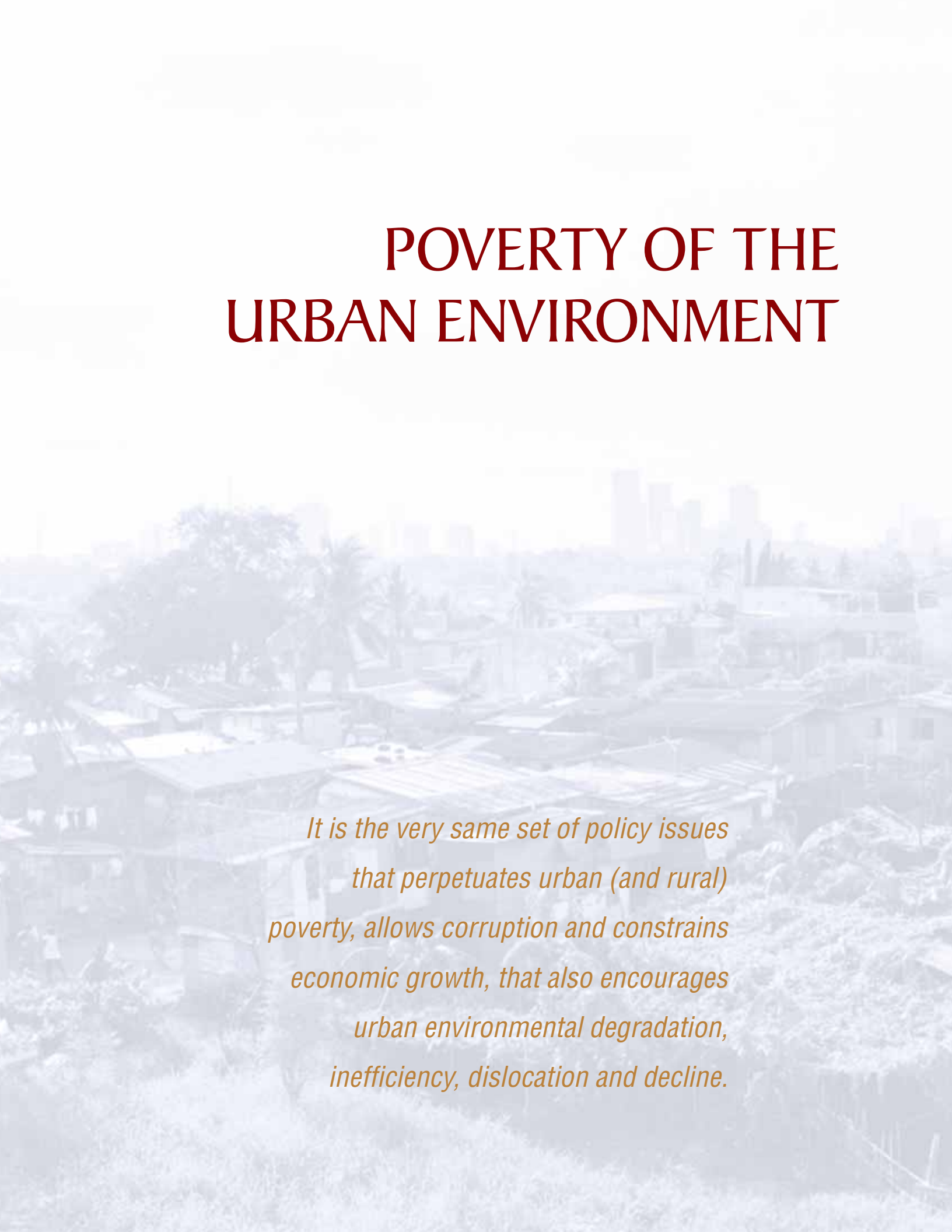
POVERTY OF THE URBAN ENVIRONMENT



It is the very same set of policy issues that perpetuates urban (and rural) poverty, allows corruption and constrains economic growth, that also encourages urban environmental degradation, inefficiency, dislocation and decline.

