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A Bibliometric Analysis of Current Knowledge Structure and Research Progress Related to Urban Community Garden Systems

Hua Zheng [1,2,3], Min Guo [1,3], Qian Wang [2], Qinghai Zhang [1,3,*] and Noriko Akita [2,*]

[1] College of Horticulture, Nanjing Agricultural University, Nanjing 210095, China
[2] Graduate School of Horticulture, Chiba University, Matsudo 271-8510, Japan
[3] Key Laboratory of Landscaping, Ministry of Agriculture, Nanjing 210095, China
* Correspondence: qinghai@njau.edu.cn (Q.Z.); noriko@faculty.chiba-u.jp (N.A.)

Abstract: Community gardens offer broad research opportunities and analytical resources encompassing urban planning to environmental sustainability, food systems, and social capital. However, little is known about the knowledge structure and research development related to community gardens. This study presents an in-depth bibliometric performance analysis and visual scientific mapping analysis of the literature on community gardens by examining 487 published papers selected from the Web of Science database. The results indicated a considerable rise in research papers in this subject area from 2012 onwards, with most contributions from the United States. Studies from high-income countries accounted for 93.22%, and 38 countries have cooperated 167 times in this field. "Health" is the most frequent keyword, and the terms "ecosystem services" has been gaining popularity over the last five years. A combination of co-citation clustering and keyword co-occurrence clustering analysis identified three major research themes in the field of community gardens: "ecosystem services and disservices", "multidimensional association", and "sustainable garden systems". The development of ecosystem value assessment frameworks, the establishment of region-wide soil monitoring databases, accounting for the cost-effectiveness of nature-based solutions, the integration of garden systems into smart cities, and the integration of water management into regulation will be important future research directions regarding community gardens. Overall, this study provides scholars with a systematic and quantitative understanding of community gardens.

Keywords: co-citation network analysis; ecosystem services; health; nature-based solutions; sustainability; urban food systems

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1. Introduction

With urban areas housing a majority of the world's population, the development of urban spaces requires constant exploration [1,2]. Community gardens (CGs), viewed as the multifunctional urban green infrastructure, food production spaces, and green spaces that promote nature contact, have become a widespread land-based practice [3–5]. As a socio-spatial paradigm, practices of CGs have shown a marked impact on cities such as creating participatory spaces [6–9], promoting community cohesion [10–13], improving the health of residents [14–16], performing environmental education functions [17–19], and enriching the composition of urban food systems [20–22]. Simultaneously, scientific literature on CGs research is expanding with several scholars contributing on different disciplinary perspectives. Fox-Kämper et al. [23] critically examined governance structures and practices at different stages of garden development. Certomà and Martellozzo [24] proposed a quantitative spatial analysis based on geostatistical linear regression methods to discuss the spatial relevance of urban gardening, Menconi et al. [25] conducted a differentiated assessment of 32 ecosystem services provided by CGs, and Smith et al. [26] presented a systematic approach for CGs siting through multicriteria decision analysis. In general, the

past scientific research has comprehensively reported substantial developments related to various aspects of CGs.

However, awareness of the intellectual landscape for CGs publications still needs to be improved. To the best of our knowledge, reviews on CGs have been scarce in recent years and tend to be systematic reviews by experts from their research perspectives. For example, Marsh and Spinaze [27] conducted a literature review on the relationship between CGs and end-of-life experiences in academic research. Burt et al. [28] analyzed 31 quantitative, qualitative, and mixed methods studies exploring the relationship between participation in community gardening and food disputes. Gregis et al. [29] systematically reviewed 84 papers to assess whether CGs can provide health and well-being. These expert-dependent reviews use unique insights to analyze one or several perspectives of CGs in depth but lack a complete assessment of the current state of the CGs field and fail to provide scholars with a cognitive blueprint for CGs. A comprehensive systematic review in the field of CGs dates back to a decade ago when Guittart et al. [30] used a systematic review approach to quantitatively assess 87 publications and identified potential directions for CGs research. Nevertheless, in the decade since the review was published, the scholarly literature on CGs has grown at a rate visible to the naked eye, and there is scope to focus on its emerging research themes and future research needs. In addition, traditional systematic reviews have a few limitations. First, the researchers who review the publications must have a high level of professional knowledge to eliminate any tendency of bias. Second, the increasing interest in CGs has led to the emergence of a large body of research literature; using manual selection processes may limit the sample size of literature included in the study eliminating critical publications and contributions [31]. Therefore, there is an urgent need to use tools that can process large amounts of scientific data to assess the existing knowledge and research progress in the field of CGs more systematically and comprehensively.

Bibliometrics with its ability to assess a large number of publications and broad applicability in every field of knowledge is defined as "the application of mathematics and statistical methods to books and other media of communication" by Pritchard [32]. The core of bibliometrics is evaluation ability, which takes the data related to various scientific literature as the research object, using a series of informatics and statistical laws or models to quantitatively evaluate the social and structural relationships between different components of the literature [33], and then summarizes the research status and development trend of a particular knowledge field. The output content is quantitative information. Finally, knowledge maps are generated using scientific mapping software tool. The development of bibliometric databases (e.g., Web of Science, Scopus, Google Scholar) has facilitated sampling [34], and the development of computer software has created tools for bibliometric research [35]. Bibliometric analysis satisfies the principle of reproducibility in scientific research [36–39], meets the requirements of verifiability in different contexts, has a transparent research process [40], and the assessment results are objective and reliable.

Despite the popularity of bibliometric software, no studies have used it to analyze CGs. This study aims to extend the previous traditional literature review of CGs using bibliometric tools. We attempted to specifically understand (1) the extent of available research literature on CGs, and their interconnections, (2) current critical topics in CGs research, how they evolved, and whether they are persistent or transient, and (3) research themes in CGs and future research needs. To our knowledge, there is no evidence of previous literature reviews answering these questions. The contributions of this study are threefold. First, as there are no papers dedicated to the bibliometric analysis of urban CGs, the findings of the current study are expected to fill the existing knowledge gap. The findings may be relevant to researchers of different disciplines and in particular to new researchers orienting themselves to the field. Second, we explored trends in community gardens to provide valuable insights for future research. Third, the study also highlights the reality their establishment, and thus promoting their standardization and legalization.

2. Scientific Background of Urban Community Gardens

2.1. Historical Overview on Urban Community Gardens

Some historians believe that the concept of CGs in the United States originated from allotment gardens (AGs) in the United Kingdom [41], which provided food production and green space for the public. Genter et al. [42] considered CGs as an alternative to AGs. Burchardt [43], a rural historian in the United Kingdom, argues that the concept of AGs dates back to the Middle Ages, originating in the countryside and sprouting in the city, and undergoing a transition from large allotments in the countryside to small AGs in and around urban centers. In the US, the development of CGs since 1894 have been categorized by Bassett [44] into seven eras viz., potato patches, school gardens, garden city plots, liberty gardens, relief gardens, victory gardens, and community gardens.

Lawson [45] argued that the community gardening movement is best described as a series of distinct stages, each with a different ideology and purpose, although all result in people building gardens on public or abandoned land. Industrialization and urbanization were the most important social processes affecting human society in the 19th and 20th centuries. The overview of the history of CGs is not intended to describe several particular processes under the influence of industrialization and urbanization, but rather to grasp the commonalities that exist across CGs in various countries and regions, cultures, and stages of development, although the paths were not identical. Therefore, we compared the garden movements in the United Kingdom and the United States taking place at critical points between the late 19th and late 20th centuries and collated the similarities, as shown in Table 1. We found that the socioeconomic climate effects CGs [46], and urban gardening projects have historically responded to specific crises and emergencies [47]. Overall, AGs in the UK and CGs in the US have unique socio-environmental significance and a long history. Both have undergone a transformation from welfare security for urbanized populations to burdening social, cultural, and environmental responsibilities.

Table 1. Similarities between the garden movements in the UK and the US.

Period	Similarities	In the UK	In the US
Late 19th century –before 1920s	Garden city plots	▪ The Small Holdings and Allotments Act 1908 established the framework for the system of allotment gardens and specified procedures for the compulsory leasing or purchase of land for allotments [48].	▪ The success of the Potato Patches launched in Detroit in 1894 inspired the Vacant Land Cultivation Society (VLCS) to allow unemployed landowners to grow vegetables on their vacant lots [49,50].
During World War I (1914–1918)	Liberty gardens	▪ The food crisis that arose from the First World War led to an increase in interest in gardening for the purposes of domestic food production [51]. ▪ Farmers have filled the gap of agricultural labor shortage [52].	▪ Encouraged people to grow their food to promote food conservation and support soldiers by creating the United States School Garden Army [53].
The Great Depression (1920s–1930s)	Relief gardens	▪ The Agricultural Land Utilisation Act 1931 allowed for the confiscation of unused land, which was then transformed into allotment gardens [54].	▪ Many Americans adopt urban gardening as a form of relief work. Furthermore, local citizen groups have initiated work-relief gardens and sustainable gardens away from cities [55,56].

Table 1. *Cont.*

Period	Similarities	In the UK	In the US
During World War II (1939–1945)	Victory gardens	▪ The Dig for Victory campaign was organized by the British agricultural economist Professor John Raeburn. Its objective was to encourage the British people to grow their own food [57,58].	▪ In 1942, the National Victory Garden Institute was established to encourage gardening as a response to the needs of a nation in crisis [59].
Post-war Decline (1950s–1960s)	— —		
1960s–late 20th century	Garden revival	▪ In 1969, Thorpe Report proposed that the allotment garden could be replaced by the concept of the leisure garden, wherein there would be less emphasis on vegetable production [60,61]. ▪ The Future of Allotments report was published in 1998 and sought greater protection for allotments [42,62]. ▪ Integration into local agendas in the 21st century [63,64].	▪ In 1978, gardeners and activists founded the American Community Gardening Association (ACGA) [45]. ▪ Community gardens set the tone and people began to focus on its value in areas other than production, including health benefits and food security [45,50].

Notes: The historical literature on community gardens in the post-war period of decline is inadequate.

2.2. Existing Definitions of CGs

It is well known that the term "community" is inherently difficult to define, and Bell and Newby [65] compiled 98 definitions of community covering geographical, political, social, and economic terms. Patrick and Wickizer [66] reviewed social science definitions of communities and identified three broad categories: place, social interaction, and social and political responsibility. Table 2 lists the eight definitions of community garden identified in the literature. We found that the function of gardens also changes over time [67,68], and existing definitions would not encapsulate multiple meanings that organizers and participants bring to CGs. It is worth noting that Rees and Melix [69] argued that those who strive to create a definition for CGs tend to offer something more narrow.

Table 2. Definitions of community garden.

Author (Year)	Categories	Citation Count	Definition
Kurtz, 2001	▪ Geography; Urban Studies	113	▪ "tangible arenas in which urban residents can establish and sustain relationships with one another, with elements of nature, and with their neighborhood" (p. 660). [70]
Kurtz, 2001	▪ Geography; Urban Studies	113	▪ "provide important, locally differentiated places in which urban residents formulate and adapt multiple interpretations of the meaning of both community and garden" (p. 657). [70]
Glover et al., 2005	▪ Social Sciences - Other Topics; Sociology	103	▪ "an organized, grassroots initiative whereby a section of land is used to produce food or flowers or both in an urban environment for the personal use or collective benefit of its members" (p. 265). [71]

Table 2. *Cont.*

Author (Year)	Categories	Citation Count	Definition
Kingsley et al., 2009	▪ Social Sciences - Other Topics	146	▪ "plots of land allocated to individuals to create gardens of their choice in a communal environment" (p. 209). [14]
Lyson, 2004	▪ Agriculture; History & Philosophy of Science; Sociology	0	▪ "locally-based agricultural and food production system that is tightly linked to a community's social and economic development" (p. 1). [72]
Guitart et al., 2012	▪ Plant Sciences; Environmental Sciences & Ecology; Forestry; Urban Studies	285	▪ "open spaces which are managed and operated by members of the local community in which food or flowers are cultivated" (p. 364). [30]
Aptekar, 2015	▪ Sociology	47	▪ " . . . are public spaces that hold potential for unsettling categories and encouraging tolerance, a crucial function in contexts of gentrification and immigration-fueled diversity" (p. 211). [73]
He and Zhu, 2018	▪ Plant Sciences; Environmental Sciences & Ecology; Forestry; Urban Studies	42	▪ "a type of open space that is planted collectively with either vegetables or flowers by local members" (p. 154). [74]

Notes: Both categories and citation count are from Web of Science (accessed on 25 March 2022).

2.3. The types of Gardens Included in Our Search Strategy

Community garden is a term with a rich connotation, and there is no single blueprint for the organization of CGs [75]. Škamlová et al. [76] argue that there is a strict distinction between CGs and allotment gardens in previous literature. Community gardens emphasize spaces for collective activities, and have a different governance structure, in which, community members can personalize the garden space. Allotment gardens emphasize divisions in the land and that these plots are planted individually [77]. However, some CGs projects are cross-genre. Menconi et al. [25] described the American CGs as a hybrid of the European allotment and the European CGs, where gardeners own and pay for their own small plots, and the overall management is shared. Some scholars have used the term "organized garden project" instead of CGs [47,71]. Larson [78] put forward the statement of CGs systems, noting that German allotment gardens provide a useful contrast to the US system, but also have similarities to the UK allotment system and that, they can be called community garden systems in general. Van den Berg et al. [79] argued that allotment gardens can be seen as a subtype of the CGs.

Based on historical analysis, the definition of CGs (Sections 2.1 and 2.2), and the search strategy for edible green infrastructure proposed by Russo et al. [80], we identified the types of gardens in the literature database of this study. The CGs in this study emphasized community-based urban agricultural activities and was distinct from home gardens. Community, allotment, school, rooftop, and therapeutic gardens were all included in our search strategy (Figure 1). It must be noted that in the process of sampling, the authors must manually assess each selected paper's relevance to the CGs before deciding whether or not to include it in the database.

Figure 1. Illustrations of the types of gardens included in this study.

3. Methodology

This study aimed to track and monitor the knowledge structure of CGs and shed light on research developments. This section details the data sources, bibliometric tools, and analytical strategies used in this study. The research framework is illustrated in Figure 2.

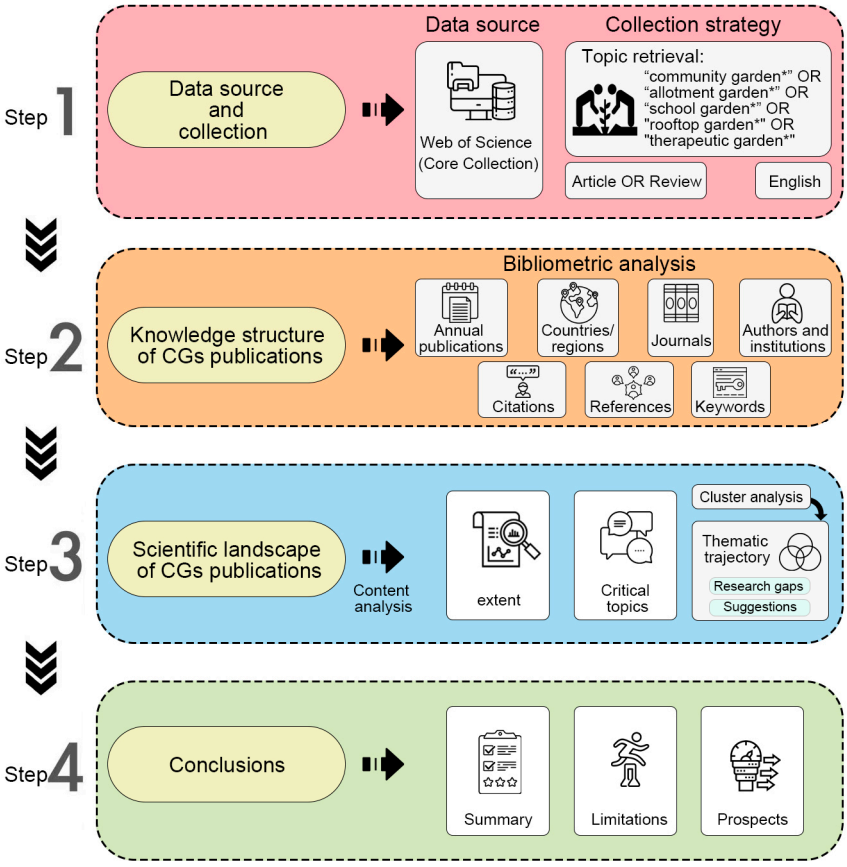

Figure 2. Research framework.

3.1. Data Collection

The study collected bibliographic data from the Web of Science (WOS) core collection database. The WOS is the world's oldest authoritative citation database, which can well index early digital archives, and is recognized as one of the world's leading databases for assessing scientific research. The WOS index offers tens of millions of research publications across countless disciplines, including engineering, technology, management, social sciences, and humanities [81,82], and has been widely used to conduct data-intensive research

in bibliometrics. Therefore, it is reasonable to use the WOS database as the data source for this study.

The dataset construction was divided into two stages: in the first stage, topic retrieval used was topic search (TS) = ("community garden*" OR "allotment garden*" OR "school garden*" OR "rooftop garden*" OR "therapeutic garden*"). To search for publications as comprehensively as possible, no time span was used. To improve the validity and representativeness of the literature, specific record types (e.g., books, editorial materials, and proceedings papers) were excluded and only articles and reviews published in English were considered. The subject and search types were then combined by the Boolean logic operator "AND" to select articles that meet these criteria. A data search was conducted on March 25, 2022, and 978 publication records were retrieved. In the second stage, to ensure the relevance of publications to urban CGs, two authors performed a rigorous manual check and assessment of the titles, abstracts, and full texts of the publications. For the discrepant judgments, the two authors discussed on a case-by-case basis to arrive at a consensual decision. Finally, 487 publications were selected and exported in a plain text format, including full records and cited references for bibliometric analysis. Additionally, full texts in PDF format were downloaded and imported into EndNote (version X9) to review the specific content of the publications.

