Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

# Importance of Social Responsibility for Food Security in the city of Guayaquil - Ecuador

Ing. Guido Poveda Burgos, MBA
Docente de la Universidad de Guayaquil
guido.povedabu@ug.edu.ec

Ing. Fernando Ponce Orellana, MAE
Docente de la Universidad de Guayaquil
fernando.ponceor@ug.edu.ec

Ing. Enith López Franco, MAE
Docente de la Universidad de Guayaquil
enith.lopezf@ug.edu.ec

Ing. Katia Ruiz Molina, MGS
Docente de la Universidad de Guayaquil
katia.ruizmo@ug.edu.ec

Ing. Zoila Franco Castañeda, MAE
Docente de la Universidad de Guayaquil
zoila.francoc@ug.edu.ec

Ing. Simón Parrales Escalante, MBA
Docente de la Universidad de Guayaquil
simon.parralese@ug.edu.ec

**Abstract**

A documentary review is conducted on research papers published in Latin America on food security through social responsibility policies during the period 2016-2020. The bibliographic search is performed through parameters established in the Scopus platform resulting in a total of 1,862 documents that meet the same, which are subjected to a bibliometric analysis in order to describe the volume of scientific production on the topic related above, as well as an analysis with a qualitative approach to understand the position of some authors regarding the implementation of social responsibility policies for food security. In this way, conclusions can be drawn to apply the relevant interpretation to the case of Guayaquil-Ecuador, comparing its current situation with that proposed by the identified bibliography.

**Key words:** Social Responsibility, Food Safety.

## 1. Introduction

food security deals with the accessibility that the population has to the ideal amount of food to satisfy this need. The absence of this possibility constitutes food insecurity, which is directly related to the levels of poverty that are so common in Latin American countries (León B., Martínez, Espíndola, & Schejtman, 2003). Ecuador does not escape these conditions, however, there have been several strategies that companies have designed to help stakeholders directly and indirectly

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

related to their economic activity, as well as government policies that seek to ensure compliance with the fundamental rights of human beings. Stimulating agricultural activity is also a strategy that has been a success story in neighboring countries such as Colombia, Peru and Brazil. Therefore, Ecuador has also applied strategies to help increase agricultural production and avoid food shortages. For 2014, the Central Bank of Ecuador revealed that the growth in agricultural production for thirteen consecutive years was 8.31 percentage points while population growth was 1.5 percentage points (Ayaviri, Fernández, Omero Flores, & Fierro López, 2016). This allows inferring that there is a higher food production in relation to the increase in population, which means that there may not be shortages according to the figures mentioned. Knowing then what have been the measures of different economic sectors in relation to food security is of great help in research on the quality of life and welfare of citizens, so it is necessary to consult the current literature on the topic of study, in order to answer the question: How has been the production of research on food security from the perspective of social responsibility in Guayaquil, Ecuador?

## 2. General Objective

To analyze from a bibliometric and bibliographic perspective, the production of research papers concerning the variable Social Responsibility and Food Safety, during the period 2016-2020.

## 3.Methodology

A bibliometric review is carried out by applying search filters in the Scopus tool to identify the research works which will be classified according to the most important characteristics in order to know how the scientific production on the topic proposed in this work has been. Similarly, at each point of analysis, the position of some researchers will be qualitatively reviewed to apply the knowledge to the case of Guayaquil-Ecuador.

### 3.1 Methodological design

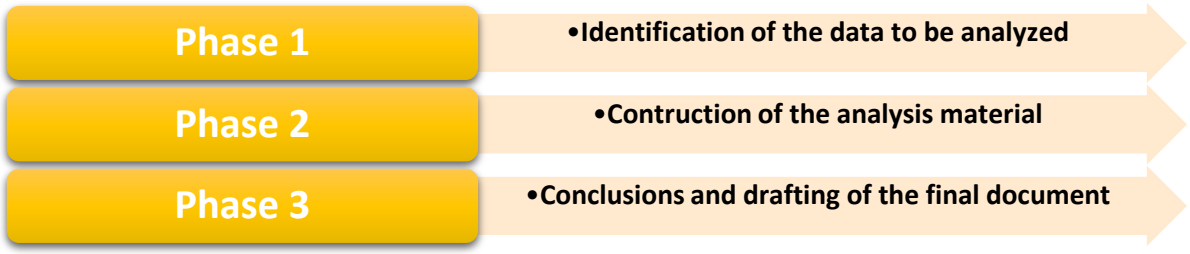



**Table 1.** Methodological design.
**Source:** Own elaboration (2021)

#### 3.1.1 Phase 1

Through Phase 1, research papers published in high impact journals indexed in the Scopus database are identified through its *Search* tool under the following parameters:

- ✓ Published documents whose study variables are related to Social Responsibility for Food Safety.
- ✓ Research papers published during the period 2016-2020.
- ✓ Publications by Latin American authors and institutions.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

- ✓ Without distinction of type of publication.
- ✓ Without distinction of area of knowledge.

Once the above search parameters have been applied, a total of 1,862 research papers were obtained that comply with and will be processed as established in the following phase.

### 3.1.2 Phase 2

The data will be classified through the preparation of tables and figures to facilitate their interpretation. The information will be classified according to the following aspects:

- ✓ Year of publication
- ✓ Country of origin of publication
- ✓ Participating Authors
- ✓ Knowledge area

The interpretation of this information will allow highlighting important data regarding the production of research works and will allow a qualitative analysis with the purpose of applying it to the Ecuadorian context.

