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978-0-521-67076-0 - Urban Regions: Ecology and Planning Beyond the City
Richard T. T. Forman
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Urban Regions

Ecology and Planning Beyond the City

Natural systems and their human uses are of central importance in urban regions, where diverse greenspaces and built spaces of essentially equal value spatially intertwine. With land planning, socioeconomics, and natural systems as foundations, this book combines urban planning and ecological science in examining urban regions. Writing for graduate students, academic researchers, planners, conservationists, and policy makers, and with the use of informative urban-region color maps, Richard Forman compares 38 urban regions from 32 nations, including London, Chicago, Ottawa, Brasilia, Cairo, Beijing, Bangkok, Canberra, and a major case study of the Greater Barcelona Region. Alternative patterns of urbanization spread (including sprawl) are evaluated from the perspective of nature and people, and land-use principles extracted from landscape ecology, transportation, and hydrology are stated. Good, bad, and interesting spatial patterns for creating sustainable land mosaics are pinpointed, and urban regions are considered in broader contexts, from climate change to biodiversity loss, disasters, and sense of place.

RICHARD T. T. FORMAN is Harvard University's Professor of Advanced Environmental Studies in Landscape Ecology. Previously at the University of Wisconsin and Rutgers University, he is an American Association for the Advancement of Science Fellow and recipient of the Lindback Award for Teaching Excellence as well as of honorary degrees and medals in the USA and internationally.

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Dedicated to Sabrina Forman Heim
and her family,
Karl, Brianna, Matthew

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Foreword

Encountering the title of this book by Richard Forman, my first reaction was one of surprise. It is commonplace, of course, that cities are embedded in natural systems, but the modern city seems such a triumph of modern technology over the constraints of nature that one can easily understand why urban planners have rarely found it necessary to spend much time talking with urban ecologists – or, to state it another way, why ecology and urban planning have remained quite separate domains of inquiry and action in the modern division of labor.

Ecology, a branch of biological sciences, strives to understand relationships of interdependence in the natural world, and (while not at heart activist) at times to devise strategies for their preservation. As such, of course, it informs environmental regulators and thereby places some constraints on development activity. Urban planning, on the other hand, exists to provide analysis in the service of action, and its principal concerns historically have been economic – to pursue and facilitate development while striving as well to preserve and enhance the market value of existing property investments. Planners have other concerns as well, to be sure, such as improved public health, social equity, and an attractive public realm – all of which have vital ecological dimensions. So one would be hard-pressed indeed to find a planner who disagreed with the proposition that good plans must be ecologically sound. This agreement has traditionally had a ritualistic quality, however, in that, with rare exceptions, planners have viewed ecological values mainly as constraints – to be addressed late in their analyses, particularly at the behest of environmental regulators – rather than at the very core of their mission. And they have rarely viewed ecologists as indispensable participants in their deliberations from the outset.

Richard Forman would change all that, and the argument he lays out in this volume is compelling. Though modern technologies are dazzling, he observes, having enabled us to separate urban residents from their sources of

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nourishment, potable water, and even jobs, by greater distances than would ever have been imaginable in earlier times, the “tsunami” of urban growth now threatens widespread disaster. With three billion people living in urban areas, and two billion more expected within the next quarter-century, with global warming, with energy demand rising more rapidly than energy production (the latter, moreover, often with devastating environmental effects), and with the continuing depletion of fresh water supplies and biodiversity – we seem to be racing beyond the capacities of our technological ingenuity to shield us from the natural limits of our environment. It is past time, in short, for urban planners and policy makers to recognize ecological health as the single most urgent value to be served by urban planning – without which all the others are likely to prove illusory before too many more decades pass.

Forman’s analysis is global, greatly enhancing its power. He examines 38 regions in 32 countries, representing most of the variety of large cities and regions throughout the world, and reports as well on a detailed case example of ecologically focused urban planning in Barcelona, a pioneering effort that he personally led in 2001–2002. The latter provides a truly eye-opening example of big-picture planning, carried out at the behest of Barcelona’s mayor and chief planner, to preserve the critical natural assets of that region and direct its development for generations to come in ways that minimize environmental degradation. What emerges clearly from this exercise is that there need not be a major conflict between the objectives of ecological health and economic development, but that one had better focus on the ecology early on if there is to be much hope of reconciling them in the end.