3.2. Bibliometric Tools

An essential result of the bibliometric analysis is "scientific knowledge map", which has the properties and characteristics of "graph" and "spectrum" and is mainly used to visualize the intellectual landscape of a research field. Scientific mapping is complex and multi-step, and data analysis and visualization of results from bibliometric studies include different substages, often software-assisted [83]. The scientific mapping analysis for this study was generated based on three commonly used tools: the Bibliometrix R-package (Stable Version), VOSviewer (version 1.6.17), and CiteSpace (version 5.8.R3). All three tools can compile bibliographic data from the WOS, and they play an essential role in the scholarly dissemination system.

In addition, the three software packages complement each other. The Bibliometrix R- package is an open-source package in the R environment that provides a set of tools to address the workflow of bibliometric problems, allowing visual analysis in diverse ways and displaying basic information and characteristics of the sample literature [84]. VOSviewer and CiteSpace are two free Java applications. VOSviewer has a user-friendly graphical interface that displays large metric diagrams in an easy to understand manner [85]. CiteSpace focuses on identifying intellectual turning points and pivotal points in the development of a particular field. For example, the timeline view focuses on the time span of the research base [86,87].

3.3. Bibliometric Analytical Strategies

Bibliometric analysis provides a quantitative description of publications through performance and scientific mapping analysis. Valuable insights are gained with respect to research components of annual publications, countries/regions, journals, authors and institutions, citations, references, and keywords.

Performance analysis reveals the contribution of the research components from an objective and quantitative perspective. Performance analysis for literature measurement includes several indicators activity recognized by the scientific community, such as total publications (TP), global total citations (TC), local total citations (LTC), and H-index. Local total citations refer to the number of citations in the current database. The H-index is defined as a journal/author with at least h papers cited more than h times [88]. The Bibliometrix R- package allows the identification of these scientific impact indices and their representation through visualizations or maps.

Scientific mapping focuses more on the relationships between components. We used three bibliometric techniques: (1) Collaboration analysis, which is essential for understand-

ing co-authors and knowledge dissemination among scholars and can be used to identify the collaborative relationships that exist between countries, institutions, and authors in the CGs field. (2) Co-citation analysis can trace a knowledge base by identifying core works in a field. Our study used CiteSpace's co-citation cluster analysis to trace the knowledge base and explore the research topics in CGs, while CiteSpace allows for the generation of timeline maps that can present the evolutionary trends of research topics. (3) Keyword co-occurrence analysis is an effective method for exploring research hotspots. VOSviewer detects the frequency of keyword co-occurrence, generates keyword co-occurrence networks, and allows us to perform statistical analysis on the generated co-occurrence networks. CiteSpace allows the generation of time zone maps to identify the time of the first concentration of keywords. This study compared different software programs to generate the same scientific maps and selected the most readable maps for a comprehensive presentation.

4. Results

We derived the main information for the database using the Bibliometrix R-package (Table 3). A total of 487 papers related to CGs were published from 232 sources during 1995–2022, including 471 original research articles and 16 reviews. The average number of published papers per year was 17.87, and the average number of citations per paper was 27.41. A total of 1369 authors were involved in this research area.

Table 3. Main information about data.

Description	Results
Timespan	1995:2022
Number of sources	232
Average published papers per year	17.87
Average citations per paper	27.41
References	17,818
Number of articles	471
Number of reviews	16
Keywords Plus (ID)	872
Author's Keywords (DE)	1316
Number of authors	1369

Note: author keywords = keywords defined by the authors; keywords plus = keywords designated by the WoS databases.

4.1. Information about Annual Publications

From the annual distribution of publications (Figure 3a), the number of publications per year increased significantly since 2012. Prior to this, there were consistently less than 10 new publications per year; in 2019, there were over 80 publications. Although there are some fluctuations in the number of papers published each year, the overall growth trend indicates that research on CGs was paid more attention. In any research, citations are crucial to locate and learn from the work of others. Figure 3b shows the number of citations and year of publication of each paper, which gives an overview of the citation pattern of the publications. The distribution of citations is uneven, with most papers receiving more citations published before 2007. The mean total citations per paper (Figure 3c) and the mean total citations per year (Figure 3d) showed higher values in 2000, 2008, and 2010, partly due to the increased interest in the CGs field and partly due to the increasing number of publications being acknowledged. It is worth noting that the frequency of citations is increasing over time; therefore, the knowledge structure of the annual citation analysis is reshaped with inter-annual changes. We found that the total number of publications has increased in recent years (after 2015), while mean total citations per paper, and mean total citations per year are lower, mainly since citations take time to accumulate. More recent papers need more time to gain sufficient exposure and citations.

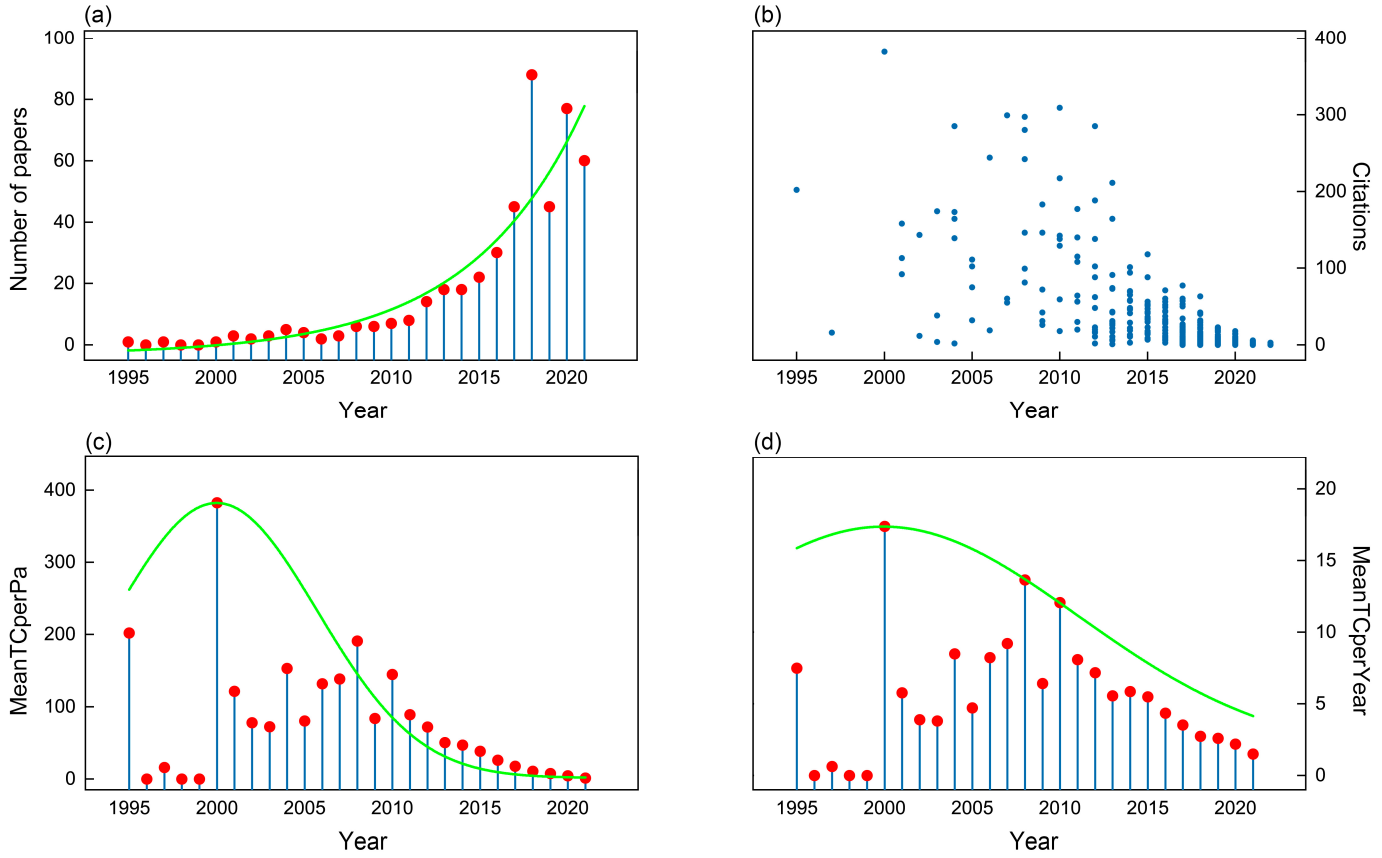

Figure 3. Contribution of community gardens research from 1995 to 2021, including (**a**) total publications, (**b**) number of citations given to each paper, (**c**) mean total citations per paper (MeanTCperPa), (**d**) mean total citations per year (MeanTCperYear). The green line indicates the trend of change.

4.2. Characteristics of CGs Publications by Countries/Regions

The number of papers published by a country in a research field and the number of citations worldwide reflect the extent of scientific research conducted in the country in that particular field [89]. We collated national publications by country according to the corresponding author's country. The results show that 47 countries contributed to the CGs literature (Figure 4a); the darker the color, the higher the number of papers. The highest number of papers was from the USA (178 papers and 6568 citations), followed by Australia (49 papers and 1135 citations), the UK (44 papers and 1009 citations), and Canada (24 papers and 1104 citations). According to the regional classification scheme of the World Bank (2022) [90], we found that the majority of studies (93.22%) were from high-income countries, 5.75% were from upper-middle-income countries, relatively few studies (1.03%) were from lower-middle-income countries, and none were from low-income countries (Figure 4b). The top 4 countries in terms of the number of articles mentioned above are all high-income countries. Brazil (12 papers and 85 citations) and South Africa (6 papers and 42 citations) are the prominent performers among the upper-middle-income countries, and Indonesia (2 papers and 23 citations) is the representative of the lower-middle-income countries.

A visual analysis of the literature database allowed us to recognize international collaborations between influential countries/regions in the CGs field. We mapped the country/region collaboration network as shown in Figure 5. If the authors of a publication are from several different countries, then connecting lines are created between them to indicate the collaborations, and the thickness of the lines directly reflects the frequency of collaborations between countries. Statistics show that 38 countries have cooperated 167 times in this field, with the USA having the broadest range of collaborators, followed by England, Germany, France, Australia, and Poland. Canada ranks fourth in terms of

the number of papers but maintains a closed structure relative to other highly productive countries. The US maintains a distinct position in this regard and has established itself as a significant contributor.

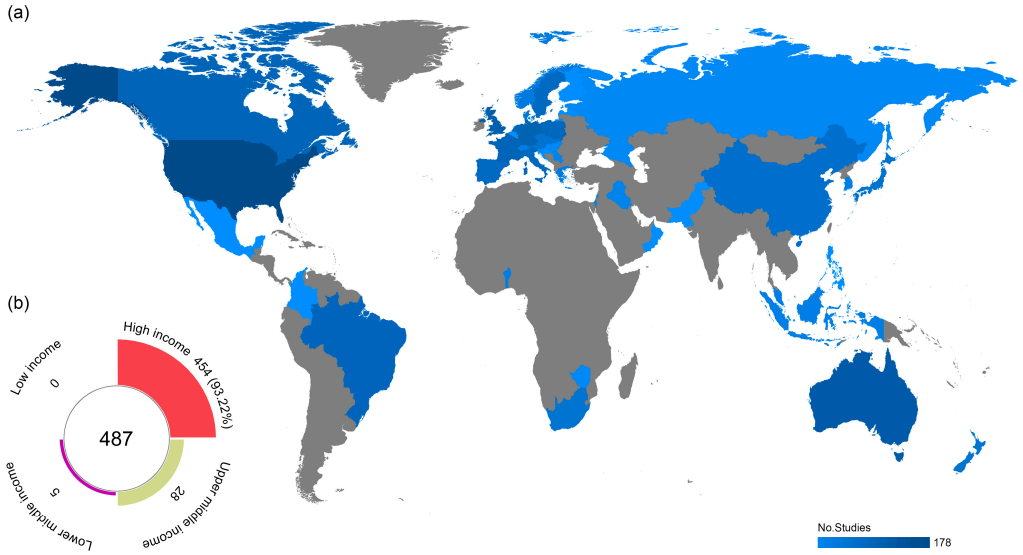

Figure 4. (**a**) Global distribution of community gardens research, (**b**) the number of publications by income groups as defined by the World Bank.

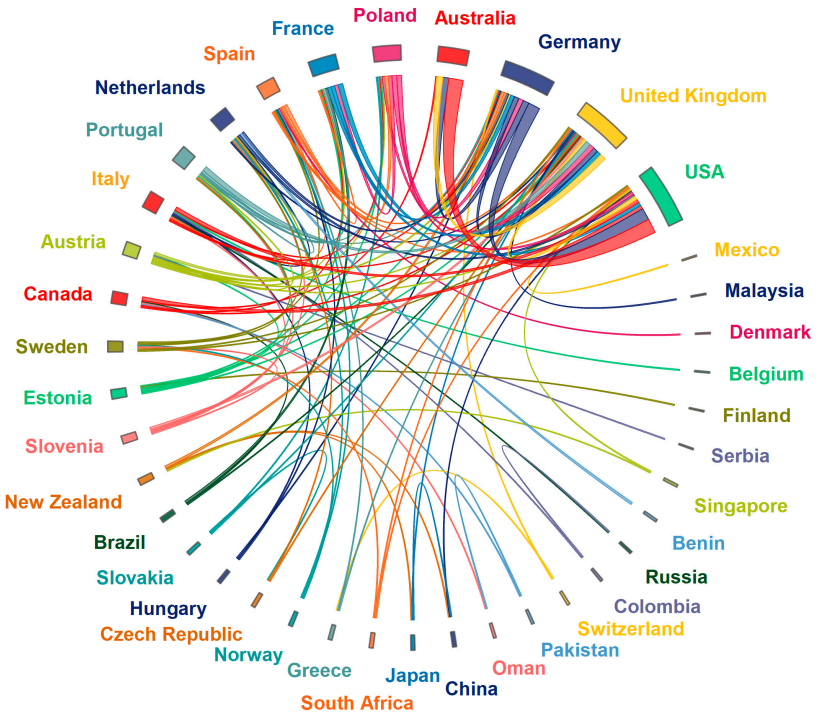

Figure 5. The country/region collaboration network.

4.3. Main Source Journals and Highly Cited Journals

A total of 487 CGs publications were published in 232 peer-reviewed journals. Scientific research on CGs can be linked to the domains of environmental studies, urban studies, ecology, health science and other fields. Simultaneously, CGs research in connection with green sustainable science technology, geography, and food science have gradually become vital. As shown in Table 4, the top five journals publishing the most CGs papers were Urban Forestry & Urban Greening (34 papers), Sustainability (30 papers), Local Environment

(21 papers), Landscape and Urban Planning (14 papers), Urban Ecosystems (13 papers). The top five journals based on global total citations were Urban Forestry & Urban Greening (912 citations), Health & Place (702 citations), Landscape and Urban Planning (601 citations), Agriculture and Human Values (544 citations), and Urban Geography (410 citations). The journal with the highest H-index is Urban Forestry & Urban Greening (14) followed by Landscape and Urban Planning (10). Figure 6 shows the top 20 Local Cited Sources from reference lists. The top five sources were Local Environment (541 citations), Landscape and Urban Planning (492 citations), Urban Forestry & Urban Greening (460 citations), Agriculture and Human Values (351 citations), and Antipode (296 citations).

Table 4. The top 20 sources about research on community gardens based on total publications (TP) from 1995 to 2022.

Rank	Sources	TP	TC	H-Index	IF
1	Urban Forestry & Urban Greening	34	912	14	5.766
2	Sustainability	30	231	9	3.889
3	Local Environment	21	240	9	3.59
4	Landscape and Urban Planning	14	601	10	8.119
5	Urban Ecosystems	13	261	8	2.686
6	Agriculture and Human Values	11	544	8	4.908
7	International Journal of Environmental Research and Public Health	10	159	5	4.614
8	Renewable Agriculture and Food Systems	7	41	6	2.915
9	Urban Geography	7	410	7	3.563
10	Urban Studies	7	216	4	4.418
11	Antipode	6	389	6	4.246
12	Geoforum	6	387	5	3.926
13	Health & Place	6	702	6	4.931
14	Journal of Community Health	5	165	4	4.371
15	Land	5	11	2	3.905
16	Social & Cultural Geography	5	56	3	2.888
17	Cities	4	100	3	6.077
18	Geographical review	4	396	4	1.592
19	Science of the Total Environment	4	59	3	10.753
20	Sustainable Cities and Society	4	58	2	10.696

Note: TP is total papers and TC is global total citations; H-index is defined as that a journal has at least H papers cited more than H times; IF is impact factor comes from 2021 Journal Citation Reports.

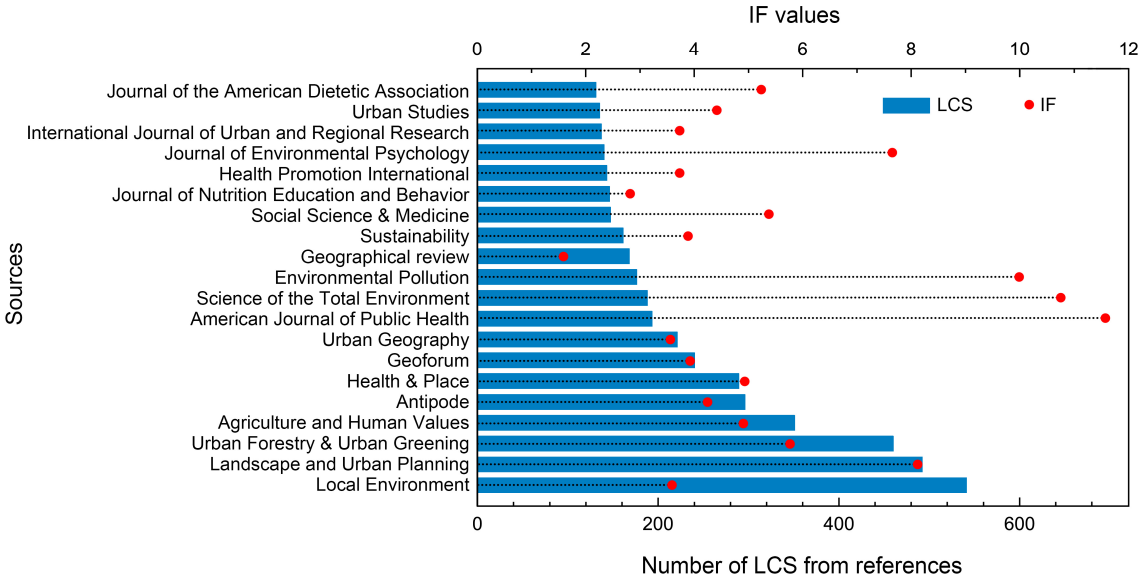

Figure 6. The top 20 local cited sources (LCS) on community gardens research from 1995 to 2022. The blue histogram represented the number of LCS (bottom X axis). IF is impact factor comes from 2021 Journal Citation Reports. The red dot was the impact factor of journals (upper X axis).

