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Relationship Between The Uses Of Ntic And The Social Responsibility Of The Agricultural Exporting Companies Of Guayaquil-Ecuador To The European Market

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Abstract

A documentary review was carried out on the production and publication of research papers related to the study of NTICS and Social Responsibility variables for agricultural exporting companies in Latin America. The purpose of the bibliometric analysis proposed in this document is to know the main characteristics of the volume of publications registered in the Scopus database during the period 2016-2021, achieving the identification of 37 publications. The information provided by the said platform was organized through tables and figures categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics were described, a qualitative analysis was used to refer to the position of different authors on the proposed topic. Among the main findings of this research, it is found that Ecuador, with 10 publications, was the Latin American country with the highest scientific production registered in the name of authors affiliated with institutions of that country. The area of knowledge that made the greatest contribution to the construction of bibliographic material referring to the study of NTICS and Social Responsibility for agricultural exporting companies was Computer Science with 23 published documents, and the type of publication that was most used during the period mentioned above was the conference article, which represented 57% of the total scientific production.

Keywords: NTICS, Agribusiness, Agribusiness, Social Responsibility, Ecuador, Exports.

1. Introduction

Agriculture brings together all practices carried out to obtain products from the land for the benefit of mankind. These are millenary activities that have sustained the survival of human beings since the beginning of time, and as these have evolved, so has agriculture. Therefore, it can be affirmed that a high percentage of the sustenance of humanity depends on the extraction of agricultural products, which implies that a determining factor to fulfill this objective is to have land suitable for the cultivation of different species, suitable spaces for practices such as livestock, and fish farming, among others.

Latin America has a great variety of soils that allow the cultivation of almost any product, as well as access to different bodies of water from which it is also possible to extract hundreds of species for local, regional, national and international consumption. However, one of the main problems most frequently

encountered in Latin American countries has historically been low productivity, unequal distribution of productive resources, social exclusion, territorial imbalances, as well as technological and financial dependence on the sector (García, 2003). Of these, one of the main factors that can contribute to the optimization of agroindustrial processes today is the use of New Information and Communication Technologies (NICT), which can contribute significantly to the competitiveness of the agricultural sector in Latin America, including aspects such as decision making in the face of climate change by way of prevention and crop protection through online information systems that allow access to these data in real-time through digital devices (Nagel, 2012). It should be noted that it is expected to measure the social impact that the improvement in agricultural processes through the incursion of NTICS resources and as Social Responsibility policies institutionalized by companies in this sector, which even go in line with Sustainable Development Goals (SDG) of the United Nations (UN) may involve programs for the End of Poverty (Goal 1), Zero Hunger (Goal 2), Affordable and Non-Polluting Energy (Goal 7), among others (UN, 2022). Because of the analysis of the relationship between the use of NTICS and the Social Responsibility of agricultural exporting companies in Latin America, it is expected to know through the bibliometric and bibliographic analysis proposed for the execution of this document, the current situation of the companies of the same sector in Guayaquil, Ecuador and thus establish and interpret its current situation.

2. General objective

To analyze from a bibliometric and bibliographic perspective, the production of research papers on the variable NTICS and Social Responsibility for Latin American agricultural exporting companies with an emphasis on those of Ecuador during the period 2016-2021.

3. Methodology

A quantitative analysis of the information provided by Scopus is carried out under a bibliometric approach to the scientific production related to the study of NTICS and Social Responsibility for Latin American agricultural exporting companies. Also, from a qualitative perspective, examples of some research papers published in the area of the study mentioned above are analyzed from a bibliographic approach to describe the position of different authors on the proposed topic.

The search is carried out through the tool provided by Scopus and the parameters referenced in Figure 1 are established.

