Systematic Review

Gender, Sustainability, and Urbanism: A Systematic Review of Literature and Cross-Cluster Analysis

Aysad Gudekli [1], Murat Ertan Dogan [2],*, Tulay Goru Dogan [3] and Duygu Gudekli [4]

[1]   Faculty of Communication, Department of Public Relations and Promotion, Akdeniz University, 07058 Antalya, Türkiye; agudekli@akdeniz.edu.tr
[2]   Faculty of Science and Letters, Department of Science Culture, Yasar University, 35100 Izmir, Türkiye
[3]   Faculty of Communication, Department of New Media and Communication, Yasar University, 35100 Izmir, Türkiye; tulay.dogan@yasar.edu.tr
[4]   Forensic Vocational School, Department of Law, Akdeniz University, 07058 Antalya, Türkiye; duygugudekli@akdeniz.edu.tr
*   Correspondence: murat.dogan@yasar.edu.tr

Abstract: Gender diversity and equality have a significant influence on policymaking regarding sustainable development, environmental issues, and urbanism. This study examines the general bibliometric outlook and research patterns of publications on gender equality, urbanism, and sustainability to provide a general perspective on the relevant literature and trends for institutions and scholars who wish to conduct research within the framework of gender, sustainability, and urbanism. The findings of this study show that there are a limited number of studies dealing with gender equality, sustainability, and urbanism. The study analyzed 308 papers in total, utilizing data mining and analytics techniques such as t-SNE and SNA for a systematic review process. The study utilized the PRISMA protocol as the research method. The results showed that research on the frame of gender, sustainability, and urbanism peaked in 2021, and the top countries for studying gender, sustainability, and urbanism are the USA, the UK, Spain, and China. The research fields that contributed the most were those dealing with environmental studies and green and sustainable technologies, followed by those dealing with business and women's studies. The following three thematically inclined clusters were revealed by the t-SNE analysis: (1) Gender Diversity, Corporate Sustainability, and Board Governance; (2) Gender, Environmental Sustainability, Sustainable Development, and Policy Agenda; and (3) Gender, Sustainable Urbanism, and Community Development. The findings of the study revealed that fostering gender equality with policies such as gender mainstreaming, as in SDG 5 and SDG 11, and gender equality strategies of the EU or UN will help to overcome discrimination against women in the urban space and empower sustainable development.

Keywords: gender equality; gender studies; sustainability; urbanism; environmental sustainability; systematic review; bibliometric research

1. Introduction

Urban design is crucial in forming the urban surroundings to cater to the diverse requirements of different social groups [1]. Specifically, it involves crafting safe, pedestrian-friendly communities with parks, playgrounds, and schools accessible to families with children [2]. Urban design that caters to the needs of different segments of society can foster inclusive, sustainable, and vibrant cities [3]. For older people, this includes providing accessible public transportation, age-friendly infrastructure, and well-designed public spaces that promote social interaction and mobility. People with disabilities benefit from universally accessible buildings, streets, and transportation systems that enable independent living and full participation in urban life [3,4]. Low-income communities also require consideration in urban design, with a focus on affordable housing, equitable access to services, and opportunities for economic growth [5]. By embracing a holistic approach

that addresses the needs of these diverse groups, urban design can promote inclusivity, sustainability, and well-being for all members of society.

Integrating gender equality into urban design is also crucial to create inclusive and sustainable cities. Gender-inclusive urban planning acknowledges that men and women often have different mobility patterns, safety concerns, and access to resources [6]. This involves ensuring that public spaces are well-lit and secure, public transportation is safe, and housing designs address the unique needs and safety of women and other marginalized gender groups. Furthermore, urban design should encourage women's participation in decision-making processes related to city planning and governance, fostering diverse perspectives that lead to more equitable outcomes [7–9]. By integrating gender equality considerations alongside those of various age groups, abilities, and socioeconomic backgrounds, urban design can reflect the diversity of urban populations and promote more just and livable cities for everyone.

In an increasingly urbanized world, the intricate interplay between gender, sustainability, and urbanism presents a compelling research arena. As urban populations surge and predictions indicate that over two-thirds of the global population will be living in cities by 2050, the imperative to establish equitable, sustainable urban spaces becomes paramount [10]. International initiatives like UN-Habitat and The Urban Agenda for the EU emphasize sustainable urbanization through dimensions such as education, economic growth, social inclusion, and environmental protection, aligned with the Sustainable Development Goals (SDGs). Within this context, the symbiotic relationship between gender equality and sustainable urbanism is gaining recognition as a pivotal factor for holistic and enduring development.

While empirical research directly investigating the fusion of gender equality, urbanism, and sustainability remains relatively limited, existing scholarship has provided illuminating insights. For instance, Meinzen-Dick et al. [11] highlighted the pivotal role of gender in sustainability programs, revealing how gender-blind initiatives can inadvertently disadvantage women. In this direction, research has elucidated how gender norms exert influence over consumption patterns and lifestyle choices, establishing an intrinsic link between gender and sustainability [12]. Delving into the interplay between gender and urbanism unveils a complex web of unequal resource allocation, limited opportunities, and power dynamics across genders within urban spaces, which in turn impact facets ranging from public space accessibility to housing tenure [6].

Another critical facet that amplifies the importance of integrating gender perspectives is the Sustainable Development Goals (SDGs). The SDGs provide a global framework that resonates with the objectives of gender-conscious urbanism and sustainable urban development, aiming to create inclusive, resilient, and livable cities for all [13]. Women's participation in decision-making processes emerges as a central tenet in this endeavor. Research has consistently demonstrated that women's active involvement not only enhances diversity in perspectives but also facilitates holistic urban planning that integrates social, economic, and environmental considerations [14]. Additionally, the interplay of environmental concerns and gender equity underpins this discourse. Organizations and public bodies that prioritize gender diversity in leadership positions exhibit superior environmental performance and a heightened commitment to corporate social responsibility [15,16].

Most studies in the urbanism field dealing with sustainability focus on the SDGs and corporate/governance social responsibility or gender equality [11,13–15]. However, few studies explore the interrelated concepts of gender, sustainability, and urbanism. Therefore, this study dives into these topics using a bibliometric approach, mapping out the scholarly landscape to uncover trends and knowledge gaps related to the interplay between gender, urbanism, and sustainability. This research aims to contribute to the ongoing academic conversation and provide a foundation for future studies in this vital field.

2. Literature Review

Providing towns and cities with healthy and secure living conditions, prosperous economies, and social benefits for various groups today and future generations is a global problem in an increasingly urbanized world [17–19]. Today, more than half of the world's population (56.5% live in cities, and this is predicted to reach two-thirds (68%) by the year 2050. In the next 30 years, more than two billion people will live in cities [10]. This situation, in the most general sense, implies the concentration of urban life and brings with it the urgency of taking important steps to ensure the sustainability of city life and the use of the city's resources and possibilities. Numerous policy initiatives for sustainable urbanization are being undertaken worldwide, such as the UN-Habitat and The Urban Agenda for the EU, which focus on sustainable development and urbanization [20,21]. These initiatives highlight various dimensions of urbanism, such as education, economic development, social inclusion, and environmental protection, in the framework of sustainable development goals (SDGs).

In the existing literature on urbanism, the issue of gender equality has gained recognition as a key part of sustainable development [7,11,12,22]. Research on gender equality and urbanism exposes the unequal allocation of resources, opportunities, and power across genders within urban environments [23]. Compared to heterosexual men in the urban space, gender minorities, women, and people with disabilities encounter social and economic disadvantages [6,24]. These disadvantages can be sorted into six topics [6]: (1) access to the services and spaces in the public realm; (2) affordable and easy mobility in the cities; (3) safety in public and private spaces; (4) hygiene and being free from health risks; (5) climate resilience; and (6) security of tenure which means owning housing, having work, and building wealth. Promoting gender equality in urbanism is important for achieving the United Nations' Sustainable Development Goals, particularly SDG 5 (gender equality), that aim to create more sustainable and livable cities for all [7,13]. Gender equality in sustainable urbanism encompasses not only the relationships between men and women but also the intersections with other factors such as class, race, ethnicity, sexuality, place, and other important differences [25]. Inclusive urban design, driven by gender perspectives, creates cities that are accessible, resilient, and responsive to the needs of diverse populations as stated in the SDG 11 (sustainable cities and communities) [18,26]. In short, the literature pertaining to gender equality and urbanism suggests that gender equality is crucial for sustainability and can have positive impacts on environmental performance, corporate social responsibility, and urban development. The integration of gender perspectives in urban design can lead to more equitable and sustainable outcomes.

