



**UNITED NATIONS**  
**ECONOMIC AND SOCIAL COUNCIL**

Distr.  
GENERAL  
E/ESCWA/13/4/Add.22  
5 February 1986  
ORIGINAL: ENGLISH

**ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA**

Thirteenth session  
19-24 April 1986  
Baghdad

Item 6(a) of the provisional agenda

**PROGRESS MADE IN THE IMPLEMENTATION OF  
THE WORK PROGRAMME**

**URBANIZATION IN WESTERN ASIA:**

**ENVIRONMENTAL CONSEQUENCES**

Note by the Secretariat

86-0181

Received  
17 MAR 1986  
ECWA Library

CONTENTS

<u>Chapter</u>	<u>Page</u>
I. INTRODUCTION .....	1
II. STATUS OF URBANIZATION IN THE ESCWA REGION .....	2
III. ENVIRONMENTAL PROBLEMS OF URBANIZATION IN THE ESCWA REGION ..	4
IV. ENVIRONMENTAL CONSEQUENCES OF URBANIZATION: TRENDS AND RECOMMENDED ACTIONS .....	11
A. Urban development .....	11
B. Management of the urban environment .....	12
C. Public participation .....	12
D. Housing .....	13
E. Water supply, sewerage and liquid pollution .....	14
F. Industrial development and pollution .....	16
G. Air pollution and the microclimate of cities .....	17
H. Management of urban solid wastes .....	17
I. Urbanization and public health .....	18
J. Transport, tourism and recreation .....	19

## I. INTRODUCTION

Environmental problems of metropolitan centres in the ESCWA region stem, by and large, from the rapid rate of population growth in areas that are not prepared to accept the sudden influx of new inhabitants.

The population explosion in many metropolitan agglomerations has caused considerable strains on all types of environmental services and in turn posed real threats to public health and the environment. In our overcrowded cities, refuse collection systems are often only able to serve less than half of the urban population. While coverage with water in urban areas is 84 per cent, coverage with sewerage networks is only 56 per cent, which leads to grossly inadequate sanitation in the squatter areas. The impact of the unhygienic conditions has been reflected in the infant mortality rate, which averages 110 per thousand in the region compared with the World Health Organization (WHO) target of 50 per thousand.

Substantial increases in the number of cars and traffic congestion coupled with uncontrolled emissions from industrial sources contributed to the acute problems of air pollution. Overcrowding, noise, air pollution and inadequate housing create dissatisfaction and psychological stresses among the urban poor living in the metropolitan centres.

The emphasis of governments and local institutions in the past has been directed for the most part to development and sound use of resources rather than promotion of environmental quality. It was not until the last decade that governments began to express serious concern for environmental protection. Most recently, public concern has begun to move from short-term pollution problems to the broader issue of the environmental impacts of population growth and economic development.

Another new task is being assigned to the battery of existing local governments' functions: environmental protection. While the programmes vary from area-wide planning and implementation of integrated environmental programmes to management of limited activities such as monitoring emissions and issuing permits to industry, they all seem to be moving in the general direction of linking development to environmental quality.

The recent proliferation of new programmes for pollution control and environmental enhancement made it essential for policy and programme co-ordination in the environmental area. As tougher environmental standards are gradually enacted, and as local governments become increasingly concerned about the overlapping and unco-ordinated environmental programmes, the complex interrelationships and the need to streamline these programmes become apparent. This realization has sparked the recent interest in creating an autonomous administrative mechanism for management of environment in the ESCWA metropolitan centres.

## II. STATUS OF URBANIZATION IN THE ESCWA REGION

The rate of urban growth in the member States is currently about twice that of the developed countries and is expected to be three times as high by the year 2000.

Concentration of urbanization in the primate cities, especially in the developing countries of the ESCWA region, causes acute environmental problems. Large-scale industrialization, massive migration of the rural population to the primate cities, the inadequacy of shelter and the accompanying infrastructure of water and sewerage, as well as the inefficiency of transport and other public services, have created serious social and environmental problems in the marginal settlements of the metropolitan areas.

Most local governments have begun to accept marginal settlements as an inescapable part of the urbanization process and consequently initiate on-site renovation programmes rather than clearance. In Cairo, Damascus and Amman comprehensive on-site renovations were begun recently with the aim of providing adequate urban infrastructure and public services while retaining or improving most of the existing housing stock in the marginal settlements. While relocation is inevitable for some prime locations in the metropolitan centres, on-site renovations seem appropriate in most cases as they are less expensive and result in minimal socio-economic impact on the community.

