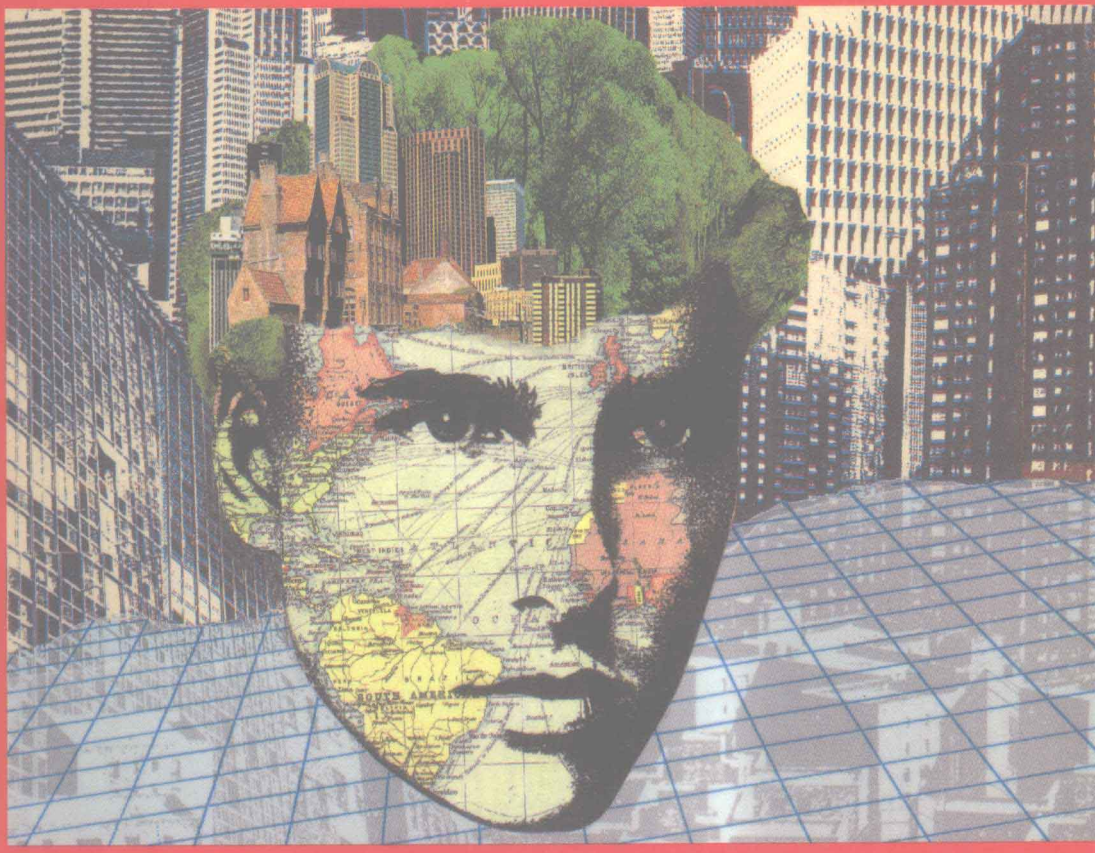
THE GAIA ATLAS OF

CITIES

New directions for sustainable urban living



Herbert Girardet

Foreword by Lester R. Brown, President, Worldwatch Institute

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New directions for sustainable urban living

