

Challenges in Implementing Urban Green Space: A Review

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ABSTRACT

Urban green spaces refer to established area within urban area, such as parks, garden, and open spaces. These spaces play a crucial role in promoting environmental sustainability, providing opportunities for leisure activities, and enhancing the general well-being of urban residents. The architecture of a “dense city” has disadvantages since it promotes crowded regions, reduces the amount of urban green space, and exacerbates the urban heat island effect. In the post-pandemic era, heightened awareness of health and well-being has reinforced the importance of accessible green space within communities. Therefore, this study systematically analysed existing literature to investigate the obstacles encountered while constructing green spaces within urban environments and the implementation strategies related to urban environments. The challenges are categorised into three (3) primary domains: Social and Health, Environment and Economy. This study provides insights into the difficulties faced by Urban Green Spaces (UGS) and offers suggestions for enhancing the city’s planning and management of green areas.

THE NEEDS FOR GREEN AGENDA IN CITY DEVELOPMENT

According to the World Health Organisation (WHO), health is defined as a state of well-being that necessitates taking preventive measures and addressing social and environmental issues via joint efforts involving multiple sectors. Prior research has demonstrated that Urban Green Space (UGS) has a significant role in enhancing the well-being of cities and their inhabitants and promoting better health and social unity (Boarnet, 2006). UGS, or Urban Green Spaces, designated areas within cities that provide people with better air quality, opportunities for physical activity, and more social contact with other community members (Hunter et al., 2019). The interest in understanding the impact of urban environments on these

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characteristics has grown in recent decades, given that over half the global population now lives in cities (Keniger et al., 2013).

Like many other countries, Malaysia is currently grappling with the increasing urbanisation, degradation of the environment, and problems posed by climate change. In recent years, Malaysia has experienced a notable increase in its efforts and initiatives to promote the growth of eco-friendly and sustainable urban areas. The concept of “green cities” has gained prominence as a potential solution to these challenges and the pursuit of a sustainable future. The development of green cities in Malaysia aims to incorporate environmental considerations, social welfare, and economic growth into urban planning and design. Implementing UGS in development projects in Malaysia can significantly enhance the quality of life for its citizens UGS are essential components of urban environments since they can enhance the overall quality of life and shape the behaviour of urban residents. The current phenomenon of population growth has led to an increase in the city’s population. The city’s progress is essential to accommodate the swiftly expanding population.

However, the influx of people into the city has led to many issues, such as air pollution, traffic congestion, excessive garbage production, and reduced open spaces. A shift in perspective towards environmentally friendly urban design is necessary as unregulated urban expansion could exert considerable pressure on ecosystems and natural resources. Thus, establishing and maintaining UGS within cities can improve environmental sustainability, social harmony, and community welfare (Kemarau et al., 2021). In recent development policy, Malaysia increasingly prioritises developing eco-friendly and sustainable urban areas, in line with its progress towards being a developing nation. The shift towards more eco-friendly urban areas required substantial dedication from the government and society. For instance, Kuching Sarawak has a significant proportion of around 22% of its metropolitan area covered by green spaces (Niewenhuijsen, 2016). These green spaces include public parks, natural reserves, and other areas, significantly contributing to the city’s overall urban environment. The government has outlined strategies for expanding existing green areas, establishing new parks and greenways, and incorporating green infrastructure into urban planning and development to enhance the size and quality of the city’s green space as a stance on promoting sustainability.

The potential benefits incorporating urban green spaces into project development encompassed in this context are elevated property values, enhanced social integration and engagement, improved physical and emotional well-being, and heightened resilience against the impacts of climate change. The “green city” concept underscores the integration of green technologies, ecologically friendly infrastructure, and urban environments. The primary objective of this initiative is to enhance the overall well-being of the residents, mitigate adverse environmental impacts, and foster a robust economic climate. Sustainable urban planning constitutes a fundamental element within the framework of green city development. Implementing a comprehensive urban planning strategy that promotes mixed-use development, compact urban expansion, and efficient transit infrastructure to mitigate carbon emissions and foster pedestrian-friendly environments (Wey et al., 2022).

THE GREEN URBAN DEVELOPMENT IN MALAYSIA

Green city research in Malaysia focuses on the potential advantages, problems, and methods for constructing sustainable urban settings in the Malaysian context (Kookana et al., 2020). This involves researching existing laws, practices, and projects linked to sustainable urban development and suggesting methods to enhance them. In Malaysia, there is an expanding corpus of study on different elements of green cities, such as sustainable transportation, green buildings, renewable energy, waste management, and green areas. Malaysian researchers are also investigating novel techniques to promotes urban sustainability, such

as smart cities and circular economy concepts. It can also help the country achieve its Sustainable Development Goals (SDGs), notably SDG 11, which aims to make green cities. To effectively execute the 2030 Agenda for Sustainable Development, including procedures to create a new framework for urban development, it is critical to understand the major urbanisation trends that are likely to emerge in the next years.

