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Understanding the relevance of farmers' markets from 1955 to 2022: A bibliometric review

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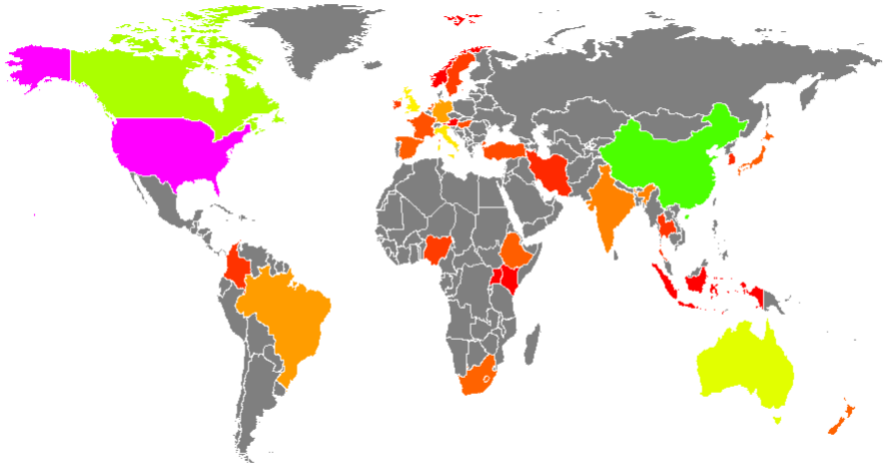
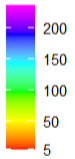
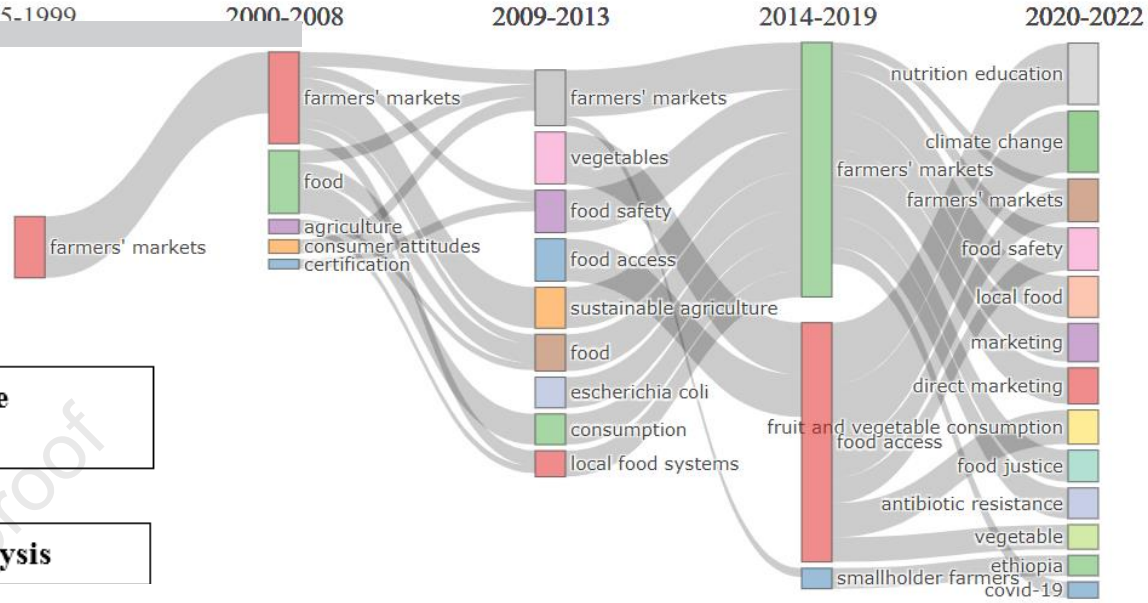
Most productive and most cooperative countries







Final Database (n=1,765)

Bibliometric analysis

Performance analysis

Publication- and citation-related metrics
- Number of publications
- Number of citations
- Most productive authors
- Most productive countries
- Collaboration between countries

Science mapping

Citation analysis
- Most influential journals
- Most influential papers

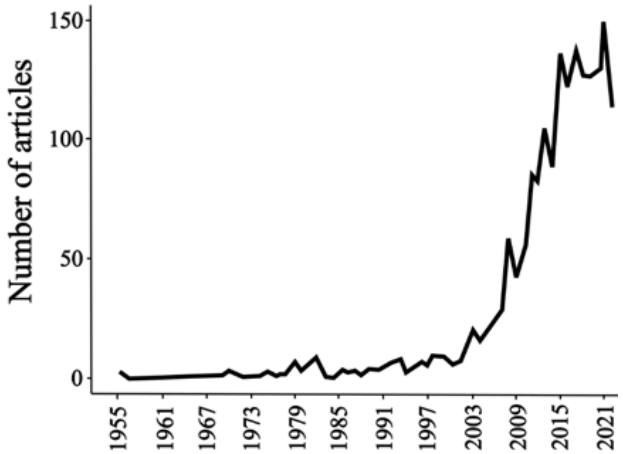
Co-citation analysis
- Journal co-citation

Bibliometric coupling
- Bibliometric coupling

Thematic analysis
- Thematic evolution
- Trend topics
- Thematic map

Network analysis

Network metrics
- Collaboration network
- Historiogram



Number of citations	Number of papers	% of papers
Over 200	11	0.6%
Between 100 and 200	28	1.6%
Between 50 and 100	93	5.3%
Less than 50	1284	72.7%
0 citations	349	19.8%
Total	***1765***	***100%***

General citation structure

Understanding the relevance of farmers' markets from 1955 to 2022: A bibliometric review

Abstract

With the emergence of modern food supply chains, there has been a noticeable decline in consumer trust and an increase in information asymmetry. Short food supply chains, including farmers' markets, offer potential solutions to these issues. Currently, farmers' markets are primarily found in the United States and the European Union, and their impact on sustainability has gained significant attention. However, the relevance of this traditional approach within modern supply chains remains largely unexplored. Thus, this study aims to examine the existing literature on farmers' markets using bibliometric techniques applied to 1,765 documents sourced from the Scopus and Web of Science databases spanning from 1955 to2022. The paper tracks the research trends associated with farmers' markets by identifying the stages of evolution of key topics, articles, journals, author citations, and co-citation networks. The findings demonstrate an increasing trend in publication of papers on this subject, highlight five interconnected areas of market research, and provide a foundation for future research and policy making by outlining the main and specific research avenues to explore.

Keywords: farmer’s market, bibliometric review, short food supply chains, performance analysis, science mapping, network analysis

1 Introduction

Food safety scandals and scares occurred at the end of the twentieth century, and the beginning of the twenty-first. Consumer commitment to healthier and more sustainable food has brought the topic of short food supply chains (SFSCs) or alternative food networks (AFNs) to the forefront [1, 2]. SFSCs have rapidly developed and become the subject of active scientific and

political debate in recent years [1, 3, 4]. Additionally, with the appearance of modern supply chains, relationships and communication between consumers and producers have decreased, leading to an increase in information asymmetry and a decrease in consumer trust [5-7].

Local, shorter, and more economically- (higher producer prices), socially- (direct relationships between producers and consumers), and environmentally (reduced food miles) sustainable supply chains can help solve these problems, and SFSCs can be an alternative to global supply chains [3, 8]. Consumers and politicians play an important role in supporting these initiatives. Both the rural development initiatives of the European Union's Common Agricultural Policy (CAP) and the United States' Farm Bill support the spread of short supply chains [4, 9]. There are many types of SFSCs [10, 11], including farmers' markets (FMs), community-supported agriculture (CSA), box schemes, farm shops, farm-based butchers' shops, cooperatives, and other initiatives. While we are aware of the variety of SFSCs, FMs were chosen for examination in this article as they are currently the most popular and widespread form of SFSC [12-15]. FMs are the traditional and historical method of food retailing and, in some areas (mainly among developing and Mediterranean European countries), continue to be an important sales channel [16]. In Anglocentric countries (the United States, the United Kingdom, Australia, Canada, and New Zealand), traditional FMs have largely disappeared due to the advent of supermarkets [16]. However, modern FMs appeared in the 1970s [17], and the re-emergence of a new generation of FMs is ongoing. In addition, in many Central and Eastern European countries (Hungary and Poland) FMs emerged alongside traditional food self-provisioning practices [18].

Whether the FMs that have appeared since the second half of the twentieth century only satisfy the needs of niche market segments or are a relevant sales channel among modern food supply chains is a question that requires comprehensive research. The abundant related literature indicates the relevance of FMs both in the everyday lives of consumers and in the field of research. Therefore, this study aims to identify major research topics and define a research

agenda for FMs by describing a comprehensive bibliometric analysis. Reviews of FMs have been published that focus on aspects such as retail and direct marketing [19], tourism and urban areas [20], the relationship between FMs and nutritional issues, and nutrition incentive programs, FM customers' characteristics [21], and the facilitators of and barriers to FM use among low-income consumers [22]. However, to the best of our knowledge, only one bibliometric review has been published that focuses on FM actors, dynamics, and attributes [23]. However, this study only included items from a single literature database and excluded publications about state-funded public health initiatives and food assistance programs associated with FMs, and contained only a short section that applied network analysis techniques. Considering the exponentially growing literature on FMs in recent years, our analysis provides an updated and more holistic summary of the topic.

Our contribution to the existing literature is threefold. First, our bibliometric analysis makes a new contribution to pre-existing studies by considering FMs from a holistic perspective over the broadest time horizon, including the last few years, during which the number of publications focused on FMs has grown rapidly. Second, unlike most bibliometric reviews that rely only on a single database, we combined the two largest databases (Web of Science and Scopus) to include the most relevant publications in the analysis. Third, we applied the most advanced techniques of bibliometric analysis (including science mapping and network analysis) to provide a comprehensive overview.

Our investigation aims to identify the pillars of the relevance of modern FMs. First, we present a descriptive review of publication trends, major countries and institutions, and journal sources. After this, we describe a computer-assisted bibliometric analysis that was undertaken to provide fresh and unique insights into past and present research, highlight the main studies on FMs, and define specific avenues for further work by researchers, decision-makers, and policymakers.

