

Review Article

Investigating the Crucial Indicators of Green Architecture to Enhance Quality of Life

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Article Info	Abstract
Article History	Green architecture has gained increasing attention as an environmentally responsible approach that supports human well-being, sustainable lifestyles, and improved living environments. Although many studies have examined green building principles, the direct relationship between green architecture and quality of life remains insufficiently integrated, as much of the existing literature focuses mainly on technical and environmental performance. This systematic review addresses this gap by identifying and analysing the key indicators of green architecture that contribute to quality of life and by proposing a conceptual framework linking sustainable design with human well-being. Relevant academic literature was systematically reviewed to extract, classify, and compare the most frequently discussed indicators. The findings show that social well-being was the most frequently identified indicator, appearing in 88% of the reviewed studies, followed by community impact and resource management at 84%, and pollution reduction and ecological footprint at 80%. These results indicate that green architecture should be understood not only as a technical response to environmental challenges but also as a holistic strategy for creating healthier, more livable, and socially responsive environments. The study highlights the interrelationships among environmental, social, and resource-based indicators and provides practical guidance for architects, urban developers, and decision-makers seeking to integrate sustainable and human-centred principles into contemporary built environments.
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Sustainable living	
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1. Introduction

All aspects of the world revolve around humanity, with the individual's good health being a fundamental condition at the core of this concentration [1]. Previous studies have underscored the importance of acknowledging the criteria that fundamental human needs establish for creating conducive living environments. They have also examined how to enhance quality of life through mental and physical well-being to foster a healthy society [2]. The studies, Naser and Al-Mamoori [3], and Abd, et al. [4],

recommended implementing healthy architecture to create comfortable living environments for humans. This human-centered perspective underscores an increasing acknowledgement that constructed environments significantly influence individuals' health, well-being, and overall quality of life [5].

Urbanization is a significant global environmental challenge of the twenty-first century [6]. Rapid urbanization and development induce substantial alterations, with profound ramifications for biodiversity and human well-being [7]. In this context, the latest research has identified carbon emissions as a significant global problem in response to environmental challenges. The research highlights the efficacy of WELL Building Standard indicators in reducing greenhouse gas emissions by integrating sustainability with human well-being [8]. A recent review of American perspectives on environmental issues indicated that nearly three-quarters of Americans assert that "the country should do whatever it takes to protect the environment." Consequently, when confronted, the behavioral response would be to adopt more sustainable practices [9].

In the past decade, green architecture has gained international recognition as a strategy for reducing environmental impact and improving human well-being [10]. Sustainable Development Goal 3 (SDG) mandates: "Guarantee healthy lives and foster well-being for all individuals across all age groups." Incorporating this objective into plans and strategies entails shifting priorities to integrating health and well-being within urban experiences, which requires a holistic approach. This method is crucial for promoting more sustainable and resilient urban areas and human settlements and has led to the emergence of green architecture [11]. Green architecture encompasses design principles that enhance occupants' physical health, mental well-being, comfort, and standards of living. Recent research indicates that green buildings typically offer superior indoor environmental quality compared with conventional structures, resulting in direct benefits for occupant health [5]. Green architecture can significantly promote health and well-being [12]. By investigating the essential indicators for improving quality of life and raising standards of living, while offering a conceptual framework and theoretical approach, this study aims to provide valuable insights.

Although research on green architecture and its significance in achieving SDGs is expanding, its effect on enhancing quality of life has not been thoroughly examined. Previous research has been constrained in scope, focusing on a singular indicator or a limited set of selected indicators. This indicates that existing studies fail to examine the study problem from a comprehensive viewpoint. Consequently, the

research gap necessitates a comprehensive framework for the analysis and classification of the most effective green architecture indicators for enhancing quality of life.

This study aims to identify and classify the most important green building indicators that impact quality of life by developing a comprehensive conceptual framework based on a systematic review of literature. The significance of this study lies in identifying reference indicators derived from recurring commonalities across previous studies, thereby establishing benchmarks for examining the relationship between green architecture and quality of life. The research focuses on organizing and classifying these commonly reported indicators to clarify their role in supporting well-being, sustainable living, and the creation of livable environments.

This systematic review offers a comprehensive synthesis of high-quality research over the past decade (2014–2024) about the impact of green architecture on quality of life, well-being, and sustainable living. The global view this study employs research from multiple locations to capture diverse contexts, focusing on peer-reviewed literature from journals indexed in Scopus and Web of Science (WoS).

Additional search platforms (e.g., Elsevier, MDPI, Google Scholar, ResearchGate, PubMed, Academia, ScienceDirect, JSTOR) were used to identify potential studies; all records were then screened for indexing status. Only articles indexed in Scopus or WoS were included in the final analysis, ensuring a reliable and consistent evidence base.

2. Literature Review

Green architecture, or sustainable architecture, is a design methodology aimed at reducing the environmental impact of buildings throughout their life cycle, from construction to demolition, while limiting negative impact on human health and the ecosystem [13]. Currently, green construction strategies may be the most widely embraced and best-known methods for advancing urban sustainability globally. The built environment is essential for occupant well-being, and green buildings can significantly impact this aspect [14]. Opinions vary regarding the definition of green architecture as [15] the creation of buildings that are environmentally responsible, encourage community participation, and are efficient in the use of resources throughout the building's life cycle. While Moghayedi, et al. [16] view green architecture as a form of smart green technology that adopts environmentally friendly building practices and improves the social aspect of development, the Leadership in Energy and Environmental Design (LEED) framework,

developed by the U.S. Green Building Council (USGBC), supports this perspective by defining green architecture as creating healthy, highly efficient, and cost-saving green buildings. The essence of green architecture, according to LEED, is environmental efficiency, health, performance and resource conservation. In this context, it is essential to discuss the major frameworks for evaluating green buildings. The various evaluation methods differ in their levels of accuracy, scope, and application domains [17, 18]. BREEAM, developed in the UK, assesses buildings based on their overall environmental impact, encompassing energy use, health and well-being, pollution, transportation, materials, waste, water, land use and environment, and management processes. Similarly, LEED, created by the USGBC, is one of the most comprehensive and globally recognized certifications, evaluating buildings across multiple categories, including energy efficiency, water efficiency, materials and resources, indoor environmental quality, and design innovation [19].

In addition to these two leading frameworks, CASBEE's comprehensive rating system for the built environment produces a detailed assessment throughout a building's lifecycle to maximize environmental benefits. Beyond environmental performance, other important certifications include WELL, which focuses on the health and well-being of occupants by evaluating factors such as air, water, nutrition, light, fitness, comfort, and mental health [20].

The overall well-being of residents is a comprehensive term. Research indicates that green buildings are significantly associated with various aspects of occupant well-being. Currently, green construction strategies are perhaps the most widely recognized and accepted approaches for advancing urban sustainability globally. The built environment is essential for occupant well-being, and green buildings can significantly impact this aspect [21]. By identifying these connections, this study clarifies how green architecture concepts contribute to enhancing quality of life.

Table 1 summarizes the key research gaps and corresponding contributions of this study, as identified in the literature review.

3. Methodology

A systematic literature review (SLR) on green architecture enhancing quality of life was performed using the 2020 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology, which ensures transparency, reliability, and replicability of findings while minimizing bias [20, 22].

Table 1. Research gap and study contribution

Research Gap	Contribution of the Study
Previous studies examined only a single indicator or a small subset of indicators.	This review compiles and analyzes 49 indicators across the literature.
Lack of a comprehensive framework for organizing green architecture indicators related to quality of life.	The study classifies the indicators into 16 primary indicators and four sustainability aspects (environment, economic, social, and technology).
No systematic comparison to determine the most influential indicators.	The study introduces a frequency-based prioritization to identify the most impactful indicators.
Limited examination of how green architecture holistically supports quality of life.	The review provides a holistic synthesis showing how indicators collectively contribute to enhancing quality of life.
Absence of a structured multi-stage analysis in prior research.	The study develops an eight-stage analytical framework to ensure methodological rigor and clarity.

