

Download File PDF The Vertical Farm Feeding World In 21st Century Dickson D Despommier

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The Vertical Farm Feeding the World in the 21st Century Picador

London is one of the world's leading cities. It is home to an extraordinary concentration and diversity of people, industries, politics, religions and ideas, and plays an important role in our highly globalised and tightly networked modern world. What does the future hold for London? Investigating any aspect of the city's future reveals a complex picture of interrelations and dependencies. The London 2062 Programme from University College London brings a new, cross-disciplinary and highly collaborative approach to investigating this complexity. The programme crosses departmental boundaries within the university, and promotes active collaboration between leading academics and those who shape London through policy and practice. This book approaches the question of London's future by

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considering the city in terms of Connections, Things, Power and Dreams.

Remediating deficits and managing disabilities has been a central preoccupation for clinical psychologists. Positive Psychology, in contrast, is concerned with the enhancement of happiness and well-being, involving the scientific study of the role of personal strengths and positive social systems in the promotion of optimal wellbeing. Alan Carr's Positive Psychology has become essential reading for anyone requiring a thorough and accessible introduction to the field. This new edition retains all the features that made the first edition so popular, including: accounts of major theories and relevant research learning objectives chapter summaries research and personal development questions suggestions for further reading measures for use in research glossaries of new terms. The book has also been completely updated to take account of recent research and major advances, and includes a new chapter on Positive Psychotherapy, an extended account of research on character strengths and virtues, and a discussion of recent ground-breaking research on emotional intelligence. This new edition of Positive Psychology will prove a valuable resource for psychology students and lecturers, as well as those involved in postgraduate training in related areas such as clinical psychology, social work, counselling and psychotherapy.

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Food matters. It is a basic human need, yet its availability in adequate, safe, nutritious and regular amounts for humans is by no means assured. While land and water for food production are both declining at alarming rates due to natural and human causes, the demand for food is still growing as populations all over the world increase. The unending questions – where food comes from; how it is grown; how climate change impacts the supply of vegetables and fish and what we can do about it; nutrition in diet; future new types of food that will be produced in factories; how safe is organic food and GMOs, etc – present some of the most pressing food-related issues everyone, from leaders and policymakers to corporate chiefs and man-in-the-street, needs to be aware of. This seminal book, *Food Matters*, by Professor Paul Teng and Manda Foo provides explanations to the many questions asked about today's food sources and quality. Written in prose that is easily understandable, it takes the reader through the fascinating story of the origin of our common foods, how they have changed in looks and their methods of production, and discusses many issues on the minds of consumers and governments. *Protecting Our Future, Volume 2*, completes the comprehensive examination of the cybersecurity threats to our nation's sixteen Critical Infrastructure Sectors begun in *Protecting Our Future, Volume 1*. Subject matter experts offer an in-depth analysis of

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operational needs and suggest best practices within the remaining sectors: IT, the chemical industry, commercial facilities, manufacturing, water systems and dams, emergency services, food and agriculture, and transportation. Used separately or together, these two volumes are an excellent foundational resource, and will enable cybersecurity practitioners, students, and employers to gain ground-level insight from experienced professionals, and to develop top-of-mind awareness in the areas most directly impacting the future of our nation's security.

Each century has its own unique approach toward addressing the problem of high density and the 21st century is no exception. As cities try to cope with rapid population growth - adding 2.5 billion dwellers by 2050 - and grapple with destructive sprawl, politicians, planners and architects have become increasingly interested in the vertical city paradigm. Unfortunately, cities all over the world are grossly unprepared for integrating tall buildings, as these buildings may aggravate multidimensional sustainability challenges resulting in a "vertical sprawl" that could have worse consequences than "horizontal" sprawl. By using extensive data and numerous illustrations this book provides a comprehensive guide to the successful and sustainable integration of tall buildings into cities. A new crop of skyscrapers that employ passive design

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strategies, green technologies, energy-saving systems and innovative renewable energy offers significant architectural improvements. At the urban scale, the book argues that planners must integrate tall buildings with efficient mass transit, walkable neighbourhoods, cycling networks, vibrant mixed-use activities, iconic transit stations, attractive plazas, well-landscaped streets, spacious parks and engaging public art. Particularly, it proposes the Tall Building and Transit Oriented Development (TB-TOD) model as one of the sustainable options for large cities going forward. Building on the work of leaders in the fields of ecological and sustainable design, this book will open readers' eyes to a wider range of possibilities for utilizing green, resilient, smart, and sustainable features in architecture and urban planning projects. The 20 chapters offer comprehensive reading for all those interested in the planning, design, and construction of sustainable cities.