3.1 Methodological design

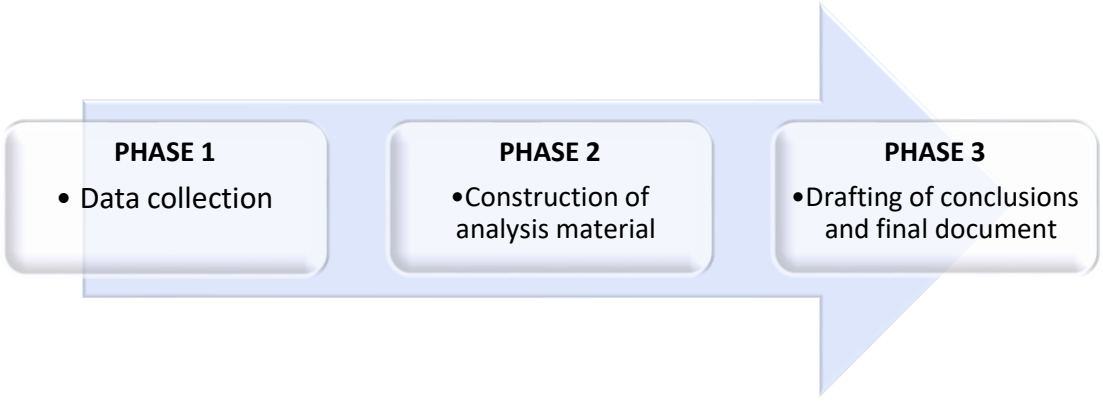

Figure 1. Methodological design
Source: Own elaboration

3.1.1 Phase 1: Data collection

- ✓ The data collection was carried out from the Scopus web page search tool, through which a total of 37 publications were identified. For this purpose, search filters were established consisting of:
- ✓ Published papers whose study variables are related to the study of NTICS and Social Responsibility for agricultural exporting companies.
- ✓ Limited to Latin American countries.
- ✓ Without distinction of area of knowledge.
- ✓ Without distinction of type of publication.

3.1.2 Phase 2: Construction of analysis material

The information identified in the previous phase is organized. The classification will be done through graphs, figures and tables based on data provided by Scopus.

- ✓ Co-occurrence of words.
- ✓ Year of publication
- ✓ Country of origin of the publication.
- ✓ Area of knowledge.
- ✓ Type of publication

3.1.3 Phase 3: Drafting of conclusions and final document

After the analysis is carried out in the previous phase, the conclusions are drawn up and the final document is prepared.

4. Results

4.1 Co-occurrence of words

Figure 2 shows the co-occurrence of keywords within the publications identified in the Scopus database.

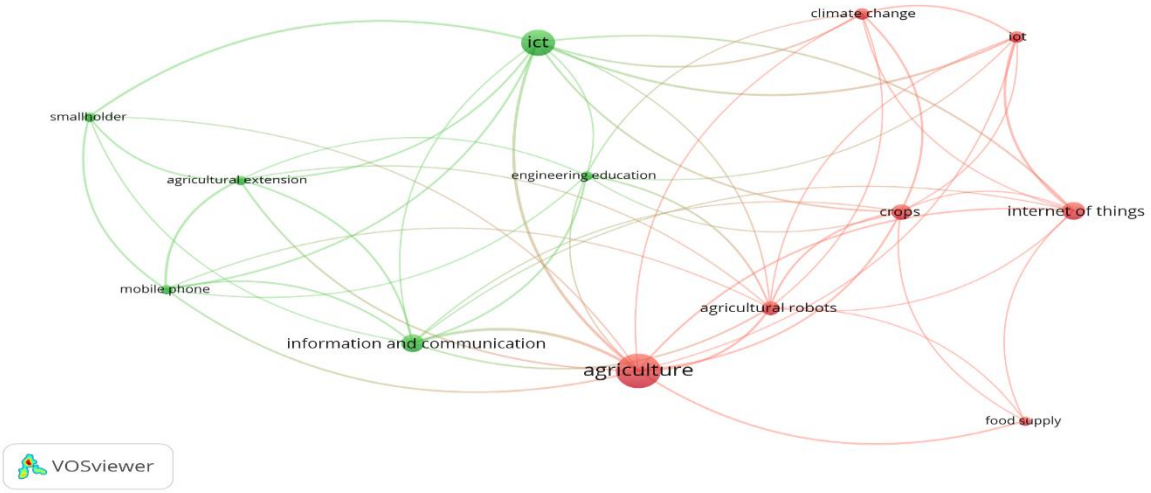

Figure 2. Co-occurrence of words
Source: Own elaboration (2022); based on data provided by Scopus.

As shown in Figure 2, the generation of two main groups of research is evident, both represented by the colors green and red, which correspond to publications related to ICT and Agriculture, respectively. In the first subset, the frequent use of variables such as Extension in Agriculture, Smallbolder, Mobile Phone, Engineering Education, Information and Communication stands out, which allows inferring that everything around a millenary practice such as agriculture. it has been possible to potentiate the processes thanks to technological advances and the use of new tools to optimize the work of agriculture not only in Ecuador but in all agricultural countries. This is also supported by the research registered in Scopus, whose main variables were the Internet of Things, Food Supply, Robots for Agriculture, Crops and even Climate Change. From the above, it can be inferred that the research identified for the

development of this article is relevant to fulfill the stated objective and allows giving meaning and orientation to the bibliometric analysis.

4.2 Distribution of scientific production by year of publication.

Figure 3 shows how the scientific production is distributed according to the year of publication, taking into account the period from 2016 to 2021.

