

# **Urban Sustainability in the Third World: A Review of the Literature**

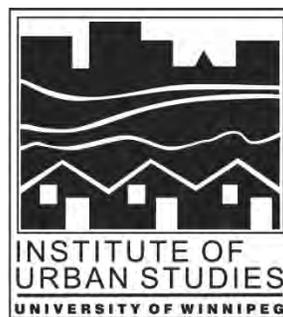
**Issues in Urban Sustainability No. 5**

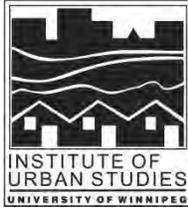
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**by Tasneem Chowdhury & Christine Furedy  
1994**

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**The Institute of Urban Studies**





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**URBAN SUSTAINABILITY IN THE THIRD WORLD: A REVIEW OF THE LITERATURE**

**Issues in Urban Sustainability No. 5**

Published 1994 by the Institute of Urban Studies, University of Winnipeg

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Note: The cover page and this information page are new replacements, 2015.

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Tasneem Chowdhury and Christine Furedy

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**PUBLICATION DATA**

Chowdhury, Tasneem and Christine Furedy  
Urban Sustainability in the Third World: A Review of the Literature

(Issues in Urban Sustainability; 5)

ISBN: 1-896023-14-2

I. The University of Winnipeg. Institute of Urban Studies II. Title. III. Series:  
Issues in Urban Sustainability (The University of Winnipeg, Institute of Urban Studies);  
5.

This publication was funded by the Canada Mortgage and Housing Corporation, but  
the views expressed are the personal views of the author(s) and the Corporation  
accepts no responsibility for them.

Published by:

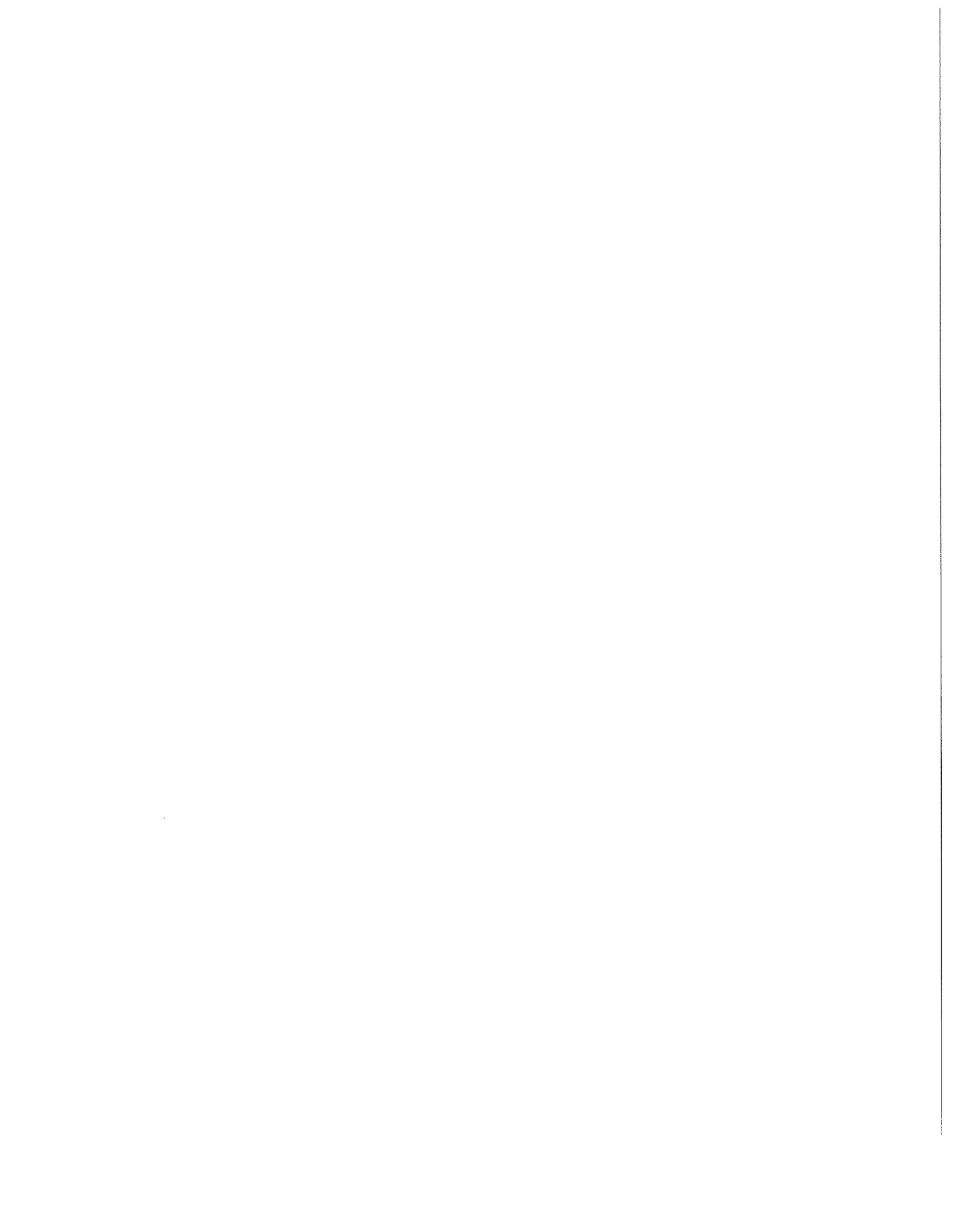
Institute of Urban Studies  
The University of Winnipeg  
515 Portage Avenue  
Winnipeg, Manitoba  
R3B 2E9

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ISBN: 1-896023-14-2

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## INTRODUCTION AND SCOPE

In the extensive and rapidly expanding literature addressing environment and sustainability, relatively little has been written about cities, and even less about cities in the Third World. The urban environment is an emerging field of inquiry and is being addressed by researchers from diverse disciplinary viewpoints. Yet most writers, both from developed and developing countries, who have dealt with issues of urban sustainability in the Third World, agree on a common theme: the main concern is "development," which, in the context of the Third World city, denotes the attainment of a decent standard of living for all residents; and, if such development is to be sustainable, it has to deal with poverty in a way that does not irreparably degrade the environment.

In *World Cities and Environment*, the final report on the Five Cities Consultation Project (1992), Patricia McCarney writes,

The first conclusion . . . is that we cannot talk about the environment without also talking about poverty. In all cities involved in the project, the linkage was clear between economic need and environmental degradation. The poor live in overcrowded housing, located near polluting industries . . . They usually build their houses informally on marginal lands, often on precarious slopes prone to mudslides or on floodplains. They lack connection to their city's sewage system and they do not have the benefit of municipal collection of solid waste . . . They have limited choice on where to live, what water to drink or where to bathe; and so they are peculiarly vulnerable to environmental problems (pp. 23, 24).

The cities of most developing countries are characterized by having a large proportion of citizens living at or below the national poverty line, and by the severe "lacks" mentioned above—of essential infrastructure, housing, other services to meet basic needs. In addition, lack of expertise in environmental understanding, effective planning and municipal finances all affect the lives of the poor more severely than those of the better-off. For such cities, as Stephen Lewis (quoted in Stren, Whitney and White, 1992, p. 6) points out, ". . . the crux of the debate [of sustainable development] is how you deal with poverty in human settlements . . . everything else is academic . . ." Similarly, in the introduction to the issue on "Sustainable Cities" of the journal *Environment and Urbanization*, David Satterthwaite stresses that, "Any consideration of sustainable development and cities in Africa, Asia and Latin America must have the improvement of the housing, living and working environment of poorer groups as a central focus" (p. 3).

In view of this common concern among authors, this literature review will be primarily concerned with the relationship of "sustainability" to "development" with reference to the needs of the poor. Since writings on sustainable development in the urban Third World are rare, this review will also include relevant studies and reports which deal with urban poverty, basic services and urban

management: these topics are integral to or directly effect the urban environment. Urban poverty is linked to environmental degradation at both cause and effect levels: basic urban services such as land, housing, water and sanitation are now regarded as urban "environmental resources" (McCarney, forthcoming); urban management practices impact on the urban environment and regulate access to environmental resources. Given the disparate literature that exists in all of these areas, this review is by no means comprehensive, but should be considered an introduction to literature on Third World urban sustainability for readers not closely acquainted with these issues. We have concentrated on studies which are readily available to Canadians.

The review consists of four major sections. The first section deals with a conceptual analysis of "sustainable development," highlighting the differences in issues of sustainability between developed and developing countries, discussing the tensions between economic growth and sustainability and those between poverty and environmental degradation. It then goes on to cite studies that deal with the various "pressure points" of the urban environment—water, sanitation, health, housing, transport—as these services, or the lack of them, impact on the urban poor. The next section will deal with urban resources that are already in existence, for example urban agriculture and waste management/recycling, and that might be tapped more effectively. This will be followed by a section on planning and policy addressing the various mechanisms of urban management, including strengthening local authorities, citizen participation, an extended role for non-governmental organizations (NGOs) and voluntary agencies, and the changes needed in international co-operation and assistance. The importance of gender analysis is stressed. The review will conclude with comments on future research.