4.4. Highly Influential Authors and Cooperation of Institutions

We reviewed the authors with high global total citations. One representative author was selected if several of them belonged to the same research community, and ten representative authors are listed in Table 5. S. Barthel received the highest total citations (865 citations), total local citations (138 citations), and the highest H-index (5). His primary research included the impacts of CGs on climate change and social well-being from a socio-ecological perspective [1,91]. T.D. Glover focused on the development of social capital in CGs [92,93]. J.S. Litt studied the health and psychosocial benefits of CGs [94,95]. K. Alaimo focused on policy and environmental support for CGs to promote healthy eating and physical activity [96]. X. Armstrong examined the characteristics of CGs for community development and health promotion in New York [97]. X. Schmelzkopf focused on the land use and spatial role of CGs in urban spaces [98]. D.A. Guitart studied food diversity in school CGs [99] and the impacts of horticultural practices on the ecological vitality of CGs [100]. K.C. Matteson focused on the biodiversity of CGs [101]. Wakefield provided evidence of the health benefits of CGs [102]. M.B. Pudup assessed the impact of gardening practices on individuals and social transformation [47]. The contributions of these highly cited authors form the foundation for CGs research.

Table 5. The ten representative authors contributing to community gardens research based on global total citations (TC) from 1995 to 2022.

Rank	Author/Institution	TC	LTC	TP	H-Index
1	S. Barthel/Stockholm University	865	138	6	5
2	T.D. Glover/University of Waterloo	517	135	5	4
3	J.S. Litt/Colorado School of Public Health	431	133	4	3
4	K. Alaimo/Michigan State University	409	128	3	2
5	D. Armstrong/University at Albany	382	119	1	1
6	K. Schmelzkopf/Monmouth University	345	115	2	2
7	D.A. Guitart/Griffith University	341	125	3	3
8	K.C. Matteson/Miami University	330	2	3	3
9	S. Wakefield/University of Toronto	299	89	1	1
10	M.B. Pudup/University of California, Santa Cruz	297	74	1	1

Note: TC is global total citations; LTC is local total citations; TP is total papers; H-index is defined as that an author has at least H papers cited more than H times.

To explore the collaborative relationships between institutions, we used VOSviewer to cluster the top 20 most productive institutions (Figure 7). Each node in the figure represents one institution, with the node size representing number of CGs papers, link between the nodes representing the collaboration between institutions, and different colors of the nodes representing different clustering results. Twenty items generated seven clusters with 25 links and a total link strength of 59. The largest cluster is the green cluster represented by the University of California Santa Cruz, which includes five institutions with solid collaborative relationships and significant research interest in CGs and biodiversity [103,104], social and environmental change [105,106], and public space management [107]. The red cluster, represented by Adam Mickiewicz University, also contains five institutions that focus on the environmental and socioeconomic impacts of CGs [108,109], ecosystem services [110], and soil trace metal contamination [111,112]. The blue cluster, represented by Stockholm University contains three institutions that focus on CGs and urban environmental sustainability [113,114] and social ecology [1]. The three institutions in the yellow cluster study social capital related to CGs [115], school CGs [116], and urban green spaces [117,118]. The two research institutions in the purple cluster focus on urban agroecosystems [119] and urban spatial environments [120,121]. Griffith University and Rutgers University are in the top 20 but do not collaborate with other highly productive institutions, thus remaining in distinct clusters.

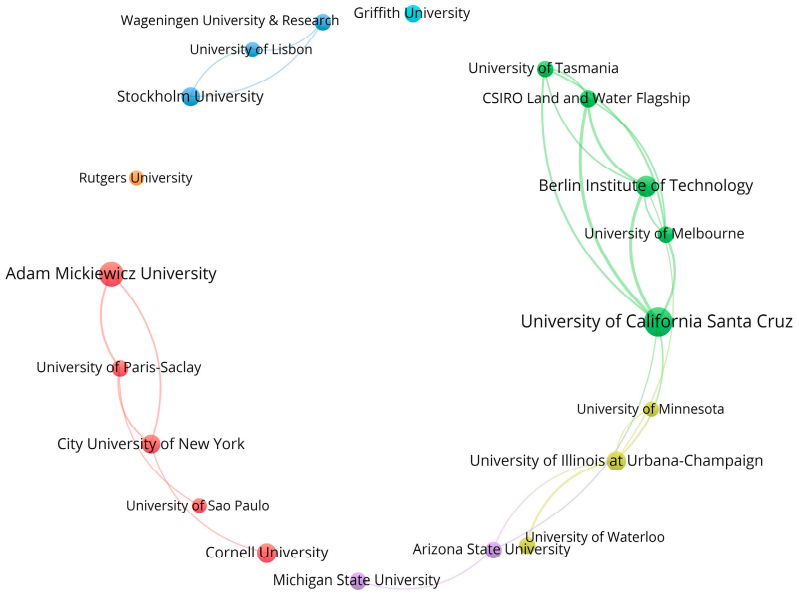

Figure 7. Collaboration network analysis of top 20 productive institutions.

4.5. Most Cited Papers

A high citation count is often considered as an indicator of a paper's impact [122], and we collated the top 20 most cited published papers on CGs based on global total citations from 1995 to 2022 (Table 6). The article "A survey of community gardens in upstate New York: Implications for health promotion and community development" by Armstrong [97] was the most frequently cited paper with 382 citations. The paper also has the highest number of local citations (118), and was published in Health & Place, dedicated to the role of place in understanding health and wellness. Armstrong interviewed 20 CG project coordinators from 63 gardens in New York City and found that the most common reasons for participating in garden activities were access to fresh food and enjoyment of nature and health benefits. Barthel et al. [1] provided an example of socio-ecological memory as a common source of community resilience in times of crisis, gaining the second-highest number of global citations. The review article "Past results and future directions in urban community gardens research" [30], published in the journal Urban Forestry & Urban Greening achieved the second-highest number of local citations and showed that most research on CGs was concentrated in the social sciences, and CG in connection with natural sciences was significantly under-explored.

Table 6. The top 20 most cited published papers on community gardens based on global total citations (TC) from 1995 to 2022.

Rank	Title	Author (Year)	TC	LTC
1	A survey of community gardens in upstate New York: Implications for health promotion and community development [97]	Armstrong, 2000	382	118
2	Social–ecological memory in urban gardens—Retaining the capacity for management of ecosystem services [1]	Barthel et al., 2010	309	43
3	Growing urban health: Community gardening in South-East Toronto [102]	Wakefield et al., 2007	299	89
4	It takes a garden: Cultivating citizen-subjects in organized garden projects [47]	Pudup, 2008	297	73
5	Past results and future directions in urban community gardens research [30]	Guitart et al., 2012	285	105
6	Culturing community development, neighborhood open space, and civic agriculture: The case of Latino community gardens in New York City [123]	Saldivar-Tanaka and Krasny, 2004	285	0
7	Fruit and Vegetable Intake among Urban Community Gardeners [96]	Alaimo et al., 2008	280	90
8	Vitamin G: effects of green space on health, well-being, and social safety [124]	Groenewegen et al., 2006	244	5

Table 6. *Cont.*

Rank	Title	Author (Year)	TC	LTC
9	Bee Richness and Abundance in New York City Urban Gardens [125]	Matteson et al., 2008	242	0
10	Review of the Nutritional Implications of Farmers' Markets and Community Gardens: A Call for Evaluation and Research Efforts [126]	McCormack et al., 2010	217	28
11	The potential of 'Urban Green Commons' in the resilience building of cities [127]	Colding and Barthel, 2013	211	26
12	Urban Community Gardens as Contested Space [128]	Schmelzkopf, 1995	202	70
13	Actually Existing Commons: Three Moments of Space of Community Gardens in New York City [129]	Eizenberg, 2012a	188	47
14	Collective efficacy in Denver, Colorado: Strengthening neighborhoods and health through community gardens [95]	Teig et al., 2009	183	60
15	Community Gardening: A Parsimonious Path to Individual, Community, and Environmental Resilience [130]	Okvat and Zautra, 2011	177	54
16	Community Gardens: Lessons Learned From California Healthy Cities and Communities [131]	Twiss et al., 2003	174	49
17	Tending Cultural Landscape and Food Citizenship in Toronto's Community Gardens [132]	Baker, 2004	173	47
18	Civic greening and environmental learning in public-access community gardens in Berlin [133]	Bendt et al., 2013	164	43
19	Leisure Spaces as Potential Sites for Interracial Interaction: Community Gardens in Urban Areas [134]	Shinew et al., 2004	164	33
20	People, Land and Sustainability: Community Gardens and the Social Dimension of Sustainable Development [135]	Ferris et al., 2001	158	49

Note: TC is global total citations, and LTC is local total citations; both are from the WoS (accessed on 25 March 2022).

Through systematic reviews, we found that the top 20 cited articles were published before 2013, with a research focus on the health benefits of CGs [124,126,131], biodiversity conservation [125], social interaction promotion [123,135], and social-ecological memory [127]. Of these 20 highly cited articles, five reported research and experience from New York, revealing that the case of New York has contributed significantly to the development of research base of CGs. Finally, we need to emphasize that the results in Table 6 are not representative of all high-quality papers and that some articles published in recent years may gain higher citations in the future as their work is recognized.

4.6. Analysis of Co-Reference Papers

Co-citations can efficiently identify the underlying structure and evolutionary trends of the knowledge domain [136]. In this study, we mapped and clustered the co-citations of CGs. The parameters were configured as follows: time slicing from 1995 to 2022, years per slice was one year, and term source included title, abstract, and author's keywords. The term type was noun phrases, node types were references, selection criteria threshold was top 50, and pruning using pathfinder for pruning sliced networks. The results are shown in the timeline visualization of the co-citation network in Figure 8, where clusters are displayed horizontally along the timeline and the relevant literature is divided into 12 clusters, with each cluster's number displayed at the end of the cluster timeline in the form of "# number word(s)". Each node in the network points to a cited article, where each edge represents a co-citation relationship between a pair of cited articles. The size of the node is proportional to the co-citation frequency. Modularity Q = 0.6633 indicates a significant knowledge structure. Mean silhouette = 0.848 indicates high reliability of the clustering results [137].

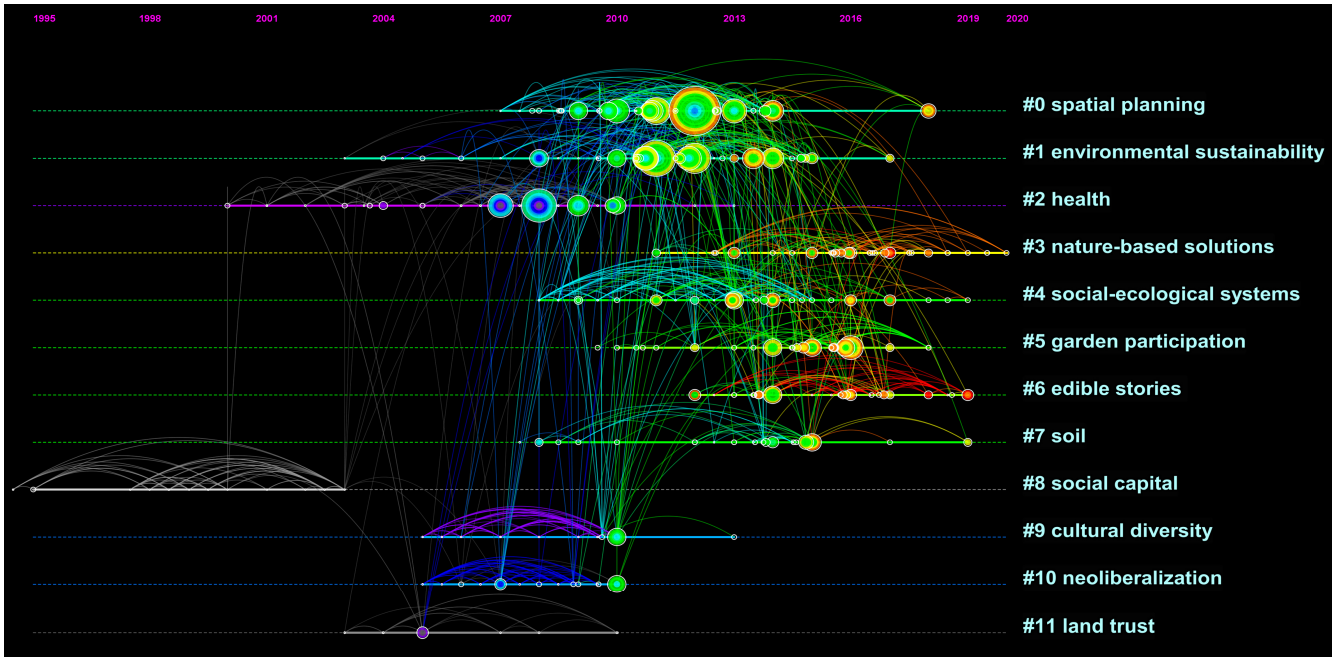

Figure 8. Timeline visualization of the co-citation clusters. The legend above the display area is marked every 3 years. Clusters are displayed horizontally along timelines and the label of each cluster is shown at the end of the cluster's timeline.

The descriptions of the 12 clusters from cluster #0 to cluster #11 are detailed in Table 7. The silhouette values for all 12 clusters ranged from 0.706 to 0.996, indicating that the clusters derived from the network were sufficiently consistent. It is worth mentioning that the cluster labels are listed by log-likelihood rate (LLR), except for cluster #3. To better illustrate the research topic, we conducted a critical review to understand the readability of the cluster labels. We found that the label of cluster #3 showed by LLR is Poland, which did not intuitively represent the meaning of the topic. Based on our critical review, Cluster #3 shows user defined cluster label: nature-based solutions.

Table 7. Co-citation clusters information.

Cluster	Size	Silhouette	Mean (Year)	Description
#0 spatial planning	39	0.706	2011	▪ Identify the space of CGs in the city and analyze its spatial function.
#1 environmental sustainability	37	0.755	2010	▪ Study how and what impact of CGs have on environmental sustainability and identify the benefits of CGs.
#2 health	36	0.918	2006	▪ Summarize the evidence for a causal relationship between CGs and health benefits.
#3 nature-based solutions	31	0.849	2016	▪ Elaborate on the effectiveness of CGs as nature-based interventions.
#4 social-ecological systems	30	0.861	2012	▪ Assess the contribution of CGs' social-ecological services to individuals, communities, and cities.
#5 garden participation	27	0.828	2014	▪ Identify the motivation, benefits, drivers, and barriers of gardeners to participate in CGs and analyze the possibility of their continuous participation.

Table 7. *Cont.*

Cluster	Size	Silhouette	Mean (Year)	Description
#6 edible stories	26	0.774	2015	▪ Characterize the association between CGs and the food system.
#7 soil	24	0.904	2013	▪ Identify potential heavy metals and organic chemical pollutants in CGs soil.
#8 social capital	18	0.962	1999	▪ Examine the extent to which CGs provide opportunities to increase social capital.
#9 cultural diversity	17	0.996	2008	▪ Focus on how people from different cultural backgrounds can collaborate in CGs.
#10 neoliberalization	16	0.955	2007	▪ Investigate the integration of CGs in the context of neoliberal urban governance.
#11 land trust	7	0.976	2005	▪ Discuss modes of community ownership and ways of protecting land use rights.

Note: TP is total papers and TC is global total citations; H-index is defined as that a journal has at least H papers cited more than H times; IF is impact factor comes from 2021 Journal Citation Reports.

Closely related scientific publications were grouped into the same cluster that corresponds to a research topic [138]. Based on the research span of each cluster in Figure 8, considering the time of the emergence, the CGs research topics were categorized into long-active research topics, short-term research topics, and emerging research topics.

4.6.1. Long-Active Research Topics

The long-active research topics first emerged early (before 2010), lasted for at least a decade, and have recently continued to receive attention. Five clusters can be considered as long-active research topics: cluster #0, spatial planning; cluster #1, environmental sustainability; cluster #2, health; cluster #4, socio-ecological systems; and cluster #7, soil. These topics are being pursued and developed steadily since their emergence.

Cluster #0: Spatial planning. This cluster represents a focus on urban green spaces. CGs may be a tool for repurposing a range of abandoned or unused irregular spaces within a city [139]. The urgent need for CGs is not only for food, but also for recycling and transforming urban spaces [50]. Previous works have covered range of practical aspects related to CGs including spatial distribution, spatial function, and levels of spatial attractiveness. For example, Spilková and Vágner [140] used government gazette data to reveal the significance of AGs in the Czech Republic through spatial analysis. The authors reported that larger cities with a pressing need for green space and areas with an industrial history had a higher density of gardens. Hake [141] drew on published empirical research to identify four models of learning spaces for CGs: home-learning, service-based gardening, shared site spaces, and contested spaces. Langegger [142] used ethnographic and archival methods to describe how CGs public spaces emerged on private property and became collaborative spaces between community residents. Morckel [143] used photo-random sampling scoring to measure the perceived attractiveness of CGs and open spaces in Columbus in each season. The findings showed that CGs were more attractive than open spaces and that the level of perceived attractiveness varied by season. However, CGs need more than just space. As an ongoing effort, gardening needs space and continuous interest of people. The acceptability of community gardening, its integration into land use planning, and the level of collaboration between stakeholders all play a role in its success [76].

