International Journal of Environmental Resilience Research and Science (IJERRS)
Revista Internacional Resiliência Ambiental Pesquisa e Ciência Sociedade 5.0 Resiliência Ambiental
ISSN 2675-3456

Intellectual Structure of the Scientific Production on Farmers' Markets and Local Agri-Food Systems: An Analysis in the Light of Co-Citations

Estrutura Intelectual da Produção Científica sobre Mercados de Agricultores e Sistemas Agroalimentares Locais: Uma Análise à Luz das Cocitações

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Abstract: This paper presents the structure of scientific production that provides the basis for studies on farmers' markets and local agri-food systems through co-citation analysis. The method used was exploratory, and the data for the analysis consisted of scientific articles retrieved from the Web of Science database. The results revealed that studies on this topic began in 1944, although only from 2000 there was a significant increase in research. The Exploratory Factor Analysis (EFA) reveals that the structure of scientific production on farmers' markets and local agri-food systems is addressed in 72.24% by 84 articles. The result of EFA was grouped into five dimensions: the fundamental definitions of alternative local food economies, the characteristics of local food systems, the diversity of alternative food networks, the search for innovative practices and management improvements in alternative local agri-food networks, and the *locus* of the dynamics of alternative agri-food networks where the consumer-producer relationship is prioritized. This study reinforces the need for further research to seek an understanding of the vital role of farmers' markets and local agri-food systems in society. Future research is recommended to explore the ways and possibilities for producer-consumer rapprochement in the short-circuit food supply chain in farmers' markets.
Keywords: Farmers' market; Local agri-food systems; Co-citation analysis.

Resumo: Este estudo objetiva apresentar, por meio da análise de cocitações, a estrutura da produção científica que fornece base para estudos sobre mercados de agricultores e sistemas agroalimentares locais. O método utilizado foi exploratório e os dados para as análises foram constituídos de artigos científicos recuperados na base Web of Science. Os resultados revelaram que os estudos sobre esse tema se iniciaram na década de 1940, mais precisamente em 1944, mas só a partir de 2000 ocorreu aumento significativo nas pesquisas. A Análise Fatorial Exploratória (AFE) revela que a estrutura da

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ISSN 2675-3456

produção científica sobre mercados de agricultores e sistemas agroalimentares locais é explicada, em 72,24% dos casos, por 84 artigos, para os quais foi possível fazer um agrupamento em cinco dimensões: as definições constitutivas das economias locais alimentares alternativas; as características dos sistemas alimentares locais; a diversidade das redes alimentícias alternativas; a busca por práticas inovadoras e melhorias de gestão nas redes agroalimentares locais alternativas; e *locus* da dinâmica de redes alternativas agroalimentares onde a relação consumidor/produtor é priorizada. Este estudo reforça a necessidade de continuidade de investigações visando à busca de um entendimento progressivo a respeito do importante papel dos mercados de agricultores e dos sistemas agroalimentares locais na sociedade. Futuras pesquisas poderiam explorar as formas e as possibilidades de aproximação entre produtor e consumidor na cadeia de circuitos curtos de abastecimento de alimentos nos mercados de agricultores.
Palavras-chave: Mercado de agricultores; Sistemas agroalimentares locais; Análise de cocitações.

INTRODUCTION

Farmers' markets play a prominent role in alternative food networks. The contribution of these social economy organizations to network development can relate in part to the process of the regional grouping. These farmers' markets are not only contributing to the visibility and availability of local food, as they are also providing a platform for a wide range of interested parties to know, learn, and mobilize knowledge about the limits and possibilities of local food systems (Beckie; Kennedy; Wittman, 2012).

Given this finding, the following question arises: How is structured the scientific production that provides the theoretical basis for studies on farmers' markets and local agri-food systems and their correlates? Seeking to answer this question, this paper, from its inception, aims to analyze the intellectual structure of the scientific production that provides the basis for these studies on farmers' markets and local agri-food systems, for this purpose relying on the methodological procedures of the so-called ‘analysis of co-citations.’

As the term 'co-citation' itself allows us to understand, it is about how researchers, in their texts, comment on each other's relation to a certain theme. Thus, a study supported by co-citations obviously needs, starting from a theme, to select authors and texts to be interrelated. The choice of scientific articles for the present co-citations study was made by consulting databases on the Web of Science (WOS) website, produced and maintained by Thomson Reuters, and on the Scopus website, with the following keywords: 'farmers market' and 'local agri-food systems' or 'proximity market' or 'alternative food networks,' in which 267 publications were identified. Bibexcel was the electronic tool used to organize the data for the

bibliometric analysis, and SPSS was used to perform the Exploratory Factor Analysis (EFA), whose objective was to verify the pattern of correlations existing among the variables and employ these patterns of correlations to group the variables into factors (Hair Jr. et al., 2009).

From these perspectives, this study brings several contributions. First, in relation to academic productions in the area, it presents the results of investigations carried out, opening opportunities for more focused and objective studies, aiming at the expansion of knowledge in the area, in addition to highlighting gaps in studies not yet conducted, but that may increase the source of understanding. According to Lopes et al. (2012), scientific publications demonstrate the evolution of studies, within a given period, from the classical authors of the theme.

It is important to highlight that, in this study, the intellectual structure of the scientific production about farmers' markets and local agri-food systems is understood as the structure visualized from the degree of similarity of content (research theme). This similarity, by allowing the elaboration of groupings (dimensions), highlights the structural relations of theoretical and methodological connectivity of the theme, the proximity, and the interconnections of this field of the scientific domain.

