



Review

# Contemporary Public Policies to Strengthen Family Farming in the International Perspective: A Bibliometric Study

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**Abstract:** Family farming produces most of the fresh food consumed in large urban centers. However, its success depends on a variety of public policies, which range from strengthening the means of production to supporting marketing channels. In this article, we conduct a careful bibliometric analysis of studies in the international literature that address “family farming, public policies, and socioeconomic development”. The aim of the study is to identify and classify the public policies aimed at supporting family farming and socioeconomic development. We carried out a systematic literature review considering five international scientific journal databases using pairs of the keywords “public policies”, “family farming” and “socioeconomic development”. The resulting sample was a total of 625 articles, covering the period between 1984 and 2020. A bibliometric analysis of the first 50 articles selected by the Methodi Ordinatio tool was performed. For the final portfolio, 10 variables were analyzed to better assess and understand the current literature. Our analysis shows an increase in publications in the last five years, with articles from South America being more prevalent than those from other continents. Brazil being one of the key countries that has developed public policies aimed at family farming and rural socioeconomic development.

**Keywords:** family agriculture; public policies; socioeconomic development; Methodi Ordinatio; bliometry



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## 1. Introduction

Based on analyses on the emergence and evolution of family farming, the importance of this segment of rural producers began to be recognized in the 1970s and gained strength from the 1990s onwards [1–3]. Contrary to the reductionist idea that family farming is associated only with subsistence production, recent data from the United Nations (UN) indicate that family farming is responsible for 80% of the production of food consumed in large urban centers worldwide, encompassing about 500 million rural producers and corresponding to approximately 90% of the world's agricultural properties [4].

This scenario underscores the importance of family agriculture, especially in terms of feeding the world's population and of sustainability development. According to [5], family farming is now seen as having several functions beyond the social, economic, environmental, and income generating potential in rural and local economies, playing an important role in the preservation of traditional foods and agrobiodiversity. Furthermore, recently family farming has also begun to be recognized for its role in food security [6,7]. However, for family-run agriculture to persist in today's extremely competitive and globalized world, it must adapt to market requirements and organize regionally through the formation of associations and cooperatives, so that together, farmers can strengthen their position and

achieve common goals. Through cooperation, farmers can gain access to credit lines with lower interest rates, market their products more profitably, and formalize their agricultural ventures [8–10].

The year 2014 was considered the International Year of Family Farming by the United Nations (UN). It is important to do the reflection about the family farming situation, focusing on food security, sustainability, and economic development. Family farming has great diversity among the countries in global terms. They have also different agricultural systems and political profiles; all these differences are a challenge to creating public policies, aimed at global food and nutrition security [11–13].

In Brazil, the creation of public policies aimed at the socioeconomic development of family farming began with the declaration of the Constitution in 1988, creating a milestone that brought about important changes and enabled the effective implementation of public policies from the 1990s onwards [14]. At that time, family-run rural properties in Brazil needed help to survive. It was with this in mind that in 1995 Resolution No. 2191 of the National Monetary Council of Brazil (CMN) established the National Program to Strengthen Family Agriculture (Programa Nacional de Fortalecimento da Agricultura Familiar; PRONAF), instituted the following year through Decree No. 1946 of 1996. To date, PRONAF is a key reference for family agriculture policies around the world [15].

The implementation of public policies must be seen as a tool to support economic development. For family farmers, public policies help to improve their quality of life and establish connections with other economic actors, improving productive cycles, inputs, raw materials, and final products [16,17].

Brazil currently has several programs and public policies that encourage and strengthen family agriculture. However, it was only at the end of the 20th century that family farming underwent major changes, where several programs were developed and modeled after PRONAF, including: Technical Assistance and Rural Extension (ATER); Food Acquisition Program (PAA); National School Food Program (PNAE); National Land Credit Program (PNCF); Growth Acceleration Program (PAC2); Unified Animal Health Care System (SUASA); Terra Forte; along with a range of national programs directed at property legalization, land registration and land tenure regularization, the production and use of biodiesel, and crop insurance [14].

In this context, public policies are vitally important for family farmers as they offer the support necessary to consolidate groups of producers, maintain their activities in rural areas, and diversify production [14]. Since these public policies have a social focus and aim to reduce social inequalities and poverty, they help generate new jobs and increase rural income levels, as much of the rural population has limited professional qualifications.

Public Policies can come to contribute to family farming, they are a way to promote rural development and global socioeconomic development. The objective of present study is to identify and classify the public policies aimed at supporting family farming and socioeconomic development. We provide information that to serve as support for associations or government agencies to verify and establish effective strategies to foster the development of family agriculture at the municipal and regional levels. For academia and society, this study not only consolidates a large amount of information and demonstrates the growing importance of the theme, but it also offers relevant, in-depth scientific information in an accessible way.

## 2. Materials and Methods

This study consists of a systematic review of articles listed in selected databases, applying a bibliometric approach to obtain statistical data on the topic. This descriptive and exploratory research had the following objectives: contribute to the enrichment of the theoretical framework; analyze the scientific production that correlates with family farming, public policies, and socioeconomic development; use quantitative Scientometric methods to define a portfolio; and qualitatively analyze the articles identified in the bibliographic search [18–20].

To identify the portfolio of scientific articles, the Methodi Ordinatio was used. This bibliometric analysis methodology is used to help researchers obtain bibliometric data related to the topics of interest [21–23]. According to [24], through the InOrdination Formula (1), the Methodi Ordinatio employs three parameters to filter articles for relevance: year of publication; number of citations; and impact factor. With these parameters applied in the equation, it is possible to determine the scientific relevance of the articles.

$$\text{InOrdination} = (\text{IF}/1000) + \alpha \times [10 - (\text{ResearchYear} - \text{PublishYear})] + (\text{Ci}) \quad (1)$$

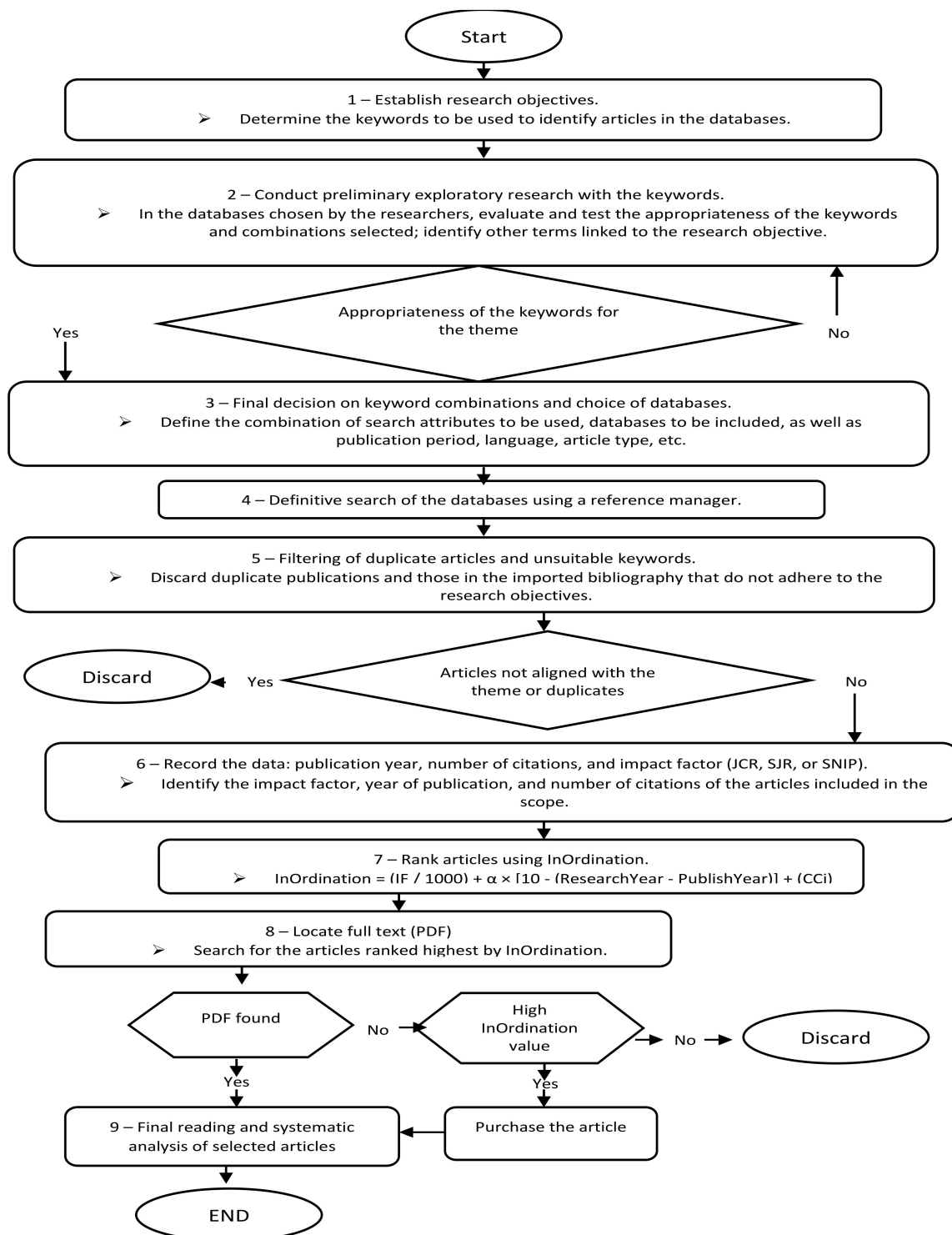
where IF refers to the impact factor [25], divided by 1000 to normalize the value;  $\alpha$  is the assigned weight, from 1 to 10, for the year of publication, with a greater weight/importance given to newer articles; and Ci is the number of times the article has been cited.