Unlike other SFSCs, FMs are widely supported and funded by local and regional governments [4, 24]. Accordingly, we seek to answer the following research questions (RQs):

- RQ1: How has the literature on FMs evolved?
- RQ2: Who are the most impactful authors that have published on this topic?
- RQ3: In which countries and institutions do the most influential authors work? How are research networks and groups developing?
- RQ4: Which main publications have influenced the topic most?
- RQ5: Which scientific journals generate the most knowledge about FMs? Which scientific journals have the potential to be publication outlets for such articles?
- RQ6: What were the dominant themes and topics associated with FMs in past years?
- RQ7: What are the limitations of studies on FMs, and which topic(s) associated with FMs should/will be studied further? What research agendas and patterns related to FMs are likely to emerge?

The rest of the paper is organized as follows. The following section provides an overview of the theoretical background of FMs. Section 3 describes the materials and the methodology that were used. Section 4 illustrates the results of bibliometric analysis, including descriptive statistics and more complex econometric tools. Section 5 concludes, and the last section reflects on the limitations of the research and specifies research directions for the future.

2 Overview of the empirical literature focusing on farmers' markets

Farmers' markets are markets that are held regularly in a public area eitherin an institution or the open air, where farmers and livestock farmers sell locally grown agricultural products directly to consumers [25-27]. Farmers' and reseller markets were often mixed in the past, but as the function and differentiation of farmers' markets became more important, reseller participation began to be regulated [27, 28]. In the case of FMs, the boundaries associated with

small-scale producers (vendors) and consumers are well-defined. However, the rebalancing and redistributing of bases of power are occurring to make local food more visible to consumers [19, 29]. Despite this, there are many significant differences in the definitions, forms, operations, and product mixes of FMs [20, 25, 27, 28]. Selling and buying in FMs is associated with numerous advantages from the perspective of the producers and consumers who participate in them, and this type of SFSC may be a solution to social, economic, and – in some cases – environmental sustainability challenges.

FMs allow vendors to sell their products directly to consumers through direct contact with them [30-32]. In many cases, they represent a profitable alternative to the low prices associated with commodity markets (supermarkets) connected to the industrial agricultural system. Money that remains in the local economy may cover the wages of local employees, the purchase of local products, or the development of the economy [33, 34]. From a social point of view, FMs can reconstruct rural and urban links and generate further health benefits (e.g., easier access to fruits and vegetables in larger settlements). Farmers can get to know their consumers and other producers better, helping share experiences (for example, in the field of marketing or business) [35, 36]. FMs often significantly increase employment and local tax revenue [32, 37]. Owing to local sales, food is not usually transported over long distances (fewer food miles), in contrast to the logistics systems used by, for example, supermarkets. Furthermore, less use of packaging material and fertilizers and a reduction in food waste have also been claimed [29, 38, 39].

Consumers can access mostly fresh, high-quality, healthy local products at competitive (often perceived as lower) prices and partake of the atmosphere and experience of the FM [25, 32, 40-43]. Despite the common perception of low prices at FMs, consumers are often willing to pay a premium for local products [44, 45]. In addition, transparency and the creation of relationships and trust are valued. FMs allow customers to build deeper relationships with customers and provide a meeting place for friends and communities [46-49]. In the United States, there are

several state public health initiatives and food assistance programs related to FMs aimed at helping people, mainly those with a lower income, to obtain healthy, nutritious food [29, 50-52]. FMs may also help consumers learn more about local products, production methods, and sustainable growing practices [29, 35, 53].

However, we must not forget that short food supply chains, including FMs, have downsides, and the positive effects cannot always be scientifically proven. Long food supply chains and industries may be more sustainable [54, 55]. Hygiene and cleanliness may be negative aspects of such markets, even though in the developed world strict rules apply to the conditions under which FMs operate [56]. As FMs have grown in popularity, many vendors at FMs do not necessarily continue to represent their initial core values, confusing or misleading consumers, which has implications for the certification of FMs and the expectations of customers [57, 58]. Moreover, and perhaps the most important aspect, high prices at FMs can be a significant obstacle to their wider use, althoughprices at FMs may be close to those associated with mainstream retail outlets due to the pandemic and the recent food inflation [59].

While food quality, food price, and market atmosphere (mainly social interaction) are the primary attractions of FMs, customers who are liable to value the factors mentioned above have well-defined socio-demographic characteristics. Women tend to visit FMs more often than men, but perhaps only because women are the primary food purchaser in many households [19, 41, 42, 60, 61]. There is relatively wide variation in customer age among countries and continents, but in general, the typical FM consumer is between 35 and 55 years old [31, 60, 62-64]. Consumers interested in FMs are more educated than average; this tendency is characteristic of almost all SFSCs [12, 64-66]. In terms of demographic characteristics, examining the income situation of FM customers is one of the most challenging tasks, but it is often discussed in the literature. Most studies find that members of the middle or upper-middle class are typical FM consumers [41-43, 60, 63, 67, 68].

3 Methodology

Bibliometric reviews are widely used to identify trends in specific research domains. These reviews involve applying statistical tools to a large sample of publications [69]. The methods, such as trend and network analysis, allow researchers to measure the impact of research trends and analyze the structural characteristics of a specific research field [70]. The number of publicationsusing this methodology in business, economics, and social sciences is growing [71]. However, to our knowledge, only one bibliometric study has addressed the topic of FMs. Based on a sample (n=438) derived from Scopus, Figueroa-Rodriguez, Alvarez-Avila [23] investigated the actors, dynamics, and attributes of FMs by applying performance analysis and science mapping. Therefore, to contribute to existing literature, this paper uses a bibliometric analysis to detect the most important research trends and to understand the research patterns related to FMs, one of the most traditional marketing channels for agricultural and food products.

Among the recently published bibliometric reviews, there is no consensus on which bibliometric database to use. However, in many cases, Google Scholar, Web of Science (WoS), and/or Scopus have been investigated [72]. In our bibliometric analysis, priority was given to peer-reviewed publications in English. Therefore, we did not consider Google Scholar, as it is includes mostly unpublished materials and a large share of non-English publications [73]. Recent bibliometric studies in the field of business studies have used the WoS database [74-76] or Scopus [1, 77-79] However, only a few studies have used both databases simultaneously [80]. For our study, we include both WoS and Scopus to identify a wider range of high-quality and peer-reviewed publications [80] considering the advantages and disadvantages of each [81] and to contribute to the literature with a more complex approach.

For the study, the authors used several software and online platforms to build and analyze an accurate and reliable database. First, to collect and maintain references, search items were imported into the software EndNote [82]. Next, we used the Covidence online platform to identify duplicates and non-relevant studies [83]. Finally, we used the R programming language and a dedicated Bibliometrix package for the bibliometric analysis [77, 84].

Publications satisfying the search criterion of including "farmer* market" in the title, abstract, author keywords, or keywords plus (WoS) or title, abstract, or keywords (Scopus) were all considered. The search was run on August 23, 2022, thus including hits available until that time point. Publications that used other terminology (e.g., 'wet market' in the Asian context or simply 'market') in this selected research domain may have been excluded. However, our search term is the most commonly used *'terminus technicus'* for referring to markets where producers sell their products directly to consumers. In addition, by enlarging our research focus to include publications' titles, abstracts, and keywords, there was a higher probability of capturing relevant publications for our bibliometric analysis.

The initial database yielded over 3,020 hits, but after excluding duplicates and removing non-relevant studies, the final database for the bibliometric analysis consisted of 1,765 items (see Figure 1).

Our search included both Scopus and WoS databases; therefore, a three-stage process of duplicate removal was applied. First, the EndNote's de-duplication tool that focuses on Digital Object Identifiers (DOI numbers) was used [82], and then Covidence's duplicate detection was applied [85], which screens for matches between titles, publication years, volumes, and authors. Finally, the duplicated matching function in R was used to search for duplicates in the bibliometric database. The algorithm identifies records as duplicates if the title, abstract, or identification number are the same.

After removing duplicates, the authors manually screened the remaining database using the online Covidence platform. Only items published in English and peer-reviewed (research articles, review articles, books, and book chapters) were included. In addition, to identify non-relevant studies, the title and abstract screening method of Covidence was run to exclude studies that fit the mentioned criteria but focused on unrelated topics (farmers' market access or farmers' marketing schemes). Once the dataset was narrowed down to the final selection, we followed the guidelines of Paul, Merchant [86]. We applied the bibliometric techniques suggested by Donthu, Kumar [71] and Mukherjee, Lim [87].

First, we generated descriptive statistics (sections 4.1-4.6). The number of publications and citations helps to evaluate each topic's dynamics and importance. The most productive authors and countries and the collaboration map between countries show which individuals from where investigated FMs most frequently.

The next part of the analysis is science mapping (sections 4.7-4.13), starting with citation analysis. Identifying the most influential journals helps pinpoint the most important outlets for the studies, while the most influential papers are the most relevant studies published. Journal co-citations indicate the most relevant research avenues, while bibliometric coupling concentrates on sorting publications into thematic clusters based on shared references. The thematic analysis reviews the thematic evolution, identifies key topics by time, and maps them by relevance and degree of development.

Finally, a network analysis is provided (sections 4.14-4.15). The collaboration network illustrates the most relevant co-authors and their groups, and the historiogram puts the most important and related publications on a timeline.