This review thus concentrates on social dimensions and the immediate short-term concerns of survival in the urban environment, which are sometimes referred to as the "brown" issues in contrast to the "green" issues of long-term ecological sustainability (e.g., ozone depletion) (Sivaramakrishnan, 1993; McCarney, 1992; Cohen, 1992). The studies selected for citation are the ones which are most useful in contributing to an understanding of the topic and/or which provide recommendations or practical examples of sustainability. Preference is given to the most recent and accessible studies and all the studies cited are in English. Since only a few leading writers have so published on urban sustainability in developing countries, their work will be a dominant source of reference. Major conferences and colloquia will be described. A list of offices and resource centres where relevant material may be obtained is also appended.

## I. CONCEPTUAL FRAMEWORK

It is generally agreed that the publication which first focused global attention on "sustainable development" and popularized this term is *Our Common Future* (1987) by the World Commission on Environment and Development (also known as the Brundtland Commission). Authors have pointed out, however, that the meaning and the implications of the concept of "sustainable development," as popularized by the Brundtland Report, i.e., "development that meets the needs of the present without compromising the ability of future generations to meet their own needs," has different connotations for North and South and has resulted in differences in the conceptual framework for urban sustainability.<sup>1</sup>

### A. DIFFERENCES IN SUSTAINABILITY ISSUES BETWEEN NORTH AND SOUTH

While the primary concern in Northern cities is on overcoming environmental constraints while attempting to maintain present standards of living (Mitlin, 1992, p. 111), the emphasis in the literature about the South is about the lack of development and minimal living standards in its cities. Authors point out that in cities of the South, the effects of weak environmental controls and poor land-use planning pose direct dangers to the low-income majority. It is the sheer lack of basic services that is being discussed in alarming environmental terms. By contrast, in the North, where housing is adequate, health facilities and other infrastructure are relatively well-endowed, the immediate short-term effects of environmental hazards are generally mild. Hence the emphasis in the North is more on long-term ecological sustainability with more sustainable patterns of resource use, services provision and ecosystem exploitation (UNCHS, 1991; WHO, 1992, p. 66; McCarney, 1992, p. 2; Stren, 1992, pp. 2-3). *Sustainable Cities, Urbanization and the Environment in International Perspective* (Stren, White and Whitney, 1992), one of the few major studies addressing Third World cities, has as its underlying theme the contrast between North and South, both in terms of urban realities and the framing of the environmental policy agenda.

*Our Common Future* came out of world-wide expert and public consultations which brought to light serious survival concerns of the poorest nations of the South. These links between poverty, inequality and environmental degradation formed a major theme in the analysis and recommendations of the Commission. A separate chapter on "Urban Challenges" encompassed Third World urban service deficiencies and called for a "greater flow of international resources to support efforts by developing countries to tackle the unfolding urban crisis" (WCED, 1987, p. 26).

The next major global project linking the environment and development was the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit held at Rio

de Janeiro in June 1992, out of which came *Agenda 21*. In the months leading up to the summit, however, there was serious concern among some writers (McCarney, 1992; Satterthwaite, 1992; Korten, 1992) that the lessons learned through the work of the Brundtland Commission, which stated categorically that meeting human needs was central to sustainable development, were being ignored in the preparatory meetings and publications for the Summit and that a Northern Agenda of ecological issues ranging from climate change to biodiversity would take priority. Although, at the Summit itself, some Third World issues were recognized as being critical to global sustainability,<sup>2</sup> the principal discussions were natural resource and ecological issues. Authors are concerned about this shift of focus from the "human" and poverty issues of the Brundtland Report to the primarily ecological agenda of the Summit and see it as a result of influence by Northern governments whose economies are increasingly constrained by global ecological problems (McCarney, 1994, pp. 8-9; Hardoy *et al.*, 1992).

This concern with ecological problems has influenced the growing international interest in urban environmental issues. This often means greater attention by governments and aid agencies to chemical agents in the air, rather than biological agents in water, food, air and soil; and more attention to the "loss of agricultural land due to urban spread than to the fact that most of the urban populations lack access to safe and sufficient water supplies and to safe, healthy and legal housing" (Hardoy *et al.*, 1992, pp. 22-23). Urban researchers stress that the environmental problems of the South need to be prioritized according to the needs of the urban poor. As Campbell (1989) points out:

The adverse effects of household air-borne and water-carried diseases on child-mortality and female life expectancy are of no less global proportions than, say, the destruction of tropical forests, and in immediate human terms they may be the most urgent of all worldwide environmental problems (p. 173).

## B. TENSIONS BETWEEN ECONOMIC DEVELOPMENT AND SUSTAINABILITY

There is considerable debate within the literature about the relationship between sustainable development and economic growth. *Our Common Future* states that it is impossible to separate economic development issues from environment issues; many forms of development erode the environmental resources upon which they must be based, and environmental degradation can undermine economic development (WCED, 1987, p. 3). Some authors point out that the economic gains that many Third World countries have made have inevitably been at the expense of the environment. Vaclav Smil (1984) writes about the considerable degradation to which the Chinese environment has been subjected and the continuing deterioration of both the natural and human-made environment. Quesada-Mateo and Solis-Rivera (1990) write about the conflict between Costa Rica's economic needs and the goal of ecological conservation. Chi (1992) points out that environmental

degradation in Taiwan has intensified under the ideology of "almighty economic growth" by successive governments.

While sustainable development requires economic growth to provide for basic needs, it simultaneously requires changing current patterns of natural resource exploitation. At the same time, it is pointed out that high levels of productive activity and widespread poverty can coexist, requiring that societies meet human needs not only by increasing production but also by ensuring equitable opportunities for all (WCED, 1987, p. 44; UNDP, 1991b). Trainer (1990, p. 72) also implies that economic growth has not helped the poor, but rather delivered wealth to the rich few. Some writers have suggested that development not be measured in economic terms only, but also in terms of satisfied human needs and other realistic indicators such as investment in human resources, energy efficiency and environmental quality. Others recommend that the subsistence economics as a basis for economic development be given the importance and recognition it deserves and be included in policies for development (Sayne, 1992, p. 49; Lee-Smith and Schlyter, 1992, p. 4; Lee-Smith and Trujillo, 1992, p. 77).

### C. POPULATION PRESSURES AND ENVIRONMENTAL DEGRADATION

Cities in the developing world are growing far more rapidly than those in the developed world. The World Bank estimates that by the year 2000, there will be 25 cities with more than 10 million inhabitants. Out of these 20 will be located in the Third World (White and Whitney, 1992, p. 18; McCarney, 1992, p. 2). Such rapid urban growth brings with it problems of gigantic proportions, both in terms of development and environmental degradation, especially where there is little or no consideration for the environmental implications and a lack of an adequate institutional framework to ensure that these implications are addressed (Hardoy *et al.*, 1992, p. 17; see Stren and White, 1989).<sup>3</sup>

There is a continuing debate in the literature about the impacts that growing population pressures of poor countries have on the environment. Some authors argue that the large populations and the accompanying poverty are responsible for ecological degradation and over-exploitation; others argue that, while population pressures may impact negatively on local environments, it is the rich countries with relatively stable populations that are instrumental in causing the most damage to the global environment (WCED, 1987, p. 3; Chambers, 1987; WHO, 1992; Lee-Smith and Trujillo, 1992). David Satterthwaite (1992, p. 5) emphasizes that it is levels of *per capita* consumption of non-renewable resources and waste generation, not population size, which impact on the global

environment and that "the two billion or so poorest people in the Third World make very little call on the world's finite renewable resources."

Such arguments, however, are part of national and international relations between North and South and are rarely applied to an urban analysis of population growth. For the most part, overconsumption in the developed countries has little to do directly with daily realities elsewhere. The overriding concern in urban research is the about rapid urban expansion without effective urban governance and the resulting "pressure points" in urban services.

## II. SERVICES FOR THE POOR: THE ENVIRONMENTAL "PRESSURE POINTS"

Sustainable urban development has been defined by Richardson (1992, p. 148) as "the development of a city's physical structure and systems and its economic base in such a way as to enable it to provide a satisfactory human environment with minimal demands on resources and minimal adverse effects on the natural environment."

During recent years, the discussion of urban services in developing countries has broadened to include the concept of sustainability. The very rapid growth of urban settlements in recent decades along with lack of urban finances and inadequate management has exacerbated urban environmental problems such as poor housing conditions, energy and water shortages, and very inadequate waste disposal and sanitation. Congested traffic conditions and air pollution are also matters of increasing concern. Large proportions of urban populations live in such conditions.<sup>4</sup> Several studies (Izeogi, 1989; Stren and White, 1989; Castaneda, 1989; Jimenez and Velasquez, 1989) address these issues in environmental terms.