As for the structure of this study, in addition to this introduction, general aspects about farmers' markets and local agri-food systems and the words/expressions that compose their nomenclature are presented, as well as the analysis of the scientific production as a whole. Next, the method adopted for the selection of the publications is presented. Afterward, the analysis of the co-citations contained in the publications is developed, presenting the theoretical basis for studies about farmers' markets and local agri-food systems, through the Exploratory Factor Analysis (EFA) and, finally, the concluding remarks and suggestions for future research.

MARKETS FROM A SOCIAL ROOTEDNESS PERSPECTIVE

Hinrichs (2000), in researching farmers' markets and community, qualified agriculture by arguing that, for many, the notion of social rootedness has become an appropriate path to social ties. In this argument, the author took on the thesis that direct alternative farming enhances human and economic interactions by fostering a sense of social connection,

reciprocity, and trust, which is often seen as the hallmark (and comparative advantage) of these farmers' markets. This is a market often linked to direct marketing, to the growing interest of consumers to know the provenance of the food they eat.

In this context, the transdisciplinary approach of economic sociology, with its underlying notion of 'social insertion,' has become increasingly pertinent. This has led many authors (Thrift; Olds, 1996; Lie, 1997; Jessop, 1999; Hinrichs, 2000) to revisit the work of economic historian Karl Polanyi (1886-1968) and its subsequent reevaluation by Mark Granovetter (1985), who expanded the notion of 'insertion' introduced by Polanyi (1944), arguing that an approach to the concept of ' embeddedness' can facilitate an understanding of how the functioning of a capitalist economy is influenced by being embedded in ongoing social relations.

According to Granovetter (1985), how behaviors and institutions are affected by social relationships is one of the classic questions in social theory. In his seminal article, he argues that social relations can substantially alter the nature of activities among individuals through trust generation, particularly where there is a direct and ongoing interaction among the participants concerned. This has led to a more general recognition that, in fact, the highly dispersed neoclassical conception of the market, and its associated economic activity, is always embedded in a broader political, cultural, and social reality. Thorne (1996), however, while acknowledging that essentially all economic exchange is embedded in social relations, points out that these exchanges are often distanced and beyond the control of individuals at a local level.

From this discussion, it is clear that the notion of 'social rootedness,' and what it might mean in a geographical or spatial context, has been the subject of considerable debate and criticism. It follows, therefore, that the extension of the concept into the realm of nature has received less criticism, despite Murdoch, Marsden, and Banks' (2000) assertion that 'rootedness' can refer not only to social relationships but also to natural relationships.

In the context of agri-food studies, Goodman (2003) asserts that the concept of embeddedness, like that of rootedness, is a socio-material construct whose idea is inherently ambivalent, contingent, and dynamic. Indeed, some authors claim that farmers' markets and other direct sales arrangements embody specific sets of values and ideologies between food producers and consumers (Kloppenburg et al., 2000; Hinrichs, 2003). The concept of

embeddedness can be a very useful theoretical device to further investigate the relationship between food and territory. In general terms, this notion has been used to emphasize the social component of economic activity. In agri-food studies, embeddedness has proven to be an effective concept for highlighting the more socially supported character of alternative food networks.

In some analysts´ views, farmers' markets are considered a (constructed) space for the expression of ideas and values regarding local food and the nature of its diversity (Kirwan, 2004). Kirwan (2004) further states that in Granovettarian terms, trust in the product is being developed as a result of the ongoing personal relationships between the producers and the consumers concerned. As Granovetter (1985) suggests, this trust depends on the prior interaction among the participants in this farmers' market, and in this context continued consumers' satisfaction with the perceived quality of the products they receive (which includes their trust in the personal integrity of the producers). The exchange among them is also influenced by the producer's promotion of consumer understanding that traditional production methods have often been employed, along with the localness (locality, spatial proximity) of their production.

Sonnino and Marsden (2005) focus attention on the concept of embeddedness - which, as the literature makes clear, is one of the key characteristics that distinguish alternative food networks from conventional chains. Drawing on a growing literature on the meaning and implications of this concept in the food context, 'embeddedness' was used as an analytical tool to identify a refined agenda and framework for researching and designing alternative food networks.

According to Wilkinson (2008), in the last decade, there have been profound changes in the forms of intermediation between family production and the market, access to which now requires more autonomy and capacities on the part of farmers. The author also highlights the importance of studies on non-farm labor markets and pluriactivity in the recent debate. Pluriactive agricultural activities are understood as a family's strategy to diversify its activities, thus including off-farm activities, and ensure the reproduction of the family and its permanence in rural areas (Wilkinson, 2008).

Wilkinson (2008) observes the micro and small agro-industrial enterprises and argues that these markets can be visualized as an extension of family relationships, in which the

reliability of the product derives from trust in the producer, and may refrain from formal quality guarantees. In the author's words, "kinship, neighborhood, personal knowledge, and repeated transactions among actors affirm reputations and consolidate loyalties, making such markets relatively immune to external pressures, whether market or regulatory" (2008, p. 94).

As recognized by Wilkinson (2016), in claiming theories of convention, societies stipulate a plurality of values, deemed legitimate, which accommodate the production and exchange of goods and services. Perceiving value as a "socially constructed property rather than a result of aggregate supply and demand encounters based on individual preferences" (2016, p. 58).