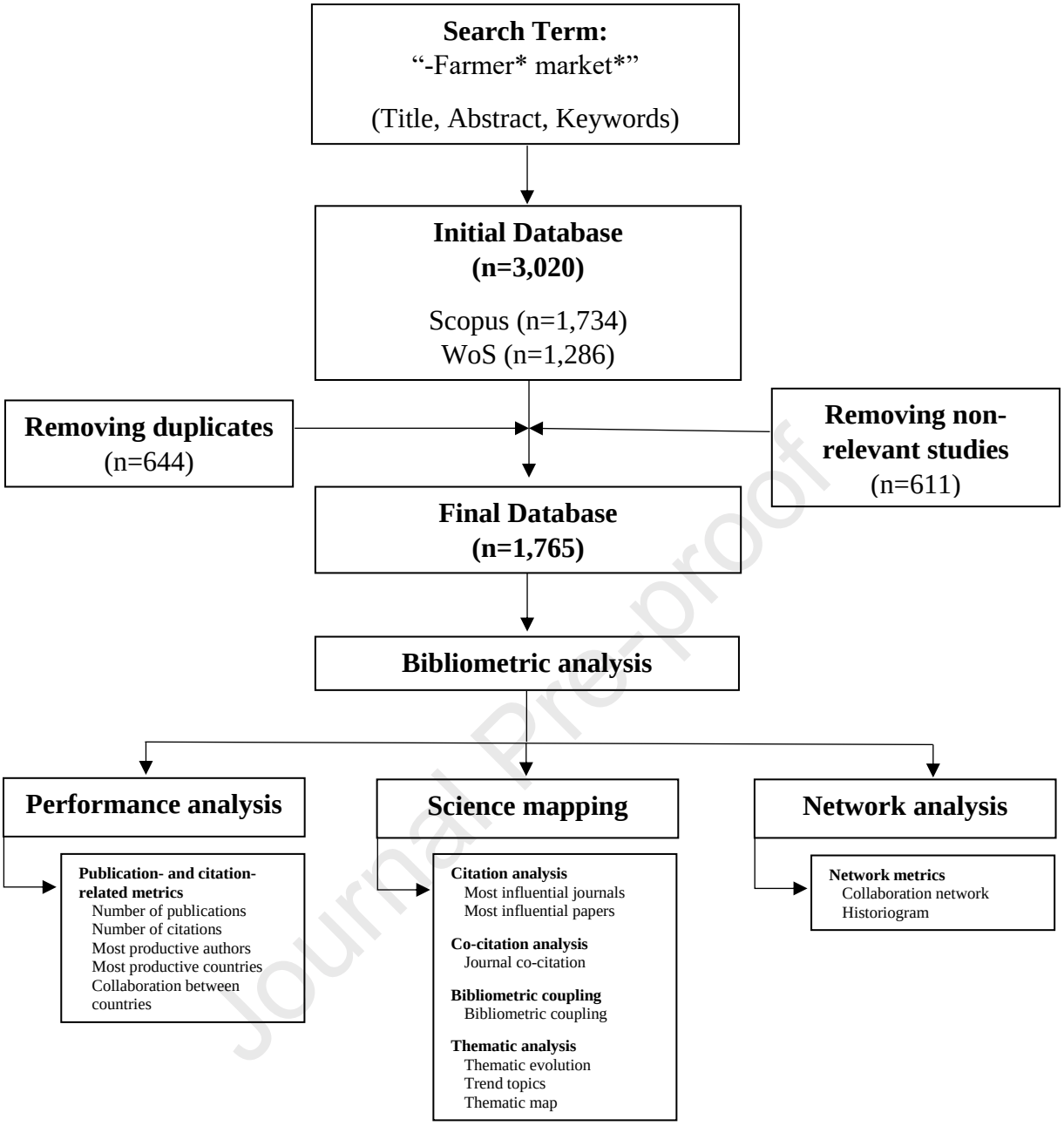


Figure 1 Research design for the bibliometric review related to the field of farmers' markets (FMs)

4 Results

4.1 Summary of quantitative results

Our study analyzed a total of 1,765 documents (referred to as the *database*) from 796 sources. These documents were contributed by 4,539 authors and spanned a period from 1955 to 2022. The majority of documents were research articles (1,577), but 25 books, 96 book chapters, and 67 reviews were also identified. On average, each publication had between three and four authors, and 8.1% of articles had co-authors from multiple countries. At the time of the analysis, the average age of the articles in our database is eight years, with a total of 54,416 references. Each article is received, on average, 15 citations, and the number of articles has been growing at an annual rate of 7.31% (Table 1).

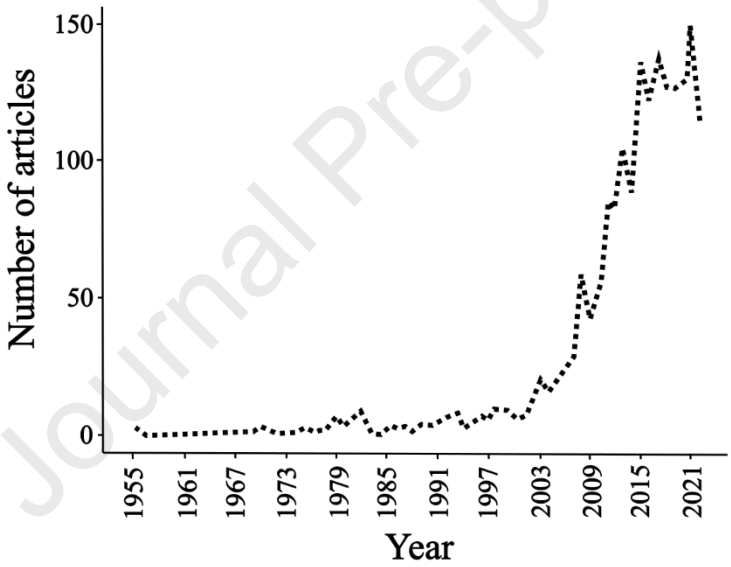
Database characteristics for the bibliometric review of farmers' markets (FMs)	
Documents	1,765
Sources (Journals, Books, etc.)	796
Keywords Plus (ID)	3,372
Author Keywords (DE)	3,649
Time Period	1955-2022
Average citations per doc	15.37
Annual Growth Rate %	7.31
Document Average Age	7.95
References	54,416
Authors	4,539
Authors of single-authored docs	315
Single-authored docs	360
Co-Authors per doc	3.48
International co-authorships %	8.102
DOCUMENT TYPES	
Article	1,577
Book	25
book chapter	96
Review	67

Table 1 Description of database containing farmers' markerts (FMs) publications

238

239 ## 4.2 Number of publications

240 The increase in the number of FM-connected scientific publications may be related to the
241 growing interest in research on agri-food supply chains in general, as identified over the last
242 two decades [88], and the rising number of FMs worldwide. Since the end of the twentieth
243 century, FMs have enjoyed a worldwide renaissance. The rising in the number of published
244 journal articles suggests that this research topic has recently been approched with a more
245 scientific perspective. Figure 2 shows the evolution of publications in this field.



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247 **Figure 2** Annual scientific production of farmers' market (FM)-related studies (1955-
248 2022). *Note: As the database was created in August, 2022, the data for 2022 do not cover a*
249 *full year.*

250 The pattern of FM-related publications can be divided into five stages (Table 2). The early stage
251 lasted from 1949 to 1999, during which only a few scientific publications were published. In
252 the USA, publications date back to the end of the 1940s [19], but in Europe, scientific activity
253 related to the topic started mainly after the 2000s. Farmers' markets have been significant
254 initiatives for the United States government and Canada since the 1970s [19, 89]; however,

most studies before 2000were based on articles in the popular press [19]. In Europe, the number of modern FMs started to grow only at the end of the 1990s [90, 91].

The second phase spans from 2000 to 2008, during which the number of publications began to rise. In the early 2000s, publications mainly focused on alternative food networks [2, 92-94]. During this period, an important event in the USA was the transition from food stamps to a debit-card format known as the Electronic Benefits Transfer (EBT) system). This change temporarily had negative impact on money spent at FMs [95, 96], resulting in fewer studies conducted in the USA.

The third stage, identified as 2009 to 2013, followedthe global financial crisis, and witnessed an increase in the number of publications. This period was influenced by the number of publications related to the Supplemental Nutrition Assistance Program (SNAP) in the USA. The effects of the 2008 Farm Bill unfolded during this period, with increased funding for EBT/SNAP access at FMs. From 2011 onwards, the USDA started providing $4 million per year to support EBT at FMs [96], also increasing the amount of the related literature.

A rapid upward trend can be seen during the fourth stage (2014-2019), with the number of publications reaching almost 150 per year. During this period, short food supply chains received increasing attention and the number of publications began to rise rapidly [1, 97]. Spending on SNAP benefits at FMs also started to increase. In 2017, $24.4 million in SNAP benefits were redeemed at FMs in the USA, an increase of 35.2% over 2012 [98].

The last stage was from 2020 to present days when the number of publications reached its highest point. A substantial increase occurred from 2020 onwards, reflecting the impact of COVID-19 and its implications for FMs. Based on this pattern of development (e.g., the rise of FM-relatod publications) and recognizing the repeated importance of sjort food supply chains, another increase may be expected after relief from the COVID-19 crisis.

Stages	Years	Stage name
1.	1955-1999	Early stagnation
2.	2000-2008	Initial growth
3.	2009-2013	Post-crisis boom
4.	2014-2019	Blooming stage
5.	2020-2022	Impact of COVID-19

Table 2 Periods in research defined according to the volume of publications based on a bibliometric review of farmers' markets (FMs) from 1955 to 2022

4.3 Number of citations

The average number of global citations in our database fluctuates enormously. 'Global citations' refers to the total number of citations defined in Scopus and WoS, including some citations from outside our database. In contrast, 'local citation' refers to the number of times one publication cites another within our 1,765 document database. The general citation structure shows that only 11 papers have more than 200 global citations (0.7 % of the total), and only 39 publications have more than 100 citations (2.2%) (see Table 3). At the opposite end of the scale, 349 papers (1.6 %) had no citations, and most papers were cited less than 50 times (72.7 % of the total).

Number of citations	Number of papers	% of papers
Over 200	11	0.6%
Between 100 and 200	28	1.6%
Between 50 and 100	93	5.3%
Less than 50	1284	72.7%
0 citations	349	19.8%
Total	***1765***	***100%***

Table 3 General citation structure of farmers' markets (FM) publications in a bibliometric review from 1955 to 2022

4.4 Most productive authors

An author's influence reflects their prominence in a particular research field, measured by the number of times the publications in which the particular author has contributed are cited.This

allows identification of the most relevant authors in a field of knowledge [99]. Table 4 shows the top ten most cited and most published authors in the database who, through their work, have contributed to the growth of the respective fields. These authors stand out because of the number of their publications, citations or both. Freedman is the most published and cited author, with 18 articles and 196 citations. In terms of citations, he is followed by Ammerman (188), McGuirt (186), Pitts (146), and Wu (134). Among them, Ammerman, Freedman and Pitts have the longest publication periods of 16, 11 and nine years respectively. The most productive and cited authors are almost all active in the USA, except for Joseph, and Smithers, based in Canada (University of Guelph). This clearly shows the importance of the USA to the topic of FMs. The top five most productive authors are researchers from the University of North Carolina, the University of South Carolina, and East Carolina University.