The Challenge

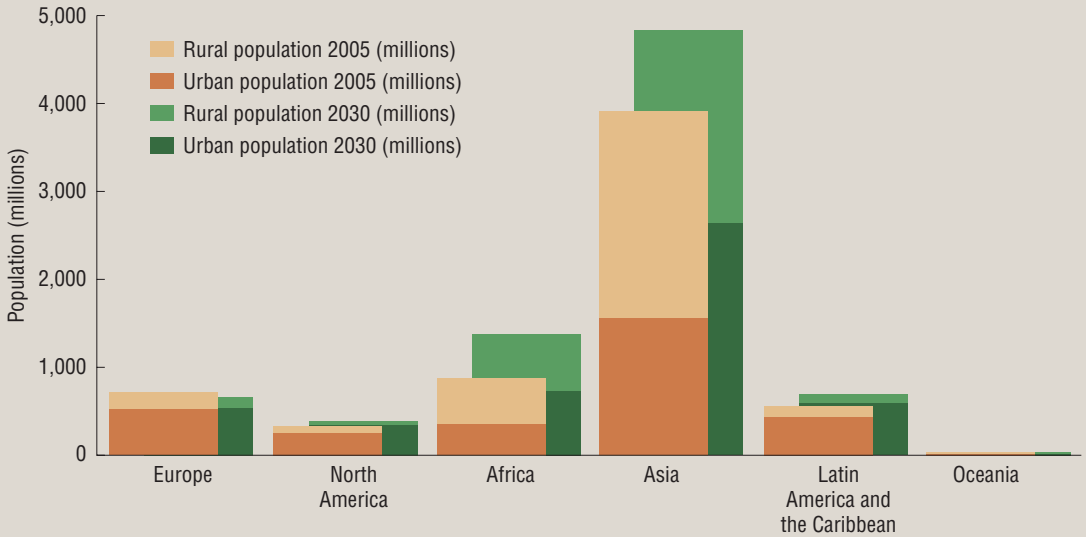
The demographic changes expected over the next decades have been well rehearsed. Each year more than 60 million people are added to the global urban population. In the next 25 years, the world's urban areas will grow by an estimated 1.8 billion people. Almost all this growth will occur in the developing world. How this urban expansion takes place has extremely significant implications, both for efforts to reduce the negative impacts on health and the built environment, and for efforts to safeguard the natural resource base.

Urban areas depend on environmental services for their survival. Urban dwellers draw from the surrounding areas for the water they drink, the air they breathe, the energy they use, and the food they eat. Yet, these urban dwellers pose a threat to these very common goods, particularly through pollution, greenhouse gas emissions, deforestation, and depletion of water resources. Rapid urbanization in developing countries has resulted in dramatic environmental deterioration, severely affecting the growing numbers of urban poor, with the impact on water being most acute.

Latin America has very high levels of urbanization, but the region is still managing the consequences of a largely unplanned transition and decades of poor governance preceding democratization. However, the most significant shifts yet in the global urban landscape are under way in: (i) Sub-Saharan Africa, which has recently been described by the United Nations Environment Programme (UNEP) as a region under environmental assault,[1] where most of the urban transition is still to occur; and (ii) Asia, which already has the largest numbers of people in slums.

Governments and cities have a unique, yet limited, opportunity to learn from mistakes elsewhere

RURAL AND URBAN POPULATION BY REGION IN 2005 AND 2030



Source: United Nations, World Urbanization Prospects: The 2003 Revision.

and to avoid the costly consequences of failing to adequately plan for an increasingly urban future. By embracing the positive impacts of urbanization, governments have the opportunity to spur economic growth, avoid social attrition, and prevent social conflict, widespread urban degradation, and human misery.

Yet, for a variety of reasons, neither policy frameworks nor infrastructural investments have kept up with urban growth and the pressure on environmental services in the developing world. The most essential and difficult decisions are not being made; consequently, the really important choices—those with long-term consequences—are being made by default. These choices are, almost invariably, the wrong ones.

At the beginning of the 21st century, more than two centuries after Charles Dickens railed against the conditions of the poor in London's slums, the majority of the world's towns and cities have no sewerage. Globally, two-thirds of the sewage from urban areas is sent untreated into lakes, rivers, and coastal waters. Each year more than 450 cubic kilometres of wastewater is dumped into streams and rivers that are in many cases the source of urban potable water, and hundreds of thousands of urban dwellers die each year from diseases attributable to unsafe water or inadequate sanitation. Less than a third of municipal solid waste is properly handled or disposed of. According to the World Health Organization (WHO), 3 million people die annually as a result of outdoor air pollution from vehicles and industrial emissions; 1.6 million, as a result of indoor pollution from the use of solid fuel, mostly in developing countries.