Herbert Girardet

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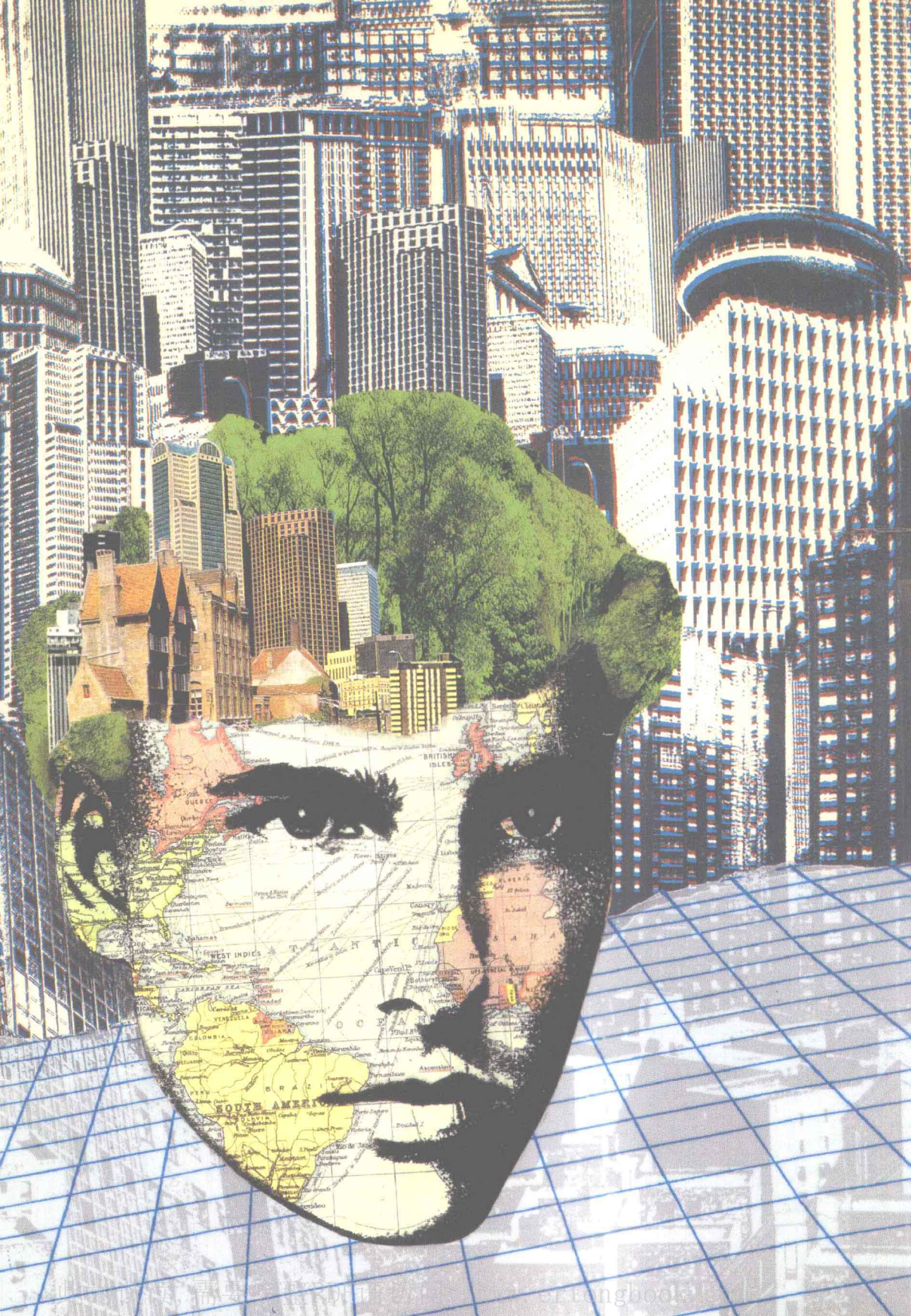
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Dedication

To country people,
to city people,
and a living Earth
we must never
take for granted

FOREWORD

When this century began, 14 percent of us lived in cities. When it ends, a majority of us will live in cities. We will be an urban species.

After millions of years hunting and gathering and thousands of years tilling the soil, we are now entering a new era where urban living is the dominant life style. In evolutionary terms, this latest shift has occurred at a breath-taking pace, creating problems never before encountered. Herbert Girardet defines these issues brilliantly in Part Two, which deals with the urban ecological and social crisis under the title of "Sick cities, sick world".

