

THE RESTORATION ECONOMY

THE GREATEST NEW GROWTH FRONTIER

IMMEDIATE & EMERGING
OPPORTUNITIES FOR BUSINESSES,
COMMUNITIES & INVESTORS

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An Excerpt From

***The Restoration Economy:
The Greatest New Growth Frontier***

by Storm Cunningham

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Contents

Preface vii

Acknowledgments xii

| | |
|---|----------|
| Introduction | 1 |
| <i>The Biggest Thing You've Never Seen</i> | 2 |
| <i>Opening Our Eyes to the Restoration Economy</i> | 3 |
| <i>The Turning Point</i> | 5 |
| <i>How Restoration's Growth Is Reflected in Our Print Media</i> | 8 |
| <i>Others Have Seen This Coming</i> | 12 |

Part One

| | |
|--|-----------|
| The Transition from Our "New Development" Past to Our "Restorative Development" Future | 15 |
| 1 The Three Foundations of the Restoration Economy | 17 |
| <i>The Twenty-First Century's Three Global Crises</i> | 17 |
| 2 The Three Modes of the Development Life Cycle and Their Three Realms of Development | 29 |
| <i>Trimodal Relevance</i> | 32 |
| <i>The End of the Beginning</i> | 33 |
| 3 Historical Perspectives on the Three Crises and on Restorative Development | 35 |
| <i>Back to the West</i> | 37 |
| <i>An Unprecedented Moment in Time</i> | 40 |
| 4 Why Our Trillion-Dollar-Plus Restoration Economy Has Been Kept a Secret | 43 |
| <i>The Global Restoration Economy</i> | 44 |
| <i>A Strangely Silent Revolution: We Don't Talk Much About Restoration Because We're Still Developing the Language</i> | 45 |
| <i>Confusing Maintenance with Restoration</i> | 48 |
| <i>Returning to the Real</i> | 49 |

Part Two

| | |
|---|-----------|
| The Four Growth Industries Restoring Our Natural Environment: Ecosystems, Watersheds, Fisheries, and Farms | 53 |
| 5 Restoring Our Ecosystems: Lakes, Wetlands, Prairies, Shores, and Others | 55 |
| <i>The Scope of the Ecosystem Restoration Industry</i> | 57 |
| <i>Problems and Solutions</i> | 59 |
| <i>Issues and Insights</i> | 68 |
| <i>Closing Thoughts</i> | 74 |
| 6 Restoring Our Watersheds: Aquifers, Forests, Rivers, and Streams | 77 |
| <i>The Scope of the Watershed Restoration Industry</i> | 79 |
| <i>Problems and Solutions</i> | 80 |
| <i>Issues and Insights</i> | 89 |
| <i>Closing Thoughts</i> | 92 |
| 7 Restoring Our Fisheries: Estuaries, Reefs, and Oceans | 97 |
| <i>The Scope of the Fisheries Restoration Industry</i> | 99 |
| <i>Problems and Solutions</i> | 99 |
| <i>Issues and Insights</i> | 107 |
| <i>Closing Thoughts</i> | 110 |
| 8 Restoring Our Farms and Rural Economies | 113 |
| <i>The Scope of the Agricultural Restoration Industry</i> | 115 |
| <i>Problems and Solutions</i> | 115 |
| <i>Issues and Insights</i> | 125 |
| <i>Closing Thoughts</i> | 126 |

Part Three

| | |
|---|------------|
| The Four Growth Industries Restoring Our Built Environment: Brownfields, Infrastructure, Heritage, and Misfortunes | 129 |
| 9 Restoring Our Brownfields: Industrial Sites, Ports, and Military Bases | 131 |
| <i>The Scope of the Brownfields Restoration Industry</i> | 133 |
| <i>Problems and Solutions</i> | 139 |
| <i>Issues and Insights</i> | 145 |
| <i>A Closing Story</i> | 150 |
| 10 Restoring Our Infrastructure: Transportation, Power, Solid Waste, and Water | 153 |
| <i>The Scope of the Infrastructure Restoration Industry</i> | 154 |
| <i>Public Transportation Infrastructure</i> | 155 |
| <i>Public Power Infrastructure</i> | 159 |
| <i>Public Solid Waste Infrastructure</i> | 162 |
| <i>Public Water Infrastructure</i> | 164 |

| | | |
|------------------|--|------------|
| | <i>Issues and Insights</i> | 174 |
| | <i>Closing Thoughts</i> | 176 |
| 11 | Restoring Our Heritage: Historic Sites and Structures | 179 |
| | <i>The Scope of the Heritage Restoration Industry</i> | 180 |
| | <i>Natural Heritage</i> | 182 |
| | <i>Built Heritage</i> | 187 |
| | <i>Issues and Insights</i> | 196 |
| | <i>A Closing Story</i> | 200 |
| 12 | Restoring Our Misfortunes: Natural Disasters, Human-made Disasters, and Wars | 203 |
| | <i>A Horrifying Halloween</i> | 204 |
| | <i>The Scope of the Disaster/War Restoration Industry</i> | 207 |
| | <i>Problems and Solutions</i> | 208 |
| | <i>War Restoration</i> | 211 |
| | <i>Human-made (Anthropogenic) Disaster Restoration</i> | 217 |
| | <i>Natural Disaster Restoration</i> | 224 |
| | <i>Issues and Insights</i> | 227 |
| | <i>Closing Thoughts</i> | 232 |
| Part Four | | |
| | Putting It All Together | 235 |
| 13 | Ecological Restoration: Conservation's Ideal Partner | 237 |
| | <i>Conservation Just Can't Do the Job by Itself: It's Achieved Some Great Victories, but It's Losing the War</i> | 238 |
| | <i>The Dangers of Restoration</i> | 242 |
| | <i>How Ecological Restoration and Conservation Are Tying the Knot</i> | 243 |
| | <i>Closing Thoughts</i> | 251 |
| 14 | Restorative Development: Sustainable Development's Salvation | 253 |
| | <i>My Personal Sustainability Crisis</i> | 254 |
| | <i>Sustainable Development Is Dead: Long Live Sustainable Development!</i> | 256 |
| | <i>One Possible Solution</i> | 262 |
| | <i>Closing Thoughts</i> | 264 |
| 15 | Bermuda Case Study: The Unplanned Restoration of a Nation | 267 |
| | <i>Nonsuch Island</i> | 267 |
| | <i>Nonsuch into the Future</i> | 273 |
| | <i>Daniel's Head Village</i> | 274 |
| | <i>Royal Navy Dockyards: The Bermuda Maritime Museum and the West End Development Corporation</i> | 278 |
| | <i>St. George</i> | 282 |
| | <i>Bermuda's Restored Future?</i> | 283 |
| | <i>Closing Thoughts</i> | 285 |

| | |
|--|------------|
| Conclusion | 287 |
| <i>Built and Natural Are Often Hard to Separate</i> | 288 |
| <i>The Restoration of Our Natural and Built Environments</i> | |
| <i>Has Become the Greatest Business Frontier</i> | |
| <i>of the Twenty-First Century</i> | 289 |
| <i>Our Integrative Future</i> | 290 |
| <i>Investment Opportunities</i> | 293 |
| <i>Restorative Politicians</i> | 295 |
| <i>What to Do with This Knowledge</i> | 299 |
| <i>A Few Parting Thoughts</i> | 300 |
| | |
| Appendix: Trolling for Numbers | 307 |
| Restoration Readings | 311 |
| Resource Guide: Education, Memberships, Journals, and Events | 319 |
| Index | 331 |
| About the Author | 341 |



Preface

Definitions

Restorative Development A mode of economic activity that returns property, structures, or objects to an earlier condition, transforms them into a healthier and/or more functional condition, or replaces an unsalvageable structure without consuming more land.

—working definition (by author)

The Realm of Restorative Development The industries, institutions, professions, government agencies, etc. that research, teach, fund, design, or perform restorative development, or supply its technologies.

—working definition (by author)

Restoration Economy An economic period in which restorative development is the dominant mode (as opposed to either new development or maintenance/conservation).

