**Remittances Review**
June 2023
Volume: 8, No: 4, pp. 3975-3985
ISSN: 2059-6588 (Print) | ISSN: 2059-6596 (Online)

Received: 11 November 2022 Accepted: 28 March, 2023
DOI: https://doi.org/10.33182/rr.v8i4.279

# THE ASSURANCE AND TECHNIFICATION OF FOOD SECURITY IN LATIN AMERICA AS A RESPONSE TO THE GLOBAL CRISIS OF SUFFICIENT AND HEALTHY FOOD

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***Abstract***

*A documentary review was carried out on the production and publication of research papers related to the study of the variables Food Security, Technification and World Food Crisis. The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2017-2022, achieving the identification of 56 publications. The information provided by this platform was organized through graphs and figures categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics have been described, the position of different authors towards the proposed theme is referenced through a qualitative analysis. Among the main findings made through this research, it is found that India with 11 publications was the Latin American country with the highest scientific production registered in the name of authors affiliated with institutions of that nation. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material referring to the study of Food Security, Technification and World Food Crisis was Environmental Sciences with 22 published documents, and the Type of Publication most used during the period indicated above were Journal Articles with 39% of the total scientific production.*

***Keywords:*** *Food Security, Technification, Global Food Crisis, Latin America.*

## Introduction

In the current era, where climate change and the food crisis affect the entire global population, Latin America is at the center of this crisis poised to play a critical role in addressing the growing

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obstacles to food security. As the rest of the world grapples with the complexity of current climate change, population and population growth, economic inequality and evident socio-political tensions, the Latin American region increasingly faces the urgent need to transform food security. The slender agricultural marriage and the wide variety of ecosystems in the Latin American region reveal a great opportunity and challenges as this region strives to feed its population and achieve cooperation to the challenges of food security at the international level.

The present global food crisis, personified by the volatility of food prices, food shortages characterized by vulnerability and climate change, marks the need for the intervention of the Latin American region to adopt new technologies in order to ensure sufficient and healthy supplies for the population in general. This global food crisis, combined by the growing Covid-19 pandemic, has brought unprecedented challenges to current food systems around the world, showing the fragility of the current food system and pointing out that traditional paradigms of production and distribution are inefficient and insufficient.

In this regard, the Latin American region is committed to a major transformation of its food security strategies, having the basic principles of healthy sustainability, resilience and inclusion to improve the current food system. At the epicenter of these changes is the recognition of the interconnectedness of current food supply chains and the region's present need not only to feed the current population numbering but also to contribute and cooperate to the global food security agenda. In this article we examine the dimensions of the modernization of food security implemented by Latin America and identifying the historical and cultural facts of the region with agriculture and highlighting how the traditional practices that this particular region plays has evolved and has managed to adapt to the growing modern challenges. However, we explore how the role of technological innovation plays a crucial role in food practices enabling international cooperation in strengthening Latin America's productive capacity to respond effectively to the global health food crisis. The long road to modernizing food security in Latin America is complicated by successes and failures. Nonetheless, these international cooperations not only help meet the nutritional demand for food, but also help shape the improvement of the current food system and the development of a more sustainable system. As Latin American countries engage in these changes, they make an integral global effort to transform and build a resilient food system. Equitable and sustainable for future generations. For this reason, this article seeks to describe the main characteristics of the compendium of publications indexed in the Scopus database related to the variables Food Security, Technification and World Food Crisis, as well. As the description of the position of certain authors affiliated with Latin American institutions, during the period between 2017 and 2022.

## 2. General Objective

Analyze from a bibliometric and bibliographic perspective, the preparation and publication of research papers in high-impact journals indexed in the Scopus database on the variables Food

Security, Technification and World Food Crisis during the period 2017-2022.

## 3. Methodology

This article is carried out through a research with mixed orientation that combines the quantitative and qualitative method. On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of scientific production corresponding to the study of the variables Food Security, Technification and World Food Crisis. On the other hand, examples of some research works published in the area of study indicated above are analyzed from a qualitative perspective, starting from a bibliographic approach that allows describing the position of different authors towards the proposed topic. It is important to note that the entire search was performed through Scopus, managing to establish the parameters referenced in Figure 1.

