

Editorial

Strategies for Sustainable Urban Development—Addressing the Challenges of the 21st Century

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Urbanisation has been one of the most transformative processes of our time, and in recent decades has led to significant changes in the way we live, work, and interact with the world around us. With more people moving to cities, there is a growing need for sustainable urban development strategies that balance economic growth, environmental protection, and social well-being. At the same time, the field of urban studies and planning is rapidly evolving, and so are the challenges that cities face in the 21st century. From climate change and resource depletion to pandemics and social inequality, the complex and interconnected nature of urban systems requires innovative approaches for planning and design.

This Special Issue brings together a diverse range of scholars and practitioners who share a commitment to advancing sustainable urban development. The collection of papers presents cutting-edge research on a wide range of topics, including resilience, value creation, blockchain architecture, decarbonisation, COVID-19, street network efficiency, vulnerable communities, transit-oriented development, green roofs, and post-occupancy evaluation. Each study offers a unique perspective on the challenges and opportunities of sustainable urban development, highlighting innovative strategies and best practices that can inform future urban planning and policy.

The interdisciplinary and international scope of this publication reflects the complex and diverse nature of sustainable urban development, as well as the urgent need for collaboration and exchange across disciplines and borders. By presenting ten original research studies, this publication aims to foster a more informed and productive conversation about the future of our cities and the challenges we face in building sustainable, equitable, and resilient urban communities. As such, this Special Issue is intended to serve as a valuable resource for researchers, practitioners, policymakers, and students who seek to advance the cause of sustainable urban development in the 21st century.

Wang et al. [1] evaluated the resilience level of cities in the Chengdu–Chongqing urban agglomeration of China, using multiple interdisciplinary methods such as the entropy weight method, Theil index, and geographically and temporally weighted regression. The research shows that urban resilience has evolved from a low to high level, with significant spatial differences in resilience levels. The study also identified several factors that positively impact urban resilience, including administrative level, marketisation level, industrial structure, population density, urbanisation level, and the level of emergency facilities, which have spatial and temporal heterogeneity. The study proposes strategies from the perspective of sustainable urban development to improve the resilience level of urban agglomerations in western China. These findings provide new theoretical support and decision-making reference for sustainable urban development in China.

The academic study by Li et al. [2] focused on the value creation of public–private partnerships (PPPs) in the development of urban rail transit (URT) projects in China. PPPs



Citation: Shen, L.; Ochoa, J.J.; Bao, H. Strategies for Sustainable Urban Development—Addressing the Challenges of the 21st Century. *Buildings* **2023**, *13*, 847. <https://doi.org/10.3390/buildings13040847>

Received: 14 March 2023

Accepted: 20 March 2023

Published: 23 March 2023



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are adopted in URT projects to benefit both public and private sectors due to the heavy investment and abundant construction and management experience required. However, achieving basic project objectives is no longer sufficient for value creation, and partner synergy is necessary to achieve added value. This study adopts a grounded theory approach to identify the influencing factors of value creation of URT PPP projects in China. Resource complementarity among stakeholders, cooperation environments, and partnership synergy were identified as the main influencing factors. The study establishes a theoretical model to describe how these factors promote value creation during the implementation of URT PPP projects, providing a model for further empirical examination.

Lv et al. [3] examined the potential use of blockchain technology as a solution to security and privacy issues in the context of the Internet of Things (IoT), with a focus on smart homes. The authors propose a classification-based blockchain architecture with a hierarchical proof-of-work mechanism to reduce storage consumption and decrease latency. This involves dividing IoT devices into child nodes by data classification and adjusting the difficulty of the proof-of-work to set moderate-cost security grades. The proposed architecture is shown to offer significant improvements in terms of storage and efficiency compared to traditional methods and current technology, while maintaining security. This research provides valuable insights into the development of secure and efficient blockchain-based solutions for IoT applications.