—working definition (by author)

During the '70s and '80s, my return trips to favorite islands, villages, SCUBA sites, and mountain jungles almost invariably broke my heart. Usually, they had significantly deteriorated—and often had been destroyed outright—since my last visit.

In many cities, their best assets (such as beautiful historic buildings) had been replaced with sterile, ugly monstrosities that would themselves be torn down in 30 years. Developers were increasingly desperate for new land to conquer and were taking whatever they could get . . . appropriate or not.

But then, in the late '90s, I began noticing a miraculous new trend: a number of places—both ecosystems and communities—were actually getting better, some spectacularly so. Rivers that had been devoid of fish were teeming with them. Blighted industrial waterfronts were becoming

gorgeous, lively, economically thriving public areas. Devastated, clear-cut hills were becoming forests again—*real* forests, not just the typical tree farms that are devoid of wildlife.

I began investigating this seeming miracle and discovered a monstrously huge, almost entirely hidden economic sector. It was restoring our world—both our built environment and our natural environment—and it already accounted for over a trillion dollars per year. But nobody was paying it any attention! I found this incredible, and decided to expose these sneaky people.

I also wanted to help bring the millions of restorationists together. All were working in isolation, unaware that they were part of the fastest-growing economic sector on the planet. I wrote this book because I wanted the public to see them, wanted more businesses to partake in the profits they were making, wanted more communities to follow their example, and I wanted them all to “look up and see each other.”

READ THE FOLLOWING SIX PARAGRAPHS, AND YOU’LL KNOW THIS BOOK’S MAJOR IDEAS

During the last two decades of the twentieth century, we failed to notice a turning point of immense significance. New development—the development mode that has dominated the past three centuries—lost significant “market share” to another mode: restorative development. Despite the fact that restorative development will dominate the twenty-first century, its phenomenal rate of growth has gone largely undocumented. This is hardly an unimportant transition: economic growth based primarily on the exploitation of new resources and territories is giving way to economic growth based on expanding our resources and improving our existing assets. How could we miss a story like that?

More importantly, why is it happening? Primarily, it’s because we’ve now developed most of the world that *can* be developed without destroying some other inherent value or vital function of that property. The major driver of economic growth in the twenty-first century will thus be *redeveloping* our nations, *revitalizing* our cities, and *rehabilitating* and expanding our ecosystems. We’ll be adding health and wealth, in a way that doesn’t cause a corresponding loss of health or wealth elsewhere. (If that sounds like sustainable development to you, note that restorative development isn’t about expanding our domain in a sustainable manner: it’s about revitalizing the domain we already occupy. More on this in Chapter 14.)

Development activity comes in three life cycle “flavors”: (1) new development, (2) maintenance/conservation, and (3) restorative development. Obvious? Sure. But we’ve failed to formally acknowledge these three modes of development in our economic and social dialogue. This failure substantially delayed our inevitable transition to the long-lasting “third” mode: restoration (the real “third wave”?). This has been a tragic oversight, because, of the three development modes, restorative development is the only one that can fuel continual economic growth without limit. Fortunately, the “restoration backlog” is creating such pressure that we seem to be making up for lost time.

We’ve been stuck in the first stage of development (new development) far too long. Like a homeowner who compulsively adds another floor to his/her house each year, this habit of continually “piling on,” rather than restoring what we’ve already got, can only end in collapse. This has put us deep in the throes of three global crises: the Constraint Crisis, the Corrosion Crisis, and the Contamination Crisis. Together, they form the foundations of the Restoration Economy, and are good guides to business and community restoration opportunities.

The Restoration Economy can be divided into eight component industries (actually macro industries): four natural and four built. These eight industries are currently balkanized and inefficient—hamstrung by separation from one another—and therein lies great opportunity. Industries that restore the *built* environment have far more in common with those restoring the *natural* environment than either group realizes. The various restorative professions need to recognize, celebrate, and leverage what they have in common, for their mutual benefit. With integration, restorative development’s displacement of new development as the dominant paradigm will occur far more quickly—possibly in just a few years, rather than a decade or more.

Restoration will soon account for the vast majority of development on this planet. It already rules in many U.S. cities, such as Chicago, Louisville, and Washington, D.C. Whether it becomes the dominant mode in 2010, or as late as 2020, will largely depend on how soon corporate and government planners wake up to the fact that restorative development is already the fastest growing of the three development modes. Those leaders who become aware of this vast new frontier of opportunity, and who guide their community, national, and company futures in this direction, will be the foremost leaders of the twenty-first century.

WHAT THIS BOOK IS, WHAT IT ISN'T, AND WHO IT'S FOR

This is not a technical book—and it's certainly not an economics book—despite the title and the plethora of technical subjects. Although the subject matter is deadly serious, I've chosen to write in an informal, anecdotal style. Restoration has become a very passionate subject for me, so I hope you'll forgive an occasional rant, personal story, or attempt at humor.

My goal is to catalyze, not catalog, so you won't be wading through copious footnotes (which might be frustrating for researchers and teachers, I know, but it's preferred by my principal target audience: organizational leaders). This is primarily a business book, for readers of every stripe: corporate leaders, investors, entrepreneurs, engineers, contractors, architects, scientists, environmentalists, students, developers, and government planners, to name a few. What these diverse readers have in common may relate to your reason for exploring these pages:

1. a professional need or personal desire for insight into the future of world economic development and investment trends.
2. a career that requires you to generate a constant flow of immediate growth opportunities.
3. a personal passion (or political agenda) for revitalizing human communities and/or ecosystems, in a way that produces dramatic, measurable results and healthy business or tax revenues.

Those factors apply to the world of business, nonprofits, and government alike.

This book is meant to launch a new dialogue, not to resolve or end one. We need to start talking about, thinking about, and researching the “whole” created by the myriad activities that are already restoring our built and natural environments worldwide.

Restorative development: The process of adding new value to natural or built assets, ideally in a manner that detracts neither from their other preexisting values, nor from the value of other assets.

—one of several working definitions (by author)

I hope you'll find this book not only exciting and useful, but sensitizing. One early reviewer reported that reading the manuscript of this book reminded him of taking a wilderness survival course, after which he suddenly perceived the wealth of edible and medicinal plants that had surrounded him all along. Likewise, before you've finished this book, you'll probably start seeing restorative development everywhere you look.

This is not some wistful vision of the future: it's already happening. Restoration comprises the largest new economic growth cycle since the beginning of the industrial revolution. Millions of people are already working at it and/or investing in it as you read this, and billions are already benefiting from it. What can you do with this newfound awareness of restorative development? You can revitalize your company, your land, or your community. In doing so, you may just revitalize your life.

Our "frontier-style" economic mode, in which we turn virgin land into farms, highways, and buildings—and irreplaceable virgin resources into products and waste—is reaching its natural terminus. Development has arrived at the ends of the Earth. Progress has nowhere to turn, except to revisit and restore what we've already wrought.

Most of us are at least vaguely aware of the eight industries of restoration that comprise the realm of restorative development, but we're only now beginning to perceive them as a discrete, multifaceted economic sector. Perception is seldom a linear progression: stare at the eight restorative industries long enough, and—like one of those "magic pictures"—all of a sudden the omnipresence of restorative development becomes startlingly clear, leaving us shaking our heads at our previous obliviousness.



THE THREE MODES OF THE DEVELOPMENT LIFE CYCLE

Maturing civilizations stand on three legs:

1. new development
2. maintenance/conservation
3. restorative development

Dominance periodically shifts from one leg to another, fundamentally altering technology, culture, and commerce. We are now in such a transition.

- **New Development** This crude pioneering mode launches most communities and civilizations, but destroys irreplaceable assets if prolonged. New development is fast becoming less profitable, less desirable, and less possible.
 - **Maintenance/Conservation** This calmer mode is always present, seldom dominant.
 - **Restorative Development** This dynamic, high-energy mode restores the existing built environment and natural environment. Restorative development is nearing dominance—in construction, ecology, government, and business.
-

Introduction



The world's great age begins anew,
The golden years return,
The earth doth like a snake renew
Her winter weeds outworn.