### 3.1. Methodological design

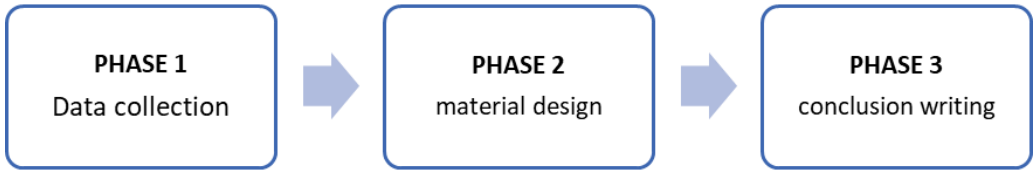


**Figure 1.** Methodological design

**Source:** Authors.

#### 3.1.1 Phase 1: Data collection

Data collection was executed from the Search tool on the Scopus website, where 56 publications were obtained from the choice of the following filters:

TITLE-ABS-KEY ( food AND security, AND technology, AND world AND food AND crisis ) AND PUBYEAR > 2016 AND PUBYEAR < 2023

- Published documents whose study variables are related to the study of the variables Food Security, Technification and World Food Crisis.
- Limited to the period 2017-2022.
- Without distinction of country of origin.
- Without distinction of area of knowledge.
- Regardless of type of publication.

#### 3.1.2 Phase 2: Construction of analysis material

The information collected in Scopus during the previous phase is organized and subsequently

classified by graphs, figures and tables as follows:

- 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 outcome document

In this phase, we proceed with the analysis of the results previously yielded resulting in the determination of conclusions and, consequently, the obtaining of the final document.

## 4. Results

### 4.1 Co-occurrence of words

Figure 2 shows the Co-occurrence of keywords found in the publications identified in the Scopus database.

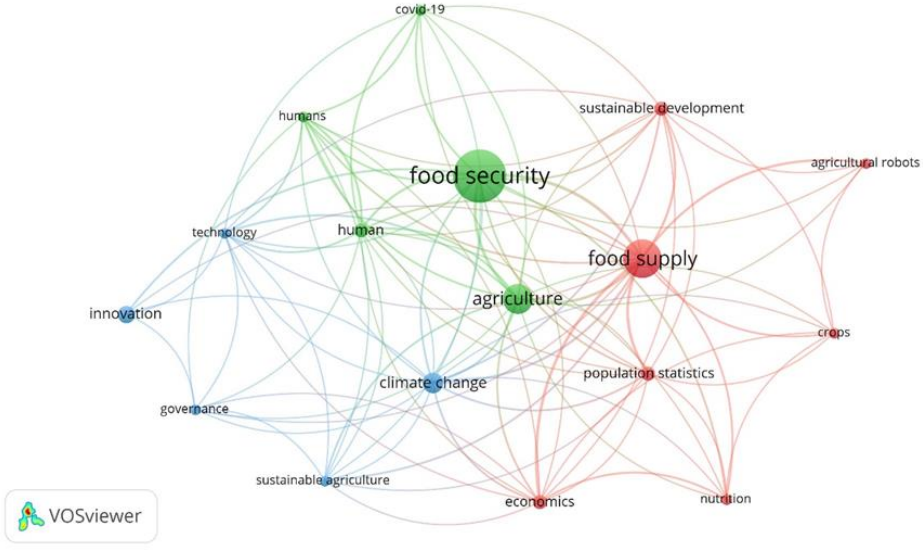


**Figure 2.** Co-occurrence of words

**Source:** Own elaboration (2023); based on data exported from Scopus.

Food Safety was the most frequently used keyword within the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. Food Supply is among the most frequently used variables, associated with variables such as

Agriculture, Sustainable Development, Sustainable Agriculture, Technology, Climate Change, Nutrition. The technification of food safety in Latin America is a multifaceted process characterized by the adoption of advanced technologies, the implementation of strict quality control measures and the harmonization of food safety standards with international standards. These changes reflect not only the region's commitment to protecting public health, but also the region's recognition of the vital role food safety plays in economic development, business competitiveness and consumer confidence.

### 4.2 Distribution of scientific production by year of publication

Figure 3 shows how scientific production is distributed according to the year of publication.