Salazar et al. [4] explored the challenges of reducing greenhouse gas (GHG) emissions in the building sector, which is one of the main emitters contributing to climate change. Governments have developed nationally determined contributions (NDCs) and roadmaps to establish measures to achieve net-zero emissions. However, stakeholder integration is a significant barrier to implementing these measures, especially in the building sector. This research employs social network analysis (SNA) concepts to explore the roles of actors required to achieve net-zero emissions in the Colombian building sector. The study uses the results of semi-structured interviews led by the Colombian Green Building Council (CGBC) within the framework of the Zero Carbon Building Accelerator (ZCBA) project. The findings reveal highly interconnected networks characterised by redundant connections among actors. Three types of actors are identified within each enabler network: prominent actors, second-level actors, and perimeter actors. The study emphasises the importance of stakeholder integration in the transition to net-zero emissions in the building sector.

Kim S. and Kim H. [5] investigated the night-time economy (NTE) of Seoul, Korea, and explored the relationship between NTE vitality (NTEV), COVID-19, and credit card sales. The research aims to empirically identify the characteristics of Korea's NTE and derive an indicator of NTEV by considering the NTE in urban regions. The study evaluates NTEV using indicators of nightly floating population, night-lighting value, and the number of entertainment facilities. The results suggest that the NTEV can boost the consumption economy of the entire city. Additionally, the impact of COVID-19 on the economy differed depending on the density of facilities to which the social distancing policy was applied, and an increase in the number of confirmed COVID-19 patients decreased credit card sales, thereby deteriorating the urban economy. The study highlights the importance of NTEs in promoting economic recovery in the wake of the COVID-19 pandemic.

Anabtawi and Scoppa [6] employed quantitative methods to assess the effectiveness of street connectivity policies implemented by Abu Dhabi's Urban Planning Council (UPC) in newly developed projects. The study measured efficiency by analysing the directness of pedestrian routes between residential and non-residential destinations in twelve neighbourhoods of the Capital District project. The results indicated that over 58% of the neighbourhoods failed to connect residential plots efficiently, and more than 40% of residential plots could not connect efficiently to non-residential plots. The study provides recommendations for policymakers and project developers to enhance street infrastructure using the sikkak alleyway system found in other neighbourhoods in the city, aligning with Estidama's walkability standards. The study's rigorous quantitative analyses can be utilised in real-world projects, improving the connection between policy and practice.

The study by Giorgi et al. [7] examined the vulnerability of communities, cities, and territories due to current changes and the potential for urban architectural interventions to mitigate these vulnerabilities. However, these interventions require sustained and transversal visions that consider the temporal context of the coming decades. To address this issue, the study describes the research project “Design for Vulnerables”, which aims to define methodologies for reducing urban vulnerabilities in the future. The project involved a design workshop in a vulnerable community in northern Mexico, which was analysed using a research-by-design methodology. The study identifies current issues that affect urban vulnerabilities and generates a set of principles for Design for Vulnerables, graphically represented by a re-interpretation of the Krebs cycle. This multidisciplinary approach demonstrates the potential for urban design to reduce vulnerabilities and support social initiatives.

Huang et al. [8] studied the challenges in promoting Transit-Oriented Developments (TODs) through urban design and proposed a new framework that integrates generative design methods and data-driven decision-making approaches. The authors argue that the traditional design decision making, which is based on designers’ experience, lacks quantitative feedback on design schemes and therefore fails to promote progress in urban design. The proposed framework incorporates urban design intelligence for TODs and employs parametric tools and models to evaluate generative urban design proposals, providing timely feedback to support design decisions. A case study was conducted to demonstrate the feasibility of the proposed approach, which successfully selects optimal TOD design solutions. This study highlights the significance of integrating quantitative and qualitative assessment in experience-based decision making and emphasises the role of designers’ decision making in generative urban design.

Alqahtany [9] investigated the major effects and challenges faced in implementing the green roof technique in Riyadh, Saudi Arabia. The implementation of green roofs is crucial for achieving urban sustainability, as they are energy-efficient, eco-friendly, and cost-effective in the long run. Despite their benefits, there is a reluctance to adopt green roofs in Saudi Arabia, and the reasons for this have not been reported. To address this gap in knowledge, a survey questionnaire was designed to explore the level of awareness among the public and the challenges they face in installing green roofs. An extensive literature review and reconnaissance survey were conducted to identify the key factors and challenges to include in the questionnaire. The findings indicate a high level of support for green roofs among the people of Riyadh, with aesthetic enhancement and air quality control being the most commonly cited benefit; however, the climate of the region was identified as the biggest challenge in implementing green roofs. The study concludes with recommendations for local authorities to take action and assist building owners and policy makers in overcoming the challenges associated with green roofs.