Various studies have discussed the interconnected issues of gender equality and urban design from different perspectives. Within the framework of concepts, such as gender-conscious urbanism, gender-inclusive urban planning, and gender mainstreaming, there are several approaches in the literature to eliminate the effects of the inequalities stated above in urban design. While all these approaches seek to incorporate gender perspectives into urban planning and design, they differ in their strategies and focus. Gender-conscious urbanism raises awareness of gender-related issues [7], gender mainstreaming integrates gender perspectives across all aspects of urban development [27], and gender-inclusive urban design specifically aims to create physical spaces that cater to the diverse needs of all genders [6].

Overall, all the concepts discussed above converge on the idea that greater gender equality leads to increased equal participation in decision-making at multiple levels [28]. The participation of women in the management of cities and the female perspective finding a place in urban life may bring a different perspective to urbanism and eliminate the deficiencies [29,30]. In addition, the participation of women in administrative processes in urban planning increases sensitivity to environmental issues, as women approach environmental problems more sensitively and make more environmentally friendly decisions [14]. Existing studies in the literature suggest that the participation of women in board governance and providing board diversity in public bodies and corporations result in increasing

environmental sustainability, decreasing consumption, promoting social cohesion, community engagement, and long-term and holistic urban planning that considers the social, economic, and environmental well-being of the community.

The participation of women in managerial positions, not only in urban decision-making mechanisms but also in business life, will contribute to the development of urban life in areas such as environmental problems, air quality, waste management, protection of green fields, and building durable and sustainable structures. Companies with gender diversity increase the use of clean energy, reduce their carbon footprint, and perform better environmentally [8]. Women's participation in decision-making in the sense of board gender diversity in corporations may also result in enhanced corporate sustainability. Therefore, corporations with gender diversity prioritize social, environmental, and economic responsibility in their operations, and minimize negative impacts on the environment and society while maximizing positive contributions [15,31,32]. In addition, another factor that can contribute to urban development and its sustainability is to increase the female workforce and women's entrepreneurship [9,33]. In this sense, women's empowerment and women's inclusion in decision-making processes are crucial for the sustainability of urbanism.

A large number of existing studies in the broader literature have examined urban design, gender equality, and sustainability concepts from different perspectives. Previous studies have almost exclusively focused on the relations between gender and sustainability or gender and urban design. However, there is no similar research to this study in the literature examining gender, sustainability, and urbanism with a systematic review. Through an examination and analysis across these areas, this research provides valuable insights into the importance of considering gender perspectives. It covers a range of domains, including sustainability, environmental resilience, and urban planning. The study aims to highlight the significance of policies promoting gender equality, like gender mainstreaming, while emphasizing the potential for exploration in this field. The findings offer knowledge for scholars, institutions, and policymakers who are dedicated to advancing urban development that is inclusive of all genders. Ultimately, this research not only acknowledges the issue of gender inequality within spaces but also establishes a strong foundation for future studies and practical actions aimed at fostering sustainable development while advocating for gender equality. The existing empirical research with a systematic review methodology is provided in the previous research section.

Previous Empirical Studies

This section presents a review of previous literature on empirical research related to urbanism, gender equality, and sustainability. As far as we know, no previous empirical research has investigated the interconnected concepts of gender, sustainability, and urbanism in a systematic review. However, there is research questioning the relations between gender and sustainability or gender and urban studies, and vice versa in the existing literature. For example, Meinzen-Dick et al. [11] claimed that gender plays an important role in sustainability. The results of their research on the temporary literature about sustainability and gender showed that many programs to promote sustainability have been gender-blind but ended up primarily working with men, who are more likely to occupy public spaces and are often more recognized by people. Similarly, Bloodhart and Swim [12] argued that gender inequality has a crucial effect on consumption. In their study, Bloodhart and Swim [12] argued that gender stereotypes and norms shape environmentally relevant actions such as consumption and lifestyle practices. Shrestha et al. [34] investigated the importance of a gender perspective on energy-saving and transitions for sustainability by adopting a systematic review process in their work between 1983 and 2019. They investigated 3037 papers that were published in this period, and the review process identified 80 relevant papers from Scopus, ScienceDirect, and Wiley databases as a result. The results of the systematic review highlighted the importance of incorporating a gender perspective in energy policy and planning for sustainability, referring to the SDG5,

SDG10, and SDG12. This research emphasized that prioritizing gender equality is essential for achieving sustainable development.

The existing literature on gender equality and sustainability also includes research about corporate governance and environmental sustainability through board gender diversity. Aguilera et al. [15] examined the literature on the corporate governance of environmental sustainability in the Financial Times Research Rank list of the top 50 journals in their research. After searching 55 journals, they sampled 124 articles from 21 journals from the years 1997 to 2020. The authors argued that corporate governance can play a crucial role in driving environmental initiatives and achieving environmental sustainability outcomes. The authors provided a critical analysis of what we know and pointed to the knowledge gaps around owners, boards of directors, CEOs, top management teams, and employees as corporate governance actors. Therefore, the study found that companies with more women in top management and board positions tend to have better environmental performance. Similarly, Wu et al. [16] researched the gender diversity of corporate boards and social responsibility, utilizing a meta-analysis consisting of three primary research methods: regression analysis, binary model, and generalized method of movement.

The authors conducted a literature search using the Web of Science, Scopus, and the CNKI database. In the first instance, 64 articles were selected, but 20 papers were excluded due to missing information. In total, 44 articles were published between 2010 and 2019. As a result, the empirical findings of the research suggest that board gender diversity is positively associated with corporate social responsibility performance. Singhania et al. [35] also conducted a bibliometric analysis of 242 peer-reviewed research articles from the Scopus Index database to synthesize the knowledge base of gender diversity and corporate sustainability. The study identified three topic clusters: linking gender diversity with sustainability, corporate social responsibility, and financial performance. According to the survey, the volume of research on gender diversity and business sustainability peaked in the year 2021, and the top five most productive countries are the United States, Italy, Spain, the United Kingdom, and Australia. The authors suggested that a feasible cause for the increase in gender diversity and corporate sustainability literature in these nations was the attention paid to the gender diversity element, and sustainability might be related to economic development and literacy levels.

The contemporary literature on gender equality, corporate governance, and sustainability refers to concepts such as corporate social responsibility and board gender diversity [36,37]. As discussed in the literature review, research on gender equality and corporate governance reveals that increasing the number of women on corporate boards has positive effects on social responsibility, environmental performance, and sustainability. Therefore, the relationship with gender equality in corporate or city governance may result in the same relationship in sustainable urbanism. Raman et al. [33] conducted a bibliometric analysis of women's entrepreneurship and sustainable development, examining 3157 publications from the Web of Science Core Collection published between 1991 and 2021. The study found that the literature on women's entrepreneurship grew slowly in its initial two decades, with more noticeable growth between 2014 and 2018, and peaked in 2017. The study found that there is a strong relationship between women's entrepreneurship and the Sustainable Development Goals, particularly SDG 5 (gender equality), SDG 8 (decent work and economic growth), and SDG 10 (reducing inequalities).

In sum, the reviewed literature underscores the growing importance of integrating gender equality, sustainability, and urbanism. While no comprehensive empirical research specifically explores the interplay of these three concepts, the existing studies highlight the significant impact of gender perspectives on sustainability and urban development. While empirical research specifically addressing the intersections of gender, sustainability, and urbanism remains limited, these findings collectively emphasize the need to explore and integrate gender perspectives within urban design and planning to achieve sustainable, inclusive, and equitable cities.

This research is driven by the need to address gender disparities within contexts amidst rapid urbanization efforts towards achieving sustainability objectives. As the global population increasingly moves towards cities, it becomes crucial to create sustainable and inclusive environments. The study identifies a gap in the literature where limited research directly examines how gender interacts with sustainability goals, within a context. In this context, the motivation of this study is to provide a general perspective on the relevant literature and trends for individuals or institutions who wish to conduct research within the framework of gender equality, urbanism, and sustainability. Therefore, the aim of this paper is to clarify the general bibliometric outlook on gender, sustainability, and urbanism with a systematic review by exploring the research clusters in the field with a cross-cluster analysis. In this regard, this study addresses the following research questions:

1. What is the general bibliometric outlook on gender equality, urbanism, and sustainability?
2. What are the research patterns of publications on gender equality, urbanism, and sustainability?

