percentage of households with access to safe drinking water and sewerage has increased as it is expected to do even more so during the next few years. Improvements in the supply of urban water in the Pacific subregion are also continuing, although, in some cases, these may be threatened by catchment disturbances or simply by the over-exploitation of limited ground-water resources. Most urban centres in the Pacific have also advanced their treatment of sewage. Fiji's approach, i.e. dispersing secondary effluent into mangrove areas, is one example that is proving to be an effective way of avoiding eutrophication problems.

Solid wastes

In low-income countries, large cities such as Calcutta and Karachi generate around 0.4-0.7 kg of solid waste per capita per day, while cities in middle-income countries, such as Manila, Bangkok and Kuala Lumpur, generate around 0.5-1.0 kg of waste per capita per day. In high-income countries, principal cities such as Tokyo and Singapore produce daily over 0.8-1.5 kg of solid waste per capita. Waste characteristics also vary with the economic level of the cities. In high-income cities, domestic solid waste contains a bigger fraction of combustible materials such as paper and plastic, whereas waste from low-income cities contains a bigger fraction of compostable materials, mainly food wastes and other biodegradable materials.

The storage, collection, transport, treatment and final disposal of solid wastes also vary, depending mainly on the economic development of the country. In many cities in developing countries, refuse is stored for disposal in a variety of containers ranging from old kerosene cans and rattan baskets to used grocery bags. In many instances, the refuse is dumped on roads or pavements rather than in proper refuse bins. Collection is done mainly using open dump-trucks and a few compactor-type collection vehicles. Disposal is normally by burning as well as dumping in sites where scavengers collect whatever saleable items they can find. With often limited land available for disposal sites, it was revealed in 1981 that 18 Pacific island countries had major waste disposal problems; there has been little improvement in this situation in the ensuing years. Cities of developing countries usually have problems related to inadequate budgets, lack of technical

know-how and lack of public cooperation regarding proper storage and disposal of solid wastes.

Ambient environmental situation

Air pollution

Good air quality is essential for human health and for the environment as a whole. Polluted air can adversly affect the quality of life, especially for those with asthma, bronchitis and similar respiratory problems. Polluted air can damage historic buildings and kill or damage sensitive plant life. In the long term, it can even change the quality of the soil and water. With few exceptions, most large urban areas in the ESCAP region suffer from air pollution, mainly in the form of suspended particulates and sulphur dioxide. Generally, in high-income countries, cities such as Tokyo, Osaka, Melbourne and Sydney have relatively lower levels of air pollution than cities in developing countries: for instance, Shenyang, New Delhi, Tehran and Jakarta, where World Health Organization guidelines on particulates and noxious gases are invariably exceeded. It should be mentioned that pollution caused by nitrogen oxides is one of the major problems faced by cities of developed countries such as Japan.

The deterioration of air quality in urban areas is mainly the result of increases in industrial and manufacturing activities and in the number of motor vehicles. Motor vehicles normally concentrate in the urban areas and contribute significantly to the production of various types of air pollutants, including carbon monoxide, hydrocarbons, nitrogen oxides and particulates.

In several countries of the region, the increase in per capita energy consumption has been quite dramatic. For instance, over the period 1965 to 1985, the per capita energy consumption of Indonesia, in kilograms of oil equivalent, increased from 91 to 219; in Thailand, from 80 to 343; in Malaysia, from 312 to 826; and in Singapore, from 670 to 2,165.

There is another environmental dimension to this aspect of development besides related air pollution problems, namely, the depletion of non-renewable natural resources. Like the air pollution problem, the depletion of non-renewable sources of energy has global implications.

There is a corresponding relationship between the increase in air pollution and the rise in respiratory diseases. Air pollution pushes up the incidence and severity of emphysema and chronic bronchitis, and dirty air severely aggravates the symptoms of many kinds of asthma. Air pollution also boosts the frequency with which people, especially children, develop short-term respiratory ailments. Mortality due to cardiovascular disease, particularly of people over 65 years of age, can increase with air pollution because laboured breathing strains the heart. Studies in China have revealed that air pollution, along with smoking, also greatly increases the risks of lung cancer.