A search was performed considering titles, keywords, and abstracts of scientific articles listed in five databases (Scopus (Elsevier), ScienceDirect (Elsevier), Web of Science, OASIS.BR, and SciELO). Three keywords were used in pairs to identify the sample: “public policies”, “family farming”, and “socioeconomic development”. After identifying all relevant articles in the databases, they were imported to the Zotero (<https://www.zotero.org>, accessed on 10 May 2020) reference manager, which was used to exclude duplicates. JabRef (<https://www.jabref.org>, accessed on 10 May 2020) was used to convert the data from HTML format to a spreadsheet and export to Microsoft Excel. Figure 1 shows the steps of this research, based on the Methodi Ordinatio.

The InOrdination method, represented in Figure 1, is divided into nine stages. The first steps are the general definition of the study, selection of keywords and search in databases (1, 2, 3, 4). Step 5 consists of applying the filters to the initial portfolio. (Deleting duplicate articles, deleting books, exclusion of articles not compatible with the scope of work, deleting articles with restricted access.) Steps 6, 7, and 8, consists of collecting the necessary data from the articles (year of publication, impact factor, and number of citations), for later application in InOrdination, after delimiting the quantity and order of the articles, they are found to perform the last step 9, which is the final reading and systematic analysis of the articles.

To calculate the InOrdination, (step 7) information on the year of publication, impact factor of the journal, and number of citations were recorded. The impact factor was obtained from the Journal Citation Report [25], which offers a means of evaluating the quality of scientific production around a theme [26]. The number of citations for each article was identified using Google Scholar (<https://scholar.google.com.br/>, accessed on 15 July 2020) and the year of publication by importing data from JabRef. According to [27], citations are what formally connect one publication to another in terms of content.

Data processing was performed using the UCINET (<https://sites.google.com/site/ucinetsoftware/home>, accessed on 18 May 2021) software [28,29]. For this, three indicators were obtained in the UCINET program: Betweenness, Degree, and Indegree. According to [30], the degree of intermediation of the network (Betweenness) measures how much a given author connects with other authors in the network. In other words, it is the flow that passes through one author to interconnect with other authors in the network via the shortest path, attributing importance as a function of the flow. A greater value for centrality of intermediation given to an author, directly or indirectly established in the network, is related to the publications that are connected to the author. The Degree refers to the connections established by an author with other authors in the network, representing the actor’s power in the network. Indegree is the connections established by the various members of a certain group with an author, representing the author’s prestige [31].



**Figure 1.** Workflow of the Methodi Ordinatio. Source: adapted from Pagani, Resende, and Kovaleski (2015).

The systematic analysis of the articles in the portfolio was performed considering the following variables:

1. Year of publication;
2. Number of publications per journal;
3. Citations per article;
4. Nationality of authors and co-authors;
5. Countries of origin of the articles (considering the nationality of the first author);

6. Author and co-author connection network;
7. Author and co-author citation network;
8. Analysis of the keywords;
9. Article format;
10. Analysis of the article focus.

To create profiles for the authors who publish on the topic, each author received a researcher code that was used in the following analyses (Appendix A).

### 3. Analysis

The search on the five databases provided a total of 625 articles, published between the years 1984 and 2020 (Table 1). Articles from Scopus and SciELO accounted for more than 80% of the total number of articles identified at this initial stage. We applied some filters (Table 1) for the selection of the portfolio papers in which the systematic reading and analysis was carried out. The first filter was applied to exclude duplicate articles, leaving 443 articles. A second filter discarded books, book chapters, and event summaries, leaving 434 articles. In the third filter, articles that were outside the scope of this study were excluded, after which 130 articles remained. In the fourth filter, articles with restricted access were discarded, for a total of 110 articles with free open access. The InOrdination index was calculated for these 110 articles, to identify the 50 most scientifically relevant articles related to family farming, public policies, and socioeconomic development (Appendix B), making up the portfolio analyzed in this study.

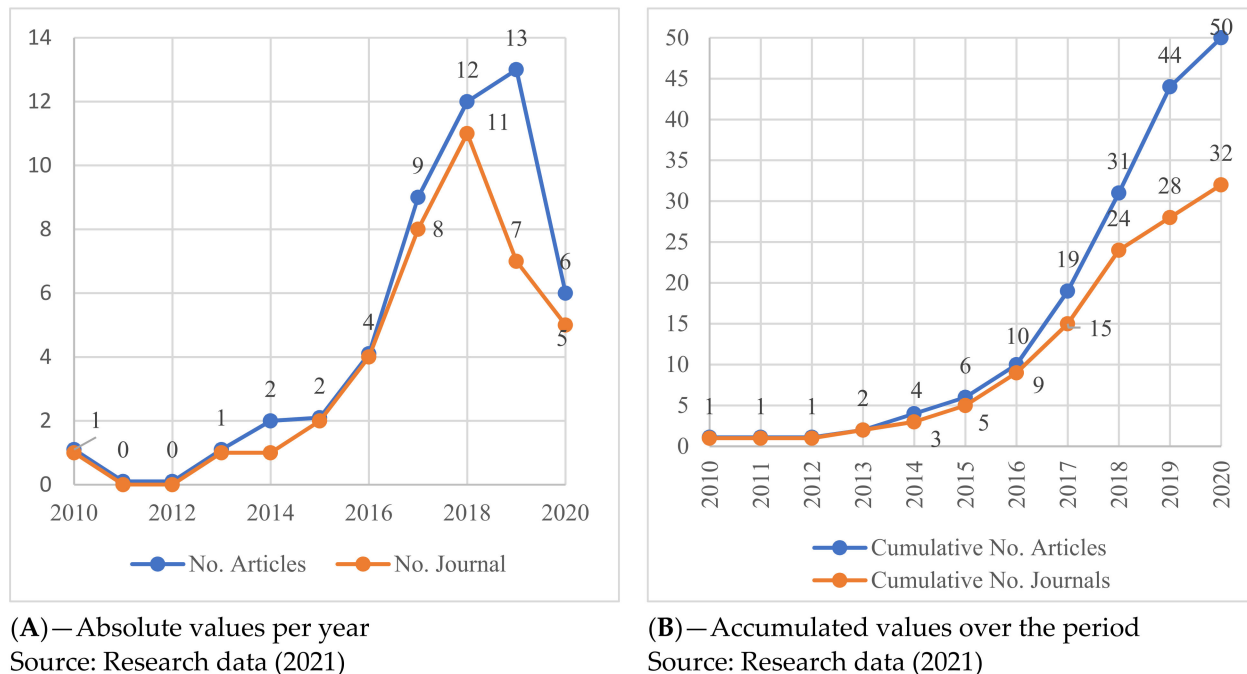
**Table 1.** Steps followed to achieve the final portfolio.

| Combination of Search Words                       | Database             |                             |                |          |        |
|---|----------------------|-----------------------------|----------------|----------|--------|
|   | Scopus<br>(Elsevier) | ScienceDirect<br>(Elsevier) | Web of Science | OASIS.BR | SciELO |
| “public policies” AND “family farming”            | 137                  | 23                          | 55             | 9        | 133    |
| “socioeconomic development” AND “family farming”  | 12                   | 0                           | 1              | 0        | 15     |
| “public policies” AND “socioeconomic development” | 50                   | 9                           | 12             | 3        | 166    |
| TOTAL PER DATABASE                                | 199                  | 32                          | 68             | 12       | 314    |
| TOTAL   |                      |                             | 625            |          |        |
| Total articles after filter 1                     |                      |                             | 443            |          |        |
| Total articles after filter 2                     |                      |                             | 434            |          |        |
| Total articles after filter 3                     |                      |                             | 130            |          |        |
| Total articles after filter 4                     |                      |                             | 110            |          |        |
| Methodi Ordinatio                                 |                      |                             | 50             |          |        |
| FINAL PORTIFOLIO *                                |                      |                             | 50             |          |        |

Source: research data (2021). Notes: Filter 1: Exclusion of duplicate articles; Filter 2: exclusion of books; Filter 3: exclusion of articles beyond the scope; Filter 4: exclusion of articles with restricted access; \* articles selected using the Methodi Ordinatio.

In Figure 2, the number of journals and articles identified as the most relevant by the Methodi Ordinatio are represented in chronological order, covering the period from 2010 to 2020. These 50 articles were published in a total of 32 different journals, with 88% (44) published in 27 journals over the last five years. Revista de Economia e Sociologia Rural had the most published articles (11 in total), followed by Mundo Agrário and Sustainability with three articles each, and Land Use Policy, Interações, Espacios, and Latin American Research Review with two articles each. The other 25 journals had only

one publication on the subject. The growth in the number of studies in different journals demonstrates the increasing importance of the theme of public policies for the development of family farming.