3. Methodology

3.1. Research Design

This study used the PRISMA protocol (Supplementary Materials) to conduct comprehensive bibliometric research [38]. The research corpus consisted of scholarly papers sourced from the Web of Science database, ensuring broad coverage of the relevant literature, and that were written in English to ease the analysis. To ensure the validity and triangulation of the dataset, multiple methods were employed. Firstly, text mining techniques [39] were applied to extract key information, such as author names, affiliations, keywords, and citation networks, enabling comprehensive exploration of the dataset. Secondly, a social network analysis [40] was conducted to identify and visualize collaborative networks among researchers, institutions, and research communities, providing insights into knowledge diffusion and collaboration patterns. Lastly, t-SNE [41] (t-distributed Stochastic Neighbor Embedding) was utilized as a dimensionality reduction technique to visually represent the relationships between documents in a lower-dimensional space, allowing for the clustering and exploration of thematic similarities. By integrating these diverse methodologies, this research aimed to ensure the validity of findings through cross-validation and triangulation, providing a robust analysis of the scholarly landscape, highlighting prominent researchers and institutions, identifying emerging trends, and revealing knowledge dissemination patterns in the studied domain.

In the initial stage of document selection through the PRISMA protocol, a query was created using specific keywords and applied to the Web of Science database on the 4th of May 2023 as shown in Table 1. This resulted in a total of 558 documents being retrieved. In the second stage, the selection was narrowed down to include only relevant fields (see Figure 5), which resulted in 404 documents remaining. Medical fields appeared in the WoS database such as oncology, cardiology, entomology, obstetrics, etc. and were excluded from the study as the contents were irrelevant. In the third stage, the focus was further refined by limiting the selection to specific article types, resulting in 376 documents that met the criteria. Subsequently, the documents were imported into the Zotero application, where an additional step was taken to exclude irrelevant articles. After this step, the number of remaining documents was reduced to 350. Finally, in the fourth stage, the selection was narrowed down to include only documents written in English, resulting in a final set of 308 documents as shown in Table 2. These selection criteria, along with the use of the Zotero application for excluding irrelevant articles, were applied to ensure the relevance and quality of the chosen documents for the bibliometric research (see Figure 1).

Table 1. The research corpus, search queries, and parameters selected for the inclusion criteria.

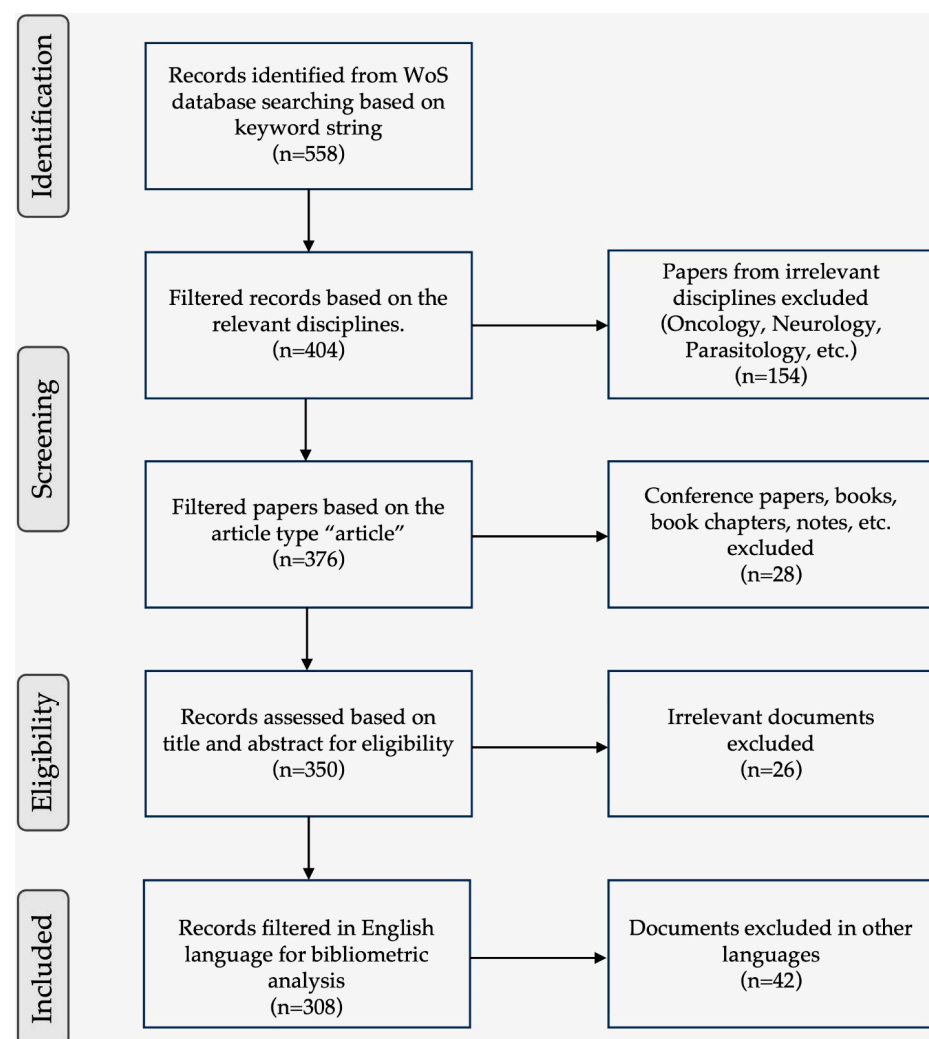| Research Corpus	
Name of Database	Web of Science
Search Period	1993–2023
Search Queries	
Queries (Subject Specific)	TITLE ("gender" OR "women" OR "men "OR "female" OR "male")
Boolean Search Parameter	AND
Queries (Field Specific)	TITLE ("sustain *")
Boolean Search Parameter	AND
Queries (Field Specific)	TITLE ("urban space" OR "urban *" OR "environ *")

Figure 1. Overview of inclusion and exclusion criteria based on the PRISMA model.

Table 2. Exclusion criteria through the PRISMA protocol.

Identification	The number of identified documents in Web of Science (*n* = 558)
Screening	Documents from irrelevant fields excluded (*n* = 154) Document type limited to "article" (*n* = 404) Non-empirical articles excluded (*n* = 54) Articles written in other languages than English excluded (*n* = 42)
Included	A total of 308 papers included in the final research corpus

The rationale behind using the WoS database is that the records in other databases such as Scopus are more limited and highly overlap with WoS. The selected keywords prioritize the research motivation in the "gender, sustainability, and urbanism", since gender issues are the core argument for equality in the urban space.

3.2. Software Used for Data Analysis

For conducting the bibliometric analysis, the R studio integrated development environment (IDE) and VOS Viewer 1.16.18 (0) [42] software were used. Codes were generated to make the t-SNE analysis, and the Biblioshiny user interface was used for the creation of visuals in collaboration with the VOS Viewer. To identify the most influential authors, articles, and journals, a co-citation analysis, citation analysis, co-occurrence maps, and volume analysis were utilized by using generated codes in R Studio.

4. Findings and Discussion

The findings from the study are discussed in three subtopics in this section. Firstly, findings about the general bibliometric outlook such as annual scientific production, most cited keywords, sources (journals) with the highest impact in the field, contributions of the countries, and distribution of the research in the academic fields are given. Secondly, a keyword analysis with t-SNE is discussed, and lastly the SNA results are shown and discussed with cluster topics through the SNA and t-SNA analyses.

4.1. General Bibliometric Outlook

From a holistic point of view, the authors did not set a period for the research of the existing literature in this study. Within the framework of keywords for search in the databases, more than 500 publications and 750 authors contributed to the literature on gender, sustainability, and urbanism. In total, 105 of the articles in the finalized research corpus were single-authored papers.

As seen in Figure 2, the research about gender equality, sustainability, and urbanism goes back almost two decades to 1993, and 2016 was the year that studies started to increase dramatically. After the dramatic increase in 2016, the year 2021 was the peak point according to our analysis.