Millions of children cross streams of raw sewage daily, in many cases right at their own front door. Because millions of poor people, mainly women and girls, have only sporadic or no formal access to potable water, obtaining it is a time-consuming and, ultimately, inefficient pursuit. Diarrhoea is the second most common cause of under-five mortality, accounting for some 1.3 million deaths annually.

UNEP / Siu Woon-Ying

Environmental pollution from heavy industrial waste in Yangzhou, China.

These urban environmental issues are among the most pressing problems facing developing cities today. Urban environmental degradation is human degradation; it is not an issue that can be resolved by technological innovation alone. The poverty of the urban environment is not a marginal issue:

BOX 1. LINKING POVERTY AND ENVIRONMENT IN HYDERABAD, INDIA

With a population of over 5 million, Hyderabad, India, is beset with severe environmental problems. Water and air pollution and poor sanitation take a heavy toll on the quality of life of city residents, impacting the urban poor most severely. It is estimated that Hyderabad's urban poor constitute 30–35 percent of the population, with many living in slums along polluted water courses and drainage ways.

The linkages between urban growth, development, environment, and poverty were examined in a case study in 2001, which concluded that "there are clear indications that environmental conditions; lack of safe drinking water, sanitation, air and water pollution, etc., adversely affect the living conditions of the poor through impacts on health. The burdens of disease and disability lead to loss of man–days and income, and to higher health care and medical costs for the poor. Thus, investments in environmental infrastructure are warranted on grounds of improving productivity of the poor apart from providing basic conditions for economic growth and job creation. Strategies of poverty alleviation . . . need to consider investments in basic civic infrastructure . . . as important instruments for poverty alleviation."[a]

[a] "Cities Databook: Urban Indicators for Managing Cities," CD-ROM version, Manila, Asian Development Bank, 2001.

Mark Edwards / Still Pictures

Slum housing crowding a canal in Mumbai, India.

there is a clear and consistent relationship between weak systems of governance, corruption, urban poverty, and a degraded urban environment.

The City as the Solution?

Cities occupy just 2 percent of the Earth's surface, yet their inhabitants already consume 75 percent of the planet's natural resources for goods and services, and 80 percent of global carbon dioxide emissions originate in towns and cities. Although it has become conventional wisdom for some that cities are threats to both the global and the local environment, the world's urban areas may actually offer the best hope for a sustainable future. Urban areas will certainly be the most significant sites of the struggle. As Achim Steiner, UNEP's newly appointed executive director has noted, "The quest for sustainability will be increasingly won or lost in our urban areas.[2] It is imperative, therefore, to view cities—and the mayors who run them—as essential allies in the struggle against urban environmental decay and poverty, not as their cause."

Cities are already the world's economic engines, accounting for almost 80 percent of total economic growth. Cities are also proven poverty fighters. Urban dwellers have higher incomes than their rural counterparts and consume less energy per unit

of economic output. Cities provide formal and informal businesses with the benefits of agglomeration, saving costs by sharing markets and services. As centres of wealth generation, well-run and empowered cities can generate vast amounts of financial capital that can be used to reduce poverty and improve the quality of life for urban dwellers.

However, too many national government developmental and environmental policy frameworks have not kept pace with demographic shifts or with facts on the ground. Indeed, development agencies and governments alike need to move beyond the tired, sterile juxtaposition of rural and urban poverty and promote a developmental paradigm that assists the poor on the basis of their poverty—and their latent ability to actively contribute to economic growth—rather than on the basis of their location.

Far greater attention needs to be paid to the contribution that urban growth can make to the reduction of rural poverty, whether by expanding markets, stimulating agricultural productivity and rural incomes, or providing new opportunities for employment and remittances.[3]

It is at the city level that the limitations of sectoral and project-based approaches to growth and development are exposed and the links between weak governance, poor policy choices, urban poverty, and urban environmental degradation become inseparable. Indeed, the city is precisely where the issue of the urban environment becomes—or should become—a core issue of urban management and not, as development practice has long indicated, a peripheral add-on.

The very same set of policy issues that perpetuates urban (and rural) poverty, allows corruption, and constrains economic growth also encourages urban environmental degradation, inefficiency, dislocation, and decline**.** Many of these policies stem from an indifferent, often hostile, attitude to the urban poor, whether codified in legislation or merely enforced through administrative practice.