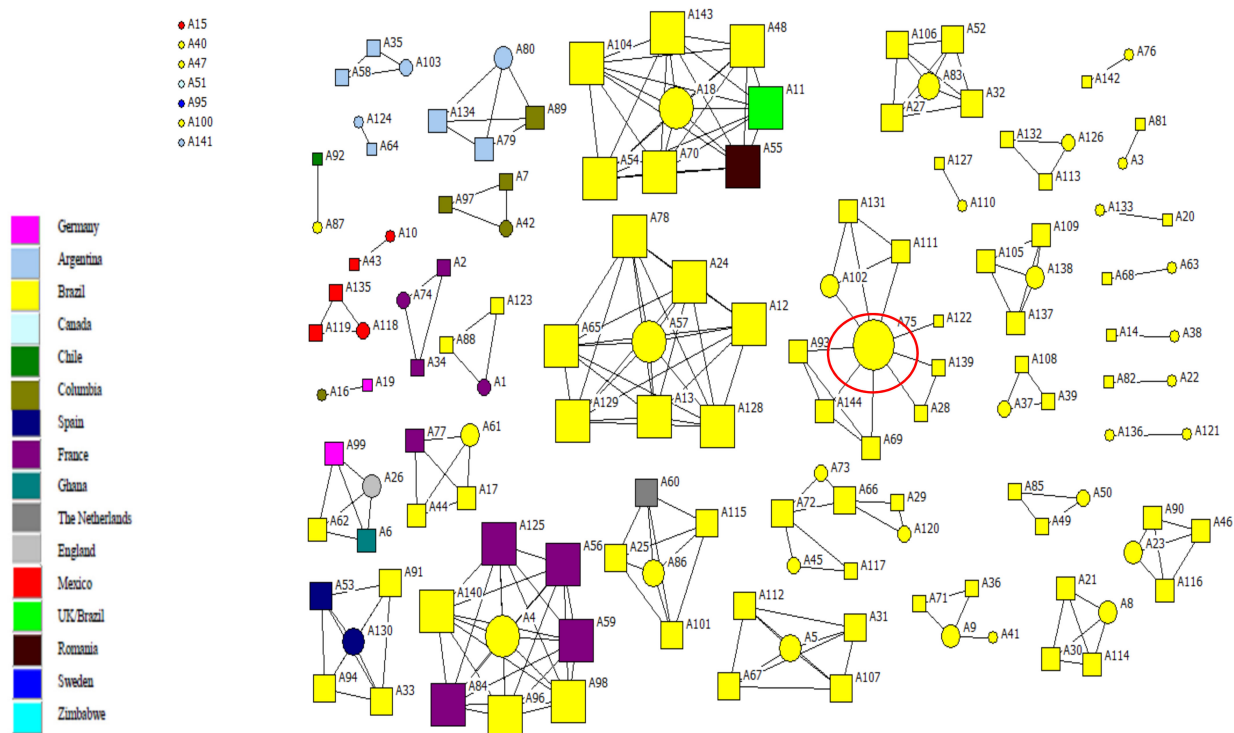


**Figure 2.** Chronological profile of publications identified as most relevant by the Methodi Ordinatio, represented in absolute (A) and cumulative (B) values. Note: 2B the journals are counted only the first time it appears.

The 50 publications in the portfolio are authored by a total of 144 researchers, from 16 different countries spanning four continents, with authors from only 10 countries publishing as first author (Brazil, Argentina, Chile, Mexico, Sweden, France, Canada, Spain, Colombia, and England), and the other six countries represented through co-authors (Zimbabwe, Ghana, Romania, UK, Netherlands, and Germany). In Figure 3, the nationality and the collaboration networks established between these 144 authors is shown. Authors from developing countries in South America appear to have produced the most relevant scientific studies related to the themes of family farming, public policy, and socioeconomic development (over 80% of publications), while authors from Europe represent approximately 12%, North America approximately 6%, and the African continent just over 1%.

Figure 3 represents the network of connections for publications established between these 144 authors, showing a total of 449 interactions. From this, we can see that seven studies (14%) are publications by individual authors and the other 43 are collaborations between two or more authors. These publishing partnerships were considered as research centers. Using this criterion, 36 research centers were identified, where 12 studies (24%) are publications in pairs and 31 (62%) had the participation of three or more authors. Three articles were written by eight authors. Among these 36 identified research centers, Brazil stands out as the country with the most in relation to the number of authors, publications, and international connections for scientific production. Brazilian researchers account for approximately 70% of the total number of authors, and they are present in almost 78% of the identified research centers. More than half (55%) of these research centers are composed exclusively of Brazilian researchers. The other 22% of research centers that include Brazilian researchers developed their work in collaboration with researchers from nine other countries (Holland, France, Spain, England, Zimbabwe, Ghana, Romania, United Kingdom, and Chile).





**Figure 3.** Connection map of publications between authors. Circles indicate first author and squares indicate other authors.

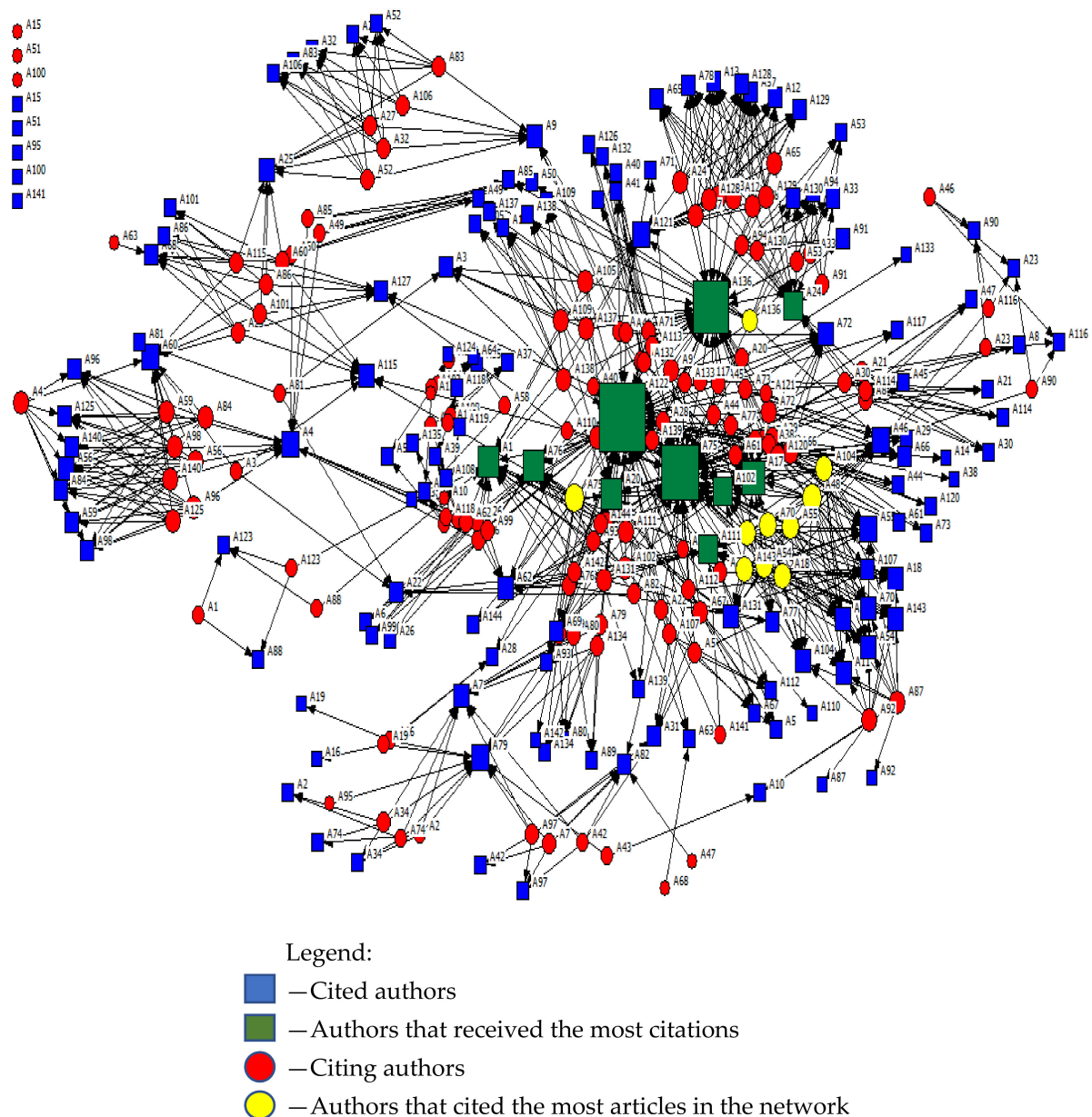
Among the 50 studies in the portfolio, 38 (76%) have at least one Brazilian author. The article with the greatest diversity of authors includes authors from England, Ghana, Zimbabwe, and Brazil, who together published a single study. Furthermore, 56% of the other countries that published on the subject established partnerships with researchers from Brazil.