Cluster #1: Environmental sustainability. The environmental sustainability of CGs is manifested in a range of ways including urban biodiversity, climate change, air quality, water systems, carbon sequestration, and ecosystem services such as habitat and soil microbial environments. For example, the native plant composition of garden landscapes regulates the foraging patterns of bumblebees [144] and CGs reduce stormwater runoff from impermeable urban surfaces [26]. Soil compaction analysis found that urban gardening can improve

soil physical properties and optimize water infiltration [145]. Carbon storage estimates in allotments across the UK showed that allotments hold little carbon storage, and that urban gardening can protect or enhance the ecosystem services of soils [146]. Vegetation in gardens reduces the environmental temperature [130]. Allotment gardens in Germany were found to be cooler at night than the urban built environment providing a climate regulation system for night-time temperatures [147]. The production of compost from food scraps in gardens reduces greenhouse gas emissions during disposal [148]. Furthermore, CGs also benefit the environment in other ways, such as through environmental education [149].

Cluster #2: Health. Research has focused on improving access to nutrition, physical activity, physical health, and mental health through CGs. Qualitative and inductive analysis showed gardeners to form emotional connections to the garden by directly experiencing nature through growing food, supporting positive health-related behaviors, and overall well-being [94]. A cross-sectional randomized telephone survey by Alaimo et al. [96] reported higher fruit and vegetable intake among urban adults from family participation in CGs. Community gardeners were also reported to have a significantly lower body mass index than that of their neighbors not involved in CGs and were less likely to be overweight or obese [150]. CGs dedicated to specific populations can also have health benefits; for example, Guitart et al. [99] found through an on-site survey of school administrators the potential health benefits from the agricultural diversity of school CGs providing healthy vegetables and fruits for children. In addition, CGs can help in stress release [151]; can be a tool for health promotion to adapt to the complexities of a new life and cope with past trauma; and can help refugee gardeners with better physical and emotional benefits by acting as healing spaces for depression or anxiety [152].

Cluster #4: Socio-ecological systems. First at the micro level, Mmako [153] studied the tenants in a social housing development in Melbourne and observed that CGs offer a supportive physical and social environment, which is crucial for socially isolated individuals in social housing complexes. Litt et al. [154] used a multilevel statistical model to evaluate data from a demographic survey of Denver residents to reveal neighborhood processes that influence food-related behaviors, noting that CGs can bridge the gap between people and food production location. Second, at the meso level, a hands-on CGs initiative from Shanghai confirmed its positive impact on the environmental health of communities and community building [155]. CGs build social relationships between participants leading to their better health and well-being [156]. Finally, at the macro level, Chan et al. [157] conducted exploratory and in-depth interviews and archival research observing five CGs in the post-sandy period, revealing the role of CGs in the "red zones" of coastal New York City as a multipurpose community sanctuary and the development of supportive communities. A case study of Lincoln City shows that CGs can act as socio-ecological refuge to foster resilience and promote community food security by preserving and disseminating adaptive cultural and ecological memories, skills, and resources related to growing food and managing the local urban environment [158].

Cluster #7: Soil. Soils in CGs are often subjected to potential health risks caused by heavy metals and organic chemical contaminants [80]. The literature from this cluster provides a comprehensive assessment of the levels of contaminants in CGs soils and crops. Amato-Lourenco et al. [159] conducted soil particle size analysis by sedimentation and showed that traffic emissions were the primary source of polycyclic aromatic hydrocarbons in the soil. Laidlaw et al. [160] reported that 8% of CGs in Melbourne, Australia had a soil Pb levels higher than Australian standards. In most cases, trace element contamination can be explained by the historical and environmental conditions of the site [161]. Ways to reduce Pb exposure in urban CGs include planting of vegetables with lower Pb content and covering non-bed soils with high Pb content accessible to young children [162]. Improved plot-specific soil management and measurement is a potential solution for maintaining soil moisture and reducing water use under changing climatic conditions [163].

4.6.2. Emerging Research Topics

Three research topics are emerging and have received more attention in recent years, with explosive growth in the related literature: cluster #3, nature-based solutions; cluster #5, garden participation; and cluster #6, edible stories. The mean years of publication of the cited articles in the three clusters were 2016, 2014, and 2015, respectively.

Cluster #3: Nature-based solutions. Nature-based interventions have been reported to be often more effective than other interventions in addressing climate impacts [164]. This cluster focused on the evaluation of CGs as nature-based interventions. Sowińska-Świerkosz et al. [165] while analyzing the potential of AGs as nature-based solutions in Poland found that AGs along with other long-established urban green/blue infrastructure may be considered as a simple NBS with limited effectiveness. According to Maćkiewicz and Asuero [166], who examined the environmental and socio-economic effects of different forms of joint-stock company ownership of AGs, both public and private allotments are nature-based solutions that have a positive influence on their users' health and well-being. The role of both types of AGs in mitigating adverse climatic conditions should be enhanced and further developed. Van der Jagt et al. [167] analyzed six CGs in five European countries from a garden governance perspective, verifying that public urban gardens act as nature-based solutions that contribute to social resilience. However, it is worth noting that only a few studies have assessed social and ecological consequences in an integrated manner and have compared the cost-effectiveness of different interventions.

Cluster #5: Garden participation. This cluster explains the functional, emotional, and conditional factors that influence gardeners' participation in CGs. The main functional motivations are access to food, organic farming, leisure, recreation, maintaining physical and mental health, enhancing social interactions, and education [168]. Among the broad motivations for urban gardening in Europe, there is an increasing emphasis on active recreation, contact with nature, and high-quality food supplies [169]. Teuber et al. [170] found that recreation was an essential driver of AGs, while food production was less important in two German allotments. According to Jordi-Sánchez and Díaz-Aguilar [171] CGs are complex practices with multiple mixed meanings, with predominant reason being enjoyment of leisure time. Emotional motivation is mainly reflected in place attachment. In New York, Petrovic et al. [172] observed that gardeners have strong attachments to their gardens regardless of the harvest and place attachment is positively correlated with gardeners knowing other gardeners. The conditional factors are mainly the time demand for gardening activities, accessibility of the garden and gardening experience [173]. Gardeners' engagement behavior is influenced by functional, emotional and conditional factors and cannot be viewed in isolation, but rather interact with each other. An increased gardening experience enhances the impact of affective motivation on garden participation [174]. Overall, participants' motivations vary across national and social contexts. As Kingsley et al. [8] stated, motivations for participation in CGs are diverse and span a range of ancestral, social, environmental, and political domains. In addition, the benefits, drivers, and barriers of CGs directly affect the participation of gardeners and the perception and support of non-gardeners to CGs [74].

Cluster #6: Edible stories. Growing vegetables and eating harvests are essential components of CGs [175]. Wang et al. [176] reported that CGs mitigate food deserts in Edmonton, Canada. Sovová and Veen [177] discovered that CGs gardeners in the Netherlands and the Czech Republic were keen to know how their food was produced and transparency in the food production process was one reason why home-grown food was deemed better than store-bought foods. Community gardeners participate in gardening activities that increase the consumption of vegetables and fruits [178]. Gardener takes a new interest in growing fresh food and sharing produce and recipes [179]. In addition, CGs can make university students aware of the benefits of using local food [180]. The story in the CGs is an edible one about food preparation, emotional connection, socialization, and sense of belonging [181].

4.6.3. Short-Term Research Topics

Short-term research topics first appeared early (before 2005), lasted for less than a decade and have not been of major interest in recent years. Four topics can be considered short-term research topics: cluster #8, social capital; cluster #9, cultural diversity; cluster #10, neoliberalization; and cluster #11, land trust.

Cluster #8: Social capital. The by-product of CGs as social space is social capital [71]. The recreational nature of CGs is essential for building strong relationships and is a common source of social capital that can act as a social lubricant for social capital production [115]. However, social capital among CGs group members can be both a benefit and cost, depending on where garden participants are located in the social network [92].

Cluster #9: Cultural diversity. Through a qualitative study of international students' learning experiences in CGs on university campuses, Shan and Walter [182] demonstrated a mixed knowledge production that promotes understanding, connection, and interculturality. Shinew et al. [134] confirmed, through empirical research, that CGs are an effective source of bringing together ethnically diverse groups.

Cluster #10: Neoliberalization. In neoliberal urban restructuring, CGs are seen as mobilizing inclusive socio-political arrangements to counter the harmful effects of urban problems [183]. Grassroots urban CGs act as civic spaces that compete with and reinforce local neoliberal policies [184]. However, it has also been argued that CGs are more conducive to resisting neoliberalism in terms of spatial use values, spatial equity, and food justice [185].

Cluster #11: Land trust. This is relevant for the long-term sustainability of the CGs itself to become a permanent and valuable space in the city. In New York City, Eizenberg [186] found that land trusts emphasize community ownership models and aim to respond to the marketization of public spaces by privatizing land for CGs. Whether CGs are an opportunity for a new primary industry under low economic opportunities, or simply a transitional land use has been a hot topic of research debate [187], and the municipal government is concerned that maintenance of the garden is not guaranteed if the purchase of the land is approved [128].

4.7. Keywords' Evolution and Co-Occurrence

Keyword analysis was conducted to gain an overview of preferred and emerging trends in a set of publications. In this study, we detected 1316 author's keywords and 872 keywords plus, which are two types of keywords proposed by WOS for the researcher. The author's keywords consist of terms that the authors believe best represent the content of the paper. Keywords plus are automatically generated by the WOS database and do not necessarily appear in the article's title or author's keywords. Both types of keywords are essential parts of academic publications. Since keywords plus capture an article's content more broadly and diversely than the author's keywords [188], we examined the top 50 keywords plus. It is to be noted that we standardized keywords plus based on three criteria before conducting the evolution and co-occurrence check: (1) the singular and plural of countable nouns were merged; for example, "community garden" into "community gardens," "pollinator" into "pollinators"; (2) abbreviations and extensions of proper nouns "GIS" merged into "geographic information system"; and (3) The merging of words with the same concept and attributes, e.g., "soil pollution" into "soil contamination", "COVID-19 pandemic" into "COVID-19", "agro-biodiversity" into "agrobiodiversity" to improve the accuracy of the results.

Given the above analysis, we used CiteSpace to produce a time zone view of the top 50 keywords plus (Figure 9) to explore the evolution of the keywords. Each circle in the figure represents a keyword, and the size of the circle represents the frequency of the occurrence of the keyword. Connecting lines indicate that two keywords appear in one or more papers. The year shown is when it was first concentrated in this dataset. We found six high-frequency keywords that appeared before 2011: "health", "new york", "impact", "environment", "physical activity", and "people". This represents the early stages of research on CGs, which have focused on their impact on the environment. There

is a history of research on CGs in New York City. There is growing awareness of the health benefits of CGs. Most of the high-frequency keywords in the literature dataset were first concentrated in studies between 2012 and 2016, with the most prominent ones being "community garden", "agriculture", "benefits", "space", "food", "ecosystem services", "governance", "sustainability", "biodiversity". A large number of keywords emerged during this period, and the research content was diversified and differentiated. The main high-frequency keywords appearing in 2017 were significantly fewer than before including primarily "urban agriculture", "resilience", "experience", and "motivation". In addition, we should also pay particular attention to nodes that have appeared recently and with high frequency such as "ecosystem services" and "benefit", indicating that these keywords have gained much attention in a brief period.

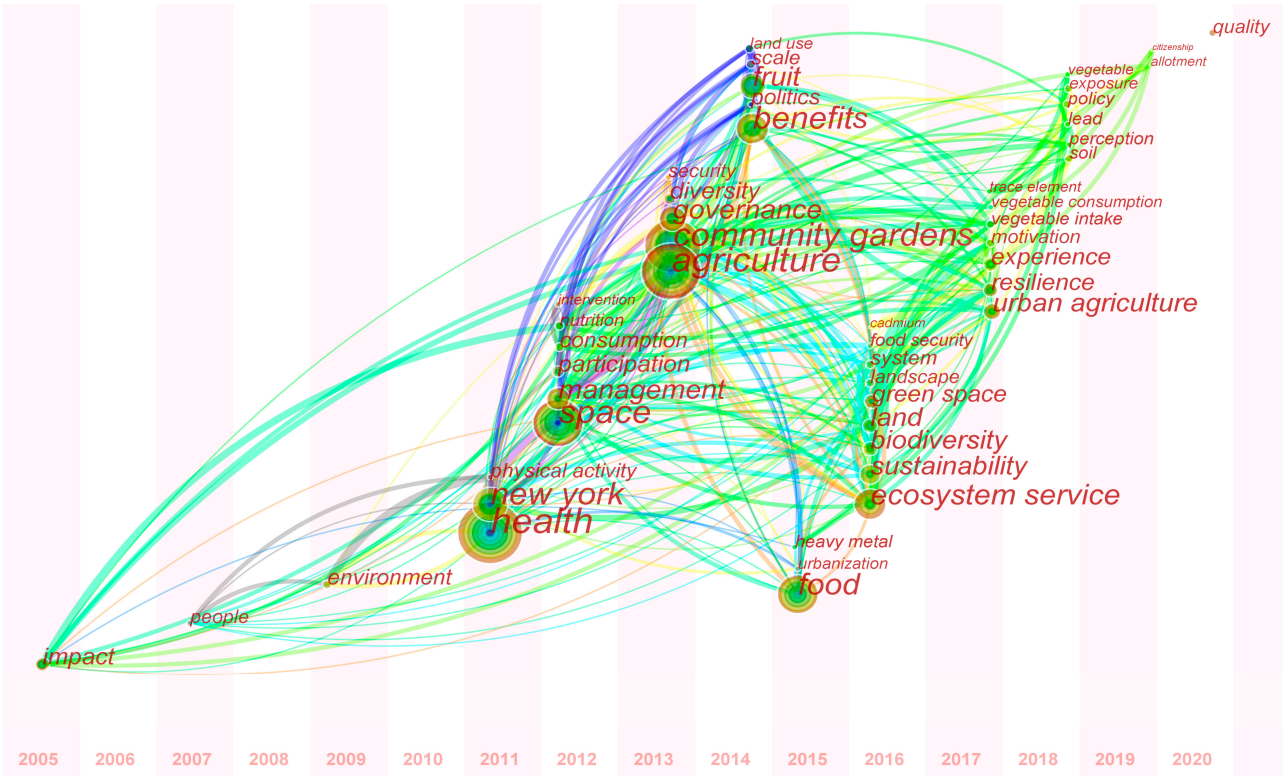

Figure 9. Top 50 keywords plus time-zone visualization of community gardens publications. The time-zone view consists of an array of vertical strips as time zones, which emphasizes the temporal relationships. The horizontal movement of an item is restricted to its own time zone, but its vertical movement is completely determined by its connections to items in other time zones.

To examine the relationship between the cognitive structure of the study and the main themes, we used VOSviewer software to clearly describe the co-occurrence network of the top 50 keywords plus (Figure 10). This shows that (1) the size of each keyword node indicates the frequency of the word in this database, (2) the larger nodes near the center represent the important nodes in the relationship network; the more links the nodes have, the closer the relationship between the keywords, e.g. "health", " agriculture" and "community gardens" have significantly larger nodes than the other keywords and have higher values based on the link strength calculated by the software, and (3) the keywords near the outer edge represent relatively small research areas such as "politics", "trace-elements", "vegetable consumption", and "perceptions". Each cluster represents co-occurring keywords with common attributes, indicating that these words often co-occur. In the co-occurrence network, keywords were clustered into four clusters. The red, green, blue and yellow clusters focus on studies about ecosystem services of CGs, benefits of CGs

as interventions, long-term sustainability of CGs, and heavy metal contamination in CGs soils, respectively.

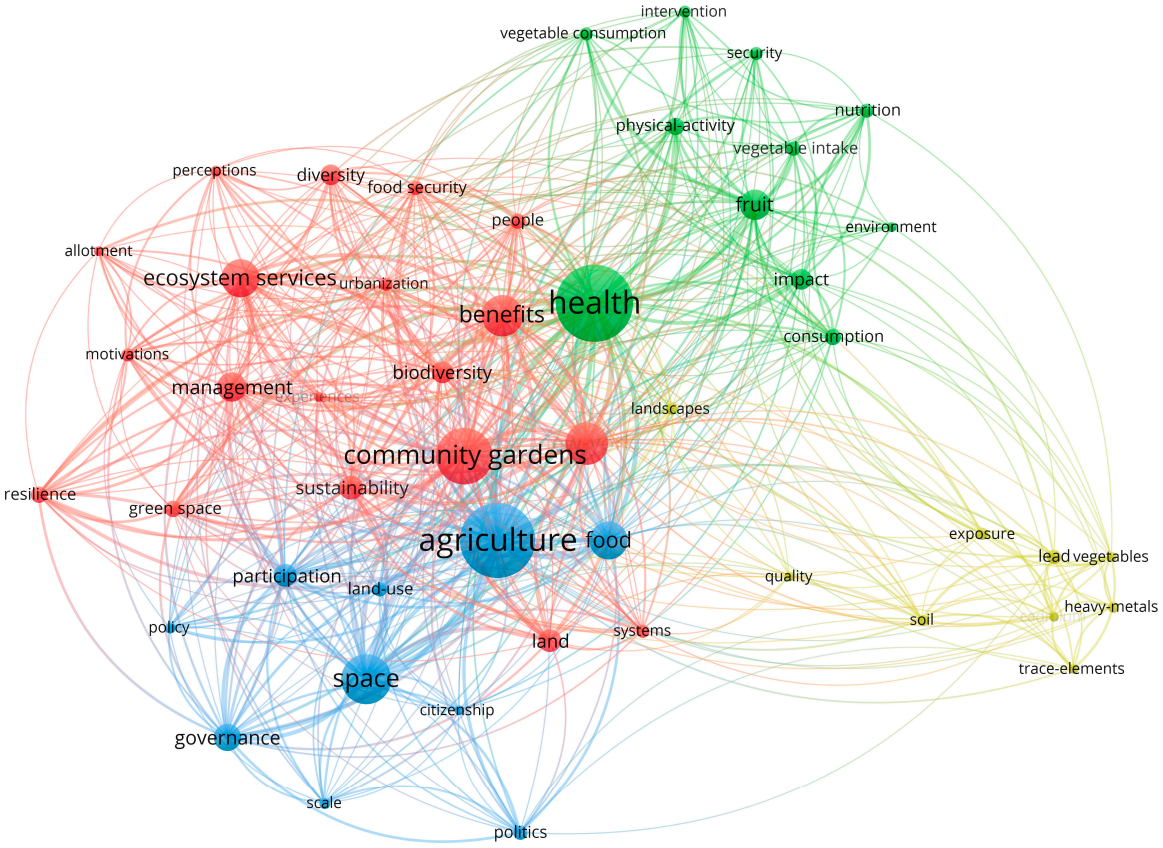

Figure 10. The co-occurrence network for top 50 keywords plus.

