ENVIRONMENTAL IMPACT OF RAPID URBANIZATION AND INDUSTRIAL DEVELOPMENT: WATER RESOURCES IN THE URBAN CONTEXT

May 15, 1989

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by

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ACRONYMS

ADB	Asian Development Bank
A.I.D.	Agency for International Development
ANE	Bureau for Asia and the Near East
BMA	Bangkok Metropolitan Administration
BMR	Bombay Metropolitan Region
CMDA	Calcutta Metropolitan Development Authority
CPHEEO	Central Public Health Engineering and Environment Organization (India)
GEMS	Global Environment Monitoring System
GNP	Gross National Product
HABITAT	United Nations Center for Human Settlements
JABOTABEK	Jakarta, Bogor, Tangra, and Bekasi
MHR	Ministry of Housing and Reconstruction (Egypt)
MLGCD	Ministry of Local Governments and Community Development (Philippines)
MMC	Metro Manila Commission
MMDA	Madras Metropolitan Development Authority
MOH	Ministry of Health
MOPE	Ministry for Population and Environment (Indonesia)
MWWA	Metropolitan Water Works Authority (Thailand)
NCEPC	National Committee on Environmental Planning and Coordination (India)
NEB	National Environment Board (Philippines)
NEDA	National Economic and Development Authority (Philippines)
NEPC	National Economic Protection Council (Philippines)

NGO	Nongovernmental Organization
NPCC	National Pollution Control Commission (Philippines)
OCP	Office of the Commissioner for Planning (Philippines)
PVO	Private Voluntary Organization
UN	United Nations
UNEP	United Nations Environment Program
WASH	Water and Sanitation for Health Project
WRI	World Resources Institute

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EXECUTIVE SUMMARY

OVERVIEW

This paper is one of a series commissioned by A.I.D.'s Bureau for Asia and the Near East (ANE) for its use in developing its Environment and Natural Resources Management Strategy. As such, it assesses the environmental effects of rapid urbanization and industrial development in the 15 countries that fall within the purview of ANE: Morocco, Tunisia, Egypt, Jordan, Yemen Arab Republic (A.R.), Oman, Pakistan, India, Nepal, Burma, Bangladesh, Sri Lanka, Thailand, Indonesia, and the Philippines. These countries are greatly diverse in geographic location and population growth, but they have all experienced rapid urbanization and industrial growth over the past 20 years.

Between 1950 and the year 2000 the population in the ANE countries is expected to triple, from 600 million to 1.8 billion. During the same period, the urban population is expected to increase sixfold, from about 100 million to more than 600 million. The urban population explosion can be attributed to natural increases in the large urban populations and migration from rural areas to take advantage of the greater employment opportunities offered in urban areas. An extremely important problem caused by urban growth is the rapid increase in the number of poverty-stricken urban households. Urban poverty very often causes greater hardships than rural poverty, and the complex urban situation makes it almost impossible for services to be provided without government intervention.

The rapidly changing urban situation has had a detrimental effect on the environment of almost every city in the ANE region. Deterioration of water quality has had serious impacts on health and the overall quality of life for urban dwellers and workers. Air pollution has reached critical proportions in many Asian cities, and industrial and hazardous wastes are being disposed of indiscriminately, with resultant environmental and public health consequences.

Environmental degradation is of concern in the dense urban core, as well as in the rapidly expanding peri-urban areas in ANE cities. Dense housing of substandard condition, unsuitable land use arrangements, and municipal and industrial waste disposal all contribute to a critical need for action to alleviate or address environmental and natural resource protection. Water shortages have occurred; inadequate wastewater collection has resulted in deplorable sanitary conditions; municipal and industrial wastes have polluted watercourses; development on fragile lands has made them prone to excessive flood damage; the overextraction of groundwater has caused land subsidence; industrial and vehicular

emissions pollute the air. Public health levels are very low, and the urban poor who are concentrated in densely populated peri-urban enclaves tend to suffer the most from the degraded environment.

This paper focuses on water-related environmental issues. This is not to deemphasize the crucial environmental problems associated with air quality and industrial and hazardous wastes. Water is life, however, and one of the key elements on which urban living relies.

INTERSECTORAL PERSPECTIVE

Water is the natural resource that is central to sustainable development and, thus, it has broad cross-sectoral relevance. Water resources provide a direct link to all development sectors and to the sectors that make up the sphere of urban development. The linkages work in both directions--urbanization has impacts on water and other resources, and those resources play a major role in influencing urbanization and industrial growth.

Development interventions in any sector--housing, physical infrastructure, health, industry, or agriculture--affect water resources. In the rapidly developing urban environments, the ripple effects of poor sectoral programming on water and the environment are dramatic. The impact of a compromised water supply will be felt by individuals as a loss in the quality of life and by industry and commerce as a degraded input in the production process. Decreased health and well-being will in turn have negative repercussions on productivity. Thus, development that does not protect urban water resources ultimately will forestall economic growth and undermine efforts to achieve the elusive goal of a healthful and sustainable urban environment.

Typically, provision of water supply has preceded provision of adequate sanitation in the ANE region. Sewerage has seriously lagged water supply, often diminishing the intended benefits for health and quality of life associated with safe drinking water. Sanitation's relevance to water resources and, thus, to this paper is that proper disposal of wastewater is a major factor in preventing degradation of the environment and public health, in and outside the cities.

INDICATORS

A major objective of this paper is to present a set of strategic indicators for use as guides in formulating urban policy and programs and in monitoring program status. Four

categories of indicators were developed based on available data: urban/demographic, economic, social, and environmental. The indicators included within each of the four categories, uses of the information, and potential data sources are summarized in Table 1. A number of the indicators are quantified for the ANE countries in Appendix A.

For most of the ANE countries, a great deal of information is available or the framework is in place to collect the data needed for the indicators. The problem with much of these data is that they are not ordinarily comparable between countries, or they are not at the appropriate level of detail for use in making policy decisions regarding urban planning and/or natural resources. (See Section III for a detailed discussion of the indicators, data sources, and data needs.)

NATIONAL POLICIES AND APPROACHES

Many varied patterns of urban development and environmental policy have been adopted by central governments and various city and regional entities in the ANE countries (see summary in Table 2). Success has been varied, but in general, the urban environmental policies adopted were weak and noncomprehensive, and funding for implementation, monitoring, and regulatory control was low.

In most of the ANE countries, responsibilities for urban development are badly fragmented among many ministries and agencies. These responsibilities are generally based on laws and regulations that are concerned with parts of problems and that prevent actions based on comprehensive, long-term considerations. Further, there is very poor coordination among agencies or sectors.

The institutions involved in urban development and management of the environment are in dire need of strengthening so that comprehensive urban management, including land use policy, water resource and supply management, spatial planning, public health policy, and pollution control can be developed and implemented. Further, heightened environmental awareness must be incorporated and integrated into planning at all levels so that both direct and indirect impacts can be identified and addressed. This awareness must be developed both in U.S. funding agencies and in the ministries and agencies of countries in Asia and the Near East.

Table 1: Indicators, Uses and Data Sources

Type of Data	Indicator	Uses of Information	Examples of Data Sources	Summary Table in Appendix
Urban/ Demographic	• % urban population	• assesses importance of urban sector	- secondary data such as census, international donor agencies	A1
	• growth rate of urban population	• indicates scale and magnitude of urban growth • identifies potential future problem areas	- local planning ministries - World Bank, United Nations, US A.I.D. - universities and	A1
	• absolute number of urban dwellers	• serves as basis on which to assess demands for infrastructure, housing & jobs	institutions - HABITAT - data on human settlements	A1
	• physical distribution of population in urban centers	• determines appropriate allocation of resources (primary cities or secondary)		A2
	• growth of cities	• indicator of magnitude of problem		A2a
Economic	• Gross National Product per capita	• correlates with % urbanized; shows strength of urban area in national economy	- secondary data such as census, international donor agencies	A3
	• % labor force in services and industry	• correlates with level of urbanization, could be basis for industrial location policy • increasing industrialization could have environmental impacts	- World Bank, United Nations, US A.I.D. - universities and institutions - World Development Report	A4
	• poverty levels (rural/urban)	• indicates ability to pay for services • shows relative attractiveness of urban areas		A5
Social	• health data such as infant mortality rates, incidence of waterborne diseases, respiratory diseases, life expectancy	• symptom of environmental conditions • indicates of availability of safe drinking water, waste disposal and treatment, or sanitation	- World Bank - World Health Organization - Water Supply and Sanitation Decade data	A6
Environmental	• coverage of infrastructure - water, sewers, solid waste • urban waste generation rates	• indicates environmental conditions	- Water Supply and Sanitation Decade data	A7
	• housing conditions	• determines quality of life	- HABITAT	A8
	• housing densities	• measures of population pressure on land and water resources	- local ministries and agencies - field observations - case studies of cities if available	
	• high-rise/multi-story building types	• measures of scarcity of urban land and high land values	- GEMS, INFOTERRA	
	• location of urban development in relation to water resources	• indentifies marginal areas - possible future problem areas	- urban planning agencies	
	• water quality	• indicates success of waste disposal and treatment, management of water resources	- international donor agencies, missions, local offices	
	• land use patterns	• identifies possible problem areas such as residential adjacent to industry		

Sources: *Based on readily available data*

Table 2: Selected Country Approaches to Environmental Protection, Urban Sector and Industrial Location

Country	National Spatial Policy	Industrial Location Policy	National Urbanization Policy	Environmental Regulations/ Policy	Water and Sanitation	Hazardous Waste	Health	Housing	Comments
Morocco				E	E		E	E	
Jordan				E	E		E		Presence of water determines spatial policy
Sri Lanka				E					Uncoordinated urban development
Bangladesh				E	E	E	E		Environmental policy not well implemented
Pakistan				L	E				Environmental policy in place but not integrated
Egypt			E	E	E			E	Spatial policy focused on decentralization
India		E		L	E		E	E	Industrial development not permitted in 5 largest cities
Nepal				E					National conservation strategy - not linked to urban areas
Yemen A.R.									Law based on Islamic principles
Thailand	L			L	E	E	E		Decentralization policy ineffective
Philippines	E	E		E	E		E	E	Spatial policies focus on growth centers
Indonesia	E		E	E	E	E			Extensive environmental regulations

E - Exists (success unknown)
L - Limited Success in Implementation
Blank - Denotes no policy or inavailability of data

COMPARATIVE PERSPECTIVE

In an attempt to delineate general urban characteristics across the ANE countries, a detailed comparative analysis of eight cities was prepared based on the following framework:

- Urban form, which identifies the city's profile--high-rise or sprawling, its role in the national or regional economy, and the anticipated population growth.
- The quality of life in the city considering housing, health, coverage of water, proper sanitation, and municipal solid waste disposal services.
- The environmental characteristics of the city.
- Management responses and/or governmental organization in reaction to rapid urbanization.

The comparative analysis indicates that the most significant problems across the ANE countries are the following:

- Lack of adequate water supply, sanitation, solid waste disposal, and drainage. The lack of these services is the most critical factor contributing to the degradation of the environment and the quality of life of urban inhabitants.
- Urban land use is driven by high-density development necessitated by the unavailability of land. This development pattern has had a deleterious impact on the environment and has caused incremental destruction of natural resources.
- The response by central and provincial governments to the problems of urbanization has generally been the piecemeal creation of authorities or organizations with fragmented responsibilities and very short-term objectives. Support for these organizations by the central or provincial governments often wanes soon after their creation and the weakened organizations in turn have tended to focus only on single sectors.

Several policy implications follow from the comparative analyses:

- The ANE countries require stronger, comprehensive policy frameworks that contain strong environmental components.

- Urban policies and programs must focus on strengthening the management processes within and between local and national organizations so that urban development activities can be carried out based on long-term objectives that address the multisectoral needs of large metropolitan agglomerations.

- Urban government institutions must be upgraded so they can readily identify problems accompanying rapid urbanization and industrial growth. Urban databases should be developed to provide urgently needed information on the dimensions of urban problems and steps being taken to resolve those problems.

- Environmental impact cannot be considered incrementally. Policies and strategies must be comprehensive and fully recognize sectoral linkages.

- Urban governments' highest priorities in terms of service provision to mitigate environmental degradation should be wastewater collection, water supply, and solid waste collection and disposal.

MAJOR DONOR ASSISTANCE IN THE URBAN SECTOR

Donor assistance in the urban sector has been primarily directed toward physical infrastructure, physical planning (including spatial planning), and urban administration and finance. Environmental issues, if they have been dealt with at all, have usually been part of other programs or sector strategies.

A.I.D.

A.I.D.'s efforts for the past 15 years have focused on projects in rural areas and have largely involved technical assistance. There have been some notable capital-intensive urban interventions, however, mainly in Egypt.

Many of A.I.D.'s programs serve urban populations indirectly, for example, through health and economic development projects. Environmental factors are considered by evaluating the potential environmental effects of particular projects rather than through specific interventions.

Several A.I.D. program mechanisms can be used to provide direct assistance to urban areas:

- Direct assistance for provision of urban infrastructure, to the benefit of the urban poor.
- Housing guarantee programs (Office of Housing and Urban Programs), which provide credit guarantees to finance upgrading of infrastructure services in low-income settlements, development of serviced land sites, municipal management, and finance and land management.
- Economic support and development activities.
- Social service projects in the health, nutrition, population, and educational sectors.

The level of A.I.D. support for the ANE countries varies greatly. Table 3 summarizes A.I.D. funding for different sectors in the ANE countries and provides examples of projects and programs. The table illustrates, except for Egypt, the rural focus and technical assistance nature of ANE's programs.

A.I.D.'s program of housing guarantees in the ANE region for FY 1990 is about $100 million. This program is A.I.D.'s most powerful tool for urban development; it provides for millions of dollars of housing and infrastructure credits at little actual cost to A.I.D. The housing programs supported provide all utilities and other urban services.

Other Assistance

The World Bank's worldwide program in urban development is by far the largest urban program in terms of dollar volume. It is expected to reach several billion dollars in FY 1990. Other United Nations agencies and the Asian Development Bank (ADB) also provide urban sector assistance, mainly technical assistance. However, the ADB's capital investment projects are growing. Other major donors providing bilateral urban development assistance to ANE countries, primarily infrastructure development and housing, include the governments of Great Britain, the Netherlands, West Germany, Canada, Japan, and the Scandinavian countries.

The Government of Japan has become a major donor of foreign assistance over the past few years. Japan's annual worldwide foreign aid budget for FY 1990 is projected to be the largest of any bilateral aid budget.

Table 3: Bureau for Asia and Near East - Summary of Funding
(US $millions)*

Country	Total	Health	Education/ Human Resources	Selected Development Activities	Economic Support Fund	Other**	Examples of Projects with Urban Components
Near East:							
Morocco							
1987	28.4		1.2	1.4	10.0	15.8	Health management improvement
1988	32.5				20.0	12.5	Anhi low income housing
1989	32.5	0.7			20.0	11.8	Tetouan Urban Development
1990	27.5	1.0			15.0	11.6	Watershed management
Tunisia							
1987	17.5	0.3				17.2	Technology transfer
1988	10.9			0.0		10.9	Small project assistance
1989	11.3					11.3	Improved water resources management
1990	12.5					12.5	Science and technology
Egypt							
1987	820.0				820.0	0.0	Cairo/Alexandria wastewater system expansion
1988	718.0				718.0	0.0	Industrial production
1989	930.0				930.0	0.0	Provincial cities
1990	815.0				815.0	0.0	Water/wastewater institutional development
Jordan							
1987	111.0				111.0	25.0	Low cost housing support (1988)
1988	18.1				18.1	0.0	Water systems and services management
1989	15.0				15.0	0.0	Industrial development
1990	35.0				35.0	0.0	Zarqua Ruseifa water and wastewater
Yemen A.R.							
1987	23.3	4.1	9.1			10.1	Tihama Primary Health Care
1988	22.1	2.9	8.3			10.9	Yemen enterprise support
1989	21.0	1.0	6.6			13.4	Basic educational development
1990	21.1	1.0	8.9			11.2	Development training
Oman							
1987	15.0				15.0	0.0	Water resources development
1988	13.0				13.0	0.0	School construction
1989	15.0				15.0	0.0	
1990	20.0				20.0	0.0	
Asia:							
Pakistan							
1987	275.5	5.0			250.5	20.0	Institutional excellence
1988	384.0				334.0	50.0	Development support training
1989	265.0	5.0	13.0		215.0	32.0	Energy planning and development
1990	300.0	1.8	16.0		250.0	32.2	Roads resources management
India							
1987	57.6	8.0		6.2		43.4	Development and management training
1988	23.7	10.2		3.7		9.8	Advancement of commercial technology
1989	24.0	7.0	0.5	3.3		13.2	PVOs for health
1990	25.0	7.8	0.4	5.5		11.4	Technical assistance and support/housing finance

(continued)

Table 3: Bureau for Asia and Near East - Summary of Funding / cont
(US $millions)*

Country	Total	Health	Education/ Human Resources	Selected Development Activities	Economic Support Fund	Other**	Examples of Projects with Urban Components
Asia							
Bangladesh							
1987	84.2	2.0	3.0	1.5		77.7	Urban volunteer program
1988	59.3	1.5	4.3	1.5		52.0	Local government infrastructure and service
1989	61.3	2.0	0.2	2.5		56.7	Enterprise development
1990	55.0	2.3	2.3	1.9		48.5	
Sri Lanka							
1987	23.5	0.3		1.4		21.9	Water supply and sanitation sector
1988	26.8			4.0		22.8	Natural resources and environmental policy
1989	26.8			5.2		21.6	Rehabiliation assistance
1990	18.0			4.6		13.4	Private sector policy support
Nepal							
1987	15.0	3.4	1.0			10.6	Resource conservation and utilization
1988	12.5	1.3	0.8			10.4	PVO co-financing
1989	12.0	1.5	0.5			10.0	
1990	12.0	1.3	1.2			9.5	
Burma							
1987	8.0	1.5	1.0			5.5	
1988	5.1		1.5			3.6	
1989						0.0	
1990						0.0	
Thailand							
1987	21.5	0.3				21.2	Emerging problems of development
1988	21.9			0.0		21.9	Science and technology for development
1989	18.6					18.6	Decentralized development management
1990	19.5					19.5	University development
Philippines							
1987	237.0	4.9	1.3		235.0	-4.2	Municipal development fund
1988	70.0	3.4	0.4	3.4	15.0	47.8	Shelter sector program
1989	338.0	1.3	1.2	1.4	298.0	36.?	Local government improvement
1990	415.0	3.3	2.8	4.5	160.0	24..	Barangay water supply
Indonesia							
1987	85.8	7.2	3.6	4.0		71.0	Local government training
1988	40.5	9.7	6.0	7.6		17.2	Financial institutions development
1989	42.0	3.9	4.4	3.0		30.7	Health sector financing
1990	43.0	8.6	2.9	7.1		24.4	Municipal finance

* This summary does not include full reporting of Housing Guarantee loans provided by the Office of Housing and Urban Development (For example, Jordan received $35 million in Housing Guarantee loans for land policy change and housing for low income groups. Large HG programs for India, Indonesia and Sri Lanka are not reflected.)

**"Other "includes: Agriculture, rural development, nutrition, population planning, child survival, and AIDS

Source: US A.I.D. Congressional Presentation Fiscal Year 1990, Annex II - Asia and Near East

OPTIONS AND APPROACHES FOR A.I.D.

Policy Framework

A.I.D. must develop policy that will guide its urban program activities. Options and approaches for policy formulation must be based on consideration of the following elements:

- The cross-sectoral nature of environmental policy,
- Resource constraints, which may limit A.I.D.'s contribution to technical assistance, and
- The need to include detailed environmental analyses as an integral component of all projects and programs in A.I.D.'s assistance portfolio.

The most critical element concerns funding.

Technical Assistance and Capital Investments

The ANE countries will require enormous investments over the next 10 to 20 years for rehabilitation and/or provision of physical infrastructure, including housing, in urban areas. If A.I.D. practices remain unchanged from those of the past decade, however, it is doubtful that many A.I.D.-sponsored, capital-intensive interventions will be implemented in the ANE region over the next several years. Thus, A.I.D.'s options for policy and programming may be limited to the provision of technical assistance. Such low levels of funding may, in fact, force A.I.D. to take a subsidiary role in the ANE urban sector.

A.I.D.'s most significant urban development intervention appears to be its program of housing loan guarantees. This program offers A.I.D. two options for providing high levels of capital for urban development: (1) increase the total program size or (2) expand on the housing guarantee concept to encompass loans to finance general urban development projects. Such guarantees could provide funds for "seed" money for locally funded projects, credit at beneficial interest rates, and contributions to national or regional development banks.

SPECIFIC APPROACHES

Infrastructure Development

For A.I.D. to be a major donor in urban development, interventions will be necessary to provide the needed infrastructure for basic services, especially urban wastewater collection and treatment. Such interventions would be a major policy shift for A.I.D.

Institutional and Human Resource Development

Weak institutions abound in almost all sectors of the ANE countries. For urban and environmental programs to be implemented and sustained, capable governmental and other institutions must exist. Thus, A.I.D.'s basic strategy should include strengthening host country capabilities to develop and manage urban government and service delivery programs. When selecting programs and projects, A.I.D. should give priority to those that contribute to and are supportive of developing urban and environmental institutional capabilities.

The development of human resources is closely aligned with institutional development. Although human resource needs vary across the ANE region, the general level of need is very high. Training and educational systems oriented toward comprehensive urban management and environmental and resource management stand out as priority needs. ANE countries require enormous help in training personnel and institutionalizing the personnel and support systems needed for effective performance. These are potentially key areas for A.I.D. intervention, and possibilities to provide these interventions should routinely be evaluated as elements of all A.I.D. programs and projects.

Land Use and Housing

Assistance in land use planning and housing will help provide services to maintain the urban populace and bolster the environmental quality of urban areas. Thus, A.I.D.'s assistance in these areas will enable it to be involved at the most basic levels of urban and national planning and development.

Support of Private Sector and NGO Initiatives

A.I.D.'s support of initiatives by the private sector and/or nongovernmental organizations (NGOs) could produce benefits on several fronts. An obvious benefit is that the initiatives are locally conceived in reaction to obvious needs. Thus, they should

have a high probability of success. Second, pressure on the central government to provide the services would be relieved or lessened. Further, because the service is being provided through the private sector, a high degree of cost recovery can be expected.

Private sector initiatives that A.I.D. could support in the ANE countries include the following: provision of water supply and/or wastewater disposal, provision of solid waste collection and disposal, housing development, roadway and drainage maintenance, and general construction services. This list could be expanded depending on the investments available and the characteristics of private sector services in a particular country.

PRIORITIES FOR A.I.D. PROGRAMMING

A.I.D. Program Examination

If A.I.D. is to have a prominent program in urban development, it will have to refocus its efforts and activities to provide a more balanced approach between rural and urban programs. Further, A.I.D. may have to provide assistance in projects requiring large capital investments.

A.I.D.'s first priority should be to revise its procedures to reflect the more balanced approach. The initial component of this effort would include a review of existing A.I.D. policy, programs, and activities to achieve the following objectives:

- Identify policy or statutes that work against A.I.D.'s providing a balanced urban-rural programming approach.
- Determine which projects or programs contain urban components and cross-sectoral environmental elements and whether they should and could be expanded.
- Determine possible areas of cooperation among A.I.D. groups (bureaus, missions, and the Office of Housing and Urban Programs) and between A.I.D. and other bilateral donors and multilateral development banks. Opportunities for cooperation, especially those that involve co-financing, should be incorporated into future A.I.D. program development planning.

The greatest need in all ANE countries is for the provision of basic services—primarily urban wastewater collection and treatment, followed by provision of facilities for water supply and solid waste services. Such capital-intensive needs pose a basic problem for A.I.D. For many years A.I.D.'s program levels have been restrained by a policy of supporting only noncapital-intensive projects. There is little evidence that A.I.D. will have greater budgets with which to furnish any large amounts of capital. If this is the case, A.I.D.'s urban programs may be out of step with the concerns and physical needs of many countries in the ANE region. Providing little or low levels of capital investments may relegate A.I.D.'s assistance to a minor role in ANE urban sectors. If this is the case, policy must recognize this fact. If not, cooperation with bilateral and multilateral agencies should become a cornerstone of A.I.D.'s approach to managing natural and environmental resources.

A.I.D. could decide, however, to provide capital assistance selectively. The following steps are recommended to implement that course:

- Examine the portfolio of existing and proposed projects to determine the feasibility and applicability of expanding the concept of housing guarantees to help finance other types of projects.

- Examine the housing guarantee programs for FY 1990 to determine if they can be expanded to provide further comprehensive urban development assistance as part of the shelter-upgrading portfolio of projects.

- Determine how programs in ANE countries could be expanded if various cost-recovery mechanisms were built into the programs. Consideration needs to be given to the tax base for investment and the thrift rate for recovery. Although few utilities in water and sanitation are totally unsubsidized or financially self-sufficient, components could be cost recoverable, and, hence supportive of the service.

- Determine how various programs could be expanded if private or commercial sector firms were utilized to provide the services and/or financing necessary while cost-recovery systems are being implemented.

- Determine the potential of marshalling the support of the private or commercial sector to bolster A.I.D. activities by providing services, financing (thus, perhaps, gaining an equity position in the venture), or private loan guarantees for various projects.

PROGRAM PRIORITIES

ANE Bureau priorities in terms of program content should be projects that will enable countries to provide sustainable basic services to the urban poor. Such programs will provide physical infrastructure coupled with help to institutions (public and private sector) so they can provide high-quality, sustainable services. Such projects are obviously popular in host countries and A.I.D. may be able to provide them, especially if capital investments can be provided.

If added capital assistance is not forthcoming, it is imperative that A.I.D. cooperate with other donors providing such support so that technical assistance programs are acceptable to the host countries and have a leveraging effect on the overall program.

Based on the conclusion that A.I.D. cannot be a major provider of investment funds for urban infrastructure and services, it is vital that collaborative and co-financing efforts with other bilateral donors and multilateral funding institutions become the focus of future efforts. In-roads to this approach are already evident as part of the activities of the International Water Supply and Sanitation Decade, wherein donors have been meeting to develop joint approaches and programs.

The development of common strategies on which collaborative activities can be built, as well as the identification of specific projects for cooperation and co-financing, should be the focus of A.I.D. program priorities in environmental and natural resource protection in the future. The next level of priority should be programs that foster the development of comprehensive urban and environmental policy (from national policy determination to zoning and land use planning at the local levels).

Priority Program Recommendations

It is extremely difficult to establish priorities among ANE programs or countries. Some technical criteria A.I.D. could consider in making the choices regarding urban program priorities include the following:

- Existence of national urban and/or environmental policy,
- Severity of need or level of environmental degradation,
- Program priority as evidenced by inclusion in national plans,
- Urban needs, in terms of basic services—water supply, wastewater, and solid wastes—and the unit cost of responding to those needs, specifically in relation to the urban poor,
- History of positive implementation of programs,
- Existence of an institution that can implement the program and assume clear-cut, comprehensive responsibility for providing the service,
- Potential of the program to be sustained, at least in part, with local financing, private sector involvement, or through a local NGO, and
- Potential of the program to be implemented through co-financing of several donors or multilateral lending institutions.

These recommendations, implemented in cooperation with other bilateral donors and multilateral lending institutions operating in the region, would provide a basis for beginning to address critical environmental challenges now and in the future.

I. INTRODUCTION

Scope of the Paper

This paper assesses the environmental effects of rapid urbanization and industrial development in the 15 countries that fall within the purview of A.I.D.'s Bureau for Asia and the Near East (ANE): Morocco, Tunisia, Egypt, Jordan, Yemen Arab Republic (A.R.), Oman, Pakistan, India, Nepal, Burma, Bangladesh, Sri Lanka, Thailand, Indonesia, and the Philippines (Figure 1). These countries are highly diverse: climate and topography range from tropical in Pakistan and Bangladesh to arid in Morocco and Yemen A.R., and from coastal in the Philippines and Indonesia to mountainous in Nepal and India. The national levels of urban population range from 7 percent in Nepal to 56 percent in Tunisia. The urban population in India is more than four times the total population of Egypt.

