

12th Asia-Pacific International Conference on Environment-Behaviour Studies
Savoy Homann Bidakara Hotel, Bandung, Indonesia, 04-05 Oct 2024

Sustainable-Smart-Healthy Development Framework for Future Urban Social Spaces Imaginary: A systematic literature review

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Abstract

The value of sustainable urbanisation has been redefined by UN-Habitat, which includes intangible and cultural values. The holistic framework of creating such sustainable urbanisation still lacks evidence to answer the question of integrating the components of sustainable urbanisation in building smart and healthy social spaces. Therefore, this paper aims to propose a holistic sustainable-smart-healthy (SSH) framework – an SSH social space where people can live a healthy urban lifestyle that benefits future generations. Through the systematic literature review methodology, important themes were constructed. This study has contributed to the existing sustainable development body of knowledge in conceptualising SSH future urban environments.

Keywords: Intangible and cultural values; sustainable-smart-healthy development; urban imaginary, urban planning

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DOI:

1.0 Introduction

Sustainable-smart-healthy (SSH) development is a popular yet challenging development trend in the world and Malaysia today (Lim, Malek, Yussoff, & Yigitcanlar, 2021; Ramaswami, Russell, Culligan, Sharma, & Kumar, 2016; Thompson et al., 2023; Trindade et al., 2017). The value of sustainable urbanisation has been redefined by UN-Habitat (2020) which, in addition to including three main aspects, namely economic, social, and environmental, sustainability also needs to be evaluated in terms of Intangible and Cultural Values (ICV) such as established institutions, and cultural diversity.

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The aspect of ICV is important, and there is lacking research contributing to the ICV relationship to urbanisation’s social, economic and environmental value, even though in the early 2020s. UN-Habitat (2020) recommended methods such as increased learning and health, tolerance and community understanding, and equity opportunities in public spaces. Furthermore, under the era of the fourth industrial revolution (4IR), with the development of advanced technology or smart instruments such as artificial intelligence (AI), Internet of Things (IoTs), and cloud computing and big data analytics (BDA) as new instrumentation of urban solutions, creating urban cyber-physical ecosystem has been welcomed by decision-makers (Malek, Lim, & Tahir, 2022).

However, innovation under the urban cyber-physical ecosystem (physical, digital and biological) is full of unknown factors and challenges (Economic Planning Unit, 2021). For example, how to measure the health of cities (physical) and citizens (biological) using available (digital) infrastructure to help overcome the threat of the COVID-19 pandemic is an urgent issue (Lim, 2022) that opens room for further exploration.

In the bigger picture, the holistic framework of creating such sustainable-smart-healthy social space for future urban imagination still lacks evidence to answer the question – how to integrate the components, i.e., ICV, urban cyber-physical ecosystem, and smart instruments in building sustainable-smart-healthy social space. Therefore, this paper aims to propose a holistic SSH framework for urban imaginary – a sustainable-smart-healthy social space where people can live a prosperous and healthy urban lifestyle that benefits the present and future generations. To explore the framework, this paper applied the systematic literature review methodology using the Google Scholar database. The following section explains the methodology, findings, discussion and concluding remark.

2.0 Methodology

Since the topics of linking the relationship between sustainable urbanisation value, smart city, and healthy city development were limited in literature, the authors decided to explore the big picture through the systematic literature review (SLR) method (Moher, Liberati, Tetzlaff, & Altman, 2009). This method has been applied in previous studies such as Trindade et al. (2017) in the sustainable development of smart cities; Malek, Lim, & Yigitcanlar (2021) in social inclusion in building a citizen-centric smart city; Rocha et al. (2021) in smart cities’ applications to facilitate the mobility of older adults; De Nicola and Villani (2021) in smart city ontology and their applications; Buttazzoni, Veenhof, and Minaker (2020), Corsi, de Souza, Pagani, and Kovaleski (2022), Da Rosa Tavares and Victória Barbosa (2020, and Pacheco Rocha et al. (2019) in smart cities, technologies and healthcare. Therefore, this SLR method is proven effective in providing a deeper understanding of scientific research topics. The commonly chosen databases are Google Scholar, Web of Science, and Scopus.