3.1. Design Study

This study uses a systematic review to investigate the critical indicators of green architecture that influence quality of life. The research design was descriptive and analytical, concentrating on the gathering and synthesis of data from published scholarly journals. The systematic review method was selected for its structured approach to collecting and evaluating information from diverse sources, thereby providing extensive comprehension. The study conformed to PRISMA standards to ensure a rigorous and transparent evaluation process [20].

3.2. Search Strategy

During the SLR, keyword searches were conducted on two electronic databases: Scopus and WoS, to identify pertinent papers published between 2014 and 2024. Initial keyword selections were tested relating to “green architecture” and “quality of life”. Essential search terms integrated notions of green architecture (e.g., “green building”, “sustainable building”, “eco-friendly design”, “quality of life”, “LEED/BREEAM/WELL certified”, “sustainability impact”) with results concerning quality of life (e.g., “health”, “well-being”, “comfort”, “sustainable living”, “living standards”). The search was global, without regional limitations. Further records were obtained by examining the reference lists of significant papers. Additional platforms such as Google Scholar, ResearchGate, Academia, PubMed, ScienceDirect and JSTOR were used solely as search channels to locate studies; inclusion in the review was restricted to peer-reviewed articles indexed in Scopus and WoS.

Boolean operators (AND/OR) were used to construct a comprehensive search string as follows:

(“green architecture” OR “green building” OR “sustainable building” OR “eco-friendly design” OR

“environmental design” OR “sustainability impact”)

AND

(“quality of life” OR "QOL" OR “well-being” OR “health” OR “comfort” OR “sustainable living” OR “living standards”).

Searches were conducted from 6 October 2024 to 28 February 2025. Eligible studies were limited to publications from January 2014 to December 2024. Table 2 shows the full electronic searches.

The dataset was limited to Scopus and WoS due to the rigorous peer-review standards of these databases.

Table 2. Database search strategy

Database	Search
Scopus	TITLE-ABS-KEY(("green architecture" OR "green building" OR "sustainable building" OR "eco-friendly design" OR "environmental design") AND ("quality of life" OR "QOL" OR "well-being" OR "health" OR "comfort" OR "sustainable living" OR "living standards")) AND (PUBYEAR > 2013 AND PUBYEAR < 2025) AND (LIMIT-TO(LANGUAGE, "English"))
WoS	TS = (("green architecture" OR "green building" OR "sustainable building" OR "eco-friendly design") AND ("quality of life" OR "well-being" OR "health" OR "comfort" OR "sustainable living" OR "living standards"))) Refined by: LANGUAGES: (ENGLISH); DOCUMENT TYPES: (ARTICLE OR REVIEW)
PubMed (<i>platform used only to locate indexed studies</i>)	((("green architecture"[Title/Abstract] OR "green building"[Title/Abstract] OR "sustainable building"[Title/Abstract] OR "eco-friendly design"[Title/Abstract]) AND ("quality of life"[Title/Abstract] OR "well-being"[Title/Abstract] OR "health"[Title/Abstract] OR "comfort"[Title/Abstract])) AND ("2014/01/01"[Date - Publication] : "2024/12/31"[Date - Publication])
ScienceDirect (<i>search platform only</i>)	("green architecture" OR "sustainable building") AND ("quality of life" OR "well-being" OR "comfort" OR "health") Filters: Research articles, 2014–2024
Google Scholar (<i>used only as a search channel</i>)	"Green architecture" AND "quality of life" AND ("sustainable building" OR "eco-friendly design") used only to identify Scopus/WoS indexed studies
ResearchGate / Academia.edu (<i>used only for locating studies</i>)	Keywords: green architecture; sustainable building; quality of life - used solely to find full texts; only Scopus/WoS indexed records included

3.3. Eligibility Criteria and Study Selection

The inclusion criteria for this review included studies that empirically or systematically examined the relationship between green building/architecture features and their impact on occupants’ quality of life and well-being. To ensure high-quality sources, the review focused on studies published in peer-reviewed scholarly journals included exclusively in Scopus or WoS. The publication date range was set from January 2014 to December 2024 to capture the most recent decade of research.

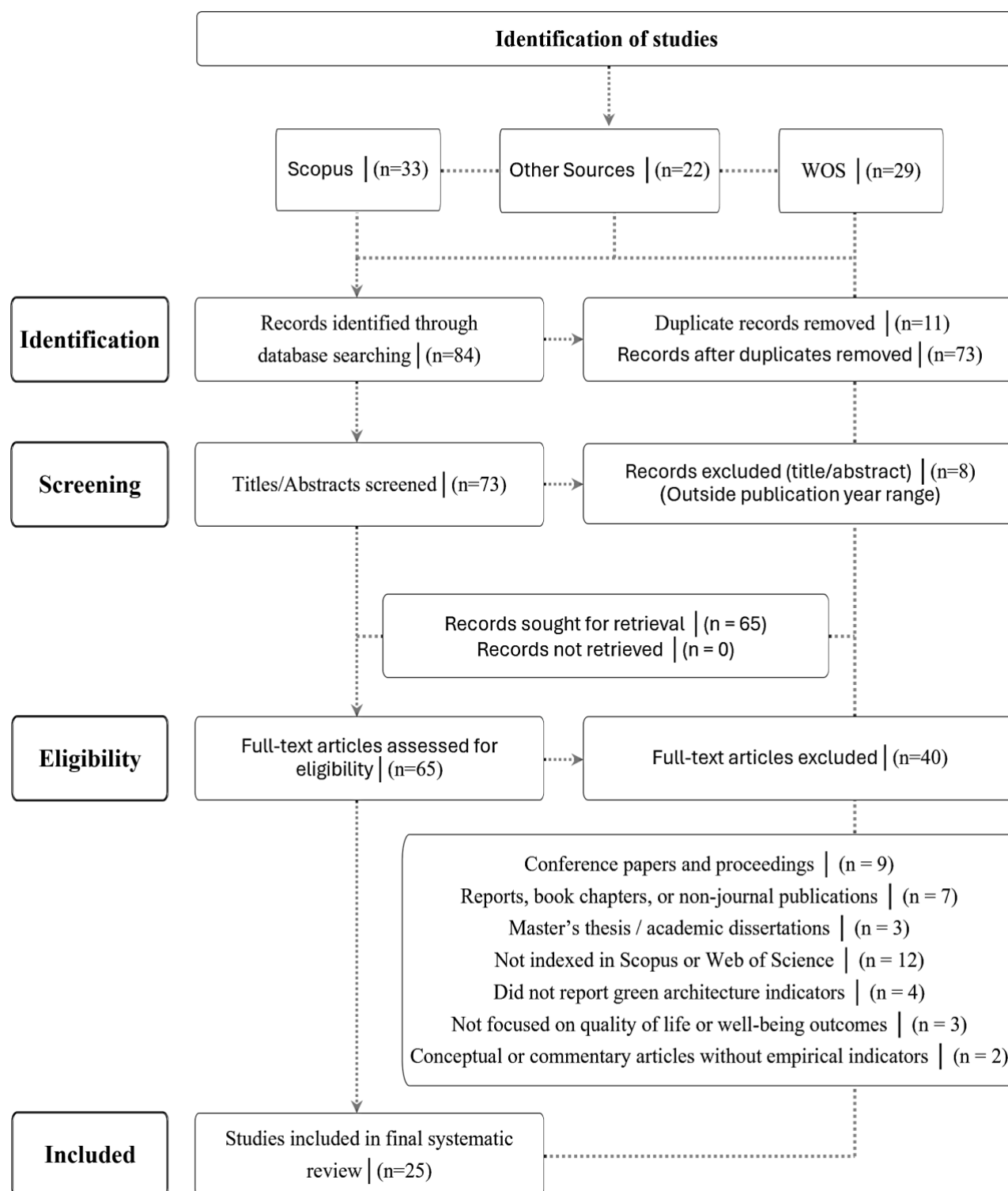


Figure 1. PRISMA flow diagram (study selection process)

Research on green architecture that did not emphasize quality of life or human well-being or lacked human-centered outcome data was rejected, as were studies that did not explicitly mention the green architecture indicators. Furthermore, opinion pieces, editorials, and non-peer-reviewed articles were omitted to uphold the academic integrity of the review. In addition, studies published in journals not indexed in Scopus or WoS were excluded to ensure the inclusion of high-quality, peer-reviewed academic sources.