This paper is one of a series commissioned by the ANE Bureau for its use in developing an environmental and natural resources management strategy for the region. The focus of the paper is the effects of rapid urbanization and industrial growth on water resources in urban areas and on the greater environment. Other papers focus on industrial and hazardous wastes and energy.

Rapid urbanization and industrial growth are detrimentally affecting water resources (both quantity and quality), air, land, and soil, as well as ecological habitats. Although the protection of all of these resources is critical and the results of their degradation detract from the quality of life in urban areas, this paper focuses on water resources because water is the natural resource that is central to sustainable development and, thus, has broad cross-sectoral relevance.

The ANE Bureau's draft strategy suggests that "water shortages may be the emerging critical concern of the next 20 years in many of the ANE countries."[1] In a United Nations study of mega-cities, water was highlighted as a key environmental resource in terms of its provision to the urban populace, the importance of water resources to developmental activity, and the impact of land use and waste disposal practices on water quality and supply.[2]

Typically, provision of water supply has preceded provision of adequate sanitation in the ANE region. Levels of water service vary according to the ability or willingness of customers to pay for the service, and they range from treated water piped

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[1] References follow Section VIII.

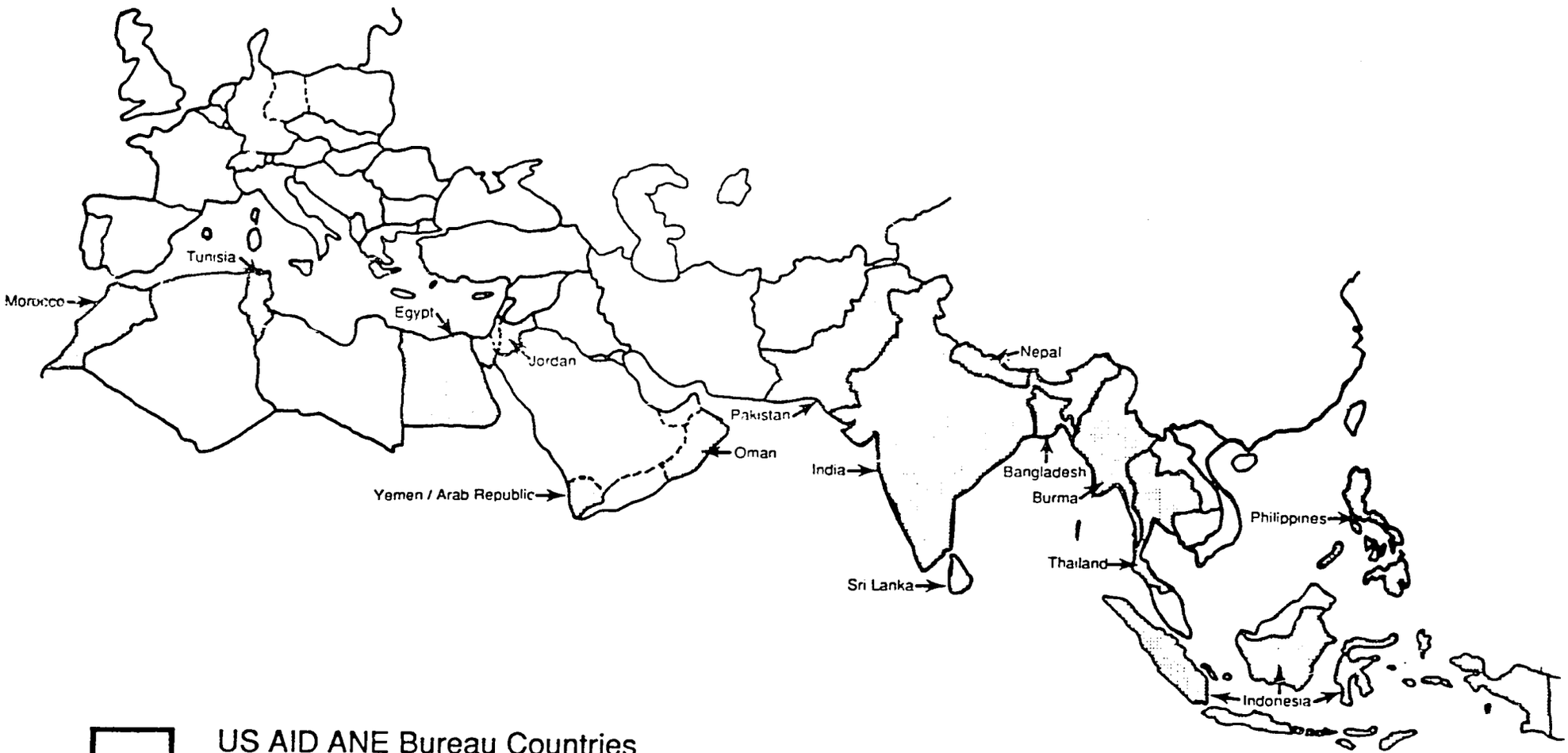


Figure 1
Asia Near East Region

to each home, to standposts on a piped system, to wells with hand pumps (each serving a large number of people), to the private vending of water to households.

The provision of sewerage has seriously lagged the provision of water, often diminishing the intended benefits for health and quality of life associated with safe drinking water. Sanitation's relevance to water resources, and thus to this paper, is that proper disposal of wastewater is a major factor in preventing the degradation of water quality and public health.

Implicit in this analysis is the consideration of land as a finite and, hence, precious natural resource. Conversion of land to urban uses is usually irreversible. There is great competition for land in urban areas in the ANE region, and the juxtaposition of land uses, such as industrial and residential, has important implications for the urban environment and its inhabitants.

Magnitude of the Problem

Rapid urbanization and industrial growth have been observed for over 20 years in the ANE region. Between 1950 and the year 2000, the total population in A.I.D.'s ANE countries is expected to have increased from 600 million to 1.8 billion, more than half of whom will be living in India. During the same period, the urban population is expected to increase sixfold, from about 100 million to more than 600 million. Table 1 and Figure 2 illustrate the growing share of urban populations in the ANE region. Comparing overall population trends in the area with population growth in the ANE countries, the urban population in North Africa is expected to almost double between 1985 and the year 2000, by which time about 90 percent of the population will be living in urban areas. In southeastern and southern Asia, the urban population is predicted to more than double, and the share of urban inhabitants is expected to increase from a quarter to a third of the total population during the same period.

As shown in Table 2, in 1950 only two metropolitan agglomerations in the world had more than 10 million residents; in 1975 there were seven such cities, none of which was in an ANE country. However, by the year 2000, there will be 25 cities with more than 10 million inhabitants; 9 of those cities are in the ANE region and 17 are in Asia and the Near East.[3] This dramatic population explosion is attributed to the natural increase of large urban populations and migration from rural areas to take advantage of the greater employment opportunities offered in urban areas (Figure 3). Associated with the unprecedented growth

Table 1: Urban Population Growth in the Asia Near East Region

Country	Total Population (millions)			Urban Population (millions)			Urban Population as % of Total			Average Annual Growth Rate (%) of Urban Population	
	1950	1985	2000	1950	1985	2000	1950	1985	2000	1965-80	1980-85
Morocco	9	22	30	2	10	16	26	44		4.2	4.2
Tunisia	4	7	9	1	4	6	31	56		4.2	3.7
Egypt	20	47	64	9	22	35	42	46		2.9	3.4
Jordan	1	4	6	0	2	5	35	69	74	5.3	4.0
Yemen A.R	3	7	11		1	4	2	19	33	10.7	7.3
Oman	0.4	1	2	0.01	0.34	0.30	2	9	15	8.1	7.3
Pakistan	40	100	141	7	27	53	18	29	38	4.3	4.8
India	358	759	964	62	197	330	17	25	34	3.6	3.9
Bangladesh	42	101	146	2	18	27	4	13	18	8.0	7.9
Sri Lanka	8	16	20	1	3	5	14	21	24	2.3	8.4
Nepal	8	16	23	0	1	3	2	7	14	5.1	5.6
Burma	18	37	48	3	9	17	16	24	28	2.8	2.8
Thailand	20	51	66	2	13	19	10	18	29	4.6	3.2
Philippines	21	54	74	6	22	36	27	39	49	4.0	3.2
Indonesia	80	166	211	10	59	77	12	25	37	4.7	2.3
Total	632	1,390	1,815	105	389	634	17	30	33		

Sources: *Prospects of World Urbanization 1984-1985*
World Development Report 1988
World Resources 1988-1989
U.S. AID ANE Bureau - Draft Natural Resources Strategy 1988
International Drinking Water and Sanitation Decade, Review of Mid-decade Progress

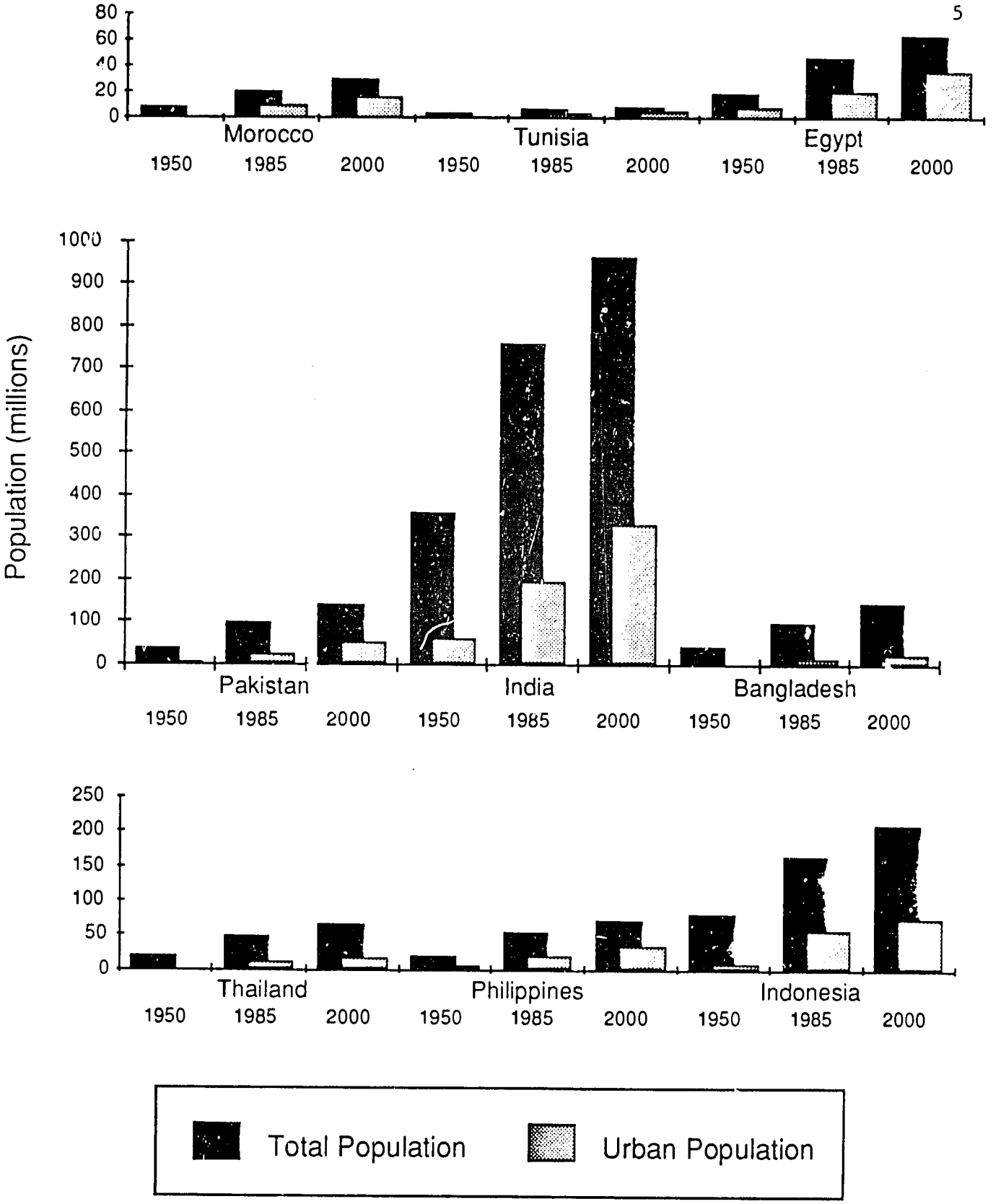


Figure 2
Urban Population Growth in Selected ANE Countries

Source: U.N. Prospects of Urbanization 1984-1985.

Table 2: Cities and Metropolitan Areas with Populations over 10 million - 1950, 1975, 2000

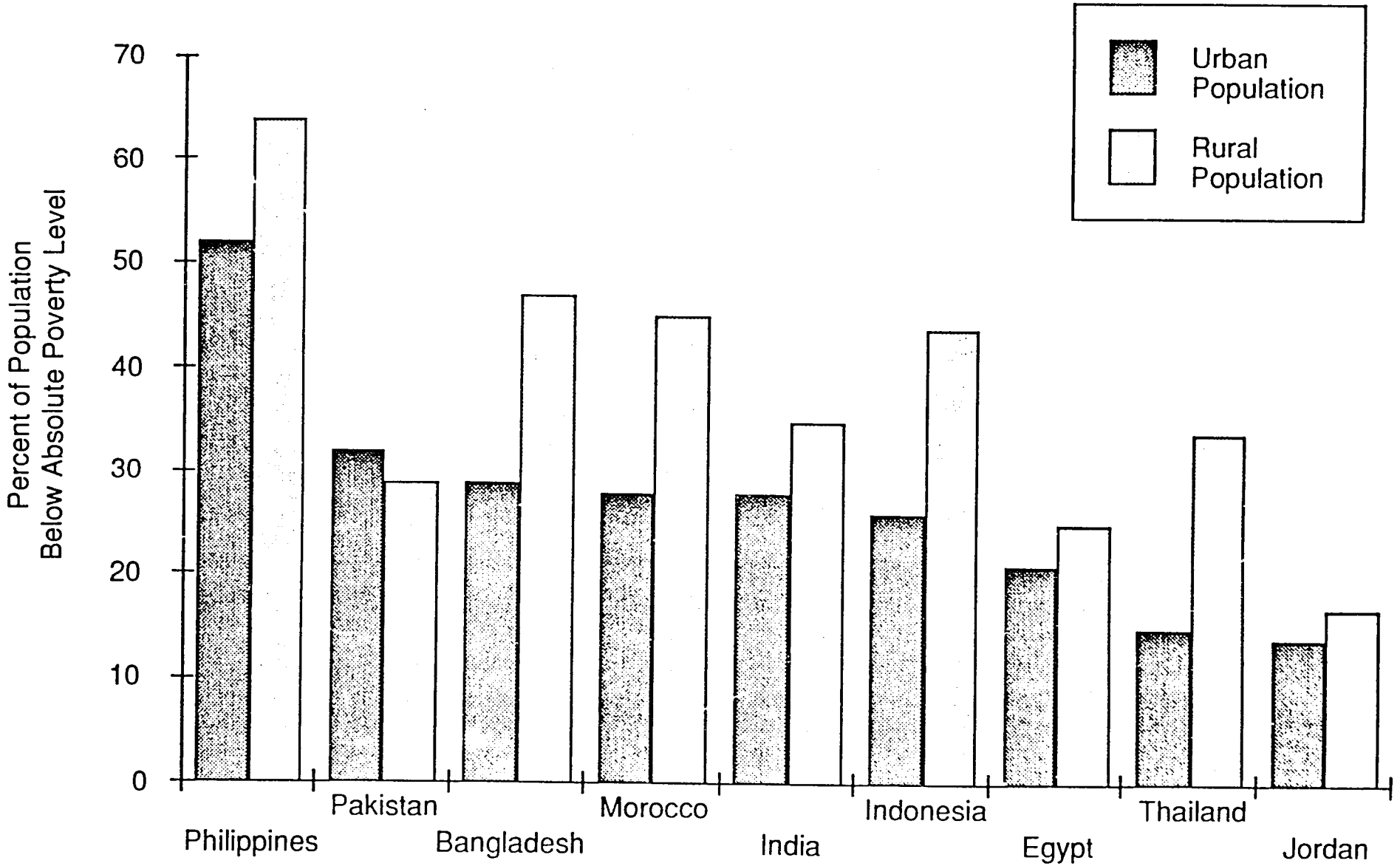
1950	Million
New York /New Jersey	12.2
London	10.4

1975	
New York/New Jersey	19.8
Mexico City	11.9
Los Angeles/Long Beach	10.8
London	10.4
Tokyo Δ	17.7
Shanghai Δ	11.6
Sao Paulo	10.7

2000	Million	2000	Million
Mexico City	31.0	Sao Paulo	25.8
Tokyo Δ	24.2	New York/New Jersey	22.8
Shanghai Δ	22.7	Rio de Janeiro	19.0
BeijingΔ	19.9	Calcutta Δ*	16.7
Greater Bombay Δ*	17.1	Seoul Δ	14.2
Jakarta Δ*	16.6	Cairo metro Δ*	13.1
Los Angeles	14.2	Manila Δ*	12.3
Madras Δ*	12.9	Bangkok Δ*	11.9
Buenos Aires	12.1	Delhi Δ*	11.7
Karachi Δ*	11.8	Paris	11.3
Bogota	11.7	Istanbul Δ	11.2
Tehran Δ	11.3	Osaka, Kobe Δ	11.1
Baghdad Δ	11.1		

Δ Cities in the Asia Near East Region
* Cities in USAID's ANE Region

Source: United Nations, 1980 in World Bank Capital Cities Proposal



Source: USAID Annex II : Asia / Near East - FY 1990

Figure 3
Percentage of Population Living Below the Absolute Poverty Level in Selected ANE Countries

of urban populations is an increase in the share of the labor force working in industry and services (Figure 4). Thus, industrial development, a goal pursued by many countries as the basis of overall economic development, is a definite factor in rapid urbanization.

This rapidly changing urban situation often has had detrimental effects on the environment: water shortages become critical; inadequate sewerage results in unsatisfactory sanitation; municipal and industrial wastes pollute drinking water supplies; development on fragile lands is prone to excessive damage from flooding and can be the cause of the destruction of ecosystems; the overextraction of groundwater has caused salinization and land subsidence; and industrial and vehicular emissions pollute the air and cause health conditions to deteriorate.

An extremely important problem caused by urban growth is the rapid increase in the number of poverty-stricken urban households. Due to many factors, urban poverty very often entails greater hardships than rural poverty. The urban poor who are concentrated in the densely populated peri-urban enclaves suffer the most from the degraded environment, and the complex urgent situation makes it almost impossible to provide services without government intervention.[4]

If unchecked, the deleterious impacts of urbanization on the environment may soon negate the employment and service opportunities offered in the urban areas. Rapid development also threatens the long-term economic sustainability of the urban concentrations and will necessitate significant future investment to reverse environmental damage.

Environmental concerns must be part of the planning for addressing the complexities and exponential development trends of the urban areas. The scale and magnitude of urbanization in the ANE region and the environmental consequences both in the cities and beyond point to the need to develop an urban strategy that takes full cognizance of the implications of rapid urbanization and industrial growth.

Outline of Paper

The scale and complexity of environmental problems in urban areas are examined in Section II, and Section III outlines various indicators that can be used as measures of environmental conditions in urban areas. Section IV presents case studies for eight cities in the ANE region and uses those case studies to illustrate and classify the growing environmental and other problems (i.e., issues related to health and the quality of life)

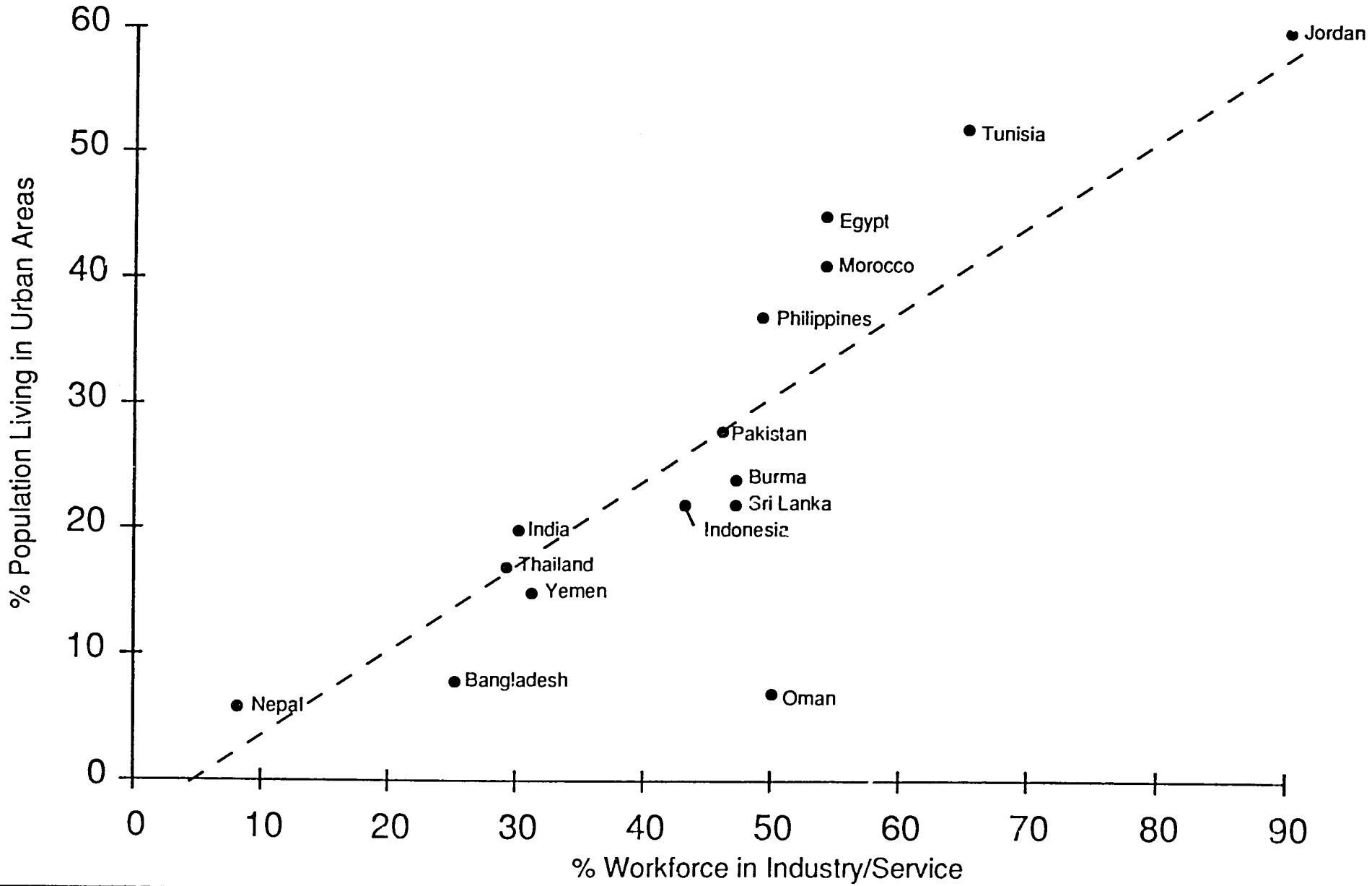


Figure 4
Urban Population and Workforce in Industry/Services 1980

Source: World Development Report, 1988.

associated with urban development. The regulatory and institutional approaches used by many ANE countries to protect the environment are outlined in Section V. Programs and projects for the urban sector that are supported by international donor agencies are described in Section VI. The final sections, VII and VIII, outline options and approaches for A.I.D. and recommend priorities for A.I.D. policies and programs, respectively.

II. INTERSECTORAL ASPECTS OF WATER RESOURCES, RAPID URBANIZATION, AND INDUSTRIAL GROWTH

The importance of water resources for the urban economy cannot be overestimated. Figure 5 depicts how water resources serve as a direct link to all development sectors and to the sectors that make up the sphere of urban development. The linkages work in both directions—urbanization has impacts on natural resources, and natural resources play a major role in influencing urbanization and driving industrial growth.

Sector Linkages

In the urban environment, particularly where growth is rapid, the ripple effects of unwise sectoral programming on water and the environment are most dramatic.[5] The impact of a compromised water supply will be felt by the individual as a loss in the quality of life, and by industry and commerce as a degraded input in the production process. Decreased health and well-being will, in turn, have negative repercussions on productivity. Thus, development that does not protect urban water resources ultimately will forestall economic growth and undermine efforts to achieve a healthful and sustainable urban environment.

Water resources are also important locational determinants. Of a sample of 15 major cities in the ANE region, 13 are located along rivers or coastlines. Such locations offer access opportunities via the waterways.

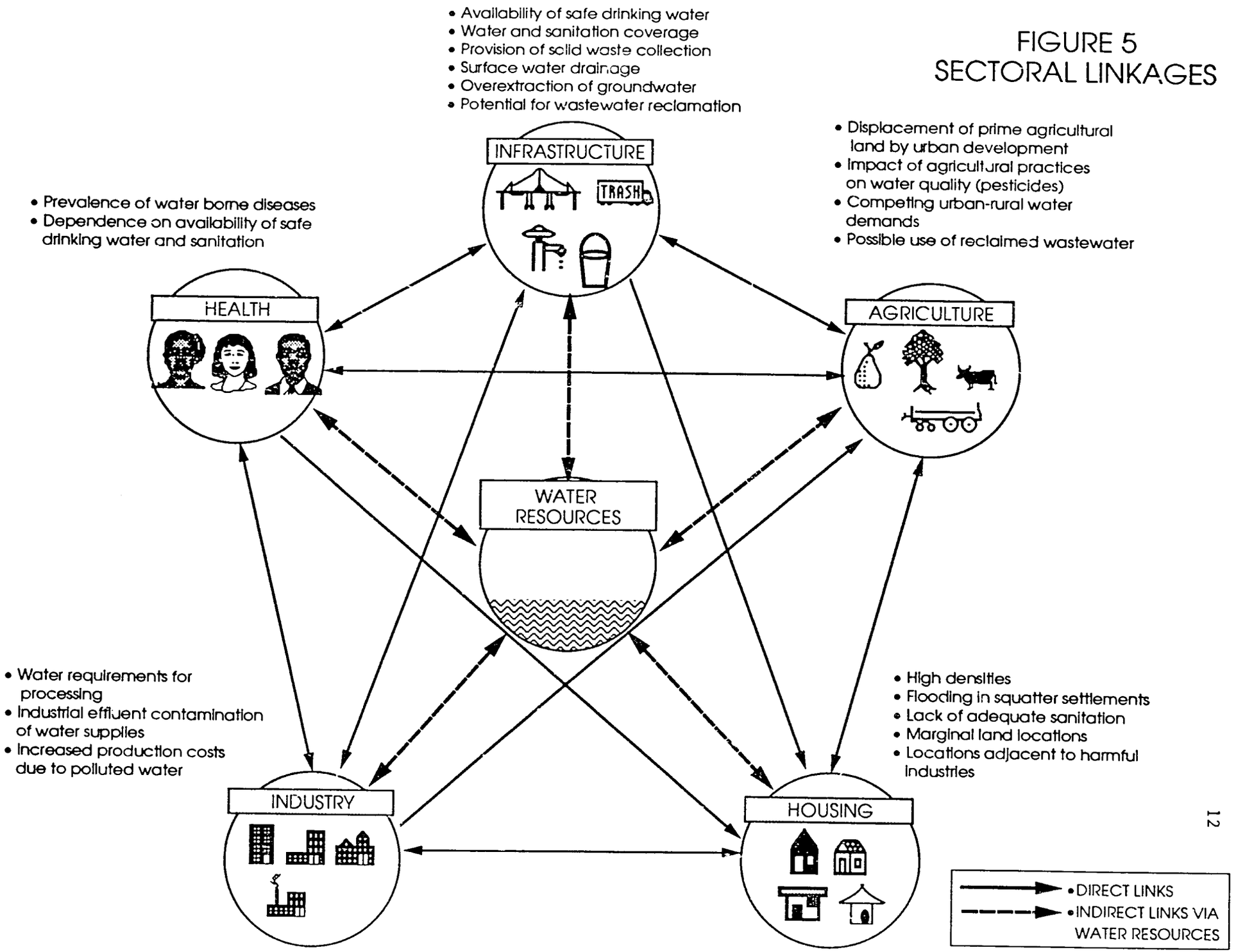
The quality of water resources for drinking and hygienic purposes has significant health impacts for urban dwellers. Waterborne diseases, for example, are major factors in the high infant and child mortality rates in the ANE region.

a. Housing

Residential development can constitute between 30 and 80 percent of land use in urban areas in the ANE countries. Housing types range from permanent structures, often multistory houses with good water supply and adequate sewerage; to slums of deteriorated, overcrowded housing stock with little or inadequate water supply and sewerage; to squatter settlements lacking basic amenities.[6]

The form, density, and locational characteristics of the housing are determinants in the provision of water supply and they affect water quality. The established urban cores usually have some level of water and waste disposal services. Because of the scarcity of urban land, however, some cities are growing

FIGURE 5
SECTORAL LINKAGES



vertically, which limits the opportunity for providing low-cost sanitation solutions.