Government policies and initiatives are crucial in encouraging and supporting the expansion of urban green spaces. Marchi et al. (2022) suggest that UGS hold significant importance within the urban landscape, particularly during periods of societal upheaval or epidemic outbreaks like as the Coronavirus disease 2019 (COVID-19) pandemic, wherein their potential positive influence may be heightened (Marchi et al., 2022). Governments establish urban planning frameworks and zoning restrictions to delineate areas within cities for the purpose of green spaces, parks, and recreational activities (Rakhshandehroo et al., 2014). The regulations pertain to the distribution of enough land for the purpose of establishing green spaces inside urban areas, as well as their integration into the broader design of the city. Green infrastructure refers to the planning and administration of natural and partially natural spaces, including parks, gardens, urban forests, wetlands, and green corridors.

Globally, several international policies, such as SDGs, the Paris Agreement, Global Environment for Cities etc., establish the policies and guidelines for worldwide sustainable development and environmental preservation. At the national level, governments implement targeted policies to address their own urban challenges and goals, including measures such as implementing green building regulations, enhancing public transportation systems, and promoting biodiversity conservation. This can be further elaborated in the Twelfth (12th) Malaysia Plan, the National Green Technology Policy, and the Green Technology Master Plan Malaysia. Furthermore, at the state or regional level, which is Sarawak, Sarawak's Post COVID-19 Development Strategy, 2030 is implemented to accommodate local intricacies and preferences, guaranteeing a more focused and efficient strategy for sustainable urban growth while offering a strategic plan to assure the progression towards a more resilient and environmentally friendly future for Sarawak. Table 1 summarises the list of policies that could be the guide for the green urban development implementation.

Table 1. The Policy on Green Urban Development in Malaysia

No.	Policy on Green Urban Development	Focuses	Source
1	Sustainable Development Goals (SDGs) (2015 to 2030)	Goal (11) Ensure cities' inclusive, safe, resilient, and sustainable.	United Nations
2	Paris Agreement (2015 to present)	Providing guide to mitigate greenhouse gas emissions.	S&P Global
3	Global Environment for Cities (2019- 2050)	Providing guidelines for the decisionmakers at city level to adapt climate, biodiversity, and pollution issues for environmental sustainability.	United Nations Environment Programme
4	The Organisation for Economic Cooperation and Development (OECD) (1961 to 2050)	Creating better policies for economic growth while ensuring natural assets continue to provide resources and environmental services that humans need.	OECD
5	The National Green Technology Policy (NGTP) (2009 to present)	Adaptation to green technology to promote national economy and sustainable development	Asia Pacific Energy Portal

6	Green Technology Master Plan Malaysia (2017 to 2030)	Providing strategic directions to support NGTP which promotes green technology related policies and action plans.	Green Technology Master Plan Malaysia
7	Twelfth Malaysia Plan (2021 to 2025)	Ensuring socioeconomic development including economic empowerment, environmental sustainability, and social re-engineering.	Government of Malaysia (Ministry of Economy Malaysia)
8	National Urbanisation Policy 2 (2006 to present)	To stimulate and organise national urbanisation planning and development to ensure it is more efficient and systematic, particularly in managing the expected rise in urban population by 2020.	PLAN Malaysia

Source: Authors (2024)

Table 2. The Initiatives by The Sarawak Government towards Green Agenda.

No.	Initiatives by the Government	Focuses	Source
1	Sarawak Post COVID Development Strategy 2030 (PCDS 2030)	To promote sustainable urban transformation through green construction practises, resilient infrastructure, low-carbon development and digital innovation.	Official Portal of Sarawak Government
2	Sarawak Net Zero Target 2050	To build climate-resilient cities, the expansion of urban greenery, mitigate heat island effects, enhance urban microclimates in alignment with low-carbon and sustainable urban planning principles.	Jabatan Premier Sarawak
3	Sarawak Green Policy Economy 2030	To support sustainable development goals by promoting low-carbon growth, improving environmental quality and enhancing resilient urban ecosystems.	Jabatan Premier Sarawak
4	Sarawak Sustainability Blueprint 2030		
	Strategic Thrust 7: Sustainable Stewardship of Natural Assets	To conserve biodiversity and maintain ecological balance by expanding and protect Totally Protected Areas (TPAs) and other forest regions.	Ministry of Energy and Environmental Sustainability Sarawak
	Strategic Thrust 8: Sustainable Cities	To promote sustainable urban mobility by introducing Green Transit-Oriented Development (TOD) that encourages compact, walkable, and transit-focused communities.	

Source: Authors (2025)

THE SYSTEMATIC LITERATURE REVIEW

A Systematic Literature Review (SLR) is a systematic and comprehensive method to examine prior scholarly works within a particular field, with the aim of identifying, analysing, and consolidating the

existing evidence. The primary objective of a SLR is to present a comprehensive and impartial synthesis of existing knowledge pertaining to a certain subject matter. In the process of doing a SLR, it is imperative to adhere to the principles of correct citation and reference. In conducting the systematic literature review for this paper (refer to Figure 1), the analysis of articles and journals spans from the year 2023 back to 2013, providing a comprehensive overview of the relevant research. This methodology is crucial for upholding academic integrity and appropriately acknowledging the sources of information utilised in the review. Four (4) main steps as elaborated below;

(i) Examine the technique of selection

Three (3) online databases which Scopus, ScienceDirect and Web of Science were used as the articles and journals search engine. The primary keywords are “urban green space” and “project”, used to search the relevant articles. A total of 98 journals and articles that are identified using the primary keywords. The databases were alternatively searched using phrases (such as “urban green space”) OR “community”, “health”, “leisure”, “nature area” or “common space” “community space” OR “green space” AND “health” as secondary keywords. However, the findings are inadequate to be proceeded for SLR.

