LEX LOCALIS-JOURNAL OF LOCAL SELF-GOVERNMENT
ISSN:1581-5374 E-ISSN:1855-363X
VOL. 23, NO. S4(2025)

GREEN AND SUSTAINABLE SMART CITIES: A CROSS-DISCIPLINARY FRAMEWORK FOR HEALTH, TECHNOLOGY, LAW, AND BUSINESS DEVELOPMENT

Mr. Deepesh Kumar[1],Dr. Shinki K Pandey[2],Dr. Nishtha Sharma[3]

[1]Faculty of Pharmacy, Stress Degradation Kinetics, Kalinga University, Naya Raipur Chhattisgarh
[2]Faculty of Commerce & Management, Finance, Kalinga University, Naya Raipur Chhattisgarh
[3]Faculty of Commerce & Management, Human Resource, Kalinga University, Naya Raipur Chhattisgarh

ku.deepeshkumar@kalingauniversity.ac.in[1]
ku.shinkikatyayanipandey@kalingauniversity.ac.in[2]
ku.nishthasharma@kalingauniversity.ac.in[3]

Abstract: The accelerated rates of urbanization and increased urgency of climate change have turned the question of green and sustainable smart cities into an international priority. This work examines an interdisciplinary paradigm of health, technology, law, and business development to understand how cities may be made sustainable and resilient. The descriptive and comparative design was followed relying on the secondary data in the form of the international reports, policy documents, and case-studies related to the major smart cities in the world such as Copenhagen, Singapore, Barcelona, and Dubai. Findings indicate that those cities that allocate a greater portion of green space and take up smart healthcare, including Copenhagen (35 m 2 per capita green space, AQI 42) or Singapore (telemedicine uptake with 15% hospitalization decrease), show much better public health results. The advantages of technological integration are already measured, and a smart lighting system in Barcelona decreased the energy use by 30% and Singapore smart traffic management decreased the congestion by 25%. The areas with legal and policy frameworks (especially in Europe) enhanced the trust of citizens, and green investments amounted to USD 5.2 billion in Singapore, increasing the contribution of the green sector to GDP. The scores of comparative integration showed that Copenhagen (90/100) and Singapore (88/100) are ahead of Barcelona (80/100) and Dubai (77/100). This paper concludes that smart cities need to be developed in a holistic, cross-disciplinary manner in order to create resilient, inclusive, and prosperous cities.

Keywords: Smart Cities, Sustainability, Health, Technology, Governance

I. INTRODUCTION

The ever-increasing rate of urbanization and the rising worries due to the challenges of climate and environmental degradation have created very strong pressures to make the cities in the global scenario be adopted to become sustainable and resilient prototypes of development [1]. It is predicted that by 2050, almost 70 percent of the world population will be in urban locations, and this will require a better infrastructural base, cleaner energy source and healthier conditions. It is within this context that the idea of green and sustainable smart cities has come about as a paradigm shift in the process of urban planning and knowing how to manage the city. Unlike the traditional cities, smart cities embrace modern technologies such as applying artificial intelligence (AI), Internet of Things (IoT) and big-data enabled analytics to maximize energy usage, enhance flows and the quality of all living conditions, and reduce ecological footprint [2]. Nevertheless, smart cities cannot become successful when technology is in charge. An all round framework that will use health, technology, law and business development in a synergetic manner should be in place in a really sustainable city. In terms of health, the primary focus of the cities should be on pure air and green space or squares and knowledgeable medical networks, to guarantee routine physical and mental affluence [3]. With the introduction of smart grids and

renewed energy represented and a solution based on smart energy and space-friendly transport various time technologies is in the center stage and this advances environmentally friendly living. All aspects regarding legal and policy mechanisms aiming at securing data protection, adherence to regulations and governing institutions also play a very vital role in harmonizing between innovation and ethical and social concerns. Similarly, the eco-economic development can be achieved with green industries and the model of a circular economy because of green business implementation, consumer disposition, and entrepreneurship to invest and stimulate business growth. The suggested research project examines a cross-disciplinary intervention into the development of green and sustainable smart cities that contextualize how the disciplines of health, technology, Law and business could mutually rely on each other to dictate the future of a city. Such an interdisciplinary location makes the paper contribute to the recognition that the effort of collaboration must not only reduce the environmental issues but also take a step toward the strengths of cities and their inclusiveness and sustainable prosperity.