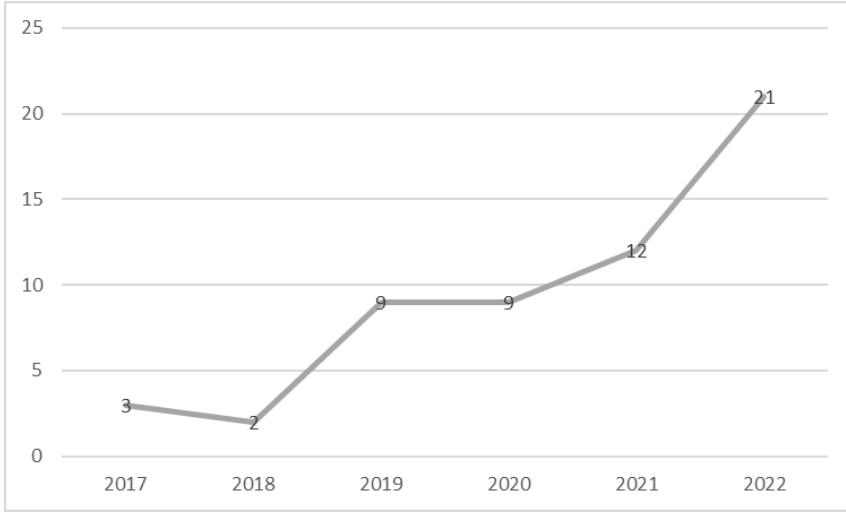


**Figure 3.** Distribution of scientific production by year of publication.

**Source:** Own elaboration (2023); based on data exported from Scopus

Among the main characteristics evidenced by the distribution of scientific production by year of publication, a level of number of publications registered in Scopus was the years 2022, reaching a total of 21 documents published in journals indexed in said platform. This can be explained thanks to articles such as the one entitled "To the farm, Mars and beyond: technologies for growing food in space, the future of long-duration space missions and implications for Earth in the coverage of the English media" This article shows that the news about the technology has been, In general, uncritical. Media narratives on issues of food growth in space have not been studied. This study looks at how English media coverage (n = 170) of 67 publications informs the feasibility of long-duration space missions, human settlements and high-tech agricultural technologies. We provide a representative sample of the types of agricultural technologies being covered, the organizations and key players in the field, and a critical analysis of media narratives.

Using mixed methods of content and discourse analysis, this study finds that media publications overwhelmingly portray long-duration space missions as inevitable and as a positive good for humanity. Without a critical assessment of the societal implications of food technologies for long-duration space missions in relation to their benefits on Earth, we risk overlooking systemic and structural inequalities in the food system.(Shaw, 2022)

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

Figure 4 shows how scientific production is distributed according to the nationality of the authors.

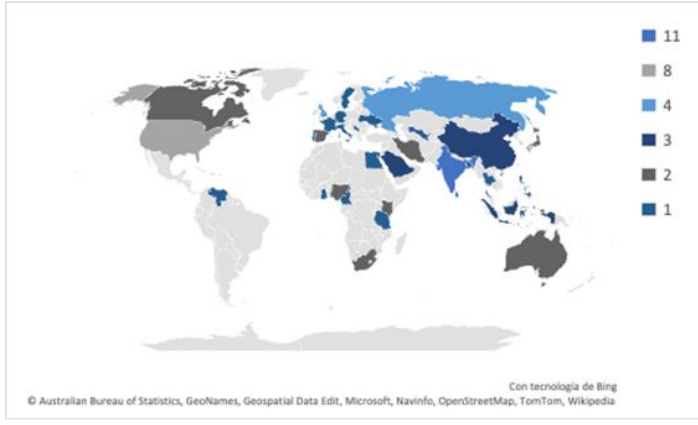


**Figure 4.** Distribution of scientific production by country of origin.

**Source:** Own elaboration (2023); based on data provided by Scopus.

Within the distribution of scientific production by country of origin, records from institutions were taken into account, establishing India, as the country of that community, with the highest number of publications indexed in Scopus during the period 2017-2022, with a total of 11 publications in total. Secondly, the United States with 8 scientific papers, and Russia ranking third presenting to the scientific community, with a total of 4 papers among which is the article entitled "Modern aspects of capital investment in the development of individual agricultural enterprises as a prerogative for food security of Ukraine" The objective of this article is to assess the resource and production potential of private farms, as well as justifying the feasibility of using its existing investment instruments. In the work general and special scientific methods are used. The main emphasis is on assessing the resource and production potential of the categories of farms studied. The methods of structural analysis and evaluation of time series have made it possible to establish the link between the level of crisis phenomena and the growing importance of personal farms in the country's food supply, as well as to compare their potential with the potential of the agricultural sector. of the country as a whole. Research results. It was found that personal farms play an important role in the food security of the country, as well as in the