Regarding the other 12 studies (24%), they originate from seven countries that published their research without collaboration with Brazilian researchers. Of these, eight (22%) represent research centers and four are from individual authors (Figure 3). These studies were carried out exclusively by researchers from Sweden, Canada, France, Argentina, Colombia, Mexico, and Germany. Among these countries, interactions between authors from Colombia, Argentina, and Germany were identified, while authors from Mexico published studies only among researchers within their own country. Canada and Sweden only published single author studies (A51 and A95).

In Figure 3, we highlight four research centers, represented as larger than the others, in which the main author is Brazilian. Of these centers, two are composed exclusively of Brazilian researchers, the largest including 10 authors and the other eight authors. A third group is composed mostly of Brazilian researchers (75%) together with researchers from Romania and the UK. The fourth research nucleus consists of eight researchers, half of which are Brazilian and the other half French. For one of these highlighted collaborative research centers, a red circle was drawn around the author that UCINET attributed the highest score for the indicator Degree. This author, Cátia Grisa (A75), was given a value of 9 for Degree, with a network intermediation (Betweenness) score of 29. This researcher is the first author in three of the four publications listed in the portfolio, all of which were conducted in partnership with other Brazilian authors.

From the analysis of the citation network presented in Figure 4, we found 883 interconnections between the 144 authors and co-authors of the 50 articles in the final portfolio. The two most cited articles had 268 and 61 citations, respectively, and were classified in order of importance as first and second by the Methodi Ordinatio. Both articles were published in the *Revista de Economia e Sociologia Rural* by Brazilian researchers (Grisa and Schneider,

2014; Souza-Esquerdo and Bergamasco, 2014). The third most cited article was published in *World Development* by an author from the UK, with 59 citations (Cabral et al., 2016). At the other end of the scale, there are 13 articles in the portfolio (26%) that have not yet been cited, published between 2018 and 2020. Thirteen studies (26%) distributed between the years 2017 and 2019 were cited less than five times, while another 11 (22%), published between 2017 and 2019, were cited between five and ten times.



**Figure 4.** Citation map among authors.

From the analysis of citations of each article by the other studies in the portfolio, we found that only three authors (A15, A51, and A100) cited no one, nor were cited by any of the other authors. Two authors (A95 and A141) were not cited by any of the other 143 authors, but they did cite some of the studies in the portfolio. This profile of authors and citations resulted in a network density of 0.042, indicating that only 4.20% of possible interactions occurred between portfolio authors. Even though there was a recent increase in studies on this topic, the network has a low density due to publications being restricted to groups of independent researchers [29–32].



Figure 4 also shows the Degree Centrality, of an author in the network, where the most cited authors in the entire network are highlighted (green squares). The author Sergio Schneider (A122) received an Indegree score of 63 and Cátia Grisa (A75) received an Indegree score of 48. These two researchers wrote the article, “Three generations of public policies for family farming and forms of interaction between society and the state in Brazil”, the most cited article in the portfolio and ranked the most important by InOrdination.

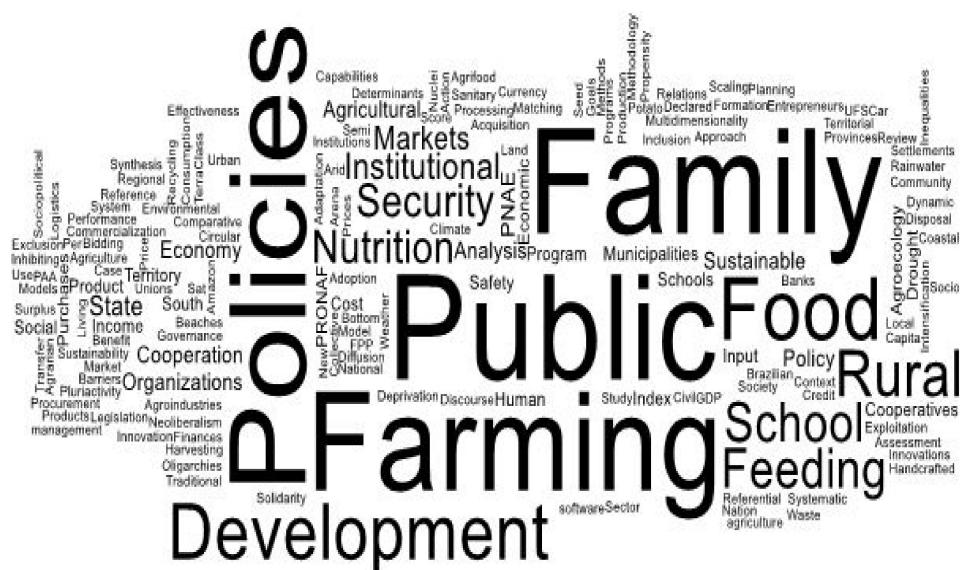
The article with the greatest diversity of authors nationality, with the first author’s affiliation in England, and others from Brazil, Zimbabwe, and Ghana, discussed the difficult interaction of public policies in one context (Brazil) and their possible implementation in other countries, in this case in Ghana, Mozambique, and Zimbabwe. The public policy in question was Brazil’s More Food Program, which was created in 2008 with the objective of “promoting food production and increasing the productivity of family farming” (Ministério da Agricultura, Pecuária e Abastecimento, 2021). Their discussion suggests that public policies developed in a given reality may face barriers to implementation in regions with different realities.

When analyzing the authors of the portfolio articles, the relevance of some authors who address this combination of themes becomes evident. For the three main authors in the portfolio, Cátia Grisa, Vanilde Ferreira Souza Esquerdo, and Lídia Cabral, the main themes discussed in their publications are, respectively: family farming, public policies, rural development; family farming, agroecology, and food systems; and development financing, rising powers, Brazil, Mozambique, and agricultural policy. The research themes of the three most influential authors are directly linked to their line of research, and it is important to highlight again that Grisa and Souza-Esquerdo are Brazilian, and Cabral is English.

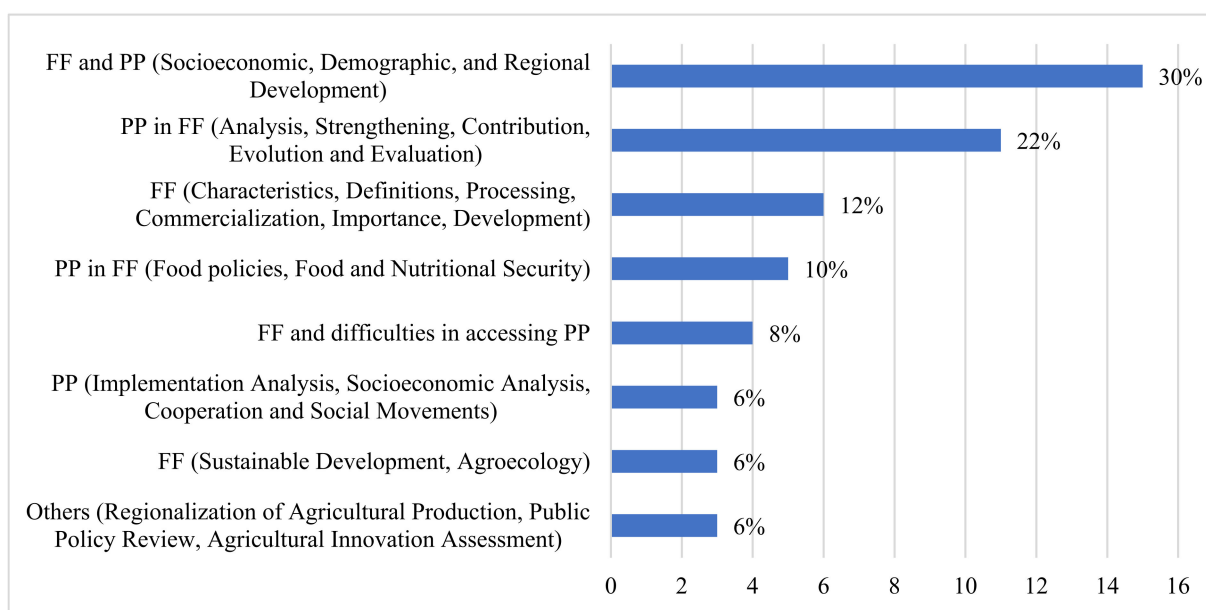
When correlating authors who do not belong to any research center shown in Figure 3, we observed that almost all are the same as those shown in Figure 4. The exceptions are authors A40 and A47, Brazilian researchers who carried out their work individually, who cited other authors in the portfolio and were also cited. Authors A15, A51, and A100, respectively, from Mexico, Canada, and Brazil, carried out their work individually. They were not cited and did not cite any of the studies in the portfolio. In relation to authors A95 and A141, their research was carried out individually and they cited authors in the network; however, they were not cited by any article in the portfolio. The only country that did not receive any citations by correlating authors in this portfolio was Sweden (A95), which is likely due to the article being published in the first half of 2020.