Alternative (agro)food networks (AAFNs and AFFNs)

As academic interest in alternative agro-food networks (AAFNs) has grown, the literature on how these networks are governed has developed in two distinct ways. The first focuses on the 're-localization' of food, exploring the economic, political, and social relationships that characterize farmers' markets and other forms of direct and proximate sales (Hinrichs, 2000; Holloway; Kneafsey, 2000; Goodman; Dupuis, 2002; Sage, 2003; Sonnino; Marsden, 2005; Kirwan, 2006). The second approach examines the role of quality certification and environmental certification practices within AAFNs. Authenticity and trust are mediated through personal interaction with the producer. Fostering consumer confidence in product authenticity and quality is critical in building a trusting customer base.

Alternative food networks include a range of actors and rely on various forms of direct marketing. They have emerged in response to concerns about the impacts of the conventional, globalized food system. These concerns range from issues of food safety, and quality, to the social, economic, and environmental externalities experienced by individuals, communities, and regions (Goodman, 2004; Sonnino; Marsden, 2005).

Jarosz (2008) argues that alternative food networks (AFNs) represent efforts to resocialize food production, distribution, and consumption.

AFNs are defined in four main ways: (1) by shorter distances between producers and consumers; (2) by small size and organic or integrative farming methods, which is in contrast to large-scale production and industrial agribusiness; (3) by the existence of food purchasing

sites, such as food cooperatives, farmers' markets, free markets, and supported agricultural communities (CSAs); (4) by a commitment to the social, economic, and environmental dimensions of sustainable food production, distribution, and consumption.

Jarosz (2008) notes that alternative food networks are commonly defined by attributes such as: i) spatial proximity between farmers and consumers; ii) existence of retail locations; iii) farmers' markets; iv) community supported agriculture - CSA; v) fairs; and vi) a commitment to sustainable food production and consumption.

AFNs (Seyfang, 2006) have opened a new field of research through the development of analytical tools to study the contribution of AAFNs to broader social change. This shift envisions AAFNs as new vectors of agricultural income diversification embedded in the cost-containment logic of non-commoditized production circuits of pressing contemporary rural development issues (Goodman, 2004).

Local Food Systems (LFSs)

Selfa and Qazi (2005) point out that for some food network actors across rural and urban localities, local food systems are defined by social relationships that may or may not be geographically close, while for others, local food systems are defined by a politically constructed boundary, such as a county, for example. Producers and consumers in the urban areas of our study are more closely identified and exemplified as face-to-face, direct markets, which are physically close when conceptualizing their local markets. However, in places where there are fewer consumers and markets, 'local' is not necessarily defined as only those that are physically close (Sage, 2003).

In short, it is mainly the local food that attracts family farmers to local food marketing. In this assessment, the value added is almost entirely explained by processes, relationships, and structures that may be inefficient or difficult to maintain on a large scale. If an important part of the prize 'local food' is, as this account suggests, intended to compensate the producer for intangible benefits that are generated by reconnection via direct exchange, then there has to be the introduction of high-level structured issues to empower producers to successfully deliver food locally, because they will be challenged to maintain a direct exchange with their consumers (Mount, 2011).

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Short Food Supply Chains (SFSCs)

Marsden, Banks, and Bristow (2000), in their discussion of 'short food supply chains,' argue that spatial embeddedness is less about proximity (i.e., reducing the geographic distance between producer and consumer) and more about embedding the product concerned with 'value-laden information' about the place of production, in the place of consumption. It is not the greater or lesser transport distance of a product that is key, but the fact that such a product is embedded with value-laden information when it reaches the consumer. This allows the consumer to make connections with the place/space of production and potentially with the values of the people involved and the production methods used.

Short food supply chains (SFSCs) are considered to be factors of rural economic growth. Their crucial characteristic is that the food that is in the supply chains is connected to small and medium-sized food enterprises (SMEs) in backward rural regions.

This process is demonstrated through forms of direct marketing and, therefore, face-to-face contact between producer and consumer. Thus, Marsden, Banks, and Bristow (2000) identified two new types of SFSCs, spatially close chains, and spatially extended chains. Spatially close chains correspond to scenarios in which products are sold through outlets in one's own region, location, or place of production so that the consumer is immediately aware of the locally embedded nature of the product at the retail point. In contrast, there are spatially extended chains. In this case, products are sold to consumers (through channels such as the internet) who are located outside the region of production and/or have no personal experience or knowledge of the area. Here, the key is to use product labeling and images to transfer information about the production process.

Table 1 shows the main studies, terminology (the main terms), and various definitions, as well as Proximity Short Circuits.

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Table 1 – Studies, terminology, and definitions of Local Markets and Short Proximity Circuits.