Author	**Institution**	**Number of published articles**	**Author**	**Institution**	**Number of citations**
Freedman	University of South Carolina	18	Freedman	University of South Carolina	196
Pitts	East Carolina University	17	Ammerman	University of North Carolina	188
McGuirt	University of North Carolina	14	McGuirt	University of North Carolina	186
Ammerman	University of North Carolina	13	Pitts	East Carolina University	146
Wu	East Carolina University	12	Wu	East Carolina University	134
Morales	University of Wisconsin	11	Alkon	University of the Pacific	126
Sommer	University of California	11	Brown	Tufts University	125
Smith	Southern Illinois University	10	Joseph	University of Guelph	113
Ward	East Tennessee State University	10	Smithers	University of Guelph	113
Di Noia	William Patterson University	9	Keyserling	University of North Carolina	105

Table 4 The top ten most published and most cited authors in the topic of farmers markets' (FMs) based on a bibliometric review from 1955 to 2022

4.5 Most productive countries

Scientific production associated with FMs is spread mainly over twenty-nine countries, from which authors have produced at least one article on this topic (Figure 3). In terms of the national affiliations of the corresponding authors, the leading nation is the USA, with 836 publications (47.4% of all articles in the database), of which only 15 publications had co-authors from other countries. The topic's popularity in the USA is likely due to legislation that supports establishing and operating FMs and the various health programs that rely on the benefits of products available at FMs. China is ranked second (93 publications, of which 25 publications had co-authors from other countries), followed by Canada (75 publications, of which 7 publications had co-authors from other countries), Australia (60 publications, of which 13 had co-authors from other countries), the United Kingdom (48 publications, of which nine had co-authors from other countries), Italy (45 publications, of which seven had co-authors from other countries), and Germany (28 publications, of which seven had co-authors from other countries) (Table 5). However, it should also be considered that as the bibliometric review included only publications written in English, this might result in a biased outcome towards publications of English-speaking countries.

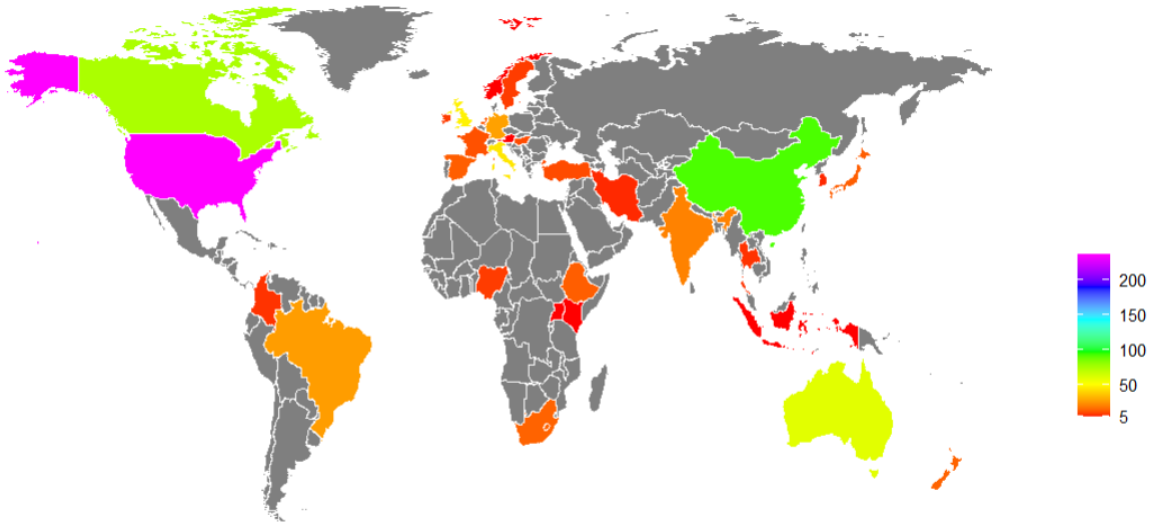


Figure 3 Most productive and most cooperative countries publishing on the topic of farmers' markets (FMs) based on a bibliometric review from 1955 to 2022

4.6 Collaboration between countries

Farmers' markets have attracted research interest around the world. This promotes global social networks and generates collaboration among authors from different countries. The affiliation of co-authors on a publication determines the network of cooperation between countries. Therefore, collaborative networks are analyzed according to the origin of the publication's first author. The USA is the most frequent international collaborator, mainly with China (16 publications), Australia (six publications), and the United Kingdom (five publications) (Figure 4). Interestingly, emerging FMs in Africa are usually investigated through international cooperation with European (primarily German) co-authors (Table 6). This suggests that collaboration of authors from developing countries with developed countries could help to increase the literature on FMs in the developing world.

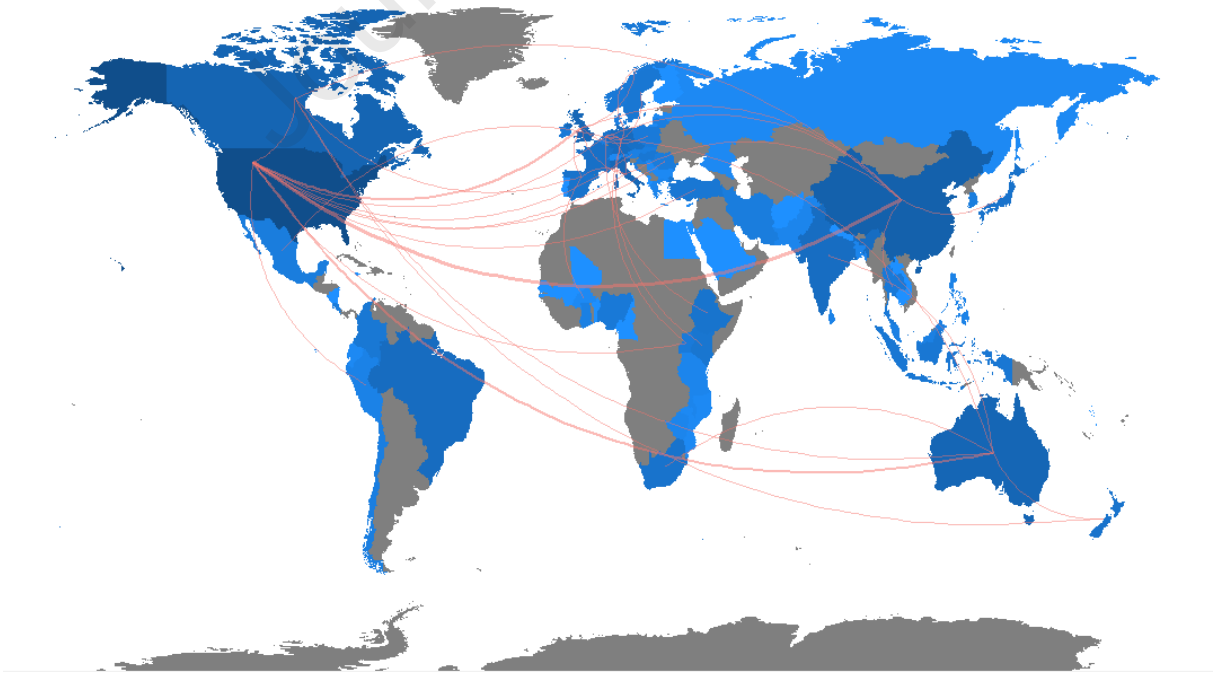


Figure 4 Collaboration map between countries in the filed of farmers' markets (FMs) based on results of bibliometric review on the topic of FMs between 1955 and 2022.

4.7 Most influential journals

Table 7 shows the top ten journals in terms of number of relevant published articles and the number of local citations (Local citations mean the number of times one publication cites another within our 1,765 document database). The articles from these journals represent 19.5% of the total (345 of the 1765 documents in the database). The Journal of Agriculture Food Systems and Community Development is the most relevant publication, with 60 published articles. There is some overlap among the top ten journals by relevance and citations. The fourth and fifth most relevant journals (Agriculture and Human Values, Public Health Nutrition) are also prominent regarding citations (second and third rank, respectively). The journal with the most local citations is the Journal of Rural Studies, with 906 local citations.

Sources	Number of Articles (published)	Sources	Number of Articles (local citations)
Journal of Agriculture Food Systems and Community Development	60	Journal of Rural Studies	906
Journal of Hunger & Environmental Nutrition	47	Agriculture and Human Values	636
Journal of Extension	37	Public Health Nutrition	504
Agriculture and Human Values	35	Journal of the American Dietetic Association	502
Public Health Nutrition	34	American Journal of Agricultural Economics	429
Sustainability	34	Sociologia Ruralis	428
British Food Journal	28	American Journal of Preventive Medicine	415
Preventing Chronic Disease	25	American Journal of Public Health	411
Journal of Nutrition Education and Behavior	24	Food Policy	388
Journal of Food Protection	21	Journal of Nutrition Education and Behavior	382

Table 5 The top ten journals in terms of number of published articles relevant to farmers' markets (FMs) and number of local citations (the number of times one publication

353 cites another within our 1,765 document database), based on results of a bibliometric review
354 on the topic of FMs between 1955 and 2022.

355 **4.8 Most influential papers**

356 Table 8 displays the ten most influential papers in the field of FMs based on the total number
357 of local citation (LCs; the number of times one publication cites another within our 1,765
358 document database.) and global citations (GCs; the total number of citations defined in Scopus
359 and WoS, including some citations from outside our database). There is a remarkable difference
360 between LC and GC values measured with a t-test (t-value: -5.572; $p<0.001$) at a 1%
361 significance level. Generally, it takes time for a paper to be cited. Accordingly, most of the
362 highly cited papers in Table 8 are over a decade old; the only exception is a systematic review
363 by Freedman, Vaudrin [22] published in 2016. The most cited article published by Brown [19]
364 received 78 local and 141 global citations and summarizes the documents published in FMs
365 between 1940 and 2000. The second most cited article with 75 LC and 222 GCs is also a review
366 of specialized literature between 1980 and 2009, which deals with the nutritional implications
367 of FMs [100]. The most cited piece of empirical research (74 LC and 127 GC) written by Hunt
368 [67] investigates linkages between producers and consumers at FMs with the help of a consumer
369 and a producer survey.