By analyzing the keywords included in the articles, a total of 217 keywords were identified in three languages (Portuguese, Spanish, and English). When considering the meaning of these keywords regardless of language, we found that the 217 keywords represented 127 different terms, among which, nine referred to the locations where the studies were conducted. These non-technical terms were excluded, for a total of 118 technical terms representing all keywords of the portfolio. Figure 5 presents a word cloud consisting of the 118 technical terms that represent the 208 identified keywords. In the figure, a larger font represents the frequency of a term’s use, with the most common being family farming (58%), public policies (54%), and socioeconomic development (20%).

Our analysis also showed that 68% of the articles were applied studies, while 32% were theoretical work related to the topic. These were grouped into eight categories according to their main themes (Figure 6). The focal themes for the present study, “public policy, family farming, and socioeconomic development” were the basis for 94% of the articles ranked in the InOrdination classification, with the most common thematic focus was: “Public policy in family farming: analysis, strengthening, contribution, evolution, and evaluation”. This analysis reinforces the importance of the present study, as it highlights the main themes considered in the identified articles. Further, it indicates that, despite the low density of the network, as only 4.20% of possible interactions occurred between authors (Figure 4), these themes are always directly or indirectly connected with the research topic.



**Figure 5.** Word cloud of keywords. Source: research data (2021).



**Figure 6.** Focal themes of the articles. PP = public policy; FF = family farming. Source: research data (2021).

## 4. Discussion

All articles in the studied portfolio have a common point of interest in strengthening public policies related to family farming, thus helping to support family farming and socio-economic development. Family agriculture supported by well-developed public policies is a key factor in increasing income for rural families, supporting food and nutritional security, reducing rural exodus, conserving biodiversity, strengthening the domestic market and the exportation of agricultural goods generated by family farming, and creating wealth not only for the local economy, but for the country as a whole [33–35].

Few articles address the themes of public policies, family farming, and socioeconomic development, even in recent years there has been a slight trend towards an increase in the number of publications. Therefore, an important point of this work was a broad review on the themes of economic development, environmental sustainability, and well-being of family farmers. The initial search in the databases was from 1984 to 2020, and the final

review, upon request by Methodi Ordinatio, was organized from 2010 to 2020, finding subjects in 16 different developing countries.

It can be seen that developing countries are most cited in the works. They are the countries with greatest social inequalities; thus, they specifically need public policies to maintain their family farming.

According to Dos Santos, et al. [7], Petersen and Silveira [17], Berchin, et al. [36], public policies for family agriculture is important for maintaining rural jobs, generating benefits for society, for sustainable development, income distribution, and for the country's food security. In other words, this can contribute to poverty reduction. It can be said that family farming is a branch of significant economic and social importance, strengthening sustainable development and economic growth.

Through an analysis of the main themes of this study (family farming and public policies in socioeconomic, demographic, and territorial development; public policy in family farming aiming at analysis, strengthening, contribution, evolution, and evaluation), we can begin to understand the outcomes of public policies in family farming and their impact on socioeconomic development worldwide.

For the maintenance of family farming in the countryside, several possibilities can be established, one could be Open Innovation. Currently, several innovation trends are passing from company business to smaller ones; thus, family farming maintained in the countryside can professionalize to better manage open innovation [37–39].

In 2003, the term Open Innovation was presented by Chesbrough, for the purpose of demonstrating how organizations can look for ideas external to their companies, in order to its development, according this author, "Innovating is more than just investing in scientific research. It's also about thinking about new business models, maintain cooperation with customers and consumers and attracting the participation of external sources of knowledge" [40]. With the intention of stimulating internal innovation processes, establishing different external paths to increase your results, open innovation helps in the flow of developments input and output of ideas [38–41]. Today an increasing number of small businesses and family farming are focused on open innovation, looking for information related to the market, and how to meet customer demands or follow up competitors [42,43].

As such, rural development is seen by several authors as a process that expands beyond economic growth (measured only by product or per capita income), to a range of sociocultural, environmental, and political–institutional aspects of rural life. Thus, it offers the capacity to generate well-being, eradicate poverty, and protect regional biodiversity [44–48].

Public policies are strategies that help strengthen family farming. Additionally, open innovation can make use of this result, having seen the example of new arrangements. There is the example of a small restaurant in the United States, Chez Panisse, which was voted one of the 50 best restaurants in the world between 2002 and 2008, by *Restaurant* magazine. This restaurant is focused on fresh local products, also transforming family farming in the region, encouraging its production and consumption [49].

This demonstrates that open innovation related to the natural food trade and family farming are linked to, and dependent on, transformations, and of the innovation systems, aiming to ensure access to external information and human capital until they are directly related in the creation of knowledge and skills extra organizations [50]. Thus, the maintenance of family farming in the field through correct public policies is important to maintain rural life.

Additionally, to achieve sustainable agriculture, specific public policies for the recovery of degraded areas are needed, whereby the goal is to adjust agricultural practices in order to promote socioeconomic development and the well-being of the population, promoting sustainability and linking society and government, thereby strengthening family farming [7]. The Sustainable Development Goals are the blueprint for achieving a better and more sustainable future for all. They address the global challenges we face, including poverty, inequality, climate change, environmental degradation, peace, and justice [51].

Therefore, for family farming, the development can be achieved through open innovation, transforming knowledge in social and economic benefits, developing new products and new marketing methods, and building the development in production systems and new operationalization methods [52]. The open innovations of agriculture are technology transfers carried out for the agricultural sector, used by farmers in order to increase productivity and socioeconomic development [53].

On the other hand, the significant presence of public policies for strengthening and developing family farming in Latin American countries is partly related to the fact that these countries are still developing, and family farming that complements large-scale farming is one of the main actors of socioeconomic development, creating more jobs in rural areas and increasing family income farming [54–56]. In Brazil, the rural environment assumes great economic and social relevance, note that an average of 16% of the Brazilian population lives in rural areas. Rural areas are important both economically and socially, as well in other countries of South America. In contrast, USA and Europe have less than 5% of the population living in rural areas [57].

In this context, Brazil stands out on the international stage when it comes to public policy programs aimed at supporting family farming. There were sixteen programs and public policies cited in the portfolio articles (PRONAF, SEAF, PGPAF, ATER, and agrarian reform settlements, PRONAF Infrastructure, Garantia-Safra, PNHR, Bolsa Família, PAA, PNAE, PGPMEis, PNPE, agribusiness, and certifications). PRONAF stands out as the key program for strengthening Brazilian family farming, as it was discussed in almost 50% of the articles in the portfolio.

Based on the results presented in the present study, the correlation established between authors from different countries on public policy is evident when it comes to the strengthening and structuring of family farming as a pillar of food security at the international level. This is consistent with the importance given to family farming by the [4]. The results found by [21] also highlighted family farming as a determinant factor in the promotion of food and nutritional security.

Our results also demonstrate that Latin America plays a prominent role in public policy research. The Colombian authors in the portfolio published a total of two studies on public policies related to food and nutritional security, agricultural production, and innovation. Initially the focus of this work was on modernizing the sector and improving agricultural productivity, and later moving to rural development. Meanwhile, authors from Chile mainly describe two types of programs: those for public sector purchasing of products from family farmers, and those aimed at school meals. Both programs are equivalent to the programs developed in Brazil, the Food Acquisition Program (PAA), and the National School Food Program (PNAE).

The authors from Mexico present data from the Procampo program, which seeks to increase producer income through direct subsidies, while adding value for products from rural producers, supporting increased income, and the maintenance of farmers in the countryside. In the four studies published by authors from Argentina, the articles address several programs, including those to support small-scale producers in northeast and northwest Argentina (PNOA and PNEA), those aimed at the inclusion of rural women (with funding from the UN), rural development for northeast Argentina (PRODERNEA), Social Agricultural Program (PSA), and Rural Development Initiatives (PROINDER).

## 5. Conclusions

The correlation established between authors from different countries on public policy is evident when it comes to the strengthening and structuring of family farming as a pillar of the food system in a region or country. Between 2010 and 2020, there was a constant growth in the number of publications on the topic, with an increase of 733% in the volume of work in the second half of the decade (2016 to 2020) compared to the first half (2010 to 2015). This increase was also identified in relation to the number of authors, which rose from 17 to 144 in the same period, an increase of almost 850%. Based on our sample,

authors from South America produced most of the scientific information on the subject, accounting for 80% of the total number of articles in the analyzed portfolio, with Brazil being one of the key countries that developed public policies aimed at family farming and rural socioeconomic development.

Additionally, we can infer that the topics related to public policies, family farming, and socioeconomic development is of wide interest, as the 50 articles in the portfolio were published across 32 different journals by a group of 144 authors and co-authors from 16 countries on four continents. This demonstrates the interest around and breadth of the researched themes. Further, it indicates that collaboration, through the exchange of ideas, information, and knowledge between authors, facilitates research development, since 86% of the articles were written with two or more authors.

This study offers important information about the interaction of public policies, family farming, and socioeconomic development. Through Scientometrics, we examined the evolution and trends from an international perspective, identifying the countries with more scientific production in the area (based on the nationality of the first author), as well as the most relevant studies and main journals publishing on the topic. We also highlight the network of connections and network of citations, and analyze keywords, type of research, and main themes of the articles. As such, the present study can contribute significantly to future research related to the topic, offering a resource for comparison and growth, and assist policy makers in the formulation and application of public policies, considering that information related to the variables discussed herein are necessary for their development.