—Percy Bysshe Shelley, *Hellas*, 1822

Restoration is the business and the spirit of the twenty-first century. Let's now expand on the subjects mentioned in the Preface, so you'll understand why this opening sentence is accurate, rather than wishful. Part of that understanding will come from facts and figures, and part from grasping three key concepts:

1. The Trimodal Development Perspective Development has three modes of operation, corresponding to natural life cycles: new development, maintenance/conservation, and restorative development. Each category produces its own realm of players.

Communities and nations normally start with new development, for obvious reasons. The maintenance and conservation mode then kicks in, to service this newly built environment (and to save parts of the newly-threatened natural environment). When their creations get too old to maintain, when the "highest and best" uses of their structures change, and/or when they run out of room and have to start redeveloping the land they've already developed, then the final, and longest-lasting, mode becomes dominant: restorative development.

When viewed from this "trimodal" perspective, the causes of many "mysterious" national and community problems suddenly become conspicuous, and strategizing becomes far simpler. The most interesting fact for business and government strategists is this: restorative development is now the fastest growing of those three modes, and it will soon be the largest of the three realms of development.

2. The Interactivity of the Built and Natural Environments This concept should be painfully obvious, but you'd never know it from the way we plan and run our world today. Industries involved in new development are, by nature, generally exploitative. They normally ignore the negative impacts of their activities, chalking them off as "the price of progress" in a manner disturbingly similar to the "justify anything" style of fundamentalist religious fanatics. When we attempt to restore the aging products of new development, however, the importance of the interrelatedness of built and natural becomes startlingly clear.

For example, city planners now know that a key to restoring the quality of metropolitan life is restoring the surrounding watersheds. Watersheds are their major source of both clean air and clean water, not to mention mental-health-enhancing green spaces and recreational areas. (A recent poll of U.S. public works directors revealed water supplies to be their top concern.)

Combining watershed restoration with infrastructure restoration is now a proven path to metropolitan restoration. Add just one more element to the mix (such as heritage restoration) and a near-magical renewal often results, as businesses become attracted to the area because it's now healthier, more efficient, and more interesting.

3. The Eight Industries of Restorative Development Most restorative development can be divided into two sectors: restoration of the natural environment, and restoration of the built environment. For practical applications, though, the realm of restorative development must be sliced more finely.

Here, you'll find it divided into eight industries, four natural and four built. The four natural environment restoration industries address ecosystems, watersheds, fisheries, and farms. The four built environment restoration industries address brownfields, infrastructure, heritage, and disaster/war.

THE BIGGEST THING YOU'VE NEVER SEEN

This most vibrant new economic growth sector has been hiding in plain sight for over a decade, but has now become too large to ignore. More than a trillion dollars worth of restorative development takes place around the world every year, but it isn't yet perceived as an industrial sector—or as any kind of whole, for that matter.

(Actually, this trillion-dollar-plus figure I'm using is extremely conservative. Just one of those eight restoration industries—infrastructure

restoration—probably accounts for over a trillion dollars worldwide each year, all by itself. The heritage industry probably comes close to another trillion, if one includes all of its facets: adaptive use of old buildings; historic district redevelopment; and rehabilitation of architectural treasures, old forts, monuments, ancient artifacts, classic homes, etc. I’m purposely understating the size of the Restoration Economy to avoid accusations of exaggeration, because no one (yet) has an accurate tally [as we’ll see in Chapter 4].)

When formal recognition of the realm of restorative development begins, the Restoration Economy will accelerate its already impressive rate of growth. This heightened pace will encompass research, business, and technology. It will also spawn numerous new professional disciplines.

This book is designed to (1) help readers perceive the Restoration Economy, (2) stimulate the “gelling” of its multitudinous disciplines and organizations as a technical and economic community, and (3) guide business, investment, NGO (nongovernmental organization), and government leaders towards related revenue-generating opportunities.

OPENING OUR EYES TO THE RESTORATION ECONOMY

What does this restorative activity look like? Looking from the window of my riverfront Old Town Alexandria, Virginia office, I see Washington, D.C.’s National Airport being restored on my left. The airport project combines three types of restorative development: replacement, adaptive reuse, and historic restoration. The first phase—replacement of several old buildings with the gorgeous new main terminal—is complete and has put \$450 million into a variety of deserving pockets. During that construction, an old hangar was adaptively reused for several years as an interim terminal. The second phase will be a complete restoration of the historic main terminal building, built in 1941.

Continuing this survey from my office window, we find, next to the airport, the 50-year-old Pentagon, which had started a 15-year, \$3 billion renovation/reconstruction project even before terrorists plunged an airliner into it. On my right is the about-to-be-restored (via replacement) Woodrow Wilson Bridge, projected to cost around \$2.5 billion. Just beyond the Wilson Bridge, at the mouth of the Potomac, is Chesapeake Bay, the world’s largest (and once it’s most economically valuable) estuary.

The collapse of the Chesapeake’s fish, shellfish, and crab harvests over recent decades stimulated a number of “expensive” pollution reduction

efforts over the years, with some measurable results. But on March 8, 2000, we moved beyond simple pollution control when the Clinton administration announced the \$100 million Chesapeake Bay restoration program, jointly funded with Virginia. This first phase tackles 35,000 acres of land, streams, and rivers, and is just the start of a three-state effort to conserve and restore a million acres of Chesapeake watershed. I can't see the bay, though, so we won't include those funds in this visual accounting.

Now let's look at the *new* development around me. On a clear day, I can make out five distant cranes where new office buildings are going up in downtown D.C. But casting the net that far away would also pull in a cornucopia of restorative development, especially infrastructure, historic buildings, monuments, and museums. Included would be the \$100 million restoration of the National Archives, begun in 2001, and the \$8.5 million restoration of the gorgeous U.S. Botanical Gardens building, completed in 2001.

So let's stick to my immediate area, from the Pentagon to the north, and south to the Wilson Bridge. There's just one significant new office building going up (at a cost of about \$40 million), plus a hotel and a few condos. Adjacent to the Wilson Bridge, on the Maryland side of the Potomac, 260 acres of riparian wetland is trying to become the problematic \$560 million National Harbor hotel, retail, and convention center complex. And that's about it for new development visible from my office.

Here's the point of this superficial survey: despite the fact that the National Harbor complex is the largest single commercial development project in Maryland's entire history, the \$6 billion of nearby restoration activity dwarfs the new development activity, by a factor of ten. Although this is a higher differential than you'll usually find west of the Mississippi, it's similar to many older eastern cities, even taking into consideration the unusually large size of the Pentagon and Wilson Bridge projects.

My visual inventory didn't mention the ubiquitous but less visible restoration activities in my local area. These include the sewer rehabilitation that's a monstrous problem over in D.C., the restorations of the Potomac and Anacostia Rivers, numerous eight- and nine-digit brown-field redevelopment efforts, and a multitude of historic residential restorations. The infamous "Mixing Bowl" interchange on I-95 (just south of D.C.) is also being rehabilitated, at a cost of about \$700 million.

Of course, there are many less visible *new* development projects, but the 10:1 ratio is likely to hold up pretty well in this neighborhood after everything is factored in. Nor does my survey include the less visible

aspects of restorative development, such as related educational activities. A 1995 survey of 51 U.S. universities revealed that 11 had graduate programs in restoration ecology (at that time, many European universities had undergraduate degrees in the subject, but no graduate programs). Bottom line: you'll be shocked to see how much restoration is going on around you, once you're sensitized to it.

What does this mean for you or your organization? If a sizeable portion of your business, your investments, or your community economic development plan is not related to restoration in some way, you're missing out on the greatest growth frontier of the twenty-first century. The good news is that, even though it already accounts for over a trillion dollars worldwide, many restorative development industries are not only still young, they are still being birthed.

Humankind seems to prefer change to derive from intelligent—or at least visionary—"leadership" at the top. But the low-profile, bottom-up emergence of the Restoration Economy is actually nature's way. Algae, invertebrates, and vertebrates were forming complementary relationships and communities millions of years before the structures and communities we call coral reefs came into existence. Trees grow thousands of root hairs, rootlets, subterranean fungal communities, etc., long before the first leaf breaks through the mulch. Even humans tend to build businesses, farms, and houses long before someone decides to identify a community and build public infrastructure, schools, churches, and other structures. (Modern exceptions are planned "smart growth" and "New Urbanist" communities. Historical exceptions include factory towns and nineteenth-century utopian experiments like Robert Owen's hybrid utopian factory town of New Lanark, Scotland.)