5. Discussion

Community gardens have been studied for almost 30 years; this study is an extension of the current classic review of CGs. To the best of our knowledge, this is the first scientific bibliometric analysis of CGs. We aimed to clarify the extent of available research literature, present current critical topics, and shed further light on the themes that have developed in the field of CGs and potential future research directions. In addition, we have discussed the limitations of this study.

5.1. What Is the Extent of Available Research Literature on CGs?

Based on our scientific background analysis, a loose definition also poses many limitations while allowing for broader research and practice. The lack of a refined definition makes it difficult to identify the theoretical underpinnings of CGs research, which affects the establishment of a research framework and leads to a lack of complete theoretical guidance. It is difficult to determine which methods are suitable for CGs based on the study's objectives. We believe that the definition of community garden needs to be gradually refined at the current research stage.

Scientometric analysis shows an upward trend in the number of publications on CGs, especially since 2012. However, scientific production of CGs is still slower to develop than in related research areas, such as urban agriculture [189]. Scientific production in high-income countries accounts for a large proportion (93.22%), which may limit the universality of research results. Many non-high-income countries are accelerating their urbanization [190], and rapid urbanization will inevitably bring new challenges to food security [191]. In the future, these countries/regions with different levels of economic development will also provide broad practice space for the development of CGs. Therefore, there is a need to

strengthen research in non-high-income countries. Based on the collaboration analysis, we found that the intensity of cooperation between countries is still not high. It is recommended that the scope of international partnerships should be actively expanded in future research.

According to the analysis of journal papers, the research fields mainly include environmental studies, urban studies, ecology, and health science. The knowledge base of CGs shows signs of diversification. As McGuire [192] argues, gardens are inclusive, non-judgmental social spaces, so the diversity of the knowledge base is not surprising. In our study, 232 journals have published papers on CGs, suggesting that the field has the potential to reach a wide variety of scientific groups and practitioners.

5.2. What Are Current Critical Topics in CGs Research?

Research topics are generally focused on issues that need to be solved quickly. Co-reference analysis identified 12 research topics, which were grouped into three main categories according to their emergence and duration as hotspots. Spatial planning, environmental sustainability, health, social-ecological systems, and soils have been long-active research topics. Nature-based solutions, garden participation, and edible stories are relatively emerging research topics. Social capital, cultural diversity, neoliberalization, and land trust are short-term research topics.

Systematic reviews of these topics suggest that the short-term research topics identified in this study are primarily concerned with in-depth studies of single elements. However, as urban green infrastructure, CGs are often not limited to the role played by a single element of the garden. Long-active and emerging research topics emphasize systematic research, transcending the limitations of single elements and small-scale areas to carry out large-scale, multi-element, and multi-domain integrated research. In general, long-active and emerging research topics are critical for current research, and multi-coupled research is the trend and direction.

5.3. What Are Research Themes in CGs and Future Research Needs?

Keywords can be a windfall for understanding the research theme. By analyzing, reviewing, and summarizing the findings of our research and based on the cluster analysis in Figures 8 and 10, we identified three themes in the field of CGs: ecosystem services and disservices, multifunctional association, and sustainable garden system (Figure 11). The findings of the co-reference clusters also correspond to these three key themes. First, #1 environmental sustainability, #4 socio-ecological systems, #7 soil, and #3 nature-based solutions correspond to the theme of ecosystem services and disservices. Second, #2 health, #6 edible stories, #8 social capital, and #9 cultural diversity correspond to the multifunctional association theme. Third, #0 Spatial Planning, #5 garden participation, #10 neoliberalization, and #11 land trust corresponds to the theme of sustainable garden system. Interestingly, each theme contained both long-active and emerging research topics revealing continuity in the development of the themes. It is to be noted that the keywords shown in Figure 10 are only a part of the top 50 keywords plus and the terms such as "community garden", "allotment", "agriculture", "people" that do not directly reflect the focus or direction of the research have been removed. The following section discusses the three themes in detail.

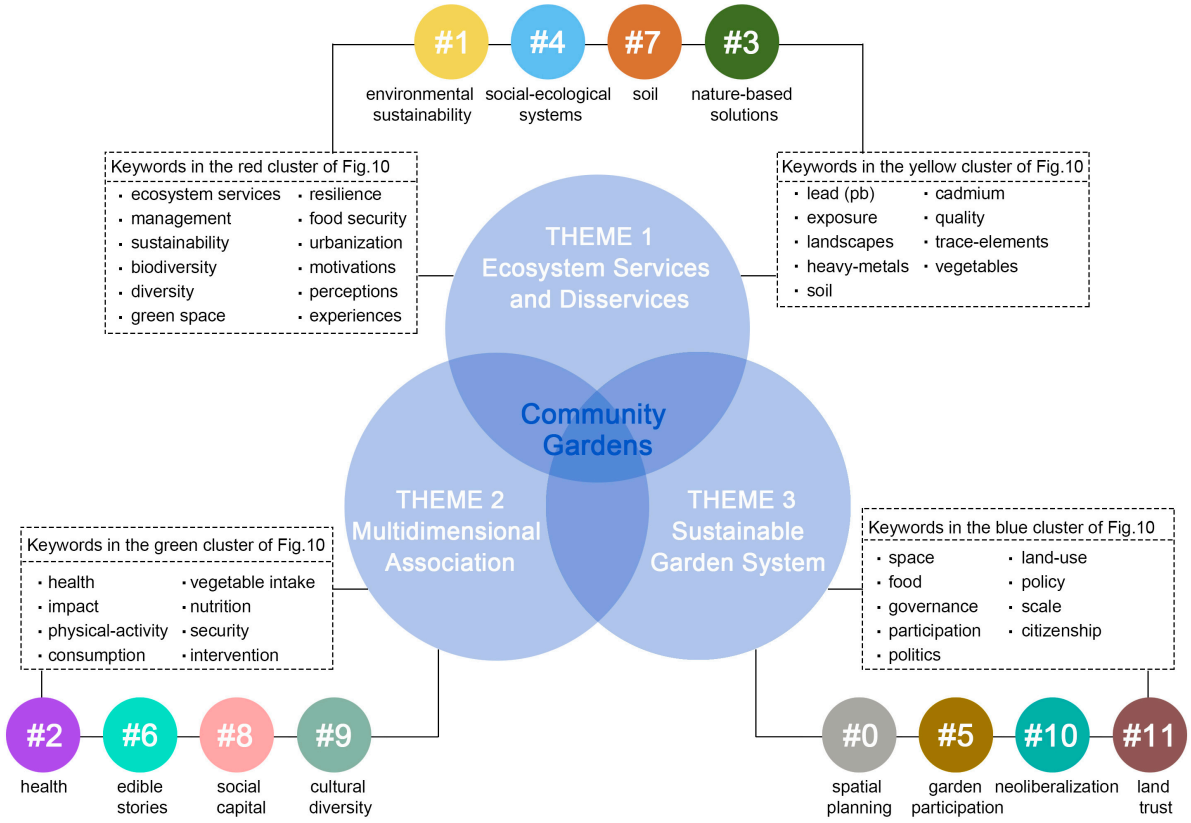

Figure 11. Three themes of urban community gardens: "# number word (s)" represents the cluster in Figure 8, and the cluster's label is marked directly below.

5.3.1. Theme 1: Ecosystem Services and Disservices

The theme emphasizes the relationship between CGs and ecosystems and their impact on natural resource management. Most of the literature assesses one or more ecosystem services such as food supply, stormwater runoff [193], biodiversity, and pollination. Camps-Calvet et al. [194] introduced ecosystem services in the CGs field using the ecosystem services framework to assess the contribution of CGs and AGs to gardeners in Barcelona, identifying 20 ecosystem services. Menconi et al. [25] conducted a differentiated assessment of the 32 ecosystem services provided by CGs. Research on the economic valuation of CGs has also been conducted. In addition to assessing the economic value of horticultural production [195,196], Albaladejo-García et al. [197] assessed the economic value of AGs to urban spaces based on the role of citizen preferences in spatial planning. Caneva et al. [198] proposed initial indicators of ecosystem services for urban community gardening. However, the type of garden [199–201] and the operational management model [202] influence ecosystem value, and a developing a framework for valuing CGs ecosystems can be a future research focus.

Ecosystem disservices in CGs are mainly linked to soil ecosystems, most notably the relationship between soil quality and potential contamination of vegetables [111,113,203] and soil exposure to heavy metals [204–207]. Soil ecosystems have attracted attention at the national/regional level, with Australia launching a national community science initiative "Vegesafe" which characterizes CGs soils and records soil metal data [208]. New York City created a clean soil bank program [209,210]. Efforts from more regions are necessary to support such initiatives or schemes to conduct soil testing and establish a region-wide CGs soil monitoring database.

Scientists have long worked to find solutions for managing soil quality. Le Guern et al. [211] applied combined system of non-accumulative cropping vegetables and metal-accumulating crops on contaminated soil and found that nature-based

solutions can be applied to a wide range of contaminated soil management. However, only a few studies have considered the cost-effectiveness of nature-based solutions, and this aspect should be strengthened in subsequent studies.

5.3.2. Theme 2: Multidimensional Association

CGs form a multidimensional network of environmental and social elements that contribute to human well-being. CGs may be seen as an innovative urban strategy to promote public health in cities, promoting well-being in terms of mental, social, and physical health [30]. They provide a learning environment for different groups, including those who experience social inequalities [212]. The role of CGs as interventions or governance arrangements in extreme storms [213,214] or earthquakes [215] recovery is also widely known such as stress reduction, sharing experiences, and gaining community support.

The COVID-19 pandemic has plunged the world into a new form of crisis, and as of March 25, 2022, eight studies linking COVID-19 and CGs have been included in the WOS Core Database. These studies discuss the specific impact of COVID-19 on CGs [119,216,217], CGs responding to food insecurity [218,219], changing CGs operations during crises [220], and CGs fostering emotional well-being in times of crises [221]. The concept of CGs was also expanded during this public health crisis, with Music et al. [222] proposing 'Pandemic Victory Gardens' as a means of resisting COVID-19 through citizen empowerment and encouraging its promotion through social media. The disastrous blockade phenomenon caused by COVID-19 has impacted the food supply chain, and we believe that the most significant food crisis was not a question of supply capacity, but affordability during the blockade. Gardening in the community through citizen empowerment can enhance access to food and sharing produce with neighbors can provide both social capital and emotional support during crises. However, people's access to information is also limited in times of crises. There is a need to investigate how CGs systems can be integrated into smart cities using information technology to make it more useful during such time.

5.3.3. Theme 3: Sustainable Garden System

Despite their role in the greenspace system [223], CGs have always faced sustainability challenges. Urban CGs spaces are part of urban politics, publicized through the devolution of public mandates and the enactment of uncertainty [224]. Vague responsibilities, lack of leadership, and unclear expectations of outcomes hinder the sustainability of gardens [225]. However, as research on CGs intensifies, there is a growing body of literature dedicated to sustainable garden systems.

In terms of spatial planning, scientific site selection strategies have been developed. Sonneveld et al. [226] developed a site selection tool for AGs based on soils, land use, groundwater depth, proximity to markets, and women's safety. Smith et al. [26] developed a site index incorporating physical and sociodemographic factors for the strategic siting of CGs. In terms of residents' participation, there is more than just investigations of motivation. Oh et al. [227] found that economic factors influence residents' continued participation and the higher the Engel coefficient, the longer the participation. In addition to participants as gardeners, input from gardening coordinators and volunteers also supports edible initiatives [228]. In terms of land use, CGs and AGs can improve well-being and support local governments in ensuring continued access to land [229]. Land-use rights are a specific need for CGs [140], and long-term sustainability requires resources and investment from municipal institutions [230]. Sustainability of CGs depends on administrative support [231].

In our study, water use and management were observed as challenges to be addressed for CGs sustainability. Though limited water resources, extreme droughts, or high temperatures can directly affect growth of agricultural products in CGs, water use is given a secondary consideration in most allotments [232]. In this regard, gardeners' experiences can help to sustainably manage water and adapt to drought conditions [233] and water tanks, and other water schemes can trigger water use awareness among gardeners [234]. Soil management is a potential solution for retaining soil moisture and water use [163].

However, research on water management in CGs has been limited to water conservation techniques and has not received sufficient attention from local governments. We recommend consideration of water management in regulatory framework for CGs.

Overall, the three themes we have summarized are interlinked and mutually reinforcing. The ability of urban CGs to enhance ecosystem services and social connections depends on the availability of sustainable places [235].

6. Conclusions

6.1. Summary

We conducted a bibliometric analysis of 487 papers from the WOS database on CGs. Scientific mapping techniques such as collaborative, co-citation, and keyword co-occurrence analysis have been used. The main findings were as follows. First, CGs have attracted an increasing amount of attention from researchers. Second, the number of publications is unevenly distributed, with most research concentrated in high-income countries. Weak collaborative relationships were observed between Asia and other countries. Third, we analyzed the performance of the source journals. Fourth, a systematic review of the literature represented by highly cited authors and highly productive institutions reveals a clear multidirectional branch of research in the field. Fifth, an analysis of the top 20 most cited papers indicates their prime focus on health benefits, ecosystem services, and social capital. The New York case study received a high level of attention. Sixth, co-reference analysis identified five long-active topics, three emerging topics, and four short-term topics. Seventh, four clusters were generated for the top 50 keywords plus: ecosystem services, benefits as an intervention, sustainability of gardens, and soil pollution. Finally, based on the results of the bibliometric analysis, a systematic review of the literature was conducted to discuss three main research themes in the field of CGs: "ecosystem services and disservices", "multidimensional associations", and "sustainable garden systems". The aim of this study is to provide a meaningful reference for urban green planners and policymakers.

6.2. Limitations

This study has its limitations. First, we extracted data from the WOS database for English publications only; in the future, other databases such as Scopus could be used in combination to enhance the robustness of the bibliometric review. Full consideration should also be given to investigating regionally-focused community garden studies to analyze research outputs recorded in local and regional languages. Second, we used a comprehensive search strategy in the first stage of data extraction and developed our dataset through second stage of manual screening. However, as CGs do not have a uniform definition and involve a multidisciplinary scope, our search strategy may not have covered all papers in the scientific literature. Nonetheless, our search strategy involved generation of data by various combinations, effectively reducing the uncertainty of missing important and relevant studies. Again, only peer-reviewed articles and reviews were considered, and inclusion of evaluation reports or indicator frameworks from urban planning departments or relevant agencies may have some influence in this regard. In the future, a database will be developed to archive the details of these documents, which will facilitate a more comprehensive study of relevant policies or actions. Finally, there are inherent weaknesses in bibliometric analysis, such as the inability of the assessment to consider the fact that citations take time to accumulate and that open-access publications may have a citation advantage. Innovative work that has not yet received a high citation frequency in recent years requires an in-depth systematic review of the content to provide a qualitative explanation. Despite these limitations, we considered combining quantitative bibliometric analysis with qualitative analysis of systematic reviews. We believe that we present a global view of CGs research over the past three decades and promote a comprehensive understanding of it among researchers.

6.3. Prospects for Future Research

CGs research is still in the exploratory stage, and it is still enriching from the existing practices of different social traditions and geographical environments. Urban green planners need to focus on the following research perspectives: (1) Future research in CGs appears to be highly sustainable, with a focus on ecological and social benefits that are likely to be further enhanced. There is a need to develop an ecosystem valuation framework for quantifying the value of CGs. (2) CGs are not necessarily an ecosystem-friendly intervention, and soil samples from CGs should be analyzed, and a soil-testing database should be established. (3) Nature-based solutions have become an emerging topic in CGs, and research on their cost-effectiveness would provide more significant support for their implementation. (4) Information technology tools may be useful to enhance food affordability in CGs. The integration of CGs into smart cities can enhance crisis-response (5) Water management has become a hot topic internationally in the field of CGs. The integration of water management into the regulatory framework of CGs is an essential guide for regulating water use in gardens.

Many empirical studies on CG have been conducted at different regional scales. However, the interpretation and understanding of CGs may vary from place to place and is often negotiated within the local context of a particular site. Urban green planners need to develop site-specific empirical measures and develop flexible research methods. Finally, one potential solution to strengthen regional collaboration and to build international cooperation is to organize an international scientific conference (or to build an international CG consortium) dedicated to the study and practice of CG.