Study	Terminology	Definition
Cone & Myhre (2000); Festing (1997); Holloway & Kneafsey (2000); Morris & Buller (2003); Renting, Marsden, and Banks (2003)	Farmers Markets (FMs)	A place where producers and consumers can bypass the consumption spaces constructed by powerful actors in the food chain. They are 'pillars' for the reconstruction of local food systems.
Ekins (1997)	Local Economies	They have their own brand of comparative advantage by building networks, human, local capital-knowledge, skills, creativity, motivation, and commitment to the community. And by having a shared vision of the present and the future, that vision can be harnessed to build mutually beneficial relationships among suppliers, producers, and consumers. A sense of shared ownership of community resources and responsibility for their viability and preservation can inspire trust, commitment, and reduce transaction costs, facilitating the process of economic interaction without marginalizing social and environmental capital.
Marsden & Smith (2005)	Alternative Feeding Economy (AFE)	They recognize the problems of disconnecting global processes from local ones and it is important to consider the place, in this context, as a form of social contingency; that it is a space for reorganizing possibilities that attempt to counter dominant forces in the agrarian landscape. The place, therefore, potentially becomes a social space (a place to share some form of disconnection) for the restructuring of resources and value; a place for the evolution of new commodity and network scenarios.
Ilbery & Kneafsey (1998); Goodman & DuPuis (2002); Goodman (2003); Allen et al. (2003); Goodman (2004); Sonnino & Marsden (2005)	Alternative Food Networks (AFNs)	They address the goals of social justice and inclusion, ecological sustainability, and economic viability (or alternatives to capitalism) within a broader social movement that considers food a human right rather than a commodity (Hassanein, 2003; Hinrichs, 2003; Goodman, 2004; Slocum, 2006). Alternative food networks include a range of actors and rely on various forms of direct marketing. they have emerged in response to concerns about the impacts of the conventional, globalized food system. These concerns range from issues of food safety, and quality, to the social, economic, and environmental externalities experienced by individuals, communities, and regions (Goodman, 2004).
Goodman (2003)	Alternative Agri-Food Networks (AAFNs)	They seek new relationships of trust with consumers (Goodman, 2003) in order to respond to increasing food anxieties and advocate a conception of production and consumption involving political, ecological, and economic aspects, a coming together of actors belonging to different spheres of social and economic life to build new systems of meaning and new food supply systems, new survival alternatives for family farmers.

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Feenstra (2002); Mount (2011)	Local Food Systems (LFSS)	A collaborative effort to build self-sustaining, place-based food economies in which production, processing, distribution, and consumption are integrated in a way that seeks to improve the economy, the environment, and the social health of a specific place.
Selfa & Qazi (2005)	Local Agri-Food System	They are defined by social relations that may or may not be geographically close, while for others, local food systems are defined by a politically constructed boundary, such as a municipality or a bioregion, for example.
Marsden, Banks, and Bristow (2000)	Short Food Supply Chains (SFSCs)	They represent a revaluation of food. Three main types of SFSCs are identified, all to facilitate or enable the defining characteristics of SFSC to exist - which is the ability to generate some form of connection between the food consumer and the food producer. With SFSC, it is not the number of times a product is handled or the distance over which it is ultimately transported that is necessarily critical, but the fact that the product reaches the consumer embedded with information, for example, printed on the packaging or communicated in person at the retail point. It is this information that allows the consumer with confidence to make connections and associations with the place/space of production and potentially the values of the people involved and the production methods that were employed for it. Spatial immersion is less about proximity (i.e., reducing the geographical distance between producer and consumer) and more about the incorporation - of the product concerned - of 'value-laden information' about the place of production into the place of consumption: "[...it is not the distance a product is transported that is key, but the fact that it is incorporated with value-laden information when it reaches the consumer].

Source: Prepared by the authors.

Analysis of scientific production

Small (1973) developed a way to analyze the connection between two documents. He based this on the study of the frequency with which they are cited together and called this technique 'co-citation analysis.' Thus, among the information from scientific productions that can be done in bibliometrics is co-citation analysis. A co-citation refers to joint occurrences in a single document, that is, a co-citation occurs the moment two documents/authors/journals are present in the references of a subsequent publication (White; Griffith, 1981).

The analysis of scientific production can be presented descriptively or by using indicators, applying, among others, multivariate analyses of bibliometric data, such as

Exploratory Factor Analysis (Vanz; Stumpf, 2010). Software is a good ally when it comes to bibliometric analyses because it enables the representation of large volumes of information by means of maps and groupings (Machado, 2015). The source of data for bibliometric studies are mainly databases, such as Scopus, Web of Science, and Capes Journals. The next section presents the method used in this study.

METHOD

The selection of scientific articles was carried out through two database searches, on the Web of Science (WOS), and Scopus websites, conducted on May 29, 2019, with the following keywords: 'Farmers Market' and 'Local agri-food systems' or 'Proximity Market' or 'Alternative food networks.' The search in the Scopus database resulted in seven articles, while in WOS 260 articles were found. Thus, the second source was chosen, as it had a larger number of publications related to the proposed theme. It is noteworthy that the option also considered the fact that the WOS is one of the most complete databases in the world.

In order to obtain a better criterion, the following refinements were performed on the WOS:

1. Only papers and book chapters were selected, resulting in 231 documents.
2. As for the period, all years were kept.
3. Then the areas of publications that were most related to the theme of the present thesis were selected: Geography, Sociology, Agriculture Multidisciplinary, History Philosophy of Science, Environmental Studies, Regional Urban Planning, Environmental Sciences, Green Sustainable Science Technology, Economics, Food Science Technology, Agronomy, Management, Agricultural Economics Policy, Development Studies, Business, Political Science, Social Science Interdisciplinary, and Ecology.

After refinement in the selected areas, 182 documents resulted. Thus, this research analyzes 182 documents (among papers and book chapters), whose first publication dates occurred between 1944 and 2016, thus demonstrating the relevance and timeliness of the theme proposed.

According to Small (1973), co-citation occurs when the same citation is mentioned in two or more papers. Smiraglia (2011) believes that when two or more authors/documents are

cited in a subsequent publication, this indicates that there is a similarity in thoughts, whether via concepts or via methods. Therefore, the greater the number of documents in which the two authors are cited, the greater the probability that they are related to the same theme.

Therefore, for the purposes of analyzing the citations contained in the 182 papers resulting from the WOS search, whose refinements were described above, it was decided to analyze the 100 most cited papers. Thus, the articles that contained at least eight citations were selected.

The Bibexcel program was used to organize the data collected, and later the Statistical Package for the Social Sciences (SPSS) program was used to perform the correlation analyses that exist among the dimensions studied.