Additionally, studies and articles that do not fall within the period specified in the systematic review were omitted. The inclusion and exclusion criteria ensured that the data collected were pertinent, reliable, and properly linked with the research aims.

Studies were filtered and selected using inclusion and exclusion criteria and keywords related to the research objective, implementing a two-stage screening process. A preliminary screening of titles and abstracts eliminated studies that were clearly irrelevant. The full texts of the remaining publications were carefully analyzed to determine eligibility in accordance with the established inclusion criteria. Figure 1 presents the PRISMA flow diagram, illustrating the research selection process from the initial literature search to the final synthesis of selected research.

A single reviewer performed the screening; therefore, inter-rater reliability measures (e.g., Cohen's Kappa) were not applicable. Even so, all decisions were re-evaluated for accuracy, and inclusion criteria were applied systematically to ensure methodological consistency.

3.4 Data Extraction and Data Synthesis

3.4.1. Data Extraction

The data extraction process involved systematically collecting the essential information from all included studies. The extracted data consisted of two stages:

Step 1 (Basic information): Critical information extracted for each study, including authors, year of publication, study classification, study methodology, and study significance.

Step 2 (Investigation): Particular emphasis on green architecture indicators addressed in each study. To achieve more accurate results, a table including each indicator was created with reference to the study. The frequency of the indicator across studies was recorded to improve the precision of the analysis.

To quantify the importance of each indicator, a frequency table was created to record the number of times each indicator appeared across the included studies. These frequencies formed the basis for generating the figures and calculating percentage distributions in the results section.

3.4.2. Data Synthesis

The synthesis of extracted data followed an eight-stage analytical framework. These stages structured the organization, interpretation, and categorization of indicators:

Stage One. Distribution by Year: Analyze publication trends to identify the growth of research over the past decade.

Stage Two. Extraction of Indicators: Review and collect all indicators identified across the selected studies.

Stage Three. Indicators with Similar Frequency: Group indicators that appeared with comparable frequency to identify common research patterns.

Stage Four. Classification into Primary Categories: Organize the 49 indicators into 16 primary categories and four sustainability aspects (environment, economy, social, and technology).

Stage Five. Relationships Between Related Categories: Identify overlaps and conceptual connections among categories.

Stage Six. Common Indicators Across Multiple Aspects: Highlight indicators that span multiple sustainability aspects, thus demonstrating multi-dimensional relevance.

Stage Seven. Application Scope: Determine whether the study addressed this indicator on a global, local, or regional scale.

Stage Eight. Field of Application: Determine whether the study addressed this indicator at the urban level, for example, public or specialized buildings.

These eight stages provided the structural basis for the results presented in Section 4 and ensured coherence between data extraction and interpretation.

3.4.3. Quality Appraisal

Following study selection, a structured quality appraisal checklist was applied to all included studies to ensure methodological consistency and transparency. The appraisal assessed key criteria, including clarity of research objectives, explicit relevance to green architecture and quality of life, adequacy of methodological description, transparency of data reporting, and publication in peer-reviewed journals indexed in Scopus or WoS.

All studies met the minimum quality requirements; therefore, none were excluded following quality assessment. See Table 3.

The purpose of the appraisal was to ensure methodological soundness rather than to assign differential weights. Consequently, the synthesis of results was frequency-based, focusing on the recurrence of indicators across the literature rather than weighting studies by quality or assessing causal impact.

Although a single reviewer conducted the screening, predefined inclusion and exclusion criteria were strictly applied, and a detailed audit trail documenting screening decisions and reasons for exclusion was

maintained to enhance transparency and minimize potential bias.

Table 3. Database search strategy

Study ID	Clear Objectives	Relevant to Green Architecture	Methodology Described	Transparent Reporting	Indexed in Scopus/WoS	Overall Quality
S1	✓	✓	✓	✓	✓	High
S2	✓	✓	✓	✓	✓	High
S3	✓	✓	✓	✓	✓	High
...	✓	✓	✓	✓	✓	High

4. Results

A database search yielded 84 documents containing specified keywords; 25 of these were included in the systematic review. The studies were conducted over the last ten years (2014-2024). The research results were evaluated in eight stages.

Stage One: Results of Distribution of Reviewed Studies by Year

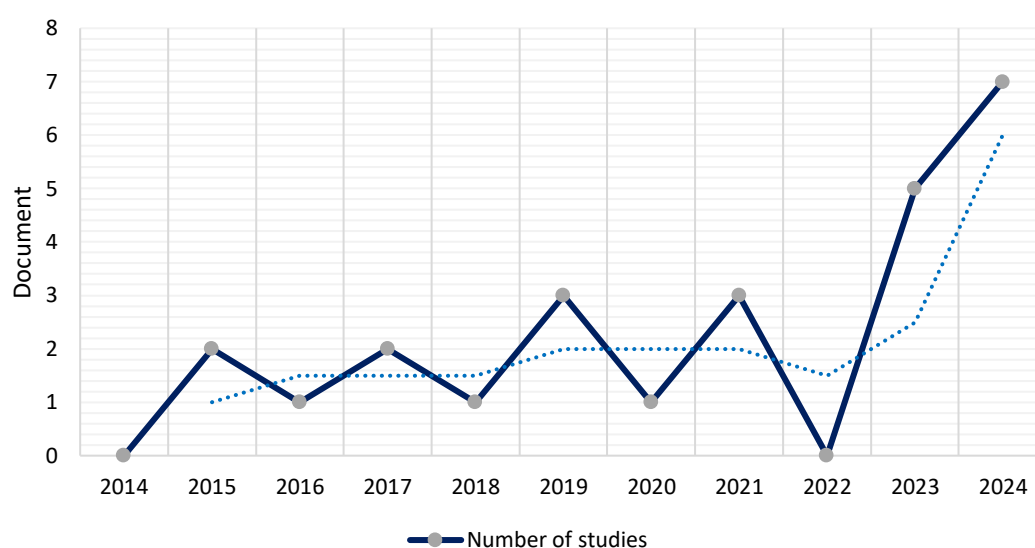


Figure 2. Distribution of reviewed studies by year

As Figure 2 shows, research examining green architecture and its impact on quality of life has increased recently, peaking in 2024 with seven published studies in the approved database.

Stage Two: Results of the Extracted Indicators

As shown, 49 indicators were identified. Figure 3 illustrates the frequency of each indicator in the reviewed studies. The social well-being indicator was the most widely addressed: it was investigated in 22 studies. The community impact and resource management indicators were each examined in 21 studies, and the pollution reduction indicator was discussed in 20 studies.