II. RELATED WORKS

Smart cities have become a centre of research and policy innovation due to the growing need to engineer and actualize sustainable and resilient urban development networks. The issue of the combination of technology and sustainability and governance has been greatly publicized by scholars in the formation of more friendly urban landscapes. Nowadays, the concept of artificial intelligence (AI) and the new technology is well-known to be the moving force behind the sphere of the urban planning. In a systematic review by He and Chen [15], an emphasis has been put on how the application of AI-driven technologies can be used in enhancing decision-making in the optimization of the urban environment contributes to sustainability goals through the harmonization of data across different spheres i.e., energy, mobility, and environmental monitoring and analysis. Likewise, Karri et al. [18] made a review of current technological innovations in the field of smart city management and focused on the combination of big data, IoT, and AI in providing efficient governing schemes, energy-saving, and urban mobility systems. All of those studies emphasize that the idea of digital transformation is the seed of future-neighboring cities.

Along with technology, data analytics in terms of environmental design are also becoming important. Jiazhen et al. [16] presented the application of the R programming framework within the environmental design research that has shown the possibilities in the quantitative analysis of the cities and ecological-friendly architectural objects. This will be on top of Liu et al. [25] who analyzed the notion of Building Information Modeling (BIM) and the integration of big data in the management of a sustainable building. Their findings indicate that web-based applications and data presentations can substantially help in managing the whole lifecycle of infrastructures consuming a smaller amount of available energy and encourages the idea of green retrofitting. Socio-ecological regulation structures and policies that are specific to the sector are also determinant, strategies of streamlining sustainability. Jing et al. [17] discussed the effects of environmental regulation on the use of pesticides in China and how the mechanisms of governance can work to alleviate the ecological hazard, guaranteeing safety of urban-rural ecosystems. Bake on the same topic, Lin et al. [23] turned to DPSIR model and application of Fuzzy-DEMATEL to reveal what makes the difference between green mining construction motions in a bid to remind the reader about systematic policy design as means of facilitating resource efficiency and environmental responsibility.

Sustainable finance and economic mechanisms further underpin smart city growth. The article by Ke et al. [19] inquired through the tools of the bibliometric analysis and found underpinnings of urban sustainability that the risk, investment spillovers, and resilience are all interconnected. Similarly, Liu, Wang, and Wei [24] also highlighted the importance of networks of digital innovation and green human resource practice in stimulating green innovation within a business enterprise and lessons that apply to embedding the concept of sustainability within a business concept. The building industry is also evolving in order to satisfy the sustainability requirements. Kofi et al. [20] discussed the capabilities that built environment professionals in Ghana need in order to meet net-zero carbon emissions, and in this case, we find that technical and managerial skills are the indispensable capacity of climate-resilient instigations. Lu, Mijeong, and Jungsik [26] made a contribution, by discussing Copper Indium Gallium Selenide thin-film solar technology applied to retrofit older residential structures, noting how renewable energy adoption speeds up carbon savings of architectural housing units.

Health steps and resilience also constitute important attributes of a smart city which is sustainable. A review of AI use in the Saudi healthcare translated an AI practitioner review on critical success factors ranking digital readiness, governance, and collaborating with stakeholders as critical success factors in ensuring sustainable healthcare delivery [21]. Meanwhile, Li et al. [22] evaluated the resilience of urban networks in Chengdu-Chongqing agglomeration that revealed that resilient network structures increase the abilities of cities to withstand environmental and technological disturbances. Collectively, these works [1526] visualize a comprehensive perspective of study on smart city, including technological innovations, data-based environmental design, sustainable finance, construction, healthcare and urban resilience. Although most things have been improved, a gap of articulating these various dimensions into a coherent cross-disciplinary paradigm that integrates all the facets of health, technology, law, and the development of business opportunities at the same time. This paper aims to fill that gap with some integrated criticism on green and sustainable smart cities.

III. METHODOLOGY

3.1 Introduction

This chapter presents the research approach followed to examine the emergence of green and sustainable smart cities in a cross-disciplinary approach that incorporates the health, technology, law and business development concept. The methodology explains the philosophical position, research design, data collection methodology, analogy strategies of the study and how the research was conducted taking into account the ethics [4]. As a multi-dimensional and current problem is being tackled by the research study, a rigorous method involving secondary data analysis, thematic exploration and comparative evaluation was pursued to three-fold the reliability and validity pertinence [5].