### 3.1.3 Phase 3

Once the information is identified, organized and interpreted through the completion of phases 1 and 2, the conclusions are drawn and the final document is written.

## 4. Results

### 4.1 Co-occurrence of words

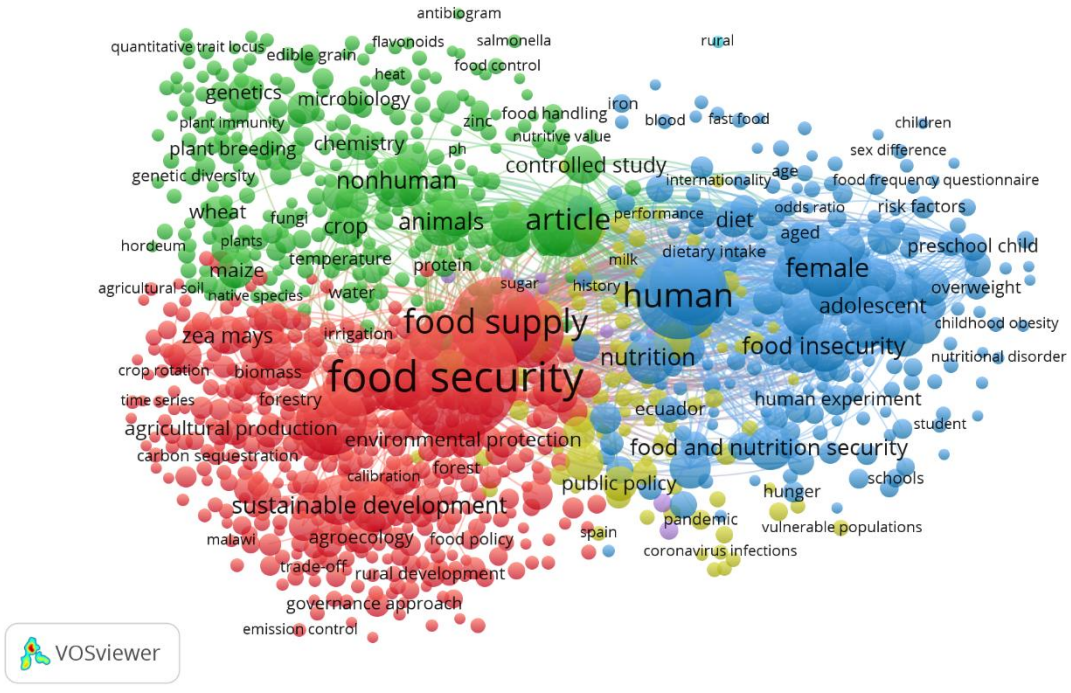



**Figure 1.** Co-occurrence of words.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

**Source:** Own elaboration (2021); based on data provided by Scopus.

Figure 1 shows the words that are most frequently related in the research identified through the execution of phase 1 of the methodological design. An important approach can be evidenced between research related to Food Safety, with terms such as Food Supply, Irrigation, Environmental Protection, Food Policy, which are very common topics, especially when talking about Social Responsibility, since it enters into the defense of any fundamental right, in a philanthropic way and of course without profit motive for companies if we are talking about the private sector, as a retribution to society in guaranteeing an improvement in the quality of life of the different interest groups with which companies have direct or indirect relationship. Regarding the study of Human Rights, topics such as Nutrition, Nutritional Security, Dietary Intake, are related to Ecuadorian papers and research works, while at the top left of the figure, solutions to the problems of food security in Latin American countries are discussed. They address issues related to measures to counteract the effects of climate change, responsible agriculture, public policies, crops, among others. In general terms, research related to food security seeks sustainable development through the generation of new knowledge and, of course, the direct intervention of public actors to ensure the satisfaction of basic human needs, one of the most important of which is precisely food.

### 4.2 Historical evolution of scientific production

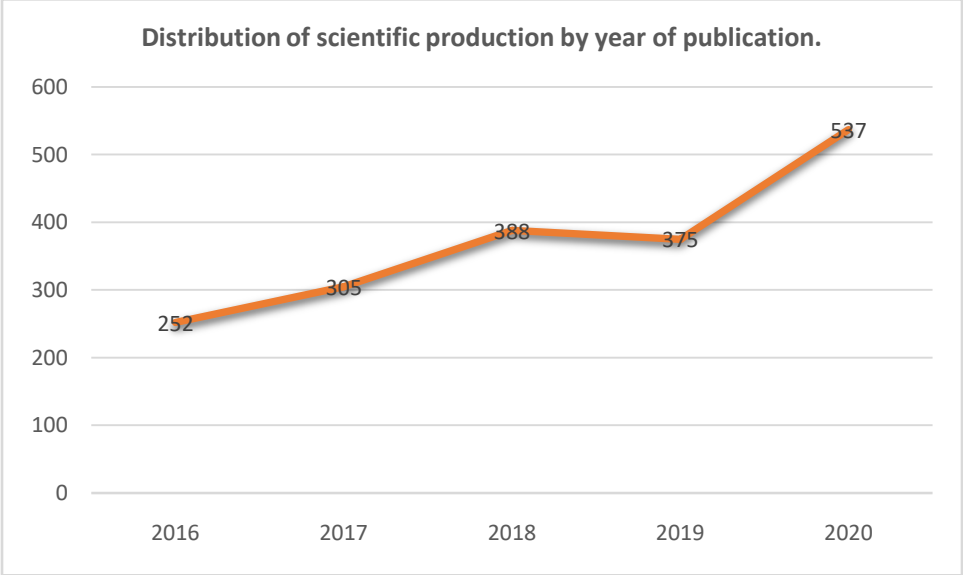



**Figure 2.** Annual evolution of scientific production.
**Source:** Own elaboration (2021); based on data provided by Scopus.