Rank	Author(s)	Title	Year	Journal	Local citations	Global citations
1	Brown	Farmers' market research 1940–2000: An inventory and review	2002	American Journal of Alternative Agriculture	78	141
2	McCormack et al.	Review of the nutritional implications of farmers' markets and community gardens: a call for evaluation and research efforts	2010	Journal of the American Dietetic Association	75	222
3	Hunt	Consumer interactions and influences on farmers' market vendors	2007	Renewable Agriculture and Food Systems	74	127
4	Smithers et al.	Unpacking the terms of engagement with local food at the farmers' market: Insights from Ontario	2008	Journal of Rural Studies	60	138
5	Kirwan	Alternative strategies in the UK agro-food system: interrogating the alterity of farmers' markets	2004	Sociologia Ruralis	57	193
6	Holloway & Kneafsey	Reading the space of the farmers' market: a preliminary investigation from the UK	2000	Sociologia Ruralis	55	202

7	Herman et al.	Effect of a targeted subsidy on the intake of fruits and vegetables among low-income women in the Special Supplemental Nutrition Program for Women, Infants, and Children	2008	American Journal of Public Health	54	192
8	Freedman et al.	Systematic review of factors influencing farmers' market use overall and among low-income populations	2016	Journal of the Academy of Nutrition and Dietetics	52	84
9	Larsen & Gilliand	A farmers' market in a food desert: Evaluating impacts on the price and availability of healthy food	2009	Health & Place	50	129
10	Racine et al.	Farmers' market use among African-American women participating in the special supplemental nutrition program for women, infants, and children	2010	Journal of the American Dietetic Association	50	62

Table 6 Most influential (cited) papers in the field of farmers' markets (FMs) based on results of a bibliometric review on the topic of FMs between 1955 and 2022. *Note: Local citations refer to the number of times one publication cites another within our 1,765 document database; and global citations refer to the total number of citations defined in Scopus and WoS, including some citations from outside our database*

4.9 Journal co-citation

Figure 5 shows the three major clusters of journals in the co-citation network. The authors aimed to create a parsimonious network that captures the most important co-citation relationships in the field of FM. The first cluster includes top journals in the field of social science and policy. These journals include Agricultural and Human Values, Journal of Rural Studies, Renewable Agriculture and Food Systems, and American Journal of Agricultural Economics and Food Policy. These multidisciplinary journals publish work with diverse theoretical perspectives and methodological approaches on the economics of agriculture and food systems, natural resources, sustainability, the environment, and rural and community development and policy issues worldwide. The second cluster includes journals focusing on nutritional and health-related issues such as the Journal of the American Dietetic Association, Journal of Hunger & Environmental Nutrition, American Journal of Public Health, Public Health Nutrition, and American Journal of Preventive Medicine. These journals publish articles on public health, health policy issues, nutrition-related and ecological problems, prevention

research, dietetics, and practice. Finally, there is a third smaller cluster that includes four journals (Applied and Environmental Microbiology, Food Control, International Committee on Food Microbiology and Hygiene, and Journal of Food Protection), which deal with all aspects of food microbiology, genetic and molecular investigations, food safety and protection. This thematic distribution indicated by the journals' co-citations illustrates the most relevant research avenues associated with FMs.

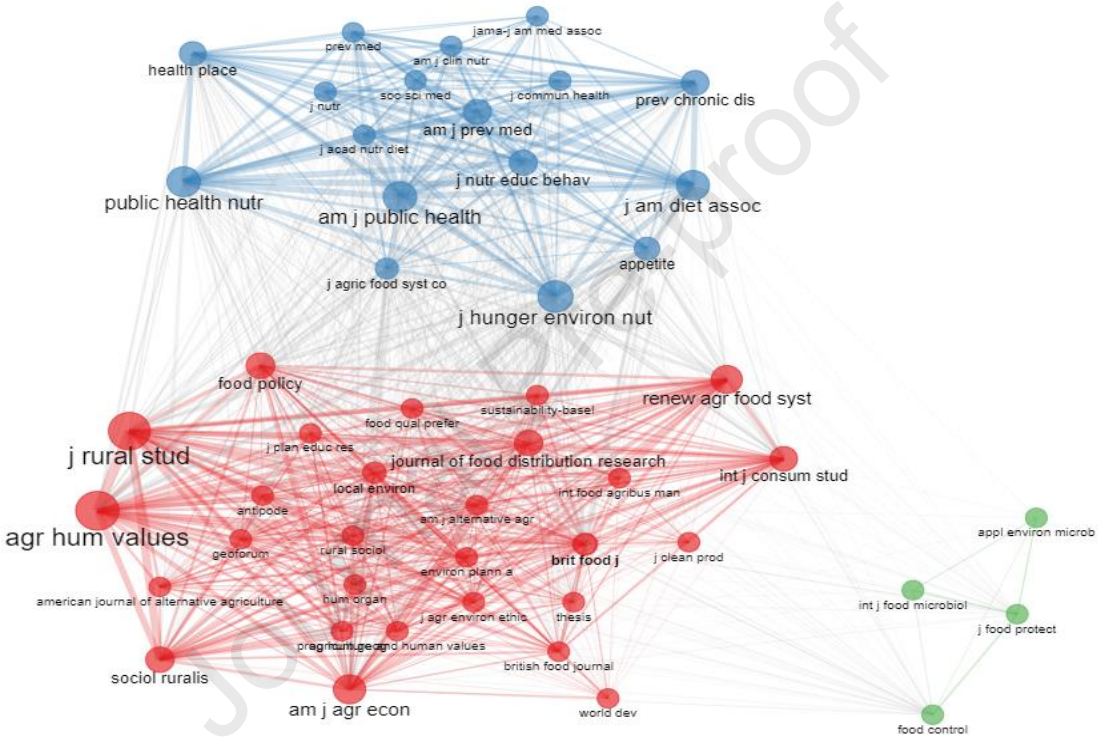


Figure 5 Co-citation network of journals on the topic of farmers' markets (FMs) based on the results of a bibliometric review on FMs between 1955 and 2022. *Note: The red cluster indicates journals in the field of social science and policy, the blue cluster indicates journals related to nutritional and health-related topics and the green cluster indicates journals that focus on all aspects of food microbiology, genetic and molecular investigations, food safety and protection.*

4.10 Bibliometric coupling

Using the method of bibliometric coupling, the most relevant journals (i.e., those with the most citations in the database) were identified based on the keywords. In Figure 6, the size of nodes refers to the journal's relevance. The analysis revealed three clusters that suggest the most concentrated research areas of FMs. The most highly cited group of journals (marked in red) addresses the agricultural and food aspects of FMs, including topics highlighted by keywords such as alternative food networks, food systems, and food safety. The second most highly group of journals focus on nutritional and health topics (blue). This cluster primarily emphasizes understanding the key drivers of the food environment, nutrition, and food access. In the third cluster (green), journals focused on rural and regional topics and renewable agriculture are collected. This research stream provides information on FM-related studies associated with sustainability keywords, willingness to pay, and fresh produce. This indicates that currently, and based on the keywords used in this bibliometric review, sustainability and environmental issues are not being intensively dealt with yet but may receive more emphasis in the future.

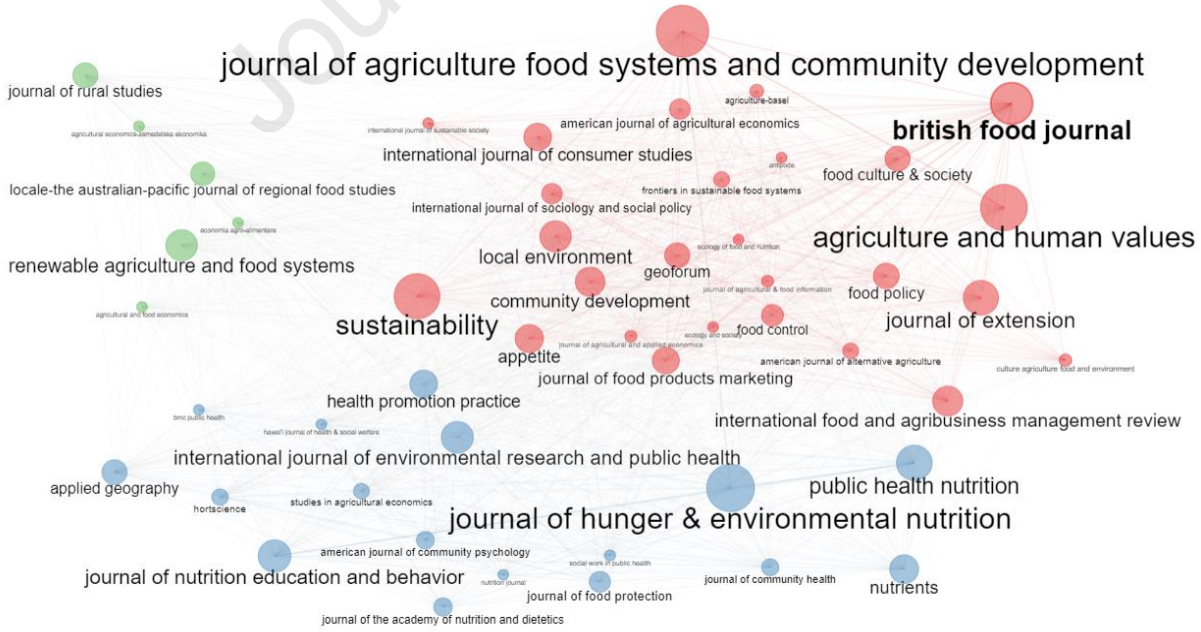
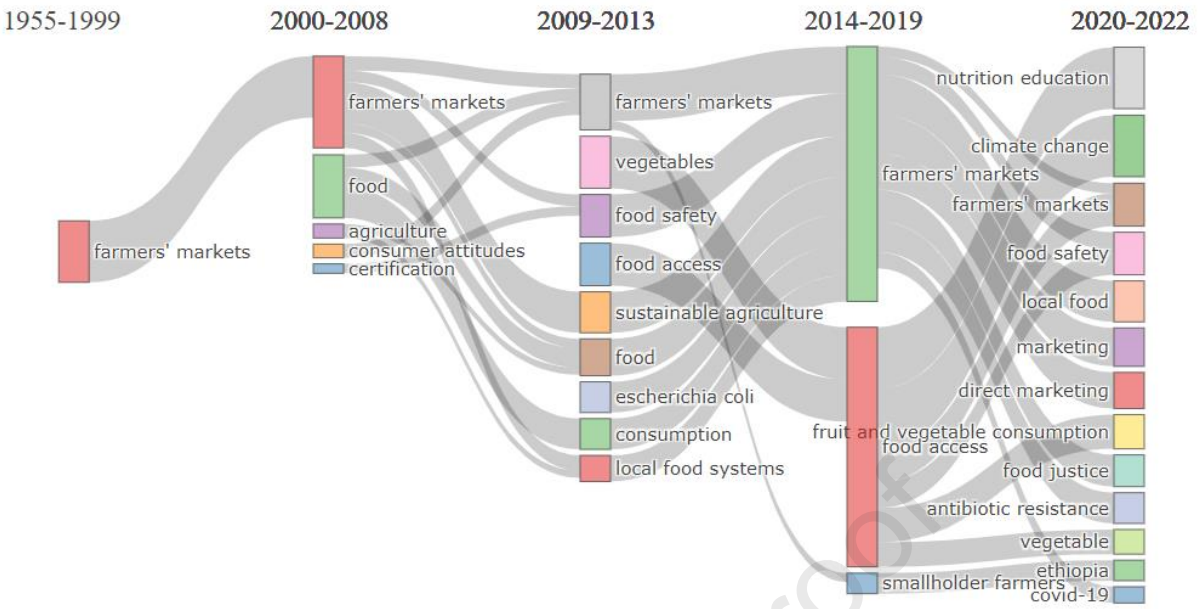