Cities are inherently unnatural in that they require enormous concentrations of food, water, and materials in a small area, concentrations far beyond anything nature is capable of providing. And in turn, as these resources are consumed, they generate enormous quantities of garbage and sewage. Just as nature cannot concentrate the resources needed to support urban life, neither can it disperse the waste produced in cities. The waste output of even a small city can quickly overtax the absorptive capacity of local terrestrial and aquatic ecosystems.

Not surprisingly, urban dwellers are far more dependent on energy than their rural counterparts. Moving large quantities of food, water, and fuel into large cities and moving garbage and sewage out are both logistically complex and energy-intensive. The larger and more sprawling the city, the more complex and costly its support systems. Nutrient-rich human wastes – an asset in a rural setting – can become an economic liability in an urban environment. Indeed, the collection and treatment of sewage is a leading claimant on urban tax revenues, even when it is processed and sold as fertilizer.

Cities extend far beyond municipal boundaries. As urban material needs multiply, they eventually exceed the capacity of the surrounding countryside, exerting pressure on ever-more distant ecosystems to supply resources. Aquifers and wetlands, farmlands and forests are all as essential to a city's survival as transport networks, but rarely, if ever, gain the urban planners' attention.

Water, at once the most vital and most abused urban resource, best illustrates the precarious relationship that now exists between cities and natural systems. Many cities are searching farther and farther afield to augment supplies from overextended or contaminated aquifers. Los Angeles, for instance, draws water from several hundred miles away. Much of it comes from Northern California, pumped over the Tehachapi Mountains, some

610 metres above sea level, into the Los Angeles basin. This journey obviously involves enormous energy expenditures. Fuelwood in Third World cities shows similar patterns. Research on fuelwood prices in India shows that the larger the city, the faster and farther the forests recede – raising transport distances and fuelwood prices.

Nutrient recycling is enormously complicated by urbanization. Each day thousands of tonnes of basic plant nutrients – nitrogen, phosphorus, and potassium – move from countryside to city in a flow of food that sustains urban populations. In turn, human organic wastes are produced. Worldwide, over two-thirds of the nutrients present in human waste are released to the environment as unreclaimed sewage, often polluting bays, rivers, lakes, and even oceans. As the energy costs of manufacturing fertilizer rise, the viability of agriculture – and, by extension, cities – may hinge on how successfully urban areas can recycle this immense volume of nutrients. Closing nutrient cycles is thus one of the building blocks of ecologically sustainable cities.

Cities are more than a set of human communities, or at least they should be. Part Three of this volume deals entirely with prescriptions: how to make cities not only ecologically sustainable but socially pleasant places in which to live. Drawing on experiences and examples from all over the world, Girardet gives a sense of what livable, sustainable cities might look like, and how they might work.

Girardet's prescriptions include resolving the eternal conflict between the city and the automobile through such measures as traffic calming, proximity, and bike lanes. He explores the potential for increasing urban self-sufficiency by harnessing solar energy, both as sunlight and in the form of wind. In short, his list of policy recommendations matches the list of ills discussed in the earlier parts of the book.

Like any good doctor, Girardet first analyzes the symptoms, diagnoses the illness, and then prescribes the remedies. This book is an imaginative, highly readable contribution, a rich new addition to the Gaia Future Series.

Lester R. Brown, President, Worldwatch Institute

***Lester R. Brown** founded the Worldwatch Institute in 1974 as a private, non-profit-making research institute devoted to the analysis of global environmental issues. Based in Washington DC, the Institute is widely known for the Worldwatch Papers, a monograph series, and since 1984 for the State of the World reports. In 1988 the World Watch magazine was launched, featuring articles on the Institute's research, and in 1991 the Environment Alert series was inaugurated.*

"She has been looking at the external city; but the internal city is more important, the one that you construct inside your head. That is where the edifice of possibility grows, and grows without your knowledge; it is subject to no planner's control."