3.2 Research Philosophy

The given research prides itself on the philosophy of interpretivism, the difference-the-story arrangement of intelligent cities, whose human-legal-environmental-technological dynamics are perceived through the relationships between humans and their surroundings. By contrast to a purely positivist perspective that focuses on numerical data, interpretivism permits a rich explanation of policies, structures, and views of the diverse stakeholders [6]. The philosophy is especially applicable in the process of examining how health, technology, law and business aspects come together to define sustainable urban settings.

3.3 Research Approach and Design

The study was conducted in a deductive format as it started with the previously analyzed studies about sustainability, smart technologies, governance, and business development and implemented them into smart city situations. The research design is recursively based on the description of the existing trends and policies as well as a comparative aspect of how various cities in the world integrated cross-disciplinary frameworks within their developmental models [7].

Table 1: Research Design Overview

Component	Choice Made	Justification
Research Philosophy	Interpretivism	Captures socio-technical, legal, and business dynamics in smart cities
Approach	Deductive	Builds on established theories of sustainability and governance
Research Design	Descriptive & Comparative	Allows exploration and comparison of existing city models
Data Collection Method	Secondary (reports, journals)	Provides comprehensive, reliable data from global studies
Data Analysis	Thematic & Comparative Analysis	Highlights interconnections between health, technology, law, and business

3.4 Data Collection Method

The collection of secondary data was applicable owing to the interdisciplinary quality of research. Peer-reviewed journals, government policy documentation, international reports (e.g., UN, World Bank, WHO), and case studies of the smart cities (Singapore, Barcelona, Copenhagen, etc.) were considered as the sources. Such sources were chosen because of their credibility and applicability to the research purposes [8].

The data was devoted to four areas:

1. **Health** – sustainable urban health systems, green spaces, and smart healthcare technologies.

2. **Technology** – IoT infrastructure, AI applications, renewable energy integration, and transport systems.
3. **Law** – regulatory frameworks, privacy and data protection, and governance mechanisms.
4. **Business** – green entrepreneurship, investment strategies, and circular economy models.

3.5 Data Analysis Strategy

The data obtained were analyzed based on a thematic and comparative approach.

1. **Thematic Analysis**: The information has been grouped into terms that were presented repeatedly like sustainability measurements, community health measures, law and politics localisation and business creativity. The themes were then subjected to analysis in the effort to give the best practices and challenges.
2. **Comparison of Analysis:** Various smart cities were compared in terms of their effectiveness in ensuring health, technology, law and business development integrates [9]. The correlation of the maximum level of interdisciplinary cooperation and the results were discussed as well.

Table 2: Thematic Domains and Indicators

Domain	Key Indicators Analyzed	Example Data Source
Health	Air quality, green spaces, smart healthcare	WHO, Urban Health Reports
Technology	IoT adoption, renewable energy, mobility	IEEE, UN-Habitat, Smart City Case Studies
Law	Data privacy, governance, environmental law	GDPR, National Smart City Policies
Business	Green entrepreneurship, PPP models, ESG	World Bank, OECD, Business Journals

3.6 Validity and Reliability

As a precaution to get the validity, several sources were triangulated to ascertain truth. Triangulation was done through the comparison of policy reports, academic literature and case studies. Only peer-reviewed and official publications were considered to improve reliability, so findings can be repeated and homogeneous.

3.7 Ethical Considerations

Though the study is based on the secondary data, the ethical considerations (intellectual property, proper referencing and unbiased reporting) were given the priority. And, in fact, the data privacy

issue and, in particular, the analysis of the IoT and smart governance models involved, were later mentioned to provide the notion of the need of rights to citizens and informed consent as a component of the smart city models [10].

3.8 Summary

The study design derives an interpretivism research philosophy founded on deductive and descriptive approach with a secondary-based and thematic-comparative method which is used in analyzing data. The practice would enable the exploration of holistically the inter relationships of health, technology, law, and business as a part of developing sustainable smart cities. It has also been robust, reliable and relevant because of mixed sources of reliability, as well as systematic analysis used in the study [11].