It is worth mentioning, however, that despite this freedom of the researcher, to conduct the Exploratory Factor Analysis (EFA), the first indicator that should be taken into consideration is the measure of adequacy that the sample represents to the factor of Kaiser-Meyer-Olkin (KMO), a measure that should be greater than 0.60 (Hair Jr. et al., 2009), considering that only a value above this one (until it reaches 1.0) allows us to assume that the factor analysis is relevant for that sample.

In addition to KMO, this research followed the parameters suggested by Hair Jr. et al. (2009), for whom Bartlett's Elasticity test must be greater than 0.05; the KMO of each variable studied in the anti-image matrix must be above 0.5; subsequently, the model is adjusted with the exclusion of variables that have a commonality lower than 0.5, as well as variables that present cross-loads above 0.5 in more than one variable; and finally, in the rotational matrix the factorial loadings are analyzed, in order to exclude variables with negative loadings.

Initially, using all the data from the sample selected for the co-citation analysis through Exploratory Factor Analysis, we sought to identify the correlation among these 100 documents. The extraction method was that of principal components and the rotation method was Varimax.

The EFA without fixing factors resulted in ten dimensions with a total explained variance of 76.08%; however, it did not generate overall KMO and Bartlett's. These two parameters are necessary to start the Exploratory Factor Analysis (EFA). It was also observed that most of the authors, totaling 93, grouped into five dimensions, while only seven would be in the others. There were also distinct dimensions in which only one and/or two authors (in this study each author is considered as being one variable) were in that dimension, knowing that, however, a

dimension (factor) must have at least three variables.

Thus, it was decided to exclude, by the method of trial and error, each of the seven variables that were alone in a factor, in order to verify which had no correlation within the data set. In this analysis, after excluding the variable BuckGetz-Guthman-1997 and fixing it in five factors, the overall KMO was 0.554 and the total variance explained was 69.30%. Therefore, 99 documents remained for the other analysis parameters suggested by Hair Jr. et al. (2009).

Bibexcel was used to organize the data for the bibliometric analysis and the Statistical Package for the Social Sciences (SPSS) to perform the EFA, whose purpose is to analyze the pattern of correlations existing among the variables and employ these patterns of correlations to group their variables into a smaller number of dimensions (Hair Jr. et al., 2009).

Each publication selected for the EFA was treated as one variable. Thus, out of the 100 publications initially selected for the co-citation analysis, 84 remained in the final model. This model had an overall KMO of 0.869, a total variance explained of 72.24%, and Cronbach's alpha greater than 0.700 in each of the five dimensions that make up the final model.

RESULTS AND DISCUSSION

The theme "farmers' markets and local agri-food systems" has been more studied in the last decades, and observing its evolution over time, it is possible to see that in 2008 there were more publications, demonstrating the relevance of the theme, totaling 15 papers. The second year with more publications was 2003, with 11 papers - it is worth noting that 2003 was the year of publication of the paper most cited by the other authors. Then, in third place, comes 2007, with ten published papers.

One notices that, after 2008, the number of publications is not very representative, as the number of papers drops drastically, indicating that this study is of crucial importance for the continued development of scientific research on the subject studied.

To better understand what these 100 documents address, we have chosen to perform a cloud of keywords to identify the similarity among them, as shown in Figure 1.

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ISSN 2675-3456

Figure 1 – Cloud of keywords

Source: Prepared by the authors.

Observing and interpreting the cloud of keywords, it is possible to observe that themes such as alternative consumption, local consumption, alternative agriculture, connections, and food systems are much discussed among the authors. It is noteworthy that some of these authors were highly cited by others, thus highlighting how representative a work can be for a particular theme.

In order to identify the structure of the scientific production on farmers' markets and local agri-food systems, we analyzed the co-citations that show the relationship between two papers based on the number of publications in which they appear cited together. The work Understanding Alternative Food Networks: exploring the role of short food supply chains in rural development, by Renting, Marsden & Banks (2003), was the most cited, with 85 occurrences. Table 1 shows the most cited publications in the 100 papers selected for the EFA.

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Table 2 – Most cited papers and books in articles about farmers' markets and local agri-food systems

Author(s)/ year	Title	No. of citations	%
Renting, Marsden e Banks (2003)	Understanding Alternative Food Networks: exploring the role of short food supply chains in rural development	85	46,70%
Hinrichs (2000)	Embeddedness and Local Food Systems: notes on two types of direct agricultural market	50	27.47%
Dupuis e Goodman (2005)	Should we go "home" to eat?: toward a reflexive politics of localism	47	25.82%
Tregear (2011)	Progressing knowledge in Alternative and Local Food Networks: critical reflections and a research agenda	46	25.27%
Hinrichs (2003)	The practice and politics of Food System Localization	41	22.53%
Jarosz (2008)	The city in the country: growing Alternative Food Networks in metropolitan areas	40	21,98%
Sonnino e Marsden (2005)	Beyond the divide: rethinking relationships between alternative and conventional food networks in Europe	40	21.98%
Murdoch, Marsden e Banks (2000)	Quality, nature, and embeddedness: some theoretical considerations in the context of the food sector	38	20.88%
Watts, Ilbery e Maye (2005)	Making reconnections in Agro-Food Geography: alternative systems of food provision	38	20.88%
Sage (2003)	Social embeddedness and relations of regard: alternative "good food" networks in south-west Ireland	37	20.33%
Winter (2003)	Embeddedness - the new food economy and defensive localism	37	20.33%
Goodman (2004)	Rural Europe Redux? Reflections on alternative agro-food networks and paradigm change	33	18.13%
Kirwan (2004)	Alternative Strategies in the UK Agro-Food System: interrogating the alterity of farmers' markets	30	16.48%
Marsden, Banks e Bristow (2000)	Food Supply Chain Approaches: exploring their role in rural development	29	15.93%
Goodman (2003)	The quality "turn" and Alternative Food Practices: reflections and agenda	28	15.38%

Source: Prepared by the authors.