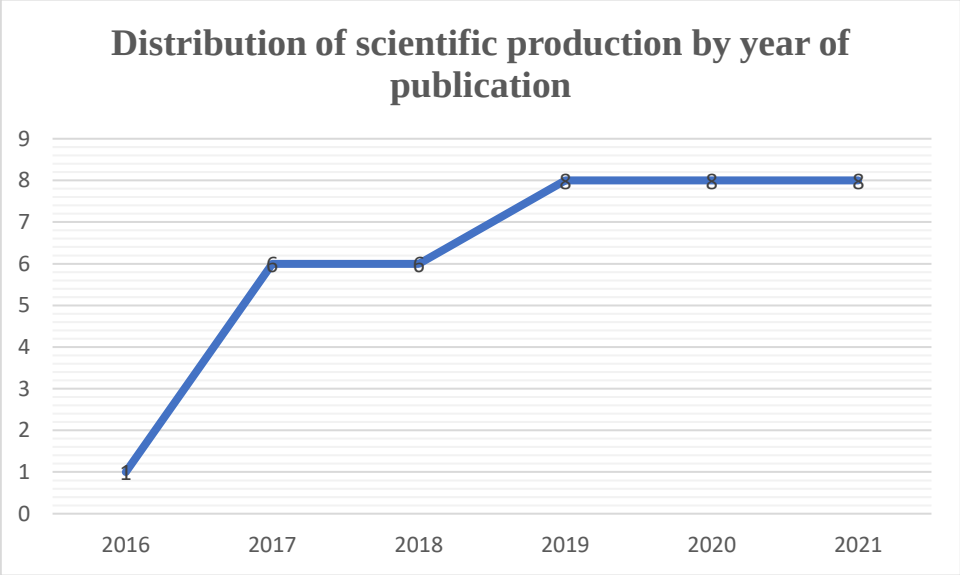

Figure 3. Distribution of scientific production by year of publication.
Source: Own elaboration (2022); based on data provided by Scopus.

Among the main characteristics that are evident when analyzing the volume of scientific production related to the study of one of the NTICS associated with Social Responsibility policies in agricultural companies is the distribution of publications according to their year of issue, which, for the case studied in this article, highlights the low volume of research papers published in journals indexed in Scopus. Scientific production in 2019, 2020 and 2021, did not exceed 8 papers in all of Latin America. In 2017 and 2018 there were 6 publications and in 2016 only 1. In 2019, the article entitled "GeoFarmer: a monitoring and feedback system for agricultural development projects" (Eitzinger et al., 2019) stands out which carried an innovative proposal called GeoFarmer that provides near real-time bidirectional data flows that support co-innovation processes in agricultural development projects. The authors came to this project motivated by the identification of a new need arising through technological advances, and that was the evidence of utility in systems that allow farmers to better manage their crops and farms through the ability to communicate their experiences, both positive and negative, with each other and with experts.

4.3 Distribution of scientific production by country of origin.

Figure 4 shows how scientific production is distributed according to the country of origin of the institution to which the authors are affiliated.

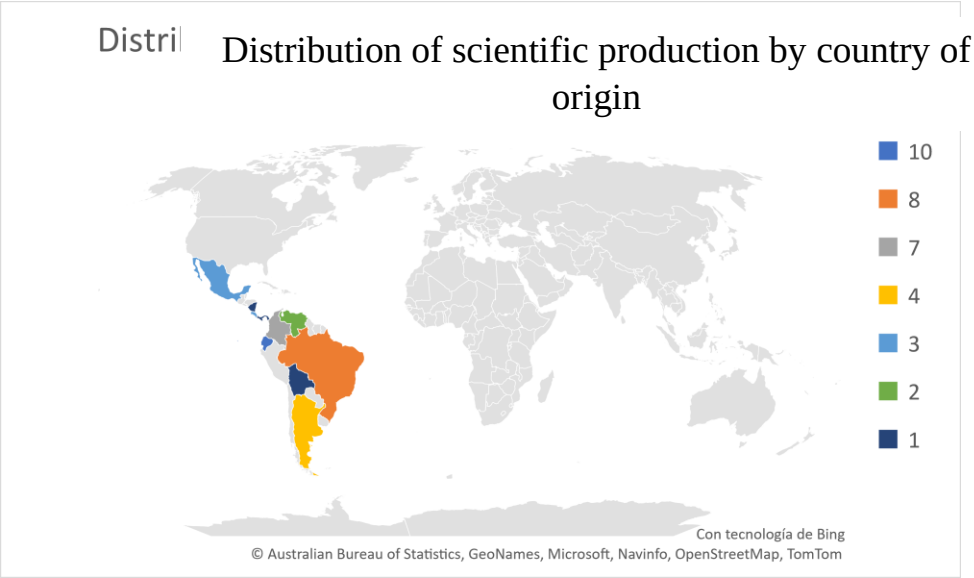

Figure 4. Distribution of scientific production by country of origin.
Source: Own elaboration (2022); based on data provided by Scopus.