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References

1. Barthel, S.; Folke, C.; Colding, J. Social–ecological memory in urban gardens—Retaining the capacity for management of ecosystem services. *Glob. Environ. Change* **2010**, *20*, 255–265. [CrossRef]
2. Hardman, M.; Chipungu, L.; Magidimisha, H.; Larkham, P.J.; Scott, A.J.; Armitage, R.P. Guerrilla gardening and green activism: Rethinking the informal urban growing movement. *Landsc. Urban Plan.* **2018**, *170*, 6–14. [CrossRef]
3. Paltseva, A.A.; Cheng, Z.; Egendorf, S.P.; Groffman, P.M. Remediation of an urban garden with elevated levels of soil contamination. *Sci. Total Environ.* **2020**, *722*, 137965. [CrossRef]
4. Zhu, J.; He, B.-J.; Tang, W.; Thompson, S. Community blemish or new dawn for the public realm? Governance challenges for self-claimed gardens in urban China. *Cities* **2020**, *102*, 102750. [CrossRef]
5. Langemeyer, J.; Madrid-Lopez, C.; Beltran, A.M.; Mendez, G.V. Urban agriculture—A necessary pathway towards urban resilience and global sustainability? *Landsc. Urban Plan.* **2021**, *210*, 104055. [CrossRef]
6. Stocker, L.; Barnett, K. The significance and praxis of community-based sustainability projects: Community gardens in western Australia. *Local Environ.* **1998**, *3*, 179–189. [CrossRef]
7. Marsh, P.; Gartrell, G.; Egg, G.; Nolan, A.; Cross, M. End-of-life care in a community garden: Findings from a participatory action research project in regional Australia. *Health Place.* **2017**, *45*, 110–116. [CrossRef]

8. Kingsley, J.; Foenander, E.; Bailey, A. "You feel like you're part of something bigger": Exploring motivations for community garden participation in Melbourne, Australia. *BMC Public Health* **2019**, *19*, 745. [CrossRef]
9. Huang, Y.; Aguilar, F.; Yang, J.; Qin, Y.; Wen, Y. Predicting citizens' participatory behavior in urban green space governance: Application of the extended theory of planned behavior. *Urban For. Urban Green.* **2021**, *61*, 127110. [CrossRef]
10. Kingsley, J.; Townsend, M. 'Dig in' to social capital: Community gardens as mechanisms for growing urban social connectedness. *Urban Policy Res.* **2006**, *24*, 525–537. [CrossRef]
11. Comstock, N.; Dickinson, L.M.; Marshall, J.A.; Soobader, M.-J.; Turbin, M.S.; Buchenau, M.; Litt, J.S. Neighborhood attachment and its correlates: Exploring neighborhood conditions, collective efficacy, and gardening. *J. Environ. Psychol.* **2010**, *30*, 435–442. [CrossRef]
12. Veen, E.J.; Bock, B.B.; Van den Berg, W.; Visser, A.J.; Wiskerke, J.S.C. Community gardening and social cohesion: Different designs, different motivations. *Local Environ.* **2016**, *21*, 1271–1287. [CrossRef]
13. Wan, C.; Shen, G.Q.; Choi, S. Underlying relationships between public urban green spaces and social cohesion: A systematic literature review. *City Cult. Soc.* **2021**, *24*, 100383. [CrossRef]
14. Kingsley, J.Y.; Townsend, M.; Henderson-Wilson, C. Cultivating health and wellbeing: Members' perceptions of the health benefits of a Port Melbourne community garden. *Leis. Stud.* **2009**, *28*, 207–219. [CrossRef]
15. Castro, D.C.; Samuels, M.; Harman, A.E. Growing healthy kids: A community garden–based obesity prevention program. *Am. J. Prev. Med.* **2013**, *44* (Suppl. 3), 193–199. [CrossRef]
16. Veldheer, S.; Winkels, R.M.; Cooper, J.; Groff, C.; Lepley, J.; Bordner, C.; Wagner, A.; George, D.R.; Sciamanna, C. Growing Healthy Hearts: Gardening Program Feasibility in a Hospital-Based Community Garden. *J. Nutr. Educ. Behav.* **2020**, *52*, 958–963. [CrossRef] [PubMed]
17. Ardoin, N.M.; Clark, C.; Kelsey, E. An exploration of future trends in environmental education research. *Environ. Educ. Res.* **2013**, *19*, 499–520. [CrossRef]
18. Jagger, S.; Sperling, E.; Inwood, H. What's growing on here? Garden-based pedagogy in a concrete jungle. *Environ. Educ. Res.* **2016**, *22*, 271–287. [CrossRef]
19. Bucher, K. Opening garden gates: Teachers making meaning of school gardens in Havana and Philadelphia. *Teach. Teach. Educ.* **2017**, *63*, 12–21. [CrossRef]
20. Corrigan, M.P. Growing what you eat: Developing community gardens in Baltimore, Maryland. *Appl. Geogr.* **2011**, *31*, 1232–1241. [CrossRef]
21. CoDyre, M.; Fraser, E.D.; Landman, K. How does your garden grow? An empirical evaluation of the costs and potential of urban gardening. *Urban For. Urban Green.* **2015**, *14*, 72–79. [CrossRef]
22. Opitz, I.; Berges, R.; Piorr, A.; Krikser, T. Contributing to food security in urban areas: Differences between urban agriculture and peri-urban agriculture in the Global North. *Agric. Hum. Values* **2016**, *33*, 341–358. [CrossRef]
23. Fox-Kämper, R.; Wesener, A.; Münderlein, D.; Sondermann, M.; McWilliam, W.; Kirk, N. Urban community gardens: An evaluation of governance approaches and related enablers and barriers at different development stages. *Landsc. Urban Plan.* **2018**, *170*, 59–68. [CrossRef]
24. Certomà, C.; Martellozzo, F. Cultivating urban justice? A spatial exploration of urban gardening crossing spatial and environmental injustice conditions. *Appl. Geogr.* **2019**, *106*, 60–70. [CrossRef]
25. Menconi, M.E.; Heland, L.; Grohmann, D. Learning from the gardeners of the oldest community garden in Seattle: Resilience explained through ecosystem services analysis. *Urban For. Urban Green.* **2020**, *56*, 126878. [CrossRef]
26. Smith, J.P.; Meerow, S.; Turner, B.L., II. Planning urban community gardens strategically through multicriteria decision analysis. *Urban For. Urban Green.* **2021**, *58*, 126897. [CrossRef]
27. Marsh, P.; Spinaze, A. Community gardens as sites of solace and end-of-life support: A literature review. *Int. J. Palliat. Nurs.* **2016**, *22*, 214–219. [CrossRef]
28. Burt, K.G.; Mayer, G.; Paul, R. A systematic, mixed studies review of the outcomes of community garden participation related to food justice. *Local Environ.* **2021**, *26*, 17–42. [CrossRef]
29. Gregis, A.; Ghisalberti, C.; Sciascia, S.; Sottile, F.; Peano, C. Community garden initiatives addressing health and well-being outcomes: A systematic review of infodemiology aspects, outcomes, and target populations. *Int. J. Environ. Res. Public Health* **2021**, *18*, 1943. [CrossRef] [PubMed]
30. Guitart, D.; Pickering, C.; Byrne, J. Past results and future directions in urban community gardens research. *Urban For. Urban Green.* **2012**, *11*, 364–373. [CrossRef]
31. Massaro, M.; Dumay, J.; Guthrie, J. On the shoulders of giants: Undertaking a structured literature review in accounting. Account. *Account. Audit. Account. J.* **2016**, *29*, 767–801. [CrossRef]
32. Pritchard, A. Statistical Bibliography or Bibliometrics. *J. Doc.* **1969**, *25*, 348–349.
33. 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]
34. Mallig, N. A relational database for bibliometric analysis. *J. Informetr.* **2010**, *4*, 564–580. [CrossRef]
35. Pan, X.; Yan, E.; Cui, M.; Hua, W. Examining the usage, citation, and diffusion patterns of bibliometric mapping software: A comparative study of three tools. *J. Informetr.* **2018**, *12*, 481–493. [CrossRef]
36. Garousi, V.; Mäntylä, M.V. Citations, research topics and active countries in software engineering: A bibliometrics study. *Comput. Sci. Rev.* **2016**, *19*, 56–77. [CrossRef]

37. Keathley-Herring, H.; Van Aken, E.; Gonzalez-Aleu, F.; Deschamps, F.; Letens, G.; Orlandini, P.C. Assessing the maturity of a research area: Bibliometric review and proposed framework. *Scientometrics* **2016**, *109*, 927–951. [CrossRef]
38. Drago, C.; Gatto, A.; Ruggeri, M. Telemedicine as technoinnovation to tackle COVID-19: A bibliometric analysis. *Technovation.* 2021; *in press*. 102417. [CrossRef]
39. Romanelli, J.P.; Silva, L.G.M.; Gonçalves, M.C.P.; Naves, R.P.; De Almeida, D.R.A.; De Resende, A.F.; Rodrigues, R.R. Repeatability of the searching process in reviews of restoration outcomes. *Restor. Ecol.* **2021**, *29*, e13496. [CrossRef]
40. Zhou, C.; Song, W. Digitalization as a way forward: A bibliometric analysis of 20 Years of servitization research. *J. Clean. Prod.* **2021**, *300*, 126943. [CrossRef]
41. Irvine, S.; Johnson, L.; Peters, K. Community gardens and sustainable land use planning: A case-study of the Alex Wilson community garden. *Local Environ.* **1999**, *4*, 33–46. [CrossRef]
42. Genter, C.; Roberts, A.; Richardson, J.; Sheaff, M. The contribution of allotment gardening to health and wellbeing: A systematic review of the literature. *Br. J. Occup. Ther.* **2015**, *78*, 593–605. [CrossRef]
43. Burchardt, J. *The Allotment Movement in England, 1793–1873*; Royal Historical Society: London, UK, 2002.
44. Bassett, T.J. Vacant Lot Cultivation: Community Gardening in America, 1893–1978. Master's Thesis, University of California, Berkeley, CA, USA, 1979.
45. Lawson, L.J. *City Bountiful: A Century of Community Gardening in America*; University of California Press: Berkeley, CA, USA; Los Angeles, CA, USA; London, UK, 2005.
46. Draper, C.; Freedman, D. Review and analysis of the benefits, purposes, and motivations associated with community gardening in the United States. *J. Community Pract.* **2010**, *18*, 458–492. [CrossRef]
47. Pudup, M.B. It takes a garden: Cultivating citizen-subjects in organized garden projects. *Geoforum* **2008**, *39*, 1228–1240. [CrossRef]
48. Nilsen, M. *The Working Man's Green Space: Allotment Gardens in England, France, and Germany, 1870–1919*, 1st ed.; University of Virginia Press: Charlottesville, VA, USA; London, UK, 2014.
49. Bine, R. Cultivation of Vacant Lots. *Calif. State J. Med.* **1916**, *14*, 348.
50. Drake, L.; Lawson, L.J. Validating verdancy or vacancy? The relationship of community gardens and vacant lands in the U.S. *Cities* **2014**, *40*, 133–142. [CrossRef]
51. Poole, S. *The Allotment Chronicles: A Social History of Allotment Gardening*; Silver Link Publishing Limited: Kettering, UK, 2006.
52. Maltz, A. "Plant a victory garden: Our food is fighting:" Lessons of food resilience from World War. *J. Environ. Stud. Sci.* **2015**, *5*, 392–403. [CrossRef]
53. Hayden-Smith, R. "Soldiers of the Soil": The work of the United States School Garden Army during World War I. *Appl. Environ. Educ. Commun.* **2007**, *6*, 19–29. [CrossRef]
54. Jones, W.H.; Taylor, R. The English Agricultural Land (Utilisation) Bill. *J. Farm Econ.* **1931**, *13*, 165–167. [CrossRef]
55. Young, H.E. *Subsistence Garden Plan*; Indianapolis, Governor's Commission on Unemployment Relief: Indianapolis, IN, USA, 1933.
56. Wolfe, E.J. *Industrial and Agricultural Work Relief Projects in the United States*; Governor's Commission on Unemployment Relief: New York, NY, USA, 1935.
57. Ginn, F. Dig for Victory! New histories of wartime gardening in Britain. *J. Hist. Geogr.* **2012**, *38*, 294–305. [CrossRef]
58. Bell, S.; Fox-Kämper, R.; Keshavarz, N.; Benson, M.; Caputo, S.; Noori, S.; Voigt, A. *Urban Allotment Gardens in Europe*; Routledge: London, UK, 2016.
59. Lawson, L.J. Garden for victory! The American victory garden campaign of World War II. In *Greening in the Red Zone*; Tidball, K.G., Krasny, M.E., Eds.; Springer: Dordrecht, The Netherlands, 2014; pp. 181–195. [CrossRef]
60. Thorpe, H. The homely allotment: From rural dole to urban amenity: A neglected aspect of urban land use. *Geography* **1975**, *60*, 169–183.
61. DeSilvey, C. Cultivated histories in a Scottish allotment garden. *Cult. Geogr.* **2003**, *10*, 442–468. [CrossRef]
62. Wiltshire, R.; Azuma, R. Rewriting the plot: Sustaining allotments in the UK and Japan. *Local Environ.* **2000**, *5*, 139–151. [CrossRef]
63. Paxton, A. *Food Miles Action Pack—A Guide to Thinking Globally and Eating Locally*; Sustaining Agriculture and Food Alliance (SAFE): London, UK, 1996.
64. Jones, M.; Stokes, T. A comparison of the provision of green spaces between urbanized areas in two European localities, and the effects of Local Agenda 21 on their respective planning strategies. *Manag. Leis.* **1998**, *3*, 71–84. [CrossRef]
65. Bell, C.; Newby, H. *Community Studies: An Introduction to the Sociology of the Local Community*, 1st ed.; Routledge: London, UK, 1971.
66. Patrick, D.L.; Wickizer, T.M. Community and health. In *Society and Health*; Amick, B.C., III, Levine, S., Tarlov, A.R., Walsh, D.C., Eds.; Oxford University Press: New York, NY, USA, 1995; pp. 46–92.
67. Moskalonek, Ż.; Połom, M.; Puzdrakiewicz, K. Changes in the function of allotment gardens in an attractive location based on the example of tri-city in Poland. *Land* **2020**, *9*, 464. [CrossRef]
68. Mokras-Grabowska, J. Allotment gardening in Poland—New practices and changes in recreational space. *Misc. Geogr.* **2020**, *24*, 245–252. [CrossRef]
69. Rees, A.; Melix, B. Landscape discourses and community garden design: Creating community gardens in one mid-sized southern US city. *Stud. Hist. Gard. Des. Landsc.* **2019**, *39*, 90–104. [CrossRef]
70. Kurtz, H. Differentiating multiple meanings of garden and community. *Urban Geogr.* **2001**, *22*, 656–670. [CrossRef]
71. Glover, T.D.; Shinew, K.J.; Parry, D.C. Association, sociability, and civic culture: The democratic effect of community gardening. *Leis. Sci.* **2005**, *27*, 75–92. [CrossRef]

72. Lyson, T.A. *Civic Agriculture: Reconnecting Farm, Food, and Community*; Tufts University Press: Medford, MA, USA, 2004.
73. Aptekar, S. Visions of public space: Reproducing and resisting social hierarchies in a community garden. *Sociol. Forum* **2015**, *30*, 209–227. [CrossRef]
74. He, B.; Zhu, J. Constructing community gardens? Residents' attitude and behaviour towards edible landscapes in emerging urban communities of China. *Urban For. Urban Green.* **2018**, *34*, 154–165. [CrossRef]
75. Göttl, I.; Penker, M. Institutions for collective gardening: A comparative analysis of 51 urban community gardens in Anglophone and German-speaking countries. *Int. J. Commons* **2020**, *14*, 30–43. [CrossRef]
76. Škamlová, L.; Wilkaniec, A.; Szczepańska, M.; Bačík, V.; Hencelová, P. The development process and effects from the management of community gardens in two post-socialist cites: Bratislava and Poznań. *Urban For. Urban Green.* **2020**, *48*, 126572. [CrossRef]
77. Scott, A.; Dean, A.; Barry, V.; Kotter, R. Places of urban disorder? Exposing the hidden nature and values of an English private urban allotment landscape. *Landsc. Urban Plan.* **2018**, *169*, 185–198. [CrossRef]
78. Larson, J.T. A comparative study of community garden systems in Germany and the United States and their role in creating sustainable communities. *Arboric. J.* **2006**, *29*, 121–141. [CrossRef]
79. Van den Berg, A.E.; van Winsum-Westra, M.; De Vries, S.; Van Dillen, S.M. Allotment gardening and health: A comparative survey among allotment gardeners and their neighbors without an allotment. *Environ. Health* **2010**, *9*, 74. [CrossRef]
80. Russo, A.; Escobedo, F.J.; Cirella, G.T.; Zerbe, S. Edible green infrastructure: An approach and review of provisioning ecosystem services and disservices in urban environments. *Agric. Ecosyst. Environ.* **2017**, *242*, 53–66. [CrossRef]
81. Zhang, J.; Jiang, L.; Liu, Z.; Li, Y.; Liu, K.; Fang, R.; Li, H.; Qu, Z.; Liu, C.; Li, F. A bibliometric and visual analysis of indoor occupation environmental health risks: Development, hotspots and trend directions. *J. Clean. Prod.* **2021**, *300*, 126824. [CrossRef]
82. Li, Y.; Fang, R.; Liu, Z.; Jiang, L.; Zhang, J.; Li, H.; Liu, C.; Li, F. The association between toxic pesticide environmental exposure and Alzheimer's disease: A scientometric and visualization analysis. *Chemosphere* **2021**, *263*, 128238. [CrossRef]
83. Cobo, M.J.; López-Herrera, A.G.; Herrera-Viedma, E.; Herrera, F. Science mapping software tools: Review, analysis, and cooperative study among tools. *J. Am. Soc. Inf. Sci. Technol.* **2011**, *62*, 1382–1402. [CrossRef]
84. Aria, M.; Cuccurullo, C. *bibliometrix*: An R-tool for comprehensive science mapping analysis. *J. Informetr.* **2017**, *11*, 959–975. [CrossRef]
85. Van Eck, N.J.; Waltman, L. Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics* **2010**, *84*, 523–538. [CrossRef]
86. Chen, C. Searching for intellectual turning points: Progressive knowledge domain visualization. *Proc. Natl. Acad. Sci. USA* **2004**, *101* (Suppl. 1), 5303–5310. [CrossRef]
87. Chen, C. CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature. *J. Am. Soc. Inf. Sci. Technol.* **2006**, *57*, 359–377. [CrossRef]
88. Hirsch, J.E. An index to quantify an individual's scientific research output. *Proc. Natl. Acad. Sci. USA* **2005**, *102*, 16569–16572. [CrossRef]
89. He, Z.; Gong, K.; Zhang, Z.; Dong, W.; Feng, H.; Yu, Q.; He, J. What is the past, present, and future of scientific research on the Yellow River Basin?—A bibliometric analysis. *Agric. Water Manag.* **2022**, *262*, 107404. [CrossRef]
90. World Bank. World Bank Country and Lending Groups. Available online: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups (accessed on 12 April 2022).
91. Barthel, S.; Parker, J.; Ernstson, H. Food and green space in cities: A resilience lens on gardens and urban environmental movements. *Urban Stud.* **2015**, *52*, 1321–1338. [CrossRef]
92. Glover, T.D. Social capital in the lived experiences of community gardeners. *Leis. Sci.* **2004**, *26*, 143–162. [CrossRef]
93. Glover, T.D. Healthy Garden Plots? Harvesting Stories of Social Connectedness from Community Gardens. *Int. J. Environ. Res. Public Health* **2021**, *18*, 5747. [CrossRef]
94. Hale, J.; Knapp, C.; Bardwell, L.; Buchenau, M.; Marshall, J.; Sancar, F.; Litt, J.S. Connecting food environments and health through the relational nature of aesthetics: Gaining insight through the community gardening experience. *Soc. Sci. Med.* **2011**, *72*, 1853–1863. [CrossRef]
95. Teig, E.; Amulya, J.; Bardwell, L.; Buchenau, M.; Marshall, J.A.; Litt, J.S. Collective efficacy in Denver, Colorado: Strengthening neighborhoods and health through community gardens. *Health Place* **2009**, *15*, 1115–1122. [CrossRef]
96. Alaimo, K.; Packnett, E.; Miles, R.A.; Kruger, D.J. Fruit and vegetable intake among urban community gardeners. *J. Nutr. Educ. Behav.* **2008**, *40*, 94–101. [CrossRef]
97. Armstrong, D. A survey of community gardens in upstate New York: Implications for health promotion and community development. *Health Place* **2000**, *6*, 319–327. [CrossRef]
98. Schmelzkopf, K. Incommensurability, land use, and the right to space: Community gardens in New York City. *Urban Geogr.* **2002**, *23*, 323–343. [CrossRef]
99. Guitart, D.A.; Pickering, C.M.; Byrne, J.A. Color me healthy: Food diversity in school community gardens in two rapidly urbanising Australian cities. *Health Place* **2014**, *26*, 110–117. [CrossRef]
100. Guitart, D.A.; Byrne, J.A.; Pickering, C.M. Greener growing: Assessing the influence of gardening practices on the ecological viability of community gardens in South East Queensland, Australia. *J. Environ. Plan. Manag.* **2015**, *58*, 189–212. [CrossRef]
101. Matteson, K.C.; Langellotto, G.A. Small scale additions of native plants fail to increase beneficial insect richness in urban gardens. *Insect. Conserv. Divers.* **2011**, *4*, 89–98. [CrossRef]
102. Wakefield, S.; Yeudall, F.; Taron, C.; Reynolds, J.; Skinner, A. Growing urban health: Community gardening in South-East Toronto. *Health Promot. Int.* **2007**, *22*, 92–101. [CrossRef]