The immediate policy challenge therefore is first to place the urban environment high on every city's agenda and for them to design development strategies that target the linkages between urban poverty, urban environmental degradation, and poor policy frameworks. A central part of the solution will include policies that take the urban poor into consideration and treat them as citizens, as an economic resource, and as willing contributors to the creation and protection of an improved urban environment.

Among the most pressing issues requiring political leadership and vision, especially in sub-Saharan Africa and south and southeast Asia, is getting public authorities to take immediate steps to prevent the next generation of slums. For a policy issue of such pressing economic, social, and environmental importance, it is truly remarkable how it continues to receive such scant attention. National and local policy makers and international development agen-

A.Appelbee / UNEP / Still Pictures

Awaiting the prevention of the next generation of slums in Manila, the Philippines.

cies alike need to respond to this urgent issue immediately, as the developing world has only a small and rapidly diminishing window of opportunity.

Consider the current situation:

- In the next two or three decades, the world will undergo the greatest and fastest demographic population shift in its history;
- This shift will take place almost exclusively in the poorest countries of the world;
- Few local and national governments have done anything to prepare for urban population growth; and,
- On the contrary, most governments have been in denial about urban growth, resulting in a refusal to plan or prepare for orderly urban expansion.

As a consequence, urban expansion has taken place, and continues to take place, on sensitive land that should be left undisturbed, along rivers or canals, in protected areas, on marginal and dangerous land, and on watersheds needed for supplying water to critical reservoirs. Newly built up areas now lack adequate roads or water, sufficient land for public facilities, or green spaces to act as the city's lungs.

If the current policy frameworks in most developing countries remain unchanged, future urban growth—increasingly as a result of natural urban population growth, rather than of rural–urban migration[4]—will continue to take place in areas of lower density, on marginal and dangerous sites, or on the urban periphery, often beyond municipal jurisdiction. The degradation of the urban environment will increase exponentially.

In summary, the absence of even minimal preparation for an urban expansion that is as certain as it is unstoppable, is inefficient, inequitable, and unsustainable and will certainly impose huge economic and environmental costs on those societies and children that can least afford them. Different policy decisions are urgently required.

This urban growth has often been popularized as the creation of one new city per day (or per week). This may be good for headlines and for presentations, but it is far removed from reality. Few, if any, cities will be completely new: most urban growth will take the form of increased densities in existing urban areas—or more likely in existing slums—and

Cities Alliance

Refuse heaps along the banks of the Mukuru canal, Nairobi, Kenya.

through the addition of new slums and the conversion of the urban periphery into slums.

If current policies remain, this new urban expansion will take place without:

- formal water supply,
- adequate sanitation,
- waste collection,
- sustainable energy,
- good governance,
- planning, and
- permission.

But it will take place.

Time to Choose

It should be clear that there is an urgent need to establish long-term policies and legislative frameworks predicated on an urban future and the protection of the urban environment. These would include policies to actively plan for urban growth; to maximize the positive impacts of urbanization; to reduce the environmental footprint of cities through sustainable energy, transport, and other environmental measures; to empower cities and their mayors; and to optimize opportunities for all citizens, present and future.

From the standpoint of local governance, higher density urban growth provides an opportunity to develop concentrated, efficient infrastructure. Water, sewage, drainage, and transportation systems can be developed in dense urban areas at a much lower cost per capita than in lower density rural or urban-sprawl areas. It is far less costly to avoid environmental degradation than to live with its consequences or to repair its damage, just as anticipating urban growth and preventing slums are infinitely more efficient than belatedly dealing with the damage to humans and the urban environment 20 or 30 years later, as is still common practice.

UNEP

Environmental degradation in one of Mumbai's slums.

However, city leaders often resist making long-term political and financial investments, whether in making land available for low-income settlement, providing urban green space, or ensuring citywide sewage treatment. Such investments do not fit into the short-term political imperatives that often drive the development agenda. More importantly, many cities have neither the revenue streams to finance these capital investments nor the comfort of stable intergovernmental transfers to plan for the medium and long term.

Environmental resources should, therefore, be viewed as long-term assets, vital to a city's future. A truly complete urban accounting would recognize and value the natural capital that is essential to the city and its residents' well-being. Forests, water-

sheds, wetlands, vacant land, mineral resources, and other natural resources all have a value that the city should recognize and incorporate into its balance sheet and, ultimately, account for.