(ii) Screening

This stage included delivery and search strategy. The procedure entails the identification of pertinent databases and the formulation of a precisely defined search query to deliberately obtain relevant literature. Each SLR was evaluated using the following criteria which are based on four (4) quality assessment (QA) questions (Refer Table 2). Only articles that meet all four (4) questions with a ‘Yes’ answer will be examined in the next phase of the SLR.

Table 3. The Quality Assessment Question

No.	Quality Assessment Question
1	Does the inclusion and exclusion criteria of the review adequately defined and acceptable?
2.	Does the literature cover all relevant studies on the UGS with specific objectives that comply with the intended studies on UGS?
3.	Does the content of the SLR give a clear overview on the UGS topic?
4.	Were the information and theories demonstrated were described adequately?

Source: Authors (2025)

(iii) Eligibility

The synthesis phase encompassed and extraction and categorisation of pertinent data from the selected papers to draw conclusions and knowledge. The process of extracting data entailed the identification and retrieval of pertinent information from the selected papers. Some of the selected papers are excluded from the SLR after screening processes due to factors such as closed-access, inadequate information etc. Finally, for the objective of data processing, the information pertaining to each selected document was extracted into an Excel spreadsheet. The categorisation stage encompassed the categorisation such as Year of Publish, Reference, Information Extractions and Location to process the extracted data to a more systematic and adequate for subsequent analysis.

(iv) Included

During this process, the selected papers are further extracted from the previous Excel spreadsheet to further analyse the output to provide the research for scientific purposes and reference. A total number of 42 selected papers with projected objectives and adequate information delivered as intended topic on UGS are recorded for future reference.

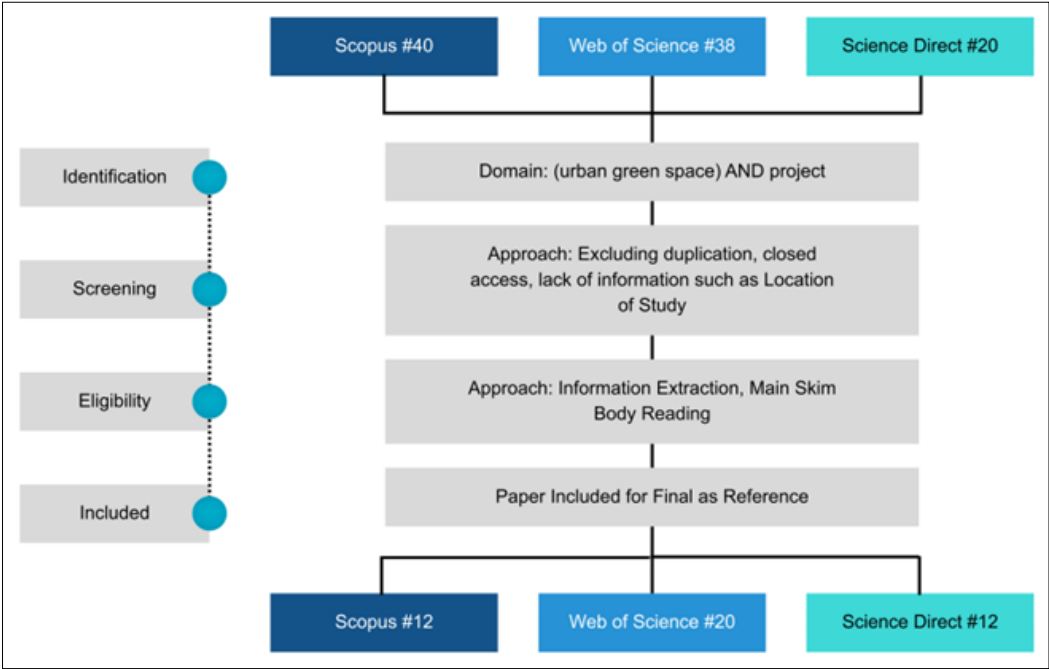


Fig. 1. The Flow Diagram for The Databases is Used for Systematic Literature Review

Source: Authors (2025)

FINDINGS AND DISCUSSION

The SLR analysis focuses on the challenges of UGS implementation. Identifying challenges is important to ensure possible solutions to minimise the risk of UGS failing to achieve its implementation objectives. This paper highlights three (3) main categories of challenges namely, Social Health, Environmental and Economic, as shown in Table 3 below. For the Social and Health category, challenges such as Life Quality (9), Knowledge (7) and Awareness (3) are the most mentioned in the selected papers, which accumulated a total number of 16. For the Environmental category, Inadequate Space (2), Lack of Access (4) and Socio-Environmental Equity (3) are identified, which accumulated a total number of 9. For the Economic category, Limited Resources (8) are the most mentioned challenges in implementing UGS by the scholar.