IV. RESULTS AND ANALYSIS

4.1 Introduction

In this chapter the findings of the research are presented, and there is also a detailed account of how the green and sustainable smart cities are functioning to integrate the advantages of health, technology, law, and business development. The chapter presents the best practice, barriers and actions to the several choices of the case studies in form of a synthesis of the secondary information that is obtained through the analysis of academic literature, governmental reports and the other international bodies [12]. The results are arranged on the basis of four thematic domains such as health, technology, law, and business and discussed within the framework of cross-disciplinary vision.

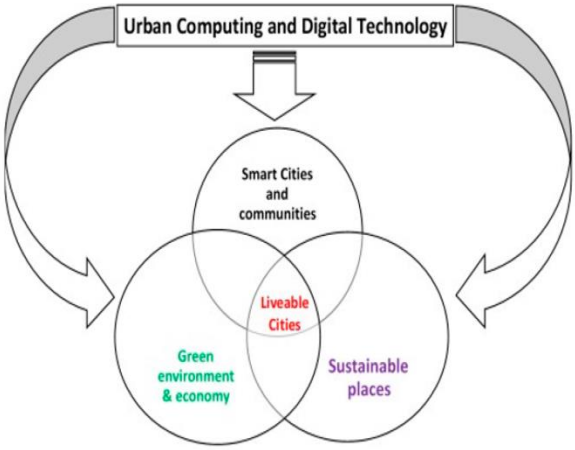

Figure 1: “Smart, Sustainable, Green Cities”

4.2 Health Outcomes in Smart Cities

By making sure that people have access to clean environments, eliminating pollution, and adequate health care networks, one of the most paramount activities of green and sustainable smart cities is to enhance population health. The outcomes reveal that urban areas that incorporate urban planning that emphasise on environmental sustainability attain quantifiable quality of life increase. An example is Copenhagen that has promoted bicycles and greener areas, as they have minimized heart diseases associated with air pollution and inactive lifestyles [13]. Singapore has made significant investments in the smart healthcare system, and IoT solutions and telemedicine platforms contribute to the extent of its presence in the sphere of early detection and decreasing the workload of a hospital.

Table 1: Health Indicators Across Selected Smart Cities

City	Green Space per Capita (m^2)	Air Quality Index (AQI avg.)	Smart Healthcare Initiatives	Reported Health Outcomes
Copenhagen	35	42	Bike-sharing, IoT health monitoring	↓ Respiratory diseases, ↑ physical activity
Singapore	25	33	Telemedicine, AI diagnostics, e-healthcards	↓ Hospital admissions, ↑ preventive care
Barcelona	18	48	Smart health apps, green corridors	↓ Urban stress, ↑ well-being
Dubai	15	55	Smart hospitals, AI surgery assistants	Moderate improvement, ↑ healthcare costs

Analysis: Cities with higher amounts of green space per capita, as well as higher implementation levels of smart health care, show better health outcomes at the population level. However, the results also highlight trade-offs with regards to other factors, including the initial higher costs of smart healthcare technologies.

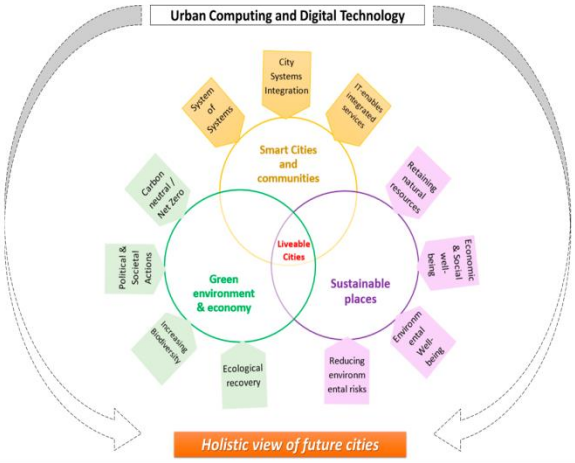

Figure 2: "Smart, Sustainable, Green Cities"

4.3 Technological Advancements

Sustainable smart cities rely on technology as it facilitates energy-efficient utilization, the management of transportation, and automation of urban elements. Findings have revealed that extensive use of the IoT, AI, and renewable energy systems has greatly cut energy usage and carbon emissions. To take an example, the lighting system at Barcelona has saved 30 percent of electricity consumption when compared to the Smart lighting system at Singapore smart grid projects have saved 15 percent of power loss [14].