*Environmental Problems in Third World Cities* (Hardoy *et al.*, 1992) identifies urban environmental problems and describes their impact on human health and the natural ecosystems. Several other studies also discuss the relationship between natural resource degradation and poverty in human settlements. These studies emphasize that good environmental management within settlements can greatly reduce environmental health problems and promote efficient use and distribution of resources, while also contributing to poverty alleviation (Leach and Mearns, 1991; Mitlin and Satterthwaite, 1992; WHO, 1992; UNCHS, 1991; UNCHS, 1992; Hardoy *et al.*, 1992). Some studies also highlight the effect that poor urban populations have on their immediate environments through exploitation of natural resources and contamination of water and land by disposal of all kinds of wastes in the locale. Such effects are inevitable given the lack of essential services like energy and water supply and waste collection/treatment. "The pollution of poverty," is, however, a sensitive issue, because in many cases the poor's means of livelihood and access to daily needs would be

threatened if strict environmental regulations were instituted (Wekwete, 1992, p. 124). Some authors suggest that the activities of the poor which have detrimental effects on the environment can be addressed by improving access to services and promoting environmental awareness and education in preference to a regulatory approach (Bandara, 1989; Campbell, 1989).

Housing, land, health, water, energy, sanitation/waste management and transport are the most common areas in the literature addressing sustainability in poor settlements. Although the importance of integrated planning and solutions has been recognized and is being addressed, most studies are sectoral in scope.

#### A. HOUSING

Urban shelter is the most visible pressure point in many Third World countries. The demand stems from high rates of urban population growth resulting from both rural to urban migration and natural increase. In most cities, the poor have limited access to legal housing or the legal land market and have to resort to a range of shelter types, many of which are illegal. Severe shortage of housing has given rise to overcrowding and insanitary conditions, overtaxing services that were planned for much lower population densities. The problem has been exacerbated by the widespread failure to consider housing within the holistic context of the urban political economy (White and Whitney, 1992, p. 22). For instance government slum clearance and squatter removal policies have destroyed housing stock, increasing homelessness. Large-scale public housing has proven very expensive and often socially disruptive (Rondinelli, 1990; Hardoy and Satterthwaite, 1989b).

Most authors agree that the shelter solutions provided by low-income citizens themselves have helped alleviate the lack of housing stock. To assist low-income populations achieve sustainable ways of acquiring shelter, a few recommendations have been commonly made in the literature:

- Revise and relax building codes and standards.
- Promote indigenous building materials to reduce costs.
- Make building materials affordable through accessible credit.
- Assist the legitimization and upgrading of squatter settlements and slums, promoting self-help projects and providing basic infrastructure and services (see Aduwo and Obudho, 1989; Rakodi and Schlyter, 1981; Valladares and Huston, 1987).
- Integrate the low-income rental market in shelter planning (see Aina, 1989).
- Promote community-based initiatives and innovative ways of providing different urban services (see UNCHS, 1986).

- Avoid large projects if they do not fulfil the objectives of providing affordable, low-income housing (see Amis and Lloyd, 1990).
- Monitor government-assisted self-help programs, such as site and services projects, to ensure that the most needy are the beneficiaries (see Hardoy and Satterthwaite, 1989b).

In essence, the sustainability of the housing sector depends on many factors, which include "a willingness to innovate, an understanding of the shelter matrix as a whole and the provision of more resources at local levels to address the problem more directly" (Wekwete, 1992, p. 129).

## B. LAND

An increasing proportion of the urban population in Africa, Asia and Latin America is forced to live in areas where they are at risk due to previous contamination of the soil or susceptibility to environmental disasters. The many poor households who live in settlements on dangerous sites such as flood-plains or steep slopes, are forced to do so because authorities failed to plan for and allocate more suitable sites (see Schteingart, 1989, p. 42; Castaneda, 1989, p. 18). The poor often live near, or on, garbage dumps (20,000 people live around the main dump in Manila—see Jimenez and Velasquez, 1989, p. 51) for want of safe and affordable sites. Small industries may be located within settlements, or industrial sites nearby add to the environmental deterioration of poor housing areas.

Some governments are attempting to guide urban industrial development towards selected growth centres and inter-urban corridors, but are hampered by the absence of consistent political will to implement such policies (Douglass, 1989). Many cities in the Third World have sufficient unused and under-utilized land sites within the built-up area to accommodate most low-income households currently living in very over-crowded conditions, yet few governments are prepared to make such land available to the poor. Low-interest finance schemes, which can support informal finance organizations such as co-operatives or credit unions or improve the responsiveness of formal financial systems also need to be developed to improve access to land and building materials (Hardoy and Satterthwaite, 1989b; Hardoy *et al.*, 1992; Di Pace *et al.*, 1992; Jimenez and Velasquez, 1989; Diaz, 1992; Skinner, Taylor and Wegelin, 1987). The UNCHS has several publications which examine how governments could increase the supply of land for housing the poor and ensure secure tenure for their housing (UNCHS, 1983a; 1983b; 1985).

### C. HEALTH

Health is a primary issue of concern in the literature for Third World sustainable development. The discussion of health cuts across all sectors. The WHO publication *Our Planet, Our Health* (1992) puts health at the centre of the discussion about environment and development. It states that health has so far been absent from the public discussion about environment and development and is seldom given high priority in development plans, even though health and development are so intimately connected that the state of health within a country is one of the most revealing indicators of its development. Another WHO publication (Giroult, 1989) describes a healthy environment as including a diverse, harmonious social structure, a diversified, sustainable and equitable economic base, a positive psychological climate, an adequate physical structure reflecting health considerations, an environment free of excessive pollution, and conservation efforts to maintain a healthy ecosystem.

WHO findings show that the poor rarely live in healthy areas. These inequalities are often legalized by planning regulations. There are much higher differentials (four to five times higher) when infant mortality rates and environment-related diseases in poorer districts are compared to richer districts. One reason for so little governmental action on environmental health concerns is because the worst impacts are generally confined to the poorer groups (Harpham *et al.*, 1988; Hardoy *et al.*, 1992).

Urban housing, waste management and potable water are considered to be closely linked with health issues. *In the Shadow of the City* (Harpham *et al.*, 1988) and *The Poor Die Young: Housing and Health in Third World Cities* (Hardoy *et al.*, 1990) describe the links among ill-health, disablement and premature death to poor housing and inadequate urban services. In many poor city districts, infants are 40-50 times more likely to die before the age of one than in Europe and North America, and virtually all such deaths are environment-related (Hardoy *et al.*, 1992, p. 20). A high incidence of diseases such as gastro-enteritis, and respiratory and skin disorders in urban areas can be linked directly to poor living and working conditions (Castaneda, 1989, p. 19).

For poor people and poor regions, it is the household environment that carries the greatest risk to health (World Bank, 1993). It is argued that improved housing and healthier environments are crucial to health and well-being and must therefore be implemented along with increased health services and better education (Goldstein *et al.*, 1990). Health should no longer be seen as the responsibility of the health authorities alone, rather it should be the shared responsibility of individuals, communities, employers and all government agencies at all levels (WHO, 1988; WHO, 1992; Hardoy and Satterthwaite, 1987; Hardoy *et al.*, 1990). An integrated approach to health is promoted. James Lisorti (1990) suggests methods by which environmental health components can often be introduced

into an expensive infrastructure project at a low additional cost, thus maximizing the benefits of such development.

#### D. WATER

Water supply is a key factor in sustainability. It has major health and environmental consequences and is a basic requirement for all human settlements, both for human use (drinking, washing and bathing), animal husbandry, agriculture and production of goods. Together with sanitation and waste collection/disposal, water supply is an environmental service normally provided by city governments (Sivaramakrishnan, 1993, p. 29). Yet a large proportion of urban Third World populations do not have access to adequate quantities of clean water because city governments have been unable to arrange supply. It is usual that water is supplied for only a few hours a day; Beijing is but one example (Yeung, 1992, p. 272). Often the areas in which poor people live are the hardest hit by seasonal shortages and cuts (Centre for Science and Environment, 1989, p. 13). In informal settlements, households resort to digging shallow wells, buying water from vendors (the price of which can be up to 4-100 times as high as that of piped water—Hardoy *et al.*, 1992, p. 42) or making illegal connections to water pipes.

Most poor populations only have access to water which is highly polluted with pathogens and chemicals (mainly from human excreta, industrial effluent and agricultural run-off). In many cities, water is becoming more a life-threatening than a life-supporting commodity (Yeung, 1992). The Centre of Science and the Environment (1989, p. 10) estimates that about two thirds of all illnesses in India are related to water-borne diseases such as typhoid, infectious hepatitis, cholera, diarrhoea and dysentery and that 70 percent of available water in India is polluted. Overall, over 80 percent of all diseases and over one third of deaths in developing countries are caused through ingesting contaminated water (UNCHS, 1990b).