Water pollution

Water is essential to human life and is used for all aspects of daily living. Although it is the responsibility of mankind to keep the environment clean, in the majority of the cities in the developing countries of the ESCAP region, urban rivers are heavily polluted with domestic sewage, industrial effluent and solid wastes. Typical examples are the Lyari and Malir rivers in Karachi, the Ravi in Lahore, the Kabul River in the cities of Kabul and Peshawar, the Chao Phraya River and the numerous canals in Bangkok, the Pasig and Tenajeros-Tullahan rivers in Metro Manila, and the Ganges in several cities of India.

While many rivers flowing through urban areas in the developing countries of the ESCAP region have deteriorated in quality, significant efforts are also being exerted to reverse this trend. The Ganga Action Plan in India is one. In the Philippines, the Department of Environment and Natural Resources has launched the Ilog Mo, Irog Ko ("My River, My Love") project aimed at cleaning up the Tenajeros-Tullahan River in Metro Manila. The project is patterned after the highly successful 10-year programme to clean up the Singapore River and Kallang Basin. Similar efforts are planned or under way in a number of other countries in the region. For example, in Pakistan, IUCN and the Government are preparing an action plan to clean the Kabul River.

Industrial, toxic and hazardous wastes

The majority of industries in the ESCAP region are located in and around urban centres. For this reason, the adverse effects of the effluent and emissions from industrial plants are more visibly felt by the urban population. The lack of central sewerage systems and the congestion that exists in many urban areas make more difficult the management of wastes coming from chemical plants and other manufacturing firms. Halogenated hydrocarbons known to be injurious to human health are the most frequently transported of such pollutants.

Noise pollution

Urban noise and traffic congestion are emerging problems in many of the principal cities of the region, although in some cities, such as Bangkok, Hong Kong and Jakarta, these constitute the most visible urban environmental problems. A

major source of urban noise is motorized traffic, particularly motorcycles equipped with two-stroke engines and sawn-off silencers. In Japan, noise is a major cause of complaints. Road traffic is also a major source of noise in Australia. If current trends continue, there will be more acoustically unacceptable areas and the number of Australians affected will increase by more than 40 per cent by the year 2000 (Australian Government, 1986). As the standard of living in the region improves, people will become more sensitive to the level of noise in the environment. Currently, only the developed countries in the region, such as Japan and Australia, consider it a major problem. However, highly urbanized countries and territories, such as Singapore and Hong Kong, have already started comprehensive programmes to monitor and control noise pollution. Increases in population, urbanization and industrialization wherever they occur will significantly increase noise pollution.

Conclusions and recommendations

Owing to the rapid economic, demographic and urban growth that has taken place in the region, the pressure on natural resources and environmental amenities has been increasing rapidly, particularly in mega-cities. Urban growth is very high, particularly in the developing countries of the region, mainly due to natural increase and migration. Urban areas, particularly mega-cities, account for a large share of economic activities. With the exception of China and India, in many countries these growth patterns are centred in only one or two major cities while, without intervention, the other urban centres remain too small to attract economic activity.

The adverse consequences of continuing urban expansion and over-urbanization are being felt in areas surrounding cities as well as inside the cities. The principal problems in the surrounding areas are the utilization of agricultural lands and open spaces to provide the necessary infrastructure. Deforestation, particularly near big cities, is also taking place to meet the energy and other needs for an expanding population. This leads to irreversible loss of land which should be available for food production and its natural ecological potential. The disproportionate increases in urban populations result in urban congestion and tremendous pressure on the urban infrastructure. Consequently, most of the principal cities in the ESCAP region, particularly in the developing countries, face problems related to inadequate housing, which results in the growth of slums and marginal settlements. Also, there is a shortage of water supply, especially in the dry hot season, and inadequate sanitation, deficient solid waste collection, poor treatment and disposal systems, traffic noise and congestion as well as air, water and noise pollution. These are the common attributes of urban areas. They have been in existence in the past and are likely to remain so for some time into the future.