Slum areas usually have low levels of water service and poor-quality water. Squatter or shanty settlements are often located in marginal areas (such as marshy lands or canal/riverbanks, which are easily flooded) because the low-income inhabitants have no other choice. These areas are of critical concern because their rates of growth are often much greater than those in the urban core. Service provision rarely can keep up with this growth, which causes existing service levels to deteriorate.

The development of low-to-medium density, middle-income informal settlements can be even more problematic and more extensive than squatter or shanty settlements. Such areas are likely to rate a greater responsiveness on the part of public officials than low-income areas, but it is more difficult to manage urban areas in an environmentally conscious way when the groups that are creating the problems are middle-income, not poor.

Low-quality housing areas in general often lack proper water supply for drinking and personal cleanliness, and they are often without sanitation services. Drainage is inadequate, which exacerbates flooding and ponding of polluted water. Rotting garbage, human feces, and associated insect and rodent infestations are commonplace; inhabitants are forced to exist in squalor in their effort to survive in urban areas.[7]

b. Infrastructure - Water supply, sanitation, and solid waste disposal

When considering the environmental impacts of provision of water and sanitation facilities, consideration must be given to the long-term protection of water supplies. Overuse of water resources, such as groundwater, can jeopardize future water supplies through overextraction, which causes salinization of the aquifers.

Untreated sewage is a prime contributor to water pollution, whether the wastes are disposed of directly into watercourses, through individual sanitation systems, or through flooding. Improper wastewater collection and disposal poses an enormous problem in urban areas. Visual observations and health statistics from the densely populated urbanized areas give strong evidence of the environmental degradation caused by the lack of proper waste collection. Industrial wastes are also great contributors to water quality degradation if proper disposal is not provided.

In the 15 ANE countries, about half of the urban population lack proper potable water supplies, and about three-quarters lack adequate sanitation facilities. Water shortages are predicted to be crucial problems facing many ANE cities.[8] Urban areas are growing at such unprecedented rates, however, and the cost of extending and/or improving facilities is so high that public utilities and governments often become moribund when faced with the low levels of capital available to meet such enormous needs.

In the ANE cities where solid waste collection and disposal services are provided on a formal basis, disposal often occurs in very poorly maintained sanitary landfills. Often, solid wastes are collected by refuse collectors who practice uncontrolled disposal; more often they are disposed of in empty areas or drainage canals, sewers (if any), and rivers. Even within the context of rapid urbanization, the collection, treatment, and disposal of municipal solid wastes are more easily addressed than the provision of water supply and sewers because the former are less demanding in terms of capital and spatial investments.

From the above, it is obvious that rapid urbanization has made it difficult to provide basic services. These problems are complex and extremely expensive to resolve. The density of most of the urban areas and the provision of housing and commercial space in multistory buildings virtually rule out any easy "low technology solutions." Where newly settled urban or peri-urban areas have densities that allow low-cost solutions to be applied, those solutions generally cannot be considered permanent. They may be suitable under current conditions, but they may have short useful lives if in-house water supply service is provided and/or continued population growth significantly increases the densities.

c. Industry

Industrial development in urban areas is a primary driver of national development. The available employment pool in urban areas is the key determinant in industrial location, which in turn causes migration for employment opportunities and exacerbates the rapid rates of urban growth. The availability of water resources, a key input in the production process, greatly affects the location of industries—along rivers, for example. However, industrial waste discharges can contaminate the water supplies; downstream water resources may be degraded to the point that they become unfit for human, industrial, and agricultural uses.[9] If industries were not scattered throughout metropolitan areas, but were concentrated in special zones, they could be served by lower quality water, thereby preserving limited high-quality water for domestic consumption, and industrial wastewaters could be separated from municipal wastewaters and given appropriate treatment.

d. Agriculture

As urban areas grow, the boundaries of cities expand outward and agricultural land is converted to urban uses. This practice obviously reduces the land available to support food production needed by the urban areas.

Agricultural practices can also affect downstream water quality through the contamination of water with chemicals and pesticides. Degradation of formerly productive agricultural lands through mismanagement can cause rural inhabitants to move to urban areas in search of employment opportunities, further exacerbating the rapid increases in population.

e. Health

Previous subsections highlighted the health implications of rapid urbanization and industrial development. There are also close associations between low-quality residential environments and poor health. Poor sanitation, poor water quality, inadequate surface water drainage, overcrowding, inadequate garbage disposal, and vector infestation are commonplace in low-quality living areas. All these contribute directly to high rates of diseases.[10]

The intersectoral links displayed in Figure 5 primarily focus on the possible negative implications of the cross-sectoral linkages. However, if water and other resources are managed with foresight, there is the potential for future positive effects. Examples include wastewater reclamation for use in irrigation and composting and recycling of municipal wastes for use in industry and services (the latter primarily through informal sector activities).

Conclusion

Urbanization and development are linked through water resources and land use. Indiscriminate use or degradation of land and water resources can adversely affect economic development and the viability of urban areas. If not confronted, the situations described will worsen as the urban areas grow and overstress the in-city and external environments. Sectoral policy and programs for the urban areas must consider overall environmental issues and recognize the complex linkages among sectors. Urban planning cannot occur in a void; it must take into account the interrelationships of the development sectors.

III. INDICATORS FOR ASSESSING THE IMPACT OF RAPID URBANIZATION AND INDUSTRIAL GROWTH ON THE URBAN ENVIRONMENT

A major objective of this paper is to present a set of strategic indicators for use as guides in formulating policy and programs and in monitoring program status. This section presents such indicators for A.I.D.'s ANE countries based on readily available data, discusses the sources of data, and describes additional data needs.

The review of available information made for this study indicates that, on the whole, there are inherent weaknesses in many of the national databases and that data for the urban sector presented on a national level can easily be misinterpreted because of the generalization of some important differences within the urban sector. Moreover, conclusions derived from cross-country comparisons can only relate to very broad characterizations of urban development. Such comparisons could not be used as the sole basis for policy analyses.[11]

The set of indicators developed in 1983 by A.I.D.'s Office of Housing and Urban Programs provided a convenient framework for use in this paper in presenting nationally representative indicators of urban development. Indicators relating to the urban environment were determined from other sources.[12]

The indicators, grouped by whether they are urban/demographic, economic, social, or environmental are summarized in Table 3. The outlines the possible uses of the indicators and methods of obtaining data. Summaries of indicators and data sources for the 15 ANE countries are presented in Appendix A.

Urban/Demographic Indicators

Three indicators can be used to assess the magnitude and scale of urban development:

1. Absolute number of urban dwellers, with which to assess demands for services, infrastructure, and housing;

2. Urban share of population, which is indicative of the importance of the urban sector in the country; and

3. Growth rate of the urban population, which predicts the future urban situation.

These measures together are indicative of the current and future status of the urban sector. Policy determinations are needed as to where to focus interventions with a view to mitigating future environmental problems—in the larger urban areas or in secondary ones.

Table 3: Indicators, Uses and Data Sources

Type of Data	Indicator	Uses of Information	Examples of Data Sources	Summary Table in Appendix
Urban/ Demographic	• % urban population	• assesses importance of urban sector	- secondary data such as census, international donor agencies	A1
	• growth rate of urban population	• indicates scale and magnitude of urban growth • identifies potential future problem areas	- local planning ministries - World Bank, United Nations, US A.I.D. - universities and institutions	A1
	• absolute number of urban dwellers	• serves as basis on which to assess demands for infrastructure, housing & jobs	- HABITAT - data on human settlements	A1
	• physical distribution of population in urban centers	• determines appropriate allocation of resources (primary cities or secondary)		A2
	• growth of cities	• indicator of magnitude of problem		A2a
Economic	• Gross National Product per capita	• correlates with % urbanized; shows strength of urban area in national economy	- secondary data such as census, international donor agencies	A3
	• % labor force in services and industry	• correlates with level of urbanization, could be basis for industrial location policy • increasing industrialization could have environmental impacts	- World Bank, United Nations, US A.I.D. - universities and institutions - World Development Report	A4
	• poverty levels (rural/urban)	• indicates ability to pay for services • shows relative attractiveness of urban areas		A5
Social	• health data such as infant mortality rates, incidence of waterborne diseases, respiratory diseases, life expectancy	• symptom of environmental conditions • indicates of availability of safe drinking water, waste disposal and treatment, or sanitation	- World Bank - World Health Organization - Water Supply and Sanitation Decade data	A6
Environmental	• coverage of infrastructure - water, sewers, solid waste	• indicates environmental conditions	- Water Supply and Sanitation Decade data	A7
	• urban waste generation rates		- HABITAT	A8
	• housing conditions	• determines quality of life	- local ministries and agencies	
	• housing densities	• measures of population pressure on land and water resources	- field observations - case studies of cities if available	
	• high-rise/multi-story building types	• measures of scarcity of urban land and high land values	- GEMS, INFOTERRA	
	• location of urban development in relation to water resources	• indentifies marginal areas - possible future problem areas	- urban planning agencies	
	• water quality	• indicates success of waste disposal and treatment, management of water resources	- international donor agencies, missions, local offices	
	• land use patterns	• identifies possible problem areas such as residential adjacent to industry		
Sources:	*Based on readily available data*			

The distribution of the urban population within a country provides insight into the allocation of resources, as well as a basis for developing national spatial policies to promote equitable growth. Indicators of population distribution in small, medium (secondary), and large cities and of the growth rates of those cities can be utilized in establishing such policies.[13]

Economic Indicators

Urbanization is closely linked to economic development. Three indicators are useful in assessing economic development trends and, hence, the possible effects of urbanization:

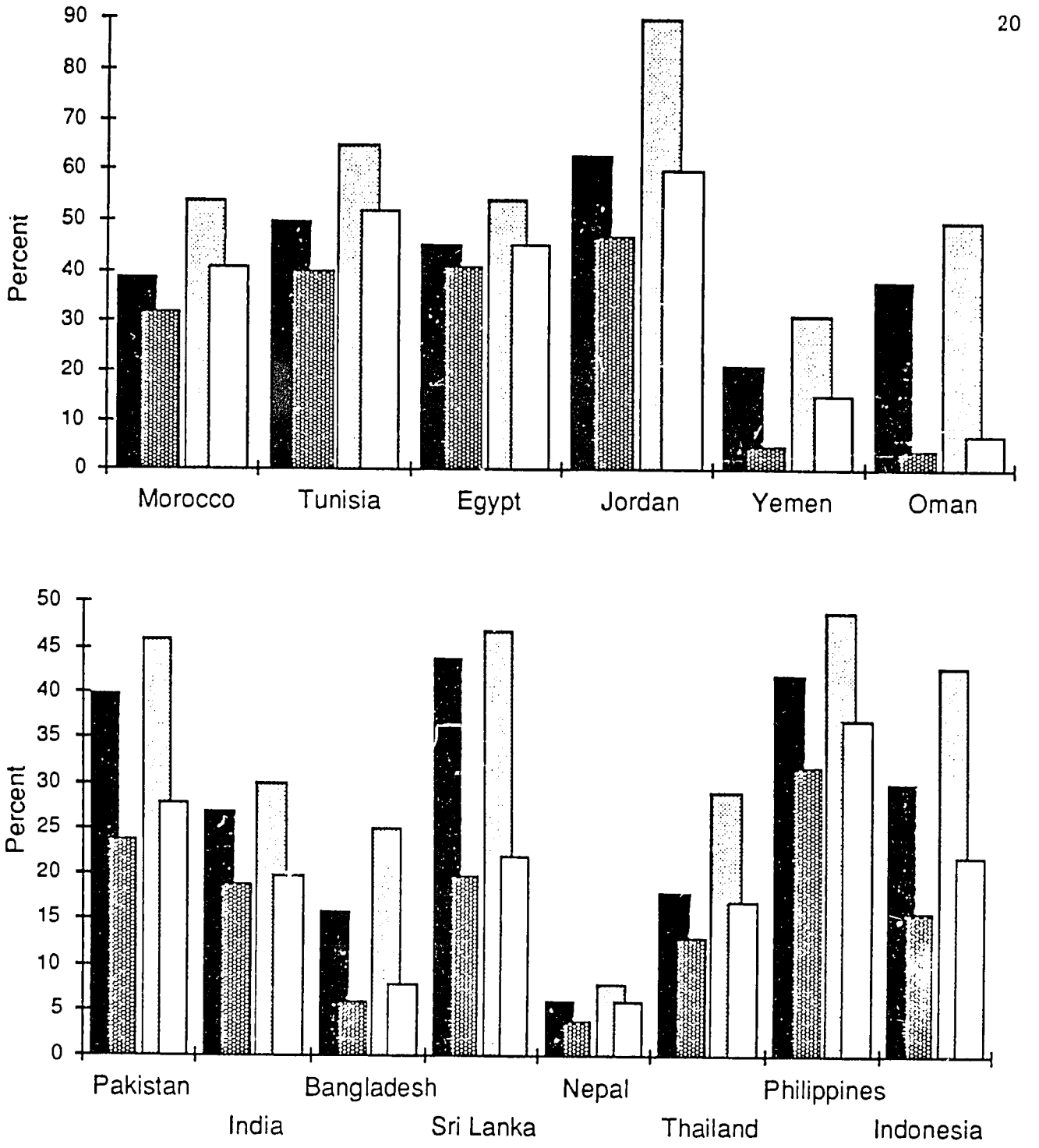
1. Gross National Product (GNP) per capita can be closely correlated to levels of urbanization, as shown in Table A3 in Appendix A. Thus, GNP is a measure of the strength of the urban economy in the national context.[14]

2. Comparisons of the percentage of the labor force employed in agriculture versus industry/services ordinarily can be used as an indicator of the importance of the urban sector in the national economy (see Figure 6). The increase in employment in industry can be utilized as an indicator of industrial site concentration (and associated externalities) in the urban areas. (See Table A4.)

3. Data on the poverty level of urban inhabitants can be useful indicators in assessing the attraction of the urban area to rural inhabitants, as well as the ability of urban dwellers to pay for housing and infrastructure. (See Table A5.)

Social Indicators

Health levels are key indicators of low or degraded environmental levels. These include infant and child mortality rates, rates of waterborne diseases, life expectancy, and caloric intake.[15] (See Table A6.)



Source: World Development Report, 1988.

Figure 6
Increase in Urban Population and the Workforce in Industry/Services 1965-1980

Environmental Indicators

A brief list of indicators that could be used to describe the urban environment include the following:

1. Water supply and sanitation coverage;
2. Generation, collection, and disposal of solid wastes;
3. Condition, characteristics (multi- or single-story), and density of housing;
4. Land use and location of urbanized areas in relation to natural resources and/or environmentally sensitive areas; and
5. Water quality.

It is difficult to define and measure housing conditions across countries. Average densities per square kilometer are rough estimates at best and are not an accurate basis on which to develop urban land use policy. However, high densities and high land values may be indicative of urban areas that are forced to build upward to provide housing and commercial space for the rapidly growing populations and associated service sector. This is significant because water supply service and wastewater collection service for high-rise areas are extremely expensive to provide. Further, for multistory housing areas, there may be no alternative for proper sanitation but to provide conventional (and very expensive) sewerage systems.

Somewhat easier to evaluate are water supply and sanitation coverage and solid waste collection. The importance of these services to environmental quality is well known.

The environmental indicators mentioned above are merely the beginning in monitoring the environmental implications of rapid urbanization. Collecting and consolidating data on these indicators would require effort, but the task would not be excessively burdensome on local planning, housing, or water/sewer authorities.

The above indicators relate primarily to human activities and the resultant environmental consequences. Other data of importance are outlined in the next section.

Data Sources

For most of A.I.D.'s ANE countries, a great deal of information is available, or the framework is in place to collect such data. The problem with a great deal of these data is that they are not necessarily comparable across countries or are not at the appropriate level of detail for use in making policy decisions regarding urban planning and/or natural resources. Data sources are summarized below; comments on how A.I.D. can best use the data are presented in later subsections.

a. A.I.D. (ANE Bureau, Office of Housing and Urban Programs, WASH)

A.I.D. has detailed information both at the bureau and mission level. However, much of the information is not necessarily available in an appropriate form for use in policy-making. A.I.D.'s Office of Housing and Urban Programs is a valuable resource for information on urban issues. The Office is currently developing an Urban Research Strategy in response to a request for recommendations for expanded A.I.D. activity in the urban sector.[16]

A.I.D.'s WASH (Water and Sanitation for Health) Project has an extensive library of information on water, sanitation, and related issues. This database includes field reports and file data on over 200 interventions undertaken by WASH at the request (and in support) of A.I.D.'s missions and bureaus.

b. World Resources Institute (WRI)

WRI, in collaboration with the United Nations Environment Program (see below), publishes an annual assessment of the resources that support the global economy. It also provides useful data and indicators on environmental issues.

c. World Bank

The World Bank publishes the World Development Report, which presents demographic, economic, health, social, and other indicators related to national development issues. The Bank sponsors ongoing research and has published many studies related to urbanization, the environment, infrastructure, housing, finance, and other issues related to development.

d. United Nations and World Health Organization

The United Nations and the World Health Organization publish data on demographics, health, housing and settlements, infrastructure, and the environment, and they conduct research on these and other issues.

The United Nations Environment Program (UNEP) sponsors research in many aspects of natural resource protection, as well as Earthwatch, a wide-ranging program to gather and disseminate information relating to the environment.

Two ongoing programs that have great potential for providing data for urban managers and policy planners are the Global Environment Monitoring System (GEMS) and INFOTERRA. GEMS uses satellite monitoring to track resources and incorporates satellite (Landsat) imaging to produce the results. The information network focuses on five areas of environmental concern—climate, transboundary pollution, earth's renewable resources, oceans, and the health consequences of pollution. In 1985, GEMS launched the Global Resource Information Database, which converts environmental data into computerized maps on a geographic information system.

The second program, INFOTERRA, is a decentralized information system that processes queries on environmental information. INFOTERRA operates through a network of government-designated institutions.

e. Local institutions

Various governmental and academic organizations in several ANE countries have established databases and are collecting country-wide data. For example, India has set up a National Environmental Information System for science and technology. Based on the UNEP data, several countries, including Bangladesh and Nepal, have published their own national directories of environmental data sources.[17]

Data Collection Methodology and Maintenance Needs

Several countries have initiated data collection and research efforts, but the data are often not readily available to decision makers. Egypt's efforts are illustrative of most national efforts. In Egypt, there is a severe shortage of data on the environment and health; fragmented data collection efforts are evident for hydrologic and climatic data, demographic statistics, mortality and morbidity data, water and wastewater treatment facility records, and data on water and air quality. Where

the data are being collected, there is no effective process for disseminating the results.

The needs throughout the ANE region concern establishing comprehensive databases, based on good information storage and retrieval systems, and establishing networks so that these data can be effectively utilized.[18] At the same time, full-scale data collection efforts would not be appropriate. Data collection is very time consuming and expensive and could divert support from badly needed initiatives. Data needs could be met by incorporating use of networks or databases that are already established (e.g., INFOTERRA, GEMS, and databases of local universities and governmental agencies) into the daily operations of urban-related administrative agencies or ministries.

Data collection efforts must also be tailored to individual national needs, and they should be coordinated at the national and local levels through the use of common databases.[19] They should be computerized if possible to enhance storage, retrieval, and analysis.

Areas for Future Research

Research conducted for this paper indicates that the most critical need is for data that provide indications of the impact of urbanization on the environment, both in and out of the cities. Data are needed on the following:

1. Water quality, for both surface- and groundwater (including toxins, nutrient levels, turbidity, prevalence of bacteria, and other components);

2. Water quantity, including the safe yield and consumption rates for aquifers;

3. Land use, open space, and areas that cannot support development, such as marginal areas, wetlands, floodplains; tracking changes in land use would also be very valuable;

4. Air quality; some countries are now establishing monitoring stations (this is of extreme importance in many ANE cities, especially those that have high percentages of cars per capita and large concentrations of heavy industry);

5. Location and coverage of natural resources, wetlands, soils, and coastal ecosystems, at a level of detail appropriate for urban planning; and

6. Solid waste generation, collection, and disposal practices.

In addition, a general review of the policies of the less developed countries in regard to urbanization and the environment would help to fill the gaps in knowledge about their programs, actual and planned.

In general, the major constraint in planning agencies is not necessarily the lack of suitable data, but the lack of authority to implement decisions. Provision of conclusive data is often a useful way to support and justify decisions.

IV. COMPARATIVE PERSPECTIVE

This section compares eight cities that are representatives of the types of urban areas in the ANE region. The sectoral linkages described in Section II are clearly illustrated in these comparisons. The discussion identifies predominant urban environmental problems, examines their causes and effects, and outlines the policy implications.

The countries in the ANE region, as noted, are characterized by different climatic zones, average incomes, and patterns of urbanization. These variations make it difficult to draw direct comparisons for the entire region. Generalizations can be drawn and priorities set, however, when the countries and their urbanization characteristics are grouped into similar categories.

Comparisons are drawn among the cities in regard to the following:

1. Urban form, which describes the city's profile—high-rise or sprawling, role in the national or regional economy, and anticipated population growth;

2. Quality of life, which considers housing, health, coverage of water, proper sanitation and municipal solid waste disposal services, proximity of industrial and other land uses to residential areas, and the resultant impact on the urban population;

3. Environmental characteristics, particularly in regard to water-related issues; these include location of the cities in relation to water resources, physical or water-related problems, and the impact of cities on the general environment;

4. Management responses to urban and environmental problems.

Typology of Urbanization

The eight case studies provide information and are the bases for conclusions about the individual cities, but the cities have differing roles to play in the economies of the ANE countries and are part of differing patterns of urbanization. Understanding the context of urban development is vital when developing policies and programs for the urban sector. As seen from Tables 4 and 5, levels of income or climatic factors, while important, are not particularly informative when determining programming or policy priorities.

Table 4: Ranking of ANE Countries by Income

Income Grouping	Country
Low income economies	Nepal
	Bangladesh
	Burma
	India
	Pakistan
	Sri Lanka
Middle income economies/ lower middle income economies	Indonesia
	Yemen A.R.
	Philippines
	Morocco
	Egypt
	Thailand
	Tunisia
	Jordan
Upper middle income economy	Oman

Source: World Development Report, 1988

Table 5: Climatic Regions

Country	ANE Agricultural Classification	Atlas Classification
Near East:		
Morocco	dry/arid	semi-arid; high risk*
Tunisia	dry/arid	arid; high risk
Egypt	dry/arid	hyper-arid
Jordan	dry/irrigated	arid; high risk
Yemen A.R.	dry/irrigated	arid; high risk
Oman	dry/irrigated	arid; high risk
Asia:		
Pakistan	dry/irrigated	arid/semi-arid
India	dry/irrigated	humid/semi-arid; high risk
Bangladesh	moist tropical	humid
Sri Lanka	moist tropical	humid/sub-humid
Nepal	dry/irrigated	humid
Burma	moist tropical	humid
Thailand	wet tropical	humid
Philippines	wet tropical	humid
Indonesia	wet tropical	humid

* High risk is defined as risk from human encroachment disturbing the ecological balance

Sources: *World Resources 1988-89*
ANE Report
The New State of the World Atlas

A typology of urbanization, with some modification to take environmental conditions into account, is an appropriate basis for the comparative assessment of the ANE countries.[20] Table 6 summarizes a typology of countries organized according to their pattern of urbanization, as follows: Type 1 countries have more than half the population living in urban areas and incomes are relatively high; Type 2 countries have more than half the population living in rural areas and incomes are relatively low; Type 3 countries are predominantly rural but are urbanizing rapidly; Type 4 countries are dominated by severe pressures on the land and have largely rural, subsistence-level societies.

Typically, A.I.D. adopts a country-by-country approach, which is entirely appropriate for developing specific policies and strategies. The typology used here is simply a method for organizing the enormous amount of data that was examined for this paper. The case studies or examples may not be directly comparable, but their common themes and problems give direction for action and priorities.

City Profiles

The eight cities are typical of the ANE region and are characteristic of elements of the urban typology. The cities are Cairo, Manila, Colombo, Bangkok, Jakarta, Dhaka, Madras, and Karachi. They play varying roles in their national economies and have varying dependencies on natural resources. The cities are either national or state capitals, and most are located on rivers or ports. Ideally, this analysis would also compare cities displaying greater disparity in size, location, and economic importance. A growing number of governments in developing countries are exploring ways of building the capacities of secondary cities in order to contribute to rural development and to a pattern of urbanization that is not focused on the primary metropolitan areas.[21]

These secondary cities are growing rapidly, but they are generally not experiencing the degree of environmental degradation found in the major cities and urban agglomerations. With forward-thinking planning there is still time to address the potential problems of the urban environment in these secondary cities before they become unmanageable.

a. Characteristics compared

The characteristics of the cities are summarized in terms of the following: (a) urban form, (b) housing, health, and quality of life, (c) environmental profile, particularly water-related issues, and (d) urban management responses.

Table 6: Urbanization Patterns/ Typology of Cities

Type	% Urbanized	Income	Pressure on Arable Land & Natural Resources	Country	City in Case Study*
1	• more than 50% of population lives in urban areas • urbanization trend well established	relatively high	tolerable	Tunisia Jordan Oman	
2	• recent urbanization trend • more than 50% of population lives in rural areas	relatively low	moderate	Egypt Morocco Philippines	Cairo Manila
3	• predominantly rural • urbanizing rapidly	low	moderate	Pakistan India Sri Lanka Thailand	Karachi Madras Colombo Bangkok
4	• predominantly rural • moderate level of urbanization	subsistence level	severe	Yemen Bangladesh Nepal Burma Indonesia	 Dhaka Jakarta

* City case study in Section IV

Source: Michael Cohen in Ghosh - Urban Development in the Third World, 1984

Urban Form. All of the eight cities are densely populated--ranging from 4,500 to 21,500 people per square kilometer, depending on the neighborhood. Some cities have sprawled explosively outward from the dense urban core, converting valuable agricultural land to one- and two-story urban uses. (See maps in Appendix B.) The speed and scale of growth leave little opportunity for municipal governments to respond with the required infrastructure and facilities to meet the needs of the new urban residents. Some cities have expanded vertically because of the rapidly increasing price and scarcity of urban land. In these cities land uses compete for space, which often results in inappropriate juxtaposition of land uses—residences are adjacent to noxious industries, for example—and the poor are forced to locate in marginal areas.

The rate of growth of these cities is unprecedented--Bangkok is expected to double its population to 10 million by the year 2000, the Dhaka metropolitan area could increase threefold to over 10 million by that time, and the population of Cairo is increasing by half a million annually.

All the cities, as noted, are located on rivers or ports, which influences the spatial location of land uses, as do transportation routes (e.g., railway lines and highways) and the topography. The urban form and spatial development characteristics of the cities are summarized in Table 7.