Hilary Mantel, *Eight Months On Ghazzah Street*

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উন্নত মানের রাবার সামগ্রী
প্রস্তুত কারক
বেগ রাবার ইণ্ডাস্ট্রিজ

World city, city world

The urban species

Sometime around the turn of the millennium an urban baby will be born whose birth will tip the balance statistically, for humanity, from being a predominantly rural into a predominantly urban species. In this culminating move to full urbanization, will humanity be fulfilling its destiny? Or will we be entering the final stage in decline toward chaos and collapse?

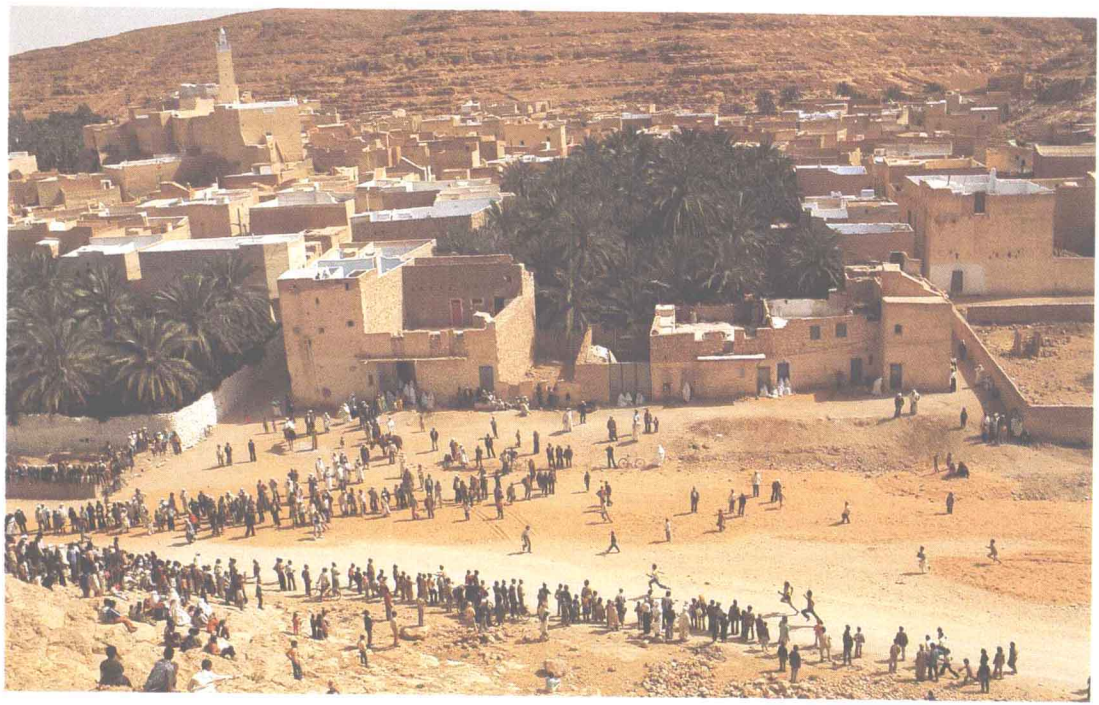
Rickshaws
Congestion on the city streets is a major problem the world over. In developing-world cities, such as Dhaka, Bangladesh (left), jams are caused by hand carts, bicycles, and hand-drawn rickshaws rather than cars and lorries. Lack of air-polluting emissions mitigates the situation.

Cities and the planet's resources

The history of early cities shows that they often depleted local hinterlands, draining their fertility without replenishing it. They exhausted the forests, watersheds, and farmland that had enabled their existence. The ancient city sites of Mesopotamia are now surrounded by bleak wastelands, covered in crusts of salt. Are we repeating this tragedy today, but on a planetary scale? The world's large cities now have the whole planet as their hinterland; they draw on resources and dump their wastes all around the globe. How can we avoid turning the planet into a desert, as the majority of our rapidly multiplying humankind becomes urban-based?

Cities as magnets
The rapid growth of cities has become the most striking feature of our civilization. There now seems little likelihood that this trend will be halted. Cities are predominantly human worlds and they have become irresistible magnets for people all over the planet.