Improvements in the quality of water are often possible at relatively low cost and with good possibilities of cost recovery from users. A piped water system can be installed to replace water vendors and provide people with a safer and more convenient supply for the same price (Hardoy *et al.*, 1990). The most recent discussions on water are now emphasizing an integrated approach to understanding the links between water, land management, waste management and urban agri-aquaculture. Decentralized, community-based water management systems are being promoted, as these could be more easily integrated with other urban functions (Mougeot and Massé, 1993). As Sandy Cairncross (1992, p. 1) remarks,

The principal challenges of the next decade will not be the technical questions—the "hardware" of water supplies and sanitation—but the "software" issues: how are the water and sanitation programs to be organized and financed? How can people be trained, organized and motivated to install, use and maintain the facilities? How can institutions develop the sector further and make improvements more sustainable? These are the questions for the 1990s.

## E. ENERGY AND AIR POLLUTION

Most developing countries face serious constraints in managing and co-ordinating their energy resources in sustainable ways. The growth in use of oil, coal and other sources of energy, fuelled largely by speedy industrialization and urbanization, has been rapid in previous decades—energy use has tripled during the last 20 years. Energy-related air pollution, primarily from motor vehicles, is a major concern. Bangkok, Mexico City, Nairobi, Santiago and Sao Paulo are among the long list of cities that suffer from serious lung-damaging air pollution (Lenssen, 1993, p. 105). In Mexico City alone, air pollution is a likely cause or contributes to 90 percent of respiratory illnesses and infections (Di Pace *et al.*, 1992).

Even though ambient air pollution is a serious concern, indoor air pollution is regarded by some authors as a graver problem (Smith, 1993). For the poor, firewood is the main energy source (WCED, 1987, p. 189). It is the leading cause of health problems due to daily exposure to high levels of toxic compounds (Bartone, 1990, p. 3). In India, wood provides 50 percent of the cooking energy in cities (Centre of Science and the Environment, 1989, p. 9). Urban and industrial firewood consumption is a factor in the deforestation of Third World environments although consumption is at bare subsistence levels (WCED, 1987; Dunkerley, 1979).<sup>5</sup> With rising wood prices and decreasing supply, poor urban families are often obliged to spend up to one third of their income on their fuel needs (WCED, 1987, p. 190). In many cities, there is a strong correlation between indoor air quality and income, with poorer people using more polluting fuels and less efficient stoves (Hardoy *et al.*, 1992, p. 101).

Several studies describe the improved design and dissemination of fuel-efficient stoves as a means to deal with rising fuel costs, decreasing energy resources and health hazards (Mazingira Institute, 1988; Inyang, 1989; Hyman, 1987). Traditional cooking stoves operate at an efficiency level of 10 percent, but improved stoves can convert 20-30 percent of biomass to useful cooking energy. Similar gains can be made in converting wood to charcoal as energy sources (Lenssen, 1993, p. 109).

Many developing countries have extensive, unexploited reserves of natural gas, which could supplant expensive and polluting fossil fuels both in industrial processes and domestic use. An enormous potential also exists for relying on renewable energy sources such as hydro, solar, wind,

biomass and geothermal energy resources to meet needs in both urban and rural areas. There are obvious benefits to human health and the environment in supplying low-waste energy (Lenssen, 1993, p. 119; WCED, 1987, p. 192).

#### F. SANITATION/WASTE MANAGEMENT

Sanitation wastes, solid wastes and waste waters contribute to the environmental hazards and low quality of life in urban settlements (UNCHS, 1991; Cairncross and Feachem, 1983). The major toxic pollutant of concern in Third World cities is human excreta (Bartone, 1990, p. 2). Around two thirds of Third World populations have no hygienic means of disposing of excreta and an even greater number lack adequate means to dispose of wastewaters (Sinnatamby, 1990). Present coverage of sewage systems is approximately only 20 to 30 percent in most African and Asian cities (Wekwete, 1992, p. 130). In Bangkok, only two percent, and in Khartoum, only five percent of the population is connected to the city's sewers (Phantumvanit and Liengcharensit, 1989, p. 33; El Sammani *et al.*, 1989, p. 262). In India, defecating in the open is common practice, since at least one third of the urban population have no latrines of any kind and another third rely on bucket latrines, which are unusable if overflowing (Centre for Science and Environment, 1989, p. 14).

In the developing countries, less solid waste is produced per inhabitant, but only 30-50 percent is collected by public authorities. Garbage disposal is generally given low priority by city governments. In Dar es Salaam, two thirds of all solid wastes remain uncollected, while 2,500 tons of garbage is left uncollected in Bogota each day (Kulaba, 1989, p. 239; Castaneda, 1989, p. 18). It is, as usual, the poorer settlements which have the least adequate garbage collection service or no service at all (Cointreau, 1982).

Hazardous wastes are rarely managed safely; they are either disposed of as liquid wastes or placed in open dumps without environmental management (Di Pace *et al.*, 1992, p. 217; Hardoy *et al.*, 1992, p. 65; Phantumvanit and Liengcharernsit, 1989, p. 35).

Many countries have large-scale programs in urban areas for pour-flush latrines and ventilated improved latrines. Some organizations such as Sulabh International in India promote composting latrines, and cities are experimenting with mobile trailer units for very congested slums. Shallow sewer or small bore sewer schemes are also becoming popular (Sinnatamby, 1990). The emphasis now is on designing and building sanitation systems that are affordable and can be properly maintained by the users.

Community-based approaches to waste management as a supplement to overburdened or inefficient conventional approaches are now promoted. One example is the much-cited Orangi Pilot

Project in a Karachi slum, where a local NGO organized residents to fund, build and manage their own sanitary system. The people built simplified sanitary latrines and a small-bore sewer system at a fraction of the cost of conventional systems (Hasan, 1989; Rahman, 1990). The Nima Welfare Association's work in Accra is a good example of community involvement in refuse collection and provision of public facilities (Lee-Smith and Syagga, 1989). The Waste Wise project in Bangalore is notable in going beyond community participation in waste management to incorporate social goals such as improving the working conditions of waste pickers (Furedy, 1992). In solid waste management, there is an emerging concern for waste reduction and an interest in traditional systems of waste trading and recycling (Furedy, 1990b). There are many recommendations for public-private partnerships for waste management (Fernandez, 1993).

#### G. TRANSPORT

Developing cities are "increasingly afflicted by serious problems of moving people and goods within their urban areas" (Yeung, 1991). Transportation for large cities in most Third World countries involves a mix of public sector management and private enterprise with a large public bus company supplemented by a diverse informal system of vehicles ranging from minibuses, cars and jeeps to rickshaws and bicycles (Stren, 1989, p. 44; Pendakur, 1986, p. 2). Yeung (1991, pp. 40-41) points out that the phenomenal growth of private cars and motor scooters has enhanced mobility for many people, but has created much air pollution and congestion (scooters, in particular, lack emission controls).

Most Third World cities follow Western models in their traffic system, thus encouraging greater private car use, without increasing capacity. In Mexico city, for example, cars make up 97 percent of the total transportation units, but account for only 16 percent of total trips (Schteingart, 1989, p. 44). The slow modes (walking, bicycling) used by the majority of the urban population are relegated to the lowest order of priority in favour of fast-moving vehicles. Although walking trips in developing countries, mostly by the poor, account for a significant portion of total trips, (in Delhi, 29% of total trips in 1981 were by walking and another 15% by bicycle), they are seldom included in policies leading to system improvement (Pendakur, 1986; Roth, 1984). Huge traffic jams, unsafe road conditions and an overburdened public transport system are common to most Third World cities.

Several writers advocate transport planning based on local analyses and value systems and not those transplanted by international consulting and lending agencies. To meet requirements for sustainability, UNCHS (1990) recommends that strategies for transport should be established on an inter-sectoral basis as part of national policies for human settlement management. As urban transport

requirements are predetermined by land-use patterns, it is important to pursue land-use policies that reduce the frequency and length of motorized trips (Pendakur, 1986). Making transport sustainable depends largely on creating urban space that is not dominated by automobiles and that safely accommodates public transport, cyclists and pedestrians (Lowe, 1990; Kenworthy and Newman, 1990).

### III. TAPPING RESOURCES

The wide range of survival strategies and coping mechanisms of the urban poor are often viewed negatively by city authorities. These mechanisms have important beneficial characteristics in terms of local capacity to solve urban services and environmental problems and to generate income. Thus they should to be considered in policy formulation. Most of these activities are "informal." They have grown with the lack of formal employment and shortage of commodities as well as the need for supplementary income. Informal work is the biggest employer of the urban poor, typically in small-scale trade and commodity production, and contributes to owner-occupied and rental housing (mainly unauthorized). Many of these activities are regarded as illegal and do not receive official support. Instead of being dismissed as disorganized and disruptive to city planning and law enforcement, authors suggest that the informal modes of urban services should be promoted and integrated in urban planning strategies (Mitullah, 1991; Yeung, Keles and Islam, 1988; de Soto, 1989; Cornia, 1987).