In response to these problems, a number of newly industrializing and developing economies in the ESCAP region have implemented, or are starting to implement, measures to alleviate the environmental problems in their principal cities. These measures include the cleaning of rivers close to urban areas, landscaping, through the planting of trees, and reserving urban areas as "green belts", site and service schemes, and the provision of planned land use, the upgrading of slums and providing for the people's basic needs and social services, as well as reducing the use of fossil fuels, among other measures. These steps will not remedy the situation over night. It will take a long time to achieve minimum environmental standards required for maintaining human health and the well-being of other living organisms. This can be achieved only by adopting effective environmental policies and implementing programmes aimed at bringing about sustainable development.

In order to ameliorate the current population, urbanization and environmental conditions, the following recommendations may be helpful for Governments to choose from. Because of countries' geographical, ecological and socio-cultural diversity, some options may be suitable to only some countries; others may already have implemented them.

1. Inter-agency/governmental cooperation and coordination

There are strong links between population, development and the environment. Therefore, Governments should strengthen mechanisms to coordinate policies and programmes, and give unified direction for integrating environmental and population concerns into development policy and planning. Particularly when formulating socio-economic policies, plans and programmes, their implications with regard to demographic trends, patterns of production and consumption, protection of the environment and the conservation of natural resources, should be taken fully into account.

2. Use of environmental technologies and methods

Environmental technologies and methods, such as geographic information systems (GIS), remote sensing and environmental impact assessment, should be used for integrated policy formulation and decision-making, evaluation and monitoring. In developed countries, environmental technologies are already being used. Ideally they should help developing countries with regard to aspects such as the supply of pollution control technology, hardware, software, access to remote sensing data and human resource development, with short courses, workshops and seminars being held as appropriate.

3. Regional and rural development

In cities, environmental problems are due mainly to over-population. Besides natural growth, migration from rural areas also contributes to very high urban growth in the developing countries of the ESCAP region. Therefore, more emphasis should be given to making rural areas more livable by providing basic amenities and social services which are either non-existent or inadequate. At the same time, jobs in the ecological and environmental sectors should also be created in rural areas. Such jobs include reforestation, small-scale agro-based industries and local tourism. This would help in reducing

the number of people moving from rural areas to the cities. Reforestation would also improve the condition of natural habitats and the supply of wood for energy purposes.

4. Strengthening of family planning programmes

Population growth in cities of the ESCAP region is very high, mainly as a result of natural growth. This situation could be improved by implementing family planning programmes, especially among the poor at their door-step. Religious leaders should also be encouraged to play a part in this regard.

5. Efficient urban planning

Plans for urban areas should be prepared and preventive measures should be adopted to stop urban sprawl by imposing regulations on unregulated urban housing. Services could be provided to people who pay for it or at least share the cost. At the same time, curative measures such as upgrading slums should also be carried out with the involvement of the community. Furthermore, the efficient allocation of land use to different urban functions and good urban form could reduce the problems of air and noise pollution created by automobile traffic, which in certain urban areas is very high.

6. Development of a comprehensive environmental database

For environmental planning and management, environmental data comprise an essential prerequisite. The environmental planner should have access to a body of well-researched environmental data, which can be regularly updated. Because some environmental issues do not have political boundaries, the ESCAP secretariat could also play an important role in the collection and dissemination of such data, which can be used for comparison and analysis at the regional or subregional levels.

7. Environmental education and awareness

Lack of environmental awareness is a very important factor in the process of environmental degradation. This situation needs to be tackled, particularly in developing countries where literacy levels are low and many people live in marginal economic circumstances. Both formal and non-formal methods of education should be adopted through means such as local media, seminars, celebrations, workshops, walks and student competitions. Also, to sensitize government representatives about these issues, ESCAP should continue to hold workshops and meetings regularly, ideally involving people from other walks of life, too.

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Lee, B.K. (1987). "Major urban development issues: an overview", In: Urban Policy Issues (Manila: Asian Development Bank).

United Nations (1991). World Urbanization Prospects, 1990 (New York: United Nations, Department of International Economic and Social Affairs).Table 1: Population growth trends in ESCAP region.