So, the fact that a plethora of restoration-oriented businesses and scientific disciplines already exist shouldn't make readers feel like they've been living under a rock. We've all been missing the big picture.

THE TURNING POINT

By opening an EcoDeposit account, individuals and institutions can support community development and ecosystem restoration in the coastal temperate rainforest of the Pacific Northwest.

—Shorebank Pacific, promotional material, 2001

[the bank's investments are increasingly focused on restoration of ecosystems, watersheds, farms, brownfields, and communities]

Sometime during the late 1990s, possibly the most important turning point in the economic development of the United States (and most other industrialized nations) was reached, and almost nobody noticed. For the first time in U.S. history, the restoration portion of many key sectors of our economy exceeded that of new development, and that of maintenance/conservation.

Only idiots make predictions in print—especially with numbers attached—but I’m having a moment of lunacy: sometime between 2012 and 2020, restorative development will account for over 50 percent of all development-related expenditures in the United States and Europe. This means that it will be larger than new development and maintenance *combined*. There will also be a highly significant amount of peripheral economic activity, such as the products and services these restorative organizations will require.

We’re reaching a “tipping point.” We’re on the verge of the inevitable transition from an economy based on new development to one based on restorative development—as have most long-lived civilizations before us. This shift is germinating a gargantuan new category of business opportunities that will dominate the rest of this century. Passing this tipping point might take another decade, but once we’ve entered a full-blown Restoration Economy, nothing will be able to reverse the momentum. As with all evolution, there will be winners and losers: those organizations unable to evolve out of new development mode will certainly be the losers.

Even more surprising than restorative development’s current size is its rate of growth, by far the fastest of the three modes of the development life cycle. A few professionals are uniquely positioned to notice this new development–restorative development turning point. One of those is Ellen Glew, Managing Director of Restore Media LLC, the firm that produces the “Restoration & Renovation Exhibition and Conference” twice a year. Glew has heard estimates of restoration’s market share growth that exceed 80 percent of the entire U.S. construction economy by 2010.

Whether the 2010 level turns out to be 65 percent or 85 percent, there is zero doubt that restoration is where the growth is. This situation will remain so until development of outer space, “the final frontier,” exceeds our enterprise here on Earth. Therefore, holding one’s corporate breath until new development regains the throne and this “restoration craze” is over will be a disastrous strategy. In fact, there are major areas of development—such as public infrastructure—in

which reconstruction and restoration already account for over 75 percent of expenditures.

Future historians may designate the year 2000 (they like round numbers) as the birth of the global Restoration Economy; the point at which centuries of one-way development reversed direction. “One-way” means forest into farm; wetland into factory; clean air/water into toxicity; living soil into lifeless dirt, depletion of non-renewable resources, etc.—with no counterbalancing activity in the opposite direction. We’re finally abandoning our addiction to building more of what we no longer want more of, while the desirable assets we already have, both built and natural, deteriorate, die, or disappear.

The new direction is to reverse that deterioration on all fronts, focusing on quality of function and diversity of components, rather than just more and bigger stuff. Businesses and governments are learning how to produce more assets and more health—not just more money—as a result of each profitable transaction. Of course, restoration itself isn’t new; what’s new is its adoption on such a massive, commercial scale, especially by developers.

Huge, burgeoning outlays of public and private funds are actively restoring our built and natural environments, and, in the process, our societies and economies. Defunct, century-old factories are becoming mixed-use retail and residence complexes. Flood-inducing denuded hills are being replanted. Fish are returning to rivers that have been freed of their engineered straightjackets. Decrepit inner cities are being revitalized. Decontaminated industrial sites are becoming parks, shopping centers, and residences. Decayed archaeological sites are being restored into vibrant tourism assets. And so on, all around the planet, even in countries that haven’t yet been fully industrialized.

Less developed nations also have fast-growing restorative development sectors, though they are generally a decade or so out of sync with industrialized countries. Their nascent Restoration Economies also tend to have different foci, due to their fast-growing populations and lesser amount of industrial and public infrastructure.

We are now in the “**Re**” century, when redevelopment displaces development, reconstruction outpaces construction, redesign is more common than design, reuse betters use, repaving keeps more people busy than does paving, reengineering dominates engineering, renew dethrones new, and revitalization supplants devitalization. We’re finally kicking our self-destructive addiction to sprawling new growth and replacing it with healthy, sustainable regrowth.

What's the big deal? Why is our transition to an economy based on restorative development, as opposed to new development, so important? Here are just three key factors:

1. Restorative development comprises the most efficacious remedy for many of our most pressing social and economic ills, addressing all spheres of activity: international, urban, rural, workplace, family, and individual.
2. Restorative development is the best way to breathe new life into both conservation (which is an insufficient balance to new development) and sustainable development (which has been progressing far too slowly). In the process, restorative development is becoming the solution to both our ecological crisis, and the economic/national security problems stemming from our impending natural resource crises.
3. Restorative development's coming dominance comprises the largest new category of business threats and opportunities, and is far more "real", more substantial, and more rewarding than the rise of the Internet and e-commerce ever were.

HOW RESTORATION'S GROWTH IS REFLECTED IN OUR PRINT MEDIA

The growth of restorative development has reduced new development's market share, and nowhere is that situation more apparent than in the pages of *Urban Land*, the excellent monthly magazine of the Urban Land Institute (ULI). ULI is an organization of private land developers, architectural/engineering firms, mayors, and other professionals interested in the future of our metropolises. If the forces of new development were going to rebel against restorative development's invasion anywhere, this is where you'd expect to see it, either in articles attacking the intruder, or simply in the publication's turning a blind eye to restoration's presence.

Instead, the contents of almost every issue are generally devoted to about two-thirds restorative development, and one-third new development. Themed issues are often closer to 100 percent restorative development. Adaptive reuse, historic restoration, infill, brownfields reindustrialization, waterfront revitalization, urban stream restoration, military base redevelopment . . . such articles comprise the majority of every issue, with just a token smattering of new development.

As we'll see later, this is why restorative development has exploded with so little controversy: rather than putting new developers out of busi-

ness, it has seduced them via a combination of greater profits and more interesting projects. Industry leaders saw something better, and they abandoned new development with hardly a backward glance. New developers morphed into restorative developers.

The industries of maintenance/conservation have less of a “philosophical” clash with restorative development, so you’ll find that most of their relevant publications are loaded with restorative content.

For instance, *Land and Water* magazine, founded in the mid-1900s, serves major landowners, contractors, government engineers (soil and water districts, departments of transportation, etc.), and landscape architects. It used to call itself “The magazine of water management and erosion control,” but in 1992, its publishers saw the future. Reflecting the changing interests and activities of its readership, the magazine’s slogan changed to “The magazine of natural resource management and restoration.” Likewise, *Old-House Journal*, launched over three decades ago, changed its slogan in February 1999 to “The *Original* Restoration Magazine,” in reaction to the recent onslaught of competition from other restoration-focused periodicals.