Articles with the highest citation scores were in the field of sustainability, sustainable development, gender, and corporate social responsibility. Figure 3 shows the main keywords in the topic of the articles, citation paths, and interlinkage through authors and citations.

The most relevant sources for gender equality, sustainability, and urbanism studies are shown in Figure 4. MDPI's *Sustainability* Journal is the main source by a long way among other sources. *Wiley's Corporate Social Responsibility and Environmental Management Journal* is the second most reliable source in the research field.
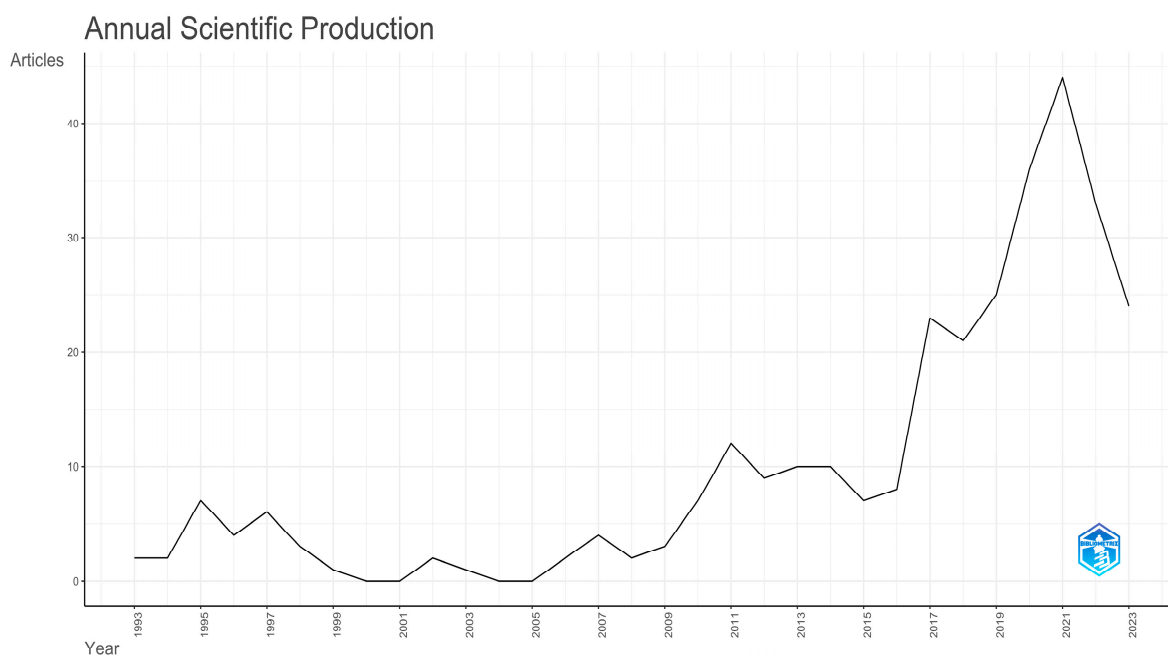
Figure 2. The timeline of annual scientific productions in gender equality, sustainability, and urbanism.
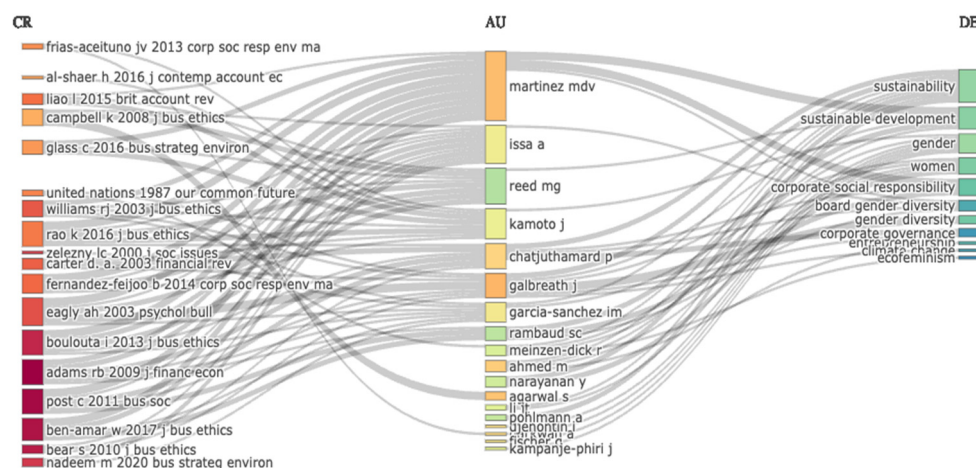
Figure 3. The most cited keywords in the article titles and citation paths.

In total, 80 countries produced empirical research on gender equality, sustainability, and urban studies, which means the domain is almost spread around the world. The USA (*n* = 106), UK (*n* = 52), Spain (*n* = 42), and PRC (*n* = 40) were the highest contributing countries in the regional distribution of the publications on the domain (see Figure 5).

The expected research areas were urban studies and urban planning. However, as shown in Figure 6, the top three research areas were environmental studies, green and sustainable science and technology, and environmental sciences. Surprisingly, the regional and urban planning, urban studies, and social sciences areas were less contributive to the research domain. The social sciences including business, management, women's studies, and interdisciplinary social sciences were the second most contributive areas in the research domain.

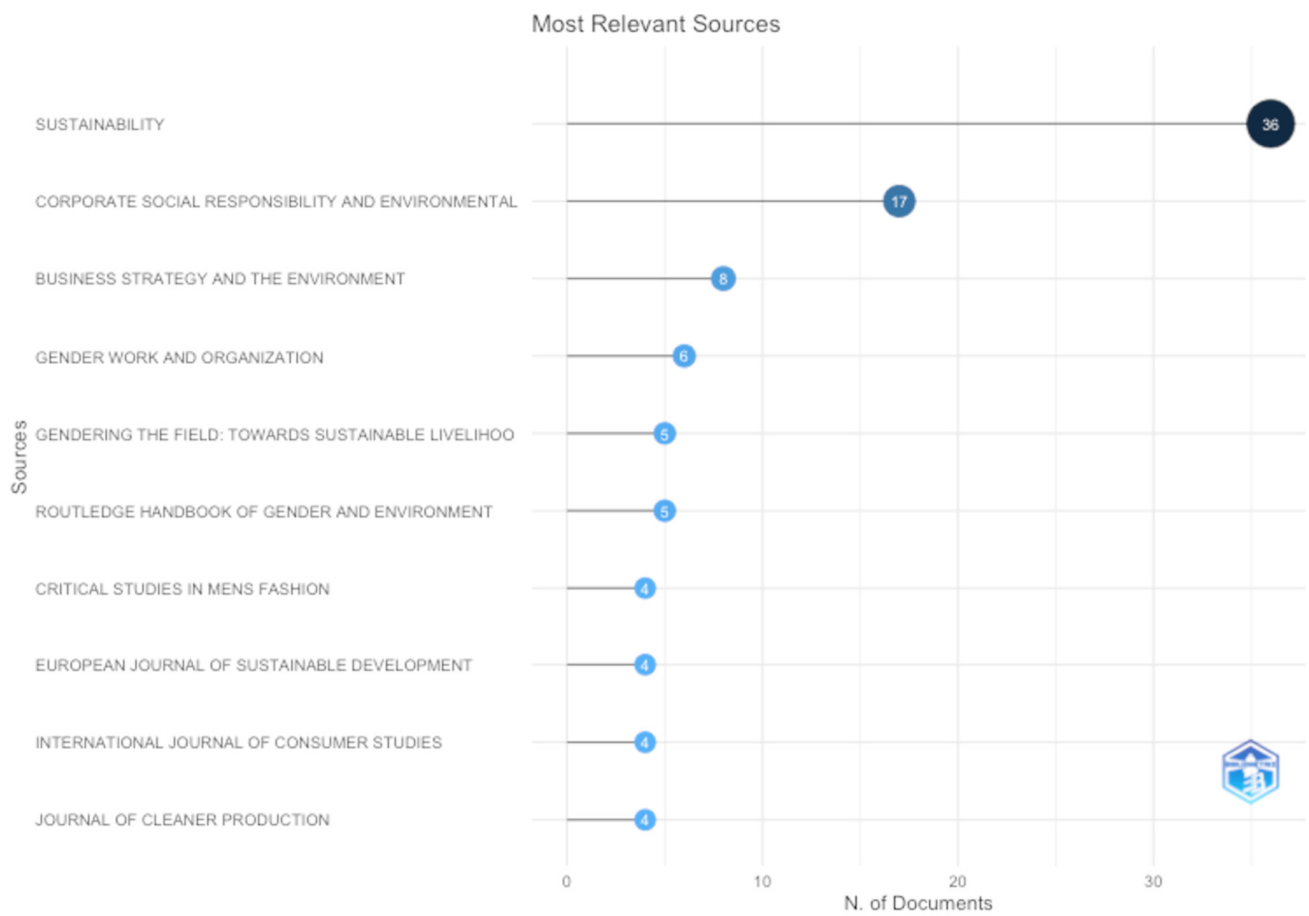**Figure 4.** The most relevant sources in the existing literature on gender equality, sustainability, and urban studies.
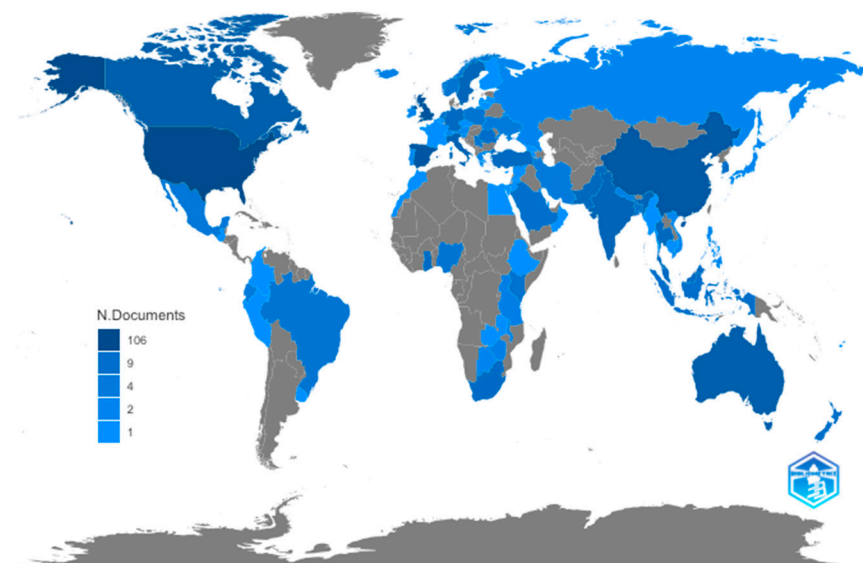