Comprehensive plans for improvement of marginal settlements should encompass integrated planning and management of a broad range of physical, environmental and socio-economic development components. Owing to the diversity of the social, economic, political, legal and environmental characteristics of the marginal settlements in the region, tailor-made programmes should be developed with the widest possible community participation. Mobilizing community participation requires informing the public of the programme concepts, identifying their priorities, overcoming skepticism and promoting indigenous activities. Activities should be co-ordinated as to location and time among concerned government agencies to maximize benefits and avoid negative impacts and wastage of resources; long-term integration of the marginal settlements with the larger urban community require implementation of improvement programmes through existing administrative and non-governmental institutions.

A high-level political commitment is crucial for development of an effective urbanization strategy. The commitment on the part of the governors and other city officials is likely to bring greater convergence between regional development plans and urbanization strategies. The present "stop-and-go" strategies of urbanization in most member States weaken the growth potential of the metropolitan centres and aggravate the existing management problems. Legislative authority should act in a flexible manner either to discourage or encourage growth with the aim of limiting or expanding the resource base of the city. It should be noted that current trends to stop population growth in primate cities of ESCWA cannot substitute strategies that directly address the problems of congestion, pollution, inadequate shelters and deteriorated environment. To ease the problems of primate cities,

intermediate urban centres must pursue policies to attract industry and deflect rural-urban and city-to-city migrants from the capital and primate cities.

In practically all member States, industrial estates have been advocated as a means of attracting new manufacturing plants to new sites with adequate services. These estates, however, are neither necessary nor sufficient to attract industry to provincial locations; they may represent a burden on the community if they are too large or premature. Evidence from experience in Saudi Arabia, Egypt and Jordan indicates that successful industrial estates are either export-processing or free-trade zones in the capital region or in major harbours.

In seeking solutions to existing environmental problems induced by unplanned urbanization in the region, the following long-term objectives should guide future actions in that regard: devolution of power and decentralization of decision-making; new settlements based on agricultural development; new settlements away from capital and primate cities; development and restructuring of major metropolitan centres; river basin development; and development of depressed regions. Decentralization in countries like Egypt, Syria, Saudi Arabia and Iraq is needed as concentration of power and allocation of public expenditures by the central governments has paralysed local governments and weakened community initiatives. It is obvious that projects to restructure major metropolitan centres will be quite different, depending on whether they deal with a high concentration of population in the city States like Kuwait, Qatar and Bahrain or with problems of metropolitan agglomerates in the context of large countries with vast hinterlands like Iraq and Egypt.

### III. ENVIRONMENTAL PROBLEMS OF URBANIZATION IN THE ESCWA REGION

There is overwhelming evidence which indicates that provision of adequate environmental services, high literacy and economic prosperity are prerequisites for the maintenance of good health in the region. The data shown in table 1 indicate a distinct decline of infant mortality as coverage with water and sewage disposal services increases. A similar trend is evident as literacy rates increase, especially for females in view of their vital role in the care of infants. Wealthier countries of the region, mainly the Gulf States, are more able to provide a full range of social services than are the less affluent countries. However, rural services continue to lag behind urban services in all member States, which emphasizes the need to intensify efforts to improve services for both urban and rural dwellers. The scarcity of financial resources and lack of experience in many countries of the region require intensive efforts on the part of the United Nations and other international co-operation agencies to help member States in acquiring information and adopting appropriate schemes of environmental services wherever needed. To that effect, ESCWA, the United Nations Environment Programme (UNEP) and WHO are promoting the development of environmental information systems for collection and dissemination of information on health and environmental effects, pollution control technologies and monitoring of emission sources.

Mental disorders account for up to 30 per cent of illness brought to the attention of physicians in the region; according to a WHO study, the problems are linked with the stressful impact of abrupt social change in the area. The traumatic encounter of the younger generations with urban values and the maladjustment of rural peoples to city ways and industrial environment are features of growing concern to psychiatrists as one child in 10 shows symptoms of psychiatric disturbance. Drug addiction is widespread in the metropolitan centres, leading addicts to toxic psychosis; in Egypt alone about 50,000 urban dwellers are addicted to opium and chemical drugs. Anxiety and depression are common in the region. Organic psychosis, psychosomatic cases and schizophrenia are among mental disorders frequently diagnosed in countries like Kuwait and Lebanon, where they account for 40 to 70 per cent of psychiatric disorders. Growing attention is being given to psychotherapeutic treatment of juvenile delinquents. Bahrain has provided care for delinquents within the penal system while Egypt and Syria have given this responsibility to the Ministries of Social Affairs.