In recent years, the global economy has struggled to meet the nutritional needs of a growing populace. In an effort to circumvent a deepening food crisis, it is pertinent to develop new sustainability strategies and practices to provide a stable supply of food resources. *Urban Agriculture and Food Systems: Breakthroughs in Research and Practice* is an authoritative resource on the latest technological developments in urban agriculture and its ability to supplement current food systems. The content within this publication represents the work of topics such as sustainable

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production in urban spaces, farming practices, and urban distribution methods. This publication is an ideal reference source for students, professionals, policymakers, researchers, and practitioners interested in recent developments in the areas of agriculture in urban spaces.

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This volume introduces an innovative tool for the development of sustainable cities and the promotion of the quality of life of city inhabitants. It presents a decision-support system to orient public administrations in identifying development scenarios for sustainable urban and territorial transformations. The authors have split the volume into five parts, which respectively describe the theoretical basis of the book, the policies in question and indicators that influence them, the decision-support system that connects indicators to policies, the case study of Ancona, Italy, and potential future directions for this work. This volume is based on transdisciplinary research completed in May 2016 that involved about 40 researchers at The University of Camerino, Italy and other European universities. With purchase of this book, readers will also have access to Electronic

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Supplementary Material that contains a database with groups of indicators of assessment of urban quality of life and a toolkit containing the data processing system and management information system used in the book's case study.

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Meat -- Wheat -- Sugar -- Risk -- Violence -- Metabolism -- Bodies -- Earth -- Acceleration.

This book offers a transdisciplinary perspective on the concept of "smart villages" Written by an authoritative group of scholars, it discusses various aspects that are essential to fostering the development of successful smart villages. Presenting cutting-edge technologies, such as big data and the Internet-of-Things, and showing how they have been successfully applied to promote rural development, it also addresses important policy and sustainability issues. As such, this book offers a timely snapshot of the state-of-the-art in smart village research and practice.

This book brings together in a single volume a grand overview of solutions - political, economic, and scientific - to social and environmental problems that are related to the growth of human populations in areas that can least cope with them now. Through progressive adaptation to social and environmental changes projected for the future, including population growth, global warming/climate change, water deficits, and increasing competition for other natural resources, the world may be able to achieve a fair degree of sustainability for some time into the future.

We cordially invite you to attend 2013 International Conference on Frontiers of Environment, Energy and

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Bioscience (ICFEEB 2013), which will be held in Beijing, China during October 24–25, 2013. The main objective of ICFEEB 2013 is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Environment, Energy and Bioscience. This conference provides opportunities for the delegates to exchange new ideas and experiences face to face, to establish business or research relations and to find global partners for future collaboration. ICFEEB 2013 received over 400 submissions which were all reviewed by at least two reviewers. As a result of our highly selective review process four hundred papers have been retained for inclusion in the ICFEEB 2013 proceedings, less than 40% of the submitted papers. The program of ICFEEB 2013 consists of invited sessions, and technical workshops and discussions covering a wide range of topics. This rich program provides all attendees with the opportunities to meet and interact with one another. We hope your experience is a fruitful and long lasting one. With your support and participation, the conference will continue its success for a long time. The conference is supported by many universities and research institutes. Many professors play an important role in the successful holding of the conference, so we would like to take this opportunity to express our sincere gratitude and highest respects to them. They have worked very hard in reviewing papers and making valuable suggestions for the authors to improve their work. We also would like to express our gratitude to the external reviewers, for