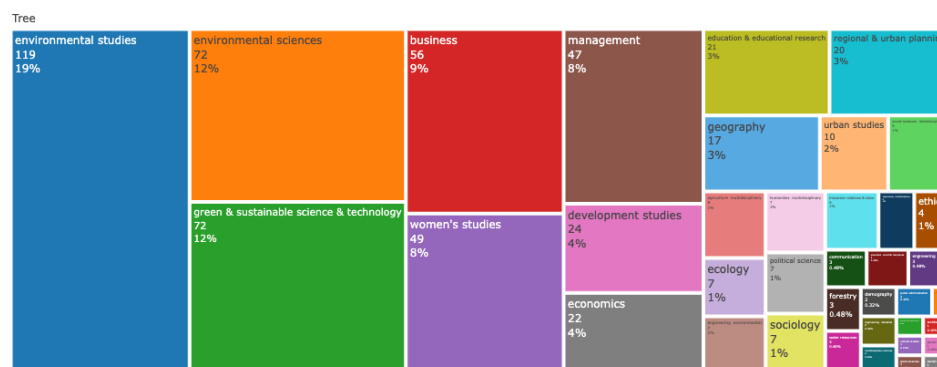**Figure 5.** Country scientific production.

Figure 6. Distribution of research in the subject areas.

4.2. Keyword Analysis

This study used t-distributed stochastic neighbor embedding (t-SNE) for visualizing high-dimensional data [43] to reveal the foci of the publications in the research corpus, to reduce dimensions, and to clarify clusters as shown in Figure 7. The analysis of the dataset derived from the research corpus for t-SNE plotted three clusters. The yellow cluster illustrates how gender influences sustainable practices and urban development. The keyword patterns in the yellow cluster are in accordance with the United Nations' Conference on Housing and Sustainable Urban Development (Habitat III) final report in 2017. The report asserts that the objective of integrating gender considerations into environmental protection is to ensure equal opportunities for men and women to participate and benefit from environmental protection and land use by recognizing and utilizing their diverse perspectives and expertise related to environmental and urban development [21]. The purple cluster suggests the consequences and impacts of gender diversity on corporate sustainability initiatives. For example, in their study, Muhammad and Migliori [44] claimed that firms with a greater gender diversity on their corporate boards exhibited more environmentally conscious behavior, as indicated by higher environmental performance. Additionally, female leaders played a pivotal role in promoting environmental sustainability. Similarly, in their study, Martinez et al. [29] found that companies with more women on their boards were more likely to voluntarily disclose Corporate Social Responsibility (CSR) information and were more likely to be included in the Dow Jones Sustainability Index. There appears to be a positive correlation between gender diversity and corporate sustainability [30,45,46]. However, Naeem et al. [47] suggested that the impact of gender diversity on corporate sustainability indicates that the outcomes may differ based on diverse factors like corporate risks, traits, and industries. In their study, they found that the proportion of female executives had a significant negative impact on corporate green innovation.

In this sense, Khalikova et al. [28] proposed that more attention should be given to gender in other areas of sustainability research, such as climate change, corporate social responsibility, food production, resource management, energy policy, and environmental behavior and education. However, even in these areas, the concept of "gender" is often limited to traditional gender roles, ignoring the impact of intersectionality on gender identity in relation to factors such as income, age, and other demographic characteristics. The red cluster as the last cluster highlights how gender perspectives contribute to sustainable development, and the environment. Odrowaz-Coates [48] argued that gender perspectives play a crucial role in sustainable development and environmental conservation. Women are more likely to take steps to reduce waste, embrace a circular economy, recycle, and promote sustainable water management. However, implementing gender-blind policies in sustainable development may lead to working primarily with men. On the other hand, targeting only women and neglecting men can occur if sustainable development issues are viewed through a gendered lens. Therefore, it is imperative to involve both men and women while considering gender [31].
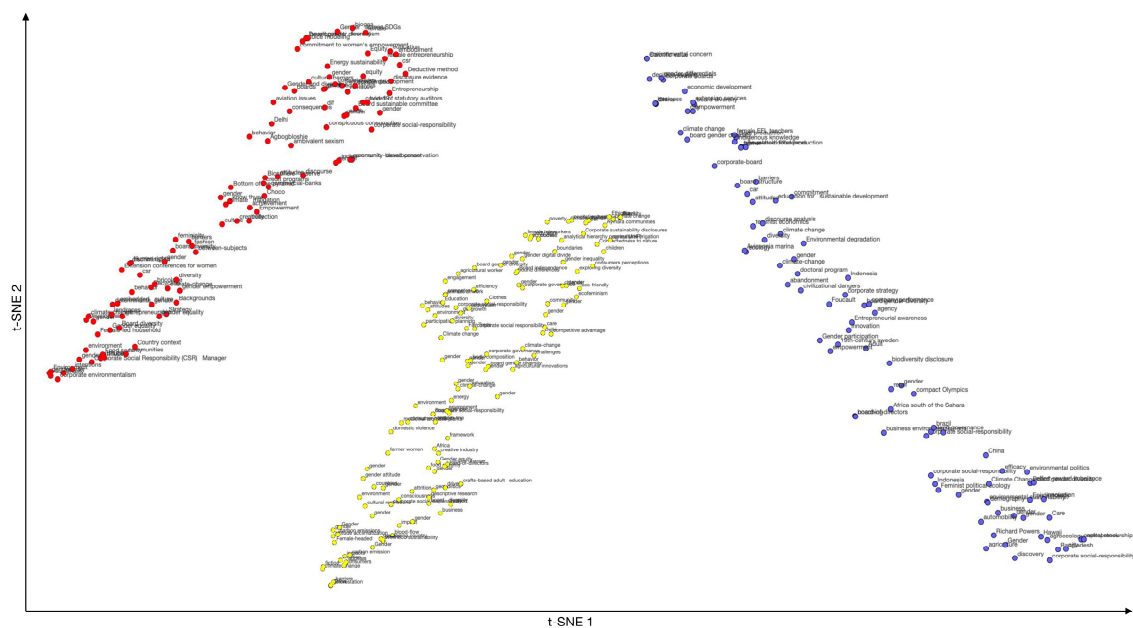
Figure 7. Cluster plot after t-SNE analysis.