Ecuador is the Latin American country with the highest number of records in Scopus with a total of 10 publications made in high-impact journals during the period 2016-2021 within which the conference article entitled "Info centers, the key factor for the deployment of e-agriculture in Ecuador" (Torres-Tello & Fuenmayor-Viteri, 2017) whose purpose was to show the advantages that Info centers can bring to agricultural activity in Ecuador to become a tool for the deployment of e-agriculture (a concept that involves ICT with agricultural activity). This objective was achieved through a bibliographic review that identified some characteristics of the projects deployed worldwide that allow proposing a way to classify them into four categories: projects for education and information dissemination, for environmental care, for online commerce, and for increasing production and adding value. This made it possible to categorize, according to their objectives, the projects that can be applied to enhance the agricultural sector in Ecuador, and the implementation of the Info centers facilitates the promotion of education and training programs in different areas of agriculture based on ICT tools.

At this point, it should be noted that the production of scientific publications, when classified by country of origin, presents a special characteristic and that is the collaboration between authors with different affiliations to both public and private institutions, and these institutions can be from the same country or different nationalities so that the production of an article co-authored by different authors from different countries of origin allows each of the countries to add up as a unit in the overall publications. This is best explained in Figure 5, which shows the flow of collaborative work from different countries.

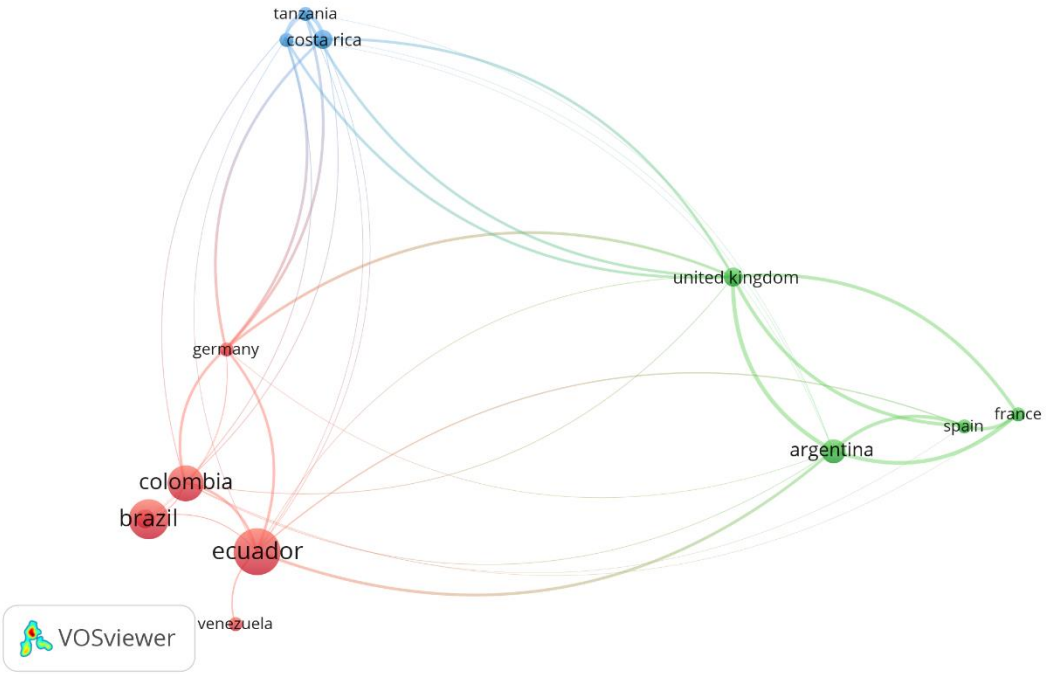

Figure 5. Co-citations between countries.
Source: Own elaboration (2022); based on data provided by Scopus.

Ecuador, Brazil and Colombia occupy the first three places in the list of Latin American countries with the highest number of records in Scopus of research papers related to the study of the relationship between the use of ICTs and the Social Responsibility of agricultural companies, and they also represent the main group of countries with the greatest international co-authorship, remotely associated with Venezuela and Germany. The presence of other Latin American countries in different societies created based on co-authorship in the production of scientific publications places Argentina with authors affiliated with institutions in the United Kingdom, Spain and France. Finally, the participation of authors from Costa Rica in research papers published by institutions in Tanzania and Kenya stands out, such as the article entitled "User-centered design of a digital advisory service: improving public agricultural extension for sustainable intensification in Tanzania" (Ortiz-Crespo et al., 2021) whose purpose was, through the creation of a digital service that addresses the different information needs of smallholder farmers to implement sustainable intensification as a rural development paradigm for sub-Saharan Africa. A trial was conducted with 97 farmers in Tanzania resulting in farmers actively engaging with the service to access agricultural advice, called Ushauri, which is an automated hotline that provides farmers with access to a set of pre-recorded messages.

4.4 Distribution of scientific production by area of knowledge

Figure 6 shows how the production of scientific publications is distributed according to the area of knowledge through which the different research methodologies are executed.