Occupational hazards predominate in almost all industrial complexes in the region. As more petrochemical complexes, power plants, textile mills, phosphate mines and steel plants spring up in order close to metropolitan centres, they bring about new work-related hazards. Noise pollution is reaching critical levels in weaving factories, steel mills and mechanical industries throughout the region, leading to widespread problems of impaired hearing. Offshore drillers in the oil-producing countries are exposed to skin diseases, chemical intoxication and heat exhaustion. In many urban areas, scores of small establishments such as food processors, car maintenance workshops, small textile finishing mills, and handicraft factories are employing both young and very old workers who work long hours in an

Table 1. Basic indices of the ESCWA region

Country	Population (Millions)		Per cent Urban (1982)	G.N.P. (1982) (per capita) \$	Adult Literacy (per cent)			Services (per cent coverage)		Infant Mortality per 1000 Birth		Primacy Index 1980-1990	
	(1982)	(2000)			T	M	F	U	T	U	T	1980	1990
Bahrain	0.371	0.688	81	5138	73	79	64	100	100	100	34.6	100	100
Democratic Yemen	2.093	3.309	36	460	31	48	16	77	44	33	152	50	40
Egypt	44.673	65.200	44	650	47	56	28	100	75	95	80	39	38
Iraq	14.160	24.926	64	2410	43	63	23	92	74	30	82	54	57
Jordan	3.130	6.400	60	1997	67	81	52	100	89	94	65	37	37
Kuwait	1.570	2.969	91	20900	71	76	64	100	100	100	22.8	100	100
Lebanon	2.640	3.617	65	1200	77	85	68	95	92	-	48	78	79
Oman	1.500	-	15	4134	30	47	12	70	15	60	111	-	76
Qatar	0.270	0.469	74	31600	-	-	-	98	95	-	30	100	100
Saudi Arabia	10.000	18.864	-	12600	25	35	12	92	91	-	103	20	20
Syria	9.300	18.102	48	1446	60	78	53	77	71	58	57	33	32
United Arab Emirates	1.130	1.916	74	24660	68	70	63	100	100	-	23.8	100	100
Yemen	7.145	9.859	11	460	9	18	2	95	30	-	174	25	22

T = Total; M = Male; F = Female; U = Urban.

The primacy index is the ratio of the population of the largest city to the total urban population.

unfavourable environment. As to heavy industries, they are being operated with known and unknown hazardous emissions which have detrimental effects on the workers' health. The massive influx of migrant labourers is placing a staggering burden on health services of the Gulf States, especially in Qatar, Bahrain and the United Arab Emirates, as these workers are subject to, and a source of, potential serious health problems. In the agrarian countries, farm workers are increasingly exposed to chemical poisoning from pesticides, the chronic threat of water-borne diseases and accidents caused by agricultural machinery.

Car traffic is rapidly increasing in urban areas and in most cases appears to be the most significant pollution source in primate cities. The population of Greater Cairo will grow from its current level of about 10 million to 13.5 million by the year 2000. Over the last 10 years the number of private cars and taxis increased from 100,000 to 750,000 (22 per cent per annum). Publicly owned transport is operated inefficiently at a considerable loss and the passenger demand far exceeds the supply of services.

Stationary turbines for electricity production are used extensively in the region. The reason for operating power plants with gas rather than steam is the steep rise in electricity demand and the immediate availability of natural gas. Industrial processes contribute appreciable loads of particulates mainly from cement and urea plants, SO<sub>2</sub> mainly from natural gas and petroleum desulfurization, as well as hydrocarbons, carbon oxides, nitrogen oxides and hydrogen fluoride. Since a multitude of industrial activities based on utilization of natural gas have been commissioned in some countries (Saudi Arabia, United Arab Emirates, Egypt and Iraq) significant air pollution problems will be created if gas desulfurization is not provided. Sprawling urban communities in the member States are expected to be increasingly exposed to respiratory diseases such as asthma, bronchitis and emphysema since noxious doses of industrial wastes, car exhaust gases and other harmful pollutants continue to be emitted at an alarming level.

Provision of adequate shelter to the deprived masses of urban communities continues to be the prime problem of major cities in the region. Inadequate financing for housing, a lack of political will, the low return on investment and the extreme shortage of building materials contributed to lower production of public housing units, and private contributions have been discouraged by the relative unproductivity of investment in housing due to rent restrictions. Governments continue to be less than aware of the role of housing as a key element for socio-economic development and a tool for environmental enhancement.

The concept of public servicing ahead of land use does not seem to have been implemented in most ESCWA countries, which aggravates existing congestion problems within city limits and hinders natural expansion in peripheral areas which lack essential services. The share of the family income spent on shelter varies considerably from one country to the other. However, low-income families in all ESCWA urban centres find it increasingly difficult - even impossible in some instances - to acquire any accommodation let alone an adequate one. Government action is needed to secure land and housing from speculative forces. Successful long-term planning for low-income housing is



dependent on availability of land, provision of reasonably priced building materials and encouraging development of the local labour force for the housing industry.