Housing, Health, and Quality of Life. The quality of life in the dense urban agglomerations is highly undesirable. Housing shortages are acute, especially for the poorest inhabitants. The lack of adequate water supply, sanitation, drainage, and solid waste disposal is the most critical problem common to all the cities studied. The environmental conditions created by high densities and lack of adequate services cause intolerable conditions for urban dwellers. Streets, drainage canals, and open areas are used to dispose of human and solid wastes, and housing conditions are cramped and unsafe. The streets and open areas, although rife with rodents and insects, are also play areas for children, and the polluted drainage canals are often the source of water for drinking, bathing, and domestic use in the slums and squatter settlements. Not surprisingly, disease and infant mortality rates are high. Table 8 outlines housing, health, and quality of life in the sample cities.

Environmental Implications. The dense urban areas have a detrimental impact on the larger environment close to and outside the cities. Municipal and industrial wastes are polluting rivers and aquifers. Overextraction of groundwater has led to large-scale subsidence in Bangkok and Jakarta, as well as increases in

Table 7: Urban Form of Selected Cities

Country/City	Place in Urban Hierarchy	Population (million)	Annual Urban Growth Rate	Urban Form	Area (sq km) 1987	Density (persons/sq km)
Egypt, Cairo	• Capitol	• 11.1 (1981) • 16.3 (2000) • about 1/4 population of country	• increases by 1/2 million	• highrise/ single story mix • spread to include Giza and Nasr City	• 900	• 45,000 to 150,000 in lower income areas
Philippines, Manila (metropolitan area)	• Capitol • primate city • dominates nation	• 5.9 (1980) • 6.9 (1982)	• 3.8%	• highrise in center • low density outside inner core • sprawls in all directions along transportation routes (ribbon development) • sporadic, peri-urban development	• 870 total • 180 urbanized core	• 9,000 overall • up to 170,000 in core
Sri Lanka, Colombo	• Capitol • port city	• 1.3 (1981) in urban core • 4.0 in metro. region		• past low density sprawl • sporadic, ad hoc • small plots	• 37 core (1981) • 1,800 metro. area	• 35,000 in core • 2,200 overall
Indonesia, Jakarta (Jabotabek metro. area)	• Capitol • port city	• 10 (1981) • expected to double within 20 years • only 6% of total	• increases by 1 million	• city grew inland along Ciliwung River • urban core • growth in north • southern orientation depending on topography	• 560 total • 180 in urbanized core	• kampungs: 3,100 in outer city; 51,500 in inner city • 21,500 average over entire city

(Continued)

Table 7: Urban Form of Selected Cities/cont

Country/City	Place in Urban Hierarchy	Population	Urban Growth Rate	Urban Form	1987	Density (persons/sq km)
Bangladesh, Dhaka (metropolitan area)	• Capitol • main city in evenly spread hierarchy • secondary cities likely to grow significantly	• 3.5 (10 million in district)	• 8% • Dhaka metro area could increase three-fold by year 2000	• low rise dense development • historic urban core • expansion along railroad and transportation routes	• 115 (1980)	• 143,000
Thailand, Bangkok (metropolitan area)	• Capitol • port city • extreme primacy • dominates the urban sector • forty times larger than the second largest city	• 5.0 million • 50% of total urban population • expected to double by year 2000	• highrise in center • 3-4.3% per annum • migrants a major component	• radially concentric pattern • compact urban core • expansion along river • unplanned, uncoordinated sprawl	• 1,600 total • 330 in urbanized core	•15,000 in core
India, Madras	• Capital of state of Tamil Nadu • largest city in south • principal commercial port	• 5.0 million (1981)	• 2.3% growth rate • growth rates within metro. area differ by neighborhoods	• urban core with secondary CBD • spread of development along transportation routes • includes City of Madras, 4 municipalities, 4 townships and 20 semi-urban local authorities	• 1,200 metro area • 1,800 in urbanized core	• 4,000 overall
Pakistan, Karachi	• Capitol since partition in 1947 • only seaport • principal commercial and industrial center • economically dominant over province	• 7,500,000 (1987) • 12-15 million by year 2000 • only 6% of population	• 5% • partially attributed to refugee immigration	• mix of high and low rise • sprawling, low density along Lyari River	• 3,527 • 1.800 in urbanized core	• 2,000

Sources: See Appendix B

Table 8: Housing, Health and Quality of Life

Country/City	Urban land	Housing	% squatters/ slums	Growth rate of squatter areas	Health profile	Location of Industry
Egypt Cario	• By 2000, land use will be residential 77%, commercial 1%, government 4%, industrial 19%	• Significant portion highrise for all income levels	• Not available	• Not available	• One of highest infant mortality rates in world (60% of total deaths) • Health impacted by human waste • Excreta related diseases • Endemic parasitic diseases • Diarrhea high	• Mainly small fabricators or specialty shops • 19% of area is industry • Industrial waste can be treated ir WWTP
Philippines Metro Manila	• Expansion limited by Manila Bay • Soil unstable • Lack of public open space • Indiscriminate mix of land use	• Overcrowding • Upgrading project of Tondo foreshore	• 60% low income • 2.5 million in squatter settlements & slums	• Grows faster than region	• Crude death rate 5.7/1,000 • Gradual improvement in mortality and morbidity • Pneumonia , respiratory diseases high	• Location of 60% manufacturing firms
Sri Lanka Colombo	• Lack of expansion land • 1/4 land marshy or subject to flooding • Rising land values		• 125,000 in shanties • 45% in slums & shanties	• Rapid growth on fringes	• Not available	• Rapid industrial development
Indonesia Jakarta (Jabotabek Metro Area)	• Urban land expensive - some highrise development	• High income suburbs • Dense slums • Lack of basic services • 24% permanent with walls • 44% temporary with bamboo walls • 32% semi-permanent	• 35% of city is kampungs or slums	• 70% of population growth is attributed to squatter and slum dwellers	• Low income groups with inadequate sanitation • Chronic health problems • High infant mortality 160/1000 live births • Pneumonia, child malnutrition, bronchitis, TB & Cholera • 80% population infected with waterborne parasites	

Table 8: Housing, Health and Quality of Life/cont.

Country/City	Urban land	Housing	% squatters/ slums	Growth rate of squatter areas	Health profile	Location of Industry
Bangladesh Dhaka	• Much speculation in urban land market • Shortages of land for housing and urban development projects • Development restricted by floodplains • Rapid conversion of high lying agricultural areas	• Serious shortage • Private sector involved in construction • Slum upgrading programs • Developing low cost housing on periphery	• Little outright squatting due to high cost of land • Squatter removal programs	• Not available	• High incidence of bronchitis and other respiratory diseases, diarrhoeal and skin diseases	• Center of jute processing and textile manufacturing • 31% of registered firms are in Dhaka • Located near rivers which are polluted from effluent
Thailand Bangkok	• 80% privately owned • Residential and commercial uses mixed in urban core • Large vacant areas witheld from development by speculation • Uncontrolled development in floodprone areas • Rapid conversion to urban land	• Public housing authority plans construction • Housing stock includes: 43% individual buildings 19% slum/squatter 9% public housing 6% subdivisions 3% klong (canal) houses	• 25% housed in slums with inadequate water & sanitation facilities • Slums of semi-permanent structures	• 2.1% annually	• Life expectancy 71 years • Infant mortality - 31 - 60 per 1000 live births	• Characterized by small firms • Construction of industrial estates 35 miles out of city • Concentation of export industries
India Madras	• Decentralization policy for over 20 yrs • Complex land acquisition process • Speculation high especially on agricultural periphery	• 30,000 - 40,000 annual demand for housing units • 200,000 households live in unimproved slums and squatter settlements • 360,000 live in substandard conditions	• 30% live in slums or squatter settlements	• Not available	• Not available	• Textile industries located in central city • No growth in formal industrial sector • Affected by Govt ban on industrial development in 5 metropolitan areas
Pakistan Karachi	• 5 sq. km in center, fully or partly serviced, is vacant due to private speculation • Much of urban core used for military purposes	• Much located on periphery in sprawling unplanned informal settlements • Extensive housing programs since 1947 - sites and service schemes, slum upgrading	• Largest squatter settlement in the region • 1/3 of the population • 432 settlements in old city and scattered throughout	• 10% a year • Twice the rate of the city	• Crude death rate 9/1000 • Infant mortality - 40/1000 live births • Geographic correlation with income	• Industrial estates • Wastes deposited or leach into Lyari River • Small scale manufacturing located in residential areas

Sources: See Appendix B

the salinization of the groundwater resources. Air is polluted from vehicular and industrial emissions, which affects surrounding land uses. The rapid expansion of the urban areas has destroyed precious agricultural land. These factors could threaten the viability of the urban areas, as well as national interests in the long run. Table 9 presents environmental profiles of the sample cities, including both internal and external environmental conditions.

Urban Management Response. Urban management in the face of rapid urbanization and environmental degradation has been varied, depending on the city and institutional framework in place. Most management efforts have been focused on the short-term--dealing with immediate problems. Many of the projects or programs are aimed at one or the other sector, such as water supply, sanitation, housing, or industrial development. The different experiences are summarized below. (Most of the data are from studies conducted by the United Nations, the World Bank, and the Economic Development Institute of the World Bank.[22])

b. Case studies

Cairo, Egypt. Cairo, the capital city, accommodates almost one-quarter of the population of the country, primarily housed in high-rise buildings. Population densities in the city are high--ranging from 4,500 to 15,000 per square kilometer (in low-income areas). The city's population will increase from 10.5 million in 1985 to about 16.3 million by the year 2000.

The critical urban environmental issues include the provision of water supplies, adequate sewers/sanitation, and municipal solid waste collection and disposal. While access to public water supplies is extensive, unserved residents are forced to use water from drainage canals, which are polluted and unsafe. In 1980, half the city was served by public sewers; major improvements are under way so that by the year 2000 over 90 percent of the population will have sewerage and wastewater treatment will be provided. (The existing wastewater treatment system is poorly maintained, however.) The city is drained by a series of canals, which form the dumping grounds for solid and industrial wastes. Infant and child mortality rates are among the highest in the world.[23]

Cairo is administered by several overlapping agencies, each focusing on different sectors. Water service is provided by the General Organization for Greater Cairo Water Supply; the Cairo Wastewater Organization has planning functions relating to wastewater collection and treatment in the metropolitan areas,

Table 9: Environmental Outline of Selected Cities

Country/City	Location	Physical/ water-related Problems	Public Water Coverage	Sewerage	Drainage	Solid Waste
Egypt Cario	• On either side of Nile River	• Water shortage • High groundwater table; septic systems not suitable • Groundwater polluted	• Water from Nile & supplementary wells • Extensive distribution w/direct house connections or standpipes • Water coverage > sewer coverage • Unserved populations obtain water from polluted areas	• 1980 - 48% served • 2000 - over 90% planned • Not kept pace with demand • Lack of maintenance leads to problems - only a quarter of the pumping facilities operate • Major improvements underway	• Canals clogged by wastes • Drainage generally inadequate	• Sewers often used to dispose of municipal waste • Inadequate waste removal • Inadequate collection
Philippines Metro Manila	• On Pasig river & port • Flat alluvial delta	• Floods frequently in monsoon season • Unstable soils • Overextraction of wells lead to saline intrusion	• 50% of city (70% population) served by piped water • Plans to extend service forestalled by lack of funding • Water vendors provide service for population outside distribution system	• 11% of population served by sewers • In unsewered areas, sewage effluent is conveyed by gutters, open ditches and watercourses • Untreated sewage dumped in Bay	• Canals and drainage inadequate • Ditches and canals are receptacles of wastes • 4 sq. kms of the city flooded annually - affects 190,000 households, causes economic losses	• 2,650 tons generated daily • Collected refuse taken to 9 landfills with ltd capacity • Remainder dumped on roads and watercourses • Improvements planned
Sri Lanka Colombo	• At mouth of Kelani River - port city	• City floods annually	• 47% access to piped water • 48% receive water from wells	• 50% covered by waterborne sewage • City been able to keep pace with demands - situation is deteriorating	• 25% urban & marshy or subject to flooding • Flooding in Kelani coastal plain area	• Not available
Indonesia Jakarta (Jabotabek Metro Area)	• Mouth of Ciliwung River - port city	• Excessive flooding • Constructed system of canals • Divided by five rivers • Overuse of groundwater leads to salization & land subsidence of city • Quality of raw water deterioated • Flooding of contaminated water into kampungs	• 90% no piped water • 30% households depend on water vendors • Kampungs lack basic services	• Lacking in kampungs • 65% no private toilets • Septic tanks - 25% • Others use pit, latrines, cesspools & ditches	• Considerable flooding • Constucted system of canals • Many use canals for bathing, laundry & defecation • Canals flood because blocked by garbage etc • In dry season insufficent flow to drain off wastes • Surface water drainage inadequate	• Garbage not collected • 30% ends up in canals, rivers & roads
Bangladesh Dhaka	• On river • Direct water link to Bay of Bengal	• Extensive seasonal flooding • Overextraction of ground water • Prone to natural disasters: floods, cyclones, tidal waves, famine	• 60% covered • Source from wells • 90,000 house connection • 1,200 common stand pipes • Remainder use polluted surface water	• 20% served by water borne sewage • 30% use septic tanks • 10% pit latrines • 5% bucket latrines • 35% surface latrines or no facilities	• Highly flood prone - most serious problem • River gets overflow from septic tanks • Encroachment causing clogged canals	• Most waste recycled • Lowest per capita generation of municipal wastes in ANE region • Dumped in sanitary landfills

(Continued)

Table 9: Environmental Outline of Selected Cities/cont

Country/City	Location	Physical/ water-related Problems	Public Water Coverage	Sewerage	Drainage	Solid Waste
Thailand Bangkok	• On Chao Phraya River • On coast • One meter above sea • 40 kms from Gulf of Thailand	• Flooding during high tides • 1,000 sq kms. of city subsiding due to extraction of groundwater • Introduced groundwater licensing system	• 2/3 has coverage • Expanded public system • Many buy or use unsafe water • Levels of service 66% piped inside water 8% piped outside water 4% public wells 2% private wells • 100,000 use polluted water	• No waterborne sewerage system • Relies mainly on pour-flush latrine and septic tank systems • Septage disposed of in drains, canals and waterways - leading to pollution of surface water	• Contructed klongs & canals • Obstruction and blockage of canals • High water table • Excessive seasonal flooding - severe damage each year • Slow storm-water runoff in monsoon season • World Bank supporting $51.9 million flood control project	• 2,740 tons per day • 80% collected • 50% left to decompose or deposited in canals
India Madras	• On port & rivers	• 4 rivers flow through metro area • Low lying delta • Floods wide-spread in monsoon • Falling ground water levels • Rivers contaminated by sewage	• Severe shortages of potable water • Supplies rationed • 40% connected to piped water • 60% use public standpipes &/or vendors	• Only 30% served by public sewers • Raw sewage flows into rivers • Collection system only serves urban core	•Inadequate storm drains • Flooding a serious problem	• Inadequate due to lack of funding • Collection by bullock carts & trucks • Not treated before landfilling • Creates pollution & waterlogging problems
Pakistan Karachi	• Karachi Port & Port Quasim • On Lyari River	• Bisected by Lyan & Malir Rivers • Industries pollute rivers • Severe water shortages	• Water supply is most crucial problem • Potable water comes from Indus, 160 kms. away • Katchi abadis not served (1/3 of city) • 40% of households have water connections - available only a few hours a day • Katchi abadis uses standpipes & water vendors • 1 standpipe per 270 people • Piped water contaminated in transmission	• 30% connects to main system • Katchi abadis not served (1/3 of city) • Untreated sewage flows into Lyari River • Treatment plants subject to system failures	• Inadequate drainage • City under water for long periods • Storm drains modest in scale • Only designed for 5-year storm • Rivers subject to flash floods • Drains lack proper outfalls • Plans to upgrade	• 4,500 tons per day • 1/3 removed • Non-mechanized • Single dump site • Garbage is burned • Improvements planned

Sources: *See Appendix B*

and the national government has responsibility for facility operations. The Egyptian National Urban Policy Study of 1982 developed a policy that focuses on growth management in the urban areas.[24] The policy suggests a strategy of decentralizing all urban expansion to desert locations and ongoing rehabilitation of water and sanitation facilities. The policy also aims to provide efficient locations for industry and to create employment to absorb the large population increases. Housing density targets are set for new settlement areas (in fill or extension areas) and existing built areas. The policy recommendations are still pending adoption by government, however.

Metropolitan Manila, Philippines. Manila, the capital city, dominates the urban sector hierarchy. The metropolitan region is made up of 4 cities and 13 municipalities and is expected to grow by 200,000 people each year, from 6 million people in 1980 to 10 million by the year 2000. The city is radial concentric in form; a high-rise urban core is surrounded by extensive development sprawling outward for 870 square kilometers. Due to the pressure for development, land uses are mixed indiscriminately. Commercial and business activities are located on major routes, and industry has located in less expensive areas around the periphery.

About 60 percent of the population are in the low-income group; 2.5 million people live in slums or squatter areas, which are growing faster than the rest of the city. Approximately a third of the population lack adequate water and sanitation facilities; many people use wells or contaminated surface water to meet daily needs. Drainage in the city is poor, and the streams and rivers are highly polluted. Municipal waste collection is inadequate, which contributes to the pollution of water supplies. Due to its location in a flat river plain, the city is prone to flooding, especially in monsoon season.

Metro Manila does not have an effective form of urban government to direct planning in the region. There is a plethora of urban governmental authorities with overlapping and uncoordinated responsibilities.[25] Metro Manila is administered by 17 separately elected municipal mayors and councils, which are coordinated by a governor and the Metro Manila Commission (MMC). The MMC has the power to implement region-wide strategies, but it has become involved primarily in sector and municipal functions, such as the management of municipal waste disposal. National government agencies have some control over programs that affect Manila's population, including health, housing, roads, drainage, and other services. Water and sewer services are provided by the Metropolitan Water and Sewerage System, which plans and implements water supply and sewerage projects in the city. The MMC has the responsibility for developing a strategic plan for the city, and it has begun to develop land use and zoning

recommendations. The MMC, however, must begin to use its powers to resolve differences among the sectoral agencies that serve the city.

Colombo, Sri Lanka. Colombo, the port capital located at the mouth of the Kelani River, is the financial and commercial center of the country. The metropolitan area covers about 1,800 square kilometers and had a population in 1981 of 4 million people. The compact urban core accommodates over a million people and is roughly 235 square kilometers; the remainder of the city sprawls outward in an ad hoc manner. There is a lack of suitable land for expansion. A quarter of the land is marshy or subject to flooding, and rising land values and speculation make the remaining land inaccessible to the majority of the city dwellers.[26] About half the population have access to municipal piped water; the remainder use water from private and public wells. Waterborne sewerage is available to about half of the population. Inadequate drainage is a serious problem for urban residents, particularly in the low-income areas.

An analysis conducted in 1977 of Colombo's urban management revealed the lack of existing legislation or institutions to coordinate overall planning for the metropolitan area. The Colombo Master Plan Project was developed in 1977 to guide growth in the region, but a complex maze of authorities has responsibility for coordinating the provision of services and managing development in the city. The Urban Development Authority was established in 1978, but it has a national mandate and, hence, orientation. There is no clear distinction between local and national planning. By the end of 1978, at least 15 central ministries were operating in the urban core in addition to the ministries administering the district. In general, the agencies and authorities that have been established address short-term needs and increase the centralization of government.[27]

Jakarta, Indonesia. Jakarta, the capital, is located at the mouth of the Ciliwung River, and in 1981 had a population of 10 million people, which is expected to double by the turn of the century. The city has expanded dramatically and occupies 560 square kilometers, with a densely urbanized core of 180 square kilometers. The average density is 21,500 people per square kilometer; densities are as high as 51,500 people per square kilometer in the slums (kampungs) and 31,300 per square kilometer in the peri-urban areas.

Over 75 percent of the housing stock is temporary or semipermanent structures. Over 35 percent of Jakarta is slums located along drainage canals, which account for 70 percent of the growth of city. Only a quarter of the population have direct connections to the public water system; over a third of the

population rely on water vendors. About 65 percent of the population do not have private toilets; 25 percent use septic systems, which do not operate adequately because of soil conditions; and the remainder use pit latrines, cesspools, or the canals. Municipal waste collection is grossly inadequate; much of the waste is deposited in canals, rivers, and roads, which causes flooding and health problems in the rainy season. The slum inhabitants use the polluted water in canals for bathing, laundering, and defecation, which leads to chronic health problems, including pneumonia, bronchitis, and cholera. Infant mortality rates are high in the slums (160 per 1,000 live births), and over 80 percent of the people of the city are infected with waterborne diseases.[28]

Due to its riverine location, the city is subject to flooding. A system of canals was built to address this problem, but the canals are often blocked by municipal and industrial wastes. Overextraction of groundwater for drinking water use has led to subsidence in the city and the salinization of the groundwater resources.

Metropolitan government in the region is hierarchical from the national level through four levels of agencies and departments with different responsibilities and implementation programs. The Jakarta metropolitan region is given provincial status with a metropolitan government and governor. The district is divided into five mayoral areas, each with a local planning agency and functional departments. Below this level are 30 kecamatans, serving populations of 220,000, which are responsible for local security, health, building control, transportation, and record keeping of land rights. The lowest administrative unit serves populations of about 30,000 and is responsible for garbage collection, tax collection, and community health. In addition to this very complex urban administration mechanism, central government ministries are also responsible for providing urban services. The Directorate General of Housing, Building, Planning and Urban Development is involved in the provision of water supply and sanitation. Other parastatals are involved in land development for residential and low-cost housing and other programs, for example.

The initial response to the urban problems on a citywide basis was the development of a Master Plan in 1965, which focused on the urban core and sectoral projects. During the government's first Five-Year Plan (1969-1974), the Jakarta provincial government began a program of upgrading the physical infrastructure of the slums by improving pathways, drainage, and health and school facilities. Water and sanitation remain problematic, however.

In 1977 a more strategic approach was taken, with the primary objective of coordinating activities of the central and local governments, taking fiscal realities into account. The

planning process emphasized the formulation of policies according to the differing abilities of the population to pay for services. In 1981 a comprehensive plan for the JABOTABEK region (an acronym for Jakarta, Bogor, Tangra, and Bekasi) was developed with assistance from the World Bank. The plan focuses on public sector provision of basic services to direct growth, targeting of the low-income community, integrating regional and municipal strategies, balancing economic and physical solutions, working with the urban land market to resolve land issues, and guiding land development. These recommendations and others are currently being implemented.

Dhaka, Bangladesh. Dhaka, the capital city, is almost twice as large as the second city in the country. It has a population of 3.4 million and will triple in size by the year 2000. The built-up land area will have to double to accommodate this population surge. Despite this physical expansion, overall urban density will rise from about 25,000 to 28,000 persons per square kilometer.[29] Speculation in the urban land market has led to shortages of land for housing and urban development projects. The city is located in the floodplain, which further restricts the land available for development. The high-lying agricultural areas on the periphery of the city (part of the fertile Ganges-Bramaputra delta) are rapidly being converted to urban uses. The city (and country) is prone to natural disasters, such as cyclones, tidal waves, famine, and monsoonal flooding.

Provision of safe drinking water is a growing problem, especially in light of the anticipated population increase. Approximately a quarter of the population have house connections or use common standpipes, and the remainder use surface water, which is often polluted by human wastes. Only 20 percent are served by waterborne sewerage, 30 percent use septic tanks (which seldom operate effectively), 15 percent use bucket or pit latrines, and the remainder use surface latrines or have no facilities at all. Dhaka has a limited problem with municipal solid waste disposal. Inefficient drainage systems are further strained by the encroachment of urban development on natural water courses. Effluent from the tanneries, sugar and jute mills, textile industries, and two thermal power stations has polluted the rivers.

The first formal response to the rapid growth of the city was the development of a Master Plan in 1959, portions of which are still in use. An industrial location policy implemented by the central government in the early 1960s directed the location of manufacturing within the Dhaka metropolitan region to planned industrial areas. The next significant step in urban planning was the Dhaka Metropolitan Area Integrated Urban Development Project, supported by the Government of Bangladesh, the Asian Development Bank, and the United Nations Development Program. The project

developed nine alternative development strategies, none of which has been successfully implemented, for a variety of reasons. Currently, the Dhaka Improvement Trust is planning to develop a structural plan for the city that focuses on the broad structure of the city and not individual development areas. However, the planning process has yet to be initiated.[30]

Bangkok, Thailand. Bangkok is a classic example of primacy; the city is 40 time larger than Chian Mai, the second largest city.[31] The city accommodates approximately 5 million people (half the total urban population) and the population is expected to double by the year 2000. The city has a compact urban core of commercial uses; the residential areas (including slums) have moved out to the periphery along transportation routes, leaving large vacant parcels in the city undeveloped.

Approximately a quarter of the population live in slums and squatter settlements with inadequate water and sanitation facilities. About two-thirds of the population have access to public water, which is being expanded. Many people buy or use unsafe water, and there is no central sewerage system. Much of the city has septic systems, which do not operate effectively given the soil and flood-prone characteristics of the city. Canals (klongs) were built to address the severe drainage problems in the city, but they are often blocked with garbage. Solid waste collection services cover about 80 percent of the city, but disposal of wastes much less than that. Infant mortality rates vary between 31 and 60 per 1,000 live births, depending on the location in the city.

The city is prone to flooding during high tides and storms. Overextraction of the groundwater has led to subsidence of a large portion of the city and salinization of groundwater resources. Over 1,000 square kilometers of the city are sinking at a rate of 10 centimeters a year.

Urban planning proceeds on an ad hoc basis in the absence of any policy guidelines, whether metropolitan, provincial, or national.[32] Various planning efforts have been under way since the 1960s, but they have met with limited success. The Sixth National Economic and Social Development Plan (1987-1991) specifies that controlling the growth of Bangkok is a national priority and recommends such controls as zoning and land use regulations. Past efforts in this regard were not enforced, however. The plan divides Bangkok into four strategic areas for different targeted investment strategies. Much of the planned investment is intended to address infrastructure inadequacies, as well as to promote decentralization.[33]

Madras, India. Madras, the largest city in southern India, is the capital of the state of Tamil Nadu. It has a population of 5 million and an average annual growth rate of 2.3 percent. The city has a compact urban core and a decentralized business district. Development has spread along transportation routes and encompasses an area of 1,160 square kilometers. The highest rate of growth is occurring on the periphery. More than half a million people live in unimproved slums, and the annual demand for housing is about 30,000 to 40,000 units a year.

Despite the abundance of water in the region, the city suffers from severe water shortages, which necessitates rationing. Approximately 40 percent of the population have piped water and the remainder use public standpipes or rely on water vendors. Only a third of the city is served by public sewers, primarily in the urban core; the sewage is untreated and flows into the rivers. Municipal solid waste collection/disposal in the city is inadequate; the wastes are not treated before dumping, which causes pollution of the groundwater as well as waterlogging problems.

The Madras Metropolitan Plan (1971-1991) outlined a strategy of urban containment and growth management objectives. In 1974 the Madras Metropolitan Development Authority (MMDA) prepared a Master Plan outlining development rules and regulations and broad land uses based on the promotion of corridor growth, satellite towns and urban nodes, to be enforced by the MMDA. A multiplicity of organizations are involved in planning for and providing services to the metropolitan area. Implementation at the local level is inhibited, however, by inadequately trained personnel and ineffective enforcement of the rules and regulations.

Development planning began with a metropolitan perspective, but the process of relating sectoral projects and operational policies to that perspective is yet to be properly established. Sectoral problems, such as transport, water supply and sewerage, storm drainage, and housing need to be addressed by metropolitan-wide planning.[34]

Karachi, Pakistan. Karachi is a-low density city sprawling from the core along the Lyari River. It has a population of 7.5 million, which is predicted to increase to 13 or 15 million by the year 2000. In 1974 the city covered 374 square kilometers, by 1987 it had increased to 3,500 square kilometers, with the urbanized core covering 1,800 square kilometers. Over 5 square kilometers of fully or partially serviced land in the center of the city are vacant because private land speculation has caused a distorted residential land market and a highly dispersed, discontinuous pattern of urban development.[35] The city has one of the largest concentrations of squatter settlements in the region;

the settlements are growing at a rate of 10 percent a year, twice the rate of the rest of the city. Health indicators show a close correlation with geographic location and income characteristics of households. Infant mortality rates are about 46 per 1,000 live births.