#### A. WASTE RECYCLING

One characteristic of most Third World cities is the remarkable intensity and complexity of ways in which limited resources are used and reused (Hardoy *et al.*, 1992, p. 133). Waste recovery, based on recognizing wastes as "unused resources," although not without health-related and other problems, brings economic and environmental benefits. The livelihoods of several million urban dwellers depend on wastes, including workers in small industries which recycle such diverse materials as plastics, bottles, metals, bones, feathers, intestines, hair, leather and textile scraps (Furedy, 1990b; Furedy, 1992). Waste-pickers who recover waste from street bins, dump-pickers who scavenge materials from dumps, itinerant buyers who barter or purchase materials, transporters, second-hand marketeers and various producers using recyclables are all part of the hierarchy of the informal waste recycling economy (Furedy, 1990b). In Bogota an estimated 30,000-50,000 earn a living from informal waste management (Pachecho, 1992, p. 72). The benefits to governments from such waste reduction are considerable. Not only is waste collected and managed, but informal recycling has also

proved to reduce the demand for energy, raw materials, fertilizers and foreign exchange (Vogler, 1981; Cointreau, *et al.*, 1984; Pachecho, 1992).

It is common for the poorest and most disadvantaged groups to be involved in the lowest levels of waste recovery, encountering many health risks through handling contaminated and rotting products and accidental injury, especially in dump picking (Kungskulniti, 1990). Hazardous wastes (such as industrial and hospital wastes) are mixed with household wastes, adding to the dangers of this work (Cointreau, 1982). As Hardoy, Mitlin and Satterthwaite (1992, p. 135) emphasize, "a critical consideration is how the great environmental advantages of informal resource recovery and utilization can be kept, while income levels and working conditions are improved and health risks minimized" for the waste workers.

In some countries, NGOs are experimenting with community-based waste management projects, which have as their goal not only recovery and recycling of materials, but also combine social, economic and ecological motivations, such as improving living and working conditions for pickers, promoting efficient means of recycling, and environmental education (see Furedy, 1992 for case studies in Asia). In Kathmandu, a picking platform was built at a composting site so that pickers can retrieve recyclables from the wastes delivered for composting (Furedy, 1992, p. 52). In Jakarta, decentralized, low-tech composting of the considerable organics in municipal wastes, is being promoted. Furedy (1994), White and Whitney (1992, p. 24) and others recommend that for cities attempting to "modernize" waste management, it is more appropriate to improve operation of the informal system, than to supplant it with expensive mechanized plants. Encouragement of source separation is being recommended in solid waste management (Furedy, 1989, p. v).

## **B. URBAN AGRICULTURE**

Urban agriculture has lately been promoted as a strategy to tackle cross-sectoral urban issues such as water, waste management, food, employment and land-management, specially as they affect the poor. It includes market gardening, animal husbandry, orcharding, and aquaculture (Smit and Nasr, 1992). This activity operates on various scales, including small household plots, balcony and rooftop containers, and organized market gardening. Composting of organic wastes for use in urban agriculture contributes to waste reduction (Lardinois and van de Klundert, 1993).

While urban agriculture involves people from all categories, it is a survival strategy of the urban poor (Mougeot, 1993). The poorest households are least likely to have access to a household garden and usually use areas left unsuitable for urban development or reserved for future development or idle public land such as roadsides, vacant lots, steep slopes or floodplains. In Zaria, Nigeria, 60 percent

of the urban area is cultivated, while in Beijing it is 28 percent (Smit, Rutta and Nasr, forthcoming, 1994). In Kenya, 66 percent of urban households grow part of their food (Mazingira, 1985). Several Chinese cities are self-sufficient in food grown in urban and peri-urban areas (Yeung, 1993).

As Sivaramakrishnan (1993, p. 28) points out, "from the very beginning, these settlements start at an environmental liability." Urban food production has been neglected by most municipal authorities for a long time: they often claim that it engenders health hazards, traffic problems and environmental degradation. In Singapore, all livestock rearing is forbidden; many cities have similar laws for the main urban area. The activities are usually condoned. Some public entities, however, such as an airport in Cameroon, the University of Manila, hospitals in Lima and a race track in Jakarta, lease part of their land for urban agriculture (Smit, Rutta and Nasr, forthcoming, 1994). In Southern Africa, Malawi and Mozambique have officially recognized the importance of urban agriculture in improving food supply.

The benefits of urban agriculture are many and it needs municipal support (such as agricultural loans) to achieve its potential. It provides economic and environmental benefits for the farmers, their communities and their cities: it is sometimes the largest production industry in the informal sector and hence generates jobs, enterprises and income; it helps reverse environmental degradation; it reuses urban organic waste and wastewater to produce food and fuel; aquaculture helps preserve multi-functional wetlands (Ghosh, 1990; Furedy, 1990c).<sup>6</sup> In other ways, urban agriculture is a means of resource conservation, as crops are produced close to the market, requiring less transportation and resulting in less crop loss in transit. Because of these multiple linkages and benefits, urban agriculture, more than most industries, requires public-private partnerships to achieve its potential (Smit, Rutta and Nasr, forthcoming, 1994).

### C. ALTERNATIVE TRANSPORT

The cities of Third World countries have a vast range of vehicle types supplementing public sector ones. These alternative transport modes include, among others, the auto-rickshaws of Indian cities, bicycle rickshaws (Dhaka), jeepney (Manila), tuktuk (Bangkok), becak (Jakarta), matatu (Nairobi) and various kinds of mini- and micro-buses. All of these vehicles are small and extremely versatile: they are demand-responsive and comparatively inexpensive; they can navigate narrow roads and lanes; and they can provide door-to-door service in most instances. These vehicles are either converted jeeps or vans, improved cab versions of motorcycles or bicycles or just small buses. Most operate in the informal sector (for example, in Manila only about half of the 35,000 jeepneys are licensed) and provide both service and employment for the urban poor (Pendakur, 1986; Yeung, 1991).

As noted above, urban planning processes rarely incorporate informal modes of transit, even though these fill obvious needs. In Nairobi, public transport only provides for 27 percent of all journeys; 24 percent of city residents walk because of high costs of public transport, and about 23 percent use matatus (small pickups or minibuses), with the rest of the population using cars, motorcycles or bicycles. Matatus were illegal till the 1980s, in spite of their popular use since the 1950s. They were legalized in the 1984, but they are still not included in planning mechanisms and do not receive official support. The second most important mode—walking—has also been neglected in transportation analyses and planning (Lee-Smith, 1989). Similarly, in Bangladesh, bicycle rickshaws fulfil an "environmentally-friendly" part of the public demand for transportation. Rickshaws account for more than half of Dhaka's vehicles, serve 70 percent of its passengers and provide 43 percent of the total passenger-miles. The rickshaw industry, with over a million workers, is also one of the largest employers. Yet, rickshaws have been totally left out of government planning except for a short provision in the latest Five Year Plan for its gradual elimination (Gallagher, 1992). Jakarta is proceeding with plans to replace bicycle rickshaws with mini-buses (Yeung, 1991, p. 42).

Affordable and efficient transport is of fundamental importance to a city and especially to poor people, who often have to travel long distances daily to reach their places of work in the main economic centres. Overcrowded, insufficient public transport adds to the many burdens of the urban poor (UNCHS, 1992; Hardoy *et al.*, 1992). Up to a quarter of households in Third World countries cannot afford public transport and have to rely on alternative modes (Lowe, 1990). City governments need to play an active role in integrated traffic planning and improving the technology for alternative modes of transport, especially to reduce harmful emissions.

#### IV. PLANNING AND POLICY

In most Third World countries, urban populations have expanded without a corresponding expansion in the services and facilities essential for an adequate and healthy urban environment. Existing urban services are inefficiently and inequitably distributed. The urban poor are often left without services even when they are willing to pay for them, while the rich receive subsidized services (Bartone, 1990, p. 7). There is broad agreement in the literature that urban policies and planning, while aiming to raise standards of living, need to be assessed environmentally and adapted to sustainable standards.

Although there are not many examples of how this has been done successfully, some studies recommend policy shifts which would reflect the changing Third World environment and take advantage of not only governmental but also non-governmental resources (Wisner, 1990; UNDP,

1991a). Sachs and Duff (1980) along with others early stressed that the industrial cities of more affluent nations are not suitable models for developing countries: Third World cities must develop their own planning models for sustainability. Leitmann (1992) emphasizes that urban environmental strategies for Third World cities should have an explicit focus on the problems of the poor, while seeking to enhance the economic productivity, health, and natural ecology of cities. Other studies generally recommend complementary lines of action including political, social, economic, institutional and technological change with an emphasis on poverty alleviation (Cadman and Payne, 1990; UNDP, 1991a). Some cities are developing "green plans." A theme in a number of commentaries is the need for a "gender analysis" of urban environmental and developmental policies (Moser, 1989; Stren, 1992; Clarke, 1991; Sayne, 1991).

Three major areas of planning and policy requirements for urban sustainability, which were identified in the literature will be addressed in this section:

- A. Appropriate urban management strategies
- B. The importance of a gender analysis
- C. New norms for international co-operation and assistance

#### A. URBAN PLANNING AND MANAGEMENT

The primary concern in the management discussions is the acute lack of urban services. Improvement of access by the poor to urban environmental resources and their protection from the impacts of environmental degradation is seen as a problem of urban management. Appropriate urban management is seen as critical to economic development and environmental sustainability (McCarney, forthcoming; Bartone, 1990). Most Third World governments, however, have unstable political and administrative systems with weak taxing capacity and are ill-equipped adequately to manage the urban environment.