The leading experiment of the Amman Municipality for promoting "self-reliance" should be highlighted as it provides a realistic solution to the squatters and reduces capital investment of the housing schemes. The project is based on a "sites and basic services" approach whereby house lots are provided with basic infrastructure such as sewerage, water and electricity and sold as such to low-income families. The purchaser then completes his household according to his needs and as his income allows. Construction of two-storey frames with floors and one or two rooms completed served as the basis for an effective "core house" project for slum clearance in Amman. Such a policy should be expedited by Governments in the region for low-income housing in slum areas.

Some of the important priorities of the region lie in the areas of safe water supply, sanitation and community health. Environmental health problems, especially in the marginal settlements, are intensive in nature and extensive in impact, presenting a complex situation that demands immediate attention. Urbanization in the past was motivated by rapid financial returns, and the pursuit of economic development without due regard to community needs which has led to the current distortions. Environmental services like water supply and excreta and wastewater disposal require huge investments with no direct return which could prove their economic worth. Development plans clearly demonstrate the fallacy of planning for better economic productivity without concurrent environmental protection; as a result, the gap between economic growth and environmental deficiencies has continued to increase in urban settlements of the region.

Increased industrial activities coupled with inadequate control of wastes in major metropolitan centres have resulted in steady decline of the quality of surface waters (Cairo, Alexandria, Baghdad, Amman, Damascus), and withdrawal of underground waters at a rate greater than that of recharge (Bahrain and Qatar) rendered underground supplies unfit for domestic uses. Discharge of raw or partially treated domestic wastes into surface waters has impaired the assimilative capacities of streams and led to a deterioration of natural water bodies.

Most urban water supply systems have exceeded their serviceable life and exhibit serious leakage. Service connections are frequently worn-out or inappropriately installed which causes enormous wastage and potential cross-pollution. Surveillance of the water quality in the networks and at household level is nominal; in a few instances, urban areas' water supplies are virtually unmonitored. Water rates, by and large, are unrealistically low, which encourages considerable wastage. Most of the metropolitan water treatment plants were installed by international firms using traditional technologies with little or no on-site experimentation, which often results in ineffective operation and excessive use of chemicals. Maintenance of distribution systems has been marginal in most cities; corrosion, insufficient replacement of damaged lines and faulty installation has led to tremendous "unaccounted for water" which makes up as much as 40 per cent of the total

supply (Cairo and Alexandria). Obviously, leakage control and efficient network maintenance can lead to the upgrading of water quality besides adding an extra source for the increased urban population in the future.

Sewerage and sewage treatment works are among the priority problems in the urban communities. The emphasis on provision of water supply as a first priority of municipalities has undoubtedly accentuated problems of sewage management. The increasing incidence of water-borne diseases, mosquito infestation and pollution of streams by sewage attest to the urgency of the problem. Most industries discharge their effluents into the sewerage networks or directly into the streams without adequate treatment. The associated water pollution - a negative index of industrial development in the region - is assuming large proportions in almost all metropolitan areas of the member States. The public health consequences of continued population growth in non-sewered areas, coupled with the increased discharge of untreated sewage, has an adverse impact on the welfare and environment of urban areas.

Most municipalities are unable to manage an efficient solid waste management system; this is attributed in part to the relegation of waste handling and disposal to the lowest level of responsibility. Street-sweeping is normally manual except in a very few countries. More than 80 per cent of urban solid wastes and refuse is disposed of by open dumping in an unhygienic way although sanitary landfilling or controlled tipping is being practised in some areas. Composting is receiving increasing attention in a number of member States since it yields a compost fertilizer of suitable quality. Plans in some major cities (Kuwait, Doha, Abu Dhabi, Alexandria, etc.) exist for increasing portions of the refuse to be composted. Incineration is still practised in some areas despite objections on account of atmospheric pollution. Labour-intensive recycling operates on a vast scale in Egypt, where almost all saleable items are salvaged. At present, urban centres are facing the following solid waste management problems: air pollution from burning of refuse, rodent and insect vectors in open communal storage, health hazards to workers exposed to an unhygienic environment, delayed and inefficient refuse collection, lack of suitable and accessible landfill sites and shortages of motor vehicles and equipment.

Most municipalities are not equipped with pollution-monitoring laboratories, although local agencies are being setup for the enforcement of standards for domestic as well as industrial emissions. Most enacted standards are not realistic in view of available technology and resources; this, in addition to the ineffectiveness of monitoring schemes, has led to widespread non-compliance with the emission standards and gross disregard for local environmental protection regulations.

Environmental services, particularly sewage treatment works, encounter serious operational problems in most member States. Quite commonly, projects receive the benefit of high technology and are equipped with sophisticated facilities which require highly skilled technicians. Design and construction is often assigned to an agency independent of the agency in charge of operations; this hampers essential adjustments during early phases of operation of treatment works. Other problems which impede proper operation of environmental services include: shortage of manpower needed for management and

operation of the services, ineffectiveness of preventive maintenance, lack of accountability, systematic overloading of treatment units, frequent bypassing or erratic operation of waste control systems, laxity in management especially in handling urban solid wastes, and apparent lack of consumer vigilance and public interest.