103. Mayorga, I.; Bichier, P.; Philpott, S.M. Local and landscape drivers of bird abundance, species richness, and trait composition in urban agroecosystems. *Urban Ecosyst.* **2020**, *23*, 495–505. [CrossRef]
104. Egerer, M.; Ordóñez, C.; Lin, B.B.; Kendal, D. Multicultural gardeners and park users benefit from and attach diverse values to urban nature spaces. *Urban For. Urban Green.* **2019**, *46*, 126445. [CrossRef]
105. Egerer, M.H.; Lin, B.B.; Kendal, D. Temperature variability differs in urban agroecosystems across two metropolitan regions. *Climate* **2019**, *7*, 50. [CrossRef]
106. Lin, B.B.; Egerer, M.H. Global social and environmental change drives the management and delivery of ecosystem services from urban gardens: A case study from Central Coast, California. *Glob. Environ. Chang.* **2020**, *60*, 102006. [CrossRef]
107. Egerer, M.; Fairbairn, M. Gated gardens: Effects of urbanization on community formation and commons management in community gardens. *Geoforum* **2018**, *96*, 61–69. [CrossRef]
108. Kirby, C.K.; Specht, K.; Fox-Kämper, R.; Hawes, J.K.; Cohen, N.; Caputo, S.; Ilieva, R.T.; Lelièvre, A.; Poniży, L.; Schoen, V.; et al. Differences in motivations and social impacts across urban agriculture types: Case studies in Europe and the US. *Landsc. Urban Plan.* **2021**, *212*, 104110. [CrossRef]
109. Maantay, J.A.; Maroko, A.R. Brownfields to greenfields: Environmental justice versus environmental gentrification. *Int. J. Environ. Res. Public Health* **2018**, *15*, 2233. [CrossRef]
110. Speak, A.F.; Mizgajski, A.; Borysiak, J. Allotment gardens and parks: Provision of ecosystem services with an emphasis on biodiversity. *Urban For. Urban Green.* **2015**, *14*, 772–781. [CrossRef]
111. Bosiacki, M.; Bednorz, L.; Fedeńczak, K.; Górecki, T.; Mizgajski, A.; Poniży, L.; Spiżewski, T. Soil Quality as a Key Factor in Producing Vegetables for Home Consumption—A Case Study of Urban Allotments in Gorzów Wielkopolski (Poland). *Agronomy* **2021**, *11*, 1836. [CrossRef]
112. Cheng, Z.; Paltseva, A.; Li, I.; Morin, T.; Huot, H.; Egendorf, S.; Su, Z.; Yolanda, R.; Singh, K.; Lee, L.; et al. Trace Metal Contamination in New York City Garden Soils. *Soil Sci.* **2015**, *180*, 167–174. [CrossRef]
113. Leitão, T.E.; Cameira, M.R.; Costa, H.D.; Pacheco, J.M.; Henriques, M.J.; Martins, L.L.; Mourato, M.P. Environmental quality in urban allotment gardens: Atmospheric deposition, soil, water and vegetable assessment at Lisbon City. *Water Air Soil Pollut.* **2018**, *229*, 31. [CrossRef]
114. Tapia, C.; Randall, L.; Wang, S.; Borges, L.A. Monitoring the contribution of urban agriculture to urban sustainability: An indicator-based framework. *Sustain. Cities Soc.* **2021**, *74*, 103130. [CrossRef]
115. Glover, T.D.; Parry, D.C.; Shinew, K.J. Building relationships, accessing resources: Mobilizing social capital in community garden contexts. *J. Leis. Res.* **2005**, *37*, 450–474. [CrossRef]
116. Langhout, R.D.; Rappaport, J.; Simmons, D. Integrating community into the classroom: Community gardening, community involvement, and project-based learning. *Urban Educ.* **2002**, *37*, 323–349. [CrossRef]
117. Taylor, J.R.; Lovell, S.T. Mapping public and private spaces of urban agriculture in Chicago through the analysis of high-resolution aerial images in Google Earth. *Landsc. Urban Plan.* **2012**, *108*, 57–70. [CrossRef]
118. Gobster, P.H.; Rigolon, A.; Hadavi, S.; Stewart, W.P. Beyond proximity: Extending the "greening hypothesis" in the context of vacant lot stewardship. *Landsc. Urban Plan.* **2020**, *197*, 103773. [CrossRef]
119. Chenarides, L.; Grebitus, C.; Lusk, J.L.; Printezis, I. Who practices urban agriculture? An empirical analysis of participation before and during the COVID-19 pandemic. *Agribusiness* **2021**, *37*, 142–159. [CrossRef] [PubMed]
120. Mack, E.A.; Tong, D.; Credit, K. Gardening in the desert: A spatial optimization approach to locating gardens in rapidly expanding urban environments. *Int. J. Health Geogr.* **2017**, *16*, 37. [CrossRef]
121. Moore, S.A.; Wilson, J.; Kelly-Richards, S.; Marston, S.A. School gardens as sites for forging progressive socioecological futures. *Ann. Assoc. Am. Geogr.* **2015**, *105*, 407–415. [CrossRef]
122. Aksnes, D.W. Characteristics of highly cited papers. *Res. Eval.* **2003**, *12*, 159–170. [CrossRef]
123. Saldivar-Tanaka, L.; Krasny, M.E. Culturing community development, neighborhood open space, and civic agriculture: The case of Latino community gardens in New York City. *Agric. Hum. Values* **2004**, *21*, 399–412. [CrossRef]
124. Groenewegen, P.P.; Van den Berg, A.E.; De Vries, S.; Verheij, R.A. Vitamin G: Effects of green space on health, well-being, and social safety. *BMC Public Health* **2006**, *6*, 149. [CrossRef]
125. Matteson, K.C.; Ascher, J.S.; Langellotto, G.A. Bee richness and abundance in New York City urban gardens. *Ann. Entomol. Soc. Am.* **2008**, *101*, 140–150. [CrossRef]
126. McCormack, L.A.; Laska, M.N.; Larson, N.I.; Story, M. Review of the Nutritional Implications of Farmers' Markets and Community Gardens: A Call for Evaluation and Research Efforts. *J. Am. Diet. Assoc.* **2010**, *110*, 399–408. [CrossRef]
127. Colding, J.; Barthel, S. The potential of 'Urban Green Commons' in the resilience building of cities. *Ecol. Econ.* **2013**, *86*, 156–166. [CrossRef]
128. Schmelzkopf, K. Urban community gardens as contested space. *Geogr. Rev.* **1995**, *85*, 364–381. [CrossRef]
129. Eizenberg, E. Actually existing commons: Three moments of space of community gardens in New York City. *Antipode* **2012**, *44*, 764–782. [CrossRef]
130. Okvat, H.A.; Zautra, A.J. Community gardening: A parsimonious path to individual, community, and environmental resilience. *Am. J. Community Psychol.* **2011**, *47*, 374–387. [CrossRef]
131. Twiss, J.; Dickinson, J.; Duma, S.; Kleinman, T.; Paulsen, H.; Rilveria, L. Community gardens: Lessons learned from California healthy cities and communities. *Am. J. Public Health* **2003**, *93*, 1435–1438. [CrossRef]
132. Baker, L.E. Tending cultural landscapes and food citizenship in Toronto's community gardens. *Geogr. Rev.* **2004**, *94*, 305–325. [CrossRef]

133. Bendt, P.; Barthel, S.; Colding, J. Civic greening and environmental learning in public-access community gardens in Berlin. *Landsc. Urban Plan.* **2013**, *109*, 18–30. [CrossRef]
134. Shinew, K.J.; Glover, T.D.; Parry, D.C. Leisure spaces as potential sites for interracial interaction: Community gardens in urban areas. *J. Leis. Res.* **2004**, *36*, 336–355. [CrossRef]
135. Ferris, J.; Norman, C.; Sempik, J. People, land and sustainability: Community gardens and the social dimension of sustainable development. *Soc. Policy Adm.* **2001**, *35*, 559–568. [CrossRef]
136. Chen, R.; Zhang, R.; Han, H. Where has carbon footprint research gone? *Ecol. Indic.* **2021**, *120*, 106882. [CrossRef]
137. Chen, C. *CiteSpace: A Practical Guide for Mapping Scientific Literature*; Nova Science Publishers: New York, NY, USA, 2016.
138. Šubelj, L.; van Eck, N.J.; Waltman, L. Clustering Scientific Publications Based on Citation Relations: A Systematic Comparison of Different Methods. *PLoS ONE* **2016**, *11*, e0154404. [CrossRef] [PubMed]
139. Gasperi, D.; Pennisi, G.; Rizzati, N.; Magrefi, F.; Bazzocchi, G.; Mezzacapo, U.; Centrone Stefani, M.; Sanyé-Mengual, E.; Orsini, F.; Gianquinto, G. Towards Regenerated and Productive Vacant Areas through Urban Horticulture: Lessons from Bologna, Italy. *Sustainability* **2016**, *8*, 1347. [CrossRef]
140. Spilková, J.; Vágner, J. Food gardens as important elements of urban agriculture: Spatio-developmental trends and future prospects for urban gardening in Czechia. *Norsk. Geogr. Tidsskr. Nor. J. Geogr.* **2018**, *72*, 1–12. [CrossRef]
141. Hake, B.J. Gardens as learning spaces: Intergenerational learning in urban food gardens. *J. Intergenerational Relatsh.* **2017**, *15*, 26–38. [CrossRef]
142. Langegger, S. Emergent public space: Sustaining Chicano culture in North Denver. *Cities* **2013**, *35*, 26–32. [CrossRef]
143. Morckel, V. Community gardens or vacant lots? Rethinking the attractiveness and seasonality of green land uses in distressed neighborhoods. *Urban For. Urban Green.* **2015**, *14*, 714–721. [CrossRef]
144. O'Connell, M.; Jordan, Z.; McGilvray, E.; Cohen, H.; Liere, H.; Lin, B.B.; Philpott, S.M.; Jha, S. Reap what you sow: Local plant composition mediates bumblebee foraging patterns within urban garden landscapes. *Urban Ecosyst.* **2021**, *24*, 391–404. [CrossRef]
145. Corrêa, C.J.P.; Tonello, K.C.; Nnadi, E. Urban Gardens and Soil Compaction: A Land Use Alternative for Runoff Decrease. *Environ. Process.* **2021**, *8*, 1213–1230. [CrossRef]
146. Dobson, M.C.; Crispo, M.; Blevins, R.S.; Warren, P.H.; Edmondson, J.L. An assessment of urban horticultural soil quality in the United Kingdom and its contribution to carbon storage. *Sci. Total Environ.* **2021**, *777*, 146199. [CrossRef] [PubMed]
147. Rost, A.T.; Liste, V.; Seidel, C.; Matscheroth, L.; Otto, M.; Meier, F.; Fenner, D. How cool are allotment gardens? A case study of nocturnal air temperature differences in Berlin, Germany. *Atmosphere* **2020**, *11*, 500. [CrossRef]
148. Shimpo, N. The governance of a community garden with a food cycle in suburban Tokyo. *Urban Agric. Reg. Food Syst.* **2021**, *6*, e20015. [CrossRef]
149. Corkery, L. Community Gardens as a Platform for Education for Sustainability. *Aust. J. Environ. Educ.* **2004**, *20*, 69–75. [CrossRef]
150. Zick, C.D.; Smith, K.R.; Kowaleski-Jones, L.; Uno, C.; Merrill, B.J. Harvesting more than vegetables: The potential weight control benefits of community gardening. *Am. J. Public Health* **2013**, *103*, 1110–1115. [CrossRef]
151. Pitt, H. Therapeutic experiences of community gardens: Putting flow in its place. *Health Place* **2014**, *27*, 84–91. [CrossRef]
152. Hartwig, K.A.; Mason, M. Community gardens for refugee and immigrant communities as a means of health promotion. *J. Community Health* **2016**, *41*, 1153–1159. [CrossRef]
153. Mmako, N.J.; Capetola, T.; Henderson-Wilson, C. Sowing social inclusion for marginalised residents of a social housing development through a community garden. *Health Promot. J. Aust.* **2019**, *30*, 350–358. [CrossRef]
154. Litt, J.S.; Soobader, M.-J.; Turbin, M.S.; Hale, J.W.; Buchenau, M.; Marshall, J.A. The influence of social involvement, neighborhood aesthetics, and community garden participation on fruit and vegetable consumption. *Am. J. Public Health* **2011**, *101*, 1466–1473. [CrossRef]
155. Kou, H.; Zhang, S.; Liu, Y. Community-engaged research for the promotion of healthy urban environments: A case study of community garden initiative in Shanghai, China. *Int. J. Environ. Res. Public Health* **2019**, *16*, 4145. [CrossRef]
156. Liamputtong, P.; Sanchez, E.L. Cultivating community: Perceptions of community garden and reasons for participating in a rural Victorian town. *Act. Adapt. Aging* **2018**, *42*, 124–142. [CrossRef]
157. Chan, J.; DuBois, B.; Tidball, K.G. Refuges of local resilience: Community gardens in post-Sandy New York City. *Urban For. Urban Green.* **2015**, *14*, 625–635. [CrossRef]
158. Chan, J.; Pennisi, L.; Francis, C.A. Social-ecological refuges: Reconnecting in community gardens in Lincoln, Nebraska. *J. Ethnobiol.* **2016**, *36*, 842–860. [CrossRef]
159. Amato-Lourenco, L.F.; Saiki, M.; Saldiva, P.H.N.; Mauad, T. Influence of air pollution and soil contamination on the contents of polycyclic aromatic hydrocarbons (PAHs) in vegetables grown in urban gardens of Sao Paulo, Brazil. *Front. Environ. Sci.* **2017**, *5*, 77. [CrossRef]
160. Laidlaw, M.A.; Alankarage, D.H.; Reichman, S.M.; Taylor, M.P.; Ball, A.S. Assessment of soil metal concentrations in residential and community vegetable gardens in Melbourne, Australia. *Chemosphere* **2018**, *199*, 303–311. [CrossRef]
161. Bechet, B.; Joimel, S.; Jean-Soro, L.; Hursthouse, A.; Agboola, A.; Leitão, T.E.; Costa, H.; do Rosário Cameira, M.; Le Guern, C.; Schwartz, C.; et al. Spatial variability of trace elements in allotment gardens of four European cities: Assessments at city, garden, and plot scale. *J. Soils Sediments* **2018**, *18*, 391–406. [CrossRef]
162. Spliethoff, H.M.; Mitchell, R.G.; Shayler, H.; Marquez-Bravo, L.G.; Russell-Anelli, J.; Ferenz, G.; McBride, M. Estimated lead (Pb) exposures for a population of urban community gardeners. *Environ. Geochem. Health* **2016**, *38*, 955–971. [CrossRef]
163. Lin, B.B.; Egerer, M.H.; Liere, H.; Jha, S.; Philpott, S.M. Soil management is key to maintaining soil moisture in urban gardens facing changing climatic conditions. *Sci. Rep.* **2018**, *8*, 17565. [CrossRef]