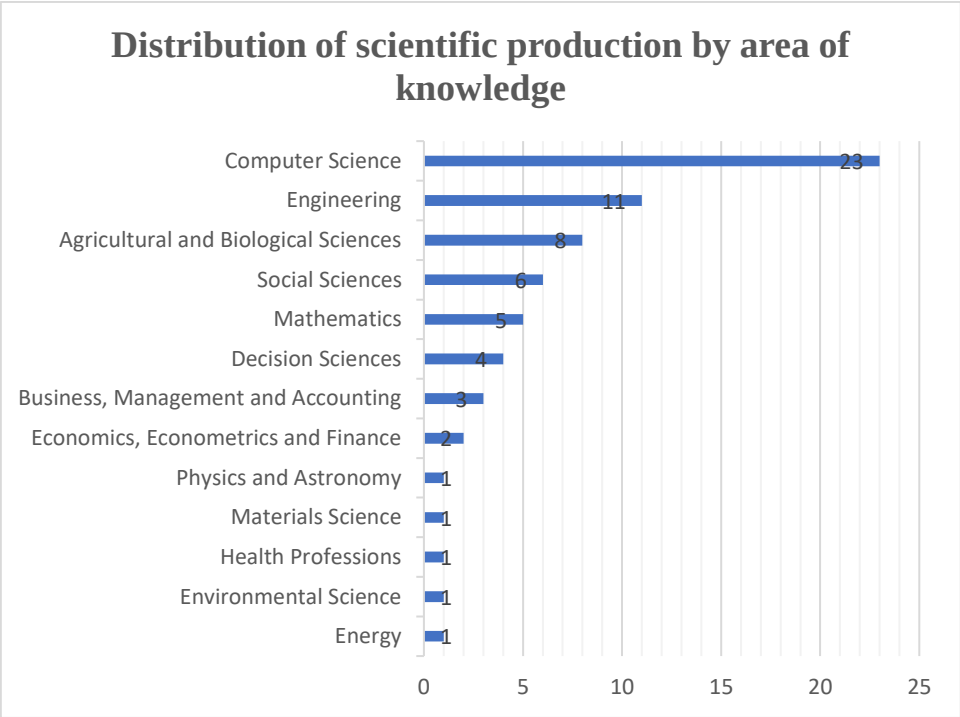

Figure 6. Distribution of scientific production by area of knowledge.
Source: Own elaboration (2022); based on data provided by Scopus.

Due to the subject matter, it is fair to say that Computer Sciences was the area of knowledge with the greatest influence in the execution of research works on the study of the relationship between the use of ICT and the social responsibility of Latin American agricultural companies. A total of 23 publications were supported by the different sciences related to the study of technology and its advances in the agricultural sector. In the second place, Engineering with 11 publications, followed by Agriculture and Biological Sciences with 8. Social Sciences also show an important influence in the study of the topic mentioned above, thanks to the social component that involves measuring the impact of the use of NTICS in the different agricultural techniques, 6 investigations were carried out through the theories that make up this area of knowledge, such as the conference article entitled "Technologies of the fourth industrial revolution for the agricultural sector: An analysis of trends in Agriculture 4. 0" (Flórez-Martínez & Uribe-Galvis, 2020), whose objective was to identify the key trends, technologies and challenges for the development of Agriculture 4.0, in the advent of the 5.0 Revolution "a human revolution" due to the importance of the incorporation of 4RI technology in the agricultural sector. It is necessary to understand how they can contribute and generate synergies with traditional knowledge to face the challenges that research, technological development and innovation activities are considered a priority.

4.5 Type of publication

Figure 7 shows how the bibliographic production is distributed according to the type of publication chosen by the authors.

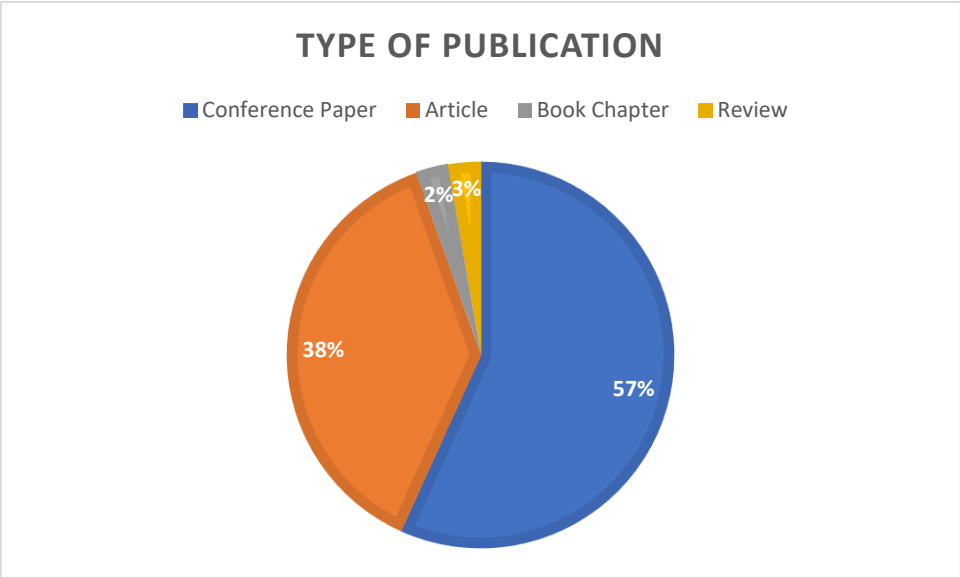

Figure 7. Type of publication
Source: Own elaboration (2022); based on data provided by Scopus.