In brief, though written by an ecologist, this is very much a book for urban planners, policy-makers, and all others who care seriously about the future of urban life on this planet. Moving to implement Forman’s ideas will be a formidable challenge indeed, even in those very rare enlightened jurisdictions with planning traditions comparable to Barcelona’s, and vastly more so everywhere else. But global transformations invariably begin in the realm of ideas. And Forman here lays out a very big one. Planners and urban policy-makers everywhere, take heed!

Alan A. Altshuler
*Ruth and Frank Stanton Professor in Urban Policy
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* Also: formerly Secretary, Massachusetts Department of Transportation; formerly Director, Taubman Center for State and Local Government, Kennedy School of Government; formerly Dean of the Faculty of Design, Harvard University.

Foreword

When Daniel Burnham exhorted the planners of the early twentieth century to “make no small plans,” ecology was not something that very many urban planners knew much about. Indeed, the ecology of that time probably seemed irrelevant to planners, because it had little to say about humans in ecosystems, or even about the structure and function of broad-scale landscapes. These concerns were late inventions in ecology, but they have finally emerged and come together to generate a sound and growing body of knowledge that relates to urban mosaics as ecological systems. The new knowledge and perspectives of landscape ecology and urban ecological studies bring the science of ecology, the practice of urban planners, and the needs of dwellers in urban regions to an unprecedented threshold of truly ecological planning at regional scales. Richard Forman has written a satisfyingly original and compelling book to carry us over that threshold.

As an ecologist I find several things particularly exciting about this book. It identifies the big issues and concerns about urbanization at the beginning of the first urban century – the century in which humans become numerically an urban species. The growth, intensification, and global spread of urbanization are staggering. Ecology must find a way to engage with this wave, and not retreat in its face. With the rapid changes in urban systems, they take on new forms and establish new interactions with their regions. The old assumptions about the forms of cities, and the ecological implications of those forms will not support effective ecological research or interaction between ecologists and planners in the future. Forman recognizes the significance of the amazing transformations our urbanized world is experiencing, and translates them into a conceptual language that can help bring ecological knowledge to bear in the design and management of the Earth’s changing urban face. Ecologists have much to learn from this, and it provides a way to interact with planners

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who are confronting and dealing with the novel urban patterns around the world.

Perhaps most pleasing to an ecologist is the fact that the ecology here is up-to-date and sound. This is no mere urban ecology by analogy with the patterns of processes outside the human realm. Rather this book articulates, in clear and relevant ways, the major principles that must guide the application of real scientific ecology to cities and their regions. Also important to see here is the fact that generalizations are couched within taxonomies of urban regions that can identify the constraints governing their applicability. These generalizations are couched so that they should not be inappropriately applied, or over extended.

This book will be a key tool in the important and widely recognized work of bridging between contemporary ecology and urban planning. The “worked example” of plans for the Barcelona region in the context of examining the ecological opportunities and constraints for 38 metropolises around the world is a very powerful guide for truly ecologically based regional planning. Ecology has too often been a weak or small tool in planning. Forman shows us how strong and central it can be. At the same time, the reader will find respect for both ecology and planning, based on long experience in education and research in both. This is a brave and necessary book, which does its work with both scientific clarity and the poetry or keen observation and sensitivity to the humanities and the social realm.