In 1990, UNCHS (Habitat) launched the Sustainable Cities Programme (SCP) to provide municipal authorities and their partners in the public, private and popular sectors with an improved environmental planning and management capacity (UNCHS, 1992, p. 43). This programme is the operational arm of the environment component of the joint UNDP/World Bank/UNCHS Urban Management Programme (UMP), a global programme initiated in 1986, whose principal objective is to strengthen the contributions urban centres make towards human development, including economic growth, social development, environmental improvement and alleviation of poverty.<sup>7</sup> Both these programs will facilitate dissemination of research, sharing of expertise and feed-back on operational activities world-wide.

In papers prepared for the Urban Management and Environment component of the UMP, the constraints faced by urban governments in three cities—Accra, Sao Paolo and Jakarta—have been identified as: limited choice of instruments for environmental management, weak regulatory powers and limited capacity to enforce regulations, high compliance costs for environmental laws, insufficient financial, human and technological resources, lack of intergovernmental and inter-ministerial coordination, limited public participation and inadequate public education (Amuzu and Leitmann, 1991; Leitmann, 1991; Clarke, Hadiwinoto and Leitmann, 1991). These constraints are more or less common to the developing world and have to be addressed in order to reach sustainable solutions to urban environmental problems.

Several studies (Clarke, 1991; Clark, 1991; Jimenez and Velasquez, 1989; UNDP, 1991a, pp. 4-5; Hardoy *et al.*, 1992; de Soto, 1989; Cornia, 1987) have identified a number of urban management priorities for sustainability:

- Poverty alleviation
  - promoting income-generating activities of the poor
  - promoting the informal sector
- Providing shelter, infrastructure and services
  - promoting "enabling" strategies by improving the poor's access to land, finance and building materials
  - targeting the poor for basic urban services and ensuring accessibility
  - addressing environmental health concerns
- Improving the urban ecology
  - improving energy use, resource use, solid waste management and alternative transport
  - environmental zoning to control siting of new industries; legislation controlling industrial pollution backed up by strong legal enforcement
  - incorporating the environment in urban planning; environment impact assessment of proposed projects

These studies also suggest that fundamental changes in the political structure of urban government is needed in order to deal effectively with sustainability issues. As Hardoy, Mitlin and Satterthwaite (1992, p. 23) point out: "most environmental problems are political," and lack of services does not necessarily mean a shortage of resources but, more often, a lack of political will to set and pursue environmental priorities.

## 1. Strengthening Local Government and Administration

Almost everywhere in the developing world, local governments have very limited powers and resources to respond to problems at hand. The big national planning structures of the 1960s and 1970s did not strengthen the authority and ability of local governments. Since then, there have been efforts at decentralization, but with limited success (UNDP, 1991a). The issue of urban local government is fundamental in addressing the question of sustainability. A strong local government system also puts pressure on central government, making it more accountable.

At present most local governments operate under constraints that make their role in managing their cities extremely difficult. Usually city municipalities have to enforce policies formulated at higher levels and shaped by national economic and political trends (Leitmann, 1991; Clarke and Leitmann, 1991). On the other hand, municipalities are usually poor and ineffective because all the main forms of taxation are either set by central governments or outmoded. In Colombo, for example, where decentralization has put the control of most basic services within the jurisdiction of local governments, the results have been largely ineffective, mainly because municipalities lack the institutional, technical and financial capacity to assume the responsibilities transferred to them (Forero and Salazar, 1991). Bangladesh, too, has a decentralized planning system which, however, has not met with much success as it lacks a mechanism to ensure the community participation (Hasan, 1991). Often, local governments have no control over sources of pollution, such as industries. Authors point to decentralization of power and resources as a necessary first step, but also call for enabling political and financial mechanisms which empower local governments in their efforts to bring about improvements in people's living conditions (Forero and Salazar, 1991; Hasan, 1991; Jimenez and Velasquez, 1989; Hardoy and Satterthwaite, 1989).

Another area of concern is the fragmented and often conflicting nature of governmental institutions (White and Whitney, 1992, p.16; McCarney, forthcoming). Sivaramakrishnan and Green (1986) suggest that managerial processes should be emphasized to reduce jurisdictional conflict. Institutional development and improved communication across levels of governments is to be encouraged. Leitmann (1992) cautions that careful attention must also be paid to institutional capacity when designing interventions. Efficiency and equity in the use of technical, human and financial resources in both public and private sectors must be encouraged.

## 2. Ensuring Participatory Planning and Democracy

Several studies argue that environmental management can be improved through participatory planning with all levels of society, particularly at the grassroots (Chi, 1992; Leitmann, 1992; UNCHS,

1990b; Hasan, 1991; Schteingart, 1989). This kind of participatory planning requires more open and democratic forms of government which give rights to citizen groups to lobby and work for environmental change. Democratic structures also remain among the best checks on misallocation of resources by city and municipal governments (Hardoy *et al.*, 1992).

During the past decades, many countries have been moving towards more democratic and accountable governments, which has had more impact on environmental management (Satterthwaite, 1992). Falu and Curutchet (1991) document the significant difference between the concerns of the democratic government of Cordoba and the practices of the military government which fell in 1983. In spite of some deficiencies in planning the democratic government of Argentina is making efforts to rehouse squatters when evicting them from public land, while the military government simply bulldozed the squatters off the land it needed for public works with no compensation and no provision for rehousing.

Payne (1992) suggests that national and international donors must find new ways to support democratization that reflect individual histories and traditions, while at the same time encouraging recipient countries to conform to specific conditions. International agencies and NGOs struggling to design workable methods for community participation face even more difficulty when working in non-democratic societies. Several authors suggest that the concept of democracy should be incorporated into the broader one of sustainable development.

### C. PROMOTING COMMUNITY ORGANIZATIONS, NON-GOVERNMENTAL ORGANIZATIONS AND THE PRIVATE SECTOR

Most studies recommend the involvement of community-based and non-governmental organizations in the environmental management process, which, besides being "participatory," will mobilize more human and financial resources for sustainable development.

When poor people have to rely on their own efforts to improve their living conditions, their efforts often involve collective organization and various forms of action which are part of what is termed "urban social movements." Community-based groups usually organize around specific local issues. Urban social movements are thus defined as having as "their basic aim the improvement of the quality of individual and collective consumption within marginalized social spaces" (Schuurman and Naerssen, 1989, p.2). This could take the form of organizing to demand urban services or land, developing self-help projects or pooling resources. In his study about community groups in Asia, Denis Murphy (1990) identifies a variety of activities, including organizing basic infrastructure, improving neighbourhood living conditions, to staging protests and lobbying governments for change. In many

countries, such community action groups are already filling gaps in urban environmental management which governments are not addressing.<sup>8</sup> Yet, governments are often reluctant to support such community initiatives. As Mike Douglass (1992, p.16) points out:

From a political perspective, the dilemma for holders of power is how to move from their commonly held view that empowering the poor to take greater control over the planning and management of their habitat is a threat to political stability to a realization that the longer-term sustainability of the urban habitat rests on the inclusion of all citizens, especially the poorer ones, into a political and planning process directed towards a simultaneous effort of poverty elimination and sound environmental management.

Community action groups are increasingly being supported by local and international NGOs. As Arif Hasan (1990, p. 82) points out, it is difficult to draw a precise distinction between larger and well-organized community action groups and local NGOs, but generally NGOs work in more than one settlement, while community groups limit themselves to their locality. Relatively few international NGOs work for the urban sector, given the bias for rural development in national and international funding. However, these NGOs have usually worked at the "grassroots level" with considerable success in organizing the poor and effecting change in their living conditions. Many have pioneered new, more participatory, approaches to working with poor or disadvantaged communities, both in solving problems internally and approaching governments in an organized manner (Hardoy *et al.*, 1992; Douglass, 1992, p.31). Conventional NGOs are social welfare-oriented, providing various services for poor communities, while newer NGOs are more involved in "development" or environmental activities. These NGOs work on the understanding that development and environmental management in poor communities can only take place if people are empowered to operate and maintain such activities (Hasan, 1990, p. 83; Clark, 1991, p. 89). The journal *Environment and Urbanization* regularly publishes profiles of NGOs active in the urban sector. SPARC (Society for Promotion of Area Resource Centres) (Bombay), Consumers Association of Penang (Malaysia) and Fedevivienda (Colombia) are some of the NGOs working both with poverty and the urban environment.

NGOs are perceived to have great potential in forming linkages and partnerships among community groups, local governments, international agencies and banks (Smit, Ratta and Nasr, forthcoming). Clark (1991) foresees an extension of NGO activities into international lobbying. In facing the new global challenge, he argues, NGOs must move beyond their "doing" role to an "influencing" role in policy formulation, both at local and international levels.