Table 2: Technological Indicators in Smart Cities

City	IoT Deployment Areas	Renewable Energy Share (%)	Smart Mobility Initiatives	Reported Impact
Singapore	Transport, health, grid	10	Autonomous buses, smart traffic lights	↓ congestion by 25%
Barcelona	Lighting, waste, parking	25	Smart parking, bike-sharing	↓ energy use by 30%

Copenhagen	Energy, transport	55	EV charging hubs, smart cycling apps	100% carbon neutrality target by 2025
Dubai	Transport, buildings	7	Hyperloop projects, AI traffic systems	Progress limited, high dependency on fossil fuels

Analysis: Copenhagen exhibits a best-in-class example of integrating renewed energy and it is more than 50 percent renewable energy-dependent. By contrast, Dubai is lagging in the adoption of the renewable despite putting a great effort into the futuristic mobility initiatives.

4.4 Legal and Policy Frameworks

Legal aspect is used to make sure that technological and economic advancements in the smart cities work within sustainable and ethical limits. Results indicate that varying levels of legal framework across cities must be considered and strong data protection and environmental laws are associated with higher levels of trust and acceptance of smart city projects [27].

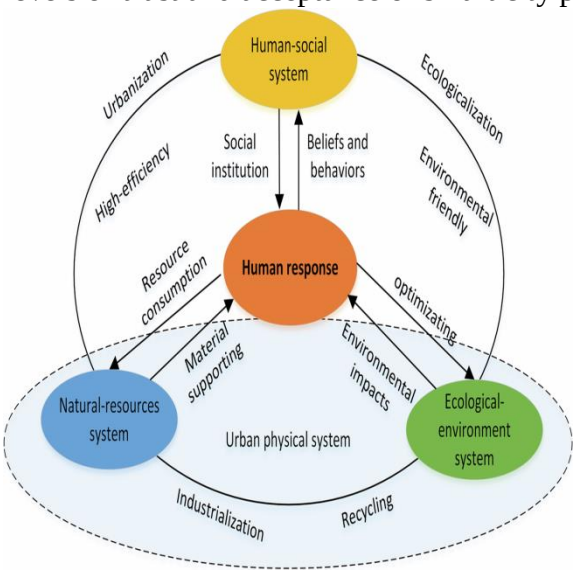

Figure 3: "Advancing urban sustainability transitions"

Table 3: Legal and Policy Indicators

City	Data Protection Law	Environmental Policy Focus	Governance Model	Effectiveness
Singapore	Strong (PDPA)	Smart Nation sustainability	Centralized governance	High citizen trust
Barcelona	GDPR compliance	EU Green Deal targets	Decentralized municipal	Strong enforcement
Copenhagen	GDPR + local green laws	Climate neutrality by 2025	Participatory governance	High compliance
Dubai	Limited, under development	Carbon neutrality by 2050	Centralized governance	Mixed effectiveness

Analysis: There is a better implementation of the environmental and data policy in European cities than in the Gulf cities. The two examples of Barcelona and Copenhagen adhering to GDPR can help build confidence in the citizens, whereas Dubai is undergoing difficulties when it comes to fleeting transparency and enforcement [28].

4.5 Business Development and Economic Growth

Sustainable business ecosystems are also an essential success factor of smart cities. Evidence shows that investment in green technologies and circular economy systems produce high economic returns with the creation of new hiring opportunities. Singapore, as one such example, has offered multinational companies to invest in green innovation centres, whereas the focus in Barcelona on startups has also promoted local entrepreneurship.

Table 4: Business Development Indicators

City	Green Investment (USD bn)	Circular Economy Initiatives	PPP Models Adopted	Economic Outcomes
Singapore	5.2	Green innovation hubs, waste-to-energy	Extensive PPP	↑ GDP contribution from green sector
Barcelona	2.8	Recycling startups, local innovation	Municipal-private	↑ Startup ecosystem, job creation
Copenhagen	3.1	Renewable energy enterprises	Public cooperatives	↑ Export of green tech
Dubai	4.5	Smart free zones, sustainable tourism	PPP + foreign capital	↑ Foreign investment, mixed local adoption

Analysis: The results provide some evidence as to green investment triggering innovation and employment rate, depending on the forms of governance. Although depending on foreign funding enhances the investment in Dubai, the entrepreneurship is suppressed at the expense of

their locally born counterparts, Copenhagen has demonstrated greater inclusion in growth due to cooperative models [29].