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providing extra help in the review process, and to the authors for contributing their research result to the conference. Special thanks go to our publisher DEStech Publications. At the same time, we also express our sincere thanks for the understanding and support of every author. Owing to time constraints, imperfection is inevitable, and any constructive criticism is welcome. We hope you will have a technically rewarding experience, and use this occasion to meet old friends and make many new ones. Do not miss the opportunity to explore in Beijing, China. And do not forget to take a sample of the many and diverse attractions in the rest of the China. We wish all attendees an enjoyable scientific gathering in Beijing, China. We look forward to seeing all of you next year at the conference. The Conference Organizing Committees October 24–25, 2013 Beijing, China *Growing Compact: Urban Form, Density and Sustainability* explores and unravels the phenomena, links and benefits between density, compactness and the sustainability of cities. It looks at the socio-climatic implications of density and takes a more holistic approach to sustainable urbanism by understanding the correlations between the social, economic and environmental dimensions of the city, and the challenges and opportunities with density. The book presents contributions from internationally well-known scholars, thinkers and practitioners whose theoretical and practical works address city planning, urban and architectural design for density and sustainability at various levels, including challenges in building resilience against climate change and natural disasters, capacity and integration

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for growth and adaptability, ageing, community and security, vegetation, food production, compact resource systems and regeneration.

This book provides a thought provoking outline of the solutions already in hand to the challenges now facing humanity with respect to prevalent gross social and economic inequalities, ecological thresholds and tipping points, and the ever-looming threat of climate catastrophe. The authors find these solutions in the arenas of renewable energy systems, agroecological methods, and reimagined social organization. Clarity is brought to the political economic obstacles standing in the way as well as the false solutions and alleged barriers that pervade the discourse thereby delaying and obstructing progress to the solutions advanced. The authors provoke readers to face up to these challenges by demonstrating how people, all over the world, have already begun this effort through collective action ranging from the local to the global community. Drawing on their own and many other scholar's research, they reject a reliance on the 'business as usual' approach trusting the capitalist market and existing global institutions, and provide an accessible popular account with thoroughly footnoted endnotes that contain technical details and references to the scientific literature. The Earth is Not for Sale informs its readers and provides well-documented solutions in a bid to inspire readers to think critically, and potentially become more active in society.

The Council on Tall Buildings and Urban Habitat has produced four Technical Guides to date, since the series

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launched in late 2012. Each of these guides is the product of a CTBUH Working Group—committees formed specifically to address focused topical subjects in the industry. The intention of each guide is the same—to provide working knowledge to the typical building owner or professional who wants a better understanding of available options for improving tall buildings, and what affects their design. The object of the series is to provide a tool-kit for the creation of better-performing tall buildings, and to spread the understanding of the considerations that need to be made in designing tall. This technical guide offers an extensive overview of the use of vertical vegetation in high-rise buildings, an indepth analysis of green walls, definitions and typology, including standards, policies and incentives. It features comprehensive case studies, along with architectural theories of the public and private benefits of green walls. The book delves into architect-design considerations and limitations, the effects of green walls on energy efficiencies and includes recommendations and future research.

"The vertical farm is a world-changing innovation whose time has come. Dickson Despommier's visionary book provides a blueprint for securing the world's food supply and at the same time solving one of the gravest environmental crises facing us today."--Sting Imagine a world where every town has their own local food source, grown in the safest way possible, where no drop of water or particle of light is wasted, and where a simple elevator ride can transport you to nature's grocery store - imagine the world of the vertical farm. When Columbia professor

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Dickson Despommier set out to solve America's food, water, and energy crises, he didn't just think big - he thought up. Despommier's stroke of genius, the vertical farm, has excited scientists, architects, and politicians around the globe. Now, in this groundbreaking book, Despommier explains how the vertical farm will have an incredible impact on changing the face of this planet for future generations. Despommier takes readers on an incredible journey inside the vertical farm, buildings filled with fruits and vegetables that will provide local food sources for entire cities. Vertical farms will allow us to: - Grow food 24 hours a day, 365 days a year - Protect crops from unpredictable and harmful weather - Re-use water collected from the indoor environment - Provide jobs for residents - Eliminate use of pesticides, fertilizers, or herbicides - Drastically reduce dependence on fossil fuels - Prevent crop loss due to shipping or storage - Stop agricultural runoff Vertical farms can be built in abandoned buildings and on deserted lots, transforming our cities into urban landscapes which will provide fresh food grown and harvested just around the corner.