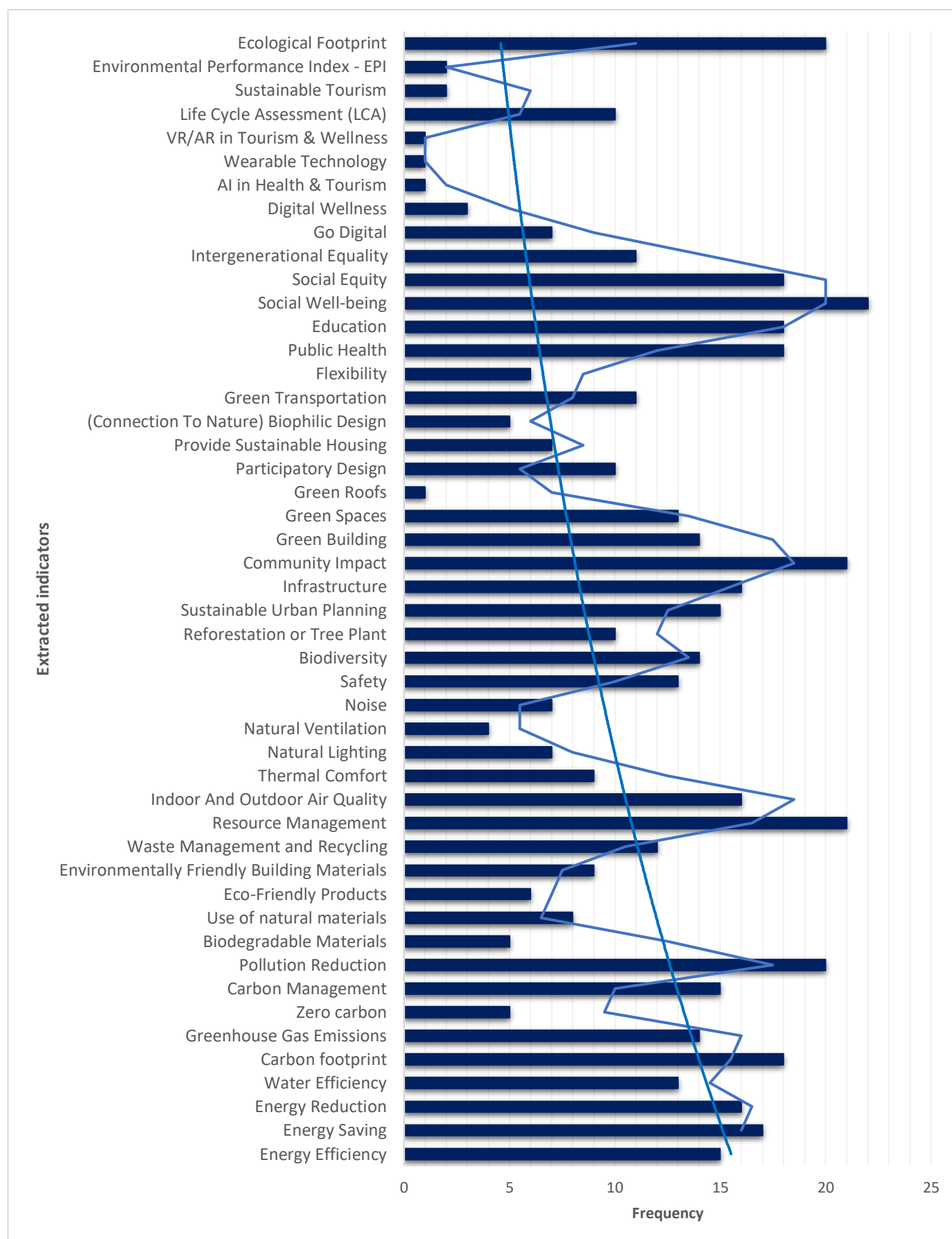


Figure 3. Frequency of indicators extracted from the studies

Stage Three: Results of Similar Indicators by Frequency

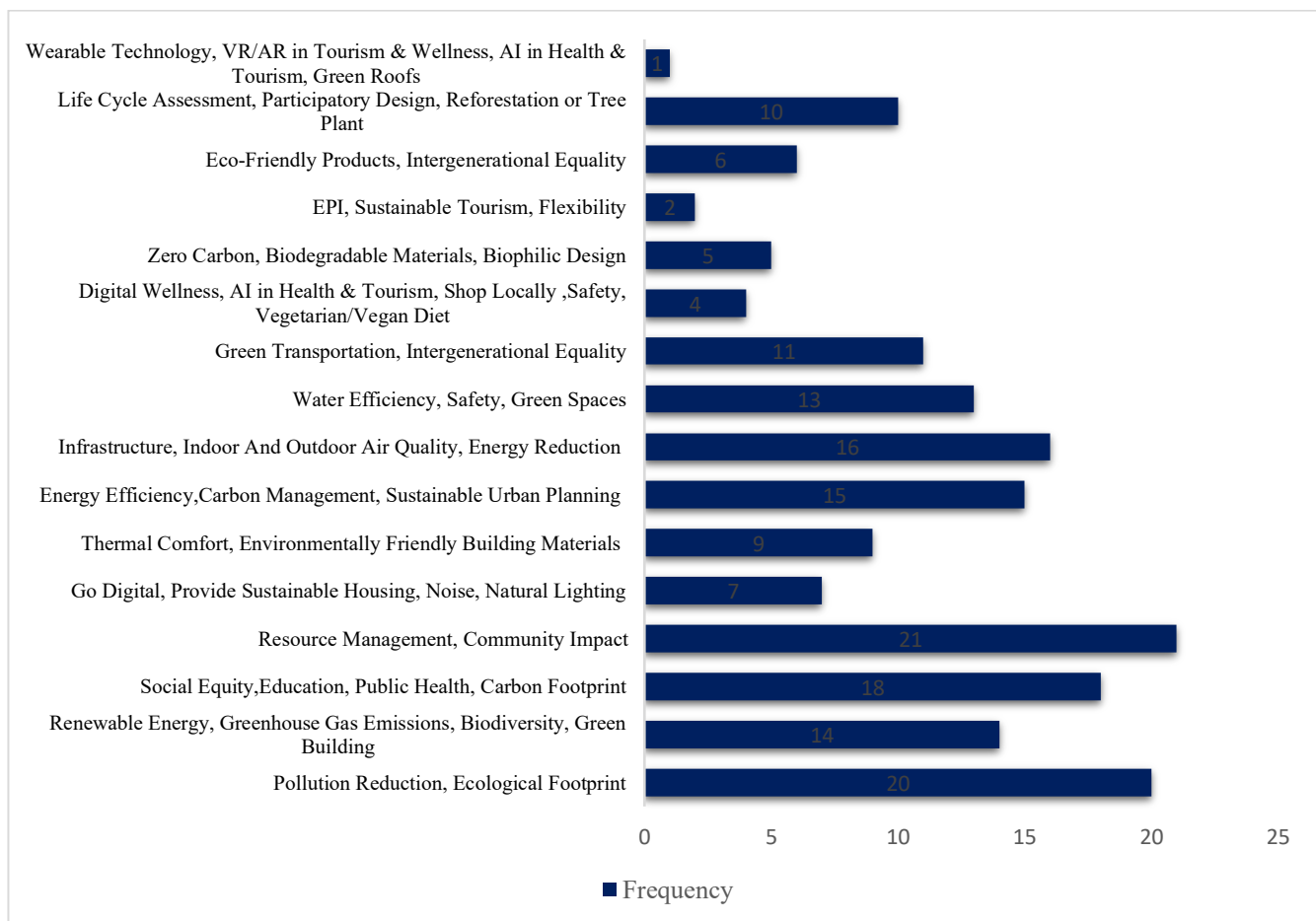


Figure 4. Frequency distribution of indicators with similar frequency across the reviewed studies

Figure 4 displays common indicators at the same frequency. This indicates the existence of interconnected and equally important research fields in academic studies. These concepts are connected in scientific research, as they are studied together with equal significance. This highlights the need for integrated approaches in the study of green architecture and sustainability.

Stage Four: Results of Classification into Primary Categories

The previous results show that sub-indicators can be classified into specific primary indicators. For instance, renewable energy, energy efficiency, energy saving and energy reduction are categorized as energy indicators. This is based on the categories of the international classification systems for green architecture, as referenced in several studies [18, 23, 24].

Figure 5 presents the percentages of the primary indicators, including their sub-indicators and their frequency in studies. The percentages indicate that the health and community well-being indicator achieved the highest score (16%), followed by the carbon emissions indicator (13%) and energy (11%). Indoor environmental quality (IEQ) and urban planning indicators each accounted for approximately 10%.