Evidence indicates that the marine environment is being contaminated by microbes and bacteria which affect the public health; it is polluted with synthetic compounds such as pesticides which accumulate in aquatic organisms; in addition, there is a gradual build-up of toxic metals such as cadmium and mercury the toxicity of which is magnified as they rise through the food chain, with man as the ultimate consumer. Most countries in the region are committed to protection of the marine environment through prohibitions on dumping of hazardous materials in the seas and the institution of national plans of action for combating massive oil spills. Sources of marine pollution which originate from major metropolitan centres in the region and are discharged into the Mediterranean, the Gulf and the Red Sea are the target of action plans jointly supported by UNEP, WHO, UNESCO and the member States.

The Gulf coastline is dotted with about 20 urban settlements which host various industrial activities such as oil refining, ship-repair, petrochemicals, steel and cement. Over 100 freighters enter the waterway daily through the Strait of Hormuz to load at one of 26 terminals; frequent accidental oil spills from tanker collisions or groundings represents a serious problem for the coastal cities of the region. Oil shipments sailing through the Gulf of Aden and the Red Sea also contribute to marine pollution and ecological damage of these waterways.

For urban dwellers in the ESCWA region, environmental decay has become a personal problem - the acrid smell of air emissions from industry and traffic, the unpleasant taste of water and unwieldy problems of waste disposal; the rumble of workshops piercing the allowable decibel level and the increasing incidences of food-poisoning. Most cities in the area are growing at an average rate of 4 per cent a year - much higher than the overall regional growth rate of 2.5 per cent. In larger metropolitan centres like Cairo the population is soaring at a staggering rate of over 8 per cent. At the present rate of urbanization, the demand for environmental services is so high that the provision of adequate services has become an overriding challenge to planners and city managers.

Just as economic development is imperative for the progress of the region, measures to control urbanization and improve environmental services in the major metropolitan centres are urgently required. Priority actions comprise the following:

(a) Autonomous agencies responsible for construction and operation of services should be established;

(b) Indigenous consultancy services and development of local manpower to reduce reliance on foreign help should be promoted;

(c) Heavy dependence on government subsidies for environmental services should be gradually decreased. This demands the levying of reasonable charges on domestic water supplies, sewerage and refuse collection. Industries should be charged the real cost if they elect to benefit from such public services;

(d) The siting of new industries should be directed away from prime cities with intelligent exploitation of the environment's assimilative capacity;

(e) Public involvement is essential to generate internal funding for new projects and to ensure, possibly through voluntary organizations, the proper performance of public services.

#### IV. ENVIRONMENTAL CONSEQUENCES OF URBANIZATION: TRENDS AND RECOMMENDED ACTIONS

If present urbanization trends continue, ESCWA metropolitan centres in the year 2000 will be more populated, more polluted and more vulnerable to ecological disruption. It is unlikely that housing, water, sanitation and other public services will be able to keep pace with urban growth. Unless decisive actions are taken promptly to alter current trends, city life and environment will be more precarious by the turn of the century than it is now.

##### A. Urban development

###### 1. Trends

(a) The ESCWA urban population in 1980 amounted to 48 million; in 1990 it will reach 71 million and at the end of the century it will increase to 102 million. Physical congestion and blight will dominate in major cities; they appear to defy efforts towards improvement or control and are causing insoluble problems of planning, management and financing.

(b) Throughout the region, urban/rural imbalance will continue and the existing community services and social institutions may be shattered as a result. Squatters' settlements are mushrooming and in some urban areas they constitute as much as half of the population.

(c) The technological, economic and human resources needed for urban renewal now appear to be beyond the means of most member States. The already extensive burden involved in the provision of housing and urban services is likely to be more difficult in the future as countries with popular urban settlements are experiencing acute balance of payment difficulties which severely restricts the investment in urban development and environmental services.

###### 2. Actions

(a) Suitable planning on a regional scale (city or metropolitan territorial planning) may guide urbanization and redirect internal and external migration to enhance rather than impede development. Planning should emphasize self-reliance and full utilization of existing economic potentials of the region and promote the establishment of new centres to absorb rural people through judicious location of new industries and the development of services in a more decentralized pattern.

(b) Regional development projects at different stages of planning and execution already exist in some member States. In spite of dissimilarities in the level of economic growth, social structure, political organization and technological development among countries of the region, it seems possible that exchange of experience on urban planning offers a unique possibility for formulation of sound plans and development of adequate operational policy. In this regard, it should not be overlooked that practical approaches and techniques emanating from the lack of resources in some member States may now prove to be of interest to urban planners in the more developed areas.