Within the distribution of scientific production by type of publication, 57% of the total production identified through the execution of Phase 1 of the Methodological Design proposed for this document corresponds to Conference Articles, while 23% corresponds to Journal Articles. Reviews represent 3% and Book Chapters 2%. Thanks to the analysis carried out, it was possible to identify the review entitled "Smart Farming: a possible solution towards a modern and sustainable agriculture in Panama" (Collado et al., 2019) whose objective was to document and provide an overview of the current situation of Agriculture in Panama and the opportunities and challenges in the study, development and implementation of Smart Farming as a technological solution in the agricultural sector of this country, to achieve smart agriculture that allows a modern and sustainable food production. The document highlights the valuable natural conditions of the Latin American environment, and how through the use of this type of technology, the use of the soil can be potentiated, including the implementation of environmental care policies through a cleaner and friendlier production with the planet, thus complying with the purpose of many companies in the agricultural sector that are beginning to institutionalize Social Responsibility policies.

5. Conclusions

Through the bibliometric analysis carried out in the development of this article, it was possible to conclude that within the classification of scientific production by country of origin, taking into account that the study was limited only to those records in Scopus from Latin American institutions, Ecuador was the country of that community with the highest number of publications, with a total of 10 scientific papers published in high impact journals, during the period 2016-2021. The above allowed inferring that this country has government programs more interested in including within their strategies for the use of natural resources, the implementation of tools based on NICT, which means that from research, strategies have been determined to optimize agricultural processes through specialized technology in the work associated with agriculture, without neglecting the Social Responsibility policies that have been in parallel with the UN SDGs and seek the quality of life for all those surrounding this activity.

Regarding the theories that support the studies analyzed in this article, it is concluded that the area of knowledge with the greatest influence on the development of the different research

methodologies was Computer Science, with 23 papers published on topics associated with this area. However, it is worth noting that, thanks to the multidisciplinarity evidenced in the proposed topic, there is great participation in other areas such as Engineering, Environmental Sciences, Business, Finance and Accounting, and Social Sciences since one of the purposes of the authors cited in this text was to analyze the social impact brought about by the implementation of technology in agricultural production not only in Ecuador, but also in Latin American countries, leading to infer that the problems in terms of productivity, competitiveness, high production costs, and low profits, among others, could be reduced thanks to the timely use of strategies based on NICT.

This article concludes by stating that the agricultural sector in Guayaquil, and Ecuador is at a crucial moment of progress and innovation that will undoubtedly lead the sector to an important level of competitiveness in the international market, including exports to Europe. This is a consequence of a good policy of use of technological resources associated with social responsibility policies. Therefore, it is hoped that through the elaboration of articles such as the one presented in this document, important theoretical bases will be laid for the generation of new knowledge and motivation for the scientific community to evaluate all the necessary fronts given the imminent technological growth at world level, in the hope that this will not be a threat but an opportunity for growth for all agricultural exporting companies in Ecuador.

References

1. Collado, E., Fossatti, A., & Saez, Y. (2019). Smart farming: A potential solution towards a modern and sustainable agriculture in Panama. AIMS Agriculture and Food, 266 - 284.

2. Eitzinger, A., Cock, J., Atzmanstorfer, K., Binder, C. R., Läderach, P., Bonilla-Findji, O., . . . Jarvis, A. (2019). GeoFarmer: A monitoring and feedback system for agricultural development projects. Computers and Electronics in Agriculture, 109 - 121.

3. Flórez-Martínez, D.-H., & Uribe-Galvis, C. P. (2020). Fourth industrial revolution technologies for agriculture sector: A trend analysis in agriculture 4.0. Proceedings of the LACCEI international Multi-conference for Engineering, Education and Technology. 18th LACCEI International Multi-Conference for Engineering, Education Caribbean Conference for Engineering and Technology: "Engineering, Integration, and Alliances for a Sustainable Development" "Hemispheric Cooperation for Competitiveness and Prosperity .

4. García, P. F. (2003). La agricultura latinoamericana en la era de la globalización y de las políticas neoliberales: un primer balance. Revista de geografia, 9-36.