Furthermore, the environmental costs of a decision, such as a reduction in ambient air quality, the loss of biodiversity, the impact on children's health, or the diminution in public health from increased pollution, are usually never costed or factored into decision making. Similarly, industry often does not include the costs of pollution in the costs of production. Instead, it shifts those costs to the general public in the form of respiratory illness, disease, and environmental degradation. However, those cities that have successfully implemented the rule that *the polluter pays* have improved their environment and the quality of life of their citizens, while the most polluted or degraded cities show a high correlation with the weakest governance and administrative capacity.

Establishing metrics and incentives for cities to develop sustainably must become part of a comprehensive plan. To help their cities prepare for a sustainable future, urban leaders need to articulate a sustainable urban vision. They cannot develop that vision simply through a top-down process and announce it to the public. Sustainability requires a fundamental transformation in attitude and behaviour at the personal level, as well as at the governmental level. Developing the vision and strategic plan to accomplish it, therefore, must be a community-based process that involves all stakeholders—local governments alone cannot transform a city.[5]

BOX 2. ENVIRONMENTAL PLANNING IN CURITIBA, BRAZIL

Curitiba is the capital of Paraná State, Brazil. Its population has doubled to 1.6 million over the past 30 years. Curitiba is more than a city with a number of exceptional projects. The key to its success is the cohesive strategy—with a focus on improving life for residents and on integrated planning—that underpins all its projects. Specific goals are social inclusion, accessibility, public amenities, urban transparency, efficiency, and environmental sustainability for the city and the metropolitan area. A unique aspect of Curitiba's strategy is how it maximizes the efficiency and productivity of transportation, land-use planning, and housing development by integrating them so they support one another in improving residents' quality of life.

The results

Curitiba has high rates of recycling: 70 percent of the city's trash. Residents who live in shanty towns get free groceries and bus tickets in exchange for their bags of garbage. They have access to social programmes and health services funded by recycling programmes, a model transit system, and large amounts of green space (nearly one-fifth of the city is parkland, with, on average, 52 square metres of green space per person and 1.5 millions trees planted by volunteers along the streets). Per capita income is 66 percent higher than the Brazilian average. The city's 30-year economic growth rate is 7.1 percent, significantly higher than the national average of 4.2 percent. Transportation and land-use planning are but two examples that reflect the city's people-first strategy and the benefits of integrated urban planning and systemwide sustainability. More than 2 million people a day use Curitiba's inexpensive and speedy transit service. Although the city has more car owners per capita than anywhere else in Brazil, car traffic has declined by 30 percent, and atmospheric pollution is the lowest in the country. Downtown areas have been transformed into pedestrian venues, including a 24-hour mall with shops, restaurants, cafes, and a street of flowers tended by street children. This vibrant pedestrian zone encourages tourism, which generated $280 million in 1994, 4 percent of the city's net income.

Building a Sustainable City

The city development strategy (CDS) supported by the Cities Alliance provides a methodology for mayors, business leaders, and citizens to develop a sustainable vision for their cities and a strategy for achieving it. So far, however, comprehensive approaches to environmental sustainability are not yet mainstream in many CDSs; nor is the environmental sustainability linked to economic growth, poverty reduction, and the other urban challenges to be met by a well-executed CDS. Given the challenges of urban poverty, the growth of slums, rising energy costs, the vulnerability of freshwater sources, and urban sprawl and related mobility costs, as well as the increased frequency of natural hazards in many cities, environment and energy considerations should become part of the core CDS process.[6]

A CDS is a powerful tool mayors can use to bring together the knowledge, information, and expertise they need to sustainably develop their cities. By integrating environmental issues into policy documents such as the CDS or poverty-reduction strategy papers, local governments can ensure that environmental issues are included in local and national development strategies.[7] Planners in different parts of the world have used a variety of tools to identify environmental actions within CDS-like overall plans, such as ecoCity planning, Strategic Environmental Assessment (SEA), and integrated development planning. Such strategies can inspire and motivate constituencies and create

BOX 3. REDUCING INDUSTRIAL POLLUTION IN CUBATÃO, BRAZIL

The city of Cubatão, in São Paulo State, Brazil, has demonstrated the success of the community activism approach. In the 1970s, Cubatão was known as the "valley of death" because of the extensive pollution from unregulated industrial development. Pollution control in industrial plants was virtually unknown. Instead, industry shifted the costs of its pollution onto the general public. The poor, who lived among the toxic-waste dumps, bore the brunt of these costs in the form of sickness and disease.