For this paper, Google Scholar was selected as it covers not only peer-reviewed journal papers but also a wide range of grey reports, books, working papers, and other website publications, which could be important for this exploratory qualitative research. This paper tried to answer the research question of integrating sustainable urbanisation components in building smart and healthy social spaces. Keywords applied are sustainable urbanisation (urbanisation), smart city(ies), healthy city(ies), etc. (see results in Table 1). The keyword search was performed from July to mid-August 2024.

Table 1. Records of patents and citations that were excluded in the identification stage

keywords	Search	Exclusion of Patents and Citations	Records after Patents and Citations were Removed
sustainable urbanisation	204	84	120
sustainable urbanisation	666	241	425
value of sustainable urbanisation	14	13	1
value of sustainable urbanisation	2	2	-
sustainable urbanisation value	-	-	-
sustainable urbanisation value	-	-	-
smart city	30,000	14,200	15,800
smart cities	34,500	17,400	17,100
healthy city	990	424	566
healthy cities	1,670	824	846
smart healthy city	11	3	8
smart healthy cities	10	2	8
healthy space	25	5	20
healthy spaces	73	26	47
healthy social space	-	-	-
healthy social spaces	-	-	-
Total	68,165	33,224	34,941

Note: The advanced search setting in Google Scholar includes 1) finding articles with the exact phrase, where the words occur in the title of the article, and no limitation on return articles authored by, published in and dated between. (Source: authors)

The SLR process followed four stages proposed by the PRISMA statement (Moher et al., 2009), namely 1) identification, 2) screening, 3) eligibility, and 4) inclusion. The stages are shown in Fig. 1. The total number of articles included in the review and thematic analysis is 75.

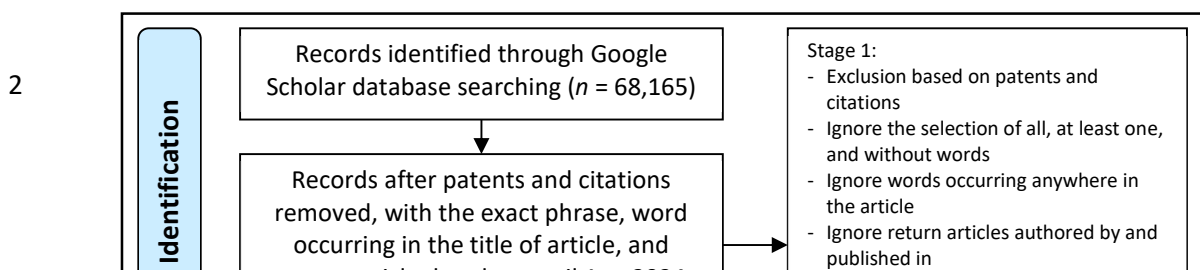


Fig. 1. The execution stages of the systematic literature review
(Source: adapted from Malek et al., (2021) and Moher et al., (2009))

3.0 Findings

The findings were structured in two sub-sections, i.e., the value of sustainable urbanisation which explains the components of constructing sustainable urbanisation, and the smart and healthy cities.

3.1 The value of sustainable urbanisation

The three core values, namely economic, social and environment, remain important in shaping sustainable urbanisation for future generations (UN-Habitat, 2020). The proposed Intangible and Cultural Values (ICV), such as established institutions and cultural diversity, are supported by other literature such as Orlove et al. (2022). Orlove et al. (2022) also relate the value of the institution and culture to preserving cultural heritage that is significant yet ignored in preserving the urban identity. The institutions, such as the state actors, have the powers to form policy and implementation. However, their resources have limitations, and besides the public private partnership (PPP), other scholars, i.e. Kummittha and Crutzen (2017), and Lim, Malek, Yussoff, and Yigitcanlar (2021) are advocating to cultivate the community's contribution and enhancing their participation in government initiatives and projects.

3.2 Smart and healthy cities

For smart city topics, this is the most popular topic among the search (de Jong & Lu, 2022; Mora, Bolici, & Deakin, 2017). The technology-driven method is dominant in practice where smart instruments, i.e., IoT technologies, smart infrastructure, smart citizens, and data analytics, are viewed as innovative solutions to tackle urban problems (De Nicola & Villani, 2021). However, from a human-driven method perspective, the holistic concept of a smart city includes six elements, namely smart economy, government, people, living, environment, and mobility, which are widely accepted and applied in many countries smart city blueprint and action plans (Giffinger et al., 2007; Lim et al., 2021). The holistic view is crucial under the 4IR (fourth industrial revolution) that stresses on the cyber-physical ecosystem (Cassandras, 2016; Golubchikov & Thornbush, 2020), efficient resource management and enhancing the resilience of the community (Okonta & Vukovic, 2024).