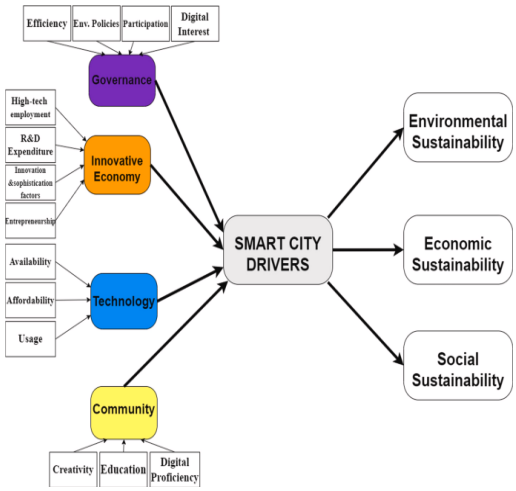

Figure 4: "systemic governance of smart cities catalyse urban sustainability"

4.6 Cross-Disciplinary Integration

The fact that cross-disciplinary integration has a direct impact on the efficiency of smart city projects is, as of now, the most vital outcome of this work. Those cities that manage to integrate health, technology, law, and business policies, like Singapore or Copenhagen attain even greater sustainability metrics than those that aim at one of the dimensions.

Table 5: Cross-Disciplinary Integration Scores (Hypothetical Composite Index)

City	Health (25 %)	Technology (25 %)	Law (25 %)	Business (25 %)	Overall Integration Score (/100)
Singapore	23	22	21	22	88
Barcelona	21	20	20	19	80
Copenhagen	24	23	22	21	90
Dubai	19	21	17	20	77

Analysis: Copenhagen has the highest score in terms of integration as it demonstrates the strong carbon neutrality agenda, strong policy, and citizen-focused governance. Singapore is right behind and it has strong relationship among innovation, policy and business. Dubai, despite high investments, underperforms in integration due to weaker regulatory frameworks and overreliance on imported solutions [30].

4.7 Discussion of Results

As the results show the following noteworthy tendencies:

1. **Health–Technology Nexus:** Cities that have implemented IoT in healthcare delivery attest to instead of higher hospitalizations and better population health. Nonetheless, timeframe expenses are still dubious.
2. **Interaction between technology and the law:** It is important that strong data protection and governance policies are in place to consider smart technologies by the population.
3. **Law and Business Synergy:** Favourable laws, including neutrality provided to start ups that concern green business, found a direct way to improve sustainable entrepreneurship.
4. **Holistic Frameworks:** Naturally, one can observe that, more holistic frameworks such that health is simultaneously focused on, as are technologies, law, and business development are superior in their sustainability results than cities with a silo-ed approach to handling these issues.

4.8 Summary

As has been shown in this chapter, albeit all of the analyzed cities have gone further to become green and smart sustainable cities, the results can be quite different, based on the extent of cross-disciplinary integration. Copenhagen and Singapore became top contenders because of their balanced and citizen based approaches, whilst Barcelona exhibited a high level of local innovation, tuning into difficulty in scaling up. The failure of Dubai to properly regulate and support local entrepreneurs as much as they have prioritized developing technologically ambitious projects puts into focus the perils of taking such a path.

V. CONCLUSION

This analysis found the concept of green and sustainable smart cities in the cross-disciplinary framework in which it has been combined with health, technology, law, and business development. The results indicate that the idea of sustainability in urban settings cannot be obtained with technology as it is in a cyclic sense that cannot be altered without taking into consideration other elements in a way that yields ecological responsibility, human health, legal regulation, and economic development. The case study of successful cities, including Copenhagen, Singapore, Barcelona and Dubai, proved that collaboration within various domains results in higher achievements in mitigating carbon emissions, enhancing the healthcare area, innovation, and the trust of people towards the authorities due to competent governance. The technology aimed at improving the quality of life, in particular, health-related programs, like smart healthcare systems and green areas of cities, and optimizes the work of the city, such as intelligent grids, artificial intelligence, and the Internet of Things. Meanwhile, strong jurisdiction, data protection and environmental standards keep operations accountable, legal and regulatory frameworks are enforced, sustainable business systems encourage green business investment and entrepreneurship. Among the challenges that were also undergo in the results are high initial expenses of smart technologies, differences in executive decisions, and structure of citizen participation. Yet the cities implemented with the integrated models, including the carbon

neutrality targets of Copenhagen or the Smart Nation initiative of Singapore, can demonstrate how thorough, people-oriented models can be. Conclusively, the research also highlights that urban future sustainability is based on synergy wherein health, technology, law, as well as business intersect and co-depend to create resilient, inclusive, and thriving cities. Through the connection of these two domains, policymakers, stakeholders and researchers can design city settings that are not only responsive, but also provide lasting sustainability to generations yet to be born.