In a model of community activism, the city's urban poor and others organized a citizen's association of victims of pollution and bad living conditions and brought public attention to this travesty. In 1983, the state environmental protection agency took action to correct the situation. It passed new regulations that required the industrial polluters to absorb the costs of pollution control and, in less than 10 years, these new regulations resulted in dramatically reduced pollution levels.

BOX 4. SUSTAINABLE URBAN DEVELOPMENT IN PENANG, MALAYSIA

In the late 1990s, government leaders in Penang were concerned about the growing pollution of rivers and nearshore waters, the deterioration in air quality from industry and automobiles, and the environmental impacts of rapid development. In response to these environmental threats, Penang leaders realized they needed to raise public awareness of sustainability issues and involve the community in the planning process. They began by creating the Sustainable Penang initiative, modelling a sustainable community indicators programme after the successful Sustainable Seattle project.

The Penang leaders convened public forums and discussion roundtables around the island so that citizens could discuss ecological sustainability, economic productivity, social justice, and cultural vibrancy. Participants identified sustainability indicators that could be used to monitor the environmental quality and sustainability of their island, and new citizens' groups were formed to promote water conservation, recycling, and the use of public transportation.

As a result of this grassroots initiative, government, civil society, and the Penang business community formed partnerships to tackle environmental problems and develop a more sustainable strategic development plan for the island.

hope within communities. The action plans that emerge from the CDS process can serve as a framework to guide and direct all future city investments and donor contributions to improve the quality of life for all citizens.

The adoption of a vision for the city and the establishment of a CDS should lay the groundwork for the development of a more sustainable approach to city management. The CDS should particularly address the interrelationships in city operations between land-use planning, transportation, energy, resource management, and economic development.

Land-use decisions affect the efficiency of transportation systems, infrastructure design, energy systems, municipal service delivery, and economic development patterns. Many cities, such as Brasilia, adopted land-use policies that mistakenly limited urban density, on the assumption that density is bad *per se*. This approach escalated the cost of inner-city housing and drove the urban poor to the outskirts of the city without adequate services or infrastructure, a model that cities continue to replicate throughout the developing world.

A fundamental flaw of many urban development patterns is that they encourage use of private cars, rather than emphasizing transport nodes with high-speed public transport, or running campaigns to promote cyclists and pedestrians. These development patterns sacrifice green space and pedestrian areas for parking and spatially separated urban functions. Highway construction and roadway maintenance costs strangle city budgets, and urban air pollution is emerging as a key threat to health, the environment, the economy, and the quality of life. To address the issue, it is essential to integrate spatial and transport planning.

Vehicle emissions also contribute to global warming, often described as the single most important threat to our planet. Climate change will cause sea levels to rise; increase the incidence of extreme weather, such as floods, droughts, and storms; and facilitate the spread of disease. All of these have the capacity to exact a huge toll on a city's basic services, infrastructure, housing, human livelihoods, and health. In addition, the urban sprawl that results from designing the city around the car requires the inefficient and costly expansion of the city's entire infrastructure, ignoring the public transport systems that can provide mobility to the middle classes and the urban poor

BOX 5. BALANCING THE URBAN ENVIRONMENT IN MARIKINA CITY, PHILIPPINES

Marikina City is part of the national capital region of Metro Manila, in the Philippines. With a population of some 400,000, Marikina has used the CDS process and the *urban karte* as a tool for "understanding present conditions and trends, identifying issues and problems, and measuring existing urban policy and achievements, in order to guide future development goals and strategies".