Table 4. The Challenges Main Category

Social and Health	Environmental	Economic
Life Quality (n-6)	Access (n-4)	Resources (n-8)
Knowledge (n-7)	Space (n-2)	
Awareness (n-3)	Socio Environmental Equity (n-3)	
n = 16	n = 9	n = 8

Source: Authors (2025)

Social and Health Category

Table 4 briefly summaries the literature findings related to the challenges in the Social and Health Category, namely Insufficient Knowledge (n-7) and Low Quality of Life (n-6). An inadequate understanding of urban green space management can result in ineffective utilisation of UGS areas, diminishing their capacity to positively contribute to community well-being, social harmony, and overall urban adaptability. Furthermore, a lack of understanding regarding community preferences and the ecological impact of various plant and tree species might hinder the creation of visually pleasing and environmentally beneficial urban green spaces during development. The diversity of urban green infrastructure features associated with different types of urban green, urban spaces and their significance in green infrastructure plans has not received widespread acknowledgement (Mofrad et al., 2022). Hence, further investigation is required to comprehensively comprehend the range of urban green infrastructure, ecosystem services, additional advantages, interconnections, and compromises linked to it. Policymakers and planners should prioritise long-term urban green planning projects and engage residents in the decision-making and planning for urban green spaces (Latinopoulos, 2022).

One (1) proposed solution is to develop a map and inventory of underground gas storage facilities to establish a comprehensive regulatory framework to guide actions and choices (Koc et al., 2017). Inadequate comprehension can have far-reaching implications on Malaysia's advancement, impacting multiple social, economic, and technical growth facets. The Twelfth (12th) Malaysia Plan priorities integrating policies across the economic, environmental, and social sectors to foster a well-rounded and sustainable growth path. The approach ensures that economic growth should be pursued not at the environments or social equity's expense. The Twelfth (12th) Malaysia Plan aligns with global frameworks such as the United nations' SDGs. This partnership will demonstrate a dedication to attaining financial expansion and broader objectives such as enhancing social welfare, alleviating poverty, and conserving the environment.

Table 5. Source Article for Social and Health Challenges

Challenges: Social and Health Category			
1. Inadequate Knowledge	Author	Year	Location
	Mofrad & Ignatieva (2022)	2022	Australia
	de Carvalho <i>et al.</i> (2022)	2022	Portugal
	Latinopoulos (2022)	2022	Thessaloniki
	Graça <i>et al.</i> (2022)	2022	Cities Worldwide
	Hanson <i>et al.</i> (2021)	2021	Sweden
	Shuvo <i>et al.</i> (2020)	2020	125 low and middle-income countries (LMICs)

	Feltynowski <i>et al.</i> (2018)	2018	Poland
2. Low Life Quality	Author	Year	Location
	Bille <i>et al.</i> (2023)	2023	China
	Veitch <i>et al.</i> (2022)	2022	Australia
	Makowska (2021)	2021	Athens
	Fischer <i>et al.</i> (2018)	2018	United Kingdom
	Liu <i>et al.</i> (2016)	2016	China
	Larson <i>et al.</i> (2016)	2016	United States

Source: Authors (2025)

Environmental Category

Table 5 summarises the list of literature findings for each challenges categories which is Environmental Category; Lack of Access (4). Inadequate access is a barrier to the successful implementation of urban green spaces, limiting community engagement and the use of these areas for recreational use and ecological purposes. The inaccessibility of green areas becomes a barrier in urban design, impeding the establishment of inclusive and dynamic urban environments that foster physical activity, social engagement, and general well-being of the community. Moreover, inadequate access to urban green not only negates their intended benefits but also limits their role in promoting a better and more sustainable urban lifestyle, emphasising the importance of intelligent design and accessibility considerations in urban development plans.

Since March 2020, due to the COVID-19 pandemic, the city has faced major restrictions on individual movement. The government has restricted movement to several leisure facilities, including public open spaces, parks, restaurants, shopping malls and recreational areas. These restrictions include limits on social activity, the need to self-quarantine, and the need to maintain social distancing. Therefore, UGS located near one's residence becomes very important to carry out leisure activities and maintain physical and mental well-being amid the limitations of personal movement caused by the COVID-19 pandemic (Koc *et al.*, 2017, Geng *et al.*, 2021). The inclusion of eco-friendly environments within the city, such as urban green spaces (UGS), has been identified as an element helping individuals' resilience during pandemics (Venter *et al.*, 2020). Therefore, experience from life during the COVID-19 outbreak has shown that UGS's location relatively far from a person's residence results in limited access and restricts the individual from enjoying the benefits of the UGS.

Inadequate access as a barrier to the growth of urban green areas refers to issues in making these locations easily accessible, usable, and inclusive for the population. Physical constraints can be resulted by limited routes, insufficient connection, or the absence of well-designed entrances, making it difficult for inhabitants to reach urban green spaces. People may be discouraged from using these sites for recreation or other activities due to their inaccessibility. Moreover, in terms of approximate and availability, the residents may have difficulty accessing urban green spaces on a regular basis if they are located distant from residential areas or are insufficient in number. A lack of proximity an availability may diminish the chance of neighbourhood members using these spaces for recreational and social interactions.