Water supply is critical to the future development of Karachi because water is piped in from 160 kilometers away. Only 40 percent of the households have access to public water, which operates for only a few hours a day. The slums (katchi abadis) are served by standpipes or water vendors. About a third of the population live in dwellings that are connected to sewers. Untreated sewage flows into the Lyari River, degrading water quality. Only a third of the city's solid waste is collected, and that is deposited in a single dump site. Industrial developments deposit untreated effluent into the rivers. Drainage is a serious problem in the city, which is under water for long periods of time.

The city has pursued a decentralization policy for over 20 years. Karachi has a Development Authority and Metropolitan Corporation, but no metropolitan policy and little coordination of spatial and socioeconomic planning for the metropolitan area at any level of government. The 1974-1985 Karachi Development Plan highlighted the crisis confronting the metropolitan region and developed a framework for improving the provision of infrastructure and public services. The 1985 plan did little to manage growth in the area, which was influenced more by market forces than growth management strategy. At the request of the Government of Pakistan, a new project financed by the United Nations Development Fund and executed by the United Nations Center for Human Settlements (HABITAT) in collaboration with the Karachi Development Authority, will develop an innovative approach to master planning. The plan will focus on the development of an urban management tool, with a strong analytical base, that can be used by city planners in the various urban subsectors. An important component of the plan will be the development of an urban-level database that will be kept up to date and used to monitor changes in the urban environment.[26]

Policy Implications

Lack of adequate water supply, sanitation, solid waste treatment and disposal, and drainage are the most critical factors degrading the urban environment and the quality of life of urban inhabitants in the ANE region. The unavailability of urban land and resulting high-density development point to the need for alternative spatial configurations in urban areas. Urban land use and associated practices are damaging the general environment, degrading water quality and quantity, and causing an

incremental destruction of natural resources in and outside the cities.

Urban management responses to development problems have varied—from unimplementable plans to metropolitan-wide plans with a sectoral emphasis. In most cases, the institutional framework of the urban governments is fragmented, complicated, uncoordinated, and often replicative. Plans and approaches have focused on short-term solutions through piecemeal creation of special authorities appointed by central or provincial governments, which in turn has led to weaker local governments and less community involvement. New institutions are not needed. Programs and policies should focus on developing processes of management within and between agencies capable of having and sustaining a metropolitan-wide perspective.

Urban management should be able to identify changing physical, socioeconomic, and environmental problems accompanying rapid urbanization and industrial growth. Better information is needed to monitor changes, which points to the need for developing urban-level databases as part of the administrative framework of urban government.

Environmental impacts can no longer be considered incrementally. The cumulative impact of urban and industrial uses, coupled with the physical characteristics of the city, suggests the need for a comprehensive urban strategy that considers land use, infrastructure, and environmental issues simultaneously. A high priority should be placed on raising awareness of the implications of human practices for the natural environment, for example, the link between contaminated water supplies and deteriorated health conditions.

Consideration should be given to planning ahead to minimize the future environmental impacts of urban development. Where possible, infrastructure should be provided before development occurs, thereby building the foundations of the city. This preempts the development of unsatisfactory health and environmental conditions and reduces future expenses, such as for retrofitting to deal with a crisis situation. Minimization should be the focus also for the generation of municipal wastes, and where wastes are generated, collection, treatment, recycling, and disposal should be considered simultaneously.

Where cities have managed to absorb the population growth, the highest priority should be the improvement of urban land use and expansion of public services. Problems in the urban land market should be addressed to provide a basis for the development of permanent shelter options. The provision of public services should address income and coverage differentials, and appropriate levels of service should be provided according to city dwellers' ability and willingness to pay.

V. COUNTRY POLICIES AND APPROACHES TO RAPID URBANIZATION AND INDUSTRIAL DEVELOPMENT

This section examines the approaches taken by ANE countries to rapid urbanization and industrial development in terms of (a) national policies and strategies that relate either directly or indirectly to the environment and the urban sector and (b) the types of urban management approaches adopted by cities to deal with the problems of rapid urbanization. Detailed examples of the interrelationships among national, regional, and local policies are provided in Appendix C.

There is a direct relationship between the growth of urban areas and national and regional policies regarding economic development and industrial location, urbanization, population distribution, and transportation networks. The main determinants of urbanization and the concentration of populations in urban areas are the rate of development of the agricultural sector, the growth rate and sectoral pattern of industrialization, locational decisions affecting the distribution of manufacturing and, therefore, service activities among cities, and the condition of the transport and communication networks.[17] Policies relating to these sectors will ultimately influence the development and importance of different urban areas within a country and often contribute to their environmental status as well.

Given the current rates of urbanization and the contribution of rapid urbanization to environmental degradation in and out of cities, comprehensive management of these factors is becoming vital lest countries sacrifice long-term sustained economic growth for short-term development gains. Countries with environmental and urban development policies in place have the potential for balancing short- and long-term goals provided their national, regional, and local policies are based on recognition of the need for comprehensiveness, and provided they follow through with effective implementation.

National Approaches and Policies

The various ANE countries have adopted a range of national policies relating to urban development and the environment. These are summarized in Table 1C and discussed below.

a. National spatial policies

Spatial policies are adopted to control the growth of large cities and to stimulate development in small and intermediate-sized urban centers. For example, as part of a long-term national settlements policy, the Philippines identified 346

Table 10: Selected Country Approaches to Environmental Protection, Urban Sector and Industrial Location

Country	National Spatial Policy	Industrial Location Policy	National Urbanization Policy	Environmental Regulations/ Policy	Water and Sanitation	Hazardous Waste	Health	Housing	Comments
Morocco				E	E		E	E	
Jordan				E	E		E		Presence of water determines spatial policy
Sri Lanka				E					Uncoordinated urban development
Bangladesh				E	F	E	E		Environmental policy not well implemented
Pakistan				L	E				Environmental policy in place but not integrated
Egypt			E	E	E			E	Spatial policy focused on decentralization
India		E		L	E		E	E	Industrial development not permitted in 5 largest cities
Nepal				E					National conservation strategy - not linked to urban areas
Yemen A.R									Law based on Islamic principles
Thailand	L			L	E	E	E		Decentralization policy ineffective.
Philippines	E	E		E	E		E	E	Spatial policies focus on growth centers
Indonesia	E		E	E	E	E			Extensive environmental regulations

E - Exists (success unknown)
L - Limited Success in Implementation
Blank - Denotes no policy or inavailability of data

Sources: Multiple

settlements as potential growth centers and ranked them in terms of importance. As part of this strategy, new industrial development is restricted within a 50-kilometer radius of the center of Manila City.[38]

b. Industrial location policies

These policies or regulations specify the location and type of industries within the country and cities. In India, for instance, the government has adopted a restrictive industrial location policy that bans large and medium-scale industries from its five largest metropolitan centers. This policy aims to reduce the industrial concentration in the central cities.[39]

The success of these national spatial and industrial location policies is mixed. Often the policies are ineffective and even counterproductive. Much depends on the prevailing economic and political climate.

c. National urbanization policies

These policies specifically direct growth patterns in urban areas. For example, the Egyptian National Urban Policy Study of 1982, as noted in Section IV, recommends policy by city type.[40] Decentralization is called for in Cairo. In Alexandria, the plan calls for inducing major population growth away from Cairo by providing major employment growth. The goal for Tanta and Mansoura (medium-sized cities) is to encourage out-migration from Cairo, to preserve prime arable land through vertical redevelopment, and to concentrate high-level regional service functions in these settlements. The emphasis for the Canal Zone cities (Suez, Ismailia, Port Said) is also on growth. (The recommendations have not yet been adopted, however.)

d. Environmental policies

Environmental policy is ordinarily made up of regulations and standards affecting the environment of urban and other areas. Nearly all of the ANE countries have environmental legislation and agencies in place. Morocco, for instance, has enacted legislation relating to air, water, soil, flora and fauna, land use, pollution and hazardous waste, and waste disposal/sanitation.[41] Sri Lanka has passed legislation relating to renewable resources (water, forests, wildlife, fisheries, and air), nonrenewable resources (minerals, soil, and coastal areas), and land use and agricultural practices.[42]

The success of such environmental policies has been varied; in none of the ANE countries have they been totally successful. The major problems are with enforcement. In most countries the approach has been narrow rather than comprehensive, and concerned with short-term solutions rather than minimizing future problems. India's environmental framework is probably the most extensive within the ANE region, but ineffective program implementation has led to a focus on pollution control and not overall environmental management.[43]

e. Water supply and sanitation policies

National approaches to water and sanitation should address both the allocation of water resources and the collection and treatment of wastes. As part of the International Drinking Water Supply and Sanitation Decade, almost all of the ANE countries developed strategies for providing these services in both rural and urban areas. For a variety of reasons, none of the ambitious targets, set at the beginning of the decade (1980) and subsequently revised downward, has been met. Water supply and sanitation coverage targets have since been included in many of the ANE countries' national plans.[44]

f. Housing strategies

Housing strategies are usually aimed at the low-income population. They have evolved from slum clearance where squatter and slum areas were bulldozed and inhabitants were either relocated or forced to find alternative accommodations, to sites and service projects, self-help housing, relaxation of standards, and development of housing cooperatives. Other efforts include improving and strengthening housing finance mechanisms through the development of financial intermediaries. Despite these efforts, however, there is a severe lack of a sufficient number of organizations that are capable of dealing with the enormous need for urban planning and housing found in most of the ANE countries.[45]

Government Expenditures

One way of assessing national efforts to protect the environment and develop urban areas is to examine government expenditures on urban-related sectors, such as housing, amenities, and health. As shown in Table 11 and Figure 7, urban-related government expenditures classified as investments in economic development are uniformly high in the ANE countries; expenditures related to education are the most variable; and investments in housing and amenities are highest in Sri Lanka,

Table11: Total National Expenditures on Housing, Health, Economic Services and Education - 1986

Country	Percent of Total Government Expenditure					Gross National Product per capita (1986 dollars)	Total Government Expenditure as % of GNP
	Housing, Amenities, Social Security & Welfare	Health	Economic Services	Education	Other*		
Near East:							
Morocco	6.6	2.8	25.9	16.6	48.1	590	35.4
Tunisia	12.4	6.5	33.1	14.3	33.7	1,140	36.9
Egypt	14.9	2.4	9.3	10.8	62.6	760	40.6
Jordan	8.6	3.8	22.5	12.2	52.9	1,540	46.0
Yemen A.R.	0.0	4.7	7.8	22.5	65.0	550	25.5
Oman	1.4	5.0	20.8	10.1	62.7	4,980	63.2
Asia:							
Pakistan	10.5	1.0	25.8	3.2	59.5	350	23.1
India	5.6	2.1	23.4	2.1	66.8	290	16.4
Bangladesh	0.6	5.3	41.6	9.9	42.6	160	10.9
Sri Lanka	20.2	19.5	37.7	6.4	16.2	400	30.5
Nepal	6.8	5.0	48.5	12.1	27.6	150	19.7
Burma	8.4	7.7	35.1	11.7	37.1	200	16.2
Thailand	4.6	5.7	22.6	19.5	47.6	810	21.7
Philippines	1.6	0.7	44.9	20.1	32.7	560	10.8
Indonesia	1.4	1.9	19.3	8.5	68.9	490	26.9

* Other includes defense and general government administration

NOTE: The sectors presented are assumed to have an urban-related component

Source: World Development Report, 1988

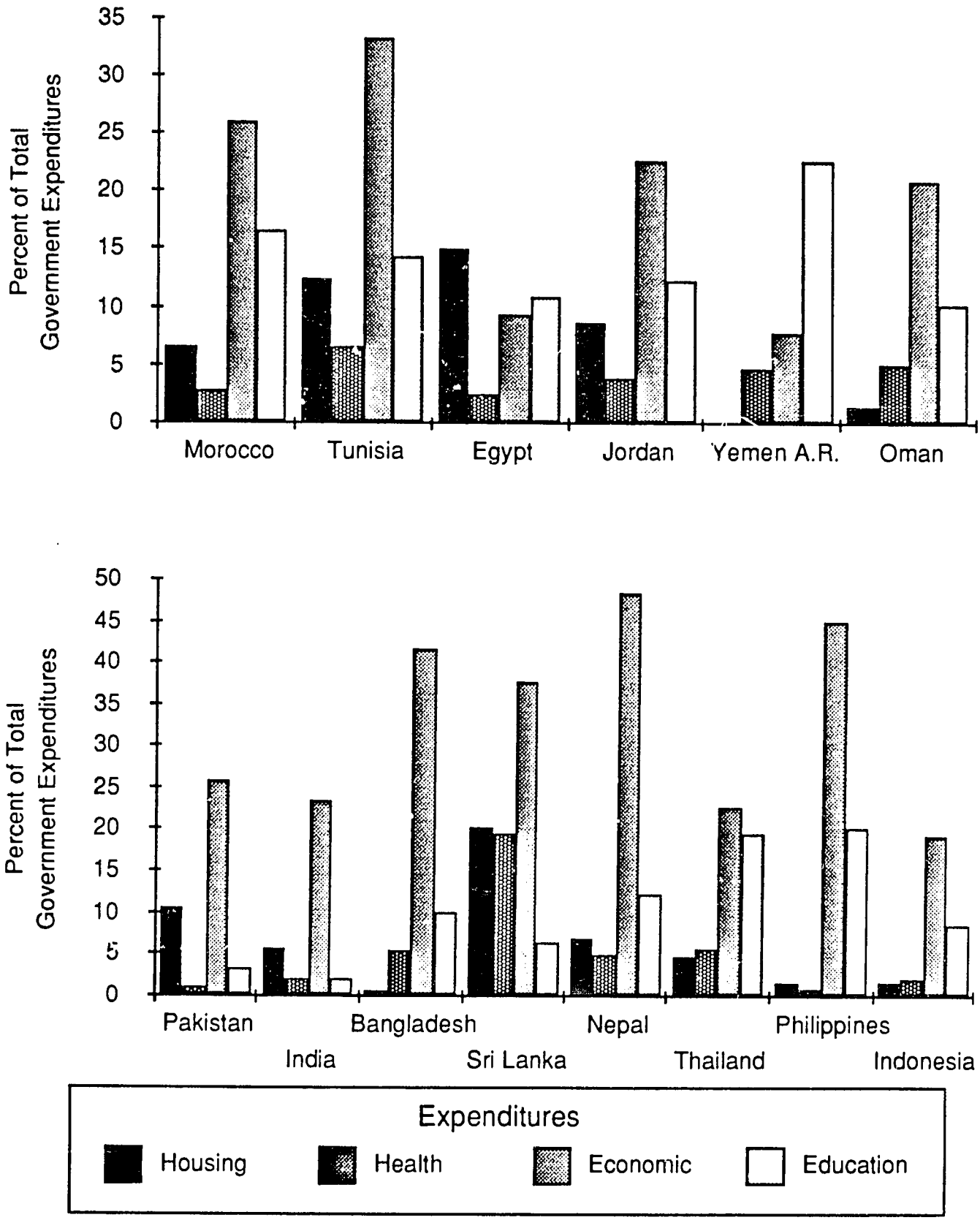


Figure 7
Urban Related Government Expenditures on Housing, Health, Economic and Education

Source: World Development Report, 1988.

Egypt, Pakistan, and Tunisia. Only Sri Lanka also allocates a high percentage of government expenditures to health programs and projects. Specific evaluation of municipal revenues and expenditures for ANE cities may be more revealing of the focus of urban activities.

The expenditures shown are for all sectors (urban and nonurban). Nevertheless, no clear trend is evident in these expenditure patterns. Perhaps the only conclusion that can be drawn is that urban investments, as measured by the total national values of housing, education, and health expenditures, take up large portions of government resources in all of the ANE countries, but they are still modest compared with the magnitude of the problem.

Urban/Metropolitan Management Strategies and Approaches

National policies have direct implications for the development and implementation of urban management approaches and governmental organizations.[46] This subsection briefly discusses the approaches taken by urban governments in the ANE countries and their relative. Information on urban management responses to the problems of urbanization is also provided in the case studies in Section IV.

Three main approaches have been used by urban governments in ANE countries to address the problems of the rapidly expanding metropolitan areas. Separate sectoral responses were followed by multisectoral responses, and various forms of metropolitan organizations make up the third type.

a. Sectoral responses

The initial response of many cities was to address particular sectors in need of immediate attention. Provision of water supply, drainage improvements, and upgraded housing were high on the agenda. Large-scale projects were implemented and managed by special authorities with either regional or local jurisdiction. These authorities initially were partially successful, but due to a variety of institutional, financial, and political constraints they lost the ability to function effectively. Some of the reasons for their demise include an emphasis on short-term sectoral plans with insufficient attention to the long-term impact on existing institutions and the lack of intersectoral coordination with existing agencies and their policies.[47] Perhaps the primary reason for their ineffectiveness, however, was the lack of available resources, human and financial, to keep up with growing sectoral demands.

b. Multisectoral approach

Partly due to the problems created by focusing on a single sector, the approach to metropolitan government logically shifted to a multisectoral one, and often the response was to set up strong, command-type development authorities with metropolitan-wide jurisdiction. These agencies had the power and budgets to implement multisectoral projects at both the metropolitan and local level. Despite the initial focus on multisectoral coordination, however, implementation efforts became sectorally oriented, as did the agencies themselves.[48] While some activities are more appropriate at the local and single sector level (e.g., schools), a multisectoral approach is appropriate when addressing broad impacts on environmental and natural resources in metropolitan areas.

c. Alternative responses

An alternative multisectoral approach was to create metropolitan governments with special provincial powers and status. Such governments were established in Jakarta (1964), Karachi (1973), Bangkok (1972), and Manila (1975), with various degrees of success. In Bangkok, the authority lost power six years later and was relegated to providing services, such as education and health care. In Jakarta, the population outgrew the boundaries of the metropolitan government's jurisdiction, which led to the creation of a new agency with even wider geographic responsibilities.

The "alternative" organizations thus became subject to the problems that led to their creation: their responsibilities could not match the rate and scale of the problems of rapid urbanization, due in part to lack of funding and insufficient political and financial power to implement their mandates.

Based on the scale of the problems, some researchers have contended that existing forms of metropolitan government in the ANE countries may be irrelevant to rapidly expanding urban agglomerations.[49] However, the research suggests that the organizational form may not be the significant problem. Rather, the lack of success may be due to shortsighted policy, low levels of funding, and low levels of human resources.

Conclusions

The urban policies and approaches adopted by central governments and by various city and regional entities in the ANE countries have been generally weak and noncomprehensive and funding levels have been low. In most of the ANE countries, responsibilities for urban development are badly fragmented among

ministries and agencies. These responsibilities generally are based on laws and regulations that are concerned with components of problems and that prevent actions based on comprehensive, long-term considerations. Further, there is poor coordination among agencies or sectors.

Environmental awareness has to be incorporated and integrated into planning at all levels so that both direct and indirect impacts are considered. The institutions involved in urban development and management of the environment are in dire need of strengthening, so that comprehensive urban management, including land use policy, water resource and supply management, spatial planning, and pollution minimization can be practiced.

All of the countries in the ANE region require stronger policy frameworks that are comprehensive in nature and include strong environmental components. The establishment of such policy will provide guidelines for the complex interventions necessary. Many of these are problems of public service provision—water supply, sewerage, drainage, solid waste disposal, shelter, and transportation—arising from the congestive effects of rapid urbanization.

This section has provided a brief overview of the policies and programs of countries in the ANE region. Additional research and review of these policies and programs, and of their relative and comparative successes, will provide a strong basis for the development of urban sector policy by the ANE Bureau.

VI. MAJOR DONOR ASSISTANCE EFFORTS

This section describes urban-related assistance provided to the ANE countries by A.I.D. and other institutions. As shown on Table 12, donor assistance in the urban sector has been primarily directed toward housing, infrastructure, physical planning (including spatial planning), and urban administration and finance. (Note there is no group of projects that can be classified as "regional urban systems.") Environmental issues if they have been dealt with at all have usually been part of other programs or sector strategies. Environmental factors are primarily considered in evaluating the potential environmental effects of particular projects rather than through specific interventions.

U.S. Agency for International Development

As directed by Congress, A.I.D.'s efforts for the past 15 years have been primarily focused on projects in rural areas. There have been some notable urban interventions, however, mainly in Egypt. Although recognition of the problems in urban areas has substantially increased, Congress has not yet directed A.I.D. to focus on urban development.[50]

Several types of A.I.D. programs do provide assistance to urban areas:

- Direct assistance for provision of urban infrastructure, such as water supply, sewerage facilities, solid waste collection, transportation facilities, highways, streets, railroads, ports, harbors, and airports.

- Housing guarantee programs of the Office of Housing and Urban Programs, which provide credit guarantees to finance upgrading of infrastructure services in low-income settlements, development of serviced land sites, municipal management, and finance and land management. Actual funds are provided through U.S. and local banks. These efforts are focused on benefiting the urban poor.

- Economic support and development activities, such as direct economic support grants and programs for export promotion, increased industrial production, and employment stimulation.

- Social service projects in the health, nutrition, population, and education sectors.[51]

Table 12: Urban-Related Programs by International Assistance Agencies

Agencies†	Physical Urban Planning	Regional Urban System	Housing	Infrastructure	Urban Economic Growth	Urban Transport	Urban Poverty	Urban Admin./ Finance	Urban Land Policy	Info. Prov.	Training
USAID (1960)			Δ	Δ				Δ		Δ	Δ
United Nations											
HABITAT (1978)	Δ		Δ					Δ	Δ	Δ	
UNDP	Δ			Δ							
UNIDO					Δ						
UNEP			Δ	Δ							
UNICEF			Δ	Δ			Δ				
WHO				Δ							
ILO					Δ		Δ				
Banks											
IBRD (World Bank - 1972)	Δ		Δ	Δ		Δ	Δ	Δ	Δ	Δ	Δ
ADB (1976,	Δ		Δ	Δ				Δ			

†Year refers to either time of creation of agency or time when active urban assistance began

Source: Yeung and Belise in Drakais-Smith, Urbanisation in the Developing World, 1986
Report to Congress on Urbanization, 1988

The level of A.I.D. support for ANE countries varies greatly. Table 13 ranks the ANE countries according to the level of total support and per capita level of assistance. The table clearly indicates that A.I.D.'s program is not nearly proportional to the urban populations in each country.

A.I.D.'s program of housing guarantees in the ANE region for FY 1990 is about $100 million. This program is A.I.D.'s most powerful tool for urban development; it provides for millions of dollars of housing credits at little actual cost to A.I.D. The housing programs supported provide infrastructure and other urban services. It is important to note that A.I.D.'s program of housing guarantees does not appear as part of its budget and, thus, is not reflected in funding reports. (There is ordinarily no expenditure, because it is a guarantee program.)

Table 14 presents the level of funding for different sectors in the ANE countries and examples of projects and programs. The funding categories are grouped according to those likely to include an urban component. (Within this grouping, urban infrastructure support could also be provided in the form of selected development activities or economic support fund programs, as described above.)

Since 1976, A.I.D. has required the preparation of environmental assessments for all projects that could potentially have a "significant effect" on the environment (in and out of the urban areas).[52] These assessments usually consider the impact of large, capital-intensive, A.I.D.-supported projects (such as in Egypt); they follow the U.S. Environmental Protection Agency guidelines for such assessments as well as the air and water quality standards of the host nation.

Multilateral Assistance

a. United Nations Agencies

Assistance in the urban sector from agencies of the United Nations was initiated in the 1960s. The United Nations Development Program is active in specific urban programs and projects. The World Health Organization has supported projects on urban infrastructure, especially water supply. The United Nations Industrial Development Organization is interested in the impact of industrial investment on urban growth. The United Nations Environment Program supports research into environmental issues worldwide. The United Nations Children's Fund has developed programs of assistance to the urban poor that focus on basic services, such as water supply and sanitation.

Table 13: U.S. AID Asia/Near East Funding - Ranked by Total Support

Country	Total Support (US $million) 1987	1988	1989	1990	Four Year Total	Four Year Average	1990 Population (millions)	Average Funding per capita 1987-1990	Funding per capita 1990	Per capita Ranking
Egypt	$819	$717	$930	$815	$3281	$820	53	$15.61	$15.51	1
Philippines	247	70	338	415	1070	268	61	4.39	6.81	4
Pakistan	275	384	265	300	1224	306	112	2.73	2.67	5
Bangladesh	84	59	61	55	259	65	115	0.56	0.48	11
Indonesia	85	40	42	43	210	53	166	0.32	0.26	13
Jordan	111	18	15	35	179	45	4	10.43	8.16	3
Morocco	28	32	32	27	119	30	25	1.21	1.10	8
India	57	23	24	25	129	32	827	0.04	0.03	14
Yemen A.R.	23	22	21	21	87	22	8	2.74	2.65	6
Oman	14	13	15	20	62	16	1	10.62	13.70	2
Thailand	21	21	18	19	79	20	41	0.48	0.47	12
Sri Lanka	23	26	26	18	93	23	17	1.33	1.03	9
Tunisia	17	10	11	12	50	13	8	1.58	1.52	7
Nepal	15	12	12	12	51	13	18	0.69	0.65	10
Burma	8	5	0	0	13	3	41	0.08	0.00	15
TOTAL	$1,827	$1,452	$1,810	$1,817	$6,906	$1,727	1,498	$3.52	$3.67	

Source: US AID Congressional Report - Asia and Near East: Annex II
World Development Report, 1988

Table 14: Bureau for Asia and Near East - Summary of Funding
(US $millions)*

Country	Total	Health	Education/ Human Resources	Selected Development Activities	Economic Support Fund	Other**	Examples of Projects with Urban Components
Near East:							
Morocco							
1987	28.4		1.2	1.4	10.0	15.8	Health management improvement
1988	32.5				20.0	12.5	Anhi low income housing
1989	32.5	0.7			20.0	11.8	Tetouan Urban Development
1990	27.5	1.0			15.0	11.6	Watershed management
Tunisia							
1987	17.5	0.3				17.2	Technology transfer
1988	10.9			0.0		10.9	Small project assistance
1989	11.3					11.3	Improved water resources management
1990	12.5					12.5	Science and technology
Egypt							
1987	820.0				820.0	0.0	Cairo/Alexandria wastewater system expansion
1988	718.0				718.0	0.0	Industrial production
1989	930.0				930.0	0.0	Provincial cities
1990	815.0				815.0	0.0	Water/wastewater institutional development
Jordan							
1987	111.0				111.0	25.0	Low cost housing support (1988)
1988	18.1				18.1	0.0	Water systems and services management
1989	15.0				15.0	0.0	Industrial development
1990	35.0				35.0	0.0	Zarqua Ruseifa water and wastewater
Yemen A.R.							
1987	23.3	4.1	9.1			10.1	Tihama Primary Health Care
1988	22.1	2.9	8.3			10.9	Yemen enterprise support
1989	21.0	1.0	6.6			13.4	Basic educational development
1990	21.1	1.0	8.9			11.2	Development training
Oman							
1987	15.0				15.0	0.0	Water resources development
1988	13.0				13.0	0.0	School construction
1989	15.0				15.0	0.0	
1990	20.0				20.0	0.0	
Asia:							
Pakistan							
1987	275.5	5.0			250.5	20.0	Institutional excellence
1988	384.0				334.0	50.0	Development support training
1989	265.0	5.0	13.0		215.0	32.0	Energy planning and development
1990	300.0	1.8	16.0		250.0	32.2	Roads resources management
India							
1987	57.6	8.0		6.2		43.4	Development and management training
1988	23.7	10.2		3.7		9.8	Advancement of commercial technology
1989	24.0	7.0	0.5	3.3		13.2	PVOs for health
1990	25.0	7.8	0.4	5.5		11.4	Technical assistance and support/housing finance

(Continued)

Table 14: Bureau for Asia and Near East - Summary of Funding / cont
(US $millions)*

Country	Total	Health	Education/ Human Resources	Selected Development Activities	Economic Support Fund	Other**	Examples of Projects with Urban Components
Asia							
Bangladesh							
1987	84.2	2.0	3.0	1.5		77.7	Urban volunteer program
1988	59.3	1.5	4.3	1.5		52.0	Local government infrastructure and service
1989	61.3	2.0	0.2	2.5		56.7	Enterprise development
1990	55.0	2.3	2.3	1.9		48.5	
Sri Lanka							
1987	23.5	0.3		1.4		21.9	Water supply and sanitation sector
1988	26.8			4.0		22.8	Natural resources and environmental policy
1989	26.8			5.2		21.6	Rehabiliation assistance
1990	18.0			4.6		13.4	Private sector po'icy support
Nepal							
1987	15.0	3.4	1.0			10.6	Resource conservation and utilization
1988	12.5	1.3	0.8			10.4	PVO co-financing
1989	12.0	1.5	0.5			10.0	
1990	12.0	1.3	1.2			9.5	
Burma							
1987	8.0	1.5	1.0			5.5	
1988	5.1		1.5			3.6	
1989						0.0	
1990						0.0	
Thailand							
1987	21.5	0.3				21.2	Emerging problems of development
1988	21.9			0.0		21.9	Science and technology for development
1989	18.6					18.6	Decentralized development management
1990	19.5					19.5	University development
Philippines							
1987	237.0	4.9	1.3		235.0	-4.2	Municipal development fund
1988	70.0	3.4	0.4	3.4	15.0	47.8	Shelter sector program
1989	338.0	1.3	1.2	1.4	298.0	36.2	Local government improvement
1990	415.0	3.3	2.8	4.5	160.0	244.4	Barangay water supply
Indonesia							
1987	85.8	7.2	3.6	4.0		71.0	Local government training
1988	40.5	9.7	6.0	7.6		17.2	Financial institutions development
1989	42.0	3.9	4.4	3.0		30.7	Health sector financing
1990	43.0	8.6	2.9	7.1		24.4	Municipal finance

* This summary does not include full reporting of Housing Guarantee loans provided by the Office of Housing and Urban Development. (For example, Jordan received $35 million in Housing Guarantee loans for land policy change and housing for low income groups. Large HG programs for India, Indonesia and Sri Lanka are not reflected.)