Looking at the table of contents of the average issue of *Land and Water*, the reality is even more obvious, because over half of the content is usually about restoration. It should be noted that this is not a “green” magazine: it’s not normally read by environmentalists or ecologists. Many of the articles deal with engineering approaches from the bad old days, such as “controlling” floods with levees, and you’ll still see titles like “Taming Those Urban Streams” (the trend is toward “rewilding”). The restorative impact is clear, though, in the titles of ten out of sixteen articles, taken from a randomly selected issue (Jul/Aug 2001). All deal with restoration or wildlife habitat creation, though that’s not always evident in the titles:

- “Land Reclamation: Creation of Peck Farm Park’s Dolomite Prairie”
- “A Beautiful Urban Tributary Stream Is Unearthed”
- “Pond Apple Habitat Wetlands Restoration”
- “Wetlands Mitigation Paves the Way for Pennsylvania Highway Project”
- “The Ideal Roadside Seed Mix: A Lesson in Native Seed Design”
- “Management of Invasive Species in Restoration Projects”
- “Illinois’ Premiere Streambank Restoration”
- “Pueblo of Santa Ana Bosque Restoration”
- “50 Years of Land Improvement”
- “Rehabilitation and Revegetation of a Landslide”

The same goes for popular (as opposed to professional) publications. The August 1999 issue of *Islands* [travel] magazine had a “millennial” special section called “The Future of Islands,” profiling 10 projects that demonstrated trends crucial to island development in the twenty-first century. It didn’t have an explicit restoration theme, but

- the first article referred to “the *resurrection* of traditional culture” and described the use of indigenous materials to contain and *remediate* a disastrous oil spill at sea [all emphases added, including all below];
- the second and third dealt with conservation and passive *restoration* of fisheries and indigenous medicinal plants (and related knowledge);
- the fourth article profiled Stanley Selengut, the ecotourism developer who designed and was the original owner of Daniel’s Head Village, a Bermuda resort based on *restorative development* (featured in Chapter 15 of this book);
- the fifth article, “*Restoring Rare Species*,” contained this passage: “. . . the Soskos could become one of the greatest resorts-plus-wildlife sanctuaries on earth, because of its outstanding opportunities to *restore* muntjac deer, pangolins, civets, and ferret badgers.” About biologist James Lazell, writer Susan Yim said, “He’s also had great success *reintroducing* species to places where they once lived—in a sense, *restoring species back to the future*.” Lazell himself was quoted as saying, “The good news is that there are people out there besides me trying to save the natural diversity of islands and *restore* them”;
- the sixth article profiled Desmond Nicholson’s Antigua projects: “Nicholson has helped in the dockyard’s *restoration* and is now . . . *rebuilding* a naval officer’s [1855] house for use as the Nelson’s Dockyard Museum [which] is a model for the *transformation of historic buildings* throughout the Caribbean”;
- the seventh discussed conservation and passive *restoration* of fruit bats in Micronesia, because the trees need their pollination services, and increased trees would “*replenish* soil fertility”;
- the eighth article dealt with heritage *restoration* and *adaptive reuse* on Dominica (one of my favorite places). Describing artist Lennox Honychurch, Yim said he might be found “directing the *restoration* of a historic 18th Century fortress . . . [or] *converting* an old marketplace into a craft market and museum . . .”;

- the ninth profiled a story of preserving and *revitalizing* native arts via “increased respect for the few remaining women of Mindanao who maintain the body of textile skills and lore”;
- tenth was an article on *restoring* native plant species—and *rehabilitating* military damage—on Lanai, Hawai’i, through commercial cultivation of indigenous species: “They’re often rare and endangered,” [Jon Kei] Matsuoka says, pointing out that these plants are intended for *reforestation* on the island of Kahoolawe, which for years was a U.S. navy bombing target. (Another wonderful project that I wish I had space to describe further.)

Whether or not *Island’s* editors noticed the continual thread of restoration in this issue, they certainly had picked up on our entry into “the Century of Restoration.”

What Restorative Activities Is this Book Not Including?

Many restoration industries have appeared or expanded quite recently, but there are many old, stable restorative professions and industries. This well-established, slower-growth side of restorative development also includes rehabilitating paleontological or archaeological finds, restoring classic vehicles (boats, aircraft, cars, carriages, etc.), and so on.

One might wonder what such “trivial” hobbyist activities or luxury items have to do with revitalizing our world. Am I going to treat every restorative activity as a part of the Restoration Economy? If so, does that make it good or important? For the purposes of this book, the answer is twofold: (1) yes, almost every restorative activity can be considered part of the realm of restorative development, and (2) no, not all will be included in this book.

What is the conceptual difference between restoring an antique motorcycle and restoring a bridge, or between restoring an heirloom gold brooch and restoring a historic home? All add value to existing assets. Both increase wealth without significantly depleting wealth or health elsewhere. The main difference is the size of the project, and the number of people who benefit. That said, there will be few mentions of hobbyist-, art-, or museum-related restoration in these pages.

Professional and Organizational Opportunities Abound

How wonderful it is that nobody need wait a single moment before starting to improve the world.

—Anne Frank, *The Diary of Anne Frank*

Opportunities in restorative development are not limited to the biologists, contractors, doctors, civil engineers, and large companies that you'd expect to be associated with solving the problems of insufficient space, aged infrastructure, or deteriorating environmental (and human) health.

A wide range of restorative professions, products, and services is emerging: from software and seminars, to stoneworking tools and model ecosystems, to videos and tours. Also needed are entirely new inventions for performing restorative work, along with a profusion of new, restoration-related service companies, NGOs, professional societies, and consultants.

We're good at taking things apart. We need to learn how to put them together. If you think you can't make money in restoration, [just] take your car into the shop or your body to the doctor.

—David Brower with Steve Chapple, *Let the Mountains Talk, Let the Rivers Run*, 1996

Young and old, organizations and professionals, public and private—all are delightedly exploiting these lucrative new markets, these eight industries of restorative development. Around the turn of the millennium, Dr. Joseph Westphal, the assistant Army secretary for civil works (the civilian responsible for overseeing the Army Corps of Engineers) told the Corps' leaders, "I think our real next opportunity is to be ready to build the infrastructure man will need to settle the planets."

A new frontier such as outer space will certainly revive the new-development portion of our economy, but it won't happen tomorrow. To find today's unlimited frontier of opportunity, we must look "behind" us, at the territory we've already settled or exploited.

OTHERS HAVE SEEN THIS COMING

This is not the first book to mention the concept of a "Restoration Economy":

- Paul Hawken's wonderful *The Ecology of Commerce* (1994) discussed the theoretical possibility of, and need for, a "restorative economy" and offered a few early examples.
- In Stewart Brand's modern classic, *How Buildings Learn* (1994), he repeatedly demonstrates (in a chapter titled "Unreal Estate") how insufficient attention to the restoration and reuse of buildings has been undercutting our economy.
- William Jordan III, founder of the journal *Ecological Restoration* has long discussed how restorative activities often animate profound

changes in cultural values. In 1997, Eric Higgs (in an article entitled “What is Good Ecological Restoration?” that appeared in the *Journal*) posited restoration as a distinct cultural mode.

However, I believe mine is the first book to unite the restoration of both natural and built environments. I further believe this to be the first book to document the rise of a *real* Restoration Economy, rather than “merely” envisioning or hoping for one.

Randy Stemler . . . is the program manager for the MRC Reforestation Program. It’s part of what he calls the “restoration economy.” “There’s a lot of money being spent locally focused on natural resource reinvestment. We go in and identify sites where it’s biologically appropriate to do reforestation. Then I arrange for financing, train the crews and plant trees where they were once growing.” In its 10 years of operation the program has been sponsored by several northern California catalog companies. Smith and Hawken was the first.

—**Bob Doran**, “If you rebuild it . . . will they come back?” *North Coast Journal Weekly*, March 2, 2000 [discussing the 18th Annual Salmonid Restoration Conference and the work of the Mattole (watershed) Restoration Council]

These first two decades of the new millennium comprise the greatest window of opportunity. During this period, healthy organizations will learn to perceive restorative development’s often-camouflaged opportunities in their eight favorite hiding places:

- Ecosystem and species restoration
- Aquifer recharging and waterway/watershed “rewilding”
- Estuary, reef, and pelagic fishery regeneration
- Rural economic revival and farm redevelopment
- Brownfields remediation, and redevelopment of closed military bases
- Utility restructuring and public infrastructure rebuilding
- Heritage site renovation/adaptive reuse of historical buildings
- War reconstruction, resettlement, and disaster recovery

As mentioned in the Preface, I’ve spent much of my last 20 years exploring our planet’s last remaining healthy jungles, reefs, and other ecosystems. I must be a masochist, because I return to some of my favorite nature spots from time to time. This allows me to perceive their decline, which is often tragic to the point of lumpy throat and leaky eyes. I’ve simultaneously encountered almost universal degradation of communities and cultures. This, too, is deeply tragic, and profoundly moving.