Table 6. Source Articles for Environmental Category

Challenges: Environmental Category			
1. Lack of Access	Author	Year	Location
	Connolly <i>et al.</i> (2023)	2023	Los Angeles
	Geng <i>et al.</i> (2021)	2021	Southern Hemisphere countries
	Marsh <i>et al.</i> (2020)	2019	Australia
	Kabisch <i>et al.</i> (2016)	2016	European Union Cities

Source: Authors (2025)

Economic Category

Table 6 summarises the list of literature findings for each challenges categories which is Economic Category; Limited Resources (8). Limited resources present significant problems in development and maintenance of urban green spaces, influencing the availability of finances for landscaping, infrastructure, and amenities required to create dynamic and sustainable green landscapes. The constraints of resources emphasise the need for strategic allocation in context of urban planning, since competing objectives may limit investments in green spaces, limiting their capacity to serve as key components of liveable, healthy, and environmentally friendly communities.

It is challenge to improve the quality of life in neighbourhoods due to the urbanisation which resulting from the land constraints and high population (Fu *et al.*, 2022). This study noted that in order to encourage connections between local cultural and natural resources, which can also contribute to local development by providing a variety of services such as recreation, biodiversity conservation, heritage, education, etc. Limited resources may be spread among multiple urban development initiatives, making it difficult to devote adequate finances for the creation and maintenance of green spaces. Urban planners and policymakers must balance these demands while also recognising the value of green spaces in promoting sustainable and liveable cities.

Table 7. Source Articles Economic Category

Challenges: Environmental Category			
1. Limited Resources	Author	Year	Location
	He <i>et al.</i> (2023)	2023	China
	Honey-Rosés <i>et al.</i> (2023)	2022	Canada
	Wang <i>et al.</i> (2020)	2020	Hong Kong
	Shuvo <i>et al.</i> (2020)	2020	125 low and middle-income countries (LMICs)
	Feltynowski & Kronenberg (2020)	2020	Poland
	Gavrilidis <i>et al.</i> (2019)	2019	Romania
	Dou <i>et al.</i> (2017)	2017	Beijing
	Van Zoest, & Hopman (2014)	2014	Dutch

Source: Authors (2025)

EXPERT INTERVIEWS

To Further validation of the strategies will be made through the expert interview discussion. The expert interview manual is designed based on the strategies which is identified in the systematic literature review. The expert interview manual is divided into two (2) sections: Section A: demographic questions to get the informants' demographic information such as their profession, highest educational qualifications, organisation background, years of experience in UGS related project and registration to any professional bodies are to be asked during the discussion. Section B will be asking on objective-related questions by using Likert scale, from strongly disagree to strongly agree on the eight (8) categories of strategies listed. Their opinion on the strategies also considered.

The questions were meant to enable informants to contribute further information and suggestions; the primary points addressed consisted of:

- (i) The understanding of "urban green space" concepts and its importance to the social, economic, and environmental.
- (ii) The courage to be involved in green spaces projects.
- (iii) The degree to which implementation or urban green spaces has been applied in construction industry.
- (iv) A close-ended question however open for opinion and suggestion in the end of questionnaire.

QUESTIONNAIRE DEVELOPMENT

Generally, there are two (2) types of questionnaires which are open-ended and close-ended questionnaire. The open-ended questions are those that require more than one (1) word answers. It offers respondents an opportunity to answer completely and give a complete overview about the situation (Hussin et al., 2021). The answer may come in the form of a list, a few sentences or a longer speech, paragraph, or essay. According to (Hussin et al., 2021), open-ended questions encourage respondents to convey attitudes, feelings, their own opinions, and ideas.

However, open-ended questionnaire cons will take time for respondents to complete the questionnaire. Meanwhile, a closed-ended question providing a list of items to be reviewed, alternative answers will be chosen by the respondent or a blank to be filled by the respondent. It may be entirely structured (arrangement) with scales requiring a "yes/no" response or a directional type of response. Open-ended questions allow respondents to use a minimum of time to complete the questionnaire (Darussalam & Hussin, 2021; Hussin et al., 2021).

Table 8. Questionnaire Criteria

Parts/Sections	Descriptions
A Respondent's Profiles	By providing respondents' responses context, boosting the research's legitimacy, and facilitating insightful interpretation of the results, collecting respondent profiles guarantees the relevance, validity, and diversity of the data.
B Urban Green Space (UGS) Implementation Strategies for The	This part of UGS implementation strategies which are collected through systematic literature review and validated via expert interviews. The strategies are drafted as questionnaire for further investigation in this research.

Construction Project Within Urban
Area in Kuching Sarawak

C	Opinion on the strategies for the implementation of the urban green spaces for construction projects within urban area in Kuching, Sarawak	Getting feedback and suggestions is essential since they validate findings, offer useful insights, and enhance study conclusions. Diverse viewpoints on the topic are provided via opinions, guaranteeing a thorough comprehension of the problem. Recommendations guarantee the study's relevance and application by providing guidance for concrete actions for implementation, policy-making, or additional research.
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Source: Authors (2025)

Table 9 presents the implementation categories and corresponding codes for UGS. It is essential to consider multiple variables while planning the development of urban green spaces in urban areas. To ensure effective and environmentally friendly growth, several vital aspects must be considered, including the location and proximity to residential areas, transportation networks, and the availability of land (Boarnet et al., 2006; Gavrilidis et al., 2019). Analysing population growth and demographic characteristics in urban areas involves identifying regions with high population density, limited availability of green spaces, and areas where many residents can access green spaces within the city. The analysis should address the shortage of large green spaces and how they may contribute positively to the city. UGS decreases environmental effects by positively affecting climate mitigation, noise reduction, air purification, and biodiversity enhancement (Wang et al., 2020). Priority should be placed on constructing UGS in places particularly susceptible to pollution and viewing it as a chance to restore ecosystems (Mofrad et al., 2022). Essentially, this UGS safeguards and improves the ecological significance of green areas and can contribute to the overall durability of the city. UGS have significant impact on urban life as they fulfil aesthetic, recreational, and cultural functions while also contributing to biodiversity conservation and environmental improvement (Mofrad et al., 2022; Connolly et al., 2023). In order to guarantee the enduring viability and appropriate preservation of green areas, it is crucial to consider factors such as finance, personnel, and infrastructure for their effective management and upkeep. Economic considerations will significantly influence the planning and design of the USG.