The period analyzed in the present study corresponds to the years between 2016 and 2020, with the purpose of focusing on the actuality of social responsibility policies aimed at food security. It is then observed how since 2016 the growth of production has been significant reporting at that time a total of 252 published research papers, which became 305 in 2017 and 388 in 2018. Only during this last year and 2019 there is a slight drop in production, going to 375 published papers within which is the paper "*World map and indicators of sustainability of the food system*" (Bene, et al.,

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

2019) which shows a set of indicators that measure the literature worldwide on issues related to food security, presenting a rigorous assessment on what is exposed by different authors on environmental, social, food security, nutritional and economic issues.

By 2020, publication records reached their highest number to date within the period analyzed, reaching a total of 537 documents published in high impact journals indexed in the Scopus database, among which is the article "*Poverty and food insecurity may increase as the threat of COVID-19 spreads*", whose objective is to analyze the relationship between poverty, food security, and the consequences of the pandemic generated by COVID-19, and to present proposals for possible solutions to the management of policies seeking nutritional security (Pereira & Oliveira, 2020) whose objective is to analyze the relationship between poverty, food security, and the consequences of the pandemic generated by COVID-19, and to present proposals for possible solutions to the management of policies that seek nutritional security. Its main conclusion is precisely a criticism of current policies, where the intervention in terms of the measures adopted to counteract the spread of the virus is detrimental to food security and, of course, an increase in poverty rates is expected in countries with emerging economies, which poses a risk to the fulfillment of government objectives and is detrimental to the quality of life.

### 4.3 Distribution of scientific production by country of origin.

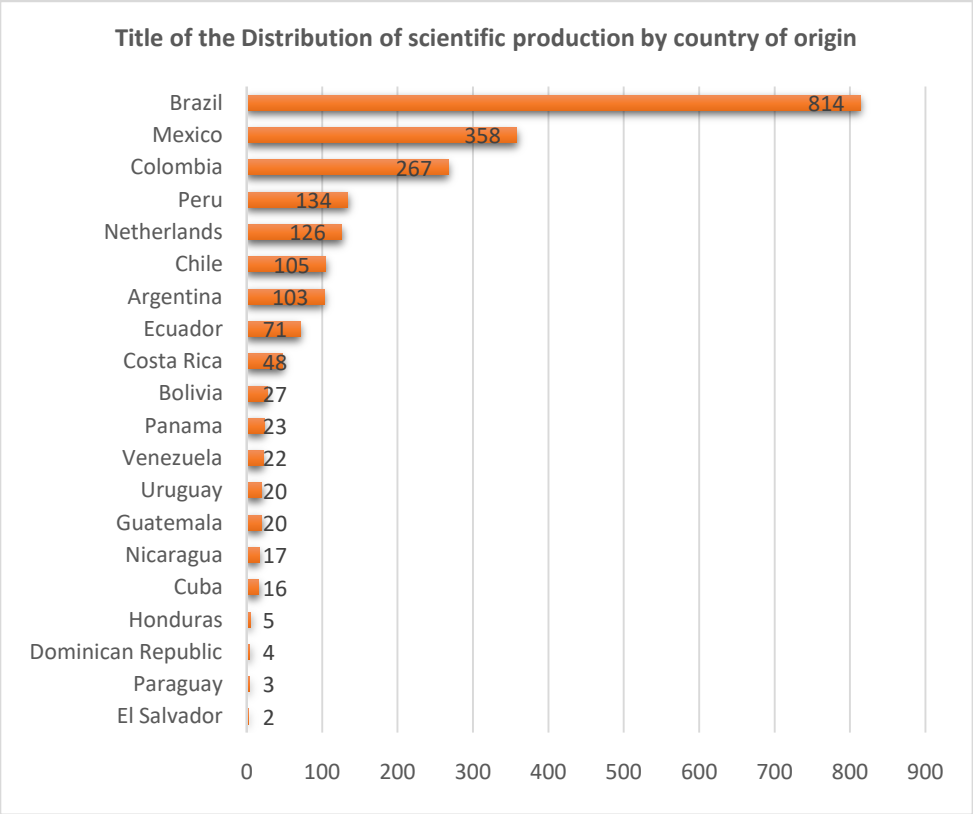



**Figure 3.**Distribution of scientific production by area of knowledge.
**Source:** Own elaboration (2021); based on data provided by Scopus.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

Figure 3 shows the number of publications registered by country during the period 2016-2020, where Brazil occupies the first place with a wide margin of difference. It registered 814 published papers while the second place registered 358 corresponding to authors with affiliation to Mexican institutions. Colombia is in third place with 267 research papers, including the one entitled "*Food security in Colombian indigenous mothers and its relationship with knowledge, attitudes and practices in early childhood*", which describes the state of the art of the Colombian indigenous population and its relationship with knowledge, attitudes and practices in early childhood (Gil, Hernandez-Carrillo, & Fonseca, 2020). which describes the nutritional status of children belonging to indigenous communities and how food security is vital for this population to reduce their indicators of deaths from malnutrition and ensure compliance with one of the fundamental rights. The main findings of the aforementioned research are that 34.9% of the households studied have food security. Breastfeeding is practiced in 11.9% of the households due to the lack of knowledge and the early ages of the mothers. And the start of the supplementary feeding plan at 6 months was 70%, so the study concludes that indigenous communities in general terms, suffer from food insecurity and therefore recommends strengthening education as there is evidence of practices that do not guarantee basic food security due to lack of knowledge (Gil, Hernandez-Carrillo).