After witnessing a lifetime of marginally successful environmental efforts, failed urban revitalization plans, and the general decrease of satisfaction with our lives and our world in general, a bright light has suddenly appeared at the end of the tunnel.

In every development-related industry I surveyed over the past four years, what has been most exciting to the investors and business planners has been the growth of restorative projects. This made me realize that tremendous untapped growth potential was awaiting the day that this immense economic sector came together and was recognized.

The first step towards this goal is giving it a name: the Restoration Economy. Come with me now on a guided tour of this unlimited new realm of economic growth, social revitalization, and planetary health.



Part One

The Transition from Our “New Development” Past to Our “Restorative Development” Future

Restorative development: A mode of development that increases the health or value of existing assets without (or with minimal) destruction of other assets, and without significantly increasing the restored assets’ geographic or ecological footprints.

—one of several working definitions (by author)

The goal of Part One is to familiarize readers with the general nature of restorative development and its underlying history, dynamics, drivers, and cycles.

This section offers generalized, big-picture insights designed to help organizational and governmental leaders understand the basic nature and underlying causes of the dominant macrotrend of the twenty-first century: the growth of restorative development. This is the factor they can least afford to ignore when formulating their developmental strategies.

Chapter 1 will review the three global crises that are driving restorative development’s rapid growth. I’ve labeled them the Constraint Crisis, the Corrosion Crisis, and the Contamination Crisis. Chapter 2 will explore the concept of looking at development from a life cycle point of view, which divides it into the three modes of new development, maintenance/conservation, and restorative development.

Chapter 3 will step back and provide a little historical perspective on restorative development. Chapter 4 will wrap up this first section by examining the question that, more than any other, seems to leave more people scratching their heads: how in the world did we accumulate such a broad expanse of related multibillion-dollar industries without noticing it much earlier?

Although you'll probably be surprised by the size of our existing restoration industries, the real eye-opener is that none of them is close to mature. Many are very, very new. Despite their already impressive rapid rates of growth, two new factors will accelerate these restorative industries at an even more astonishing pace in the coming decade.

The first factor is the simple recognition of the Restoration Economy's existence, its encompassing of both the built and natural environments, and its eight restoration industries. The second factor is the onset of integrated restoration, a practice that will spawn myriad new professional disciplines, research programs, design and consulting services, and entirely new industries. This book offers only brief flashes of the trend toward integration; this trend deserves its own book, and will get it.

The Restoration Economy will thus attempt to

1. raise awareness of why restorative development has emerged in such vast proportions, and why its advent has been both rapid and unheralded;
2. broadly define the restoration markets with the most growth potential; and
3. provide some insight into issues that must be addressed by organizations responding to restorative development's threats and opportunities.

The major activities of the twenty-first century will restore our natural world, our built world, our social world, our work world, our family world, and even our “inner world” (the realm of spirit). We are maturing from the “exploit and run” behavior of raiders, to behavior befitting of long-term natives of our planet. We're developing a sense of place, creating a present that forms a viable connection between our past and our future. Let's now explore the frontier of this global restoration.



The Three Foundations of the Restoration Economy

To restore is to make something well again. It is mending the world. People have to believe there will be a future in order to look forward. To live in that future, we need a design. To pay the bills from the past, we need a means. . . . For those who say that times are tough, that we can ill afford sweeping changes because the existing system is already broke or hobbled, consider that the U.S. and the former U.S.S.R. spent over \$10 trillion on the Cold War, enough money to replace the entire infrastructure of the world, every school, every hospital, every roadway, building and farm. In other words, we bought and sold the world in order to defeat a political movement. To now assert that we don't have the resources to build a restorative economy is ironic, since the threats we face today are actually happening, whereas the threats of the post-war nuclear stand-off were about the possibility of destruction.

—Paul Hawken, *The Ecology of Commerce*, 1992

The sudden growth of restorative development is rooted in three crises. These crises emerge whenever an economy—global or local—remains dependent on new development for too long.

THE TWENTY-FIRST CENTURY'S THREE GLOBAL CRISES

1. The Constraint Crisis We're out of "painless" expansion room: every time we put property to a new use, we lose some other vital service it was providing. Wars and legal conflicts over territory and related natural resources are epidemic.

2. The Corrosion Crisis Most of our built environment is aged and decrepit; is wearing out faster than expected; or is based on old, wasteful, dysfunctional designs.

3. The Contamination Crisis The ecosystems that produce our air, soil, food, and water—and fueled our centuries of unbridled new development—are under great stress, as are the immune systems of both human beings and wildlife. Industrial, agricultural, and military contamination is largely to blame, and its damage is compounded, in a vicious cycle, by the reduced capacity of our damaged and destroyed ecosystems to cleanse the environment.

This chapter is an overview—not a thorough accounting—of these crises. Parts Two and Three, where we look at the restorative industries that are addressing these crises, contain a more detailed examination of these crises, and our restorative responses to them. This chapter scans the Three Crises from three perspectives: the U.S. economy, non-U.S. economies, and the global natural environment. The crises won’t be segregated from each other: they are inextricably intertwined. Nor will we always label them or point them out, as each is easily recognizable.

The Three Crises at Work in the United States

Almost all of our sewer and wastewater projects are rehabilitation these days. Even with urban sprawl, construction of new systems is a rarity. It’s true nationwide, but especially so here in the Northeast, where everything is so old.

—Howard B. LaFever, P.E., DEE, Executive Vice President, Stearns & Wheler Co.,
a 250-person engineering firm (conversation with author)

In 1998, the American Society of Civil Engineers (ASCE) issued a “Report Card on America’s Infrastructure.” It revealed, for the first time, the extent of one aspect of our built environment’s deterioration: a \$1.3 *trillion* backlog of desperately needed work on our public infrastructure. Our bridges, roads, sewage plants, solid/hazardous waste handling facilities, and educational institutions are crumbling before our eyes.

Although some of this \$1.3 trillion is for maintenance, by far the majority of funding is needed for renovation and replacement. Even more importantly, while \$1.3 trillion is a gargantuan number, it represents only public infrastructure—just one of eight major industries of restoration—and it’s only the U.S. portion.

But this book isn’t about bad news. Quite the opposite: Restorative development now accounts for hundreds of billions of dollars in the

United States alone, maybe a trillion, depending on how one defines it. Just two years after the first ASCE Report Card, a small but significant portion of the transportation renovation challenge had been funded. The June 1998 Transportation Equity Act (TEA-21), along with the TEA-21 Restoration Act of July 1998, addressed a significant chunk of the U.S. Corrosion Crisis. It increased spending over a six-year period by 70 percent, allocating over \$200 billion in federal funds to U.S. transportation infrastructure. States will add significantly to this amount.

Only 20 percent of these funds is for “new starts,” while about 25 percent is officially designated for restorative projects. But, almost the entire remaining 55 percent is allowed to be spent on restoration (as opposed to maintenance, like patching potholes), and most of it will be, according to conversations with several state Department of Transportation (DOT) officials.

There’s good news for the Contamination Crisis, too. Restoration is being funded by reallocating the budgets of some of the most harmful, out-of-control agencies of new development. The U.S. Army Corps of Engineers’ budget is being reallocated from new development to ecological, infrastructure, and watershed restoration, and the Corps is far from alone. The Department of Energy now spends billions cleaning up the petrochemical and radioactive mess it left all around the United States during the last half of the twentieth century.

The United States will account for more than its fair share of space throughout this book, so we won’t focus more on it here. Suffice it to say that one would be hard put to stand on any piece of American soil without seeing (or detecting with instruments) at least one significant impact of the Constraint, Corrosion, and/or Contamination Crisis.

The Three Crises at Work Around the World

Restoration ecology plays an important role in nature conservation policy in Europe today.

—Jörg Pfadenhauer, *Restoration Ecology*, June 2001

The trillion dollar-plus annual bill for restorative development is no surprise when we consider the Three Crises globally, especially when we factor in the crushing needs of former communist bloc countries. Many of them are economic and environmental basket cases (the two usually go hand in hand), and their problems are affecting us “First Worlders” more than we like to think, in terms of our health and our wealth.