The private sector is generally perceived to be more efficient than the public sector in managing urban services such as housing, transportation and waste management. Some studies have called for privatization of several governmental activities for greater sustainability. Private enterprises can have

advantages over governmental agencies—lower production costs, more efficiency in service delivery and greater capacity to maintain capital equipment. In Karachi and Calcutta, World Bank studies showed that per passenger costs of bus services run by private companies were less than 40 percent of those of public systems (UNDP, 1991a). In some instances, privatization led to more sustainable ways of providing services, as for example, in Accra, where private waste collectors are reintroducing ass-carts for refuse collection (Amuzu and Leitmann, 1991). In Jakarta, the city government has contracted out some solid waste collection, water treatment services and industrial estate development with good results. However, there are also cautions about privatization. Competitive pricing may take services out of the financial reach of poorer families (UNDP, 1991a). Because of cost-recovery problems, some services such as drainage and street lighting may not be attractive to private companies and may not be provided in infrastructure projects (Hardoy *et al.*, 1992).

## B. GENDER ANALYSIS IN POLICY AND PLANNING

In most Third World countries, women and men have definite and different roles in society, production and the economy. As Diana Lee-Smith and Ann Schlyter (1991, p. 3) point out, the world-wide division of labour by gender is certainly not uniform, but generally women predominate in the management of subsistence. In Third World countries this involves direct and constant contact with the environment through the use and managing of resources (food, fuel, and water).

In view of this fact, several writers have called for an examination of development policies and strategies in order to ascertain their impact on women, their work, and their working and living environment. They have also stressed the importance of integration of gender issues and environment in development. Pamela Sayne (1991, p. 46) stresses that the "analysis of urban sustainability—and the interface between urbanization and the environment—badly needs a gender analysis to make it complete. Women are an important resource base in the struggle to achieve sustainable development." Unless women's knowledge and skills are understood and invested in, she argues, sustainable development cannot be achieved.

In the growing literature regarding women, environment and development, three main issues are commonly addressed:

1. How women are affected by environmental degradation and lack of services
2. How urban policies, especially planning for infrastructure and housing, impact on women and their work
3. Women's creative roles as community organizers

### 1. Environmental Degradation and Lack of Services

In much of the Third World, women are solely responsible for collecting fuel, fodder and water as primary sustainers of society. Depletion and destruction of these resources have made these tasks increasingly difficult in recent years. Women and children have to spend extraordinary amounts of time scavenging for fuel, fodder and water (Brinda Rao, 1991; Shiva, 1988; Centre of Science and Environment, 1989). When urban authorities fail to provide water supply, sanitation and refuse collection to low-income urban areas, women have to make up for the lack of such services (Lee-Smith and Trujillo, 1992, p. 79). Industrial pollution, poor services, human waste pollution, fumes from household fuel, all impact on poor women (Dankelman and Davidson, 1988). Moreover, urban authorities often make women's subsistence work, such as wood-fuel collection and urban food production illegal, forcing women into increasing hardships and illegal activities (Lee-Smith and Trujillo, 1992, p. 79). Women's traditional roles as managers, maintainers and rehabilitators of the environment need to be understood and tapped into (Moser, Dennis and Castleton, 1991; Lee-Smith and Trujillo, 1992).

### 2. Impact of Urban Policies

The issues of gender and of the environment cut across the established sectoral divisions; authors stress that all sectors and institutions must take note of the implications of their actions for the environment and for meeting women's needs (Levy, 1991). Several authors cite studies which show how urban planning and policies impact negatively on women as they strive to provide their families with basic sustenance. Yomi Oruwari's (1991) study of married women traders working out of their homes in Port Harcourt in Nigeria shows that they provide more economic support to their households than do the male household heads. For poor women, house and neighbourhood are central to economic survival, yet zoning regulations usually prevent income generating activities within residential areas, resulting in particular problems for women (Oruwari, 1991; Moser, Dennis and Castleton, 1991; Schlyter, 1990). Winnie Mitullah (1991) cites the example of women hawkers in Nairobi, who fulfil a vital need in the city's informal sector, but are constantly harassed by city authorities. Present efforts to support and promote the informal sector in Kenya concentrate on artisans (who are men) while traders (who are mostly women) continue to be harassed by public authorities. Both studies call for an enabling environment for women traders who are providing a valuable service at no cost to the city government. A study of women waste pickers in Bangalore illustrates their vulnerability in tapping resources and points to way in which their work can be improved (Huysman, forthcoming, 1994).

Other authors give examples of social housing projects and human settlement planning which do not take women's special needs into concerns, even when a large proportion of the beneficiaries are female-headed households<sup>9</sup> (Moser and Peake, 1987; UNCHS, 1985). In a squatter resettlement project in Cordoba, Argentina there were unrealistic assumptions about the "free time" that women could contribute to self-help in building their homes (Falu and Curutchet, 1991, p.34). Moser is quoted in *Our Common Future* as pointing out that housing projects often ignore the special design needs of women, for example grid-iron layouts do not allow women to keep an eye on their own and their neighbours' children (WCED, 1987, p. 257). Moser and Peake (1987) suggest that difficulties women face in acquiring housing are likely to increase with the costs of structural adjustment, not only in terms of reduced government commitment to housing, but also because of the tensions these costs impose on households. According to some writers, women's socio-economic status actually worsened during the UN decade for women, largely due to development strategies (Sen and Grown, 1987). Moser and Peake (1987) give some practical illustrations of what interventions may or may not be successful.

### 3. Women's Role as Community Organizers

As a result of the economic crisis in the Third World cities, women have to compensate for rising costs of food and shelter and cuts in public service. Apart from their traditional domestic and community obligations, women are also taking on additional community tasks such as the creation of communal kitchens, community stores and improvement or creation of facilities, all as unpaid labour (Falu and Curutchet, 1991, p. 25). In Lima alone, in 1989 there were 3000 communal kitchens, each with an average of 50 female members; a further 100,000 women were organized into 7000 "glass of milk" committees to distribute a glass of milk to children from low-income areas (Barrig, 1991, p. 67).

### C. NORMS FOR INTERNATIONAL ASSISTANCE/CO-OPERATION

Stren (1992, p. 3) emphasizes that "the major regions of the world are inextricably linked in a collective effort to find sustainable approaches to future growth." Several studies point to the need for fundamental changes in international relations and North/South cooperation, trade and assistance mechanisms.

White and Whitney (1992, pp. 8-11) sum up the current links between North and South and describe the negative impacts of these links on the poorer countries:

Although the direct control exercised under the colonial system has disappeared, indirect control and appropriation of Third World carrying capacity continues under conditions of unequal terms of trade, the net flow of capital from the LDCs to the MDCs, multinational corporations, and indebtedness. Moreover, the overseas migration "safety valve" that was permitted to the MDCs [more developed countries] in their early development is no longer available to LDCs [less developed countries] aspiring to increase their per capita incomes. . . . They are also connected by the diminution of the trickle of "aid" which is offered as a partial compensation for the unequal terms of exchange which characterize international relations.

Other writers have also pointed out that for most of the countries in the South, the past decade has been characterized by declining commodity prices, a rising international debt burden, increasing trade barriers inhibiting market access for their goods, and a resulting deterioration in their terms of trade (McCarney, 1992, p. 7; Hardoy *et al.*, 1992; French, 1993; Korten, 1992). Many argue that transition to a sustainable development path will not occur until reforms in the international economic order are made (WCED, 1987, p. 79; McCarney, 1992, pp. 7, 8). It is yet to be seen how the terms of the General Agreement on Tariffs and Trade will help the developing countries. For many of them, trade practices determine the scale and character of resource exploitation and use (WCED, 1987, p. 79). Developing countries face the dilemma of having to use commodities as exports, while also having to minimize damage to the environmental resource bases supporting this growth (WCED, 1987, p. 79).

Many authors also have expressed concern about the flourishing trade in hazardous waste, with developed countries dumping their toxic waste in developing countries at a fraction of the cost of disposal in the North (WCED, 1987; French, 1993, p. 165). Another concern is that as more and more Northern industries are relocating in the South to take advantage of cheap labour and lax environmental controls, poorer countries will keep environmental standards deliberately low in order to attract foreign investment (French, 1987, p. 166; Korten, 1992, p. 173).

The other area of concern is international aid. Although most aid agencies and national departments of international assistance say that their priority is to address poverty, recently much aid has been diverted to issues such as asylum seekers. Furthermore, very few aid agencies give attention to urban environmental problems (WCED, 1987; Korten, 1992). It is also rare for donor agencies to support projects or programmes to build urban governmental institutional capacity so that they can identify and act on environmental problems (Hardoy *et al.*, 1992). Third World governments need more technical and financial assistance to strengthen their local governments and part of the increased aid should go directly to community groups, as they are generally more successful in reaching the poorest urban residents (WCED, 1987, p. 256).