**Author Contributions:** This article is the result of a literature review about the family farming, public policies, and socioeconomic development. Currently used for the development of the doctoral research in progress. E.V.Z. developed the original idea, contributed to the research design, was responsible for data collection and analysis of the data. L.M.M. and L.B.T. contributed to the argument structuring and comments on results and analysis of the data. J.V.M.B. and A.G.V.Z. provided guidance and advice. All authors have read and agreed to the published version of the manuscript.

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

## Appendix A

**Table A1.** Authors and corresponding codes.

| Authors                        | Country   | Code | Authors                        | Country   | Code |
|--------------------------------|-----------|------|--------------------------------|-----------|------|
| ABRAMOVAY, Ricardo             | France    | A1   | FREITAS, Alair Ferreira de.    | Brazil    | A73  |
| ALLAIRE, G.                    | France    | A2   | GISCLARD, M.                   | France    | A74  |
| ALMEIDA, A.F.                  | Brazil    | A3   | GRISA, Cátia                   | Brazil    | A75  |
| ALMEIDA, C.                    | Brazil    | A4   | GUANZIROLI, Carlos Enrique     | Brazil    | A76  |
| ALMEIDA, L. M. D. M. C.        | Brazil    | A5   | GUILHOTO, Joaquim Jose Martins | France    | A77  |
| AMANOR, Kojo                   | Ghana     | A6   | HENRIQUES, P.                  | Brazil    | A78  |
| ARANDA, Camacho, Y.            | Columbia  | A7   | HERRERA, Andrea Gómez.         | Argentina | A79  |
| ARAUJO, A.L.                   | Brazil    | A8   | JARA, Cristian Emanuel         | Argentina | A80  |
| ASSIS, Thiago Rodrigo de Paula | Brazil    | A9   | JARDIM, M.A.G.                 | Brazil    | A81  |
| BACA DEL MORAL, Júlío          | Mexico    | A10  | KHAN, Saeed Khan.              | Brazil    | A82  |
| GUERRA, S. O. DE A.            | UK/Brazil | A11  | KRÜGER, C.                     | Brazil    | A83  |



Table A1. Cont.

| Authors                                | Country   | Code | Authors                          | Country   | Code |
|--|-----------|------|----------------------------------|-----------|------|
| BARBOSA, Isis Ribeiro de Oliveira      | Brazil    | A12  | LACQUES, A.-E.                   | France    | A84  |
| BARBOSA, Roseane Moreira Sampaio       | Brazil    | A13  | LEITÃO, F.O.                     | Brazil    | A85  |
| BARBOSA, Zulene                        | Brazil    | A14  | LINDOSO, D.P.                    | Brazil    | A86  |
| BARRAZA GONZALEZ, Carlos Eduardo.      | Mexico    | A15  | MAFFRA, Lourrene                 | Brazil    | A87  |
| BARRIENTOS-FUENTES, Juan Carlos        | Columbia  | A16  | MAGALHAES, Reginaldo             | Brazil    | A88  |
| BELIK, Walter                          | Brazil    | A17  | MANRIQUE, Luís Felipe Rincón     | Columbia  | A89  |
| BERCHIN, I. I.                         | Brazil    | A18  | MARCONATO, M.                    | Brazil    | A90  |
| BERG, Ernst.                           | Germany   | A19  | MARTINELLI, S. S.                | Brazil    | A91  |
| BERGAMASCO, Sonia Maria Pessoa Pereira | Brazil    | A20  | MARTINEZ, Sofia Boza.            | Chile     | A92  |
| BITTENCOURT, J.V.M.                    | Brazil    | A21  | MARTINS Kato, K.Y.               | Brazil    | A93  |
| BITTENCOURT, P. A. T.                  | Brazil    | A22  | MELGAREJO, L.                    | Brazil    | A94  |
| BRAMBILLA, M.A.                        | Brazil    | A23  | MILJAND, Matilda                 | Suécia    | A95  |
| BURLANDY, L.                           | Brazil    | A24  | MONTEIRO, A.                     | Brazil    | A96  |
| BURSZTYN, M.                           | Brazil    | A25  | MOSQUERA, Vásquez, T.            | Columbia  | A97  |
| CABRAL, Lúdia                          | England   | A26  | MOURÃO, M.                       | Brazil    | A98  |
| Caldana, A. C. F.                      | Brazil    | A27  | MUKWEREZA, Langton               | Zimbabwe  | A99  |
| CALDERON, Giraldo                      | Brazil    | A28  | NASCIMENTO, Cezar KG.            | Brazil    | A100 |
| CAMPOS, Ana Paula Teixeira de.         | Brazil    | A29  | NASUTI, S.                       | Brazil    | A101 |
| CANTERI, M.H.G.                        | Brazil    | A30  | NIEDERLE, Paulo                  | Brazil    | A102 |
| CARDOZO, D. R.                         | Brazil    | A31  | NIEMBRO, Andrés                  | Argentina | A103 |
| CASTRO, J.                             | Brazil    | A32  | NUNES, N. A.                     | Brazil    | A104 |
| CAVALLI, S. B.                         | Brazil    | A33  | OLIVEIRA, Sibeles Vasconcelos de | Brazil    | A105 |
| CITTADINI, R.                          | France    | A34  | PASSADOR, C. S.                  | Brazil    | A106 |
| CIVITARES, H. Martín                   | Argentina | A35  | PAULILLO, L. F. D. O.            | Brazil    | A107 |
| COELHO, Amanda de Melo                 | Brazil    | A36  | PEGORARE, Alexander Bruno        | Brazil    | A108 |
| CONSTANTINO, Michel                    | Brazil    | A37  | PEREIRA, Josiane Castro.         | Brazil    | A109 |
| CORREA, Bianca                         | Brazil    | A38  | PERTESEN, P.F.                   | Brazil    | A110 |
| COSTA, Reginaldo Brito da.             | Brazil    | A39  | PICOLOTTO, Everton Lazaretti     | Brazil    | A111 |
| CRUZ, Fabiana Thomé da.                | Brazil    | A40  | PUGLIESI, L.                     | Brazil    | A112 |
| CRUZ, Suely Ferreira da                | Brazil    | A41  | ROCKETT, Fernanda Camboim        | Brazil    | A113 |
| CUÉLLAR, Gálvez, D.                    | Columbia  | A42  | RODRIGUES, B.A.                  | Brazil    | A114 |
| CUEVAS REYES, Venâncio. Andaimés       | Mexico    | A43  | RODRIGUES, Filho, S.             | Brazil    | A115 |
| CUNHA, Marcelo Pereira da              | Brazil    | A44  | RODRIGUES, K.C.T.T.              | Brazil    | A116 |
| CUNHA, W.A.                            | Brazil    | A45  | SALGADO, R.J.S.F.                | Brazil    | A117 |
| DA CAMARA, M.R.G.                      | Brazil    | A46  | SANCHES, Jarquín N.H.            | Mexico    | A118 |
| DA SILVA, C.L.                         | Brazil    | A47  | SANGERMAN, Jarquín, D.M.         | Mexico    | A119 |
| DA SILVA, F. R.                        | Brazil    | A48  | SANTOS, Luana Ferreira dos       | Brazil    | A120 |
| DA SILVA, M.A.                         | Brazil    | A49  | SCHABARUM, Joseane Carla         | Brazil    | A121 |
| DA SILVA, W.H.                         | Brazil    | A50  | SCHNEIDER, Sergio                | Brazil    | A122 |
| DANTAS, M.                             | Canada    | A51  | SCHRODER, Mônica                 | Brazil    | A123 |
| DANTAS, M. K.                          | Brazil    | A52  | SEIBANE, Cecilia                 | Argentina | A124 |
| DAVÓ-BLANES, M. C.                     | Spain     | A53  | SEYLER, F.                       | France    | A125 |
| DE AMORIM, W. S.                       | Brazil    | A54  | SILVA, Tais Martins da           | Brazil    | A126 |
| DE ANDRADE, J. B. S.                   | Roménia   | A55  | SILVEIRA, L.M.                   | Brazil    | A127 |
| DESSAY, N.                             | France    | A56  | SOARES, D. DA S. B.              | Brazil    | A128 |