It is the burgeoning cities' huge appetite for the world's resources, and the vast quantities of wastes they discard, that cause the greatest concern about their long-term viability. Few modern cities are, as yet, actually collapsing due to a breakdown of supplies. Science and industrial technology are attempting to ensure that the land from which cities get their food stays



productive, that technical solutions can be put into place when reliance on nature's bounty becomes less certain. But the technosphere, which props up modern urban living, has been established with little regard for the need to ensure an intact biosphere on which the well-being of all living things ultimately depends.

The limits of urban growth are increasingly seen as environmental. Yet the issue of how modern cities might achieve sustainability has rarely been properly addressed. Will the mega-cities, with their vast appetites, turn this into a ruined planet? Or can we find ways in which to consolidate urban growth and to make our cities sustainable?

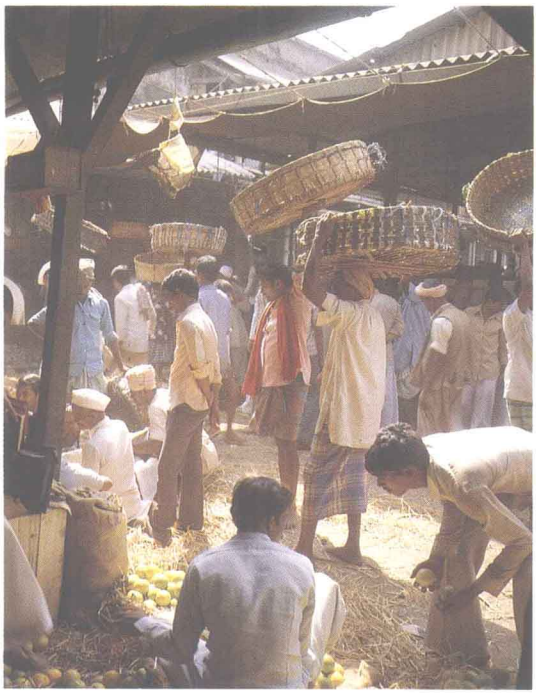
City scale
Human scale disappears beneath the pressures of numbers, growth, and the need to plan and organize our cities, turning them into grid-patterned mazes with "crystal" downtown centres (as in San Francisco, top left). Many smaller cities, especially in the developing world, still retain their spontaneous layouts and their human scale. The photograph bottom left shows Metlili in the Algerian Sahara, home of the Chaamba.

The parasite and the host

It is time to take a rational look at the relationship, presently largely parasitic, between cities and their host environment. If we are to continue to live in cities, indeed if we are to continue to flourish on this planet, we will have to find a viable relationship between cities and the living world – a relationship not parasitic but symbiotic, or mutually supportive. This book seeks to assess how this might be achieved. Part One looks at the way cities function – in terms of their metabolism, their communities, their climate and environs, their financial hold on the world, and their historical evolution. Part Two explores the problems that have arisen as a result of cities operating linear processes (see pp. 22-5). Part Three describes innovative schemes for "closing the circle"; making urban metabolisms circular, and healing cities again.

Can cities be sustainable?

Can an urbanized world be ecologically viable? This question concerns not only the appetite of



The urban mind change
The impact of cities is confined not only to environments from which they draw their resources. People, too, are changed profoundly as they are transformed from hunter-gatherers and peasants into urban factory and office workers. Intimate daily contact with the natural world is replaced by routine encounters with a world of bricks, concrete, and tarmac. A new way of life emerges as people give up local rural self-sufficiency for dependence on resources and products from distant places. By becoming supermarket hunter-gatherers, exchanging money for deep-frozen and packaged food, by spending our time in sealed buildings insulated from encounters with nature, we tend to forget that the integrity of the living world is of key importance for our own future wellbeing.

City markets
Worldwide (here in Bombay, above left, and New York, above), city markets have always been places where people meet to buy and sell and to socialize – they are part of the hub of city life. But modern technology threatens this vital contact.

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