Authors recommend that in order to achieve global sustainability, the linkages between the North and South have to be based on fairness and equity. They call for a new code of environmental ethics where the needs of people are put before capital formation and lead to a much-needed change in global value systems (Hardoy *et al.*, 1992; Lee-Smith and Trujillo, 1992). The North needs to reduce consumption of the vast quantities of the world's non-renewable resources and to change policies that have harmful effects on the Third World (Conroy and Litvinoff, 1988; Korten, 1992). Also, as Stren (1992, p. 6) points out, "it is not enough for Western countries to convince developing countries not to raid their own natural environments the way the North has done, but they will also have to be prepared to transfer resources generously to prevent this from happening." Herman Daly and John Cobb (1989) argue further that the North has to relinquish its monopolistic control of technology and reduce its dependence on the South's ecological resources for sustainable patterns of growth. Aside from the "global" perspective, however, the focus in aid discussions is on more appropriate technology transfer; affordability; cost-recovery; and resolving tensions among donor agencies, national governments and local communities (Cairncross, 1992).

## V. IDENTIFYING AREAS FOR FURTHER RESEARCH

In previous decades, cities were considered privileged, as urban populations have higher average earnings, more services and better health in general. National and international funding and research tended to be on rural research and development; urban research actually declined in the 1980s. Now the extent of urban poverty is recognized; congestion in cities, growth without infrastructure, and pollution from industries and vehicles are seen as resulting in health risks to vulnerable groups as great as rural poverty.

The 1990s have brought many calls for systematic urban research to make up for previous neglect, but there are so far few substantial studies of sustainable urban development. Most writings are essentially descriptive and proscriptive. The differences in ideological orientation of 1970s and 1980s (e.g., the "Dependency school" vs. the "grassrooters") which influenced so much earlier discussion of urban development are not prominent now. Macro perspectives are giving way to more empirical analysis, and to practical recommendations for urban management. Diversity and flexibility are stressed in approaches to solutions. But ideological differences do still emerge, as, for instance, in the debate on privatisation of urban services (Roth, 1987).

Several writers have stressed the difficulty of developing sustainable strategies in the absence of empirical research and statistical databases. The current lack of adequate data about urban populations and their environmental problems makes it difficult confidently to recommend

interventions. Mitlin (1992, p. 111) finds that there is little agreement as to the causes of the present dearth of sustainable development policies and little analysis of the low commitment of governments and individuals. There is also a lack of research about the trade-offs between benefits of development projects and possible negative effects on the environment and economy.

Most of the specific writings on urban needs are still sectoral. Cross-sectoral studies are essential for more holistic analyses and understanding of the urban environment. Furthermore, as Hardoy, Mitlin and Satterthwaite (1992, p. 206) point out, most of the literature is about a handful of large cities—typically Mexico City, Sao Paulo, Lagos, Bangkok, Cairo, Jakarta, Bombay, Delhi and Karachi—and generalizations about environmental problems are derived from these. Yet only a small proportion of the developing world's urban population lives in these megacities. Improved services and governance are needed in all the urban areas; secondary and smaller urban centres, which often have different types of environmental problems, need to be studied as well (Hardoy, Cairncross and Satterthwaite, 1990). The great diversity among Southern country cities means that priorities in research and development for sustainability will vary and researchers and planners must be alert to the limitations of generalizations.

The literature is dominated by a handful of writers, mostly from the West. The points of view of research from the South need to be represented in international publication. Writers from the South tend to write about their own primate cities; very few integrate other findings. Evaluations of sustainable development projects are needed, with discussions of the potential for replicability across regions.

The "carrying capacity" of cities, and the ways that large urban centres draw resources from elsewhere ("appropriation of carrying capacity") is an emerging field of work.<sup>10</sup> One of the very few urban studies which utilizes the Northern concept of "carrying capacity" is a paper by Sudharto P. Hadi (1993) which examines social carrying capabilities in an urban industrial community in Central Java. Urban-rural linkages in environmental degradation need to be researched in detail.

Two international projects recently launched in Canada have invited Third World specialists to examine the state of urban research in their regions, to identify gaps in research areas and to develop new research agendas. The first is the Ford Foundation project "Urban Research in the Developing World" which is being co-ordinated at the University of Toronto by the Centre for Urban and Community Studies. The other is the Urban Environment Management or URB program, conducted by the Environment and Natural Resources Division of the IDRC and concentrating on specific environmental issues. Both projects have generated a number of papers through workshops.

Stren and McCarney (1992) identify common emerging research foci as: urban poverty, urban social movements, the urban environment, governance, urban employment and management. They also list some of the areas in which information is lacking: the role of key agencies in city governments; the role of subsidies in urban growth; how the poor and disadvantaged are coping with privatization of services and how they are affected by decentralization of the state and strengthening of local governments; the role of women and children in the informal sector.

Finally, there is now scientific research on specific urban environmental problems, such as air and water pollution, cities' contributions to "greenhouse gases," and toxic waste treatment (ENSIC, 1992). Citizens' groups are pressing for research on issues of wetlands, green space, and wildlife habitat. New research tools for data collection are being developed, such as geographic information systems (GIS). As the scientific work increases, it will need to be integrated with the social perspectives emphasized in this discussion of sustainability for cities of the developing countries.

The current discussions of urban sustainability in developing countries focus on the needs of the poor and disadvantaged. If research is conducted on the many topics mentioned above, the perspective will broaden so that the issues of urban sustainability are understood in a more analytical and comprehensive manner.

## NOTES

1. The terms South, Third World and developing countries all refer to countries of Africa, Asia and Latin America. The term North refers to North America, Europe, Japan, Australia and New Zealand.
2. Agenda 21, one of the documents emerging from the Summit contains sections on urban health, human settlements management, environmental infrastructure, waste management and political structures, which deal specifically with strategies for sustainable development in Third World cities.
3. However, it is important to note that rapid urban growth in itself need not produce serious environmental problems, as is evidenced by the case of Curitiba, Brazil (see Rabinovitch, 1992).
4. In Bombay, if present trends continue, by the year 2000, 75 percent of the population will be living in slums (Centre for Science and the Environment, 1989). In Zambia, 75 percent, and in Mexico, 65 percent of the urban population live in informal or spontaneous settlements lacking basic municipal services (Schlyter, 1987; Schteingart, 1989).
5. In Delhi, for example, 223,600 tons of firewood were brought by rail from the forests of Madhya Pradesh some 700 kilometres away. Official statistics state that firewood production in the state has overtaken timber production with serious ecological implications (Centre of Science and the Environment, 1989, p. 9).
6. In Calcutta, vegetable farms were developed on refuse dumps and fish farms are fed by sewers and storm drains (Furedy, 1990c). In Mexico City, wastewater is used to irrigate 100,000 hectares for growing livestock feed (Smit and Nasr, 1992).
7. The planning process being developed by the UMP emphasizes the importance of having a long-term urban environmental management strategy (EMS) that will guide the routine development of short- and medium- term urban environmental action plan (EAP) and investment priorities (Leitman, Bartone and Bernstein, 1992, p. 137).
8. See Agarwal, d'Monte and Samarth (1987) for a description of urban and rural community groups in India organizing to struggle against environmental threats to their health or livelihoods.
9. It is estimated that today one third of the world's households are headed by women, while in urban areas, specially in Latin America and part of Africa, the figure reaches 50 percent or more (Moser, 1985).
10. "Carrying capacity" is defined as the population that can be supported indefinitely in a given habitat without permanently damaging the ecosystem it is dependent on (Rees, 1992). A wealthy city can greatly exceed the ecological carrying capacity of its region, as natural resources are imported from distant regions or from other nations.

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## MAJOR CONFERENCES AND COLLOQUIA

Colloquium on "Human Settlements and Sustainable Development," held in Toronto in June 1990. The papers from this colloquium were published in *Sustainable Cities: Urbanization and the Environment in International Perspective*, edited by Richard E. Stren, Rodney White, and Joseph Whitney (Boulder, San Francisco, Oxford: Westview Press, 1992). The major portion of the book addresses urban sustainability in the Third World and includes policy proposals for increased sustainability in different regions.

"Sustainable Development Conference," 28-30 April 1987 (London: International Institute for Environment and Development, 1987). Unpublished papers include case studies on sanitation, co-operative movements, upgrading and community development in several Third World human settlements (published in *The Greening of Aid*, 1988).

International workshop on "Planning for Sustainable Urban Development: Cities and Natural Resource Systems in Developing Countries" in July 1992 at the University of Wales, Cardiff. Over 30 papers were presented on different aspects of urban environmental problems. Papers can be ordered from Dr. Carole Rakodi, Department of City and Regional Planning, University of Wales, P.O. Box 96, Cardiff CF1 3YN, U.K.

"Cities and Sustainable Development," a core meeting of Global Forum '94, Manchester, June 24-July 3, 1994. Workshops on basic needs and poverty reduction, livelihoods, resource use, finance, governance, health and transport and communications. Forum office: P.O. Box 532, Town Hall, Manchester M60 2LA, U.K.

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Kumarian Press, 630 Oakwood Avenue, Suite 119, West Hartford, CT 06110-1529, U.S.A.

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United Nations Centre for Regional Development, Nagono 1-47-1, Nakamura-ku, Nagoya 450, Japan.

United Nations Environment Programme, 2 UN Plaza, UNDC 2 Bldg., Room 0803, New York, NY 10017, U.S.A.

World Bank Publications, 1818 H Street N.W., Washington, DC 20433, U.S.A.

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