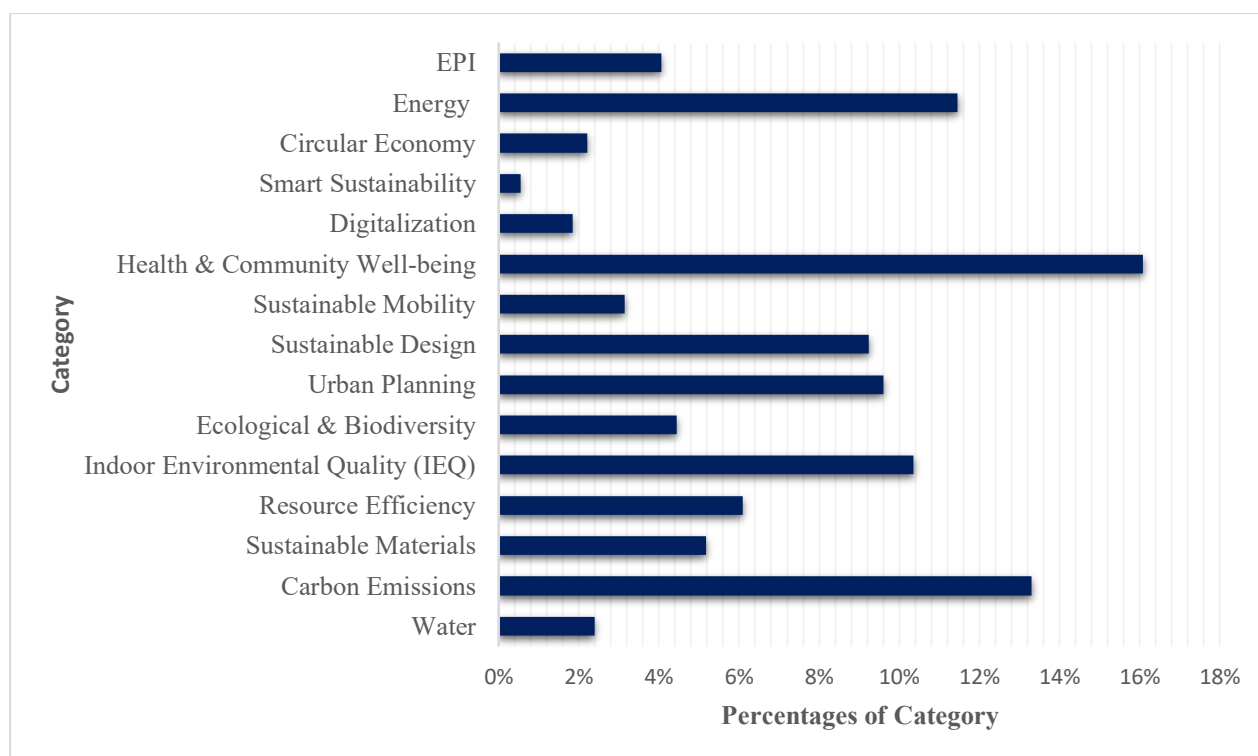


Figure 5. Percentage distribution of the primary indicator categories across the reviewed studies

Stage Five: Results of Relationships Between Related Categories

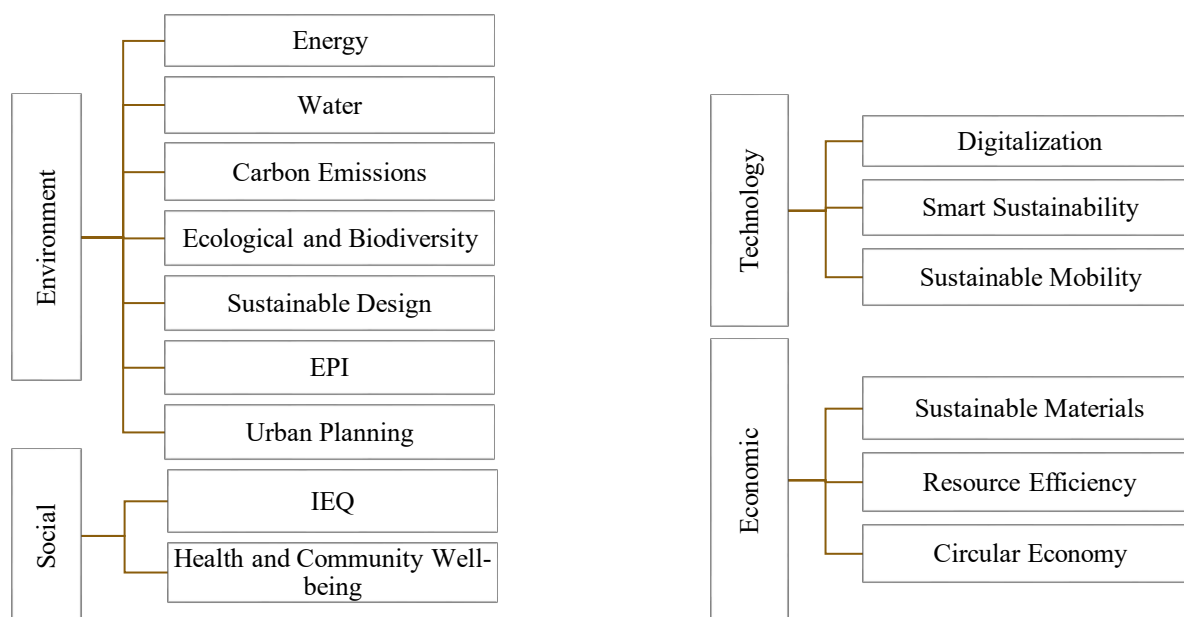


Figure 6. Classification of extracted indicators by the sustainability aspect

The indicators encompass a wide range of factors affecting environmental, economic, social, and technological aspects. The indicators can be classified into four primary aspects: environmental aspects, emphasizing resource conservation and emission reduction; economic aspects, promoting energy efficiency and sustainable development; social aspects, involving community well-being and quality of life; and technological aspects, employing digital innovation to build sustainability. This classification illustrates the

intersection of various aspects and their significance in realizing sustainable development. This classification was mentioned in several studies [23, 25], as Figure 6 shows.

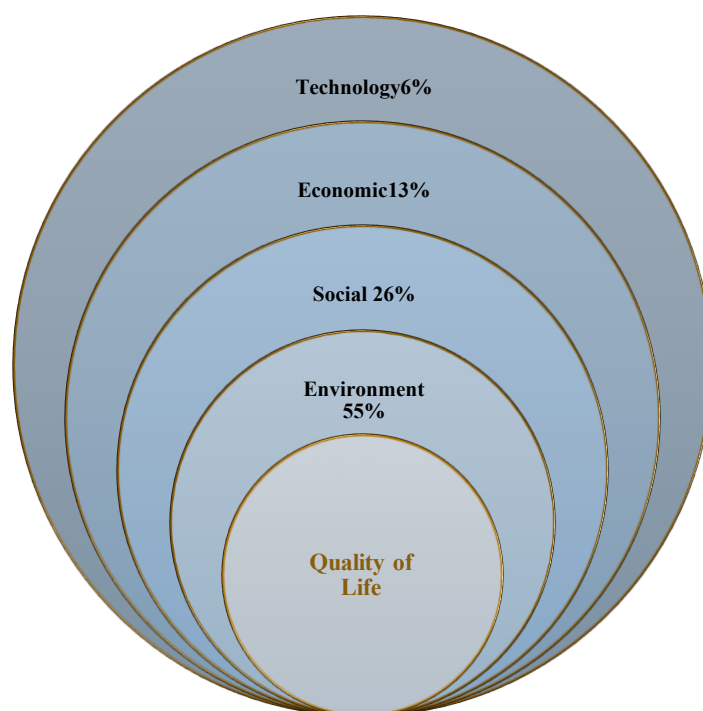


Figure 7. Percentage distribution of the four aspects

Figure 7 presents the percentages for the four aspects that affect quality of life, indicating that the environment has the most significant effect.

Stage Six: Results of Common Indicators Among Many Aspects

Some indicators can integrate multiple aspects covering various dimensions of sustainability. Some indicators do not fit exclusively into one category but involve overlaps among environment, economic, social, and technology aspects.