formation of a system of self-employment and socio-cultural relations. These farms have been shown to successfully meet the food needs of the rural population and sell surplus products on the market. These economic entities have been shown to have significant resource and production potential, but expanding the scope of their activities requires a number of measures, including changing public policy to support farms, as well as ensuring active investments in their development. (Prib, 2022)

### 4.4 Distribution of scientific production by area of knowledge

Figure 5 shows the distribution of the elaboration of scientific publications from the area of knowledge through which the different research methodologies are implemented.

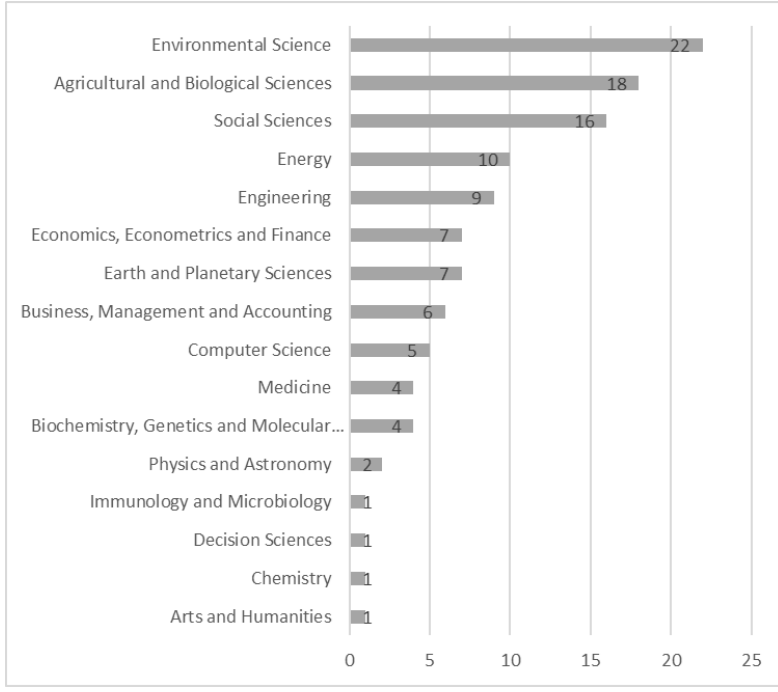


**Figure 5.** Distribution of scientific production by area of knowledge.

**Source:** Own elaboration (2023); based on data provided by Scopus.

Environmental Science was the area of knowledge with the highest number of publications registered in Scopus with a total of 22 documents that have based their variable methodologies Food Security, Technification and Global Food Crisis. In second place, Agricultural and Biological Sciences with 18 articles and Social Sciences in third place with 16. The above can be explained thanks to the contribution and study of different branches, the article with the greatest impact was registered by the Environmental Science area entitled "Research framework of the transition path of palm oil towards a model of biocircular and green economy using SWOT

analysis: a case study from Thailand" This article focuses on the development of strategies to investigate oil palm along the supply chain in Thailand. SWOT factors (strengths, weaknesses, opportunities, and threats) are recognized through stakeholder interviews. These stakeholders are feedstock producers, crude palm oil (CPO) producers, government agencies, biodiesel producers, palm oil refinery producers and researchers.

The results obtained from the data collection were analyzed and led to the formulation of strategies for future oil palm research using the TOWS matrix. According to this analysis, future framework strategies for palm oil research should consist of four categories: (1) oil palm management policy, development of regulations and economic instruments in various ways to systematically manage the oil palm industry, and application of big data and smart innovation to analyze market behavior; (2) oil palm breeding and production technologies, developing smart innovation in line with farmers' lifestyles and supporting research on oil content analysis and harvesting technology; (3) oil palm biomass conversion technologies, assessing environmental impacts through life cycle technology, assessing the potential reduction of greenhouse gas emissions and increasing the rate of palm biomass consumption; and (4) palm-based oleochemical products, developing oleochemical technology at the industrial level, expanding the potential capacity to produce oleochemical derivatives and increasing the consumption rate and value added of APC.(Usapein, 2022)

### 4.5 Type of publication

In the following graph, you will observe the distribution of the bibliographic finding according to the type of publication made by each of the authors found in Scopus.