B. Management of the urban environment

1. Trends

(a) The organizational tangle of administrative agencies responsible for community services is responsible for the gross ineffectiveness of urban environmental management. Government programmes will continue to develop piecemeal as problems and demands emerge.

(b) The continuing trend of local environmental protection committees composed of heads of the executive branch and special interest groups will diminish effectiveness and responsiveness of the committees to the real community needs.

(c) Legislators will resist providing localities with effective tools, funds and swift enforcement devices which may obstruct local initiatives to combat pollution and improve environmental quality.

2. Actions

(a) A new environmental management set-up must be created in major urban centres. The institution should have a clear perspective on the priority environmental problems, and should be flexible and responsive in assigning priorities, researching remedies and devising appropriate environmental enhancement measures.

(b) Management should rely on environmental impact assessment, cost-effective analysis, human perception studies and achievable environmental standards.

(c) Cheaper, more cost-effective programmes adapted to the needs of the local community must be developed and implemented with maximum dependence on local resources. Practices and technologies evolved in the different social and economic environments may not be appropriate.

(d) External environmental costs should be internalized whenever feasible. Available options comprise restructuring of the pricing policies to reduce environmental stresses and wastage of resources, promotion of environmentally sound practices through rewards and penalizing of undesirable activities and imposing pollutant effluent charges to encourage reduction of emissions.

C. Public participation

1. Trends

(a) Public tolerance or indifference to negative visual and psychological manifestations of pollution and other forms of environmental degradation continues.

(b) The imbalance of pressure on government will rise as the public, in contrast to regulated parties, is not organized to influence administrative and legislative actions. Although public awareness is bound to increase, special interest groups will continue to exert pressure on public decisions.

(c) Changes in public attitudes are not foreseen in the foreseeable future as benefits of environmental protection are widely dispersed with individuals being affected incrementally.

## 2. Actions

(a) Environmental policy options must be aired to the public. Information on cost and benefits of alternative measures, environmental impacts and human perception studies must be prepared in laymen's language. Public participation mechanisms should ensure that all interests are weighed in a decision in proportion to their stake in the outcome.

(b) The institutional mechanism should permit recalling of decision-makers by the public or local legislative bodies as a means of strengthening accountability to and awareness of the public.

(c) Information should be disseminated to the public through newspapers, broadcasting services and other mass-media systems.

(d) Strengthening the financial and technical capabilities of the non-governmental organizations and citizens' groups dealing with the protection and improvement of the environment.

## D. Housing

### 1. Trends

(a) Existing trends offer little likelihood of an early solution to the housing problems in the region. The impact of governments' intervention will not ease the housing shortage in the coming two decades, nor will the emphasis on rural development and the efforts towards establishing new cities cause any significant reduction of urban growth and associated housing needs.

(b) It is expected that inadequate financing for public housing and the lack of political commitment will continue to affect governments' investment in housing as the provision of shelter for the masses is regarded as a non-wealth-generating industry. Decision-makers continue to disregard housing as a tool for economic development and as a key source of social benefits.

(c) The region will witness the mushrooming of slums near industrial areas, water courses and railway lines and their spread will present a significant source of physical and social deterioration of the urban environment.

(d) Housing problems will be compounded by lack of maintenance of existing building, unrealistic government control of rental policy, absence of regional long-terms plans for housing and unavailability of labour force.

### 2. Actions

(a) The countries of the ESCWA region are facing the challenge of providing adequate shelter for everyone. Greater use of traditional material

and the incorporation of new techniques in traditional building methods should be advocated, particularly in large labour-surplus countries like Egypt. The excessive use of cement, steel and other scarce materials in luxury construction should be discouraged.

(b) Regional housing boards should explore the potentials for "core house constructions" in low-income areas, where basic facilities and inexpensive materials are provided through construction agencies and further expansions are left to the occupants. Using appropriate building technology with self-help content and locally available materials accords well with the aspirations of the people.

(c) Land policy should aim at mobilizing the necessary financial resources for development, control of land speculation and increase of the area of usable land by utilizing sanitary landfills in the proximity of human settlements and reclaiming seashores to cater for multi-storey construction for public housing. This approach has been followed by Qatar, Bahrain and Kuwait.

(d) Construction of multi-storey blocks in downtown areas as well as near work places should be intensified through the combined efforts of users, governments and co-operative organizations.

(e) Development of manpower for construction through on-the-job training and construction training institutes will create extra employment potential and aid in stabilizing housing costs.

#### E. Water supply, sewerage and liquid pollution

##### 1. Trends

(a) Urban and industrial effluents will continue to be disposed of improperly in the rivers, lakes and coastal zones near the large urban-industrial agglomerations; some member States will be unable to afford the extra cost of pollution control owing to lack of financial resources.

(b) The reuse of domestic and industrial effluents is likely to increase as urban populations expand rapidly, particularly in the water-short Gulf States. The use of treated effluents can recycle nutrients which otherwise may overload the assimilative capacity of water bodies.