Environment -Economic	Environment -Social- Economic	Environment -Economic- Technology	Environment -Social- Economic-Technology
☐	☐	☐	☐
☐ Energy	☐ IEQ	☐ EPI	☐ Sustainable Mobility
☐ Water	☐ Urban Planning		☐ Health and Community Well-being
☐ Carbon Emissions	☐ Sustainable Design		☐ Sustainable Design
☐ Sustainable Materials			☐ Sustainable Mobility
☐ Resource Efficiency			☐ Smart Sustainability
☐ Ecological and Biodiversity			
☐ Circular Economy			

Figure 8. Common indicators between aspect

Figure 8 shows that some indicators cannot be classified into just one aspect, as they may

simultaneously reflect multiple issues. This overlap enhances understanding of how these indicators interrelate.

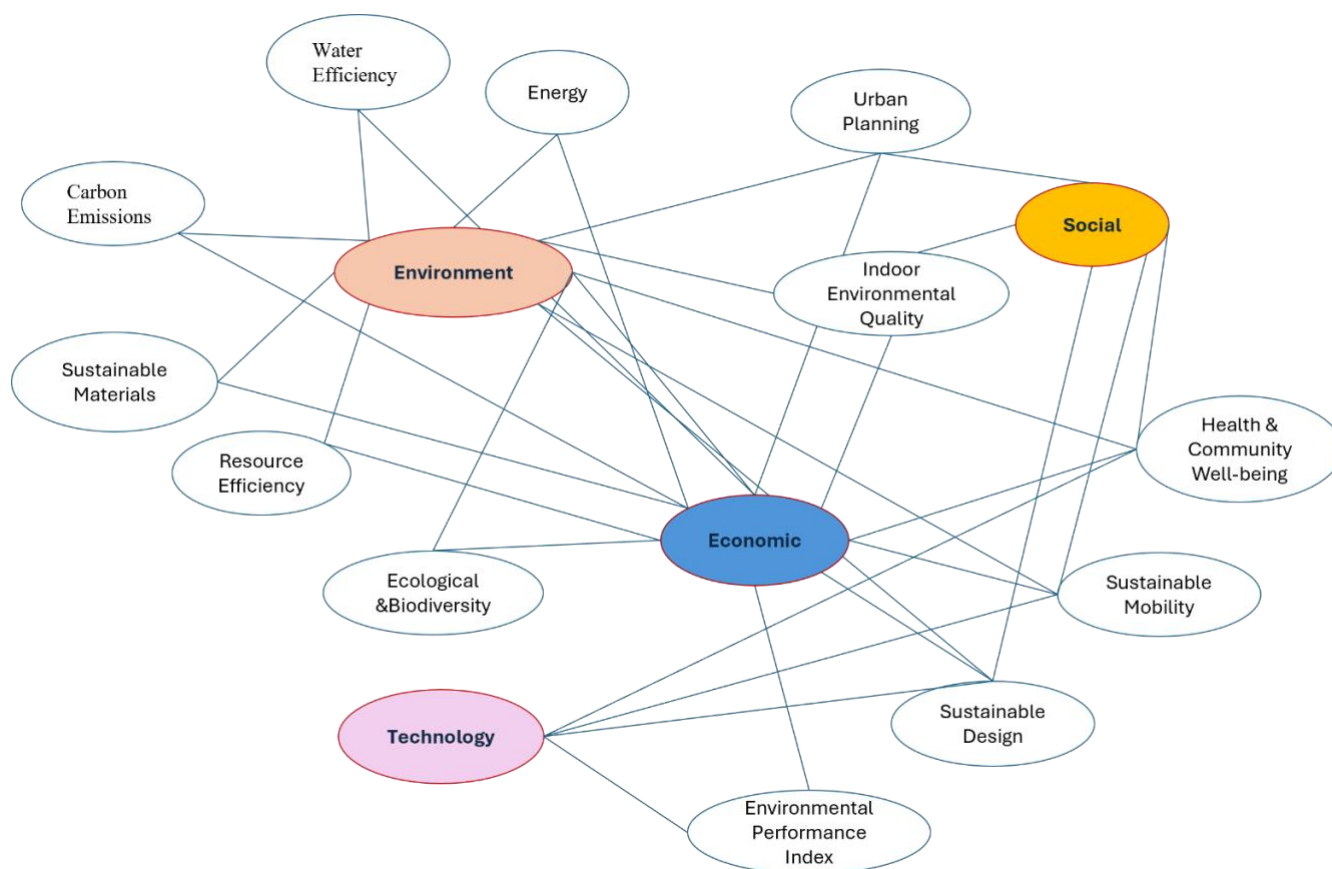


Figure 9. Network diagram illustrating the intersection of indicators within aspects

Figure 9 illustrates the substantial impact of environmental dimensions, with many indicators associated with economic and social aspects. Technology factors, although accounting for only 6% of the total, play a crucial role in promoting sustainability. For example, smart sustainability and EPI-related technology are linked with environmental and social considerations. Social indicators, such as health and community well-being, significantly impact society and affect environmental and economic dimensions.

Stage Seven: Results of the Application Scope Related to Sub-indicators

Figure 10 reflects that the major global indicators include “energy efficiency”, “carbon footprint reduction”, “sustainable urban planning”, and “waste management”. Some indicators, such as life cycle assessment, carbon footprint, and smart sustainability, are extensively used at both international and European levels, indicating that developed countries are increasingly relying on environmental assessment tools and smart sustainability strategies. Some indicators, while internationally classified, show higher usage in specific regions.