Studies show that gender perspectives are crucial in promoting sustainable development and protecting the environment and are in line with the United Nations Sustainable Development Goals (SDGs) [49]. Goal 5, which aims to achieve gender equality, ensures that women's participation in decision-making processes leads to more inclusive and effective environmental policies and practices [50]. Gender considerations play a crucial role in achieving several of the Sustainable Development Goals, including Goal 13 on combating climate change, Goal 15 on preserving life on land, Goal 7 on promoting affordable and clean energy, and Goal 12 on sustainable consumption and production [32]. By considering the distinct vulnerabilities of women and men, gender perspectives enable tailored adaptation and resilience strategies, and recognize women's deep knowledge of ecosystems, empowering them to lead in conservation efforts. In achieving Goal 13, gender perspectives contribute to tailored adaptation and resilience strategies that address the distinct vulnerabilities of women and men [51]. Additionally, gender perspectives contribute to Goal 15 by recognizing women's deep knowledge of ecosystems and empowering them to lead in conservation efforts. In achieving Goal 7, gender perspectives guide efforts to bridge energy access gaps and drive the adoption of sustainable technologies for all genders. Lastly, gender perspectives foster sustainable consumption and production by revealing gendered behaviors, leading to targeted campaigns for responsible choices. Overall, gender perspectives infuse the implementation of all SDGs with inclusivity, empowerment, and equitable outcomes, fostering a more sustainable and resilient future for our planet.

4.3. Social Network Analysis

This section presents the proposed broad emerging research themes, which were identified using the text-mining output of the abstracts of the papers in the research corpus, by performing a lexical analysis, and utilizing two stages of co-occurrence information extraction: semantic and relational [52]. Authors used different algorithms in R Studio and Vos Viewer 1.16.18(0) software to extract information and visualization. A social network analysis (SNA) was used to determine the relationship between the tags and the keywords of the papers in the research corpus. The SNA provides effective methods for summarizing networks and pinpointing key individuals or objects that occupy crucial positions within a map matrix. Keywords serve as granular representations, and analyzing the links in relation to these keywords is crucial for understanding the network's structure [53]. The SNA of the keywords are shown in Figure 8.

Figure 8. SNA plot of the keywords.

Three themes emerged after the SNA and t-SNE analysis of the keywords and abstracts of the articles in the research corpus. The emerging themes were obtained through a review of the related literature, which is supported by visual representations in Figures 7 and 8. These themes were then discussed and analyzed, with reference to the supporting literature.

4.3.1. Gender Diversity, Corporate Sustainability, and Board Governance (See the Connection of Nodes and Paths in Figure 8 and the Distances between Keywords for Corporate Sustainability, Board Gender Diversity, Board Gender, Corporate Board, Board, Gender Participation, Governance in t-Sne Analysis in Figure 7)

The first emerging theme as the output of the analysis was Gender Diversity, Corporate Sustainability, and Board Governance (see the connection of nodes and paths in Figure 8 and the distances between keywords in the t-SNE analysis in Figure 7). In their research, Singhania et al. [35] used a bibliometric research design on the domain of gender diversity and corporate sustainability. Gender diversity and corporate sustainability have enormous potential for further research. Women, in their various roles as leaders, stakeholders, educators, consumers, mothers, and responsible citizens, can promote sustainable lifestyles that embody the principles of social justice, gender equity, and sustainability, given the significant impact of gender on societal roles [48,54]. Therefore, gender diversity in a corporate board can have a positive effect on corporate sustainability by providing efficency to use resources [36,55]. Gender diversity in the boards of corporations can contribute to the sustainability of internal and external shareholders and processes of corporations. In this direction, studies encourage corporations to examine the previous academic research on corporate governance practices that lead to improved disclosure, such as larger boards, more independent directors, and increased representation of women [56]. In sum, gender diversity in corporate boards will positively impact corporate sustainability by promoting efficient resource utilization and improved disclosure, with women playing key roles as leaders, stakeholders, and responsible citizens in fostering sustainable lifestyles and societal roles.

4.3.2. Gender, Environmental Sustainability, Sustainable Development, and Policy Agenda (See the Connection of Nodes and Paths in Figure 8 and the Distances between Keywords for Environmental Sustainability, Gender, Gender Equality, Environment, Agenda, Sustainable Development Goals, Corporate Social Responsibility, Corporate Sustainability in t-Sne Analysis in Figure 7)

The second theme that emerged from the analysis was Gender, Environmental Sustainability, and Sustainable Development. This theme highlights the relation between sustainable development policies and environmental sustainability from the gender equality perspective. The implementation of policy initiatives that promote gender diversity

throughout an organization has a positive impact on sustainable development and environmental sustainability [45]. These initiatives may include gender equality plans, combined with measures aimed at increasing women's competitiveness, such as training and development opportunities, mentorship, and networking. In their paper, Calabrese et al. [57] highlighted the influence of gender equality on managers' corporate social sustainability and sustainable development with a comparison of countries in the EU and suggested that gender equality is an important factor in achieving sustainable development. The research in the field reveals that eradicating discrimination against women in both the public and private sectors by regulations and policies empowers sustainable development [29,58]. A comprehensive approach that considers the interconnectedness of gender, environmental sustainability, sustainable development, and policy agenda is essential for achieving equitable and effective outcomes and fostering a more just, inclusive, and sustainable world. To realize this, a cultural shift [59] is needed alongside legal changes, and senior leadership must lead the charge for gender diversity and communicate its organizational benefits in governance. Overall, SDG 5 recognizes gender equality as both a fundamental human right and a critical factor in achieving sustainable development. By prioritizing gender equality and women's empowerment, this goal seeks to create a more equitable, inclusive, and sustainable future for everyone.

4.3.3. Gender, Sustainable Urbanism, and Community Development (See the Connection of Nodes and Paths in Figure 8 and the Distances between Keywords for Woman, Community, Participation, Access, Region, Land, Resource, Gender Empowerment, Female Entrepreneurship, Sustainable Development in t-SNE Analysis in Figure 7)

The last and third of the clusters that emerged from the study's analysis were Gender, Sustainable Urbanism, and Community Development. However, many studies revealed that most national policies on urban planning lack gender equality; therefore, promoting gender equity and social inclusion by providing better access to public transport, improving pedestrian and cycling infrastructure, and addressing safety concerns for women in public spaces is important [7,34]. Gender-conscious urbanism will help to break a path for sustainable urbanism. However, community development has the key role in changing the policies undergoing issues for gender inequalities in urban design. Encouraging the participation and engagement of women and other marginalized groups in urban planning and decision-making processes can help for creating gender equity in urban spaces [7]. Although gender equality and urbanism are an important topic for research, there is limited empirical research in this domain. Enhancing the collaboration of the intersectional research field between urbanism, gender studies, and environmental sustainability may help to overcome this issue.

5. Conclusions and Implications

This paper examined the general bibliometric outlook on gender, sustainability, and urbanism with a systematic approach through the PRISMA protocol. The research found that there is increasing research interest on sustainability and urbanism from a gender perspective with multiple approaches. The findings indicate that gender equality is still an issue for designing a sustainable urban space. In addition to this, women's participation in decision-making processes for corporate social responsibility and sustainable development of urban spaces is increasing but still low around the world. There are policies to engage women in decision-making processes for gender equality in urbanism in territories such as the EU, UK, and the USA; however, discrimination against women and other marginalized groups remains a problem.