5. Nagel, J. (2012). Principales barreras para la adopción de las TIC en la agricultura y en las áreas rurales.

6. ONU, O. d. (07 de 2022). Naciones Unidas. Obtenido de https://www.un.org/sustainabledevelopment/es/objetivos-de-desarrollo-sostenible/

7. Ortiz-Crespo, B., Steinke, J., Quirós, C. F., van de Gevel, J., Daudi, H., Gaspar Mgimiloko, M., & van Etten, J. (2021). User-centred design of a digital advisory service: enhancing public agricultural extension for sustainable intensification in Tanzania. International Journal of Agricultural Sustainability, 566 - 582.

8. Torres-Tello, J., & Fuenmayor-Viteri, P. (2017). Infocentros, a key factor for the deployment of e-agriculture in Ecuador. 2017 4th International Conference on eDemocracy and eGovernment, ICEDEG 2017 (págs. 189 - 194). Quito: IEEE.

9. Delgado-Plaza, E., Peralta-Jaramillo, J., Andrade, J., Custoja-Ripoll, M., Elizalde, E., Carrera-Rivera, A., . . . Durazno, G.

(2021). Case study: Use of the platform and digital tools for education sustainable development, within the framework of the "COVID-19" pandemic. Paper presented at the Proceedings of the LACCEI International Multi-Conference for Engineering, Education and Technology, , 2021-
July doi:10.18687/LACCEI2021.1.1.420 Retrieved from www.scopus.com

10. Eitzinger, A. (2021). Data collection smart and simple: Evaluation and metanalysis of call data from studies applying the 5Q approach. Frontiers in Sustainable Food Systems, 5 doi:10.3389/fsufs.2021.727058

11. Eitzinger, A., Cock, J., Atzmanstorfer, K., Binder, C. R., Läderach, P., Bonilla-Findji, O., . . . Jarvis, A. (2019). GeoFarmer: A monitoring and feedback system for agricultural development projects. Computers and Electronics in Agriculture, 158, 109-121. doi:10.1016/j.compag.2019.01.049

12. Espinoza, J. A., Torres, E. P., Castro, D. M., Romero, B. R. R., & Luna, J. A. S. (2019). Application of the survey on chronic obstructive pulmonary disease (COPD) and quantification of the impact in the ten monitoring points of air quality in the city of san francisco de milagro. [Aplicación de encuesta sobre enfermedad pulmonar obstructiva crónica (EPOC) y cuantificación del impacto en los diez puntos de monitoreo de la calidad del aire en la ciudad San Francisco de Milagro] RISTI - Revista Iberica De Sistemas e Tecnologias De Informacao, 2019(E18), 245-256. Retrieved from www.scopus.com

13. Feljan, A. V., Karapantelakis, A., Mokrushin, L., Inam, R., Fersman, E., Azevedo, C. R. B., . . . Souza, R. S. (2017). Tackling IoT complexity. Ericsson Review (English Edition), 95(2), 60-69. Retrieved from www.scopus.com

14. Flórez-Martínez, D. -., & Uribe-Galvis, C. P. (2020). Fourth industrial revolution technologies for agriculture sector: A trend analysis in agriculture 4.0. Paper presented at the Proceedings of the LACCEI International Multi-Conference for Engineering, Education and Technology, doi:10.18687/LACCEI2020.1.1.11 Retrieved from www.scopus.com

15. Hernandez, J. E., Kacprzyk, J., Panetto, H., Fernandez, A., Liu, S., Ortiz, A., & De-Angelis, M. (2017). Challenges and solutions for enhancing agriculture value chain decision-making. A short review doi:10.1007/978-3-319-65151-4_68 Retrieved from www.scopus.com

16. Hoppen, N., Klein, A. C. Z., & Rigoni, E. H. (2017). Sociomaterial practices: Challenges in developing a virtual business community platform in agriculture. BAR - Brazilian Administration Review, 14(2) doi:10.1590/1807-7692bar2017170006

17. Lagos-Ortiz, K., Medina-Moreira, J., Alarcón-Salvatierra, A., Morán, M. F., del Cioppo-Morstadt, J., & Valencia-García, R. (2019). Decision support system for the control and monitoring of crops doi:10.1007/978-3-030-10728-4_3 Retrieved from www.scopus.com

18. Lemus, C. R., Santana, C. E., del Socorro Ríos Castro, M., Guadalupe López Bedolla, M., & Ramírez, B. C. L. (2020). Competitiveness and assimilation of information and communication technologies (ICT) in small producers of protected agriculture in guanajuato, mexico. [Competitividad y asimilación de tecnologías de la información y la comunicación (TIC) en pequeños productores de agricultura protegida en Guanajuato, México] Ciencia Tecnologia Agropecuaria, 21(3) doi:10.21930/RCTA.VOL21_NUM3_ART:1499

19. Maredia, M. K., Reyes, B., Ba, M. N., Dabire, C. L., Pittendrigh, B., & Bello-Bravo, J. (2018). Can mobile phone-based animated videos induce learning and technology adoption among low-literate

farmers? A field experiment in burkina faso. Information Technology for Development, 24(3), 429-460. doi:10.1080/02681102.2017.1312245