Figure 6 Bibliometric coupling of journals with publications on the topic of farmers' markets (FMs) based on the results of a bibliometric review on FMs between 1955 and 2022. *Note: The red cluster indicates journals addressing the agriculture and food aspects of FMs, the blue cluster indicates journals addressing nutritional and health topics, and the green cluster indicates journals that focus on rural and regional topics, and renewable agriculture.*

4.11 Thematic evolution

Figure 7 depicts the thematic evolution of FM literature since 1955. The figure illustrates the history of the themes and how they have evolved based on the keywords. Until 2000, the most frequently used keyword(s) is farmers' markets, and continues to dominate the research keyword(s) throughout the time period reviewed. In the early 2000s, other keywords such as food, agriculture, consumer attitudes, and certification emerged, which served as a basis for the key topics of the next period (food safety, sustainable agriculture, food consumption, and local food systems). Between 2009 and 2013, new keywords such as food access, vegetables, and food safety (e-coli related) research also appeared. Between 2014 and 2019, fewer key themes were identified (farmers' markets, food access, and smallholder farmers). In contrast, the focus was more diverse over the last three years, albeit centered on specific topics derived from previous ones. The longitudinal thematic map indicates how sophisticated FM-related studies have become in recent years, putting issues such as nutrition education, climate change, food justice, and COVID-19 onto the research agenda.

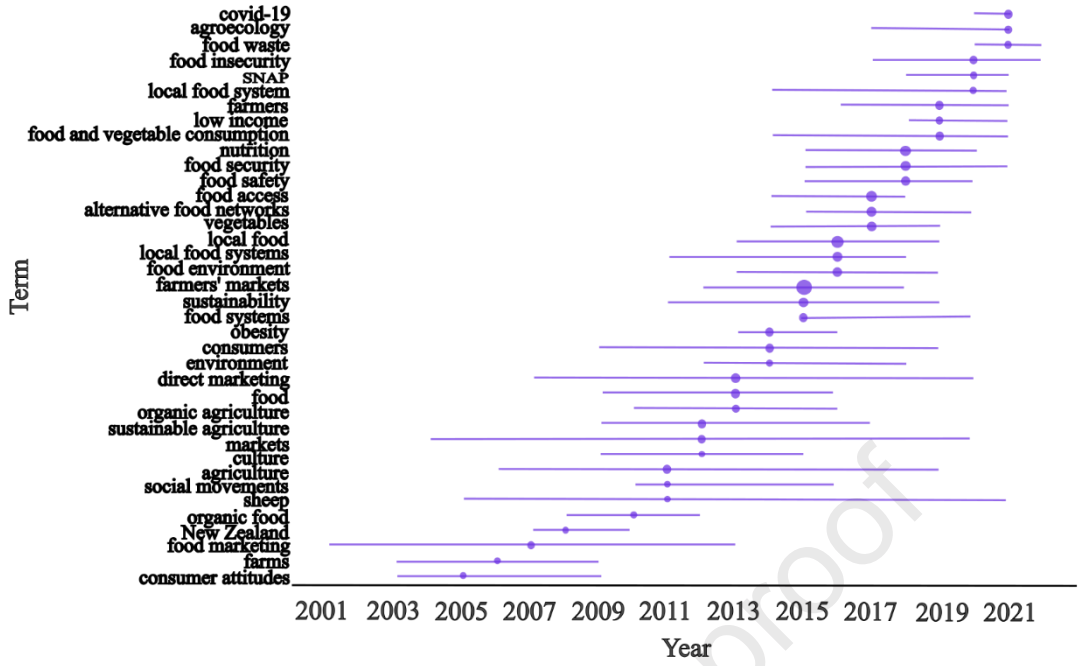


436

437 **Figure 7** Thematic evolution of the keywords of publications on the topic of farmers'
438 markets (FMs) based on result of a bibliometric review on FMs between 1955 and 2022

439 **4.12 Topic trends**

440 Topic trends have evolved over the last two decades. Figure 8 illustrates the most frequent
441 keywords and the period they were identified in. Node size refers to frequency. The most
442 common keywords (local food, food access, alternative food networks, sustainability) were
443 identified between 2015 and 2017, while the most recent publications tend to cover COVID-
444 19, food waste, and food insecurity-related issues. However, it should be noted that keywords
445 often identified in the early 2000s (consumer attitudes, food marketing) were not identified.
446 Similar to the thematic evolution, topic trends also clearly illustrate that FM-related research
447 appears to have evolved together with the most important research domains related to food
448 systems. The most identified keywords (besides *farmers' markets*, local food, food access,
449 nutrition etc.) have appeared in the last decade, indicating that recent research focus is more
450 concentrated on specific (sub)topics.



451

452 **Figure 8** Topic trends in the field of farmers' markets (FMs) related research, based on
453 the results of a bibliometric review on the topic of FMs between 1955 and 2022

454 **4.13 Thematic map**

455 The thematic map classifies topics into four categories represented by four quadrants (Figure
456 9). The topics in the upper-right quadrant are represented at high density with strong centrality,
457 indicating well-developed and central issues in the research field that play a 'motor' role. Motor
458 themes are strongly related, relevant to other research topics, and strongly developed. For
459 example, many topics in this category relate to SNAP in the USA. This initiative is designed to
460 improve the American food environment by providing access to nutritious foods that are
461 available at FMs (fruit and vegetables, first and foremost) among other places. Besides nutrition
462 education, this also contributes to improving public health (for example, by reducing obesity).

463 The FM-related research domain's basic themes (lower right quadrant; Figure 9) rely on well-
464 known topics associated with the short food supply chain concept, like local food, local food
465 systems, alternative food networks, and direct marketing, complemented by their sustainability

measurement. This quadrant also includes some of the basic terminology, such as the keywords (agriculture, farmers, consumers, and markets) and the basic concepts of specific dimensions of the short food supply chains (health and community development).

Rural development can be considered a niche and standalone theme in relation to FMs. In addition, other topics like the market access and participation of smallholder farmers, together with earlier (organic farming) and recent (agroecology) hot topics identified by Figure 8, also belong to this quadrant (upper left quadrant; Figure 9).

Among the emerging and declining themes (lower left quadrant; Figure 9), food-safety-related issues were identified, such as whether fresh produce marketed by small farms at FMs is at higher risk than that available in conventional supermarkets. Another theme located in this quadrant is the effects of the COVID-19 pandemic that emerged in China and affected consumer behavior related to FMs.

Generally, as seen on the thematic map, most identified themes are either basic or motor. This indicates that the research field of FMs is relatively well organized and structured, with several connected niche and peripheral themes. Therefore, the role of FMs in restructured food supply systems in the post-COVID era, FMs versus supermarket comparisons, and the market access of smallholder farmers are likely to be focal areas of future research.

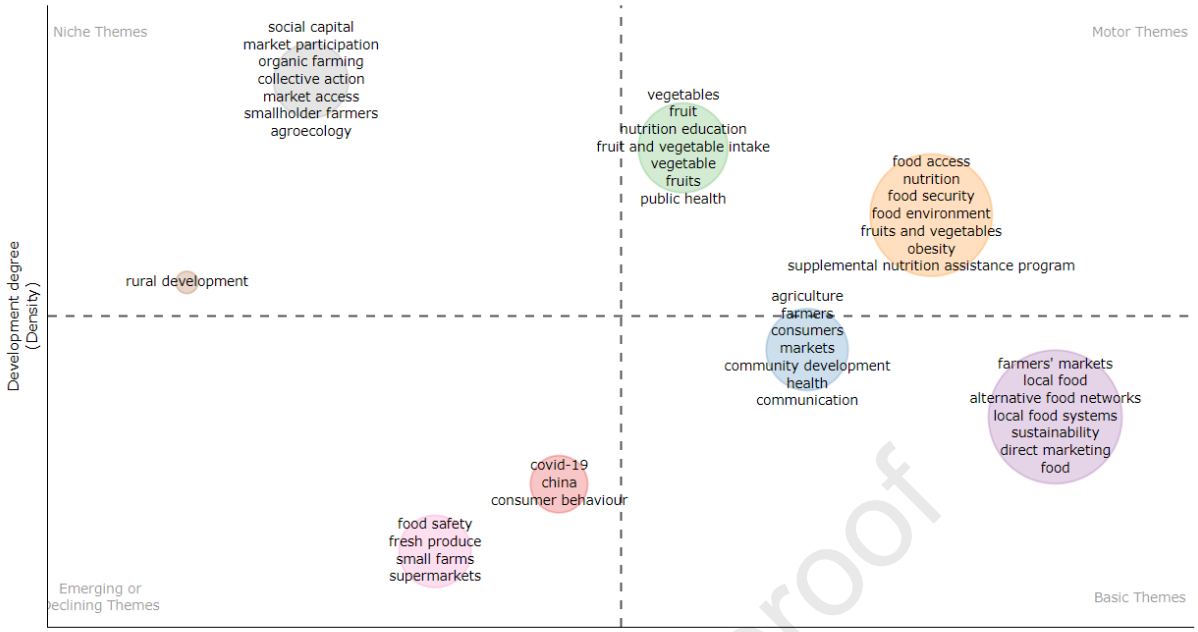


Figure 9 Thematic map of publications on the topic of farmers' markets (FMs) based on the results of a bibliometric review of FMs between 1955 and 2022

4.14 Collaboration network

Based on the co-authored articles, seven collaborative groups of authors with a determinative research focus can be identified (Figure 10). Food-safety-related issues at FMs have been frequently investigated in the USA (Gibson, Neal, and Sirsat – indicated by brown clor in Figure 10) and China (Zhang, Chen, and co-authors - red). The other research groups identified by our study all focus on the symbiotic relationship between the initiatives of the SNAP and FMs. The collaboration network identified by Ammerman, McGuirt, and Pitts mainly assessed SNAP participants' shopping and dietary behaviors at FMs (pink). At the same time, the fruit and vegetable intake of women (Affuso and Singleton - green) and children (Saxe-Custack, LaChance, and Hanna-Attisha - orange) have been the focus of many other FM studies. Sikorskij, Monica, and Di Noia also investigated the effect of nutritional education on FM-related attitudes and fruit and vegetable consumption (purple). Finally, the research group of

Friedman, Brandt, and Freedman specifically focused on assessments of the impact of establishing FMs at community health centers (blue). These results show that the most relevant identified groups of authors publish on food safety issues or SNAP-related topics.