To systematically evaluate the factors influencing the implementation of UGS, this study employs a structured coding system. This system categorises various determinants into specific groups, each represented by a letter, with numerical codes assigned to individual elements within the categories. This classification ensures clarity, uniformity, and ease of comparison, allowing for an organised assessment of the factors that shape UGS development and sustainability.

A fundamental component of this study is the application of the Relative Importance Index (RII) methodology. The RII is a statistical approach that ranks variables based on their significance, enabling policymakers, urban planners, and stakeholders to prioritise key aspects of UGS implementation. By integrating the structured coding system with the RII ranking method, this study enhances analytical precision, facilitating well-informed decision-making to strengthen green infrastructure and promote sustainable urban development.

Table 9. UGS Implementation Categories and Codes

Category	Coding	Criteria/Element
A. Planning Category	A1	Development Planning
	A2	Providing Green Space for Redeveloped Green Space
	A3	Located Near Residential Area
	A4	Redressing Park-Poverty in Community

B. Stakeholder Involvement Category	B1	Community-led Initiative
	B2	Government Support
	B3	Partnership
C. Design Category	C1	Landscape Ecological Design
	C2	Urban Vegetation
D. Maintenance Category	D1	Enhancing Quality of the Existing Green Space
	D2	Improving Recreational Facility
	D3	Preserving Heritage with Urban Green Spaces
E. Financial Category	E1	Financial Allocation
	E2	Smart Allocation
F. Policy and Guideline Category	F1	Mandatory Relation of Built Environment and Green Space
G. Awareness Category	G1	Public Involvement
	G2	Educational and Programmes
	G3	Knowledge for Broader Understanding
H. Technology Category	H1	Availability of the Urban Green Space Data
	H2	Smart System for Urban Green Space

Source: Authors (2025)

DATA ANALYSIS

To determine the relative importance of these factors, the RII was applied, a statistical method that ranks the significance of variables based on their influence on UGS strategies. The RII is calculated using the formula: RII Calculation Formula.

The Relative Importance Index (RII) is calculated using the formula:

$$RII = \frac{\sum W}{A \times N}$$

Where:

W = Weight given to each factor by respondents (on a scale of 1 to 5),

A = The highest weight (5),

N = Total number of respondents.

EXCLUSION OF END USERS IN QUESTIONNAIRE DATA

To ensure the accuracy and relevance of the questionnaire data, responses from public or end users were excluded from the analysis. This decision was made because such respondents are neither directly nor indirectly involved in the planning, management or implementation of UGS. Including their input could introduce bias or dilute the insight derived from the stakeholders.

However, end users' opinions are considered as general public perception or community feedback (Alam & Lovett, 2019) providing contextual insight into the usage, accessibility and social value of UGS. Public or citizen perceptions are therefore used as contextual or supplementary insight rather than primary data or stakeholder decision-making (Newig et al., 2023).

CONCLUSIONS

This paper is conceptual paper derived from the literature review process and will be further investigated to verify the main challenges and strategies in implementing UGS. This paper focuses on the challenges which is further classified into three (3) main categories and strategies recommendation to encounter the challenges. This paper has limitations where the review used a systematic literature review to support the discussion and critical analysis of the literature. The keywords chosen for the article selection by researchers may be skewed by the researchers concerned. However, this paper aims to improve the comprehension of the challenges in implementing UGS in Malaysia's construction industry. The objectives of this paper have been achieved by categorising the main categories and the important challenges that will help to create awareness to foster UGS implementation.

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CONFLICT OF INTEREST STATEMENT

The author declares that there is no conflict of interest regarding the publication of this journal article. The research was conducted independently, and no financial, professional, or personal relationship have influenced the study's findings, analysis, or conclusions.

AUTHORS' CONTRIBUTIONS

Hafizah Ti Morni conducted the research, authored the initial draft, and revised the manuscript. Dr Asmah Alia Mohamad Bohari conceptualised the central data and assisted with data tabulation. Dr Farrah Zuhaira Ismail contributed to defining the paper's structure and direction. Siti Nurul Ainun Mohd Mustafa oversaw the overall content and compilation of the manuscript. All authors have read and approved the final version of the manuscript.