It is worth noting that the volume of production for each country represents the number of research papers in which national authors have participated, which means that if two or more authors of different nationalities participate in a scientific article, that same article will add their countries in the above graph. Figure 2 shows how this work has been carried out by the countries as a whole and how their authors have correlated.

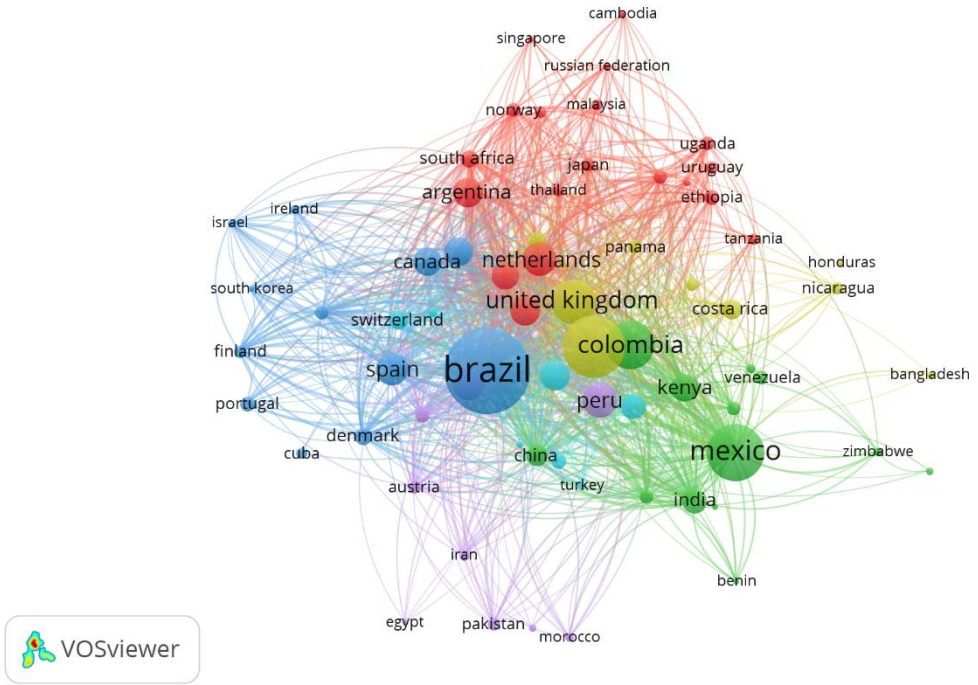



**Figure 4.**Countries participating in the bibliographic production.
**Source:** Own elaboration (2021); based on data provided by Scopus.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

As shown in Figure 4, Brazil, Colombia and Mexico form the three main groups leading the production. Brazil presents collaboration with authors from Spain, Cuba, Portugal, Canada, among others. Colombia, on the other hand, collaborates with the United Kingdom, Panama, Costa Rica and Mexico with Venezuela and India. It is important to mention studies carried out in Ecuador, since the main objective of this research is to know how this country manages its food safety policies from Social Responsibility practices. For this purpose, we analyzed the article entitled "*Evidence management in food security and nutrition*", which also has the participation of authors from other countries (Cavalli, et al., 2019). which also has participation of authors of English, Norwegian, Belgian, Italian, and American origin and whose purpose is to give scientific management to the data collected that have to do with statistics and information from primary sources on food security and nutrition, in order to give it a more accurate management in terms of the design of strategies that seek the analysis of such issues.

**4.4 Distribution of scientific production by participating authors.**

As with the distribution by country, the authors also count their published units according to their participation in each research work. Figure 5 shows the volume of production of the most relevant authors in the area of social responsibility focused on food security.