The United States leads the world in many categories of restoration, but all other industrially developed countries are now moving along the restoration track at a similar pace. As a result, most U.S. and European firms that continue to concentrate on *new* development are being forced to shift their focus to Latin America, Asia, and Africa. Even in regions where new development is still strong, such firms will be missing many, often better, opportunities if they ignore the developing world’s fast-growing restoration markets.

Three recent announcements, one for each of the Three Crises, illustrate the magnitude of non-U.S. restoration.

1. Constraint (and Contamination) Crisis At the Brownfields 2000 conference in Atlantic City, New Jersey, Detlef Grimski, a project officer with Germany’s Federal Environmental Agency, revealed 304,000 (official) contaminated sites in Germany. The agency’s studies show that restoring just 320,000 acres of these “brownfields” could provide 28 percent of Germany’s housing construction needs, and 125 percent of its industrial construction needs.

However, both Germany’s construction industry and its government are stuck in new-development mode, destroying some 300 acres of rare, precious greenfields daily, while ignoring the wealth of brownfields. (“Wealth of brownfields,” a phrase I’ve heard at several conferences, is the sort of perverse language that’s endemic in the dying days of a new development-based economy.)

2. Corrosion (and Constraint) Crisis Developer Minoru Mori, President/CEO of Mori Building Co., Ltd., and a member of Japan’s Economic Strategy Council, has proposed a *trillion*-dollar restorative development plan for Tokyo, one of the world’s oldest and most crowded cities. “Revitalizing Tokyo and other major cities is the best way to revitalize the Japanese economy,” he claims.¹ It is part of an “Urban New Deal” policy he has presented to the Japanese government. It is strongly focused on cultural renewal, calling for a “true urban renaissance.”

3. Contamination Crisis On June 5, 2000, Romania, Bulgaria, Moldova, and Ukraine signed the “Green Corridor” agreement for the Danube River, which has more riparians (countries that border it) than any river in the world. It is Europe’s largest environmental restoration initiative ever, encompassing over 1.5 million acres of wetlands and riparian habitat. That’s just a beginning: “It is our vision that other coun-

¹ Management Visions for a Changing World: Japan’s CEOs Speak on the Record, “A Better Life: Revitalizing Japan,” *Forbes.com* [Special Advertising Section].

tries along the Danube will join this initiative for a full-length green corridor, connecting Danube countries from the Black Sea to the Alps, including many EU accession countries,” stated Romica Tomescu, Romania’s Minister of Waters, Forests and Environmental Protection.²

Worldwide disaster recovery—both war and natural—is a category of restoration that accounts for over a hundred billion dollars annually. And then there are non-war, non-natural, human-caused disasters: literally hundreds of significant oil spills, industrial explosions, chemical spills, toxic fires, and radiation leaks occur daily, worldwide. Someone once said that CNN could devote a channel solely to natural and human-made disasters—giving each item 10 seconds and never repeating a story—to fill each day’s programming.

Being more “real estate challenged” (Constraint Crisis) than the United States also puts Europe ahead on the new development vs. maintenance curve. Tim Broyd, Research and Innovation Director at the WS Atkins company in the United Kingdom, told me that his company had, ten years ago, about 2,200 employees and virtually all its business was in the design of new construction. Today, the company has about 7,500 employees, but 60 percent of its business is related to managing existing facilities, and much of what it counts as “new” construction is actually restorative work (or “refurbishment,” as the Brits tend to call it). Broyd says that such growth and profitability paths—switching from new development to maintenance and restoration—are now the industry norm.

The 1998 Yangtze River floods, which were largely caused by the clear-cutting of surrounding forests, killed thousands, obliterated entire communities, and caused massive migration and waterborne sickness. To address the resulting Constraint and Contamination Crises, the Chinese government launched an emergency \$12 billion reforestation program. That \$12 billion figure exceeds the Gross Domestic Product of Panama, and that of Costa Rica. In fact, it’s larger than the GDP of 113 of the 189 countries existing in 1999, and that sum represents only *one* of China’s many deforested watersheds. Unlike conservation efforts, where million-dollar projects make headlines, the word “billion” is quite common in restoration circles, at least at the national level.

The similarly huge reforestation projects that are needed worldwide would take pages to list. In early 2000, when deforestation-related floods devastated Mozambique, Zambia, and Madagascar, Mozambique asked

²Worldwide Fund for Nature (WWF), press release, June 5, 2000.

world donors for \$450 million to rebuild its nation. Millions are still suffering the effects of the floods—again greatly amplified by deforestation—caused by Hurricane Mitch in Honduras, El Salvador, and Guatemala, in October 1998. The more reforestation takes place, the fewer such devastating disasters. Reforestation fulfills many agendas beyond mere flood prevention: producing drinking and irrigation water, carbon sequestration, firewood-lumber-pulp supply, and recreational industries are just a few of the added benefits of reforestation. As the advantages of reforestation become better recognized, the funding for watershed restoration continues to increase.

Saying Goodbye to (Some of) New Development’s Ethical Problems

As has been extensively documented in recent years—even by the bank itself—the World Bank’s colossal dam, highway, and fossil fuel power projects almost unfailingly displace poor farmers. They also disrupt healthy portions of socioeconomic systems, and kill or degrade vital ecosystems, all while (usually) failing to provide the promised counterbalancing, short- or long-term benefits.

Further, the World Bank does not attempt meaningful remedies for people it has displaced, as many have noted. For example, Lori Pottinger of the International Rivers Network said in a *Wall Street Journal* article, “We’ve never had confidence in the World Bank’s ability to restore these people’s lives.” MIT professor of Law and Development Balakrishnan Rajagopal refers to the “violence of development.” He coined the term “development cleansing” to describe the way new development, such as dam building, usually takes place on the lands of poor and/or indigenous peoples, displacing them by the hundreds of thousands, in a process similar to ethnic cleansing, only with bulldozers instead of guns.

Trying to find ways to improve and revive the waning paradigm called new development is a recipe for frustration. The Constraint and Contamination Crises will provide development banks with many decades, even centuries, of work if they switch from new development to redevelopment. As we’ll see in Chapter 14, that’s exactly where the World Bank’s future may lie: restorative development.

On a cynical note, we could say that efforts in the first seven restorative industries—ecosystems, watersheds, fisheries, farms, brownfields, infrastructure, and heritage—decrease business in the eighth: disaster restoration. No worries, though: swelling (largely coastal) populations,

combined with global climate change, should ensure a burgeoning supply of lucrative disasters for the world's restorative A/E/C (architectural, engineering, contracting) firms. The fact that politically powerful lumber companies still get away with clear-cutting ensures that many fortunes will continue to flow from flood-related restoration for decades to come.

The Three Crises Have Been Masked by Three Myths

Men and nations do behave wisely, once all other alternatives have been exhausted.

—Abba Eban, *Vogue*, August 1, 1967

The environmental problems of new development derive from all three of the Three Crises. The Corrosion Crisis contributes to environmental problems in the form of outdated, toxic industrial facilities, obsolete sewage treatment facilities, antique fossil fueled power plants, etc. The Contamination Crisis's effects in this context are obvious.

But it's the Constraint Crisis that's most tightly linked to our ecological decline. If we keep expanding our population on a planet of finite size, simple logic plots a clear path to Armageddon. Restorative development can greatly delay the collapse and can even increase quality of life along the way, but there's no escaping the laws of physics. The universe might be expanding, but this planet isn't.

It took us only twelve years to go from five billion to six billion people. Several indicators show the rate of population growth decreasing, "thanks" in part to increased death rates due to starvation, dehydration, waterborne diseases, malaria, AIDS, cancers, and other health concerns, most of which are directly or indirectly related to the Three Global Crises. The average life expectancy in many African countries has plummeted in the past decade, dropping from 62 to 40 years in Botswana, and from 61 to 39 in Zimbabwe.

Unfortunately, many anti-family-planning forces have jumped on these lowered population growth estimates and said, "See? The population is going down!" They are confusing a slowing of increase with a decrease. The most optimistic forecasters say we might see world population entering a period of net decline toward the end of this century. But they are assuming that our current downward blip in birthrates is the beginning of a long trend. Hopefully, this will prove to be the case, but it's wise to remember that the largest group of youngsters the world has

ever seen—the children of the baby boomers—is entering its peak reproduction years.