The t-SNE analysis to reveal the bibliometric outlook resulted in three clusters with overlapping keywords in three themes: (1) Gender Diversity, Corporate Sustainability, and Board Governance; (2) Gender, Environmental Sustainability, Sustainable Development, and Policy Agenda; and (3) Gender, Sustainable Urbanism, and Community Development. The analysis of the three clusters highlights the crucial role of gender perspectives in driving sustainable outcomes across various domains. The first cluster underscores

that gender diversity within corporate boards and leadership positively impacts corporate sustainability, calling for further exploration of resource efficiency and disclosure mechanisms. The second cluster establishes a reciprocal relationship between gender equality, environmental sustainability, and achieving sustainable development goals, emphasizing the significance of gender-sensitive policies for a just and equitable world. Lastly, the third cluster stresses the urgent need for gender-conscious urban planning to create inclusive and sustainable cities, suggesting avenues for research in transportation infrastructure, safety, community development, and technology-driven innovations. In the pursuit of holistic sustainability, these clusters collectively guide us toward a future where gender equality becomes intrinsically interwoven with corporate practices, environmental policies, and urban development strategies.

The findings of the study revealed that fostering gender equality with policies such as gender mainstreaming as in SDG 5 and SDG 11, and gender equality strategies of the EU or UN, will help to overcome discrimination against women in the urban space and empower sustainable development. However, there is still a limited number of studies dealing with gender mainstreaming and urban planning. In this sense, enhancing the collaboration of the intersectional research field between urbanism, gender studies, and environmental sustainability may help to increase the number of research studies in this domain. Therefore, future research can delve into:

1. Investigating strategies that enhance women's safety in public spaces, promote inclusive transportation infrastructure, and ensure women's participation in decision-making processes;
2. Exploring the role of technology and innovation in advancing gender-inclusive urban design, the impact of cultural factors on gender-sensitive planning, and the socioeconomic implications of gender-equitable urban spaces;
3. Examining how organizations and governments can collaborate to integrate gender perspectives into broader sustainable development policies and can offer practical insights into driving more comprehensive, inclusive, and impactful sustainability initiatives;
4. Determining the role of gender in shaping sustainable consumption patterns, the dynamics between gender equality and climate action, and the influence of gender-sensitive policies on promoting environmental resilience;
5. Exploring the specific strategies that foster resource efficiency, the role of leadership, and gender diversity in driving innovation for sustainable practices, and the relationship between corporate culture and gender-sensitive governance.

Further research in the direction of the above-stated topics can evolve the literature to focus on the social dynamics of urban design, especially through interdisciplinary studies in fields such as women's studies, communication, urban design, environmental sciences, and administrative sciences within the social sciences, including the aspects of not only woman but children, older people, and people with disabilities.

Institutional Review Board Statement: Ethical review and approval were waived for this study as systematic review studies do not involve any human or living participants.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data are available from the corresponding author upon reasonable request.

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

References

1. Mehta, V. Evaluating Public Space. *J. Urban Des.* **2014**, *19*, 53–88. [CrossRef]
2. Warner, M.E.; Zhang, X. Planning Communities for All Ages. *J. Plan. Educ. Res.* **2022**, *42*, 554–555. [CrossRef]
3. Sheila, R.F.; Iaione, C. Ostrom in the city: Design principles and practices for the urban commons. In *Routledge Handbook of the Study of the Commons*; Routledge: London, UK, 2019; pp. 235–255.
4. Fitzgerald, K.G.; Caro, F.G. An Overview of Age-Friendly Cities and Communities Around the World. *J. Aging Soc. Policy* **2014**, *26*, 1–18. [CrossRef] [PubMed]
5. Pozoukidou, G.; Chatziyiannaki, Z. 15-Minute City: Decomposing the New Urban Planning Eutopia. *Sustainability* **2021**, *13*, 928. [CrossRef]
6. Odbert, C.; Mulligan, J.; Jewell, R.; Ohler, S.; Elachi, L.; Kiani, N.; Rempe, S. *Handbook for Gender-Inclusive Urban Planning Design*; The World Bank: Washington, DC, USA, 2020.
7. De Simone, L. Gender-conscious urbanism and urban planning. In *Gender Equality*; Filho, W.L., Azul, A.M., Brandli, L., Lange Salvia, A., Wall, T., Eds.; Encyclopedia of the UN Sustainable Development Goals; Springer: Cham, Switzerland, 2020; pp. 1–10, ISBN 978-3-319-70060-1.
8. Issa, A. Shaping a sustainable future: The impact of board gender diversity on clean energy use and the moderating tole of environmental, social and governance controversies. *Corp. Soc. Responsib. Environ.* **2023**. *early view*. [CrossRef]
9. Apostu, S.A.; Panait, M.; Gigauri, I.; Blessinger, P. Exploring the relationship between the urbanization, higher education and female labor force with sustainable development. *J. Appl. Res. High. Educ.* **2023**. *ahead of print*. [CrossRef]
10. UN Economic and Social Affairs. World Urbanization Prospects: The 2018 Revision. Available online: https://population.un.org/wup/publications/Files/WUP2018-KeyFacts.pdf (accessed on 19 June 2023).
11. Meinzen-Dick, R.; Kovarik, C.; Quisumbing, A.R. Gender and sustainability. *Annu. Rev. Environ. Resour.* **2014**, *39*, 29–55. [CrossRef]
12. Bloodhart, B.; Swim, J.K. Sustainability and consumption: What's gender got to do with it? *J. Soc. Issues* **2020**, *76*, 101–113. [CrossRef]
13. Nikulina, V.; Simon, D.; Ny, H.; Baumann, H. Context-adapted urban planning for rapid transitioning of personal mobility towards sustainability: A systematic literature review. *Sustainability* **2019**, *11*, 1007. [CrossRef]
14. Pan, C.; Guo, H.; Jiang, Y.; Wang, H.; Qi, W. The double effects of female executives' participation on corporate sustainable competitive advantage through unethical environmental behavior and proactive environmental strategy. *Bus. Strategy Environ.* **2020**, *29*, 2324–2337. [CrossRef]
15. Aguilera, R.V.; Aragón-Correa, J.A.; Marano, V.; Tashman, P.A. The corporate governance of environmental sustainability: A review and proposal for more integrated research. *J. Manag.* **2021**, *47*, 1468–1497. [CrossRef]
16. Wu, Q.; Furuoka, F.; Lau, S.C. Corporate social responsibility and board gender diversity: A meta-analysis. *Manag. Res. Rev.* **2022**, *45*, 956–983. [CrossRef]
17. UN WomenWatch. Gender Equality and Sustainable Urbanisation: Fact Sheet 2009. Available online: https://www.un.org/womenwatch/feature/urban/downloads/WomenWatch_Gender_Equality_and_Sustainable_Urbanisation-fact_sheet.pdf (accessed on 1 August 2023).
18. Candiracci, S.; Power, K. Cities Alive: Designing Cities that Work for Women. Available online: https://www.undp.org/publications/cities-alive-designing-cities-work-women (accessed on 1 August 2023).
19. Ritchie, H.; Roser, M. Urbanization 2018. Available online: https://ourworldindata.org/urbanization#citation (accessed on 2 August 2023).
20. Urban Agenda for the EU. The Urban Agenda for the EU: EU Multi-Level Governance in Action. Available online: https://www.urbanagenda.urban-initiative.eu/urban-agenda-eu (accessed on 2 August 2023).
21. Un-Habitat. Global Activities Report 2017. In *Strengthening Partnerships in Support of the New Urban Agenda and the Sustainable Development Goals*; UN-Habitat: Nairobi, Kenya, 2017; ISBN 978-92-1-1327328.
22. Sertyesilisik, E. Sustainable Environment and Urbanization Policies to Enhance Gender Equality and Women Empowerment. In *Gender Inequality and its Implications on Education and Health*; Chakraborty, C., Pal, D., Eds.; Emerald Publishing Limited: Bingley, UK, 2023; pp. 203–212, ISBN 978-1-83753-181-3.
23. Leach, M.; Mehta, L.; Prabhakaran, P. Sustainable development: A gendered pathways approach. In *Gender Equality and Sustainable Development*; Lech, M., Ed.; Routledge: London, UK, 2015; pp. 1–33, ISBN 978-1-315-68645-5.
24. Beebeejaun, Y. Gender, urban space, and the right to everyday life. *J. Urban Aff.* **2017**, *39*, 323–334. [CrossRef]