For the healthy city, this topic is older than the smart city. From the 1990s to the early 2000s, the World Health Organization (WHO) popularly propagated the healthy city. Worldwide alliances for healthy cities were active at that time, even today. For example, according to the Alliance For Healthy Cities website, about 174 participating member cities are from Southeast Asian countries, China, Korea,

Japan and Australia (Alliance for Healthy Cities, n.d.). The World Health Organization (WHO) Awards for Healthy Cities has been organised since 2004. City in Malaysia, such as Kuching, and in Australia, such as Illawarra, received the 2004 WHO Healthy Cities Awards for their outstanding track record in improving quality of life through the Healthy Cities approach (Alliance for Healthy Cities, n.d.). Thus, the healthy city is considered an evergreen (but less attractive) topic only until the recent COVID-19 pandemic, this topic has returned to the world's attention, and the smart healthy city literature is proliferating (Buttazzoni et al., 2020; Corsi et al., 2022). The scopes stress health and well-being supportive environment, and reducing risk factors for disease (Thompson et al., 2023). The more seminal reference has to be traced back to the healthy city map that stresses three major components, i.e., global system, climate stability, and biodiversity (Barton & Grant, 2006).

4.0 Discussion

From the findings above, there are three scopes to build the SSH framework, namely, 1) institutional and cultural values (ICV) in sustainable urbanisation, 2) urban cyber, physical and health ecosystem, and 3) smart instruments in creating a smart-healthy social space. Although the literature on social space is scarce, the role of social spaces is emerging to be prominent as cities are getting denser, and democratising the public social space will benefit all citizens, including vulnerable groups (Del-Real, Ward, & Sartipi, 2021; UN-Habitat, 2020). In other words, the imagined future SSH social spaces should have equity opportunities for all to access.

From a case study in Australia, healthy social spaces in urban areas can be created and demonstrated through three elements, namely observation of the pandemic outbreak (greater use of local environments, epidemic of loneliness, social isolation and mental health), green and paved open space (increasing importance in densifying cities), and smart social space projects such as health and ageing supportive infrastructure (Thompson et al., 2023). This is a good example of combining smart technology development and promoting healthy cultural preservation through citizen's contribution and framed under participatory governance (Alves, 2019; Lim & Yigitcanlar, 2022). In summarising the findings, the authors form the SSH framework through two layers of thought: layer one on conceptual framing and layer two on implementation (see Fig. 2).