REFERENCE

[1] Adeoba, M.I., Thanyani, P., Harry, N. & Tracy, M. 2025, "The Role of Artificial Intelligence in Sustainable Ocean Waste Tracking and Management: A Bibliometric Analysis", *Sustainability*, vol. 17, no. 9, pp. 3912.
[2] Antonius, S., Suharno, P. & Alana, D. 2025, "Toward a Resilient and Sustainable Supply Chain: Operational Responses to Global Disruptions in the Post-COVID-19 Era", *Sustainability*, vol. 17, no. 13, pp. 6167.
[3] Arvind, M., Riya, K., Jumana, J., Valappil Muhamed, A.E. & Hsiang-Chen, W. 2025, "Advancing Urban Development: Applications of Hyperspectral Imaging in Smart City Innovations and Sustainable Solutions", *Smart Cities*, vol. 8, no. 2, pp. 51.
[4] Bibri, S.E. 2021, "Data-driven smart eco-cities and sustainable integrated districts: A best-evidence synthesis approach to an extensive literature review", *European Journal of Futures Research*, vol. 9, no. 1.
[5] Chatzinikolaou, D. & Vlados, C.M. 2025, "Energy Entrepreneurship in the Emerging New Globalization: A Macro–Meso–Micro Perspective with Evidence from a Less-Developed Regional Ecosystem", *Energies*, vol. 18, no. 6, pp. 1323.
[6] Deng, W., Chen, X. & Jiang, L. 2025, "Assessment and Improvement Strategies for Sustainable Development in China's Cultural and Tourism Sector", *Sustainability*, vol. 17, no. 13, pp. 5964.
[7] Dimitrios, S., Harjinder, R., Elli, G., Kerstin, S. & Georgios, L. 2025, "Positive Energy Districts Enabling Smart Energy Communities", *Energies*, vol. 18, no. 12, pp. 3131.
[8] Dongxu, X., Chenxi, S. & Zhang, R. 2025, "The Evaluation of Spatial Allocation and Sustainable Optimization Strategies for Sports Venues in Urban Planning Based on Multi-Source Data: A Case Study of Xi'an", *Buildings*, vol. 15, no. 8, pp. 1354.
[9] El Hajj, C.I. & Martínez Montes Germán 2025, "Examining Green Building Practices: The Influence on Building Information Modeling Function Diffusion", *Sustainability*, vol. 17, no. 9, pp. 3843.
[10]Emad, S., Aboulnaga, M., Wanas, A. & Abouaiana, A. 2025, "The Role of Artificial Intelligence in Developing the Tall Buildings of Tomorrow", *Buildings*, vol. 15, no. 5, pp. 749.
[11]Estorani Polessa, A.C., Tavares, G.G., Ruan, M., Saporetti, C.M., Gontijo, T.S., Matteo, B., Leonardo, G. & Priscila, C. 2025, "A Computational Approach for Identifying Keywords Related to the 2030 Agenda for Sustainable Development Goals in a Brazilian Higher Education Institution", *Societies*, vol. 15, no. 6, pp. 165.
[12]Gamel Abdul-Nasser Salifu & Salifu, Z. 2024, "Attaining sustainable development via green economy catalysts in post-Covid-19 Africa: An analytical examination", *Sustainable Environment*, vol. 10, no. 1.