25.   Tacoli, C.; Satterthwaite, D. Gender and urban change. *Environ. Urban.* **2013**, *25*, 3–8. [CrossRef]
26.   UNDP Sustainable Development Goals. Goal 11: Sustainable Cities and Communities. Available online: https://www.undp.org/sustainable-development-goals/sustainable-cities-and-communities (accessed on 2 August 2023).
27.   Daly, M. Gender mainstreaming in theory and practice. *Soc. Polit.* **2005**, *12*, 433–450. [CrossRef]
28.   Khalikova, V.R.; Jin, M.; Chopra, S.S. Gender in sustainability research: Inclusion, intersectionality, and patterns of knowledge production. *J. Ind. Ecol.* **2021**, *25*, 900–912. [CrossRef]
29.   Martinez, C.V.; Rambaud, S.C.; Parra Oller, I.M. Gender policies on board of directors and sustainable development. *Corp. Soc. Responsib. Environ. Manag.* **2019**, *26*, 1539–1553. [CrossRef]
30.   Furlotti, K.; Mazza, T.; Tibiletti, V.; Triani, S. Women in top positions on boards of directors: Gender policies disclosed in Italian sustainability reporting. *Corp. Soc. Responsib. Environ.* **2019**, *26*, 57–70. [CrossRef]
31.   Carvajal, M.; Nadeem, M.; Zaman, R. Biodiversity disclosure, sustainable development and environmental initiatives: Does board gender diversity matter? *Bus. Strategy Environ.* **2022**, *31*, 969–987. [CrossRef]
32.   Medupin, C. Women in environmental sciences (WiES) and The UN SDGs: A Catalyst for achieving a sustainable future for all. *Sustainability* **2020**, *12*, 7116. [CrossRef]
33.   Raman, R.; Subramaniam, N.; Nair, V.K.; Shivdas, A.; Achuthan, K.; Nedungadi, P. Women entrepreneurship and sustainable development: Bibliometric analysis and emerging research trends. *Sustainability* **2022**, *14*, 9160. [CrossRef]
34.   Shrestha, B.; Tiwari, S.R.; Bajracharya, S.B.; Keitsch, M.M.; Rijal, H.B. Review on the importance of gender perspective in household energy-saving behavior and energy transition for sustainability. *Energies* **2021**, *14*, 7571. [CrossRef]
35.   Singhania, S.; Singh, J.; Aggrawal, D. Gender diversity on board and corporate sustainability: A quantitative review based on bibliometric mapping. *Int. J. Syst. Assur. Eng. Manag.* **2023**, *14*, 267–286. [CrossRef]
36.   Alhosani, N.H.I.; Nobanee, H. Board gender diversity and corporate social responsibility: A bibliometric analysis. *Heliyon* **2023**, *9*, e12734. [CrossRef] [PubMed]
37.   Boukattaya, S.; Omri, A. Impact of board gender diversity on corporate social responsibility and irresponsibility: Empirical evidence from France. *Sustainability* **2021**, *13*, 4712. [CrossRef]
38.   Donthu, N.; Kumar, S.; Mukherjee, D.; Pandey, N.; Lim, W.M. How to conduct a bibliometric analysis: An overview and guidelines. *J. Bus. Res.* **2021**, *133*, 285–296. [CrossRef]
39.   Aggarwal, C.C.; Zhai, C. A survey of text classification algorithms. In *Mining Text Data*; Aggarwal, C., Zhai, C., Eds.; Springer: Boston, MA, USA, 2012; pp. 163–222. [CrossRef]
40.   Serrat, O. *Knowledge Solutions: Tools, Methods, and Approaches to Drive Organizational Performance*; Springer: Singapore, 2017. [CrossRef]
41.   Van der Maaten, L.; Hinton, G. Visualizing data using t-SNE. *J. Mach. Learn. Res.* **2008**, *9*, 2579–2605.
42.   van Eck, N.J.; Waltman, L. Text mining and visualization using VOSviewer. *arXiv* **2011**, arXiv:1109.2058.
43.   Wang, Y.; Huang, H.; Rudin, C.; Shaposhnik, Y. Understanding how dimension reduction tools work: An empirical approach to deciphering t-SNE, UMAP, TriMAP, and PaCMAP for data visualization. *J. Mach. Learn. Res.* **2021**, *22*, 9129–9201.
44.   Muhammad, H.; Migliori, S. Effects of board gender diversity and sustainability committees on environmental performance: A quantile regression approach. First View. *J. Manag. Organ.* **2022**, 1–26. [CrossRef]
45.   Kassinis, G.; Panayiotou, A.; Dimou, A.; Katsifaraki, G. Gender and environmental sustainability: A longitudinal analysis. *Corp. Soc. Responsib. Environ.* **2016**, *23*, 399–412. [CrossRef]
46.   Glass, C.; Cook, A.; Ingersoll, A.R. Do women leaders promote sustainability? Analyzing the effect of corporate governance composition on environmental performance. *Bus. Strategy Environ.* **2016**, *25*, 495–511. [CrossRef]
47.   Naeem, M.A.; Karim, S.; Mohd Nor, S.; Ismail, R. Sustainable corporate governance and gender diversity on corporate boards: Evidence from COVID-19. *Econ. Res.-Ekon. Istraživanja* **2022**, *35*, 5824–5842. [CrossRef]
48.   Odrowaz-Coates, A. Definitions of sustainability in the context of gender. *Sustainability* **2021**, *13*, 6862. [CrossRef]
49.   Leuenberger, D.Z.; Lutte, R. Sustainability, gender equity, and air transport: Planning a stronger future. *Public Works Manag.* **2022**, *27*, 238–251. [CrossRef]
50.   Lawson, L.; Chowdhury, A.R. Women in Thailand's gem and jewellery industry and the Sustainable Development Goals (SDGs): Empowerment or continued inequity? *Environ. Sci. Policy.* **2022**, *136*, 675–684. [CrossRef]
51.   Doğan, N.; Kirikkaleli, D. Does gender equality in education matter for environmental sustainability in sub-Saharan Africa? *Environ. Sci. Pollut. Res.* **2021**, *28*, 39853–39865. [CrossRef]
52.   Smith, A.E.; Humphreys, M.S. Evaluation of unsupervised semantic mapping of natural language with Leximancer concept mapping. *Behav. Res. Methods* **2006**, *38*, 262–279. [CrossRef]
53.   Hansen, D.L.; Shneiderman, B.; Smith, M.A.; Himelboim, I. *Analyzing Social Media Networks with Nodexl: Insights from a Connected World*, 2nd ed.; Morgan Kaufmann: Cambridge, MA, USA, 2020; ISBN 978-01-2817-756-3.
54.   Sánchez-Teba, E.M.; Benítez-Márquez, M.D.; Porras-Alcalá, P. Gender diversity in boards of directors: A bibliometric mapping. *J. Open Innov. Technol. Mark.* **2020**, *7*, 12. [CrossRef]
55.   Lu, J.; Herremans, I.M. Board gender diversity and environmental performance: An industries perspective. *Bus. Strategy Environ.* **2019**, *28*, 1449–1464. [CrossRef]
56.   Lagasio, V.; Cucari, N. Corporate governance and environmental social governance disclosure: A meta-analytical review. *Corp. Soc. Responsib. Environ.* **2019**, *26*, 701–711. [CrossRef]

57. Calabrese, A.; Costa, R.; Ghiron, N.L.; Menichini, T. Gender equality among CSR managers and its influence on sustainable development: A comparison among Italy, Spain and United Kingdom. *Eur. J. Sustain. Dev.* **2018**, *7*, 451. [CrossRef]

58. Kerras, H.; Sánchez-Navarro, J.L.; López-Becerra, E.I.; de-Miguel Gomez, M.D. The impact of the gender digital divide on sustainable development: Comparative analysis between the European Union and the Maghreb. *Sustainability* **2020**, *12*, 3347. [CrossRef]

59. Harcourt, W. Gender and sustainable livelihoods: Linking gendered experiences of environment, community and self. *Agric. Hum. Values* **2017**, *34*, 1007–1019. [CrossRef]

60. Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; Boutron, I.; Hoffmann, T.C.; Mulrow, C.D.; Shamseer, L.; Tetzlaff, J.M.; Akl, E.A.; Brennan, S.E.; et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ* **2021**, *372*, n71. Available online: http://www.prisma-statement.org/ (accessed on 30 August 2023). [CrossRef] [PubMed]