REFERENCES

- Alam, R., & Lovet, J. C. (2019). Prospect of public participation in the planning and management of urban green spaces in Lahore: A discourse analysis. *Sustainability*, 11(12), 3387.
- Bille, R. A., Jensen, K. E., & Buitenwerf, R. (2023). Global patterns in urban green space are strongly

- linked to human development and population density. *Urban Forestry & Urban Greening*, 81, 127980. <https://doi.org/10.1016/j.ufug.2023.127980>
- Boarnet, M. G. (2006). About this issue: Planning's role in building healthy cities: An introduction to the special issue. *Journal of the American Planning Association*, 72(1), 5–9. <https://doi.org/10.1080/01944360608976719>
- Connolly, R., Lipsitt, J., Aboelata, M., Yañez, E., Bains, J., & Jerrett, M. (2023). The association of green space, tree canopy and parks with life expectancy in neighborhoods of Los Angeles. *Environment International*, 173, 107785. <https://doi.org/10.1016/j.envint.2023.107785>
- Darussalam G., & Hussin, S. (2021). *Metodologi penyelidikan dalam pendidikan* (3rd ed.). Universiti Malaya.
- de Carvalho, C. A., Raposo, M., Pinto-Gomes, C., & Matos, R. (2022). Native or exotic: A bibliographical review of the debate on ecological science methodologies: Valuable lessons for urban green space design. *Land*, 11(8), 1201. <https://doi.org/10.3390/land11081201>
- Dou, Y., Zhen, L., De Groot, R., Du, B., & Yu, X. (2017). Assessing the importance of cultural ecosystem services in urban areas of Beijing municipality. *Ecosystem Services*, 24, 79–90. <https://doi.org/10.1016/j.ecoser.2017.02.011>
- Feltynowski, M., & Kronenberg, J. (2020). Urban green spaces—An underestimated resource in third-tier towns in Poland. *Land*, 9(11), 453. <https://doi.org/10.3390/land9110453>
- Feltynowski, M., Kronenberg, J., Bergier, T., Kabisch, N., Łaskiewicz, E., & Strohbach, M. W. (2018). Challenges of urban green space management in the face of using inadequate data. *Urban Forestry & Urban Greening*, 31, 56–66. <https://doi.org/10.1016/j.ufug.2017.12.003>
- Fischer, T. B., Jha-Thakur, U., Fawcett, P., Clement, S., Hayes, S., & Nowacki, J. (2018). Consideration of urban green space in impact assessments for health. *Impact Assessment and Project Appraisal*, 36(1), 32–44. <https://doi.org/10.1080/14615517.2017.1364021>
- Fu, J., Bu, Z., Jiang, D., Lin, G., & Li, X. (2022). Sustainable land use diagnosis based on the perspective of production–living–ecological spaces in China. *Land Use Policy*, 122, 106386. <https://doi.org/10.1016/j.landusepol.2022.106386>
- Gavrilidis, A. A., Niță, M. R., Onose, D. A., Badiu, D. L., & Năstase, I. I. (2019). Methodological framework for urban sprawl control through sustainable planning of urban green infrastructure. *Ecological Indicators*, 96, 67–78. <https://doi.org/10.1016/j.ecolind.2017.10.054>
- Geng, D., Innes, J., Wu, W., & Wang, G. (2021). Impacts of COVID-19 pandemic on urban park visitation: A global analysis. *Journal of Forestry Research*, 32, 553–567. <https://doi.org/10.1007/s11676-020-01249-w>
- Graça, M., Cruz, S., Monteiro, A., & Neset, T.-S. (2022). Designing urban green spaces for climate adaptation: A critical review of research outputs. *Urban Climate*, 42, 101126. <https://doi.org/10.1016/j.uclim.2022.101126>

- Hanson, H. I., Eckberg, E., Widenberg, M., & Alkan Olsson, J. (2021). Gardens' contribution to people and urban green space. *Urban Forestry & Urban Greening*, 63, 127198. <https://doi.org/10.1016/j.ufug.2021.127198>
- He, M., Wu, Y., Liu, X., Wu, B., & Fu, H. (2023). Constructing a multi-functional small urban green space network for green space equity in urban built-up areas: A case study of Harbin, China. *Heliyon*, 9(11), e21671. <https://doi.org/10.1016/j.heliyon.2023.e21671>
- Honey-Rosés, J., & Zapata, O. (2023). Green spaces with fewer people improve self-reported affective experience and mood. *International Journal of Environmental Research and Public Health*, 20(2), 1219. <https://doi.org/10.3390/ijerph20021219>
- Hunter, R. F., Cleland, C., Cleary, A., Droomers, M., Wheeler, B. W., Sinnett, D., Nieuwenhuijsen, M. J., & Braubach, M. (2019). Environmental, health, wellbeing, social and equity effects of urban green space interventions: A meta-narrative evidence synthesis. *Environment International*, 130, 104923. <https://doi.org/10.1016/j.envint.2019.104923>
- Hussin, F., Ali, J., & Zamzuri Noor, M. S. (2024). *Kaedah penyelidikan dan analisis data SPSS* (9th ed.). Penerbit Universiti Utara Malaysia. (Original work published 2014)
- Ignatieva, M., & Mofrad, F. (2023). Understanding urban green spaces typology's contribution to comprehensive green infrastructure planning: A study of Canberra, the national capital of Australia. *Land*, 12(5), 950. <https://doi.org/10.3390/land12050950>
- Kabisch, N., Strohbach, M., Haase, D., & Kronenberg, J. (2016). Urban green space availability in European cities. *Ecological Indicators*, 70, 586–596. <https://doi.org/10.1016/j.ecolind.2016.02.029>
- Kemarau, R. A., & Eboy, O. V. (2021). Spatial temporal of urban green space in tropical city of Kuching, Sarawak, Malaysia. *Journal of Applied Science & Process Engineering*, 8(1), 660–670. <https://doi.org/10.33736/jaspe.2919.2021>
- Keniger, L. E., Gaston, K. J., Irvine, K. N., & Fuller, R. A. (2013). What are the benefits of interacting with nature? *International Journal of Environmental Research and Public Health*, 10(3), 913–935. <https://doi.org/10.3390/ijerph10030913>
- Koc, C. B., Osmond, P., Peters, A., & Irger, M. (2017). Mapping local climate zones for urban morphology classification based on airborne remote sensing data. In *2017 Joint Urban Remote Sensing Event (JURSE)* (pp. 1–4). IEEE. <https://doi.org/10.1109/JURSE.2017.7924611>
- Kookana, R. S., Drechsel, P., Jamwal, P., & Vanderzalm, J. (2020). Urbanisation and emerging economies: Issues and potential solutions for water and food security. *Science of the Total Environment*, 732, 139057. <https://doi.org/10.1016/j.scitotenv.2020.139057>
- Larson, L. R., Jennings, V., & Cloutier, S. A. (2016). Public parks and wellbeing in urban areas of the United States. *PLOS ONE*, 11(4), e0153211. <https://doi.org/10.1371/journal.pone.0153211>
- Latinopoulos, D. (2022). Evaluating the importance of urban green spaces: A spatial analysis of citizens' perceptions in Thessaloniki. *Euro-Mediterranean Journal for Environmental Integration*, 7(2), 299–308. <https://doi.org/10.1007/s41207-022-00300-y>

