Journal of
Economics and SDGs Review
econsciences.com
Volume 1 March 2025 Issue 1

Recent Developments in Sustainable Infrastructure (RDSI) - Volume 2: Urban Infrastructure Development. I. Pal, S. Das, S.Mitra, S. Karmakar (Eds.), Springer 2024

By **Kevin JOHNNESON** †

Abstract. The book Recent Developments in Sustainable Infrastructure (RDSI) - Volume 2: Urban Infrastructure Development provides a timely and comprehensive exploration of sustainable urban transformation in the face of rapid global urbanization and environmental challenges. This volume critically examines the interdependent nature of urban infrastructure systems, highlighting integrated approaches across transportation, water resource management, waste handling, green building, and urban policy. Emphasizing systems thinking, the book delves into smart technologies and data-driven solutions to improve urban functionality and resilience. Key topics include sustainable mobility beyond electric vehicles, holistic water strategies addressing scarcity and quality, waste management aligned with circular economy principles, and green construction practices rooted in life-cycle assessments. Moreover, it underscores the significance of inclusive urban planning, adaptive policy frameworks, and ethical considerations in smart city technologies. While offering valuable insights and policy recommendations, the book also identifies areas for future improvement, such as the inclusion of more case studies, metrics for sustainability, and focus on social equity and resilience. This volume is a crucial resource for scholars, practitioners, and policymakers seeking to foster sustainable, equitable, and technologically advanced urban futures.

Keywords. Sustainable urban development, Smart cities, Green infrastructure, Circular economy, Integrated planning.
JEL. R11, Q1, O18.
SDGs. SDG9, SDG11.

Book Review

In the 21st century, the world is witnessing an unprecedented surge in urbanization. Cities are no longer mere centers of commerce and culture; they are the engines of global economies and the focal points of human habitation. However, this rapid urban expansion comes with a significant cost. The strain on existing infrastructure, the escalating consumption of resources, and the growing threat of climate change are pushing urban environments to their limits. "Recent Developments in Sustainable Infrastructure (RDSI) - Volume 2: Urban Infrastructure Development" arrives at a critical juncture, offering a timely exploration of the strategies and technologies necessary to build resilient and sustainable cities.

The book's significance lies in its recognition of the interconnectedness of urban infrastructure systems. Sustainable transportation cannot be achieved

†

in isolation from efficient water management or responsible waste disposal. Similarly, green building technologies are most effective when integrated into a holistic urban planning framework. This understanding of systemic interdependence is a recurring theme throughout the book, underscoring the need for integrated and collaborative approaches to urban development.

A Deeper Dive into Key Themes

Sustainable Transportation: Beyond Electric Vehicles:

While the book rightly emphasizes the role of electric vehicles in reducing carbon emissions, it also delves into the broader concept of sustainable mobility. This includes a critical examination of public transportation systems, with a focus on optimization, accessibility, and integration. The importance of pedestrian and bicycle infrastructure is also highlighted, recognizing the need to create human-centered urban spaces. Furthermore, the book touches upon the logistical challenges of urban freight transportation, an often-overlooked aspect of sustainable mobility. The chapters analyzing the usage of smart technologies to optimize traffic flow, and public transport schedules are very important to the modern reader.

Water Resource Management: A Holistic Approach:

Water scarcity is a growing concern in many urban areas, and the book addresses this issue with a comprehensive approach. It explores not only water conservation and wastewater treatment but also the crucial role of stormwater management. The increasing frequency of extreme weather events underscores the need for resilient stormwater systems that can mitigate flooding and protect water quality. Furthermore, the book examines the potential of decentralized water systems, such as rainwater harvesting and greywater recycling, to enhance urban water security. The book also discusses the importance of water quality monitoring, and the usage of new technologies to accomplish this.

Waste Management: Towards a Circular Economy:

The book's discussion of waste management extends beyond traditional recycling and disposal methods. It delves into the principles of a circular economy, emphasizing the need to minimize waste generation and maximize resource recovery. Advanced technologies, such as anaerobic digestion and waste-to-energy conversion, are explored as potential solutions for transforming waste into valuable resources. The book also addresses the challenges of managing electronic waste and hazardous materials, which require specialized handling and disposal procedures. The social aspects of waste management, including waste segregation and community engagement, are also given consideration.