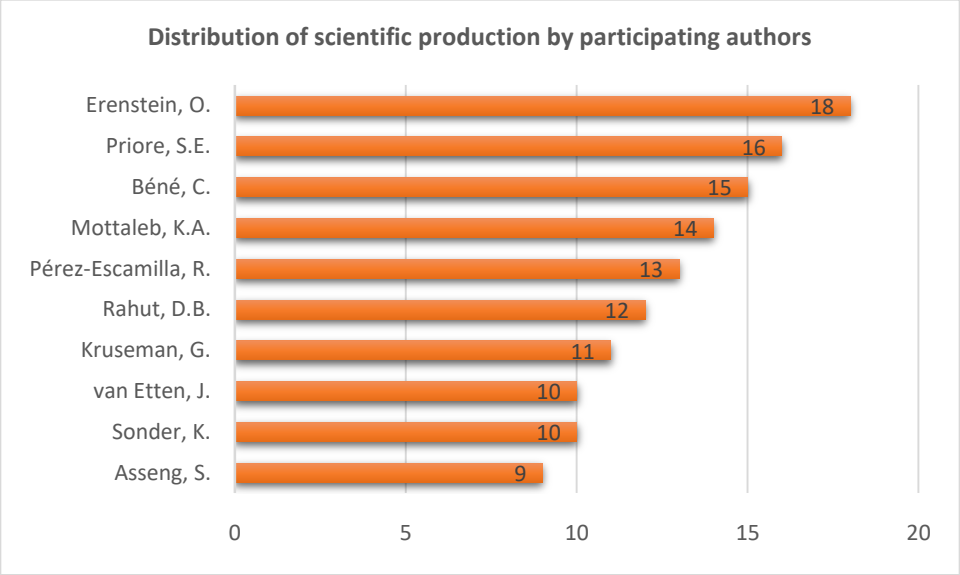



**Figure 5.**Distribution of scientific production by participating authors.
**Source:** Own elaboration (2021); based on data provided by Scopus.

Erenstein, Olaf, an author with affiliation to a Mexican institution, is the main contributor in the production of research papers concerning food security through the practice of social responsibility. In total, he registered during the period 2016-2020 a total of 18 papers within which is the scientific article entitled "*Assessment of farmers' use of climate change adaptation practices and impacts on food security and poverty in Pakistan*" (Ali & Erenstein, 2017) one of his papers with the highest impact in the scientific community, being cited 151 times in similar studies. Such research work aims to assess the factors that influence farmers' choice of techniques and strategies in crops that help mitigate the effects of climate change, which is expected to be an aggravation of the already

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

complicated economic and social situation of people whose main activity is agriculture in the poorest sectors of Pakistan.

The participation between different authors for the same research paper, is shown in Figure 6, where Erenstein, Olaf records co-authorships with other researchers such as Crossa, J and Singh p.k. also evidenced the participation of Campbell, Bruce M.S with Corner-Dolloff C. and Girvetz E. among others in articles such as "*Reducing risks to food security from climate change*" (Campbell, Corner-Dolloff, & Girvetz, 2016). where a conglomerate of research papers are reviewed that establish the risks associated with the detriment of food security, in terms of quantity and accessibility, derived from climate change that is presented in the last decade due to global pollution that has generated cases in different parts of the world such as greenhouse gases and ozone layer depletion. All these environmental complications generate soil deterioration, rainy season disorders that significantly affect crops, landslides, forest fires, among others, which ultimately affect the populations that depend directly on this activity.

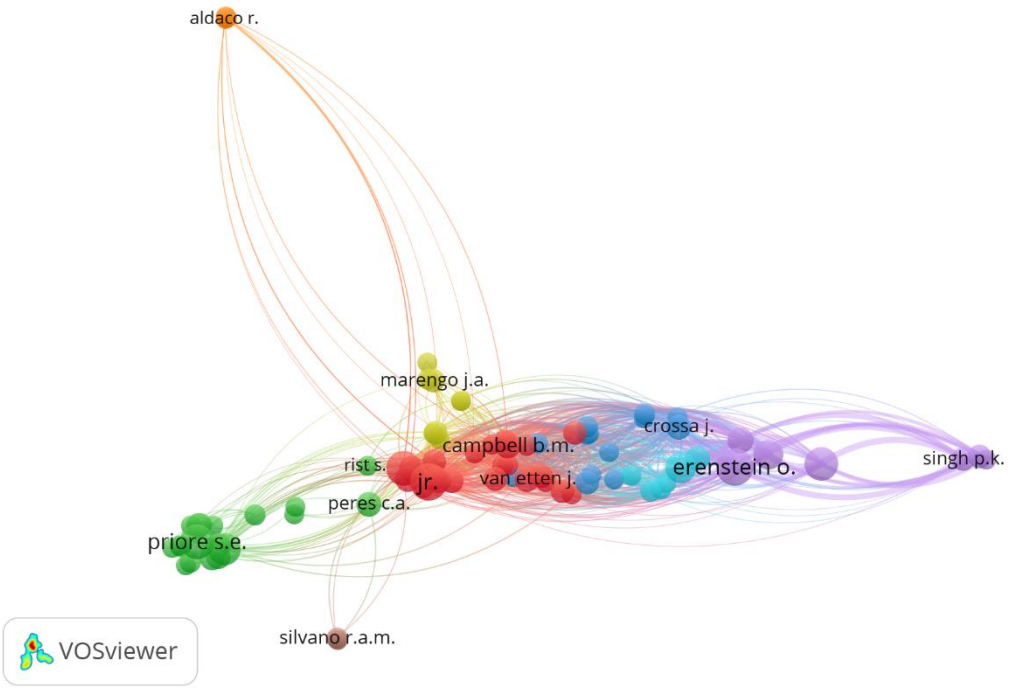



**Figure 6.** Co-authorship in scientific production.
**Source:** Own elaboration (2021); based on data provided by Scopus.