International Journal of Environmental Resilience Research and Science (IJERRS)
Revista Internacional Resiliência Ambiental Pesquisa e Ciência Sociedade 5.0 Resiliência Ambiental
ISSN 2675-3456

Intellectual structure of the scientific production

The matrix of the 100 most cited publications was used to perform the exploratory factor analysis. With the EFA, it was possible to evaluate the existing patterns among the publications cited by the 184 papers on farmers' markets and local agri-food systems. In SPSS, each publication was treated as a variable.

Table 3 – Authors' classification by dimension

Dimension 1			
Kirwan, 2004	0.859	Kneafsey et al., 2008	0.698
Slocum, 2007	0.858	Lyson e Guptill, 2004	0.691
Marsden, Banks e Bristow, 2000	0.848	Raynolds, 2000	0.690
Morris e Buller, 2003	0.813	Marsden e Smith, 2005	0.689
Ilbery e Maye, 2005b	0.812	Morris e Kirwan, 2011	0.688
Goodman e Watts, 1997	0.807	Venn et al., 2006	0.683
Feenstra, 2002	0.784	Smithers, Lamarche e Joseph, 2008	0.681
Winter, 2003	0.784	Brunori, Rossi e Malandrin, 2011	0.677
Renting, Marsden e Banks, 2003	0.782	Ploeger al., 2000	0.665
Beckie, Kennedy e Wittman, 2012	0.778	Goodman e Dupuis, 2002	0.664
Ilbery e Maye, 2005a	0.773	Morgan, Marsden e Murdoch, 2006	0.652
Jarosz, 2008	0.773	Higgins, Dibden e Cocklin, 2008	0.648
Parrott, Wilson e Murdoch, 2002	0.769	Jarosz, 2000	0.636
Henderson, 2007	0.768	Forsselle Lankoski, 2014	0.630
Goodman, 2004	0.763	Tregear, 2011	0.629
Murdoch e Miele, 1999	0.752	Ilbery e Maye, 2005b	0.618
Hinrichs e Kremer, 2002	0.750	Guthman, 2004a	0.616
Seyfang, 2006	0.741	Guthman, 2008c	0.612
Selfa e Qazi, 2005	0.737	Whatmore, Stassart e Renting, 2003	0.611
Watts, Ilbery e Maye, 2005	0.736	Penker, 2006	0.597
Ilbery e Kneafsey, 2008	0.734	Sage, 2003	0.595
Holloway e Kneafsey, 2000	0.732	Goodman, Dupuis e Goodman, 2012	0.583
Sonnino e Marsden, 2005	0.720	DeLind, 2010	0.556
Brown e Miller, 2008	0.719	Born e Purcell, 2006	0.555
Holloway et al., 2007	0.718	Feagan e Henderson, 2008	0.551
Feagan, 2007	0.713	Lamine, 2005	0.546
Allen, 2008	0.710	Wiskerke, 2009	0.530
Feenstra, 1997	0.710	Pollan, 2006	0.526
Mount, 2011	0.703	Guthman, 2008b	0.523
Hendrickson e Heffernan, 2002	0.702		

Continua…

Continua…

Dimension 2	
Hinrichs, 2000	0.825
Guthman, 2004b	0.818
Guthman, 2008a	0.81
Si, Schumilas e Scott, 2014	0.781
Allen e Guthman, 2006	0.774
Allen et al., 2003	0.711
Cone e Myhre, 2000	0.63
Granovetter, 1985	0.622
Little, Maye e Ilbery, 2010	0.612
Allen, 2010	0.606
Gibson-Graham, 2006	0.559
Dimension 3	
Ilbery et al., 2005	0.715
Murdoch, Mardsen e Banks, 2000	0.71
Follett, 2008	0.625
Sonnino, 2007	0.606
Pole e Gray, 2012	0.571
Alber e Kohler, 2007	0.565
Winter, 2003	0.557
Dimension 4	
Gibson-Graham, 2008	0.732
Maye, Holloway e Kneafsey, 2007	0.663
Kloppenburg, Hendrickson e Stevenson, 1996	0.64
Marsden e Sonnino, 2008	0.576
Dimension 5	
Cox et al., 2008	0.699
Polanyi e Maciver, 1944	0.594
Brunori, Rossi e Guidi, 2011	0.585

Source: Prepared by the authors.

In this analysis, the first test performed was the Kayser-Meyer Olkin (KMO), which ranges between 0 and 1. The KMO test indicates whether the sample can be treated by the factor analysis method (Williams; Onsman; Brown, 2010). To fit the model, the KMO test value of each variable was analyzed. The minimum value indicated for the KMO test for each variable should be 0.5. Thus, if the individual KMO value for a variable was less than 0.5, the variable was excluded, and the factor analysis was run again. After adjusting the individual KMO, the commonality of each variable was analyzed, and all were greater than 0.50. If the value of commonality is close to zero, this indicates that the variable has a low correlation as a factor (Fávero et al., 2009). Out of the 100 variables selected to perform the EFA, 16 were excluded due to the following reasons: one article did not generate overall KMO, two had cross-loading,

three had commonality less than 0.400, four had individual KMO less than 0.500, and six articles had factor loadings less than 0.500.