Even if the trend toward smaller families continues, several factors point to a less-than-rosy scenario: the Three Crises have *all* been worsening at a rate that’s greater than the population growth rate. In the United States, development of greenfields (Constraint Crisis) has outpaced population growth by a factor of three in most areas. This means that even if the population froze at its current levels, all three crises would continue to intensify. Another factor is that all real population growth (that is, not driven by immigration) in the coming decades will take place in the developing world, which has the least ability to handle it. Without an equally intense growth of restorative development, this could lead to far greater political instability than we currently experience.

The Constraint Crisis isn’t driven solely by population growth. It’s partially driven by the increasing consumerism, and thus the larger ecological footprint, of developing countries’ citizens. But even U.S. citizens—who already consume 10 times more than the average world citizen—are *still* increasing our ecological footprints. The amount of real estate “required” by each U.S. homeowner has been growing quickly and steadily in recent decades and shows no signs of slowing.

Even if the most recent projections of a world population peak of “only” nine billion around 2070 turn out to be accurate, a continuation of this increasing-footprint trend means that the Constraint Crisis will follow a much steeper trajectory than that of population growth. And the Constraint Crisis will continue to worsen, even after the population peak has been reached. That’s bad news for the world in general; good news for real estate owners.

Our seeming inability to get a handle on our breeding, manage our resources properly, eliminate toxic and wasteful industries, and effect other reforms stems in large part from three common myths that cloud our perception of the Three Crises.

Myth #1: We’ve got lots of land available for development Those who oppose rational dialogue on the problems of human population growth often point to the planet’s enormous expanses of sparsely populated lands as proof that we’ve got almost unlimited room for expansion. What they don’t understand is that the problem isn’t that we don’t have enough land for more human residences and industries: there is *plenty*.

However, we’ve reached the point where new development usually means destroying some other, often irreplaceable, use for the land that

we also consider important, whether for agriculture, watershed, species survival, indigenous peoples, or just sanity-inducing open space. Almost every acre of arable land on the planet is either already being farmed, or has been paved or housed over. The no-win situation of having to sacrifice food, wildlife, commerce, watershed, or housing to get just one of those five uses—being forced to define a “highest and best use”—is emblematic of the Constraint Crisis.

From California’s Central Valley to the suburbs of Shanghai, houses are replacing farms, even while the world’s hunger grows. Geographic expansion of communities is increasingly undesirable, even in those few cases where it’s still possible. (The Earth’s inventory of real estate is actually shrinking in real terms, due to rising sea levels.) Witness the multi-lateral war on urban sprawl and corresponding focus on smart growth.

Meanwhile, much of the land that’s left is losing its value, due to desertification, salinization, contamination, and other ills. Both of these dynamics intensify a Constraint Crisis that’s primarily caused by population growth and poor land use.

Such dynamics make it even more obvious that the solution to the Three Crises of our aged new development-dependent economy is not to stop, or even slow, economic growth, but to develop as rapidly as possible in the opposite direction: restoration. The price tag for repairing our world will be huge, but that’s not a problem as long as it’s a profitable, rather than charitable, activity. (Fully restoring a Victorian house, e.g., usually adds more to the economic and the cultural capital of a community than does building a new house, and uses far fewer resources.)

Myth #2: The prime economic value of ecosystems is their products For centuries, our accountants have measured only the timber, fish, nuts, deer, etc., harvested from ecosystems. But all systems, human and natural, are based on both goods *and* services: Just as our human economy has switched its emphasis from manufacturing to services, so too must we start focusing more heavily on the service side of the natural economy. The services provided by Earth’s natural systems far exceed the value of their products.

Ecosystem services include air and water purification, genetic resource development/storage, healthful aesthetics, and carbon sequestration (turning atmospheric carbon dioxide into oxygen and nongaseous forms of carbon, such as wood, in order to mitigate global climate change). Were these systems to go “on strike” for even a few weeks, all human civilizations would quickly collapse. As long as our accounting

systems are blind to the services provided by ecosystems, we will undervalue them and will be unable to “manage” them intelligently (they’ve actually been managing us, without our knowledge or appreciation).

Myth #3: Our oil wells are almost dry, our mines almost empty Looking at this book’s Table of Contents, we might wonder why the text focuses so much on the natural environment, when most visible forms of restoration deal with the built environment. If it struck you in this manner, you might be the victim of a third common myth, one that hamstring the “green” strategic planning of many organizations.

Many people, including many government and business leaders, think that our impending natural resource shortages primarily involve antediluvian, non-renewable materials such as metals, phosphate, coal, natural gas, petroleum, and others. The reality is that we still have vast supplies of such materials, at least for current generations. Despite the fact that our oil consumption went from 57 million barrels per day in 1973 to 73 million in 2000 (and is expected to reach 110 million by 2020), known reserves have remained at about a trillion barrels, thanks to new discoveries.

The resources that are *actually* disappearing—at a catastrophically rapid pace—are the assets we’ve always assumed were inexhaustible, such as topsoil, fisheries, fresh water, clean air, and genetic wealth (e.g., crop diversity). In other words, we’re losing those things that are produced only by complex living systems. As Saudi oil minister Ahmed Yamani famously said, the Stone Age didn’t end because we ran out of stones, but because humans came up with better ways of doing things. Likewise, our switch to renewable, nontoxic sources of energy, raw materials, pharmaceuticals, and chemicals will derive from our desire for healthier, more enjoyable lives, not from exhausted mines or dry oil wells.

Human history becomes more and more a race between education and catastrophe.

—H. G. Wells, *The Outline of History*, 1920

That’s not to say excessive use of these buried treasures isn’t a problem. Overuse of non-renewable resources is directly linked to the Contamination Crisis: our dying ecosystems; our epidemics of asthma, cancers, depression, weakened immune systems, and other signs of toxicity. Present-day species and ecosystems evolved in a world where much of

our carbon and metal ores were out of circulation. The carbon had been sequestered by ecosystems, millions of years ago. Putting it back into circulation so suddenly has been equivalent to transporting wildlife to a different planet, or to a much earlier Earth: most plants and animals can't possibly adapt quickly enough.

The apologists of the new development realm aren't always ill informed, or even influenced by material gain; they're just removed from natural reality. Even those in the life sciences sometimes have little concern for wildlife. Some biologists join the "brown" industrialists in singing "don't worry, be happy," claiming that it's arrogance for humans to think we can kill the Earth, and that nature has nothing to worry about.

The only thing that ever consoles man for the stupid things he does is the praise he always gives himself for doing them.

—Oscar Wilde

They're right on the planetary scale, of course, but such cavalier attitudes dismiss as unimportant the irretrievable loss of thousands of ancient species. This biological, aesthetic, and spiritual tragedy would occur (and is occurring) long before we snuffed ourselves. (Humans would likely be among the last of the larger life forms to go, because we share the adaptable super-survivor traits of cockroaches, starlings, and Norway rats.)

Even if a miracle occurred and we made a rapid switch to renewable resources, the ecosystems we're expecting to churn out these renewables—fish, fresh water, timber, etc.—have already lost much of their ability to do so. Many of these systems can't passively recover on their own, even if vigorously protected, at least, not quickly enough to address the needs and impacts of our fast-growing human population. These systems need *active* restoration, at local, state, national, and global levels, which is a huge job. The largest, in fact.

Environmental and lifestyle-related illnesses (e.g., heart disease, asthma, cancers, and depression) are raging, as are plagues old and new (tuberculosis, malaria, AIDS, to name a few). The reduced ability of human immune systems and wildlife ecosystems to perform under the massive load of industrial and agricultural contaminants is no small factor in this situation.

The good news is that there are many lucrative opportunities in the recapture, re-use, and/or resequestration of the metals, gases, and elements that don't belong in our air, soil, or water in such vast quantities. If we want a return to pure, unlimited fresh water; wide, clean beaches;

rich, deep topsoil; and other vital needs, the only solution is to revive the living systems that produce them. Bringing such dying "resource manufacturing systems" (to use the language of the new-development realm) back to a state of high productivity is spawning new industries of immense proportions.

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