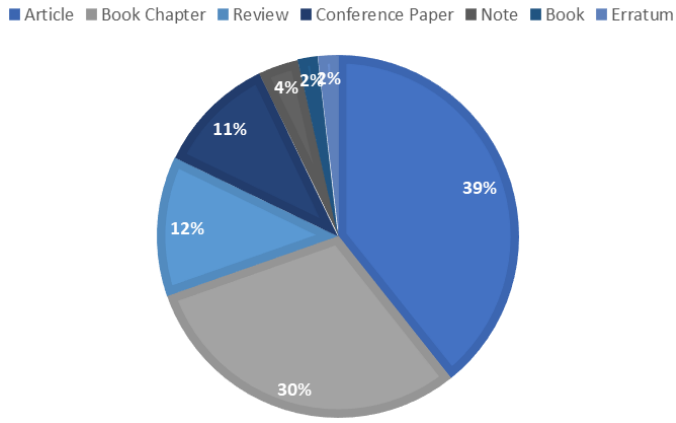


**Figure 6.** Type of publication.

**Fountain:** Own elaboration (2023); based on data provided by Scopus.

The type of publication most frequently used by the researchers referenced in the body of this

document was entitled Journal Articles with 39% of the total production identified for analysis, followed by Chapter of the book with 30%. Journal are part of this classification, representing 12% of the research papers published during the period 2017-2022, in journals indexed in Scopus. In this last category, the one entitled "Addressing the challenges of the water-energy-food nexus programme in the context of sustainable development and climate change in South Africa" stands out, which aims to create an understanding of the interdependencies of the three components and their influence on socio-economic growth and national development in the world. in the face of environmental changes induced by climate change. While these policies and programmes appear to have a sound theoretical basis, their implementation has been hampered by a number of structural and systemic challenges.

Using methods inspired by the tradition of participatory research, this article analyses the strengths and weaknesses of the water, energy and food policy framework in South Africa in the context of its implementation to achieve water, energy and food security. The findings of this paper revealed that, while some level of progress has been made in improving people's livelihoods using the nexus ecosystem, the broader objective of the concept has not materialized due to poor programme implementation, which is exacerbated by the lack of synergies and establishment of collaborations and partnerships among relevant actors responsible for managing the three components and of inadequate investments. This paper recommends a broader and more coordinated approach to implementing the water-energy-food nexus programme with a broader objective of sustainable development goals.(Adom, 2022)

**Conclusion**

Through the bibliometric analysis carried out in the present research work, it was established that India was the country with the largest number of records published with regard to the variables Food Security, Technification and World Food Crisis. with a total of 11 publications in Scopus database. In the same way, it was established that the application of theories framed in the area of Environmental Science, were used more frequently in the implementation in the technification of food security in Latin America since this region has become an important pillar to mitigate the global food crisis. While this vast Latin American region faces unique challenges such as economic inequality, population growth and the current climate crises, new technologies must be implemented and technological strategies developed to ensure sustainable access to safe and healthy food. Latin America has made significant progress in adopting and adapting technology-based solutions to improve food production, distribution and access. From precision agriculture and genetic engineering to digital platforms that connect producers and consumers, these innovations help optimize resource use, increase agricultural productivity and reduce post-harvest losses. In addition, they enable governments and organizations to better monitor and manage food supply chains, ensuring that vulnerable groups receive the support they need.

However, it is important to recognize that the technification of food safety is not without

challenges. Special attention should be paid to the environmental impact of technology implementation and potential social consequences, such as displacement of traditional agricultural practices and unequal access to technological resources. In addition, issues related to data protection and digital inequality should be addressed to ensure equal interests for all. In light of the global food crisis, the technological solutions adopted in Latin America offer hope and promise. It demonstrates the region's commitment to food security and sustainable development and its willingness to use innovation for the common good. Cooperation between governments, international organizations, academia and the private sector is essential to ensure the success of this approach.

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