I’m finishing my notes for this piece while descending into the Johannesburg, South Africa airport. Below me sprawls a region of immense natural resources, a beacon of social hope, a locus of economic power, a cultural engine. It contains an old center, quiet suburbs from the last century, gleaming new suburbs with their business and entertainment districts, and the crowded townships. There are the mine shafts, spoils, and cooling towers of the mineral industry; there are farms, and the green leafy canopy of jacaranda blooming over some neighborhoods. Forman’s book tells us how to truly bring ecology and the built and social mosaics together to envision how a metropolis such as this can evolve sustainably in the future. This book also suggests how to deal with the dynamism of Baltimore, Maryland, a very different region where much of my ecological work now takes place. But it also gives us an important way to deal with the different dynamics of the next new city – perhaps not yet named – to be established in China. The deep regional perspective and sound ecological principles articulated and put into action in this book make us think about Burnham’s exhortation in a different light. Whatever one thinks about the value or success of big plans over this last 100 years, the vision of this book suggests that it is time to make

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big plans again, but to do so on a regional, landscape ecological base – the real ecology – encapsulated in this book.

Steward T. A. Pickett
Distinguished Senior Scientist, Institute of Ecosystem Studies, Millbrook, New York
Director, Baltimore Ecosystem Study, Long Term Ecological Research

Preface

I grew up in a world of rural nations where forests and farmland seemed infinite. Now most are urban nations. Indeed, at this moment the globe zooms over a threshold; half of us (three billion people) now aggregate in and around cities.

Yet the big change lies just ahead. In a single generation two billion more people are expected to join the urban population. Where will they live their lives? In much bigger and more numerous urban regions? Next door? Like an urban tsunami, easily visible today, we sweep swiftly and powerfully across our finite land.

For years I asked people in audiences to visualize the place where they grew up, and indicate whether it is better or worse now. Minds instantly left the room, speeding through images of memorable neighborhoods, glorious experiences, tough times, meaningful spots, and inspiring nature. Upon rapid return, virtually all audiences on different continents agreed: 80 to 90 % of their formative landscapes are worse today. Yet this trend could be turned around. Incremental solutions crowd our plate, while promising big-picture solutions increasingly appear, often ready for serious evaluation or action.

One of the great challenges of history has appeared, the giant urban region. At the center, a huge city population depends fundamentally and daily on resources that are out of sight, out of the city. An engineering and architectural marvel, the city expands at its edges or along transportation corridors or dispersed as sprawl. Too often expansion devours the city's closest and best resources, impoverishing both the land and the people. Proximity is value, as transportation cost, scarce clean water, local food sources, and tourism/recreational access emphasize. Aquifers supply clean water, greenways support walkers and wildlife, and floodplain vegetation reduces flood damage. Natural systems, from ground-water and wetlands to riparian zones and wooded parks, provide these valuable resources to society.

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Four motifs with ever-changing harmonies cascade through the book’s pages: (1) urban regions, rather than cities or all-built metropolitan areas, are the key big objects today and in our future; (2) natural systems, or simply nature, and human uses of them in an urban region are of major importance; (3) all regional characteristics are changing, driven by growing populations, more cities, and diverse urbanization patterns; (4) using principles and a rich array of existing solutions, society can significantly improve every distinctive urban region.

The book title provides further clues to content. “Urban region” highlights the 150 to 200 km diameter (90 to 125 mile) area where a major city and its surroundings interact to effectively form a functional region. “Ecology” refers to interactions between plants/animals and the physical environment, though often the slightly broader concept of natural systems is used. “Planning,” as used here, is about product (rather than process), the tangible arrangement of human pieces and natural systems that forms the big picture. “Beyond the city” highlights patterns in the ring around the city. This book does not focus on the city, or all-built metropolitan area, or urban history, or socioeconomic dimensions, or mainstream urban planning, or town planning, or housing developments, or the methods of developing plans, or the implementation of plans, though, of course, bits of each appear. Finally, the book’s perspective is global.

What are the benefits, and costs, of creating a globe with a scatter of huge growing urban powerhouses? Concentrating people helps protect natural and agricultural resources elsewhere. Economic growth often occurs in growing cities. Specialized resources such as the opera house and biotechnology center appear. But seemingly intractable problems multiply for cities, surrounding towns, villages, and farms. Natural systems are degraded, even eliminated. Floods and air pollutants are harder to control. As cities grow outward, alas, we keep traveling further and importing more of our needs, at greater cost.

A prominent sign adorns my office: “Think Globally, Plan Regionally, and *Then* Act Locally.” As a philosophic foundation for a 1995 piece on land management and planning, I was thinking mainly of geographic regions. I now realize the vision especially applies to urban regions.