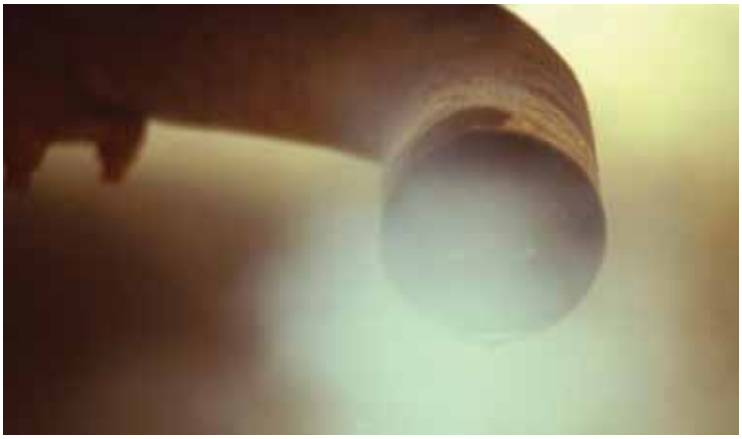
As part of its CDS, Marikina City has prioritized a balanced urban environment, which it defines as a good blend of urbanization and a healthy environment. Strategies to achieve this started with a zero-tolerance response to illegal encroachment on public space and sidewalks, targeting transgressors from all economic classes.

- The city relocated thousands of low-income settlements from along the river and created a bicycle path in their place;
- Expansion of green areas continues, with the city planting 1,000 trees every month;
- The city has focused on a comprehensive waste-segregation programme, underscored by a large-scale education and information campaign.

alike. Sprawl necessitates the expansion of water systems, sewer lines, drainage culverts, and electricity networks, at an extremely high cost per capita.

Although cities are large consumers of electrical power, demand-side management of electricity can significantly reduce this major cost in the city budget. It is often more cost-effective for a city to reduce its consumption than to accommodate additional demand through additional electrical generation. A city can sometimes implement energy-efficiency upgrades without increasing lifetime costs. Energy-efficient buildings can use new insulating materials, natural lighting, and ventilation to reduce energy costs. Solar water heaters, compact fluorescent lighting, windmills, photovoltaic systems, and liquid petroleum gas stoves offer sustainable alternatives in many emerging economies.

Along the same line, cities can reduce daily water demand by providing rebates to residents who purchase low-flush toilets and low-flow showerheads. This means the city or utility saves money and energy by not having to build and power new water systems. The question is how to provide the population at large with financially sustainable incentives to adopt such programmes. To implement these programmes, the city needs to make long-term environmental decisions, and such decisions will



NOWAK-UNEP

Vehicle emissions also contribute to global warming.

BOX 6. PROVIDING WATER SERVICES FOR THE POOR IN NAKURU, KENYA

Nakuru Municipality, located in the Rift Valley, in Kenya, has a declining economy, crumbling infrastructure, and a high growth rate. Water supply falls short of demand, resulting in many low-income residents using what is considered less than sanitary water. With the nearest river 27 kilometres away, Nakuru relies on boreholes for half of its meagre water supply, which currently falls 15,000–20,000 cubic metres short of daily demand. In the absence of a local supply, the urban poor must retrieve water from long distances or purchase it at considerable expense from local vendors.

To address these concerns, Nakuru Municipal Council undertook a Local Agenda 21 planning process, with the local community and community-based organizations (CBOs). As a result of this planning process, the council identified water and environmental management (notably of solid waste) as the two key problems. The council and the CBOs together developed water kiosks to supply safe, clean, and inexpensive water, focusing first on one low-income, under-serviced area. The council developed a plan to construct five kiosks throughout the Ronda–Kaptempwo community so that no resident would have to walk more than a kilometre to find water. Each kiosk was to be built of stone, connected to the municipal water main, secured at night, and large enough to house the tap and its attendant.

With funding from the Incentive Grants Project, the city built the water kiosks. As a commitment to its ongoing relationship with the community, the council turned over almost all kiosk management to a community organization, creating well-paying, long-term employment for several individuals, as well as building the capacity of the group to take on similar challenges in the future.

Oldrich Karasek / Still Pictures

Bicycle traffic in Chengdu, China.

BOX 7. SAVING ENERGY IN AHMEDABAD, INDIA

In Ahmedabad, India, city officials replaced incandescent bulbs in street lights with compact florescent lamps. This reduced power consumption for street lighting by 81 percent and, as it had in Honolulu, dramatically reduced labour costs, because of the longer life of the energy-efficient bulbs. Ahmedabad also enjoyed significant energy savings by placing capacitors in their water pumps. This measure reduced power consumption by 12.6 percent, saving over Rs 2.6 million a year. By replacing its steel water pipes with bigger diameter polyvinyl chloride piping, Ahmedabad reduced friction in the pipes and improved energy efficiency. This one change alone will reduce energy consumption by an estimated 1.7 million kilowatt hours each year and save the city more than Rs 4.48 million annually.

change priorities in revenue generation and expenditure in the city budget, further reinforcing the integration of environmental issues.