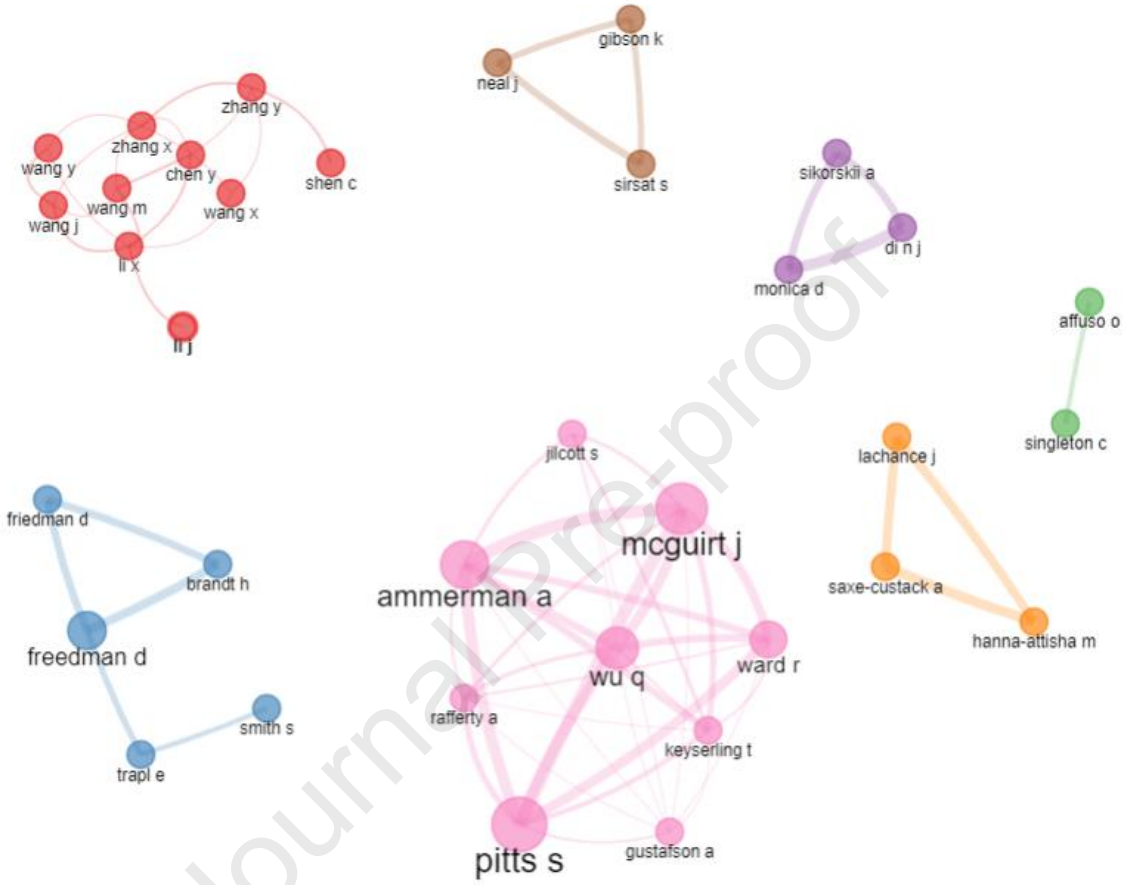
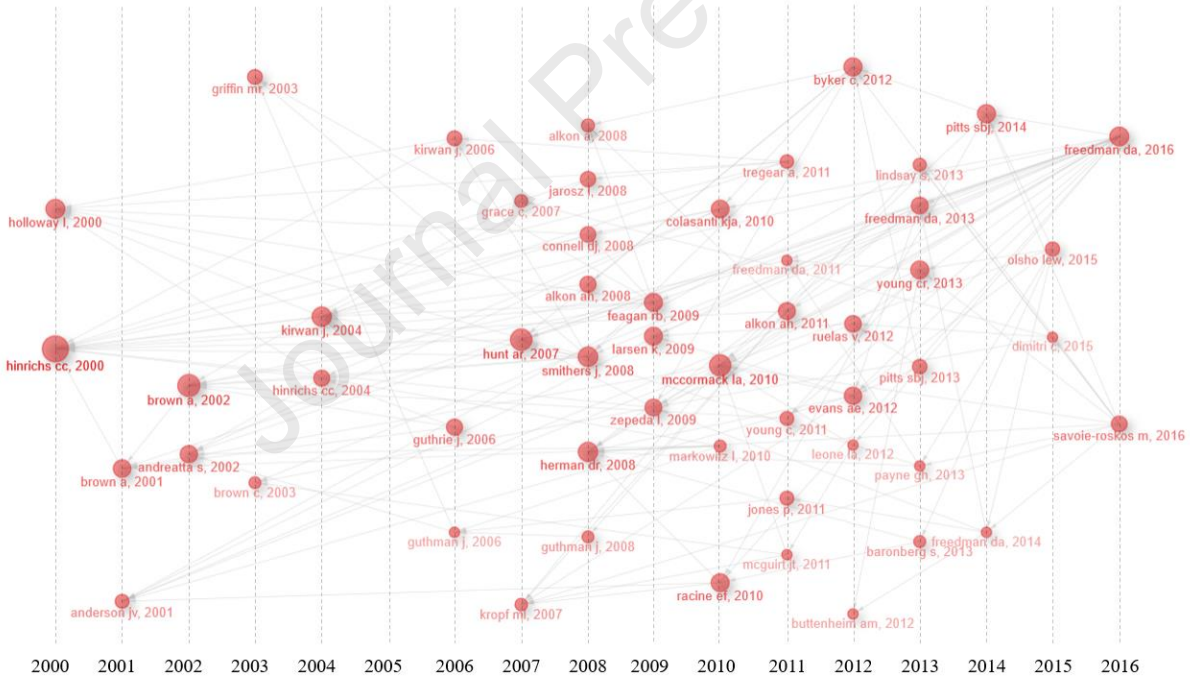


Figure 10 Author collaboration of publications on the topic of farmers' markets (FMs) based on results of a bibliometric literature on the topic of FMs from 1955 to 2022

4.15 Historiogram

Based on the LCs and GCs of the most relevant publications identified, a historiogram clearly illustrates the evolution of the FM-related research domain in the exponentially expanding period of 2000-2016 (Figure 11). The path analysis identified four research streams: one unique and three related outlets. The earliest and most distinct sub-branch identified in our study was initiated by Holloway and Kneafsey [101] with their examination of the emergence of FMs in

510 the United Kingdom and was expanded by the review of Tregear [102], which critically
511 reflected on the research agenda of alternative and local food networks, including FMs.
512 However, all three other sub-branches originate mainly from the seminal work of Brown [27],
513 who 'counted' the FMs in the USA, and Anderson, Bybee [103], who investigated the effects
514 of SNAP on fruit and vegetable consumption behavior. The upper research streams indicated
515 in Figure 11 are thus all related to FM research in an American context, including the impacts
516 of FM incentives on access to fruit and vegetables [104] and on food security [105], while the
517 concluding work of [22] identified the facilitators of and barriers to FM use, particularly among
518 low-income consumers in the USA. The historiogram, therefore, clearly illustrates the thematic
519 distribution and evolution of global FM research.



520

521 **Figure 11** Historiogram of the development in farmers' market publications based on
522 results of a bibliometric review on the topic of FMs between 1955 and 2022

5 Discussion

This paper describes a bibliometric analysis between 1995 and 2022 applied to FMs to analyze the evolution of research trends and the current research dynamics of FMs. Farmers' markets have a centuries-long history, while their renaissance started in the second half of the twentieth century [19, 89, 90]. After the 2000s, FMs became an increasingly popular initiative in the English-speaking world, as seen in the increase in related publications, yielding an average annual growth rate of 7.31% in the analyzed period. Scientific publications related to FMs are spread over 29 countries. However, the modern FM literature is primarily defined by studies related to the American SNAP. In Europe, it is studied more in the context of SFSCs and in relation to the three pillars of sustainability (economic, social, and environmental). In contrast, food safety is the research focus in China and developing countries. The USA is clearly the most prominent country regarding the number of papers, followed by China and Canada. The most productive and most cited authors are also affiliated with North America, , with seven of the top ten cited publications focusing on US-related topics. The average number of citations per publication is 15; however, only 2.2% of the sample items have more than 100 citations.

Articles on FM are published mainly by food-related journals; even within this category, journals with a rural or nutrition focus dominate. In terms of the number of articles, the Journal of Agriculture Food Systems and Community Development ranks number one, while in terms of the number of citations, the Journal of Rural Studies is the most relevant publication outlet. The two most-cited articles are literature reviews

Using bibliometric coupling applied to the most relevant journals based on the keywords, three clusters were identified that show the focal areas of research on FMs: (1) agricultural and food aspects of FMs (keywords: alternative food networks, food systems, and food safety), (2) nutritional and health issues (keywords: food environment, nutrition, and food access), and (3)

547 rural and regional topics together with renewable agriculture (keywords: sustainability,
548 willingness to pay, fresh produce). The main areas and topics can also be differentiated in time
549 (Table 9).