**"Other "includes: Agriculture, rural development, nutrition, population planning, child survival, and AIDS

Source: US A.I.D. Congressional Presentation Fiscal Year 1990, Annex II - Asia and Near East

The United Nations Center for Housing and Shelter (HABITAT), established in 1978, focuses on housing and shelter issues in developing countries. The United Nations General Assembly has endorsed a HABITAT proposal to launch a global strategy to provide adequate shelter for all through the year 2000.

The United Nations Department of International Economic and Social Affairs is currently developing a series of population studies of mega-cities. The aim of this research project is to develop population policies to improve the standard of living and quality of life of urban inhabitants. The project tracks population migration and growth trends and evaluates population distribution strategies and efforts to provide cost-effective urban infrastructure. Consideration is also given to creating employment, assembling urban land for development projects, and measuring the effectiveness of institutional arrangements for planning and managing urban growth.[53]

Most of the assistance provided by the UN agencies is in the form of technical assistance, training, and pre-investment studies, but some capital investment funds are provided. Current research projects relating to urban land policies (e.g., ownership rights, use regulations and tenure, and municipal finance) are supported by HABITAT in cooperation with the other UN agencies.

b. World Bank

The World Bank's worldwide program of assistance for urban areas is by far the largest in dollar volume; annual levels reach over one billion dollars. The program covers almost every aspect of urban development, including low-cost shelter, urban transport, and integrated urban and regional development. Past projects have focused on the largest metropolitan areas, but recent activity has included many secondary cities.[54] In the housing sector, the bank is giving increased attention in its research and policy work and in its lending program to housing finance and to the development of financial intermediaries to support housing development.

During the past five years, the World Bank's urban development programs have undergone a dramatic shift in focus to include not only provision of infrastructure but also assistance for urban administration and municipal finance, better land management, housing, and cross-sectoral interventions in transport, water supply, and sanitation as necessary conditions for good functioning of cities.[55] The World Bank also considers environmental impacts at the project level, and has developed guidelines and recommendations for mitigating potential adverse effects.[56] The bank is also executing projects for UNDP on water supply, sanitation, waste management, and urban management.

Linked to this joint UNDP/World Bank program is the Water Supply and Sanitation Decade activities undertaken by bilateral donors and multilateral lenders to achieve greater coordination and collaboration in urban sanitation and waste management.

The Asia Environment Unit is about to embark on a three-year research program for environmental management in Asia's urban areas. The proposed $2.2 million "Capital Cities Clean-Up" project will primarily focus on the impact of industrial development and urban management practices on the environment in large metropolitan areas.[57]

c. Asian Development Bank

The Asian Development Bank began its assistance to urban development in 1976 with the establishment of an Urban Development Division. Capital investment for infrastructure is the primary form of assistance.[58]

d. Other bilateral assistance

Other major donors providing urban development assistance to ANE countries include the governments of Great Britain, the Netherlands, West Germany, Canada, Japan, and the Scandinavian countries. This assistance has been primarily for infrastructure development and housing. Recent activity reflects a similar trend toward providing technical assistance that does not include "hardware" items. (Information on actual levels of assistance was not readily available for bilateral donors.)

Over the past few years, the Government of Japan has become a major provider of foreign assistance. Japan's annual worldwide foreign aid budget for FY 1990 is projected to be the largest of any bilateral aid budget. Japanese aid is directed primarily at providing hardware; however, technical assistance in the form of planning and design services is becoming a more prominent part of the program. Examples of projects include a waterworks improvement project in Cairo, $1.4 million for a health promotion project in North Sumatra, an $18 million waterworks project in Jakarta, and a $12.7 million drainage system rehabilitation project in Metro Manila.

VII. OPTIONS AND APPROACHES FOR A.I.D.

This section discusses A.I.D. policy options and approaches for environmental and urban development activities in ANE countries. This presentation is based on a framework that sets guidelines for all policy options. Subsections devoted to specific approaches follow. Recommendations for A.I.D. policy are presented in Section VIII.

Policy Framework

The A.I.D. policy options and approaches presented in this paper are based on a recognition of the need for A.I.D. to develop policy that will guide its urban program activities. Such policy must take into account the following elements:

- The cross-sectoral nature of environmental policy;
- Recognition that the availability of resources may limit A.I.D.'s contribution to technical assistance and leveraged investments; and
- The need to include detailed environmental analyses as an integral component of all projects and programs in A.I.D.'s assistance portfolio.

Note, however, that the most critical issue in all ANE countries is program funding.

a. Cross-sectoral linkages

Recognition of cross-sectoral linkages must be a key element in A.I.D.'s environmental and urban policy. Urban policy should exclude programs that foster growth in one sector at the expense of another or that cause irreversible environmental damage in one or several sectors. Rather, policy should be developed that encourages balanced economic development with minimum environmental degradation, in relation to industrial and housing-support activities, for example.

b. Technical assistance and leveraged investments

The ANE countries will require enormous investments over the next 10 to 20 years for rehabilitation and/or provision of physical infrastructure, including housing. If A.I.D. practices of the past decade remain unchanged, however, it is doubtful that many capital-intensive interventions will be implemented in the ANE region over the next several years. Thus, A.I.D.'s options

for policy and programming may be, for the most part, limited to the provision of technical assistance.

This lack of participation by A.I.D. in infrastructure projects may pose a basic dilemma for the Agency. On the one hand, the desire to provide help to those most in need is strong. On the other hand, the levels of funding available may in fact force A.I.D. to take a subsidiary role in terms of urban programs.

Recognition of the possibly limited level of A.I.D. assistance requires that A.I.D. develop policy to ensure that its contributions achieve the maximum impact. Thus, policy that fosters cooperation among bilateral donors and multilateral lending institutions to leverage investments will be imperative. Further, policy should be adopted to ensure increased cooperation among A.I.D.'s bureaus and field missions and its Office of Housing and Urban Programs.

A.I.D.'s most significant urban development intervention appears to be its program of housing loan guarantees. The cost of these guarantees is very small compared with the amount of capital secured and offers A.I.D. two options for providing high levels of capital for urban development. One option would be to increase the total program size (about $100 million for F 1990 in seven of the ANE countries). A second option would be to expand the housing guarantee concept to include guaranteeing loans for financing general urban development projects. Such guarantees could provide funds for "seed" money for locally funded projects, credit at beneficial interest rates, and contributions to national or regional development banks.

Policy should also be adopted to ensure that A.I.D.'s activities include support of private sector initiatives, especially programs (in and out of government) that have high levels of cost recovery or the potential for self-generation of investment funds.

c. Environmental aspects of program/project formulation

A.I.D. policy should be formulated so that all urban development programs or projects recognize that they may impinge on the in-city and out-of-city environments. A few examples follow:

- The environmental effects of water supply and wastewater service should be analyzed to ensure that if the added water supply increases the volume of wastewater, its discharge into watercourses or into the ground does not lower water quality, which might cause a loss in

either surface water for downstream uses or groundwater.

- Housing programs should be based on proper land use planning and should mitigate problems caused by overcrowding and/or overstressing of basic urban services.

- Industrial development and general infrastructure programs should be analyzed not only for their direct environmental impacts (effects on air, water, and noise pollution and demands on physical and financial resources) but also for their secondary or indirect effects, including effect on population shifts, housing, educational and other social infrastructure requirements, and administrative demands on the governing or owning entity.

- The management of water demand is closely related to the management of municipal and industrial wastes. Water conservation practices, for example, through appropriate pricing and cost recovery, could reduce industrial waste generation in particular and could encourage recycling.

- Rapid urban growth is causing ever-increasing urban boundaries to impinge directly on, and give rise to great competition for, valuable forest and agricultural lands and watershed.

- Rapid urbanization is causing services and resources to be out of balance. Badly degraded environmental conditions in and around major cities and in smaller cities and towns have been created by inadequate wastewater collection and solid waste services. Air pollution and hazardous wastes are causing major problems in almost all of the larger cities in the ANE area. These deficiencies have serious public health impacts, detrimentally affect the quality of urban life, and decrease economic productivity.

Thus, A.I.D. policy should require that project/program selection criteria be based in part on environmental considerations. Policy changes may be required to cause detailed analyses of urban needs and environmental impact to be prominently included in A.I.D.'s project development processes.

Specific Approaches

a. Infrastructure development

If A.I.D. is to be a major factor in urban development in ANE countries, A.I.D. interventions will have to provide the needed infrastructure for basic services, especially urban wastewater treatment. Such interventions will represent a major policy shift for A.I.D., but they may be possible by expanding the housing guarantee program and adopting the housing guarantee concept for use in other types of projects.

b. Institutional development

Weak institutions abound in almost all sectors of the ANE countries. For sustainable urban and environmental programs to be implemented and kept viable, capable governmental and other institutions must exist.

The following institutional issues and problems are common to all the ANE countries:

- Lack of manpower, skills, and human resource development programs;
- Lack of sound systems for comprehensive urban and environmental management;
- Lack of appropriate urban development, environmental, and natural resource policies;
- Unclear or uncoordinated division of responsibilities among ministries or agencies with responsibility for urban development and environmental and/or natural resource protection;
- Inability to prepare comprehensive urban plans and concurrent lack of preparation and/or inclusion of environmental and natural resource considerations in comprehensive plans;
- Lack of data on environmental conditions and lack of adequate measures of performance and of performance monitoring;
- Inability to identify, obtain funding for, implement, and sustain sound projects; and

- Lack of physical resources (vehicles, tools, equipment) needed to perform technical and administrative functions.

A.I.D. support to help eliminate the above constraints is desirable, but all of the problems discussed herein are exacerbated by a serious lack of capital funds. Thus, technical assistance alone is not necessarily welcome as a form of assistance by host countries. Further, technical assistance is rarely sustainable as a project in itself. Such programs often must be linked with other A.I.D.-supported programs, infrastructure projects supported by other foreign donors, or other types of capital assistance.

Thus, A.I.D.'s basic strategy should include strengthening host country capabilities to develop and manage urban government and service-delivery programs. When selecting program and project opportunities, A.I.D.'s priorities should go to those that contribute to and are supportive of developing urban and environmental institutional capabilities.

c. Human resource development

The development of human resources is closely aligned to institutional development. Although human resource needs vary across the ANE region, the general level of need is very high. Morocco, Tunisia, and Jordan have, on a relative basis, moderate needs. These countries have a strong tradition of providing educational opportunity. Other ANE countries are not nearly so fortunate. In many, a major portion of the small, technically capable cadres that are available are lost as part of a "brain drain" to the oil-rich countries. Thus, A.I.D.'s strategy for institutional development should include, where possible, a component to bolster "civil service" reform so that employment incentives can be provided to technically capable people. (One such strategy is to encourage the creation of parastatal organizations for service provision. Such organizations can be sustainable in capital-intensive ventures if the cost-recovery potential of the services provided is successfully exploited.)

Generally, high human resource needs are a result of low levels of education and limited access to vocational and higher learning centers. Engineers, mechanical and electrical technicians, health education specialists, behavioral scientists, and trained managers are needed in almost all urban management and environmental agencies in the ANE region. Thus, training and educational systems oriented toward comprehensive urban management and environmental and resource management are priority needs.

For the ANE countries to meet their human resource needs, enormous help will be required to establish or strengthen in-country capabilities to train personnel and institutionalize the personnel and support systems needed for effective performance. These are potentially key areas for A.I.D. intervention, and possibilities for providing these interventions should routinely be evaluated as elements of all A.I.D. programs and projects.

Similar to technical assistance, however, human resource development projects may not be popular with host governments. Thus, care must be taken when formulating these policies, for it may be impossible to implement such programs without linking them to other, more popular forms of assistance.

d. Land use and housing as a lever for balanced urban development

Proper urban development can be classified as a system that permits the balanced provision of all support services necessary for the vitality of urban life. These services include adequate physical infrastructure for basic services—water supply, sanitation, solid waste collection—and institutions and systems necessary for the proper functioning of the urban entity. Further, urban development should be balanced to complement national development efforts.

Land use planning programs, however, are not necessarily popular programs because they tend to control development. Thus, they may be in conflict with the economic forces pushing for development without regard to proper controls. This conflict is a worldwide phenomenon, not limited by any means to developing countries.

A.I.D.'s assistance in land use planning will help provide services to maintain the urban populace and bolster the environmental quality of urban areas and enable them to act as centers of national development. A.I.D.'s support of national and local efforts to improve land use planning and provide adequate housing will enable A.I.D. to become involved at the most basic levels of urban and national planning and development. (If such a policy is adopted, the sensitivities discussed above must be recognized.) Further, provision of adequate housing often can be based on private sector initiatives. Thus, such programs have the added advantage of providing needed infrastructure, while at the same time relieving a budget burden from the central government.

e. Support of private sector and nongovernmental initiatives

A.I.D.'s support of initiatives by the private sector and/or nongovernmental organizations (NGOs) should be encouraged; such initiatives can produce benefits on several fronts. An obvious benefit is that the initiatives are being locally conceived in reaction to some obvious need. Thus, they should have a high probability of success. Second, pressure on the central government to provide the services would be relieved or lessened. Further, because the service is being provided through the private sector, a high degree of cost recovery may be realized.

Development of local organizations or commercial entities falls within the recommended policy of institutional development. In fact, the nongovernmental nature of such institutions may be extremely beneficial to national development because of their "grassroots" nature.

Institutional development of the private sector should also be developed in conjunction with support of capacity building and enhancement of the technical competence of local government to manage and coordinate private sector activities.

Examples of private sector initiatives in the ANE countries that A.I.D. could support follow:

- Water supply and/or wastewater disposal,
- Solid waste collection and disposal,
- Housing developments,
- Roadway and drainage maintenance, and
- General construction services.

This list could be expanded, depending on the investments available and the characteristics of private sector services in a particular country.

f. Decentralized operations/community involvement

Many cities within the ANE countries operate at low levels of efficiency. A contributing factor in this regard could be that most central governments decide how services are to be provided, financed, and regulated. These centrally proposed urban development solutions often fail due to inappropriate budget support and lack of local acceptance.

A consideration for A.I.D. should be to encourage governments to place responsibility for urban control with local governments and local private sector institutions or other nongovernmental organizations. The goal would be to decentralize the decision-making process and place the responsibility for urban management as close to the people involved as possible. In this manner, requirements can be determined locally, community participation could be more easily encouraged, and arrangements for payment for all or a part of the services by the beneficiaries may be possible.

g. Direct help programs

Another consideration for A.I.D. would be to sponsor self-help programs in regard to urban management and environmental controls. A.I.D. could help central governments to set national goals and policy and regulatory frameworks. In a complementary program, A.I.D. could directly help local governments to produce and manage the services they provide more efficiently. This would include mechanisms to plan and finance local projects, including operating on a sound business (financial) basis, with costs being recovered, where possible, at market levels. Cost-recovery strategies might include charges, taxes, and fees.

VIII. PRIORITIES FOR A.I.D. PROGRAMMING

This section discusses priorities for A.I.D. programming. General recommendations for internal activities and programming in the ANE countries are included.

A.I.D. Program Examination

A.I.D.'s ongoing activities and support in almost all of the ANE countries are directed primarily to rural areas as part of programs that involve agriculture, rural development, health and nutrition, family planning, and child survival. The rural bias is clear and, in fact, derives from A.I.D.'s legislative mandate to provide help for the poorest groups in any particular country.

The explosion in urban population growth, however, has caused a large portion of the A.I.D. "clientele," that is, the poorest inhabitants, to reside in or near cities. Rapid urbanization, in fact, has caused the greatest growth to occur in peri-urban areas. These population concentrations tend to overstress existing facilities, and the very nature and characteristics of these kinds of population concentrations make interventions by government for provision of basic services—water supply, wastewater, and solid waste disposal—almost imperative. Thus, it will be necessary for A.I.D. to refocus its efforts and activities to provide a more balanced approach between rural and urban programs. Further, it may be necessary for A.I.D. to provide assistance in projects requiring large capital investments.

The first priority for A.I.D. should be to revise its procedures to reflect the more balanced approach. The initial component of this effort should include a review of existing A.I.D. policy, programs, and activities with the following objectives:

- Identify policy or statutes that work against A.I.D.'s providing a balanced urban-rural programming approach.
- Determine specifically which projects or programs contain definite urban components and identify the cross-sectoral components in terms of environmental sensitivities or requirements. The status of these programs should be reviewed to determine if they should or could be expanded.
- Determine possible areas of cooperation among A.I.D. groups (bureaus, missions, and the Office of Housing and Urban Programs) and between A.I.D. and other bilateral donors and multilateral

development banks. Opportunities for cooperation should be incorporated into future program development scenarios. Cooperation and co-financing with other bilateral donors and multilateral lenders should be a key element in A.I.D.'s priority activities.

Program Financing

Subsequent to the review described above, the ANE Bureau should consider the annual level of investments that can be provided to various programs in the ANE countries. As discussed in various sections of this paper, the greatest need in all of the ANE countries is the provision of basic services—primarily urban wastewater collection and treatment, followed by provision of facilities for water supply and solid waste services. Facilities (i.e., physical infrastructure) to provide these services, especially for wastewater, are extremely expensive to construct and maintain, and such capital-intensive needs pose a basic problem for A.I.D. For many years A.I.D.'s program levels, except for Egypt, have been restrained by a policy of providing only low levels of capital support and/or high levels of technical assistance. A.I.D.'s F 1990 program levels in the ANE countries are relatively low when compared with the capital (or investment) levels required for urban infrastructure. There is little evidence that A.I.D. will have larger budgets with which to furnish any large amounts of capital. If this is the case, A.I.D. programs may be out of step with the real concerns and needs of many countries in the ANE region because technical assistance programs are usually only reluctantly accepted on their own merits.

Thus, A.I.D. should, at least selectively, provide direct capital assistance to the ANE countries. The following steps are recommended to implement that course:

- Examine A.I.D.'s portfolio of existing and proposed projects to determine the feasibility and applicability of expanding the concept of housing guarantees to help finance other types of projects. The benefits of this approach are obvious: the amount of capital made available is many times the actual cost to A.I.D.; local organizations (private and public sector and NGOs) will be involved so that the program can become a "local institution" very quickly; high levels of cost recovery can be achieved to make the program self-generating.

- Examine the housing guarantee programs for F 1990 to determine if they can be expanded to provide further comprehensive urban development assistance as part of the shelter-upgrading portfolio of projects.

- Determine how various programs in ANE countries could be expanded if cost-recovery mechanisms were built into the programs. Consideration should be given to examining the tax base for investment and thrift rates for recovery. Although few utilities in sanitation/water are totally unsubsidized or financially self-sufficient, certain components show potential for cost recovery.

- Determine how various programs could be expanded if private or commercial sector firms were used to provide the necessary services while cost-recovery systems are implemented.

- Determine how the private or commercial sector could be of further help to the public sector, either by providing financing (thus perhaps gaining an equity position in the venture) or private loan guarantees for various projects.

(Note: Privatization as discussed above is not a panacea for the problems facing the ANE countries. However, the enormous needs of these countries in the face of mounting debts in many sectors make privatization a very feasible alternative for further study.)

Program Priorities and Characteristics

a. Priorities

A.I.D. must recognize that the acceptability to host countries and the sustainability of technical assistance projects will be much greater if they are tied to capital assistance projects. Thus, if A.I.D. must limit its programs to technical assistance projects, it must make a conscious effort to cooperate with other donors providing capital assistance.

The priorities of the ANE Bureau in terms of program content should be projects that will enable countries to provide basic services to the urban poor and to sustain the programs, with A.I.D. or other external assistance. Such programs are those that will provide physical infrastructure coupled with help to institutions (public and private sector) so they might provide sustainable, high-quality services.

Projects to provide infrastructure—especially wastewater collection and treatment, water supply, and solid waste collection and disposal—have not been prominent in A.I.D.'s ANE activities, except for one or two specific countries.

A.I.D. should consider, as part of its top priority, projects that promote institution strengthening. Such projects can be provided as part of infrastructure projects or as projects in their own right and should include improvements to management systems and manpower training.

The next level of priority would be programs that foster the development of comprehensive urban and environmental policy (from national policy determination to zoning and land use planning at the local levels).

By necessity, all of the programs described will be intersectoral. Thus, depending on the characteristics of the individual country, they will cross the responsibility boundaries of several ministries and reinforce the need for strong institutions, as well as strong implementation efforts on the part of A.I.D. and the implementing agency.

b. Program characteristics

The program characteristics for A.I.D.-sponsored projects are generally as described above and in Section VII. These include programs that can provide the investment capital required and those having strong institution-strengthening and human resource components. Other critical characteristics for A.I.D. to identify for projects are as follows:

- Initiation at the local level, with partial financing by the entity having responsibility for the program.
- High levels of local support to ensure widespread benefits (especially benefits to women) and suitability for local operation (or direction).
- Closer cooperation with U.S. federal agencies and private organizations with expertise in responding to urban planning and pollution problems.

Priority Countries

It is extremely difficult to establish priorities among ANE countries in terms of providing urban development programs. Section VI presents some data on which to base such choices. A.I.D. obviously confronts many political and humanitarian

pressures to sponsor projects and programs in a particular country. Political considerations will always be present if A.I.D. is the agency responsible for overseeing disbursements for programs outside the development realm.

Notwithstanding the "political facts of life," A.I.D. should consider the following technical criteria in making choices about urban program priorities:

- Existence of national urban and/or environmental policy,
- Severity of need or level of environmental degradation,
- Program priority as evidenced by inclusion in national plans,
- Urban needs, in terms of basic services—water supply, wastewater and solid wastes, and the unit cost of responding to those needs, specifically in relation to the urban poor,
- History of positive implementation of programs,
- Existence of an institution that can implement the program and assume clear cut, comprehensive responsibility for providing the service,
- Potential of the program to be sustained, at least in part, with local financing, private sector involvement, or through a local NGO,
- Potential of program to encourage other U.S. federal agencies to cooperate, and
- Potential of the program to be implemented through co-financing of several donors or multilateral lending institutions.

Conclusions

The recommendations for A.I.D. projects and programs include investments in infrastructure and/or institution strengthening. Investing in physical infrastructure to provide basic services will require a major shift in A.I.D. policy and improvements in A.I.D.'s internal coordination.

A.I.D. may need to devise innovative financing schemes. Extension of the housing guarantee concept to allow A.I.D. loan guarantees to development banks is one way that such a concept could be implemented. Co-financing with other agencies is a key component for future efforts.

These recommendations, implemented in cooperation with other bilateral donors and multilateral agencies operating in the region, will provide a basis for beginning to address the critical environmental challenges, now and in the future.