- Liu, Y., Meng, Q., Zhang, J., Zhang, L., Jancso, T., & Vatsava, R. (2016). An effective Building Neighborhood Green Index model for measuring urban green space. *International Journal of Digital Earth*, 9(4), 387–409. <https://doi.org/10.1080/17538947.2015.1037870>
- Makowska, B. (2021). Practical functioning of a sustainable urban complex with a park—The case study of Stavros Niarchos Foundation Cultural Center in Athens. *Sustainability*, 13(9), 5071. <https://doi.org/10.3390/su13095071>
- Marchi, V., Speak, A., Ugolini, F., Sanesi, G., Carrus, G., & Salbitano, F. (2022). Attitudes towards urban green during the COVID-19 pandemic via Twitter. *Cities*, 126, 103707. <https://doi.org/10.1016/j.cities.2022.103707>
- Marsh, P., Mallick, S., Flies, E., Jones, P., Pearson, S., Koolhof, I., Byrne, J., & Kendal, D. (2020). Trust, connection and equity: Can understanding context help to establish successful campus community gardens? *International Journal of Environmental Research and Public Health*, 17(20), 7476. <https://doi.org/10.3390/ijerph17207476>
- Mofrad, F., & Ignatieva, M. (2022). What is the future of the bush capital? A socio-ecological approach to enhancing Canberra's green infrastructure. *Land*, 12(1), 39. <https://doi.org/10.3390/land12010039>
- Nieuwenhuijsen, M. J. (2016). Urban and transport planning, environmental exposures and health—New concepts, methods and tools to improve health in cities. *Environmental Health*, 15, 161–171. <https://doi.org/10.1186/s12940-016-0108-1>
- Rakhshandehroo, M., & Mohd Yusof, M. J. (2014). Establishing new urban green spaces classification for Malaysian cities. In *IFLA Asia Pacific Congress* (Vol. 6, pp. 1–13).
- Shuvo, F. K., Feng, X., Akaraci, S., & Astell-Burt, T. (2020). Urban green space and health in low and middle-income countries: A critical review. *Urban Forestry & Urban Greening*, 52, 126662. <https://doi.org/10.1016/j.ufug.2020.126662>
- van Zoest, J., & Hopman, M. (2014). Taking the economic benefits of green space into account: The story of the Dutch TEEB for Cities project. *Urban Climate*, 7, 107–114. <https://doi.org/10.1016/j.uclim.2014.01.005>
- Venter, Z. S., Barton, D. N., Gundersen, V., Figari, H., & Nowell, M. (2020). Urban nature in a time of crisis: Recreational use of green space increases during the COVID-19 outbreak in Oslo, Norway. *Environmental Research Letters*, 15(10), 104075. <https://doi.org/10.1088/1748-9326/abb396>
- Veitch, J., Biggs, N., Deforche, B., & Timperio, A. (2022). What do adults want in parks? A qualitative study using walk-along interviews. *BMC Public Health*, 22, 753. <https://doi.org/10.1186/s12889-022-13064-5>
- Wang, A., Wang, H., & Chan, E. H. W. (2020). The incompatibility in urban green space provision: An agent-based comparative study. *Journal of Cleaner Production*, 253, 120007. <https://doi.org/10.1016/j.jclepro.2020.120007>
- Wey, Y. E., Sarma, V., Lechner, A. M., & Nath, T. K. (2022). Malaysians' perception on the contribution of urban green spaces to the UN sustainable development goals. *Urban Forestry & Urban Greening*,

78, 127792. <https://doi.org/10.1016/j.ufug.2022.127792>



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