After the exclusion of variables with KMO lower than 0.50, the rotational matrix generated in SPSS was analyzed, and the variable Lumpkin and Dess (1996) was removed due to its negative load on the factor. After its exclusion, the commonalities of the other variables were higher than 0.50. It should be noted that only one variable was excluded at a time. Thus, the EFA was run several times so that the model was adjusted.

Thus, in the final model of the bibliometric analysis against the five dimensions mentioned above, the overall KMO was 0.869, Bartlett's test of sphericity was significant at $p<0.000$ and the explained variance was 72.24%, and the extraction method was the principal component analysis. In view of this, Table 2 shows the authors classified in their respective dimensions. After the exploratory factor analysis was performed, the articles were grouped into factors (dimensions). From this grouping, the abstracts of each publication were analyzed qualitatively in order to identify the patterns presented by the publications, and then names were assigned to each dimension, as shown in Table 2.

Dimension 1 – The constitutive definitions of local alternative food economies

In dimension 1, 59 publications were grouped, addressing alternative networks related to food and local and alternative food systems with farmers' markets that have, within their reality, all the movement related to short food supply chains. They present, in their content, the contextual factors, aspects related to the awareness of the constructed nature of a 'local community' realizing the importance of social, cultural, and environmental particularity in our daily lives.

Urbanization and rural restructuring are key to the development of Alternative Food Networks (AFNs). AFNs emerge from political, cultural, and historical processes. The interactions of urbanization and rural restructuring produce AFNs that are differentiated and marked by uneven development that does not necessarily support all farmers participating in the network. This indicates both the fragility and dynamism inherent in AFNs that are linked to metropolitan development and transformation. Paradoxically, the growing urban demand for seasonal and organic products grown 'close to home' and the processes of rural restructuring

that emphasize small scale, i.e., products from family farming and their direct food to cities, do not necessarily allow all farmers to have constant production, maintaining a certain scale, as well as being vulnerable to edaphoclimatic conditions (Allen et al., 2003; Goodman, 2003).

Sage (2003) argues that in the case of local (alternative) food, both economic relationships (such as prices and markets) and social relationships (e.g., local ties and trust) are seen as vital to success. Social interaction can take the form of recognition, attention, respect, friendship, or sociability, all of which can be included in the concept of 'respect,' for example.

Dimension 2 – The characteristics of Local Food Systems

In dimension 2, 11 publications were grouped together addressing the potential for equity within the localization of the food system in practical and conceptual terms, considering the inherited material and discursive asymmetries within frameworks of economics, demography, geography, and democracy (Allen, 2010).

Regarding this dimension, they discuss some of the agri-food initiatives that define global and local, geographic concepts (Allen et al., 2003) and Farm-to-School (FTS) programs, which are one of the initiatives in the growing alternative agri-food movement, providing fresh local products to schools in order to feed their students. The study also addresses the policy aspect of the program and demonstrates the benefits of providing fresh fruits and vegetables to children at school (Allen; Guthman, 2006).

Another initiative inherent in this movement, according to Cone and Myhre (2000), is the practice of CSA, which also aims to create a direct relationship between farmers and those who consume the food products or shareholders. This practice occurs through studies on farms seeking to understand their motivations at the time of membership, taking into consideration the role of women in initiating and maintaining farm membership and how the extent of members' participation relates to perceptions, and ultimately raise questions about the long-term sustainability of CSA given the lifestyle and needs of farmers in tension with the competing constraints and values of shareholders.

Little, Maye, and Ilbery (2010) call attention to the creative possibilities offered by collective buying as a mechanism to move local and organic food beyond the niche market.

Alternative food networks have been built as an integral part of a constant evolution that allows consumers to participate in an expression of personal belief through their choice of food products and their means of production.

Dimension 3 – The diversity of the Alternative Food Networks

Seven publications were grouped in dimension 3. Alber & Kohler (2007) seek to understand how widespread informal food production is in European Union member countries and to what extent informal food production is a coping strategy in the face of expenses.

Follett (2008) analyzes the diversity of food networks that belong to the alternative food system in the United States, where there are many aspects that differ from the conventions and beliefs they represent. The alternative food system has been divided into two movements, corporate alternative food networks, and local alternative food networks. The latter movement focuses on environmental protection, labor standards issues, animal welfare, rural communities, small-scale farmers, and human health. The corporate alternative food networks represent a neoliberal development model that has promoted economic growth, but also an increase in social inequality and poverty.

Ilbery and Maye (2005) detect that there is considerable academic interest around the recomposition of alternative food chains based on notions of quality and territory, as well as the concept of embeddedness.

Despite the widespread use of the concept of embeddedness in the literature on agri-food networks (Soninno, 2006), the author argues that in a constructivist approach, it presupposes simultaneously social, spatial, and temporal dimensions that are dynamically created by participants in the economy as a response to specific market requirements.

Dimension 4 – The search for innovative practices and management improvements in Local Alternative Agri-food Networks

Dimension 4 was organized by grouping four publications that address how nascent academic practices of economic geographers can contribute to objects of policy and activism through projects and academic practices on diverse economies and performative practices (Gibson-Graham, 2008).

Kloppenburg, Hendrickson & Stevenson (1996) mention that the term foodshed becomes a metaphor, like its analogous term 'watershed,' which unifies and organizes the concepts of unity of place and people, nature, and society, to show the connections between production and consumption (local foodshed). This concept then seeks to facilitate critical thinking about where our food is coming from. The foodshed can serve as a conceptual and methodological unit of analysis that provides a framework for action.