Big ideas – nationalism, hard-work-makes-productive-land, economic growth, environmentalism – evolve, dominate, and are transformed or replaced over time. Will urban-region planning inevitably appear in this overlapping sequence? If so, where will the giant solutions be found? Unfortunately today most planners avoid emphasizing natural systems, and most ecologists avoid studying urban regions. That leaves a near void of directly useful models. Yet both ecologists and urban planners, along with economists, engineers, and architects, are well-equipped to contribute. Who would want to live in a major area planned or designed by only one of the group? Lack of planning might be better. But the

full range of expertise would be best. Indeed, fitting together small pieces makes incremental progress, while overall success or failure depends fundamentally on addressing the big picture and the long term.

Why would I, with roots in ecology, write this book? In essence three foundations suddenly came neatly together. One is ecology, especially landscape ecology’s spatial scientific focus on land and natural systems at the human scale. The second is more than two decades of Harvard teaching and learning from planners, designers, engineers, social scientists, humanists, and scientists. The third foundation is an intensive 15-month project developing a land-mosaic plan for the Greater Barcelona Region. Highlighting low-profile big problems, offering tangible steps for improvement, and outlining robust frameworks for real solutions are what ecologists in their finest hour do for society.

Imagine, one afternoon the head planner for Barcelona, a major European city, telephoned saying surprisingly that he had been reading my books and articles, and then two weeks later appeared during a family Thanksgiving holiday. We talked and sensed mutual respect. He asked me, in effect, to do an ecological and conceptual plan analysis for his whole urban region based on my recent book, the only model that made good sense to him. “But I’m a scientist, not a planner.” Good. “I’ve hardly ever been to Spain.” No problem. “I’ve *never* been to Barcelona.” Fine. “I’ll have to think about it.” In three weeks you should meet the Mayor and get started. After an awkward seven-month dance I started. But how does one start? I never found a model or a real city plan highlighting natural systems and their human uses as major components, though valuable pieces did accumulate over time. With an impressive team in a magical place, the outlines of a promising land mosaic emerged.

Writing this book for the wide range of people interested in urban areas, plus the equally diverse array interested in ecological science, is tough. Ecologists are overwhelmingly rural, natural systems, plants/animals, water, and management oriented. In contrast, planners are overwhelmingly urban, economics, social, people, and policy oriented. Success also means reaching perceptive educated citizens who will live in, care about, and depend on tomorrow’s urban region.

The chapters flow cascade-like through the book, until expanding with broader visions at the end. An unusual array of important foundations (Chapters 1 to 4) launches the reader into a close-up of 38 urban regions of large-to-small cities worldwide (Chapter 5). Numerous characteristics of nature, food, and water, plus built systems, built areas, and whole regions, are highlighted (Chapters 6 to 7). Then alternative urbanization models, also using many assays, identify good and bad patterns of change (Chapter 8). More pieces are added – a set of basic principles, the detailed Barcelona case study – and gathered together as key components for a land mosaic (Chapters 9 to 11). Finally,

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urban-region ecology and planning beyond the city is analyzed in the context of broader big-picture perspectives (Chapter 12).

Lots of promising patterns and trends, plus pitfalls to avoid, emerge for the thousands of distinctive urban regions worldwide. But no single solution is proposed, other than urban-region planning for natural systems and us. Rather, a richness of spatial patterns and principles are portrayed together, ready for readers to arrange, add their own ingredients, and create a land mosaic framework or vision for an urban region. The patterns represent handles for wise planning.

With fire in the belly and a dash of optimism, I expect to see more of the world on a trajectory meshing nature and people so they both thrive . . . and I can't wait.

In addressing the great urban-region challenge of history, this book simply helps get the window open a crack to grasp broader horizons. Insights, solutions, big problems, and surprises lie in wait for the reader.

Land as capital, heritage, nature,
as investment, inspiration, home.
All finite,
all requiring care.
So, add planning and ecology as wisdom,
for nature's future, our future.

Richard T. T. Forman

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