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APPENDIX A

SUMMARY TABLES OF INDICATORS

Table A1: Dimensions of Urban Population Growth

Country	Total Population (millions)						Urban Population (millions)							Urban Population as % of Total							Average Annual Growth Rate % of Urban Population	
	1950	1980	1985	1990	2000	2025	1950	1980	1985	1987	1990	2000	2025	1950	1965	1980	1985	1990	2000	2025	1965-80	1980-85
Near East:																						
Morocco	9	19	22	25	30	40	2		10	11	12	16	28	26	32	41	44	49	56	71	4.2	4.2
Tunisia	4	6	7	8	9	13	1	4	4	4	5	6	10	31	40	52	56	61	68	79	4.2	3.7
Egypt	20	42	47	53	64	90	9	19	22	23	26	35	64	42	41	45	46	49	56	71	2.9	3.4
Jordan	1	3	4	4	6	14	0.4	2	2	3	3	5	11	35	47	60	69	68	74	83	5.3	4.0
Yemen A.R	3	6	7	8	11	21		0.7	0.9		1	4	11	2	5	15	19	25	33	53	10.7	7.3
Oman	0.4	1	1	1	2	3	0.0	0.1	0.3		0.4	0.3	1	2	4	7	9	11	15	31	8.1	7.3
Asia:																						
Pakistan	40	86	100	112	141	210	7	24	27	32	34	53	119	18	24	28	29	32	38	57	4.3	4.8
India	358	689	759	827	964	1,229	62	148	197	210	243	330	658	17	19	20	25	28	34	54	3.6	3.9
Bangladesh	42	88	101	115	146	219	2	10	18	14	25	27	79	4	6	8	13	14	18	36	8.0	7.9
Sri Lanka	8	15	16	17	20	24	1	4	3	4	4	5	10	14	20	22	21	21	24	43	2.3	8.4
Nepal	8	15	16	18	23	34	0.2	1	1	1	2	3	10	2	4	6	7	10	14	31	5.1	5.6
Burma	18	34	37	41	48	66	3	8	9		10	17	31	16	21	24	24	25	28	47	2.8	2.8
Thailand	20	47	51	56	66	86	2	11	13	11	14	19	42	10	13	17	18	23	29	49	4.6	3.2
Philippines	21	48	54	61	74	103	6	17	22	23	27	36	68	27	32	37	39	42	49	66	4.0	3.2
Indonesia	80	151	166	182	211	273	10	51	59	47	70	77	152	12	16	22	25	29	37	56	4.7	2.3
Total	632	1,249	1,390	1,528	1,815	2,425	105	298	389	383	476	634	1,296									

Sources: *World Development Report 1988*
World Resources 1988-1989
Prospects of World Urbanization 1984-1985
U.S. AID ANE Bureau - Draft Natural Resources Strategy 1988
International Drinking Water and Sanitation Decade, Review of Mid-decade Progress

Table A2: Population Distribution by City Size, and Number of Cities

Country	Percentage of Total Population in Urban Areas by Size of City			Number of Cities		
	Small 20,000-100,000	Medium 100,000-500,000	Large 500,000+	Small 20,000-100,000	Medium 100,000-500,000	Large 500,000+
Morocco	<1%	11%	88%	1	5	15
Egypt	21%	21%	54%	85	17	3
Jordan	14%	15%	30%	10	2	1
India	6%	9%	2%	765	146	2
Bangladesh	3%	2%	6%	48	10	3
Nepal	6%		2%	24		1
Thailand	5%	<1%	1%	53	1	1
Philippines	55%	11%	6%	566	23	2

Source: United Nations. Compendium of Human Settlements Statistics, 1983

Table A2a: Cities and Metropolitan Areas with Projected Population over 2 Million

City/ Metropolitan Area	Population (millions) 1950	2000	% Increase
Near East:			
Egypt			
Cairo/Giza	2.5	11.1	344
Alexandria	1.0	4.4	340
Asia:			
Pakistan			
Karachi	1.0	12.0	1100
Lahore	0.8	6.2	675
India			
Ahmedabad	0.9	5.3	489
Bangalore	0.8	8.0	900
Bombay	2.9	16.0	452
Calcutta	4.4	16.5	275
Hyderabad	1.1	5.1	364
Madras	1.4	8.1	479
New Delhi	1.4	13.2	843
Poona	0.6	3.7	517
Kanpur	0.7	3.2	357
Bangladesh			
Dhaka	0.4	11.2	2700
Burma			
Rangoon	0.7	4.3	555
Thailand			
Bangkok	1.4	10.7	664
Philippines			
Manila/Quezon	1.6	11.1	594
Indonesia			
Jakarta	1.8	13.2	633
Medan	0.4	5.4	1250
Surabaya	0.7	3.7	469

Sources: ***Population Division of U.N., 1984 Assessment Prospects for Urbanization, U.N. 1984-85 (revised), Table A-9.***

Table A3: Percent Urban and Gross National Product Per Capita for a Sample of Countries

Country	GNP Per Capita (U.S.Dollars)	% Population Living in Urban Areas
Bangladesh	130	11
Burma	170	27
India	240	22
Nepal	140	5
Pakistan	300	28
Sri Lanka	270	27

Source: *Mills, 1981*
Studies in Indian Urban Development

Table A4: Labor Force Working in Industry/Services and Agriculture

Country	Working Age Population* (% of total pop.)		Percentage of Labor Force Working in Agriculture		Industry/Services		Percent Urban Population	
	1965	1985	1965	1980	1965	1980	1965	1980
Near East:								
Morocco	50	52	61	46	39	54	32	41
Tunisia	50	56	49	35	50	65	40	52
Egypt	54	55	55	46	45	54	41	45
Jordan	27	49	37	10	63	90	47	60
Yemen A.R.	54	51	79	69	21	31	5	15
Oman	53	50	62	50	38	50	4	7
Asia:								
Pakistan	50	53	60	55	40	46	24	28
India	54	56	73	70	27	30	19	20
Bangladesh	51	53	84	75	16	25	6	8
Sri Lanka	54	62	56	53	44	47	20	22
Nepal	56	54	94	93	6	8	4	6
Burma	57	54	64	53	37	47	21	24
Thailand	51	59	82	71	18	29	13	17
Philippines	52	56	58	52	42	49	32	37
Indonesia	53	56	71	57	30	43	16	22

*Working age population is defined as between the ages of 15 and 64

Source: ***World Development Report 1988***

NOTE: This table shows that as the percentage of the labor force working in industry and services increases, so does the percentage of population living in urban areas

Table A5: Poverty Indicators for a Sample of Countries

Country	Percentage of Population Living Below Absolute Poverty Level†			
	Urban	Rural	Total	Year of Data
Philippines	52	64	59	1985
Burma	40	40	-	-
Pakistan	32	29	-	1979
Bangladesh	29	47	45	1986
Morocco	28	45	-	1979
India	28	35	37	1984
Indonesia	26	44	-	1978
Egypt	21	25	-	1978
Thailand	15	34	-	1978
Jordan	14	17	-	1979

†Absolute Poverty income level is defined as that below which a minimal nutritionally adequate diet plus essential nonfood requirements are not affordable

Source: U.S. A.I.D. Annex II Asia/Near East - Fiscal Year 1990

Table A6: Health Indicators

Country		Life Expectancy at Birth (years)		Infant Mortality (per 1000 births)		Child (0-5yr) Mortality (per 1000 births)		Caloric Intake	
		1965-70	1987	1965-70	1987	1965-70	1985-90	1965	1985
Near East:									
	Morocco	50	62	67	85	93	28	2,182	2,729
	Tunisia	52	69	138	47	210	99	2,296	2,796
	Egypt	50	59	170	99	280	124	2,435	3,275
	Jordan	52	69	102	57	150	57	2,282	2,968
	Yemen A.R.	41	50	186	123	325	196	2,002	2,266
	Oman	44	55	186	112	325	157	-	-
Asia:									
	Pakistan	46	54	145	122	239	165	1,747	2,180
	India	48	56	145	96	239	148	2,100	2,126
	Bangladesh	43	51	140	137	228	188	1,964	1,804
	Sri Lanka	64	70	61	29	87	43	2,155	2,485
	Nepal	41	49	164	104	260	196	1,931	1,997
	Burma	50	53	110	102	160	85	1,928	2,508
	Thailand	57	64	84	53	118	49	2,200	2,399
	Philippines	56	65	70	50	114	72	1,936	2,260
	Indonesia	45	58	120	85	201	117	1,792	2,476

Sources: *World Development Report ,1988*
World Resources 1988-89

Table A7: Infrastructure

Country		Urban Population 1987* (millions)	Water Supply Unserved Urban Population 1980 % of pop	Water Supply Unserved Urban Population 1987* % of pop	Water Supply Unserved Urban Population 1987* millions	Sanitation Unserved Urban Population 1980 % of pop	Sanitation Unserved Urban Population 1987* % of pop	Sanitation Unserved Urban Population 1987* millions	Decade Targets: 1990 Unserved Urban Population Water Supply % of pop	Decade Targets: 1990 Unserved Urban Population Sanitation % of pop
Near East:										
	Morocco	10.7		39	4.2		23	2.5	0	
	Tunisia	4.3	0	0	0.0		16	0.7	0	
	Egypt	23.4		12	2.8		55	12.9		
	Jordan	2.5		28	0.7		70	1.8		
	Yemen A.R.	0.9	0	0	0.0		83	0.8	0	
	Oman	0.3		90	0.3		88	0.3	0	5
Asia:										
	Pakistan	32.5	28	16	5.2	58	47	15.3	0	35
	India	210.1	22	20	42.0	73	99	208.0	7	17
	Bangladesh	13.6	74	71	9.6	79	78	10.6	69	64
	Sri Lanka	3.5	34	24	0.9	20	20	0.7	0	0
	Nepal	1.5	20	30	0.4	84	83	1.2	6	63
	Burma	8.9	61	64	5.7	62	67	6.0	36	27
	Thailand	11.2	36	50	5.6	36	50	5.6	33	17
	Philippines	23.4	35	35	8.2	33	45	10.5	22	13
	Indonesia	46.6	65	60	27.9	71	71	33.1	34	40

* *Figures for Yemen, Oman, Burma are 1985 data.*

Source: *ANE Bureau, Draft Natural Resources Strategy, 1988*
WHO, Water Supply and Sanitation Decade: Mid-Decade Review

Table A8: Urban Refuse Generation Rates For a Sample of Countries

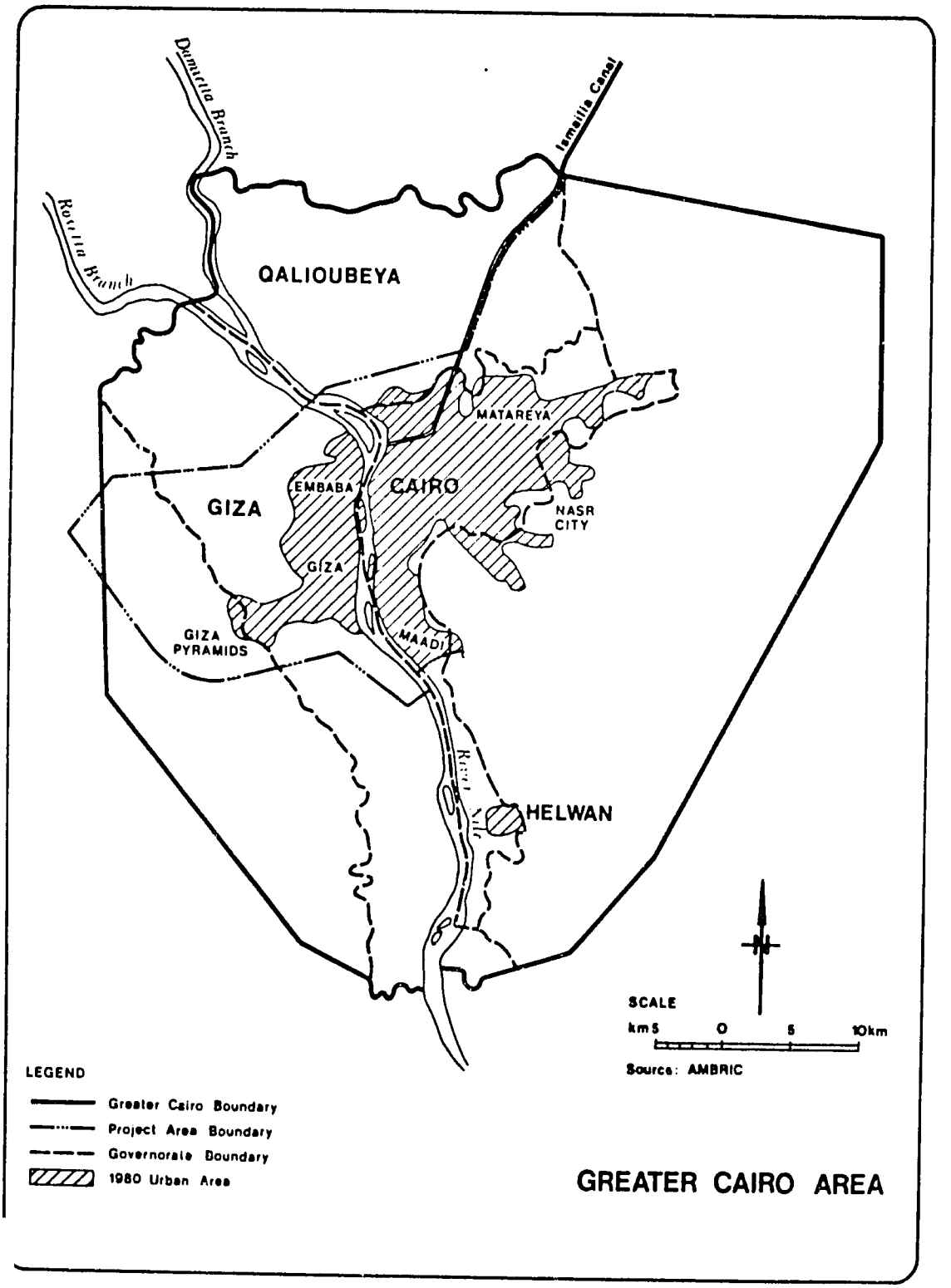
City/Country	Estimated Waste Generation Rates (kg/cap/day)
Tunis, Tunisa	0.56
Manila, Philippines	0.42
Cairo, Egypt	0.50
Jakarta, Indonesia	0.60
Surabaya, Indonesia	0.52
Bandung, Indonesia	0.55
Lahore, Pakistan	0.60
Karachi, Pakistan	0.50
Colombo, Sri Lanka	0.70
Calcutta, India	0.51
Kanpur, India	0.50

Source: Cointreau, Sandra - Solid Waste Collection Practice and Planning in Developing Countries (1984) in Holmes, John Managing Solid Wastes in Developing Countries

APPENDIX B

MAPS OF CASE STUDY CITIES

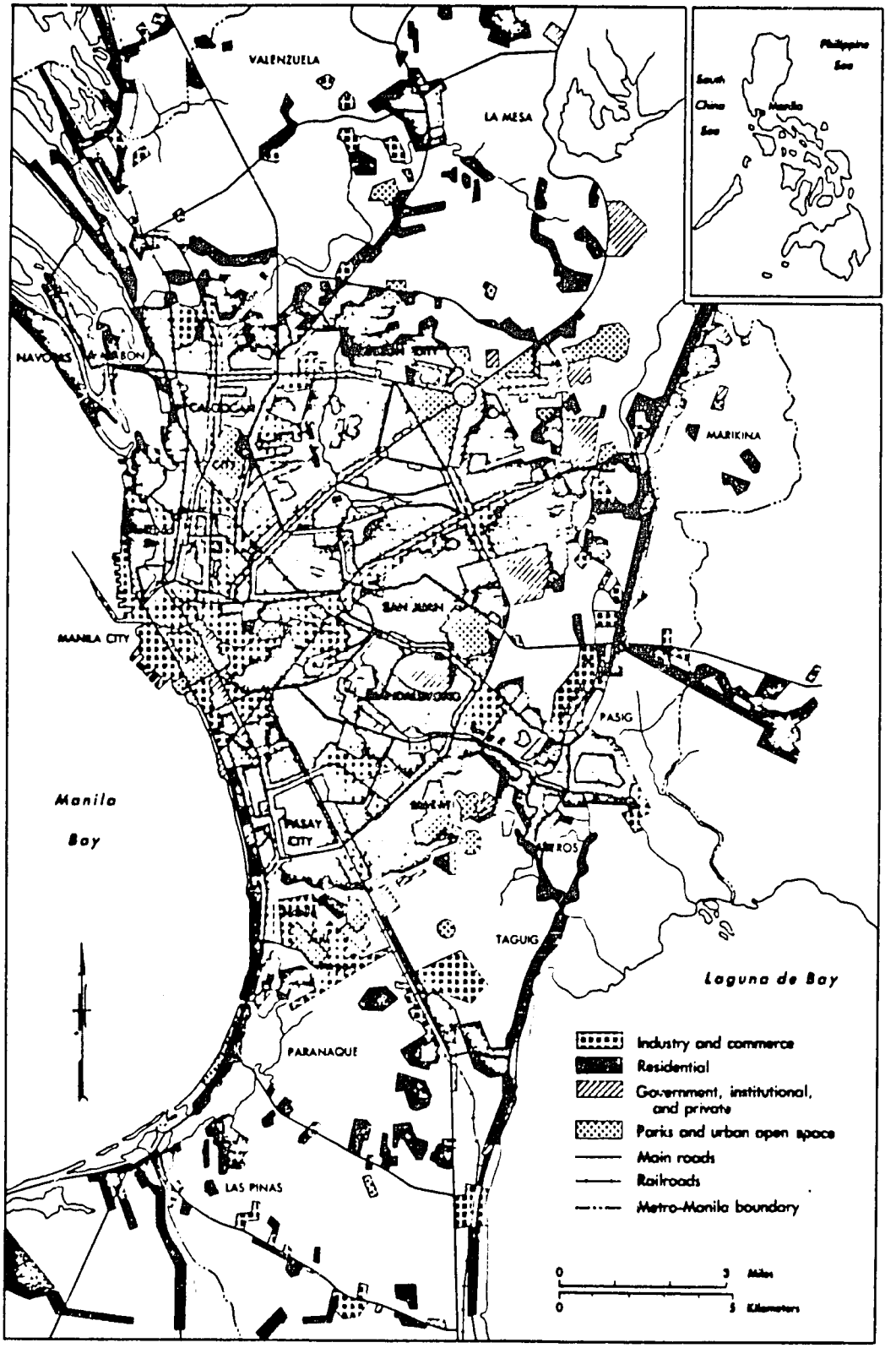
FIGURE 1



SOURCE: STANLEY CONSULTANTS. ENVIRONMENTAL ASSESSMENT: GREATER CAIRO WASTEWATER SYSTEM, WEST BANK, (WASHINGTON, D.C.:1982)

FIGURE 2

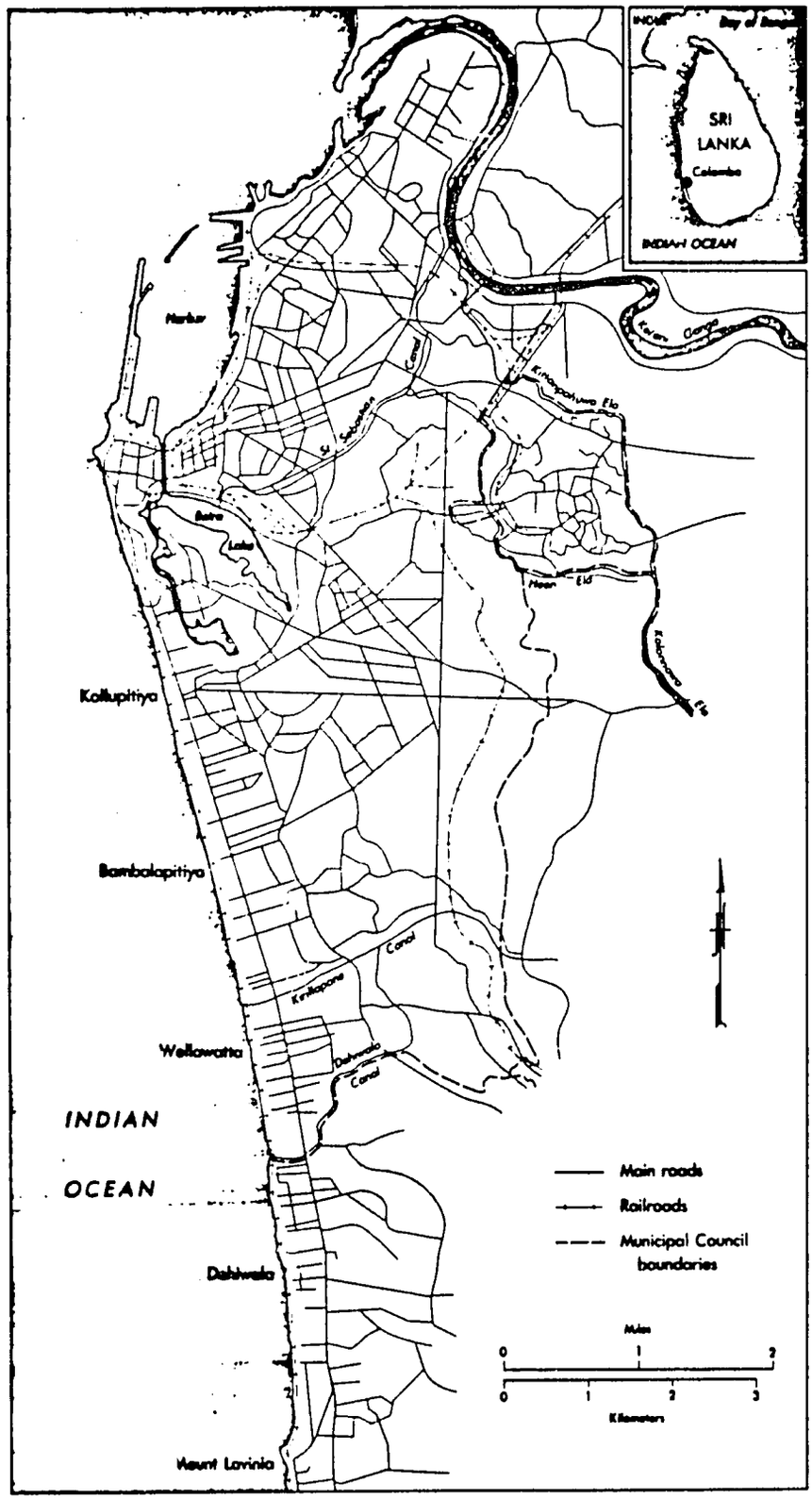
Manila Urban Area, 1984



SOURCE: SIVARAMAKRISHNAN K.C., & LESLIE GREEN. METROPOLITAN MANAGEMENT: THE ASIAN EXPERIENCE. (WASHINGTON, D.C.: EDI, 1986)

FIGURE 3

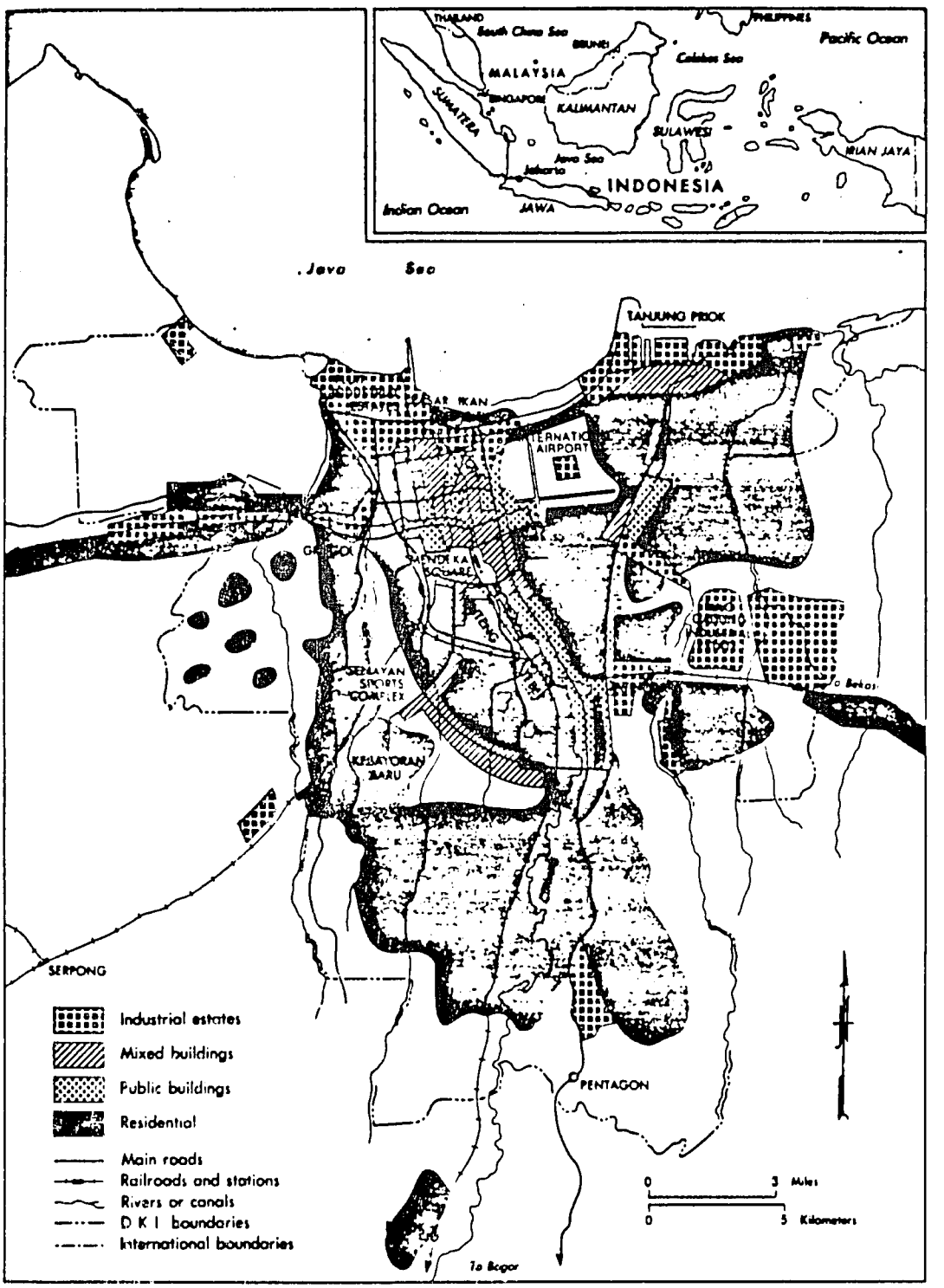
Greater Colombo, 1980



SOURCE: SIVARAMAKRISHNAN K.C., & LESLIE GREEN.
METROPOLITAN MANAGEMENT: THE ASIAN EXPERIENCE, (WASHINGTON, D.C.; EDI, 1986)

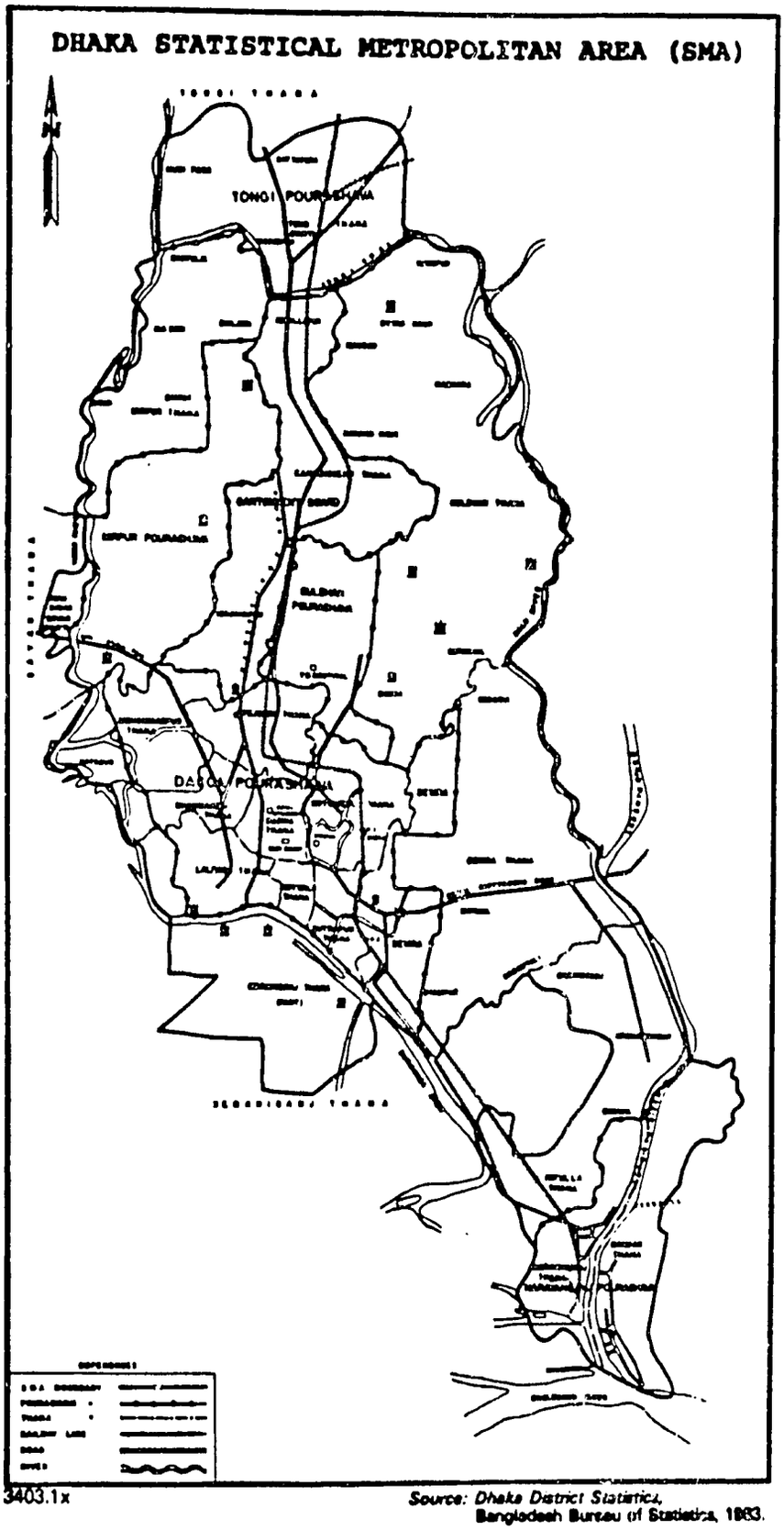
FIGURE 4

Jakarta Urban Area, 1985



SOURCE: SIVARAMAKRISHNAN K.C., & LESLIE GREEN.
METROPOLITAN MANAGEMENT: THE ASIAN EXPERIENCE. (WASHINGTON, D.C.: EDI, 1986)