550 During the early stage, from 1949 until the millennium, the research agenda of FMs was
551 established. Few scientific publications were published during this period [110-116], and those
552 mainly focus on the basics of FMs. In the early 2000s (second phase), the number of
553 publications began to increase. Significant publications were published not only in the field of
554 FM [19, 27, 67, 101, 117] but also on SFSC from a broader perspective [2, 4]. The third stage
555 began after the global world economic crisis and FMs received more and more attention in the
556 published literature. The motivations and characteristics of consumer purchases at FMs [21,
557 118-120], the effects of the opening of FMs in food deserts [107, 121, 122], the impact and
558 participation of SNAP [100, 108], and alternative agrifood movements [123] received
559 increasing emphasis during this period. In the final stage (2014-2019), the number of
560 publications grew exponentially (150 per year), but fewer key themes were on the research
561 agenda: the facilitators of and barriers to FM use and food access [22, 105, 124-127] were
562 popular topics, particularly with regard to low-income consumers. In the last stage, the average
563 number of publications per year peaked, and the focus was more diversified: developing
564 countries [128-130], food justice [131-134], climate change [130, 135], and direct marketing
565 [136] or COVID-19 [137, 138].

Period	Era	Keywords	Characteristics	Most cited publications of the period
1955-1999	Early stagnation	Farmers' market	Not many scientific publications about FMs in general	Sommer et al. (1980); Sommer et al. (1981); Lockeretz (1986); Park and Sanders (1992); McGrath et al. (1993); Lyson et al. (1995); Abel et al. (1999)
2000-2008	Initial growth	Farmers' market, food, agriculture, consumer attitudes, certification	Studies define the basics of the topic and numerous literature reviews	Holloway and Kneafsey (2000; Brown (2001); Andreatta and Wickliffe (2002); Brown (2002); Kirwan (2004); Hunt (2007);

				Herman et al. (2008); Smithers et al. (2008)
2009-2013	Post-crisis boom	Farmers' market, vegetables, food safety, food access, sustainable agriculture, food, Escherichia coli, consumptions, local food systems	Number of publications increased, U.S. consumers' consumption of fruit and vegetables, as well as SNAP, of major importance	Feagan and Morris (2009). Larsen and Grilland (2009); Zepeda (2009); Colasanti et al. (2010); McCormack et al. (2010); Racine et al. (2010); Alkon and McCullen (2011); Byker et al. (2012); Evans et al. (2012); Freedman et al. (2013)
2014-2019	Blooming stage	Farmers' market, food access, smallholder farmers	Fewer topics, primarily related to food access	Pitts et al. (2014); Dimitri et al. (2015); Freedman et al. (2016); Savoie-Roskos et al. (2016); Bryce et al. (2017); Saxe-Custack et al. (2018)
2020-2022	Impact of COVID-19	Nutrition education, climate change, farmers' market, food safety, local food, marketing, direct marketing, fruit and vegetable consumption, food justice, antibiotic resistance, vegetable, Ethiopia, COVID-19	Topics are very diverse, and the effects of COVID-19 appear.	Li et al. (2020); Plakias et al. (2020); Hansika – Wijerathn (2020); Torres et al. (2020; Pfeiffer et al. (2021); Richter et al. (2021); Rummo et al. (2021); Vericker et al. (2021); Cavite et al. (2022); Qi et al. (2022); Taylor et al. (2022)

Table 7 Thematic evolution of published literature related to farmers' markets (FMs) based on results of a bibliometric review on the topic of FMs between 1955 and 2022

5.1 Limitations and further research

Some limitations of the study should be highlighted. First, although most bibliometric reviews use one database [23, 74, 76, 139], in our research, relying on two databases (Scopus and WoS) may still have exlcluded some important FM-related papers. Despite analysing a narrow area of SFSCs, our final database contained 1,765 items; the inclusion of many publications may have created information and knowledge overload. Only the most-cited articles written in English were analyzed (non-English language publications were excluded). It would be possible to examine non-English publications more comprehensively. Second, due to the limitations associated with search-term-based reviews, some potentially relevant publications might have been excluded. Applying additional search terms to broaden the research focus might result in different outcomes. Another limitation is the application of bibliometric techniques. First, subjectivity cannot be ignored in the case of some analytical tools (visualization maps). The second is that the number of times a paper is cited does not necessarily

indicate the work's importance and quality since the analyzed publications may be recently published and the issue of self-citation may occur. Third, the authors' affiliations or home country can change over time; the analysis is only valid at the time of publication. Fourth, bibliometric analysis emphasizes past and present trends, limiting the possibility of identifying or determining future directions. This problem could be resolved to some extent by including grey literature (e.g., policy reports, blog posts) and documents in the initial phase of identifying publications.

With the help of the thematic map, we divided the topics into four categories: motor themes, basic themes, niche and standalone themes, and emerging or declining themes. Based on this, it is possible to suggest future research directions and identify some research gaps. A well-developed and central topic (motor theme) in the field of FMs is SNAP, which has been dominant since the 2000s. The main goal of SNAP is to put healthy and nutritious food (mainly fruit and vegetables) on the tables of mainly low-income American households [51, 100, 108, 115, 140-144]. The primary themes of FMs are related to local food, local food systems, and alternative food networks [43, 115, 143, 145-148]. The role of FMs in rural development [149-152] can be considered a niche area, including their effects on farmer income, job creation, money flow, and overall local economic development. Researchers could examine the market dynamics, pricing strategies (price differences between FMs and longer supply chains), and financial or sustainability viability of FMs, operations. The other niche topic is smallholder farmers – mainly their market access and participation [153, 154] and their role in organic farming [155, 156]. Both niche topics may start to grow in importance in the future since the publications of recent years have mainly focused on consumers. Furthermore, we identify two main emerging themes about which many papers may be published in the coming years: namely, the effects of the pandemic and post-COVID food supply chains [137, 138, 157-159], and Chinese food safety issues [160-162]. COVID has also accelerated the spread of new

606 digital technologies. In the United States, there are already new technological innovations (e.g.,
607 Mobile Farmer's Markets) in FMs [163, 164]. Adoption of these novel approaches is also
608 worthy to investigate, both from consumers' and producers' perspectives.

609 From a territorial perspective, one can also expect that popular research topics related to FMs
610 of the developed countries (e.g., sustainability, food sovereignty) might become part of the
611 research agenda related to developing countries' FM investigations.

612 Based on the authors' opinions and experiences, further research gaps and, thus, future research
613 areas can be identified. Short food supply chains (thus FMs) try to provide solutions to
614 environmental sustainability problems, but in many cases, their desired positive effects cannot
615 be clearly and scientifically proven [55, 165, 166]. It may also happen that the traditional food
616 industry involves more sustainable practices (for example, driving to FMs with a car can be
617 more "carbon intensive" [per kilo of product or produce] compared to super/hypermarkets). It
618 is also important to approach this from the consumers' perspective, whether they perceive
619 shopping at FMs as more sustainable than other food purchasing alternatives. From the
620 producers' and consumer's perspectives, future research could focus on the social relevance of
621 FMs (e.g., fostering community cohesion). More studies are needed to understand the
622 interactions, collaborations, and conflicts among the stakeholders. This research gap could be
623 explored through qualitative studies by analyzing different social relationships and networks
624 connected to FMs.

625 In addition, WTP research on FMs is a rather under-investigated topic. Such studies exist but
626 are usually conducted in the USA [62, 167]. This is a research gap both in Europe and in the
627 developing world. Furthermore, there is very little published literature on FMs and their
628 changing role in the developing world, even though FMs are important food purchasing
629 channels for many people in these regions. Finally, it also emerges from the literature that FM

customers are typically from the middle-aged or older age groups. There is a need for more research and measures that examine the relationship between younger age groups and FMs since their involvement in FMs could be animportant factor in terms of survival or further growth; an example could be research into FMs at universities) [12, 168].

By using a big-picture perspective, employing bibliometric tools, and summarizing the current research output and trends in this field, this study contributes to the discourse on FMs. The key rationale behind the present research was to uncover how the field of research of FMs has developed. The results of the study can help policymakers and researchers who are looking to explore this topic further obtain a better understanding of the authors, universities (with which they can form collaborative networks), countries, publications, and journals that have a strong influence on FM as well as major research gaps and future research directions.

6 Conclusion

Using a holistic approach, our bibliometric analysis offers insight into interdisciplinary and globally relevant FM-related publications. An initial finding is that FMs can be considered a source of nutritious foods mainly due to locally (regionally) produced fruit and vegetables. Also, in some countries (the USA and Canada in particular), FMs are highlighted as a special food marketing channel. In contrast, in developing countries and some parts of Europe (first and foremost, in Southern and Central-Eastern countries), FMs always were and still are part of the everyday food supply chain. In contrast, the FM studies focusing on cases in developing countries are somewhat limited in number and mainly cover food safety issues, such as whether food products bought from FMs are reliable compared to those purchased at conventional chains like supermarkets.

Based on our analysis, we can state that the literature on FMs has three main pillars. First, assessments of the policy tool of providing fresh, healthy, and nutritious food to vulnerable

American consumer groups via FMs, mainly those living in food deserts, are highly important in the research agenda. Second, in Europe, research on the contribution of FMs (as part of the SFSC concept) to sustainability measures associated with dedicated EU policies (including, among others, Farm to Fork and Green Deal) remains highly important. Third, the safety of foods purchased at FMs is still agenda key topic in many developing and developed countries.

Based on the outcomes of the study, several research gaps could also be identified. First, though the number of FMs and increase in related research is clear, there are still few publications on the real economic importance of farmers' markets and their relevance in global and national food supply chains. Are FMs only niche markets where small-scale producers can sell their products, or should they be considered as relevant food supply chains to be (further) supported?

Second, how important are the spatial differences (e.g., USA vs. EU, developed vs. developing countries) in the FM characteristics? The vast majority of the literature applies only a single country approach in their investigation, and only a few have comparative exist that provide evidence supported by the same methodological background. Third, all the pillars of sustainability are covered in the database of FM publications, and the economic (e.g., supporting local farmers through higher consumer prices) and the social (e.g., social embeddedness through the direct interactions between consumers and producers) sustainability of FMs is widely supported by the results of the studies. In addition, many publications suggest that locally produced foodstuffs sold at FMs are also environmentally sustainable. However, a few studies that have applied sophisticated Life Cycle Analysis highlight that the economies of scale of the conventional LFCSs cannot always be compensated by the proximity of the FMs. Therefore, when, where and how FMs can be also environmentally sustainable is still a research topic of high relevance.

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Highlights

- Number of farmers' markets and related publications has grown exponentially recently
- They are policy tools for providing fresh, healthy, and nutritious food in the USA
- In Europe, their contribution to sustainable food chains is the most important
- Safety of foods purchased at farmers' markets is still on the agenda

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