20. Martin, J., Torres, D., Fernandez, A., Pravisani, S., & Briend, G. (2018). Using citizen science gamification in agriculture collaborative knowledge production. Paper presented at the ACM International Conference Proceeding Series, doi:10.1145/3233824.3233859 Retrieved from www.scopus.com

21. Mata, F. J., Quesada, A., & Mata-Marín, G. (2016). Can e-commerce provide a solution to the coffee paradox?: The case of costa rica doi:10.1007/978-3-319-44447-5_17 Retrieved from www.scopus.com

22. Mikhailov, A., Oliveira, C., Padula, A. D., & Reichert, F. M. (2021). Californian innovation ecosystem: Emergence of agtechs and the new wave of agriculture. Innovation and Management Review, 18(3), 292-307. doi:10.1108/INMR-12-2018-0098

23. Muñoz-García, A., Del Cioppo, J., & Bucaram-Leverone, M. (2017). Ontology model for the knowledge management in the agricultural teaching at the UAE doi:10.1007/978-3-319-67283-0_19 Retrieved from www.scopus.com

24. Nunez V., J. M., Vargas, V. L., & Quezada L., Y. M. (2020). Implementation of a participatory methodology based on STEAM for the transfer of ICT knowledge and creation of agtech spaces for the co-design of solutions that contribute to the development of small and medium agricultural producers in colombia, panama and china. Paper presented at the EDUNINE 2020 - 4th IEEE World Engineering Education Conference: The Challenges of Education in Engineering, Computing and Technology without Exclusions: Innovation in the Era of the Industrial Revolution 4.0, Proceedings, doi:10.1109/EDUNINE48860.2020.9149486 Retrieved from www.scopus.com

25. Oliveira-Jr, A., Resende, C., Goncalves, J., Soares, F., & Moreira, W. (2020). IoT sensing platform for e-agriculture in africa. Paper presented at the 2020 IST-Africa Conference, IST-Africa 2020, Retrieved from www.scopus.com

26. Ordoñez-García, A., Siller, M., & Begovich, O. (2017). IoT architecture for urban agronomy and precision applications. Paper presented at the 2017 IEEE International Autumn Meeting on Power, Electronics and Computing, ROPEC 2017, , 2018-January 1-4. doi:10.1109/ROPEC.2017.8261582 Retrieved from www.scopus.com

27. Ortiz-Crespo, B., Steinke, J., Quirós, C. F., van de Gevel, J., Daudi, H., Gaspar Mgimiloko, M., & van Etten, J. (2021). User-centred design of a digital advisory service: Enhancing public agricultural extension for sustainable intensification in tanzania. International Journal of Agricultural Sustainability, 19(5-6), 566-582. doi:10.1080/14735903.2020.1720474

28. Pinto, D. M., de Oliveira, P., Minitti, A. F., Mendes, A. M., Vilela, G. F., Castro, G. S. A., . . . Rodrigues, G. S. (2021). Impact assessment of information and communication technologies in agriculture: Application of the ambitec-TICs method. Journal of Technology Management and Innovation, 16(2), 91-101. Retrieved from www.scopus.com

29. Plazas, J. E., & Corrales, J. C. (2018). Deploying timely alerts through converged services: An application for colombian agriculture doi:10.1007/978-3-319-70187-5_10 Retrieved from www.scopus.com

30. Pusdá-Chulde, M. R., Salazar-Fierro, F. A., Sandoval-Pillajo, L., Herrera-Granda, E. P., García-Santillán, I. D., & De Giusti, A. (2020). Image analysis based on heterogeneous architectures for precision

agriculture: A systematic literature review doi:10.1007/978-3-030-33614-1_4 Retrieved from www.scopus.com

31. Rodríguez, A., Fernández, A., & Hormazábal, J. H. (2018). Beyond the GUI in agriculture: A bibliographic review, challenges and opportunities. Paper presented at the ACM International Conference Proceeding Series, doi:10.1145/3233824.3233844 Retrieved from www.scopus.com

32. Simionato, R., Neto, J. R. T., dos Santos, C. J., Ribeiro, B. S., de Araújo, F. C. B., de Paula, A. R., . . . Yi, J. H. (2020). Survey on connectivity and cloud computing technologies: State-ofthe-art applied to agriculture 4.0. Revista Ciencia Agronomica, 51(5), 1-19. doi:10.5935/1806-6690.20200085

33. Soria-Ruiz, J., Fernández-Ordoñez, Y. M., Medina-García, G., Quijano-Carranza, J. A., Ramírez-Guzmán, M. E., Aguilar-Marcelino, L., & Vazquez-Siller, L. M. (2021). Agriculture in latin america: Recent advances and food demands by 2050 doi:10.1007/978-3-030-84156-0_7 Retrieved from www.scopus.com