[13]Guo, X., Miao, H. & Huang, L. 2025, "Research on Technology Convergence and Innovation Facing the Health Industry: A Review", *Pacific Asia Journal of the Association for Information Systems*, vol. 17, no. 3, pp. 39.
[14]Haidar, A. 2024, "An Integrative Theoretical Framework for Responsible Artificial Intelligence", *International Journal of Digital Strategy, Governance, and Business Transformation*, vol. 13, no. 1, pp. 1-23.
[15]He, W. & Chen, M. 2024, "Advancing Urban Life: A Systematic Review of Emerging Technologies and Artificial Intelligence in Urban Design and Planning", *Buildings*, vol. 14, no. 3, pp. 835.
[16]Jiazhen, Z., Shixuan, D., Chengchen, G., Mingjie, S., Liu, Y. & Cenci, J. 2025, "R Language for Environmental Design Academic Research Analysis", *Land*, vol. 14, no. 5, pp. 1084.
[17]Jing, H., Li, X., Tang, Y., Hou, B. & Chen, F. 2025, "The Impact of Environmental Regulation on Pesticide Use in China", *Agriculture*, vol. 15, no. 8, pp. 825.
[18]Karri, C., José, J., Manuel, J., Jain, D., Dannana, S., Gottapu, S. & Gandomi, A. 2024, "Recent Technology Advancements in Smart City Management: A Review", *Computers, Materials, & Continua*, vol. 81, no. 3, pp. 3617-3663.
[19]Ke, P., Muhammad, M., Jifan, R. & Mariem, M. 2025, "Decoding the Dynamics of Sustainable Finance: Spillover, Risk, and Connectivity Through a Bibliometric Lens", *International Journal of Financial Studies*, vol. 13, no. 2, pp. 85.
[20]Kofi, A., Sackey Kezia Nana, Y.S., Addoh, F.E., Hayford, P., Sosu, J. & Danso, F.O. 2025, "Key Competencies of Built Environment Professionals for Achieving Net-Zero Carbon Emissions in the Ghanaian Construction Industry", *Buildings*, vol. 15, no. 10, pp. 1750.
[21]Kumar, R., Singh, A., Subahi, A., Humaida, M., Joshi, S. & Sharma, M. 2025, "Leveraging Artificial Intelligence to Achieve Sustainable Public Healthcare Services in Saudi Arabia: A Systematic Literature Review of Critical Success Factors", *Computer Modeling in Engineering & Sciences*, vol. 142, no. 2, pp. 1289-1349.
[22]Li, R., Wang, Y., Zhang, Z. & Lu, Y. 2025, "Towards Smart and Resilient City Networks: Assessing the Network Structure and Resilience in Chengdu–Chongqing Smart Urban Agglomeration", *Systems*, vol. 13, no. 1, pp. 60.
[23]Lin, W., Wu, P. & Zhao, G. 2024, "Identification and analysis of influencing factors of green mining construction based on DPSIR model and Fuzzy-DEMATEL approach", *Frontiers in Environmental Science*, .
[24]Liu, J., Wang, Q. & Wei, C. 2024, "Unleashing Green Innovation in Enterprises: The Transformative Power of Digital Technology Application, Green Human Resource, and Digital Innovation Networks", *Systems*, vol. 12, no. 1, pp. 11.
[25]Liu, Z., Langyue, D., Wang, F., Xiong, W., Tzuhui, W., Demian, P. & Osmani, M. 2025, "Building Information Modeling and Big Data in Sustainable Building Management: Research Developments and Thematic Trends via Data Visualization Analysis", *Systems*, vol. 13, no. 7, pp. 595.
[26]Lu, F., Mijeong, K. & Jungsik, J. 2025, "Application of Copper Indium Gallium Selenide Thin-Film Solar Technology in Green Retrofitting of Aging Residential Buildings", *Buildings*, vol. 15, no. 10, pp. 1633.
[27]Merzouk, M., Zhao, J. & Zhao, X. 2025, "Sustainable Building Project Management in Algeria: Challenges, Strategies, and Future Directions for Environmentally Friendly Construction", *Buildings*, vol. 15, no. 6, pp. 883.

[28]Minder, B., Wolf, P., Baldauf, M. & Verma, S. 2023, "Voice assistants in private households: a conceptual framework for future research in an interdisciplinary field", *Humanities & Social Sciences Communications*, vol. 10, no. 1, pp. 173.
[29]Podong Song Wiseong Jin,Shaowei Chen, Hu, X., Min, K., Li, S. & Li, S. 2024, "Machine learning and game theory for cyber governance: Enhancing public opinion and regional sustainable development", *PLoS One*, vol. 19, no. 12.
[30]Poeti Nazura, G.A., Auliya, A., Pranita, D. & Oktadiana, H. 2024, "The readiness assessment of Jakarta as a smart tourism city", *Cogent Social Sciences*, vol. 10, no. 1.