**4.5 distribution of scientific production by area of knowledge.**

Agriculture and Biological Sciences are the areas that report to Scopus the highest participation in terms of research article production with a total of 856 papers, followed by Environmental Sciences and Social Sciences as 558 and 445 research papers respectively. Of the latter, the article entitled "*Challenges and opportunities of trilateral cooperation: collaboration of the United States, Brazil and Mozambique in horticultural research, 2011-2015*" stands out (Schmink, et al., 2020). which seeks to describe the operationalization of strategies designed jointly by countries such as the United States and Brazil, contributing to food security in Mozambique through investment and

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

training in technologies used in agricultural production, more precisely in vegetable crops. This helps to reduce the social gap in which countries such as the one mentioned above live and also seeks to ensure accessibility to a balanced diet for its population.

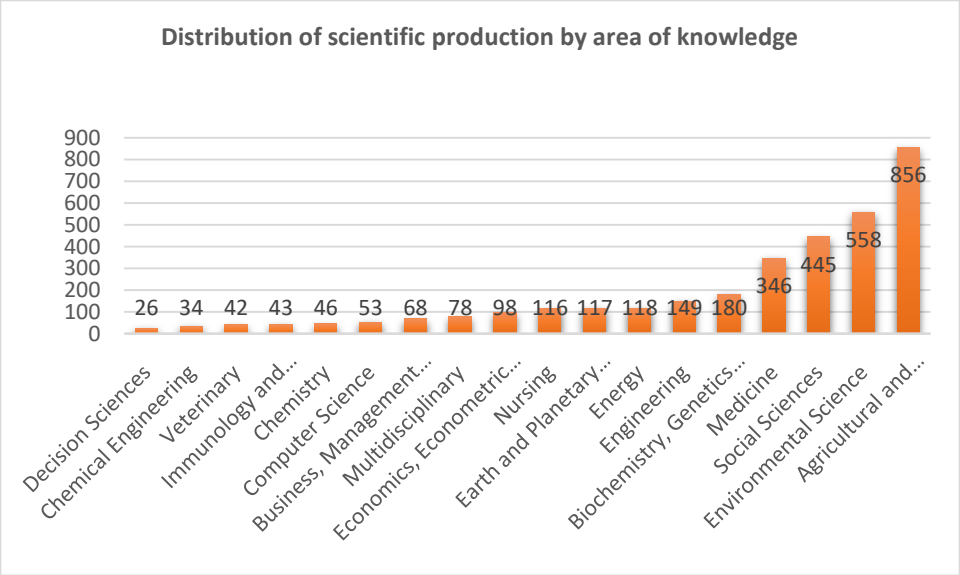



**Figure 7**. Distribution of scientific production by area of knowledge.
**Source:** Own elaboration (2021); based on data provided by Scopus.

Medicine, Biochemistry and Engineering occupy the fourth, fifth and sixth positions with 346, 180 and 149 registered papers, respectively. Economics and Finance occupy the tenth position with 98 research papers published, among which stands out the one entitled "*The relevance of market prices for the design of transfer programs in response to food insecurity*", which focuses on the analysis of market pricing as the main factor to be taken into account (De Matteis, Ellis, & Valdes, 2017) which focuses on the analysis of market pricing as the main factor to be taken into account for decision-making in the study of strategies aimed at reducing food insecurity, indicating that speculation in pricing could cease to be a risk factor for the reduction in the purchase of agricultural products.

## 5.Conclusions

In Latin America, Brazil is the country with the highest scientific production regarding the study of social responsibility practices for food security during the period 2016-2020 which allows inferring that due to its population which is one of the highest in the hemisphere, there must be policies in ensuring food for citizens, and although it is a country with a biodiversity that allows the cultivation of many species, it also saw its social responsibility practices, both in the private and public sphere, aimed at reducing poverty and the social impact generated by the COVID-19 pandemic, such as the country that is the subject of this research, Ecuador shows high rates of food insecurity, mainly in indigenous communities. Currently, the bibliography applied to the study of the variables proposed in the city of Guayaquil, does not present records, however, neighboring countries such as Colombia, show research work that could be appropriated not only because of its geographical and cultural proximity, but also because of its ecosystemic variety that allows many communities to

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

sustain their food in activities such as agriculture. However, studies analyzed in this research work reveal a relevant impact on climate change generated by global pollution, which leads to the conclusion that private sector companies can design social responsibility policies that involve not only the risks associated with food security, but issues that impact it directly, in order to ensure in some way, that the source of problems such as pollution, affect agricultural production in countries such as Ecuador, thus being a continuous work between business and society in improving the quality of life of all stakeholders.