A good example of this approach is the ecoBudget tool developed by the International Council for Local Environmental Initiatives (ICLEI), which provides a city with a method of controlling its consumption of natural resources and environmental goods; it also provides a framework for political decision making with a long-term goal of environmental sustainability. Similarly, the SEA has become an important instrument for identifying, measuring, and monitoring the environmental impacts of policies and programmes of the European Union.

City partnerships with civil society can also help mobilize human and financial resources for sustainable development. Nongovernmental organizations (NGOs) often have specialized expertise and a different perspective from that of the city government, while organizations formed and run by the urban poor can be crucial actors in addressing brown environmental issues. In many countries, these organizations engage in community-driven initiatives for slum upgrading, particularly related to housing and improvement of water, sanitation, and local environmental services. A national project for the urban environment in Thailand, for example, promotes cooperation between more than 1,000 community groups and organizations working for locally based improvements to the environment in poor areas. These local projects, largely led by women, have significantly improved water supply and waste removal, precisely the kind of environmental issues that most directly affect the daily lives of the urban poor.[8]

As can be seen from the examples in the boxes, many cities have responded to the urban environment challenge, recognizing the centrality of the issue to the economic and social future of the city and its citizens. In addition, many good city managers are already taking climate change into account. Over 80 cities worldwide have signed the San Francisco Urban Environment Accords, which

BOX 8. REVITALIZING THE RIVERS IN CHENGDU, CHINA

In the late 1990s, Chengdu, the capital of Sichuan Province, was one of the most polluted cities in southwestern China. The Fu and Nan rivers, part of the drainage basin of the Yangtze River, cradle the city. Pollution and poor infrastructure created drastic variations in river behaviour, causing fluctuating dry and wet seasons and constant flooding. Shantytowns emerged by the riverbanks. These had poor living conditions and became breeding grounds for disease and crime, deterring the city's social and economic growth.

The municipal government took time to find a solution to the rivers' drastic deterioration. After public consultation, the city officially launched the $100 million Fu River and Nan River Comprehensive Revitalization Project.

The project had a wastewater treatment component focusing on two main aspects:

- *Prevention*—Approximately 1,000 enterprises were recognized as polluters: 488 old and outdated enterprises were closed down, 478 were provided with incentives to undertake technological improvements, and 40 were moved to an industrial park outside the city;
- *Treatment*—About 26 kilometres of water discharge pipe was laid along the riverbank to collect and transport sewage to the sewage treatment plant.

Chengdu's project is unique in that it makes use of all possible resources. Through a set of policies and strategies, the project depended on community, private sector and civil society participation, and networking, to realize its goal. This project has proven that a municipality can rely on natural resources and human efforts to work toward sustainable development. The municipal government has shown that by setting out and implementing innovative and integrative policies it can respond to the social, economic, and environmental needs of the community.

mandate a 25 percent reduction in greenhouse gas emissions by 2030. Undeterred by their government's rejection of the Kyoto Protocol, 238 mayors from 41 US states have committed to the US Mayors Climate Protection Agreement, in which they agreed to meet or surpass the Kyoto targets.[9] The South African city of Nelson Mandela Bay has recently taken the lead in providing renewable energy sources for its residents through a combination of solar water-heating systems, thermal decomposition of solid waste and sewage sludge, and cogeneration technologies.[10]

Conclusion

Building sustainable cities cannot be the job of city governments alone—they control a very small amount of the resources available for city development and very often have even less of the available talent needed for urban innovation. The task requires city governments to enter into partnerships with civil society, NGOs, the business community, and community organizations, all sharing a vision for the city's future and all willing to dedicate their efforts and resources to the task.

Cities have already demonstrated that they are proven poverty fighters. They also need the tools to act as custodians of the environment. Most African and many Asian cities now need to provide their residents and migrants with ladders to escape poverty and, in so doing, create the conditions to promote the economic growth and manage and protect the urban environment for future generations. The current model is not a sustainable option.[11]

Binsyo Yoshida / UNEP

Industrial pollution in Osaka City, Japan.