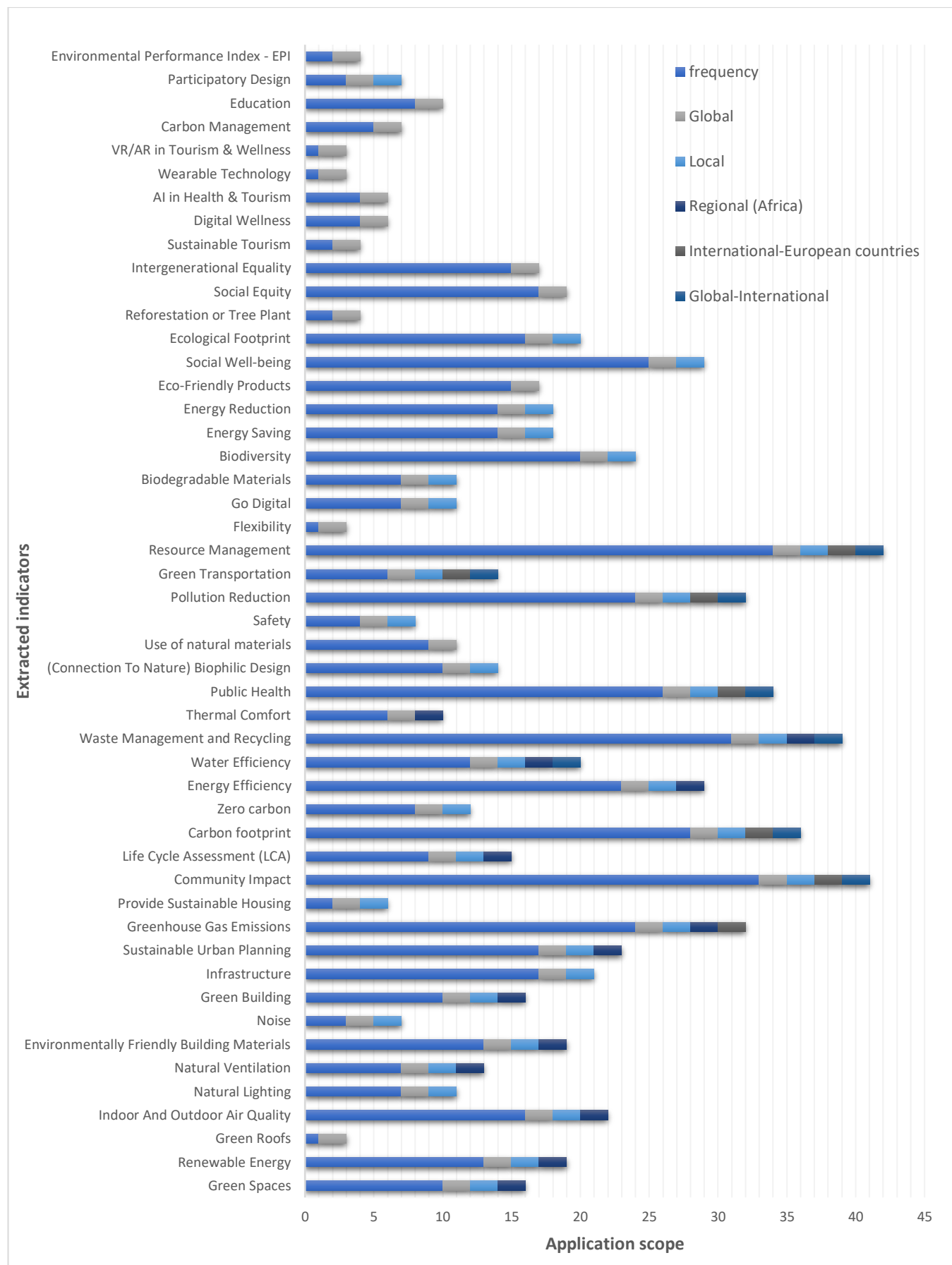


Figure 10. Application scope of indicators extracted from previous research

Stage Eight: Results of the Application Field Related to Sub-indicators

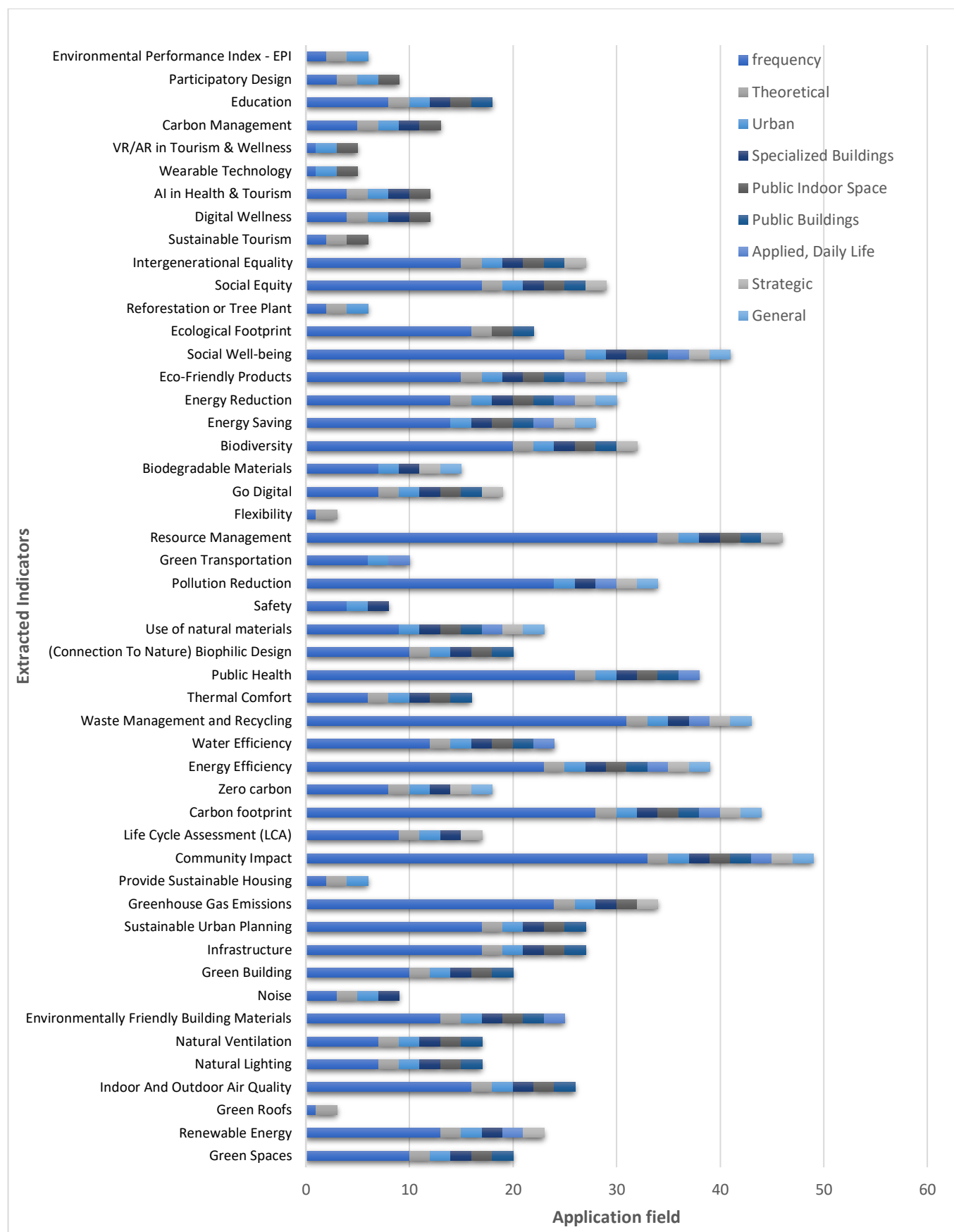


Figure 11. Application fields of indicators extracted from previous research

Figure 11 indicates significant variation in the use of indicators applied across different fields. While some indicators remain in the theoretical phase, others have been implemented in urban projects and specialized buildings. Indicators such as sustainable consumption and social well-being are connected to daily living, confirming that sustainability is no longer limited to large-scale projects but has become an integral part of the everyday lives of individuals and communities. Indicators of community impact, carbon footprint, energy efficiency, water efficiency, use of natural materials, and social well-being cover all classified fields of application, reflecting their crucial role in developing sustainable strategies for more efficient and healthy living environments.

Table 4 presents the key indicators identified in this study that demonstrate the highest frequency of occurrence across the reviewed studies concerning quality of life, aiming to identify common patterns across the literature and to serve as reference indicators for studies addressing similar research contexts.

Table 4. High-priority indicators, their scope, field, frequency rate, and references

Indicators	%	Application Scope	Field of Application	References	Impact Direction	Example Application
Social Well-being	22	Global, Local	(Applied, daily life), theoretical, general, strategic, specialized buildings, urban, public indoor space, public buildings	Ragheb, et al. [13], Mattoni, et al. [24], Varma and Palaniappan [25], Ogunmola and Kumar [26], Ghouse, et al. [27], Walsh, et al. [28], Šostar and Ristanović [29], Kent, et al. [30], Vargas-Maldonado, et al. [31], Guyomard, et al. [32], Mohammed [33], Licina [34], Hossain, et al. [35], Salas-Zapata and Ortiz-Muñoz [36], Albrecht, et al. [37], Estoque [38], Muniz, et al. [39], Zhu [40], Lee, et al. [41], Wang, et al. [21], Steenberg, et al. [42], Read and Meath [43]	Positive	Implementing water-saving fixtures, rainwater harvesting, sustainable material selection, and lifecycle-based resource planning.
Resource Management	21	Local, (International -European countries), (Global-International), Global	Specialized buildings, theoretical, urban, strategic, public indoor space, public buildings	Ragheb, et al. [13], Hwang, et al. [15], Mattoni, et al. [24], Varma and Palaniappan [25], Ogunmola and Kumar [26], Ghouse, et al. [27], Walsh, et al. [28], Šostar and Ristanović [29], Vargas-Maldonado, et al. [31], Guyomard, et al. [32], Mohammed [33], Hossain, et al. [35], Salas-Zapata and Ortiz-Muñoz [36], Albrecht, et al. [37], Estoque [38], Muniz, et al. [39], Zhu [40], Lee, et al. [41], Wang, et al. [21], Steenberg, et al. [42], Szabó [44]	Positive	Using low-VOC materials, enhancing air filtration systems, and designing landscapes that reduce noise and dust pollution.
Community Impact	21	Global, Local, (International -European countries), (Global-International)	Theoretical, urban, (applied, daily life), general, strategic, specialized buildings, public indoor space, public buildings	Ragheb, et al. [13], Hwang, et al. [15], Varma and Palaniappan [25], Ogunmola and Kumar [26], Ghouse, et al. [27], Walsh, et al. [28], Šostar and Ristanović [29], Vargas-Maldonado, et al. [31], Guyomard, et al. [32], Mohammed [33], Licina [34], Hossain, et al. [35], Salas-Zapata and Ortiz-Muñoz [36], Albrecht, et al. [37], Estoque [38], Muniz, et al. [39], Lee, et al. [41], Wang, et al. [21], Steenberg, et al. [42], Read and Meath [43], Szabó [44]	Positive	Enhancing public spaces, improving accessibility, and supporting social interactions