Marsden and Sonnino (2008) demonstrate the need for more innovative ways, on the part of the state, which provides new and creative opportunities and more spatially in terms of supply and agri-food demand management, in order to uncover the potentials of both governments and producer networks to advance sustainable rural development through agricultural multifunctionality.

Dimension 5 – Locus of the dynamics of Alternative Agri-food Networks where the consumer/producer relationship is prioritized

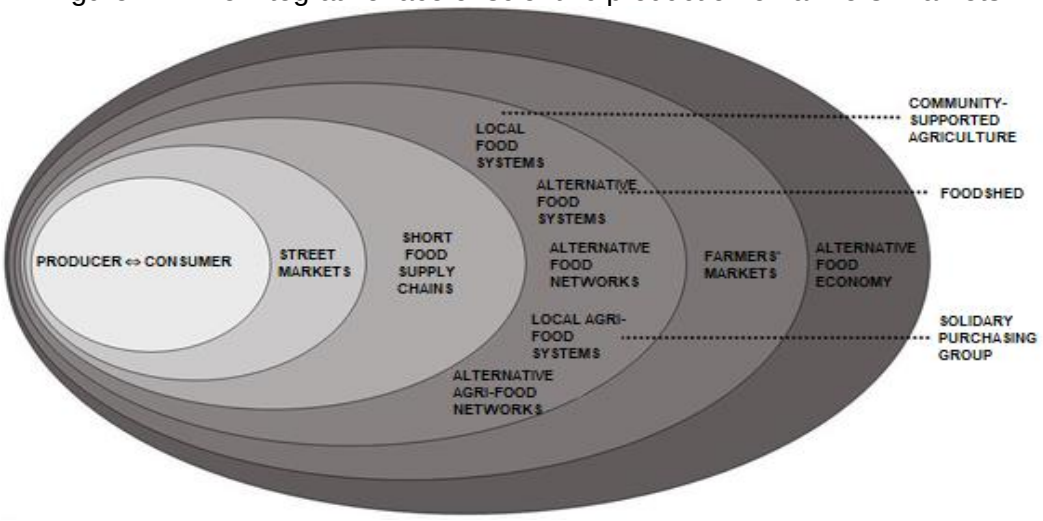
Dimension 5 groups three publications. It is about analyzing the characteristics and dynamics of alternative agri-food networks in which consumers act as precursors. The evolving attitudes of consumers are analyzed, from an actor-network perspective, in terms of behavior towards food, bringing experiences of solidarity purchasing groups (Brunori; Rossi; Guidi, 2011).

This study examines the motivations and philosophies behind producers and consumers related to some community-supported agriculture (CSA) projects within the framework of alternative food networks (Cox et al., 2008). AFN can become agents of political and environmental change. CSA, in its simplest form, involves local people investing in a farm or in the crops before harvest.

This guarantees an income for the farmer and shares the risk among the investors. In return, they receive a share of the harvest, often it is a box of vegetables, but it could be fruit, eggs, or meat. They also have the opportunity to build a closer relationship with the farmer and the CSA members. Many CSAs include elements such as social events and work details for members to help at certain times of the year. Some CSAs involve members in decision-making (Cox et al., 2008).

In light of all the above, Figure 2 demonstrates the integration of scientific production in farmers' markets.

Figure 2 – The integrative face of scientific production of farmers' markets



Source: Prepared by the authors.

Figure 2 synthesizes all the theories worked on in this literature review, demonstrating the components that participate in the structuring of farmers' markets and agri-food systems within the alternative food economy. Street markets are one of the ways in which short circuits are part of short food supply chains. Belonging to farmers' markets, there are local and alternative food systems, and alternative agri-food networks. In these systems and agri-food networks also emerge examples of actions such as community-supported agriculture (CSA), solidarity-based purchase group (SPG), and foodshed, which are already applied in some parts of the world and relate well to this producer/consumer relationship.

CONCLUDING REMARKS

This study aimed at analyzing the intellectual structure of the scientific production that provides the basis for research on farmers' markets and local agri-food systems, by means of co-citation analysis. Bibliometric methods were employed to analyze the publications and thus the most cited productions were identified, with a demonstration of the relationship among

them. Out of the 267 publications on farmers' markets and local agri-food systems, the first one occurred in the distant year 1944, but it was from the year 2000 that a significant increase occurred (with 15 publications only in 2008).

In the co-citation analysis contained in the 267 papers, it was possible to identify the knowledge base of this scientific field and to observe the degree of association among the papers as to the understanding of the community of authors. The publications were grouped into five dimensions: i) the constitutive definitions of local alternative food economies; ii) the characteristics of local food systems; iii) the diversity of alternative food networks; iv) the search for innovative practices and management improvements in local alternative food networks, and v) locus of the dynamics of alternative food networks where the consumer/producer relationship is prioritized.

Although the five dimensions identified in the research, obtained by applying the Exploratory Factor Analysis (EFA), are convergent with respect to the object of study, it is clear that each one has its own specificities, providing the construction of a theoretical framework to support future studies. It is also clear that the theme itself reinforces the need for further research in order to identify a core that contributes to the understanding of the important role of farmers' markets and local agri-food systems.

In view of these findings, we conclude that, although the economic, social, and environmental aspects inside and outside farmers' markets, widely cited in the papers under discussion, have unique meanings, we must consider that the presence, relevance, and role of the theme may lead to further research. Thus, this paper opens possibilities for future analysis, considering that the economic circumstances, social relations, and environmental awareness, among other aspects, are important to expand the study in order to explore the ways and possibilities of bringing together producer and consumer in the chain of short food supply circuits in farmers' markets.

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