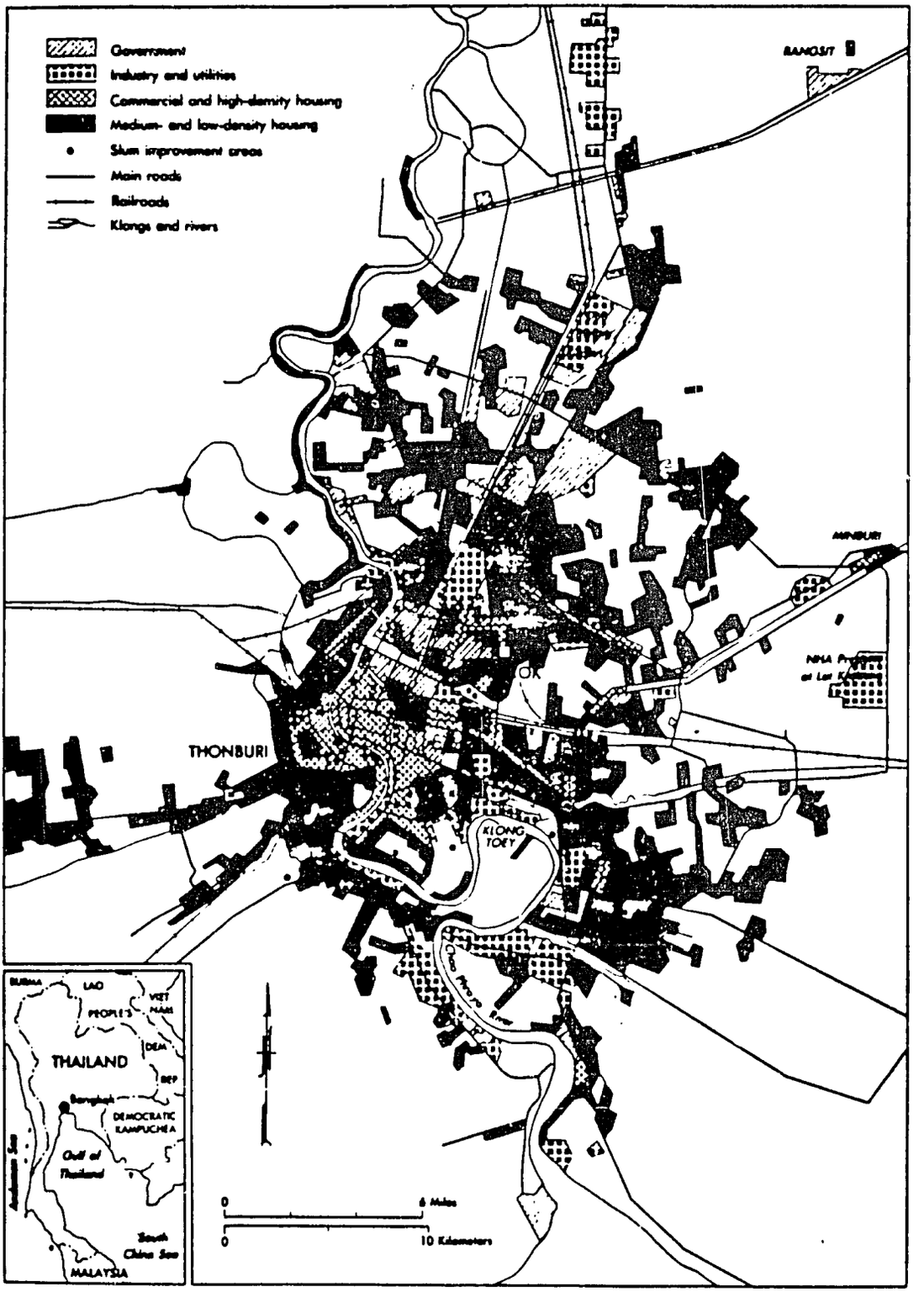
FIGURE 5



SOURCE: UNITED NATION, DEPARTMENT OF INTERNATIONAL ECONOMIC & SOCIAL AFFAIRS. POPULATION GROWTH AND POLICIES IN MEGA-CITIES: DHAKA, (NEW YORK: 1986)

FIGURE 6

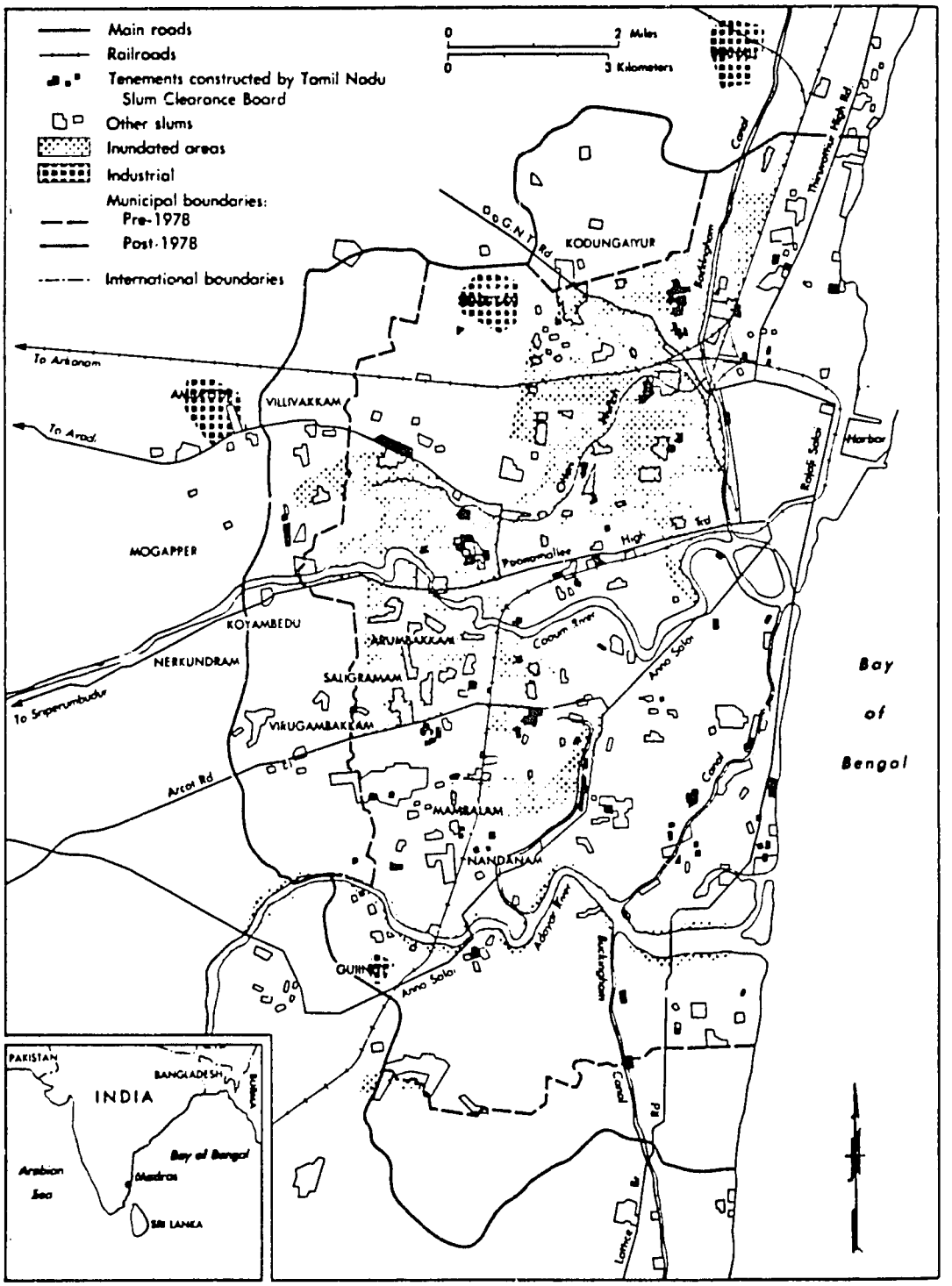
Metropolitan land use, Bangkok, 1980



SOURCE: UNITED NATION, DEPARTMENT OF INTERNATIONAL ECONOMIC & SOCIAL AFFAIRS. POPULATION GROWTH AND POLICIES IN MEGA-CITIES: BANGKOK, (NEW YORK: 1987)

FIGURE 7

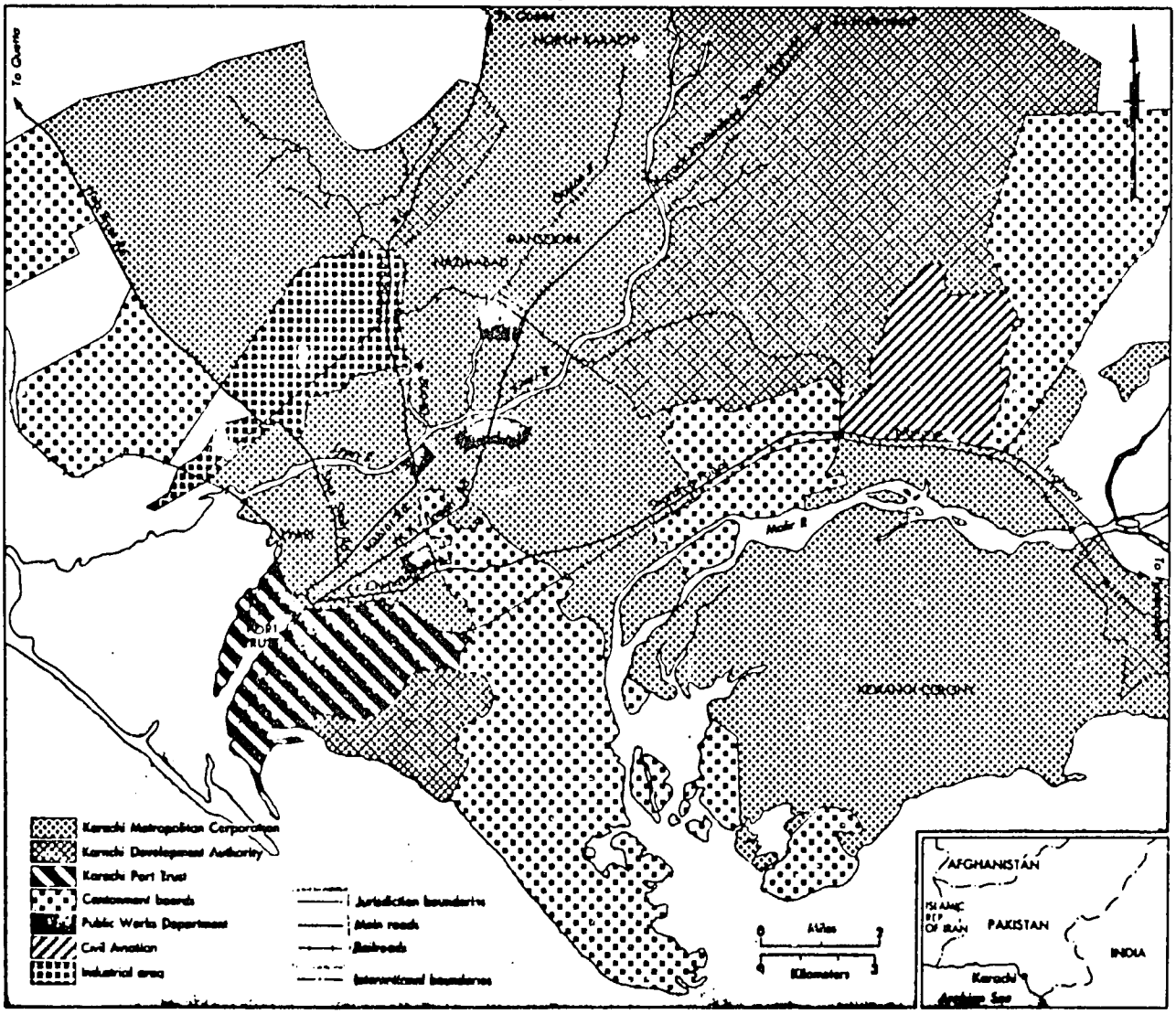
Madras Urban Area, 1984



SOURCE: UNITED NATION, DEPARTMENT OF INTERNATIONAL ECONOMIC & SOCIAL AFFAIRS. POPULATION GROWTH AND POLICIES IN MEGA-CITIES: MADRAS, (NEW YORK: 1987)

FIGURE 8

Map 13-3. Karachi Metropolitan Area: Jurisdictions of Local Bodies, 1985



SOURCE: SIVARAMAKRISHNAN K.C., & LESLIE GREEN.
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APPENDIX C

EXAMPLES OF NATIONAL APPROACHES TO ENVIRONMENTAL PROTECTION AND THE URBAN SECTOR

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This appendix provides detailed examples of the interrelationship of strategies for urban development AND have how they affect the environment.

Thailand

Thailand has had a National Environmental Quality Act and a related environmental agency, the National Environment Board (NEB), since 1975. The function of the NEB is primarily to develop environmental protection policies and to guide the many other government agencies that implement them. Many agencies, departments, and offices under several ministries are involved in the various aspects of environmental protection. The NEB, under the Ministry of Science, Technology, and Energy, has taken a leading role in monitoring adherence to environmental standards but it is overstretched.

Nationally, water and sanitation responsibilities are spread among many agencies. For example, 31 agencies and 17 committees are involved with water resources development. The Provincial Water Works Authority and the Metropolitan Water Works Authority (MWWA) are the major water supply agencies; they are responsible for towns with over 5,000 people and for the Bangkok Metropolitan Area, respectively. Water supply and flood control appear to be priorities, but sanitation problems do not seem to be receiving direct attention. Moreover, water and sanitation development are not overtly linked. For example, the Accelerated Rural Development project, which consists of drilling programs and has been creating wells with hand pumps around the country since the early 1960s, has no sanitation component. The most visible pollution strategy is the attempt to control industrial point source discharges.

Urban development and housing are governed by several different entities under the Ministry of the Interior. The Industrial Estate Authority of Thailand tries to attract industry and has embarked on a location policy that involves relocating existing industries from congested or unsuitable areas to areas distanced from the central city.

Because of the primacy of Bangkok, the national environmental program includes the metropolis. The MWWA and the Bangkok Metropolitan Administration (BMA) are the major agencies. The BMA has wide-reaching powers, but it has made flood control its top priority. Despite a series of drainage and sewerage studies, it has made little progress on sanitation and pollution.

The Third Bangkok Water Supply Project includes an attempt to eliminate groundwater use in critical subsistence areas.

The overall urban management strategy for the city has recently been updated. The Greater Bangkok Plan 2000 and the Fourth National Development Plan (1977-1981) were the first plans to promote a pattern of polycentric growth (rather than centralization); nine growth centers were identified for promotion and upgrading to medium-sized cities (100,000-300,000). A criticism that these plans tried to address is that a majority of development projects in Bangkok had been narrowly designed to solve immediate problems and were not part of a broader long-term strategy. The Fifth Plan tried to overcome these problems and planned to decentralize economic activity; the Sixth Plan identified investment strategies for each of four districts. Although these plans indicate a move toward more comprehensive planning, none was officially approved and the net effect of the decentralization strategy remains to be seen.

The most often cited problem is the number of agencies that are involved in environmental protection. Confusion and lack of coordination abound because juridical and regulatory powers are not well defined. Lack of comprehensive planning, emphasis on construction (i.e. of dams/reservoirs), and inadequate enforcement of the many environmental laws, due in part to the laissez-faire attitude of the Thai people, are also commonly noted problems.

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Indonesia

Indonesia has environmental protection legislation in place, including a mechanism for impact assessment (through the Ministry of Industry). The state Ministry for Population and Environment (MOPE) is the policy agency and is charged with influencing the government as a whole and preparing regulations. In addition to MOPE, 15 ministries are responsible for various (sectoral) aspects of environmental management. MOPE, however, has no authority over other ministries and no direct implementation responsibilities.

Organization of regional and provincial environmental agencies appears to be less developed than the national system. Provincial agencies include the BAPPEDAS planning offices and the provincial governor's offices each of which has a Bureau for Population and the Environment and Coordinating Team. National policies are thought to influence most resource management decisions.

Water and sanitation services are the responsibility of the Directorate of Hygiene and Sanitation, Ministry of Home Affairs, the Ministry of Health, and the Ministry of Public Works. Again, specific functions of the agencies do not appear to be clearly delineated. Current infrastructure programs are focused on water supply, such as the Comprehensive Health Improvement Project and the Kampung Improvement Program.

Several agencies are involved with urban development and housing under the Ministry of Public Works, including the Directorate of Urban and Regional Planning (major agency) and the Directorate General of Housing, Building, Planning and Urban Development. BAPPENAS, Ministry of Home Affairs, is a national-level coordinating agency that supervises municipal and provincial agencies dealing with the environment; its precise function is unclear. The impacts of industry are controlled through a two-stage system: (1) consideration of suitability of location and (2) issuance of nuisance license (water usage, air/water/noise pollution); national-level ministries and the provincial governor's office provide review.

The Jakarta region is treated differently, subject to direct involvement from the national level. In 1976 the Ministry of Public Works prepared the JABOTABEK Metropolitan Planning Study for Jakarta and the neighboring Bogor, Tangerang, and Bekasi

districts. This study advocated deconcentration of urban growth to ancillary urban centers around Jakarta and proposed incentives to accomplish this, such as upgrading infrastructure in certain areas. Although the plan was never adopted because of disagreement among agencies, it has affected thinking about decentralization. The JABOTABEK Metropolitan Development Plan of 1980 emphasizes improving treatment of water supplies to reduce health hazards and improving availability of water for the populace. The World Bank has been involved in the development of the updated comprehensive plan for the JABOTABEK metropolitan area.

Implementation and maintenance problems plague the water, sanitation, and planning projects. One reason cited is the low level of attention given to involving local populations. The generally weak implementation of impact assessment is feared to damage the credibility of MOPE. Another major problem cited is the fragmentation of efforts among the numerous agencies. The absence of a coherent land use policy and a lack of clear authority are additional constraints on environmental planning. Each individual agency has its own needs and objectives, and there are no mechanisms to establish guidelines or to mediate among them. Finally, planning seems to be limited by top-down development.

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Egypt

Research conducted for this paper did not uncover any single comprehensive environmental protection act or coordinating/lead environmental protection agency in Egypt. Instead, numerous environmental laws and regulations are created and implemented by numerous agencies. The overall structure of the environmental agencies emphasizes the role of local or regional entities, although functionally, national agencies play a greater role. Health appears to be the overwhelming environment-related concern, which is reflected in the overall approach of preventive

and basic health measures, such as early detection of infectious disease, vaccination, health education, and others.

The Ministry of Development is the primary land use planning agency at the national level. The 1981 Physical Planning Law requires mandatory preparation of master plans for cities and villages. Industrial siting is conducted by the local governorate, with a permit from the national Ministry of Industry (conditional on the establishment of all required public utilities).

Egypt's water and sanitation service agencies were restructured in the early 1980s, which created a solid structure of agencies at the national and regional level. Although policy states that the responsibility for the provision and operation of public utilities lies with the local authority, the national government provides planning, design, construction, and financing; local entities conduct (only) operations and maintenance. Services are provided to localities by the national Ministry of Local Government, the Ministry of Health (MOH), and the Ministry of Housing and Reconstruction (MHR).

The MOH, the most important agency regarding health aspects of water and sanitation, is responsible for setting standards for water and effluent; providing technical guidance for sanitation; monitoring of water and pollutants; and providing advisory capability for local authorities. A mutual oversight committee coordinates MOH activities with those of the Ministry of Housing and Public Utility, which is responsible for housing, public works, and sewerage works. The third agency involved with water and sanitation on the national level is the MHR, the main organization for the development of water and sewerage systems. The MHR encompasses water and sanitation agencies for Cairo, Alexandria, and the Suez Canal Zone cities, and one agency for all other areas.

Thus, regional agencies that are part of the national structure (MHR) function as the lead agency, and often adopt local responsibility. The Cairo area is served by two agencies under the MHR: the General Organization for Greater Cairo Water Supply, which is responsible for all aspects of water supply from planning to maintenance, and the General Organization for Sanitary Drainage in Cairo, which performs operations and maintenance but has no responsibility for the unsewered areas. The Cairo Wastewater Organization has planning and implementation functions and considerable powers. A similar system exists for Alexandria. The Canal Zone cities are served by the Suez Canal Authority, a regional water and sanitation agency. The remainder of Egypt is served by the National Organization for Potable Water and Sanitary Drainage, which coordinates and provides policy for the regional and city systems, and constructs sewerage/drainage facilities in cities and towns. Operations and maintenance of

the sewerage system are commonly performed by the governorate (with exceptions for Cairo, Alexandria, and the Canal Zone cities).

MOH functions are hindered by lack of trained staff, lack of equipment, and inadequate funding. Poor operations and maintenance, possibly due to the shortage of trained personnel, are major problems in water and sanitation projects.

The National Urban Policy Study of 1982 recommends policy by city type. Decentralization is called for in Cairo, with desert locations for all urban expansion and ongoing rehabilitation of water/sanitation facilities. The approach for Alexandria is to induce major population growth away from Cairo, especially through major employment growth, to deconcentrate the core, and to rehabilitate systems. The goal for Tanta and Mansoura (medium-sized cities) is to encourage out-migration, to preserve prime arable land through vertical redevelopment, and to concentrate high-level regional service functions in these settlements. The approach for the Canal Zone cities (Suez, Ismailia, Port Said) emphasizes major population growth and the development of Suez as a major center.

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India

There is no single central body for environmental protection in India. Generally, functions are scattered among many ministries and departments. Sectoral ministries at the national level coordinate plans, formulate policy, and monitor

implementation of project. Primary responsibility for the environment in general lies with the state governments.

The National Committee on Environmental Planning and Coordination (NCEPC), established under the Ministry of Science and Technology in 1972, is the closest thing to a chief environmental agency. NCEPC formulates policy, and reviews and advises the central government on environmental matters.

The Ministry of Agriculture and Irrigation has divisions for groundwater study and flood control; the Ministry of Works and Housing encompasses the national Water Supply and Sanitation Program; the Ministry of Science and Technology has the national Committee on Science and Technology and the NCEPC; and the Ministry of Health and Family Welfare includes the Central Public Health Engineering and Environment Organization (CPHEEO). CPHEEO appears to play a large role, in assisting the state governments in the preparation and execution of water supply and sanitation projects.

Another nonministerial agency, the national-level Central Board for Prevention and Control of Water Pollution, was established in 1974. This board functions as a policymaking body, coordinates activities of similar state-level boards, trains personnel, monitors water pollution, and sets standards.

The national Planning Commission oversees preparation of the five-year plans and approves all centrally funded projects. The Sixth Plan (1980-1985) included for the first time an environmental section and recognized the need to promote small towns and medium-sized cities. The Seventh Plan (1985-1990) tries to integrate environmental considerations with economic planning. It also includes aggressive goals for infrastructure improvements: urban water supply service of 100% and urban sanitation service of 80% (100% for Class I cities, 50% for Class II cities, and others, for an overall 80% rate). The sanitation goals are a huge increase over current levels.

There are several problems with the current state of India's environmental protection structure. Environmental legislation is considered inadequate, because its approach is one of pollution control rather than environmental management. An inadequate technical work force, political interference, inadequate penalties, and lengthy litigation have been cited as implementation and enforcement problems in India.

Specific state-level responsibilities include water quality preservation, solid waste disposal, public health and sanitation, land use, and industries. Unlike the national government, some states do have Departments of the Environment. Planning is considered to be weak or nonexistent at the state level, but

several of the mega-cities have their own planning capacity. Water supply is the responsibility of the municipality.

The Bombay metropolitan region (BMR) inherited a planning tradition from the British. The 1973 regional plan sought to limit Bombay City's population and to create a twin city, New Bombay. The implementation of the plan has been slow, but New Bombay was established with 250,000 people in 1985 and continual progress is being made in relocating industry and workers to New Bombay. The main agency is the BMR Development Authority, within which the Maharashtra Pollution Control Board is responsible for prevention and control of water pollution (mainly effluent monitoring and setting standards for surface water). Planning in Bombay is limited by its sectoral nature (physical, economic, and environmental), but prospects for greater integration could improve with general conditions in the city. The Bombay industry location policy has undergone a series of changes; current policy is based on allowing progressively higher value investments in areas progressively farther from the central city. Environmental considerations are not a direct part of this process.

Calcutta is a unique case within India. The Calcutta Metropolitan Development Authority (CMDA) was established in 1970 by a presidential act responding to the extremely high incidence of cholera. This agency is very powerful; it has control over many aspects of the environment that are often treated sectorally in developing countries. Its current priorities are water supply, sanitation, and area development; other responsibilities include transportation, planning, and improvement of squatter settlements. As part of a transmunicipal infrastructure program, CMDA plans and executes projects in water and sanitation, and it has been successful in improving water supply quantity and quality in the district.

Sources:

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Philippines

The Philippines has enacted environmental protection legislation, and in 1977 established a main agency, the National Environmental Protection Council by presidential decree. The NEPC, comprised of the President of the Philippines and cabinet members, is responsible for policy formulation, guidelines for the establishment of environmental quality standards, guidelines for environmental impact assessment, recommendation of new legislation, and coordination and integration of agencies charged with environmental protection and enforcement. In addition, the NEPC prepares an annual environmental status report and conducts education projects. The Environment Center of the Philippines is the participatory agency of the council in environmental planning and management at regional and local levels.

Three other agencies are significant. The National Economic and Development Authority (NEDA) provides the link between policymaking/planning and program implementation. The NEDA is a cross-sectoral agency that implements five-year plans, including infrastructure projects, and is generally responsible for all planning for areas outside Metro Manila. The Ministry of Local Governments and Community Development (MLGCD) provides guidelines for the formulation of solid waste management programs. The National Pollution Control Commission (NPCC), under the Office of the President, is the primary agency for the prevention and control of environmental pollution; the NPCC monitors pollution and is charged with taking the necessary measures to prevent/abate pollution. An Inter-Agency Advisory Council made up of representatives from various sectoral interests is attached to the NPCC.

The Ministry of Natural Resources and the Ministry of Public Works, Transportation, and Communication/National Water Resources Council are also involved in resource management.

Land use planning is conducted by the Ministry of Human Settlements and Ecology, which makes nationwide recommendations to the NEPC. There does not appear to be a national industrial location policy; Manila has a limited policy of tax incentives.

Problems cited include the context for planning—environmental policies are of secondary importance compared with economic, social, and political issues and the rate of implementation is slow because financial resources are limited in relation to the large-scale work required. The Philippines government is trying to raise awareness of the environment and pollution among the population, but environmental education should be included at all levels of schooling.

Sanitation and water supply are generally the responsibility of the national government (notably NEDA and MLGCD), and the localities (province, city, or municipality) are responsible for solid waste management, as well as health and shelter issues. For Manila, however, the regional government is effectively responsible for all infrastructure planning and projects.

Metro Manila, the capital and primate city, includes 4 cities and 13 municipalities. The Metro Manila Commission (MMC) was instituted in 1975 and has direct legislative, administrative, and fiscal control over the constituent governments. The MMC is responsible for health, sanitation, water supply, flood control, and other environment-related concerns. The MMC's Office of the Commissioner for Planning (OCP) develops plans in conformance with national development objectives, but most planning (and implementation) is done by the MMC metropolitan operations centers. The OCP and other agencies were responsible for a series of plans for Manila, which consisted mainly of intentions and goals. The main concern of the 1985 Regional Development Framework Plan of the OCP is physical planning—provision of infrastructure in areas most suitable for new urban growth. The MMC is assisted by the Capital Investment Folio, which is essentially a method for prioritizing the funding and scheduling of infrastructure projects. Allocation of 1984 MMC expenditures was dominated by water supply projects (40%) and shelters/social infrastructure (30%).

Problems with Metro Manila plans and programs include the fact that there is no agreed development strategy and explicit policy or implementation measures to promote decentralization are lacking. One source stated that the MMC has not been able to control development or to coordinate activities of various agencies and that Manila's development is the result more of market forces than government policy.

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