Possibly the most important aspect of vertical farms is that they can be built by nations with little or no arable land, transforming nations which are currently unable to farm into top food producers. In the tradition of the bestselling *The World Without Us*, *The Vertical Farm* is a completely original landmark work destined to become an instant classic. With a Foreword by Majora Carter

This book is an intellectual discourse and a concise compendium of current research in Architecture and Urbanism. Primarily, it is a book of readings of 24

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chapters. The book brings together theories, manifestos and methodologies on contemporary architecture and urbanism to raise the understanding for the future of architecture and urban planning. Overall, the book aimed to establish a bridge between theory and practice in the built environment. Thus, it reports on the latest research findings and innovative approaches, methodologies for creating, assessing, and understanding of contemporary built environment.

The frontiers of technologies have been constantly expanded in many industries around the world, including the agricultural sector. Among many “frontier technologies” in agriculture, are protected agriculture, precision agriculture, and vertical farming, all of which depart substantially from many conventional agricultural production methods. It is not yet clear how these technologies can become adoptable in developing countries, including, for example, South Asian countries like India. This paper briefly reviews the issues associated with these three types of frontier technologies. We do so by systematically checking the academic articles listed in Google Scholar, which primarily focus on these technologies in developing countries in Asia. Where appropriate, a few widely-cited overview articles for each technology were also reviewed. The findings generally reveal where performances of these technologies can be raised potentially, based on the general trends in the literature. Where evidence is rich, some generalizable economic insights about these technologies are provided. For protected agriculture, recent research has focused significantly on various

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features of protective structures (tunnel heights, covering materials, shading structures, frames and sizes) indicating that there are potentials for adaptive research on such structures to raise the productivity of protected agriculture. The research on protected agriculture also focuses on types of climate parameters controlled, and energy structures, among others. For precision agriculture, recent research has focused on the spatial variability of production environments, development of efficient and suitable data management systems, efficiency of various types of image analyses and optical sensing, efficiency of sensors and related technologies, designs of precision agriculture equipment, optimal inputs and service uses, and their spatial allocations, potentials of unmanned aerial vehicles (UAVs) and nano-technologies. For vertical farming, research has often highlighted the variations in technologies based on outdoor / indoor systems, ways to improve plants' access to light (natural or artificial), growing medium and nutrient / water supply, advanced features like electricity generation and integration of production space into an office / residential space, and water treatment. For India, issues listed above may be some of the key areas that the country can draw on from other more advanced countries in Asia, or can focus in its adaptive research to improve the relevance and applicability of these technologies to the country.

The eventual aim when applying digital technologies in agriculture is to replace or reduce the human labor required for agricultural production. Large amounts of heterogeneous data are essential for integration studies

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of automated agriculture, and the digitalization of agriculture is helping to fulfill the demand for this data, but management of the data gathered presents its own challenges. That is where the Intelligent Environment (IE) paradigm comes into play to guide the design of the systems, techniques and algorithms able to analyze the data and provide recommendations for farmers, managers and other stakeholders. This book, *Agriculture and Environment Perspectives in Intelligent Systems*, is divided into 5 chapters. Chapter 1 explores the use of intelligent systems in Controlled Environment Agriculture (CEA) facilities; Chapter 2 reviews the adoption of intelligent systems in the research field of biomonitoring; Chapter 3 proposes an intelligent system to acquire and pre-process data for precision agriculture applications; Chapter 4 illustrates the use of intelligent algorithms to make more efficient use of scarce resources such as water; and Chapter 5 focuses on the generation of intelligent models to predict frosts in crops in south-eastern Spain. There is still a need to bridge the gap between the needs of farmers, environmental managers and stakeholders and the solutions offered by information and communication technology. This book will be of interest to all those working in the field. This book examines ways of saving energy by using green roofs and facades, solar devices such as building-integrated photovoltaics (BIPV), and thermal solar panels, as components of energy-efficient building envelopes. The author takes an interdisciplinary / multidisciplinary approach to the subject that analyzes several different scientific fields connected to building

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research--sustainability, sustainable architecture, energy efficiency in buildings, and building envelopes--while approaching other collateral domains, including history, archaeology, botanics, physics, engineering, and landscape architecture. *Alternative Envelope Components for Energy-Efficient Buildings* will be a welcome resource for researchers, students, and postgraduates in the fields of energy, building materials, and renewable energy, as well as architects, engineers, and specialists in industries related to building products. Looks at the impact of building envelopes on energy usage; Offers readers an introduction to the principles of sustainability; Presents passive and active approaches to using solar devices.