Pollution Reduction	20	Local, (International -European countries), (Global-International), Global	Urban, specialized buildings (applied, daily life), general, strategic	Ragheb, et al. [13], Hwang, et al. [15], Mattoni, et al. [24], Varma and Palaniappan [25], Ogunmola and Kumar [26], Ghouse, et al. [27], Walsh, et al. [28], Vargas-Maldonado, et al. [31], Guyomard, et al. [32], Mohammed [33], Hossain, et al. [35], Salas-Zapata and Ortiz-Muñoz [36], Albrecht, et al. [37], Estoque [38], Muniz, et al. [39], Zhu [40], Lee, et al. [41], Wang, et al. [21], Steenberg, et al. [42], Shi, et al. [45]	Positive	Using low-VOC materials, enhancing air filtration systems, and designing landscapes that reduce noise and dust pollution.
Ecological Footprint	20	Global, Local	Theoretical, public indoor space, public buildings	Ragheb, et al. [13], Mattoni, et al. [24], Varma and Palaniappan [25], Ogunmola and Kumar [26], Ghouse, et al. [27], Walsh, et al. [28], Šostar and Ristanović [29], Vargas-Maldonado, et al. [31], Guyomard, et al. [32], Mohammed [33], Hossain, et al. [35], Salas-Zapata and Ortiz-Muñoz [36], Albrecht, et al. [37], Estoque [38], Muniz, et al. [39], Zhu [40], Lee, et al. [41], Wang, et al. [21], Steenberg, et al. [42], Szabó [44]	Positive	Reducing resource consumption, integrating renewable energy systems, optimizing material use, and minimizing waste across the building lifecycle.
Carbon Footprint	18	Global, Local, (International -European countries), (Global-International)	Theoretical, urban, (applied, everyday life) general, strategic, specialized buildings, public indoor space, public buildings	Ragheb, et al. [13], Mattoni, et al. [24], Varma and Palaniappan [25], Ogunmola and Kumar [26], Ghouse, et al. [27], Walsh, et al. [28], Šostar and Ristanović [29], Vargas-Maldonado, et al. [31], Guyomard, et al. [32], Mohammed [33], Hossain, et al. [35], Salas-Zapata and Ortiz-Muñoz [36], Albrecht, et al. [37], Estoque [38], Muniz, et al. [39], Zhu [40], Lee, et al. [41], Steenberg, et al. [42]	Negative	Enhancing public spaces, improving accessibility, and supporting social interactions
Public Health	18	Local, (International -European countries), (Global-International), Global	Specialized buildings, urban (applied, daily life), theoretical, public indoor space, public buildings	Ragheb, et al. [13], Mattoni, et al. [24], Hwang, et al. [15], Varma and Palaniappan [25], Walsh, et al. [28], Kent, et al. [30], Guyomard, et al. [32], Mohammed [33], Licina [34], Hossain, et al. [35], Salas-Zapata and Ortiz-Muñoz [36], Albrecht, et al. [37], Estoque [38], Zhu [40], Lee, et al. [41], Wang, et al. [21], Steenberg, et al. [42], Szabó [44]	Positive	Improving indoor air quality, ventilation, natural lighting, and incorporating green spaces to support physical and mental health.
Education	18	Global, Theoretical, Local	Specialized buildings, theoretical, urban, public indoor space, public buildings	Ragheb, et al. [13], Varma and Palaniappan [25], Ogunmola and Kumar [26], Ghouse, et al. [27], Walsh, et al. [28], Šostar and Ristanović [29], Vargas-Maldonado, et al. [31], Guyomard, et al. [32], Licina [34], Hossain, et al. [35], Salas-Zapata and Ortiz-Muñoz [36], Albrecht, et al. [37], Estoque [38], Muniz, et al. [39], Zhu [40], Lee, et al. [41], Steenberg, et al. [42], Read and Meath [43]	Positive	Incorporating recycling stations, construction waste separation, and composting systems in buildings and urban settings.
Social Equity	18	Global, Local	Theoretical, strategic, urban, specialized buildings, public indoor space, public buildings	Ragheb, et al. [13], Mattoni, et al. [24], Ogunmola and Kumar [26], Ghouse, et al. [27], Walsh, et al. [28], Šostar and Ristanović [29], Vargas-Maldonado, et al. [31], Guyomard, et al. [32], Mohammed [33], Hossain, et al. [35], Salas-Zapata and Ortiz-Muñoz [36], Albrecht, et al. [37], Estoque [38], Muniz, et al. [39], Zhu [40], Lee, et al. [41], Wang, et al. [21], Steenberg, et al. [42]	Negative	Reducing CO ₂ emissions

5. Discussion

The findings of this systematic review reveal clear patterns in how green architecture indicators are distributed and prioritized in recent literature. Environmental indicators, which constitute 55% of the identified indicators, continue to dominate sustainability research due to their direct relationship with resource management, waste reduction, emission control, and ecological preservation. In contrast, technological indicators account for only 6%, highlighting a notable gap in integrating smart systems, digital monitoring, and adaptive technologies into environmentally responsive design frameworks.

The significant rise in social and economic indicators reflects a shift toward human-centric sustainable architecture, in which community well-being, accessibility, affordability, and improved indoor comfort are increasingly central components in quality of life. Nonetheless, the analysis indicated a gap between theoretical frameworks and practical implementation. Indicators with direct environmental and social impacts appear frequently in applied research. In contrast, others, particularly technological indicators, remain largely theoretical. This imbalance underscores the need to synthesize academic knowledge with real-world applications and to expand research on underexplored dimensions, such as digital sustainability and smart environmental technologies.

6. Research Limitations

This study has several limitations that should be acknowledged. Although additional platforms such as Google Scholar, ResearchGate, ScienceDirect, and JSTOR were used to locate relevant studies, only peer-reviewed papers indexed in Scopus and WoS were included in the final analysis. As a result, high-quality studies published outside these databases may not have been captured. Moreover, the review was limited to English-language publications, which may have excluded rigorous studies published in other languages, including Arabic. A limitation of this review is that the search was conducted between 6 October 2024 and 28 February 2025. Therefore, studies published after this period may not have been captured. Additionally, data extraction and screening were conducted by a single reviewer, which may introduce subjective bias despite the use of predefined inclusion and exclusion criteria. Variations in the geographical, cultural, and methodological contexts of the included studies may also limit the generalizability of the findings. As a result, some indicators relevant to specific regions or emerging technologies may not have been captured in this review.

7. Conclusion

The systematic review of the literature, which included 25 studies, seven of which were published in 2024, revealed several key findings regarding the impact of green architecture indicators on enhancing quality of life. The study's conclusions identified high-priority indicators, including social well-being, resource management, community impact, ecological footprint, pollution reduction, carbon footprint, public health, education and social equity. The significant growth of green architecture underscores its crucial role in global sustainability strategies.

The research used a modified methodology to categorize the indicators. The in-depth analysis involved eight stages of investigation. It identified 16 primary indicators and 49 sub-indicators, classified into four aspects. The results emphasize the critical need to develop indicator frameworks to enhance their relevance and applicability across diverse real-world settings. Advancing policy integration and increasing empirical validation will strengthen the practical impact of green architecture strategies on quality of life.

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