**Table A1.** *Cont.*

| Authors                           | Country   | Code | Authors                           | Country   | Code |
|-----------------------------------|-----------|------|-----------------------------------|-----------|------|
| DIAS, Patrícia Camacho            | Brazil    | A57  | SOARES, K. C. B.                  | Brazil    | A129 |
| DONDO, Mariana                    | Argentina | A58  | SOARES, P.                        | Spain     | A130 |
| DURIEUX                           | France    | A59  | SOLDERA, Denis.                   | Brazil    | A131 |
| EIRO, F.                          | Holanda   | A60  | SOUZA, Gabriela Coelho de.        | Brazil    | A132 |
| ELIAS, Lilian de Pellegrini       | Brazil    | A61  | SOUZA-ESQUERDO, Vanilde Ferreira  | Brazil    | A133 |
| FAVARETO, Arilson                 | Brazil    | A62  | SPERAT, Ramiro Rodríguez          | Argentina | A134 |
| FERNANDEZ, Annelise Caetano Fraga | Brazil    | A63  | SUAREZ, Castellanos, J.A.         | Mexico    | A135 |
| FERRARIS, Guillermina             | Argentina | A64  | TRICHES, Rozane Márcia            | EUA       | A136 |
| FERREIRA, Daniele Mendonça.       | Brazil    | A65  | TROIAN, Alessandra                | Brazil    | A137 |
| FERREIRA, Marco Aurélio Marques   | Brazil    | A66  | TROIAN, Alexandre                 | Brazil    | A138 |
| FERRENTE, V. L. S. B.             | Brazil    | A67  | VALENCIA, Perafán, Mireya Eugenia | Brazil    | A139 |
| FILHO, Almir Cezar Baptista.      | Brazil    | A68  | VENTURIERI, A.                    | Brazil    | A140 |
| FLEXOR, G.G.                      | Brazil    | A69  | VILLARREAL, Federico.             | Argentina | A141 |
| FORNASARI, V. H.                  | Brazil    | A70  | VINCHON, Karina                   | Brazil    | A142 |
| FRANÇA, André Guerra de Melo      | Brazil    | A71  | ZIMMER, G. A. A.                  | Brazil    | A143 |
| FREITAS, A.F.                     | Brazil    | A72  | ZIMMERMANN, S.A.                  | Brazil    | A144 |

Source: author data (2021).

## Appendix B

**Table A2.** Portfolio ranking with the application of the InOrdinatio equation.

| Authors  | Title   | Journal                                       | JCR    | Year | Citation | InOrdinatio * | Ranking |
|--|---|---|--------|------|----------|---------------|---------|
| GRISA, Cátia and SCHNEIDER, Sergio   | Três gerações de políticas públicas para a agricultura familiar e formas de interação entre sociedade e estado no Brasil      | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2014 | 268      | 288.0001      | 1       |
| CABRAL, Lúdia; FAVARETO, Arilson; MUKWEREZA, Langton; AMANOR, Kojo   | Brazil's Agricultural Politics in Africa: More Food International and the Disputed Meanings of "Family Farming"               | <i>World Development</i>                      | 5.431  | 2016 | 59       | 89.0054       | 2       |
| SOUZA-ESQUERDO, Vanilde Ferreira; BERGAMASCO, Sonia Maria Pessoa Pereira   | Análise sobre o acesso aos programas de políticas públicas da agricultura familiar nos municípios do circuito das frutas (SP) | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2014 | 61       | 81.0001       | 3       |
| BERCHIN, I.I.; NUNES, N.A.; AMORIM, W.; ALVES Zimmer, G.A.; DA SILVA, F.R.; FORNASARI, V.H.; SIMA, M. ANDRADE Guerra, J.B.S.O. | The contributions of public policies for strengthening family farming and increasing food security: The case of Brazil        | <i>Land Use Policy</i>                        | 3.573  | 2019 | 12       | 57.0036       | 4       |
| ELIAS, Lilian de Pellegrini; BELIK, Walter; CUNHA, Marcelo Pereira da and GUILHOTO, Joaquim Jose Martins.                      | Socioeconomic impacts of the National School Feeding Program on family farming in Santa Catarina                              | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2019 | 8        | 53.0001       | 5       |
| CUNHA, W.A.; FREITAS, A.F.; SALGADO, R.J.S.F.  | Efeitos dos programas governamentais de aquisição de alimentos para a agricultura familiar em Espera Feliz, MG                | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2017 | 17       | 52.0001       | 6       |

Table A2. Cont.

| Authors  | Title  | Journal                                       | JCR    | Year | Citation | InOrdinatio * | Ranking |
|--|--|---|--------|------|----------|---------------|---------|
| DA SILVA, C.L.   | Proposal of a dynamic model to evaluate public policies for the circular economy: Scenarios applied to the municipality of Curitiba                                    | <i>Waste Management</i>                       | 5.431  | 2018 | 11       | 51.0054       | 7       |
| MILJAND Matilda  | Using systematic review methods to evaluate environmental public policy: methodological challenges and potential usefulness  | <i>Environmental Science &amp; Policy</i>     | 4.816  | 2020 | 1        | 51.0048       | 8       |
| DIAS, Patrícia Camacho; BARBOSA, Isis Ribeiro de Oliveira; BARBOSA, Roseane Moreira Sampaio; FERREIRA, Daniele Mendonça. | Purchases from family agriculture for school feeding in Brazilian capitals   | <i>Revista de saúde pública</i>               | 1.968  | 2020 | 0        | 50.0020       | 9       |
| ABRAMOVAY, Ricardo; MAGALHAES, Reginaldo; SCHRODER, Mônica   | Representatividade e inovação na governança dos processos participativos: o caso das organizações Brasileiras de agricultores familiares                               | <i>Sociologias</i>                            | 0.1553 | 2010 | 50       | 50.0002       | 10      |
| TROIAN, Alexandre; TROIAN, Alessandra; OLIVEIRA, Sibeles Vasconcelos de and PEREIRA, Josiane Castro.                     | The performance of municipalities of Rio Grande do Sul in the implementation of the resources of the PNAE with family agriculture                                      | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2020 | 0        | 50.0001       | 11      |
| CRUZ, Fabiana Thomé da.  | Family farming, food processing and advances and setbacks in the regulation of traditional and artisanal foods   | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2020 | 0        | 50.0001       | 12      |
| MAFFRA, Lourrene; MARTINEZ, Sofia Boza.  | Influencia de Brasil en la Política Alimentaria Latinoamericana: el programa de compras públicas a la agricultura familiar de Chile                                    | <i>Estúdios internacionales (Santiago)</i>    | 0      | 2020 | 0        | 50.0000       | 13      |
| DANTAS, M.   | The Role of Institutions in Promoting Resilience in the Development of Sustainable Food Systems: The Farmer's Perspective in the Northeast of Brazil                   | <i>World Sustainability Series</i>            | 0      | 2020 | 0        | 50.0000       | 14      |
| LINDOSO, D.P.; EIRO, F.; BURSZTYN, M.; RODRIGUES, Filho, S.; NASUTI, S.  | Harvesting water for living with drought: Insights from the Brazilian Human Coexistence with Semi-Aridity approach towards achieving the sustainable development goals | <i>Sustainability</i>                         | 2.592  | 2018 | 9        | 49.0026       | 15      |
| SCHABARUM, Joseane Carla; TRICHES, Rozane Márcia   | Aquisição de Produtos da Agricultura Familiar em Municípios Paranaenses: Análise dos produtos comercializados e dos preços praticados                                  | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2019 | 4        | 49.0001       | 16      |
| SOARES, Panmela et al.   | Potencialidades e dificuldades para o abastecimento da alimentação escolar mediante a aquisição de alimentos da agricultura familiar em um município brasileiro        | <i>Ciência &amp; Saúde Coletiva</i>           | 0      | 2015 | 24       | 49.0000       | 17      |
| GISCLARD, M.; ALLAIRE, G.; CITTADINI, R.   | Proceso de institucionalización de la agricultura familiar y nuevo referencial para el desarrollo rural en la Argentina  | <i>Mundo agrário</i>                          | 1.108  | 2015 | 23       | 48.0011       | 18      |

Table A2. Cont.