This book addresses the evolving crisis in agriculture and sketches the 'community economy' that grounds agricultural enterprise more accurately than the industrial model. In its current practice, agriculture is (in the United States but increasingly in the rest of the world) unsustainable and destructive. The most immediately unsustainable feature of industrial agriculture is its dependence on the products of petroleum—as feedstock for fertilizers, herbicides, and pesticides, and as fuel for the farm machinery and transport of agricultural products into the cities. The problems of agriculture and in general the food systems to which it is attached range from the vulnerability of monocultures to new and stronger pests to the emerging medical problem of obesity. The need for agricultural reform is widely acknowledged; one part of the new work being done suggests that food production in the cities may solve several of its problems

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at once. This book is suitable for both undergraduate and graduate students in agriculture and environmental studies.

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abandoned buildings and on deserted lots, transforming our cities into urban landscapes which will provide fresh food grown and harvested just around the corner.

Possibly the most important aspect of vertical farms is that they can be built by nations with little or no arable land, transforming nations which are currently unable to farm into top food producers. In the tradition of the bestselling *The World Without Us*, *The Vertical Farm* is a completely original landmark work destined to become an instant classic

Ensuring optimal diets and nutrition for the global population is a grand challenge fraught with many contentious issues. To achieve food security for all and protect health, we need functional, equitable, and sustainable food systems. Food systems are highly complex networks of individuals and institutions that depend on governance and policy leadership. This book explains how interconnected food systems and policies affect diets and nutrition in high-, middle-, and low-income countries. In tandem with food policy, food systems determine the availability, affordability, and nutritional quality of the food supply, which influences the diets that people are willing and able to consume. Readers will become familiar with both domestic and international food policy processes and actors, and they will be able to critically analyze and debate how policy and science affect diet and nutrition outcomes.

An insightful look at the American environmental crisis and emerging solutions from the heartland to the coasts in the era of global climate change Eminent ecologist Jeremy B. C. Jackson and award-winning journalist

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Steve Chapple traveled the length of the Mississippi River interviewing farmers, fishermen, scientists, and policymakers to better understand the mounting environmental problems ravaging the United States. Along their journey, which quickly expands to California, Florida, and New York, the pair uncovered surprising and profound connections between ecological systems and environmental crises across the country. Artfully weaving together independent research and engaging storytelling, Jackson and Chapple examine the looming threats from recent hurricanes and fires, industrial agriculture, river mismanagement, extreme weather events, drought, and rising sea levels that are pushing the country toward the breaking point of ecological and economic collapse. Yet, despite these challenges, the authors provide optimistic and practical solutions for addressing these multidimensional issues to achieve greater environmental stability, human well-being, and future economic prosperity. With a passionate call to action, they look hopefully toward emerging and achievable solutions to preserve the country's future.

This book is a printed edition of the Special Issue "Sustainable Agriculture—Beyond Organic Farming" that was published in Sustainability

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FUSION: INTEGRATED READING AND WRITING, Book 2 is a developmental English book for reading and writing at the essay level. It provides a holistically integrated reading and writing approach, making it easy for instructors to teach the basics of reading and writing in one blended course -- and showing students how the reading and writing processes are reciprocal and reinforcing. FUSION's structure highlights critical reading strategies side-by-side with the shared traits of writing, such as main idea, details, and organization, and guides students in analyzing reading to generate writing. The book teaches the types of writing (including research) that students will encounter in their future courses. Grammar instruction includes integrated, practical exercises that use high-interest professional and student models. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

?????:Industrial water pollution control

We all are indebted to nature for providing us food and its resources for our subsistence and survival. In the food domain, cereal and legume grains occupy the front line, whereas, horticultural crops have occupied the second line of defense. For healthy diet cereals and legumes provide us with carbohydrates and protein, whereas, fruits and vegetables provide