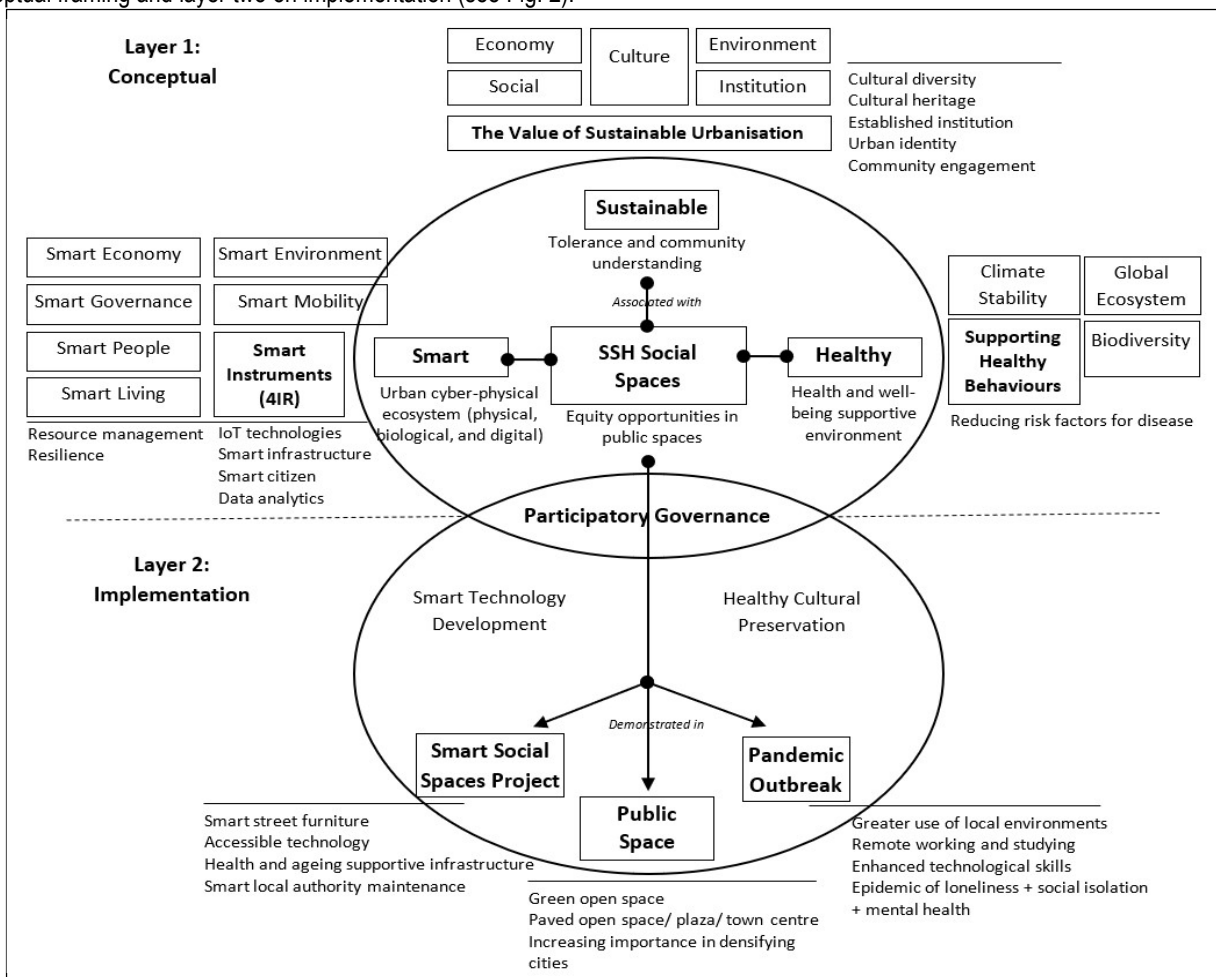


Fig. 2. The sustainable-smart-healthy (SSH) development framework

(Source: Adapted from Barton and Grant (2006), Giffinger et al. (2007), Lim and Yigitcanlar (2022), Thompson et al. (2023), and UN-Habitat (2020))

5.0 Conclusion

Through the systematic literature review methodology, important themes were constructed, i.e., integrating intangible and cultural values (i.e., institution and cultural diversity) from sustainable urbanisation, smart instruments from the smart city, and supporting healthy behaviour from the healthy city. Findings revealed that cultural heritage significantly influences urban identity and community engagement, while urban cyber-physical ecosystem enhance resource management and resilience. Additionally, smart instruments facilitate data-driven decision-making, optimising urban services and improving health outcomes. The proposed SSH framework provides a holistic approach to conceptual and implementation layers, addressing the shortcomings of previous sustainable development frameworks that focused primarily on economic, social, and environmental dimensions. With the basis of understanding layer one of those foundation conceptual ideas, i.e., associating the concepts of sustainable urbanisation, smart and healthy cities, implementing layer two would make sense through demonstration in smart (public) social spaces projects that considering potential pandemic outbreaks. Participatory governance is viewed as the heart of this SSH framework, which enables and dedicates a balance between smart technology development and healthy cultural preservation for SSH development implementation. Despite the formulation of the SSH framework, this study is limited to a single database selection that future studies could integrate another scientific platform such as Web of Science and Scopus. Besides, possible biases in the selected literature and the exclusion of non-English sources may restrict the findings' comprehensiveness and need further empirical testing on the proposed framework.

Acknowledgements

The authors thank Universiti Teknologi MARA for funding this research through the 600-RMC/VCSP 5/3 (003/2024) grant and the National University of Singapore for supporting the research.

Paper Contribution to Related Field of Study

This study has contributed to the existing sustainable development body of knowledge in conceptualising the sustainable-smart-healthy nexus by integrating intangible and cultural values, urban cyber-ecosystem, smart instruments, participatory governance and healthy-cultural sensitivity in developing sustainable future urban environments.

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