| Authors   | Title  | Journal                                       | JCR    | Year | Citation | InOrdinatio * | Ranking |
|---|--|---|--------|------|----------|---------------|---------|
| VILLARREAL, Federico.   | La inclusión de la Agricultura Familiar. Discusión de su uso en programas de desarrollo rural en Argentina                                 | <i>Mundo agrário</i>                          | 1.108  | 2018 | 8        | 48.0011       | 19      |
| NIEDERLE, Paulo; GRISA, Cátia; PICOLOTTO, Everton Lazaretti; SOLDERA, Denis.                              | Narrative disputes over family-farming public policies in Brazil: Conservative attacks and restricted countermovements                     | <i>Latin American Research Review</i>         | 0.676  | 2019 | 3        | 48.0007       | 20      |
| ASSIS, Thiago Rodrigo de Paula; FRANCA, André Guerra de Melo and COELHO, Amanda de Melo.                  | Agricultura familiar e alimentação escolar: desafios para o acesso aos mercados institucionais em três municípios mineiros                 | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2019 | 2        | 47.0001       | 21      |
| DA SILVA, W.H.; LEITÃO, F.O.; DA SILVA, M.A.  | Logistical costs associated at the institutional trade food in family farming: The case of the national school feeding program (PNAE)      | <i>Custos e Agronegócio</i>                   | 0.39   | 2018 | 6        | 46.0004       | 22      |
| JARA, Cristian Emanuel; SPERAT, Ramiro Rodríguez; MANRIQUE, Luis Felipe Rincón and HERRERA, Andrea Gómez. | Rural development and family farming in Argentina: An approach to the conjuncture from the state policies                                  | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2019 | 1        | 46.0001       | 23      |
| SANTOS, Luana Ferreira dos; FERREIRA, Marco Aurélio Marques; CAMPOS, Ana Paula Teixeira de.               | Performance barriers and public policies: analysis of family farming cooperatives  | <i>Caderno de Gestão Pública e Cidadania</i>  | 0      | 2019 | 1        | 46.0000       | 24      |
| CUÉLLAR, Gálvez, D.; ARANDA, Camacho, Y.; MOSQUERA, Vásquez, T.   | A model to promote sustainable social change based on the scaling up of a high-impact technical innovation                                 | <i>Sustainability</i>                         | 2.592  | 2018 | 5        | 45.0026       | 25      |
| SANCHES, Jarquín N.H.; SUAREZ, Castellanos, J.A.; SANGERMAN, Jarquín, D.M.                                | Pluriactividad y agricultura familiar: retos del desarrollo rural en México  | <i>Revista mexicana de ciencias agrícolas</i> | 0.884  | 2017 | 10       | 45.0009       | 26      |
| NASCIMENTO, Cezar KG.   | Territory and Public Policy in Brazil  | <i>Latin American Perspectives</i>            | 0.718  | 2019 | 0        | 45.0007       | 27      |
| BITTENCOURT, P. A. T.; KHAN, Saeed Khan.  | O impacto do Pronaf sobre a sustentabilidade agrícola de agricultores familiares na microrregião do vale do médio curu, no estado do Ceara | <i>Economia Aplicada</i>                      | 0.3    | 2019 | 0        | 45.0003       | 28      |
| FREITAS, Alan Ferreira de; FERREIRA, Marco Aurélio Marques; FREITAS, Alair Ferreira de.                   | A trajetória das organizações de agricultores familiares e a implementação de políticas públicas: Um estudo de dois casos                  | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2019 | 0        | 45.0001       | 29      |
| GUANZIROLLI, Carlos Enrique; VINCHON, Karina  | Agricultura familiar nas regiões serrana, norte e noroeste fluminense: determinantes do processo de geração de renda                       | <i>Revista de Economia e Sociologia Rural</i> | 0.1491 | 2019 | 0        | 45.0001       | 30      |
| ALMEIDA, A.F.; JRDIM, M.A.G.  | Changes socioeconomic and environmental result of public policies socioeconomic development in the northeast coast of Pará, Brazil         | <i>Desenvolvimento e Meio Ambiente</i>        | 0      | 2018 | 5        | 45.0000       | 31      |

Table A2. Cont.

| Authors   | Title  | Journal  | JCR   | Year | Citation | InOrdinatio * | Ranking |
|---|--|--|-------|------|----------|---------------|---------|
| GRISA, Cátia;<br>VALENCIA, Perafán,<br>Mireya Eugenia;<br>CALDERON, Giraldo,<br>ELENA, Patrícia                             | Transfer and translation of public policies from Brazil to Colombia: the case of public purchase from family farming   | <i>Lume, repositório digital UFRGS</i>                       | 0     | 2018 | 5        | 45.0000       | 32      |
| FERNANDEZ,<br>Annelise Caetano<br>Fraga; FILHO, Almir<br>Cezar Baptista.  | Agricultura familiar urbana: limites da política pública e das representações sociais  | <i>CIDADES, Comunidades e Territórios</i>                    | 0     | 2019 | 0        | 45.0000       | 33      |
| CRUZ, Suely Ferreira<br>da; ASSIS, Thiago<br>Rodrigo de Paula.  | Contribuições de três organizações para a comercialização da agricultura familiar no PNAE, no território sul litorâneo do Espírito Santo                         | <i>Interações (Campo Grande)</i>                             | 0     | 2019 | 0        | 45.0000       | 34      |
| PERTESEN, P.F.;<br>SILVEIRA, L.M.   | Agroecology, public policies and labor-driven intensification: Alternative development trajectories in the brazilian semi-arid region                            | <i>Sustainability</i>  | 2.592 | 2017 | 9        | 44.0026       | 35      |
| NIEMBRO, Andrés;<br>DONDO, Mariana;<br>CIVITARESI, H. Martín  | La manifestación territorial de las desigualdades socioeconómicas en Argentina: del diagnóstico a las políticas públicas   | <i>Población y sociedad</i>                                  | 0     | 2016 | 14       | 44.0000       | 36      |
| ALMEIDA, Luiz<br>Manoel de Moraes<br>Camargo et al.   | Índice “UFSCar” de Efetividades do Programa de Aquisição de Alimentos para a segurança alimentar e nutricional de agricultores familiares do interior paulista   | <i>Gestão &amp; Produção</i>                                 | 0.209 | 2018 | 2        | 42.0002       | 37      |
| ALMEIDA, C.;<br>MOURÃO, M.;<br>DESSAY, N.;<br>LACQUES, A.-E.;<br>MONTEIRO, A.;<br>DURIEUX;<br>VENTURIERI, A.;<br>SEYLER, F. | Typologies and spatialization of agricultural production systems in Rondônia, Brazil: Linking land use, socioeconomics and territorial configuration             | <i>Land</i>  | 3.573 | 2016 | 11       | 41.0036       | 38      |
| TRICHES, Márcia, R.   | Efficiency and efficacy of public food procurement from family farmers for school feeding in Brazil  | <i>Brazilian Journal of International Law</i>                | 0.200 | 2018 | 1        | 41.0002       | 39      |
| CONSTANTINO,<br>Michel; PEGORARE,<br>Alexander Bruno;<br>COSTA, Reginaldo<br>Brito da.                                      | Desempenho regional do IDH e do PIB per capita dos municípios de Mato Grosso do Sul, Brasil, entre 2000 e 2010   | <i>Interações (Campo Grande)</i>                             | 0     | 2016 | 11       | 41.0000       | 40      |
| GRISA, C.; MARTINS<br>Kato, K.Y.;<br>FLEXOR, G.G.;<br>ZIMMERMANN, S.A.  | State capacities for rural development in Brazil: analysis of public policies for family farming   | <i>Sociedade e Cultura</i>                                   | 0     | 2017 | 6        | 41.0000       | 41      |
| CORREA, Bianca;<br>BARBOSA, Zulene  | O Programa de Aquisição de Alimentos—PAA: implicações socioeconômicas junto aos agricultores familiares da comunidade de Matinha—zona rural de São Luís          | <i>GOT, Revista de Geografia e Ordenamento do Território</i> | 0     | 2018 | 1        | 41.0000       | 42      |
| SEIBANE, Cecilia;<br>FERRARIS,<br>Guillermína   | Procesos organizativos y políticas públicas destinadas a productores familiares del sur del Área Metropolitana (provincia de Buenos Aires, Argentina), 2002-2015 | <i>Mundo agrário</i>   | 1.108 | 2017 | 5        | 40.0011       | 43      |



Table A2. Cont.

| Authors   | Title   | Journal  | JCR   | Year | Citation | InOrdinatio * | Ranking |
|---|---|--|-------|------|----------|---------------|---------|
| BACA DEL MORAL, Julio e CUEVAS REYES, Venancio. Andaimos                      | Debuture of public policies in the Mexican field  | <i>Andaimos</i>  | 0.2   | 2018 | 0        | 40.0002       | 44      |
| SILVA, Taís Martins da; ROCKETT, Fernanda Camboim; SOUZA, Gabriela Coelho de. | Territorial development and national school feeding program in rural territories of litoral and Campos de Cima Da Serra rural territories, in RIO Grande do SUL | <i>Revista Brasileira de Gestão e Desenvolvimento Regional</i> | 0     | 2018 | 0        | 40.0000       | 45      |
| BARRAZA GONZALEZ, Carlos Eduardo.   | Cooperación, políticas ciudadanas y públicas (bancos de tiempo y moneda social)   | <i>Estudios políticos (México)</i>                             | 0.37  | 2017 | 4        | 39.0004       | 46      |
| BARRIENTOS-FUENTES, Juan Carlos; BERG, Ernst.                                 | Impact assessment of agricultural innovations: A review   | <i>Agronomia Colombiana</i>                                    | 0.184 | 2013 | 23       | 38.0002       | 47      |
| BRAMBILLA, M.A.; MARCONATO, M.; RODRIGUES, K.C.T.T.; DA CAMAR, M.R.G.         | Municipal development and programa bolsa familia in Brazil: Spatial analysis  | <i>Espacios</i>  | 0.158 | 2017 | 3        | 38.0002       | 48      |
| KRÜGER, C., DANTAS, M. K., CASTRO, J., PASSADOR, C. S., & Caldana, A. C. F.   | ANALYSIS OF PUBLIC POLICIES FOR DEVELOPING THE BRAZILIAN BORDER STRIP   | <i>Ambiente &amp; Sociedade</i>                                | 0.254 | 2017 | 2        | 17.0003       | 49      |
| ARAUJO, A.L.; CANTERI, M.H.G.; BITTENCOURT, J.V.M.; RODRIGUES, B.A.           | Contribution of the Brazilian government purchasing programs—PAA and PNAE—to strengthening family agriculture   | <i>Espacios</i>  | 0.158 | 2017 | 1        | 16.0002       | 50      |

Source: author data (2021). \* The assigned weight of 5 for the year of publication. The higher this weight, the more importance will be given to new articles.

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