## References

1. Ali, A., & Erenstein, O. (2017). Assessing farmer use of climate change adaptation practices and impacts on food security and poverty in Pakistan. *Climate Risk Management*, 183-194.
2. Ayaviri, D. N., Fernández, G. Q., omero Flores, M., & Fierro López., P. (2016). Advance and progress of food security policies and strategies in Ecuador. *Rev. Investig. Altoandin.* , 213-222.
3. Bene, C., Prager, S., Achicanoy, H., Toro, P., Lamotte, L., Bonilla, C., & Mapes, B. (2019). Global map and indicators of food system sustainability. *Scientific Data*.
4. Campbell, B., Corner-Dolloff, C., & Girvetz, G. (2016). Reducing risks to food security from climate change. *Global Food Security*, 34-43.
5. Cavalli, E., Gilsenan, M., Van Doren, D., G.-O., J., R., F, A., . . . H, V. (2019). Managing evidence in food safety and nutrition. *EFSA Journal*.
6. De Matteis, A., Ellis, F., & Valdes, I. (2017). The relevance of market prices for the design of transfer programs in response to food insecurity. *Quarterly Review of Economics and Finance*, 202-211.
7. Gil, A., Hernandez-Carrillo, M., & Fonseca, S. (2020). Food security in Colombian indigenous mothers and its relationship with knowledge, attitudes and practices in early childhood. *Revista Espanola de Nutricion Comunitaria*.
8. León B., A., Martínez, R., Espíndola, E., & Schejtman, A. (2003). *Pobreza, hambre y seguridad alimentaria en Centroamérica y Panamá.* Ciudad de Panama: Politicas Sociales.
9. Pereira, M., & Oliveira, A. (2020). Poverty and food insecurity may increase as the threat of COVID-19 spreads. *Public Health Nutrition*, 3236 - 3240.
10. Schmink, M., Cairns, S. J., Sitoe, I., Bowen, W., Silva, H., Ecole, C., & Haber, L. (2020). Challenges and opportunities of trilateral co-operation: Collaboration by the USA, Brazil and Mozambique on horticultural research, 2011–2015. *Development Policy Review*, 575-593.
11. de la Barrera, E., & Orozco-Martínez, R. (2016). Socio-ecological considerations on the persistence of mexican heirloom maize. *Maydica*, *61*(4) Retrieved from www.scopus.com
12. De la Cruz, G., Miranda, T. Y., Blas, R. H., Neyra, E., & Orjeda, G. (2020). Simple sequence repeat-based genetic diversity and analysis of molecular variance among on-farm native potato landraces from the influence zone of camisea gas project, northern ayacucho, peru. *American Journal of Potato Research*, *97*(2), 143-161. doi:10.1007/s12230-020-09763-7

13. De la Puente, S., López de la Lama, R., Benavente, S., Sueiro, J. C., & Pauly, D. (2020). Growing into poverty: Reconstructing peruvian small-scale fishing effort between 1950 and 2018. *Frontiers in Marine Science, 7* doi:10.3389/fmars.2020.00681
14. de León De Lama, P., Isasa, T., González, M., & García, P. (2020). Interest of sprouts and their food security. [Interés de los germinados y su Seguridad Alimentaria] *Nutricion Clinica y Dietetica Hospitalaria, 40*(1), 62-73. doi:10.12873/401ponce
15. de León, F. A. P., & Gutierrez, G. A. (2020). Genomics and animal production. [Genómica y producción animal] *Revista Peruana De Biologia, 27*(1), 15-20. doi:10.15381/rpb.v27i1.17574
16. de Leone, M. J., Hernando, C. E., Mora-García, S., & Yanovsky, M. J. (2020). It's a matter of time: The role of transcriptional regulation in the circadian clock-pathogen crosstalk in plants. *Transcription, 11*(3-4), 100-116. doi:10.1080/21541264.2020.1820300
17. De Lima Brasil, E. C., De Araújo, L. M., & De Toledo Vianna, R. P. (2016). Nutritional and food insecurity of construction workers. *Work, 54*(3), 601-608. doi:10.3233/WOR-162335
18. De Macedo, M. B., Do Lago, C. A. F., Mendiondo, E. M., & Giacomoni, M. H. (2018). Decentralized low impact development (LID) practices addressing the security of the water-energy-food nexus. Paper presented at the *International Low Impact Development Conference 2018: Getting in Tune with Green Infrastructure - Proceedings of the International Low Impact Development Conference 2018,* 30-39. doi:10.1061/9780784481783.004 Retrieved from www.scopus.com
19. De Matteis, A., Ellis, F., & Valdes, I. (2017). The relevance of market prices for the design of transfer programs in response to food insecurity. *Quarterly Review of Economics and Finance, 66,* 202-211. doi:10.1016/j.qref.2017.02.001
20. de Mattos, E. J., & Bagolin, I. P. (2017). Reducing poverty and food insecurity in rural brazil: The impact of the zero hunger program. [Réduire la pauvreté et l'insécurité dans le Brésil rural : l'incidence du programme Faim Zéro] *EuroChoices, 16*(1), 43-49. doi:10.1111/1746-692X.12150
21. de Medeiros Carvalho, M., de Fariña, L. O., Strongin, D., Ferreira, C. L. L. F., & Lindner, J. D. D. (2019). Traditional colonial-type cheese from the south of brazil: A case to support the new brazilian laws for artisanal cheese production from raw milk. *Journal of Dairy Science, 102*(11), 9711-9720. doi:10.3168/jds.2019-16373
22. de Medeiros, E. V., Silva, A. O., Duda, G. P., dos Santos, U. J., & de Souza Junior, A. J. (2019). The combination of arachis pintoi green manure and natural phosphate improves maize growth, soil microbial community structure and enzymatic activities. *Plant and Soil, 435*(1-2), 175-185. doi:10.1007/s11104-018-3887-z
23. de Medeiros, N. S. A., do Carmo, D. L., Priore, S. E., Santos, R. H. S., & Pinto, C. A. (2019). Food security and edible plant cultivation in the urban gardens of socially disadvantaged families in the municipality of viçosa, minas gerais, brazil. *Environment, Development and Sustainability, 21*(3), 1171-1184. doi:10.1007/s10668-017-0078-7
24. De Moraes Camargo Almeida, L. M., Pugliesi, L., Ferrante, V. L. S. B., Cardozo, D. R., & De Orianni Paulillo, L. F. (2018). "UFSCar" index of effectiveness applied to the food purchase program for food and nutritional safety of farming families in the hinterland of são paulo state. *Gestao e Producao, 25*(3), 500-512. doi:10.1590/0104-530X4513-18