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us minerals and vitamins. Both macro- and micro-nutrients are essential for human growth and development. The fruits and vegetables are the major source of micro-nutrients. It is estimated that up to 2.7 million lives could potentially be saved each year if fruit and vegetable production was sufficiently increased. Both at national and international levels, food and agriculture/horticulture development plans and estimates are basically developed, framed and implemented, and narrowed down to cereal production. In the present context of attaining nutrition security, this mode of thinking on 'food' needs to be changed to 'nutrients', which will include necessarily all those crops including fruit and vegetables which provide all macro- and micro-nutrients to ensure balanced nutrition needed for good human health. The present publication has attempted to reflect and discuss the above views and ideas on the subject of sustainable horticulture development and nutrition security in nine chapters with 32 articles by 32 authors.

The adoption of climate-adaptive agricultural technologies (CAATs) for extensive (outdoor) agriculture is stalled by funding gaps experienced by governments in the Mekong countries, with negative implications on the rural farming industry, on income and job security among smallholder farmers, and on food sufficiency and access across the population. We argue that one way of helping bridge these gaps

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is for providers and users of CAATs for extensive agriculture to learn from the practices of those in CAATs for intensive (indoor) agriculture. Indoor CAATs are already receiving significant private-sector investment, a key reason being their ability to leverage the complementary nature of these technologies within farms that are integrated and enabled to use the so-called Internet of things (IoT). Seamlessly linking different CAATs (sensors, crop analytics, and automation) can allow for synergies that significantly boost crop yields and, in turn, the viability of investing in CAATs. We demonstrate these synergies through two case studies, one that looks at the increasing global investment in indoor CAATs and another that describes a financial viability assessment for an indoor farm in Singapore. We conclude with lessons on how these insights can be transferred to the Mekong countries, including a prototype IoT-enabled extensive farm that integrates multiple CAATs, and an investment assessment tool for translating the yield benefits into terms that investors can appreciate.

How the world has become much better and why optimism is abundantly justified Why do so many people fear the future? Is their concern justified, or can we look forward to greater wealth and continued improvement in the way we live? Our world seems to be experiencing stagnant economic growth, climatic deterioration, dwindling natural resources, and an

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unsustainable level of population growth. The world is doomed, they argue, and there are just too many problems to overcome. But is this really the case? In *Fewer, Richer, Greener*, author Laurence B. Siegel reveals that the world has improved—and will continue to improve—in almost every dimension imaginable. This practical yet lighthearted book makes a convincing case for having gratitude for today's world and optimism about the bountiful world of tomorrow. Life has actually improved tremendously. We live in the safest, most prosperous time in all human history. Whatever the metric—food, health, longevity, education, conflict—it is demonstrably true that right now is the best time to be alive. The recent, dramatic slowing in global population growth continues to spread prosperity from the developed to the developing world. Technology is helping billions of people rise above levels of mere subsistence. This technology of prosperity is cumulative and rapidly improving: we use it to solve problems in ways that would have been unimaginable only a few decades ago. An optimistic antidote for pessimism and fear, this book: Helps to restore and reinforce our faith in the future Documents and explains how global changes impact our present and influence our future Discusses the costs and unforeseen consequences of some of the changes occurring in the modern world Offers engaging narrative, accurate data and research, and

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an in-depth look at the best books on the topic by leading thinkers Traces the history of economic progress and explores its consequences for human life around the world Fewer, Richer, Greener: Prospects for Humanity in an Age of Abundance is a must-read for anyone who wishes to regain hope for the present and wants to build a better future. More high-rise residential buildings have been built in the last two decades than at any other time before. Even in Europe, where historically a typical city's most prominent vertical accents came from chimneys and church steeples, towering buildings are increasingly shaping the urban landscape. In Vertical Europe, Andrea Glauser looks at new architectural trends in London, Paris, and Vienna, as well as the promises, desires, and fears associated with them in the minds of these cities' residents. Her book is the first full-length sociological examination of the recent skyward growth in urban Europe, bringing together debates on high-rise architecture from fields including urban planning, geography, and art history. She contextualizes this vertical construction as an area wrought with tensions between these European cities' desire to keep pace with global competition while still retaining the specific architectural qualities that have defined them for centuries.

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