164. Chausson, A.; Turner, B.; Seddon, D.; Chabaneix, N.; Girardin, C.A.J.; Kapos, V.; Key, I.; Roe, D.; Smith, A.; Woroniecki, S.; et al. Mapping the effectiveness of nature-based solutions for climate change adaptation. *Glob. Change Biol.* **2020**, *26*, 6134–6155. [CrossRef]
165. Sowińska-Świerkosz, B.; Michalik-Śnieżek, M.; Bieske-Matejak, A. Can Allotment Gardens (AGs) Be Considered an Example of Nature-Based Solutions (NBS) Based on the Use of Historical Green Infrastructure? *Sustainability* **2021**, *13*, 835. [CrossRef]
166. Maćkiewicz, B.; Asuero, R.P. Public versus private: Juxtaposing urban allotment gardens as multifunctional Nature-based Solutions. Insights from Seville. *Urban For. Urban Green.* **2021**, *65*, 127309. [CrossRef]
167. van der Jagt, A.P.N.; Szaraz, L.R.; Delshammar, T.; Cvejić, R.; Santos, A.; Goodness, J.; Buijs, A. Cultivating nature-based solutions: The governance of communal urban gardens in the European Union. *Environ. Res.* **2017**, *159*, 264–275. [CrossRef] [PubMed]
168. da Silva, I.M.; Fernandes, C.O.; Castiglione, B.; Costa, L. Characteristics and motivations of potential users of urban allotment gardens: The case of Vila Nova de Gaia municipal network of urban allotment gardens. *Urban For. Urban Green.* **2016**, *20*, 56–64. [CrossRef]
169. Poniży, L.; Latkowska, M.J.; Breuste, J.; Hursthouse, A.; Joimel, S.; Külvik, M.; Leitão, T.E.; Mizgajski, A.; Voigt, A.; Kacprzak, E.; et al. The Rich Diversity of Urban Allotment Gardens in Europe: Contemporary Trends in the Context of Historical, Socio-Economic and Legal Conditions. *Sustainability* **2021**, *13*, 11076. [CrossRef]
170. Teuber, S.; Schmidt, K.; Kühn, P.; Scholten, T. Engaging with urban green spaces—A comparison of urban and rural allotment gardens in Southwestern Germany. *Urban For. Urban Green.* **2019**, *43*, 126381. [CrossRef]
171. Jordi-Sánchez, M.; Díaz-Aguilar, A.L. Constructing organic food through urban agriculture, community gardens in Seville. *Sustainability* **2021**, *13*, 4091. [CrossRef]
172. Petrovic, N.; Simpson, T.; Orlove, B.; Dowd-Uribe, B. Environmental and social dimensions of community gardens in East Harlem. *Landsc. Urban Plan.* **2019**, *183*, 36–49. [CrossRef]
173. Lee, J.H.; Matarrita-Cascante, D. The influence of emotional and conditional motivations on gardeners' participation in community (allotment) gardens. *Urban For. Urban Green.* **2019**, *42*, 21–30. [CrossRef]
174. Hammelman, C.; Buitrago Arias, C.; Cuadros, U.; Hayes-Conroy, A.; Muñoz, D.; Quintero, X.; Saenz Montoya, A. Reflections on the affective contributions to research success in two participatory projects in Colombia. *Qual. Res.* **2020**, *20*, 378–395. [CrossRef]
175. Veen, E.J.; Eiter, S. Vegetables and social relations in Norway and the Netherlands: A comparative analysis of urban allotment gardeners. *Nat. Cult.* **2018**, *13*, 135–160. [CrossRef]
176. Wang, H.; Qiu, F.; Swallow, B. Can community gardens and farmers' markets relieve food desert problems? A study of Edmonton, Canada. *Appl. Geogr.* **2014**, *55*, 127–137. [CrossRef]
177. Sovová, L.; Veen, E.J. Neither poor nor cool: Practising food self-provisioning in allotment gardens in the Netherlands and Czechia. *Sustainability* **2020**, *12*, 5134. [CrossRef]
178. Chauvenet, C.; Sheppard, B.; Siddique, N.; Gallagher, B.; Kearney, W.; De Marco, M. A qualitative study of rural low-wealth participants' experiences with community gardens. *J. Hunger Environ. Nutr.* **2022**, *17*, 224–244. [CrossRef]
179. Gray, T.; Tracey, D.; Truong, S.; Ward, K. Community gardens as local learning environments in social housing contexts: Participant perceptions of enhanced wellbeing and community connection. *Local Environ.* **2022**, *27*, 570–585. [CrossRef]
180. Ruhl, J.; Lordly, D. University Students Harvesting the Benefits of a Garden Laboratory. *Can. J. Diet. Pract. Res.* **2021**, *82*, 107–114. [CrossRef]
181. Haedicke, S. Aroma-Home's edible stories: An urban community garden performs. *Renew. Agric. Food Syst.* **2018**, *33*, 542–547. [CrossRef]
182. Shan, H.; Walter, P. Growing everyday multiculturalism: Practice-based learning of Chinese immigrants through community gardens in Canada. *Adult Educ. Q.* **2015**, *65*, 19–34. [CrossRef]
183. Neo, H.; Chua, C.Y. Beyond Inclusion and Exclusion: Community Gardens as Spaces of Responsibility. *Ann. Am. Assoc. Geogr.* **2017**, *107*, 666–681. [CrossRef]
184. Ghose, R.; Pettygrove, M. Urban community gardens as spaces of citizenship. *Antipode* **2014**, *46*, 1092–1112. [CrossRef]
185. Barron, J. Community gardening: Cultivating subjectivities, space, and justice. *Local Environ.* **2017**, *22*, 1142–1158. [CrossRef]
186. Eizenberg, E. The changing meaning of community space: Two models of NGO management of community gardens in New York City. *Int. J. Urban Reg. Res.* **2012**, *36*, 106–120. [CrossRef]
187. Colasanti, K.J.A.; Hamm, M.W.; Litjens, C.M. The City as an "Agricultural Powerhouse"? Perspectives on Expanding Urban Agriculture from Detroit, Michigan. *Urban Geogr.* **2012**, *33*, 348–369. [CrossRef]
188. Zhang, J.; Yu, Q.; Zheng, F.; Long, C.; Lu, Z.; Duan, Z. Comparing keywords plus of WOS and author keywords: A case study of patient adherence research. *J. Assoc. Inf. Sci. Technol.* **2016**, *67*, 967–972. [CrossRef]
189. Yan, D.; Liu, L.; Liu, X.; Zhang, M. Global trends in urban agriculture research: A pathway toward urban resilience and sustainability. *Land* **2022**, *11*, 117. [CrossRef]
190. Lin, S.; Wang, S.; Marinova, D.; Zhao, D.; Hong, J. Impacts of urbanization and real economic development on CO_2 emissions in non-high income countries: Empirical research based on the extended STIRPAT model. *J. Clean. Prod.* **2017**, *166*, 952–966. [CrossRef]
191. Liu, X.; Xu, Y.; Engel, B.A.; Sun, S.; Zhao, X.; Wu, P.; Wang, Y. The impact of urbanization and aging on food security in developing countries: The view from Northwest China. *J. Clean. Prod.* **2021**, *292*, 126067. [CrossRef]
192. McGuire, L.; Morris, S.L.; Pollard, T.M. Community gardening and wellbeing: The understandings of organisers and their implications for gardening for health. *Health Place* **2022**, *75*, 102773. [CrossRef] [PubMed]
193. Gittleman, M.; Farmer, C.J.Q.; Kremer, P.; McPhearson, T. Estimating stormwater runoff for community gardens in New York City. *Urban Ecosyst.* **2017**, *20*, 129–139. [CrossRef]
194. Camps-Calvet, M.; Langemeyer, J.; Calvet-Mir, L.; Gómez-Baggethun, E. Ecosystem services provided by urban gardens in Barcelona, Spain: Insights for policy and planning. *Environ. Sci. Policy* **2016**, *62*, 14–23. [CrossRef]

195. Glavan, M.; Schmutz, U.; Williams, S.; Corsi, S.; Monaco, F.; Kneafsey, M.; Rodriguez, P.A.G.; Čenič-Istenič, M.; Pintar, M. The economic performance of urban gardening in three European cities—Examples from Ljubljana, Milan and London. *Urban For. Urban Green.* **2018**, *36*, 100–122. [CrossRef]
196. Modibedi, T.P.; Masekoameng, M.R.; Maake, M.M.S. The contribution of urban community gardens to food availability in Emfuleni Local Municipality, Gauteng Province. *Urban Ecosyst.* **2021**, *24*, 301–309. [CrossRef]
197. Albaladejo-García, J.A.; Alcon, F.; Martínez-Paz, J.M. Economic valuation of allotment gardens in peri-urban degraded agroecosystems: The role of citizens' preferences in spatial planning. *Sustain. Cities Soc.* **2021**, *68*, 102771. [CrossRef]
198. Caneva, G.; Cicinelli, E.; Scolastri, A.; Bartoli, F. Guidelines for urban community gardening: Proposal of preliminary indicators for several ecosystem services (Rome, Italy). *Urban For. Urban Green.* **2020**, *56*, 126866. [CrossRef]
199. Langemeyer, J.; Camps-Calvet, M.; Calvet-Mir, L.; Barthel, S.; Gómez-Baggethun, E. Stewardship of urban ecosystem services: Understanding the value(s) of urban gardens in Barcelona. *Landsc. Urban Plan.* **2018**, *170*, 79–89. [CrossRef]
200. Anderson, E.C.; Egerer, M.H.; Fouch, N.; Clarke, M.; Davidson, M.J. Comparing community garden typologies of Baltimore, Chicago, and New York City (USA) to understand potential implications for socio-ecological services. *Urban Ecosyst.* **2019**, *22*, 671–681. [CrossRef]
201. Cabral, I.; Keim, J.; Engelmann, R.; Kraemer, R.; Siebert, J.; Bonn, A. Ecosystem services of allotment and community gardens: A Leipzig, Germany case study. *Urban For. Urban Green.* **2017**, *23*, 44–53. [CrossRef]
202. Hashimoto, S.; Sato, Y.; Morimoto, H. Public–private collaboration in allotment garden operation has the potential to provide ecosystem services to urban dwellers more efficiently. *Paddy Water Environ.* **2019**, *17*, 391–401. [CrossRef]
203. Bidar, G.; Pelfrêne, A.; Schwartz, C.; Waterlot, C.; Sahmer, K.; Marot, F.; Douay, F. Urban kitchen gardens: Effect of the soil contamination and parameters on the trace element accumulation in vegetables—A review. *Sci. Total Environ.* **2020**, *738*, 139569. [CrossRef]
204. Ashrafzadeh, S.; Lehto, N.J.; Oddy, G.; McLaren, R.G.; Kang, L.; Dickinson, N.M.; Welsch, J.; Robinson, B.H. Heavy metals in suburban gardens and the implications of land-use change following a major earthquake. *Appl. Geochem.* **2018**, *88*, 10–16. [CrossRef]
205. Wong, R.; Gable, L.; Rivera-Núñez, Z. Perceived benefits of participation and risks of soil contamination in St. Louis Urban community gardens. *J. Community Health* **2018**, *43*, 604–610. [CrossRef]
206. Burghardt, W.; Schneider, T. Bulk density and content, density and stock of carbon, nitrogen and heavy metals in vegetable patches and lawns of allotments gardens in the northwestern Ruhr area, Germany. *J. Soils Sediments* **2018**, *18*, 407–417. [CrossRef]
207. Misenheimer, J.; Nelson, C.; Huertas, E.; Medina-Vera, M.; Prevatte, A.; Bradham, K. Total and bioaccessible soil arsenic and lead levels and plant uptake in three urban community gardens in Puerto Rico. *Geosciences* **2018**, *8*, 43. [CrossRef] [PubMed]
208. Harvey, P.J.; Peterson, P.G.; Taylor, M.P. VegeSafe: A community science program generating a national residential garden soil metal(loid) database. *Environ. Sci. Pollut. Res.* **2018**, *25*, 33745–33754. [CrossRef]
209. Walsh, D.; Glass, K.; Morris, S.; Zhang, H.; McRae, I.; Anderson, N.; Alfieri, A.; Egendorf, S.P.; Holberton, S.; Owrang, S.; et al. Sediment exchange to mitigate pollutant exposure in urban soil. *J. Environ. Manag.* **2018**, *214*, 354–361. [CrossRef] [PubMed]
210. Egendorf, S.P.; Cheng, Z.; Deeb, M.; Flores, V.; Paltseva, A.; Walsh, D.; Groffman, P.; Mielke, H.W. Constructed soils for mitigating lead (Pb) exposure and promoting urban community gardening: The New York City Clean Soil Bank pilot study. *Landsc. Urban Plan.* **2018**, *175*, 184–194. [CrossRef]
211. Le Guern, C.; Jean-Soro, L.; Béchet, B.; Lebeau, T.; Bouquet, D. Management initiatives in support of the soil quality of urban allotment gardens: Examples from Nantes (France). *Land Degrad. Dev.* **2018**, *29*, 3681–3692. [CrossRef]
212. Malberg Dyg, P.; Christensen, S.; Peterson, C.J. Community gardens and wellbeing amongst vulnerable populations: A thematic review. *Health Promot. Int.* **2020**, *35*, 790–803. [CrossRef]
213. McIlvaine-Newsad, H.; Porter, R.; Delany-Barmann, G. Change the game, not the rules: The role of community gardens in disaster resilience. *J. Park Recreat. Adm.* **2020**, *38*, 2–22. [CrossRef]
214. Campbell, L.K.; Svendsen, E.S.; Reynolds, R.; Marshall, V. Material and social relations in a coastal community garden assemblage. *Soc. Cult. Geogr.* **2021**, *22*, 1019–1041. [CrossRef]
215. Shimpo, N.; Wesener, A.; McWilliam, W. How community gardens may contribute to community resilience following an earthquake. *Urban For. Urban Green.* **2019**, *38*, 124–132. [CrossRef]
216. Schoen, V.; Blythe, C.; Caputo, S.; Fox-Kämper, R.; Specht, K.; Fargue-Lelièvre, A.; Cohen, N.; Poniży, L.; Fedeńczak, K. "We Have Been Part of the Response": The Effects of COVID-19 on Community and Allotment Gardens in the Global North. *Front. Sustain. Food Syst.* **2021**, *5*, 732641. [CrossRef]
217. Biazoti, A.R.; Nakamura, A.C.; Nagib, G.; Leão, V.O.P.D.S.; Giacchè, G.; Mauad, T. The Impact of COVID-19 on Urban Agriculture in São Paulo, Brazil. *Sustainability* **2021**, *13*, 6185. [CrossRef]
218. Mejia, A.; Bhattacharya, M.; Miraglia, J.; The Village Community Garden and Learning Center. Community Gardening as a Way to Build Cross-Cultural Community Resilience in Intersectionally Diverse Gardeners: Community-Based Participatory Research and Campus-Community-Partnered Proposal. *JMIR Res. Protoc.* **2020**, *9*, e21218. [CrossRef] [PubMed]
219. Houessou, M.D.; Cassee, A.; Sonneveld, B.G.J.S. The Effects of the COVID-19 Pandemic on Food Security in Rural and Urban Settlements in Benin: Do Allotment Gardens Soften the Blow? *Sustainability* **2021**, *13*, 7313. [CrossRef]
220. Khan, M.M.; Akram, M.T.; Janke, R.; Qadri, R.W.K.; Al-Sadi, A.M.; Farooque, A.A. Urban horticulture for food secure cities through and beyond COVID-19. *Sustainability* **2020**, *12*, 9592. [CrossRef]
221. Mejia, A.; Bhattacharya, M.; Nigon-Crowley, A.; Kirkpatrick, K.; Katoch, C. Community gardening during times of crisis: Recommendations for community-engaged dialogue, research, and praxis. *J. Agric. Food Syst. Community Dev.* **2020**, *10*, 13–19. [CrossRef]

222. Music, J.; Finch, E.; Gone, P.; Toze, S.; Charlebois, S.; Mullins, L. Pandemic Victory Gardens: Potential for local land use policies. *Land Use Policy* **2021**, *109*, 105600. [CrossRef]
223. Dymek, D.; Wilkaniec, A.; Bednorz, L.; Szczepańska, M. Significance of Allotment Gardens in Urban Green Space Systems and Their Classification for Spatial Planning Purposes: A Case Study of Poznań, Poland. *Sustainability* **2021**, *13*, 11044. [CrossRef]
224. Pikner, T.; Willman, K.; Jokinen, A. Urban commoning as a vehicle between government institutions and informality: Collective gardening practices in Tampere and Narva. *Int. J. Urban Reg. Res.* **2020**, *44*, 711–729. [CrossRef]
225. Bonow, M.; Normark, M. Community gardening in Stockholm: Participation, driving forces and the role of the municipality. *Renew. Agric. Food Syst.* **2018**, *33*, 503–517. [CrossRef]
226. Sonneveld, B.G.J.S.; Houessou, M.D.; van den Boom, G.J.M.; Aoudji, A. Where Do I Allocate My Urban Allotment Gardens? Development of a Site Selection Tool for Three Cities in Benin. *Land* **2021**, *10*, 318. [CrossRef]
227. Oh, J.; Kim, S. Effect of household economic indices on sustainability of community gardens. *J. Asian Archit. Build. Eng.* **2019**, *18*, 145–150. [CrossRef]
228. Peach, L.; Richmond, C.A.; Brunette-Debassige, C. "You can't just take a piece of land from the university and build a garden on it": Exploring Indigenizing space and place in a settler Canadian university context. *Geoforum* **2020**, *114*, 117–127. [CrossRef]
229. Bailey, A.; Kingsley, J. Connections in the garden: Opportunities for wellbeing. *Local Environ.* **2020**, *25*, 907–920. [CrossRef]
230. Giacchè, G.; Porto, L. The incredible Edible Movement: People power, adaptation, and challenges in Rennes (France) and Montreal (Canada). *Nat. Cult.* **2018**, *13*, 92–112. [CrossRef]
231. Jacob, M.; Rocha, C. Models of governance in community gardening: Administrative support fosters project longevity. *Local Environ.* **2021**, *26*, 557–574. [CrossRef]
232. Ayling, S.M.; Phillips, N.; Bunney, S. Allotments in the Future: Building Resilience to Climate Change through Improved Site Design and Efficient Water Practices. *Water* **2021**, *13*, 1457. [CrossRef]
233. Egerer, M.; Lin, B.B.; Diekmann, L. Nature connection, experience and policy encourage and maintain adaptation to drought in urban agriculture. *Environ. Res. Commun.* **2020**, *2*, 041004. [CrossRef]
234. van Holstein, E. The relational emergence of community and technology through the politics of water use. *Soc. Cult. Geogr.* **2020**, *21*, 314–335. [CrossRef]
235. Beavers, A.W.; Atkinson, A.; Ma, W.; Alaimo, K. Garden characteristics and types of program involvement associated with sustained garden membership in an urban gardening support program. *Urban For. Urban Green.* **2021**, *59*, 127026. [CrossRef]