Green Building Technologies: Beyond Energy Efficiency:

While energy efficiency remains a core focus of green building technologies, the book also highlights the importance of other sustainability considerations. These include the use of sustainable building materials, the integration of green roofs and walls, and the optimization of indoor environmental quality. The book also explores the concept of life-cycle

assessment, which evaluates the environmental impacts of buildings throughout their entire life cycle. The book also discusses the importance of building orientation, and the use of natural ventilation to reduce energy consumption.

Urban Planning and Policy: The Foundation of Sustainability:

The book emphasizes that sustainable urban infrastructure cannot be achieved without effective planning and policy frameworks. It explores the role of integrated planning, which considers the interdependencies between different infrastructure systems. The importance of stakeholder engagement, including community participation and collaboration with the private sector, is also highlighted. Furthermore, the book examines the need for flexible and adaptive policy frameworks that can respond to evolving challenges and opportunities. The book also examines the effect of urban sprawl on sustainability.

Advanced Technologies: Enabling Smart Cities:

The book does a good job of showing the importance of new technologies. The use of the Internet of Things (IoT), big data analytics, and artificial intelligence (AI) is transforming urban infrastructure management. These technologies enable real-time monitoring, predictive maintenance, and optimized resource allocation. For example, IoT sensors can be used to monitor traffic flow, water quality, and energy consumption, while AI algorithms can analyze this data to identify patterns and optimize system performance. The book also touches upon the ethical considerations surrounding the use of these technologies, including data privacy and security.

Enhancing the Value: Recommendations for Future Editions

Expanded Case Studies:

While the book provides valuable insights, the inclusion of more detailed case studies would further enhance its practical relevance. Real-world examples of successful sustainable infrastructure projects would provide valuable lessons for practitioners and policymakers.

Quantifiable Metrics and Indicators:

The book could benefit from a more comprehensive discussion of quantifiable metrics and indicators for assessing the sustainability of urban infrastructure. This would enable more rigorous evaluation and comparison of different projects and strategies.

Social Equity and Inclusion:

While the book touches upon social considerations, a more explicit focus on social equity and inclusion would be valuable. This could include a discussion of how sustainable infrastructure projects can address the needs of vulnerable populations and promote social justice.

Financial and Economic Considerations:

A deeper analysis of the financial and economic aspects of sustainable urban infrastructure would be beneficial. This could include a discussion of

funding mechanisms, cost-benefit analysis, and the economic impacts of sustainable infrastructure investments.

Resilience Planning:

With the increasing threat of climate change, a greater focus on resilience planning would be very valuable. This should include discussion of how infrastructure can be built to withstand extreme weather events, and other natural disasters.

Conclusion: A Valuable Resource for a Sustainable Future

"Recent Developments in Sustainable Infrastructure (RDSI) - Volume 2: Urban Infrastructure Development" is a valuable and timely contribution to the field of urban sustainability. Its comprehensive coverage of key themes, diverse perspectives, and emphasis on innovation make it an essential resource for researchers, policymakers, and practitioners. The book provides a compelling vision for building resilient and sustainable cities, and it offers practical insights into the strategies and technologies necessary to achieve this vision. As urban populations continue to grow, and as the challenges of climate change intensify, the insights provided in this book will become increasingly important.

Author statements
Acknowledgements: Not applicable.
Author contributions: The contribution of the authors is equal.
Funding: No funding was received for this study.
Availability of data and materials: Not applicable.
Ethics declarations
Ethics approval and consent to participate: Not applicable.
Consent for publication: Not applicable.
Consent to participate: Not applicable.
Competing interests: The authors declare that they have no competing interests.
Informed consent: Not applicable.
Consent for publication: All authors agreed with the content and gave explicit consent to submit the manuscript to *Journal of Economics and SDGs Review*
Data Availability Statement: Not applicable.