25. de Moraes Hernandes, J. F., & Rosolen, V. B. (2020). *Organic foods in brazil: A bibliometric study of academic researches related to organic production before and after the conceptual law* doi:10.1007/978-3-030-26759-9_28 Retrieved from www.scopus.com
26. de Moraes, T. P., Darley, F. M., & Timm, C. D. (2019). Microbiological evaluation of sushi and sashimi prepared in specialized restaurants. [Avaliação microbiológica de sushi e sashimi preparados em restaurantes especializados] *Revista De Ciencias Agroveterinarias, 18*(2), 254-257. doi:10.5965/223811711812019254
27. de Morais Sato, P., Unsain, R. F., Gittelsohn, J., Sanches Tavares da Silva, J. G., Gonçalves Perez, I. C., & Baeza Scagliusi, F. (2017). Strategies used by overweight and obese low-income mothers to feed their families in urban brazil. *Appetite, 111*, 63-70. doi:10.1016/j.appet.2016.12.033
28. de Moura Ariza Alpino, T., Santos, C. R. B., de Barros, D. C., & de Freitas, C. M. (2020). COVID-19 and food and nutritional (in)security: Action by the brazilian federal government during the pandemic, with budget cuts and institutional dismantlement. [COVID-19 e (in)seguridad alimentaria y nutricional: acciones del Gobierno Federal brasileño en la pandemia frente a los recortes presupuestarios e institucionales] *Cadernos De Saude Publica, 36*(8) doi:10.1590/0102-311X00161320
29. de Moura-Silva, A. G., Aguiar, A., de Moura, E. G., & Jorge, N. (2016). Influence of soil cover and N and K fertilization on the quality of biofortified QPM in the humid tropics. *Journal of the Science of Food and Agriculture, 96*(11), 3807-3812. doi:10.1002/jsfa.7574
30. de Oliveira Aparecido, L. E., de Souza Rolim, G., Camargo Lamparelli, R. A., de Souza, P. S., & dos Santos, E. R. (2017). Agrometeorological models for forecasting coffee yield. *Agronomy Journal, 109*(1), 249-258. doi:10.2134/agronj2016.03.0166
31. de Oliveira Chaves, Y. A., Val Springer, M., Boloy, R. A. M., de Castro Ferreira Soares, O. M., & Madeira, J. G. F. (2020). Performance study of a microturbine system for cogeneration application using biogas from manipueira. *Bioenergy Research, 13*(2), 659-667. doi:10.1007/s12155-019-10071-0
32. De Oliveira Lima, F. S., Dos Santos, G. R., Correa, V. R., Resplandes, P., Dos Santos, R., Correia, M. A. R., & Nogueira, S. R. (2016). Agronomic performance of selected sweet potato cultivars under greenhouse and field infested with meloidogyne incognita and soilborne insect pests. *Nematropica, 46*(1), 97-105. Retrieved from www.scopus.com
33. De Oliveira, A. C. M., Tavares, M. C. M., & Bezerra, A. R. (2017). Eating insecurity among pregnant women in the public health system in a state capital in the northeast of brazil. [Insegurança alimentar em gestantes da rede pública de saúde de uma capital do nordeste Brasileiro] *Ciencia e Saude Coletiva, 22*(2), 519-526. doi:10.1590/1413-81232017222.27382015
34. De Oliveira, D. L., Stawicki, M., & Mezzomo, T. R. (2017). Relationship between quality of life and the metabolic-nutritional profile of individuals with type 2 diabetes mellitus. *Mundo Da Saude, 41*(1), 77-86. doi:10.15343/0104-7809.201741017786
35. De Oliveira, E. J., De Oliveira, S. A. S., Otto, C., Alicai, T., De Freitas, J. P. X., Cortes, D. F. M., . . . Robinson, M. (2020). A novel seed treatment-based multiplication approach for cassava planting material. *PLoS ONE, 15*(3) doi:10.1371/journal.pone.0229943

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Pages. 16275 - 16287
Received 25 April 2021; Accepted 08 May 2021.

36. de Oliveira, J. T. C., Gabriel, C. G., de Assis Guedes de Vasconcelos,F., Machado, M. L., Soar, C., & Fagundes, A. (2020). Government-subsidized restaurants in brazil: An evaluation within the framework of food and nutrition security. [Restaurantes populares brasileiros: avaliação no âmbito da segurança alimentar e nutricional] *Revista De Nutricao, 33*, 1-12. doi:10.1590/1678-9865202033e200085
37. de Oliveira, J. T. C., Gabriel, C. G., Machado, M. L., Réos, M. F., Soar, C., & Venske, D. K. R. (2019). Government-subsidized restaurants as promoters of the realization of the human right to adequate food: Proposal of an evaluation model. *Revista De Nutricao, 32* doi:10.1590/1678-9865201932E180193
38. de Oliveira, N. R. F., & Jaime, P. C. (2016). The meeting between sustainable rural development and health promotion in food guide for the brazilian population. [O encontro entre o desenvolvimento rural sustentável e a promoção da saúde no Guia Alimentar para a