(c) Urbanization and industrialization will also increase the consumptive uses of water. Cooling for power-generating facilities is expected to increase threefold by the year 2000. Thermal pollution is critical in the region as natural water bodies are usually warm for most of the year and, for many species living close to their upper temperature tolerance, thermal discharge is often lethal.

(d) Construction and operating costs of water and sewerage systems in the region are on the average the highest in the world. They are nearly double the costs of Europe and three to four times the costs of Africa and the Americas. Costs will continue to escalate due to reliance on foreign



contractors, adoption of energy-intensive treatment technologies and the abnormal losses of the distribution systems which often consume half of the water supplies.

(e) By the year 2000 water coverage will reach all the urban population of the region while sanitation services will be extended to about 90 per cent of the region, with anticipated complete coverage in urban settlements of the Gulf States, Egypt, Iraq and Jordan.

(f) Provision of water and sewerage services may be impeded owing to inappropriate administrative and financial frameworks, inadequate or outmoded legal instruments, insufficient local production of materials, difficulties in using proper tariffs to curb water wastage, shortage of manpower and absence of comprehensive long-term regional plans for water and sanitation.

## 2. Actions

(a) Average urban water per capita consumption has reached about 300 l/d in the Gulf States and between 100-200 l/d in other countries of the region. The needs of the growing population coupled with the scarcity of water supplies require increased reliance on water recycling in industry, extensive metering and reduction of network losses.

(b) Since provision of a continuous water supply will not be feasible in most ESCWA urban centres because of increasing size of population and limited capacity of distribution systems, it is recommended to supply water at normal pressure at specific periods with minimum pressure being maintained at all times to reduce pollution due to suction if supplies are turned off intermittently.

(c) While the benefits of dams and irrigation development may outweigh the costs, environmental impacts should be incorporated as an essential part of the river basin development schemes. The impact of the Aswan dam is a case in point, as elevation of the water table and increased salinization were attributed to year-round irrigation; other impacts were the collapse of sardine fishing, the relocation of 100,000 people and the spread of water-borne diseases.

(d) Sewerage master plans should be prepared to relate sewage management to land use, water consumption, transportation and industrial growth.

(e) State governments and central planning agencies should promote the solution of sewerage problems on a metropolitan-wide basis rather than a local piecemeal basis and should provide the needed financial and technical support to accomplish this task.

(f) Several wastewater treatment works face chronic problems of overloading, treatment upsets due to the presence of toxic industrial constituents, lack of expert manpower and ineffectiveness of preventive maintenance. Performance has to be upgraded and continuously monitored to enable safe use of treated effluents for crop irrigation and other non-domestic uses.

(g) Enactment of legislation to control pollution and evolution of appropriate emission standards should be "tailor-made" to suit local socio-economic and technical capabilities. At the outset, the environmental standards should be more relaxed than those of advanced countries but gradually reviewed and upgraded to meet stringent environmental quality requirements.

(h) Autonomous water supply and sewerage boards should be established in major metropolitan centres to ensure effective and responsive performance in the construction, operation and maintenance of the services.

## F. Industrial development and pollution

### 1. Trends

(a) The industrialization pattern in most ESCWA countries will maintain most of its present counter-productive effects. Industry will concentrate in urban centres, which will contribute significantly to overcrowding, poor hygiene, overloading of services and appreciable environmental degradation.

(b) In those countries of the region that do not have established polices, and institutional set-ups to ensure implementation of adequate safeguards to alleviate industrial pollution, transnational corporations may seize the opportunity to introduce less cost-intensive polluting industries in order to achieve maximum profitability.

### 2. Actions

(a) The negative consequences of industrialization should be abated through institution of suitable emission standards, installation of pollution control equipment, implementation of in-plant controls and effective monitoring of pollution sources.

(b) A concerted effort towards recovering the secondary materials would not only alleviate the waste problems but could as well provide a substantial source of raw materials. New impetus should be given to the potential of regional exchange of secondary products for recovery and utilization.

(c) Governments of populated countries should promote employment of labour-intensive less polluting industries, upgrade existing production systems to reduce wastes and decentralize industrialization to ease the burden on the strained urban centres. In the oil producing countries, efforts should be directed towards use of modern low or non-waste technologies and prohibition of hazardous technologies that are no longer tolerated in the industrialized countries.

(d) A regional information network for industry and environment and establishment of guidelines on the appropriate technologies and approaches to the siting of industries should be developed.

## G. Air pollution and the microclimate of cities

### 1. Trends

(a) With increase in urban growth, the mean temperature in the cities is expected to rise owing to loss of evaporative cooling normally provided by vegetation, the gain of reradiated heat from pavements and heat produced directly by factories and exhaust of air conditioning systems. However, the incremental temperature increase is not expected to produce dramatic changes in climate in the foreseeable future.