Wu and Li [10] examined the significance of sports parks for physical activity in China in the context of the COVID-19 epidemic. The study reviewed national fitness policies and identifies different types of sports parks to investigate the usage and preferences of urban dwellers in sports parks using a questionnaire, behavioural observation, and interviews as research methods. The study examined the Beijing Olympic Forest Park, Sun Park, and Huilongguan Park as examples and found that participants exhibited high overall satisfaction with the sports parks. Furthermore, the study identified Sports Facilities and Maintenance and Management as the two most significant factors that influence residents’ willingness to use sports parks. The findings of this study can guide future planning and construction of sports parks in China.

In conclusion, this Special Issue presents a comprehensive and insightful examination of new research in sustainable urban development, highlighting the associated challenges and opportunities. The studies emphasise the crucial role of community engagement and the pressing need to address the specific challenges, particularly confronting vulnerable communities. It is our firm belief that this publication will constitute a noteworthy contribution to the ongoing dialogue on sustainable urban development and foster the development

of more efficacious and comprehensive strategies for urban planning and design. Such efforts are essential to address the multifaceted challenges that confront our cities today and in the future.

We are grateful to the authors for their valuable contributions and dedication to advancing knowledge in this field. We also extend our appreciation to the peer reviewers for their critical evaluation and feedback, which has helped ensure the quality and rigour of the papers included in this publication. We aspire that this compilation of works will inspire further research and dialogue on sustainable urban development and facilitate the development of more sustainable urban communities worldwide.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Wang, B.; Han, S.; Ao, Y.; Liao, F. Evaluation and Factor Analysis for Urban Resilience: A Case Study of Chengdu–Chongqing Urban Agglomeration. *Buildings* **2022**, *12*, 962. [[CrossRef](#)]
2. Li, X.; Yuan, J.; Liu, X.; Ke, Y.; Jia, S. Identifying Critical Influencing Factors of the Value Creation of Urban Rail Transit PPP Projects in China. *Buildings* **2022**, *12*, 1080. [[CrossRef](#)]
3. Lv, W.; Wang, N.; Xie, X.; Hong, Z. A Classification-Based Blockchain Architecture for Smart Home with Hierarchical PoW Mechanism. *Buildings* **2022**, *12*, 1321. [[CrossRef](#)]
4. Salazar, J.; Guevara, J.; Espinosa, M.; Rivera, F.; Franco, J.F. Decarbonization of the Colombian Building Sector: Social Network Analysis of Enabling Stakeholders. *Buildings* **2022**, *12*, 1531. [[CrossRef](#)]
5. Kim, S.-A.; Kim, H. Structural Relationship between COVID-19, Night-Time Economic Vitality, and Credit-Card Sales: The Application of a Formative Measurement Model in PLS-SEM. *Buildings* **2022**, *12*, 1606. [[CrossRef](#)]
6. Anabtawi, R.; Scoppa, M. Measuring Street Network Efficiency and Block Sizes in Superblocks—Addressing the Gap between Policy and Practice. *Buildings* **2022**, *12*, 1686. [[CrossRef](#)]
7. Giorgi, E.; Cattaneo, T.; Serrato Guerrero, K.P. The Principles of Design for Vulnerable Communities: A Research by Design Approach Overrunning the Disciplinary Boundaries. *Buildings* **2022**, *12*, 1789. [[CrossRef](#)]
8. Huang, X.; Yuan, W.; White, M.; Langenheim, N. A Parametric Framework to Assess Generative Urban Design Proposals for Transit-Oriented Development. *Buildings* **2022**, *12*, 1971. [[CrossRef](#)]
9. Alqahtany, A. Green Roofs as an Approach to Enhance Urban Sustainability: A Study of Public Perception in Riyadh, Saudi Arabia. *Buildings* **2022**, *12*, 2202. [[CrossRef](#)]
10. Wu, X.; Li, X. Post-Occupancy Evaluation of Sports Parks during the COVID-19 Pandemic: Taking Sports Parks in Beijing as Examples. *Buildings* **2022**, *12*, 2250. [[CrossRef](#)]

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