(b) The city air will be more polluted with gradual build-up of particulate matter, sulphur oxides and nitrogen oxides. These materials have a climatological effect as well as an esthetic and public health impact.

(c) Air-borne diseases such as chronic tonsillitis and acute bronchitis will continue to prevail in the region.

### 2. Actions

(a) Preventive and remedial measures should be implemented through control of existing sources and physical planning of present and future areas to take into consideration the quantity and location of sources and the means of disposal of high-load emissions.

(b) To reduce environmental impacts of traffic emissions the policies for public transport and land use should be geared to improving the efficiency of mass transit and limiting the growth of automobile use.

(c) Busy centres should be relieved by providing bypass routes to divert unnecessary traffic and concentrate emissions in selected corridors separated from population centres.

(d) Research and monitoring of urban air pollution should be strengthened to enable assessment of sources, loads, mechanisms of transport and dispersion in the atmosphere.

## H. Management of urban solid wastes

### 1. Trends

(a) Mechanization of the collection system will remain the major obstacle towards effective handling of refuse.

(b) Although incineration and composting are carried out in a number of ESCWA cities, sanitary landfills will continue to be the predominant choice of a method for disposal of urban solid waste.

(c) Municipalities will continue to regard recycling of waste as capital investment projects which need to break even or make profit. However, recycling is likely to be an economically feasible option owing to the high costs of other disposal methods.

## 2. Actions

(a) Urban planning should reserve within city master plans an adequate area for long-range refuse disposal need.

(b) Further efforts should concentrate on the potentials for material recovery and on-the-site disposal of refuse.

(c) Governments should promote recycling of solid waste through taxing on virgin materials to encourage use of secondary materials, setting up incentives for industries to use byproducts and eliminating inequity between the transport cost of scrap and virgin materials.

### I. Urbanization and public health

#### 1. Trends

(a) Health hazards emanating from pollution are likely to increase in the future due to continued release of toxic chemicals which causes poisoning upon exposure to high doses and may induce chronic diseases if released into the environment in low doses for long periods.

(b) The unfavourable climate, malnutrition, low socio-economic standards, hypersensitivity and the deteriorated living conditions in substandard communities will continue to hinder the objective of Health For All by 2000.

(c) Attention will be given to studies on total exposure of populations and sensitive subgroups to potentially toxic substances arriving by various pathways.

(d) Hazards of traffic pollution are bound to increase, particularly in the congested city centres; with potential formation of excessive photochemical oxidants responsible for smarting eyes, throat irritations and impairment of lung functions.

(e) Illness related to life-style in urban communities and the link between environment and mental health will remain a focus of attention.

#### 2. Actions

The following are recommended:

(a) Continued support for the United Nations' and other international efforts to control major infectious diseases and programmes for promoting human environment in urban settlements.

(b) Development of effective programmes for primary health care in ESCWA metropolitan centres.

(c) Support for research and development on improved environmental quality and actions to combat environmentally induced diseases.

(d) Threshold limit values and acceptable daily intakes of potentially harmful substances established based on regional epidemiological studies in view of prevailing undernutrition, spread of parasitic infections and exposure to unhygienic environment among majority of urban population.

(e) Concerted efforts to develop health information systems and data on mortality and morbidity associated with environmental pollution. Such data are essential for carrying out retrospective analyses of cause and effect relationships and the consequent devising of appropriate remedial measures.

(f) Assessment of health impacts, particularly risk assessment, should be incorporated along with environmental integrity in the feasibility studies of the major developmental programmes.

## J. Transport, tourism and recreation

### 1. Trends

(a) Urban transport networks will gain more attention as a dominant mover of people and goods. However, progress may be slowed by lack of parking areas, lack of co-ordination between various mass-transit systems, unsatisfactory road conditions and inefficient traffic control systems.

(b) Tourism is likely to expand, especially for coastal cities and prime historical sites, which will bring added social and environmental strains along with financial benefits to areas with touristic potentials.

(c) Development of adequate urban recreational facilities is crucial for urban dwellers; however, the shortage of land, water resources and public finance will continue to affect rapid development of recreational centres in most cities of the region.

### 2. Actions

(a) Further actions are needed to limit noisy and polluting vehicles; there should be continued development of roads, traffic systems and extension of services to suburban areas; regulatory instruments should be devised where appropriate to achieve these tasks.

(b) Guidelines should be developed to reduce damaging impact of tourism on fragile environments and urban communities.

(c) Recreation should be regarded as an important aspect of metropolitan planning; local governments should support private and public endeavours to provide recreational facilities in urban centres.

(d) Legislation should be enacted to provide a means of acquiring and preserving land and other natural resources for recreational use.

(e) The public awareness of the social, cultural and health values of recreation should be enhanced.