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Sustainable Development Indicators In Latin American And Caribbean Countries

Geomar Molina-Bolivar[1], Iris Jimenez-Pitre[2], , Edgar J. Carmona Suárez[3]

[1]Grupo de Investigación BIEMARC, Universidad de La Guajira, Riohacha, Colombia , https://orcid.org/0000-0001-6380-379X , gmolina@uniguajira.edu.co

[2]Grupo de Investigación BIEMARC, Universidad de La Guajira, Riohacha, Colombia , https://orcid.org/0000-0002-8109-7013 , iajimenez@uniguajira.edu.co

[3]Umiversidad del Quindío, Armenia, Colombia , https://orcid.org/ 0000-0001-6399-2842, ecarmona@uniquindio.edu.co

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Abstract

A documentary review was carried out on the production and publication of research papers on sustainable development indicators in Latin America and the Caribbean. The bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in Scopus database during the period 2016-2021, achieving the identification of 1182 publications in total. The information provided by the said platform was organized using 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 Brazil, with 519 publications, was the 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 most significant contribution to the construction of bibliographic material referring to the study of Sustainable Development Indicators in Latin America and the Caribbean was Environmental Sciences, with 608 published documents, and the Type of Publication that was most used during the period indicated above was the Journal Article, representing 74% of the total scientific production.

Keywords: sustainable development, Latin America

EMAIL ID : gmolina@uniguajira.edu.co

1. Introduction

Sustainable development is the ability to achieve economic and social progress without compromising natural resources, thus being a viable growth without compromising the resources of the next generations, taking into account social equity and responsibility for the actions taken, taking into account the consequences and how this may impact society. The UN has addressed 17 goals to achieve sustainability since 2015 for the 2030 agenda taking into account vulnerable populations to actions to be taken to combat climate change as an opportunity for governments to adopt policies to conserve resources while growing economically and socially. In Latin America in recent decades, environmental policies have been implemented in government agendas prioritizing social progress, considering that our communities are potentially vulnerable where public policies do not reach all regions. Even so, great progress has been made since 2000, when nations have implemented environmental modules that have changed regional dynamics into more sustainable ones. In addition, companies are essential agents of change, taking into account indicators such as natural resource indicators such as forest area, biological diversity and CO2 levels, and indicators that determine a dignified life, such as the population that can access public services, taking into account both urban and rural populations. All this helps that in Latin America and the Caribbean, environmental management is increasingly included in action plans and public policies to ensure better results in the investment of public spending and how this is reflected in the social growth and economic development of these countries. Therefore, it is becoming more and more frequent to have research and a greater volume of scientific production regarding the indicators that are currently used to determine how to use more sustainable processes in Latin American and Caribbean countries and how this helps to have an economic and social growth that does not compromise the natural resources of future generations and allows to conserve the territory. At the same time, companies carry out their economic and commercial activities.

2. General Objective

To analyze from a bibliometric and bibliographic perspective the production of research papers on the variable Indicators of sustainable development in Latin America and the Caribbean during 2016-2021.

3. Methodology

A quantitative analysis of the information provided by Scopus is made under a bibliometric approach to the scientific production related to the study of sustainable development indicators in Latin America and the Caribbean. 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 performed through the tool provided by Scopus, and the parameters referenced in Figure 1 are established.

3.1 Methodological design

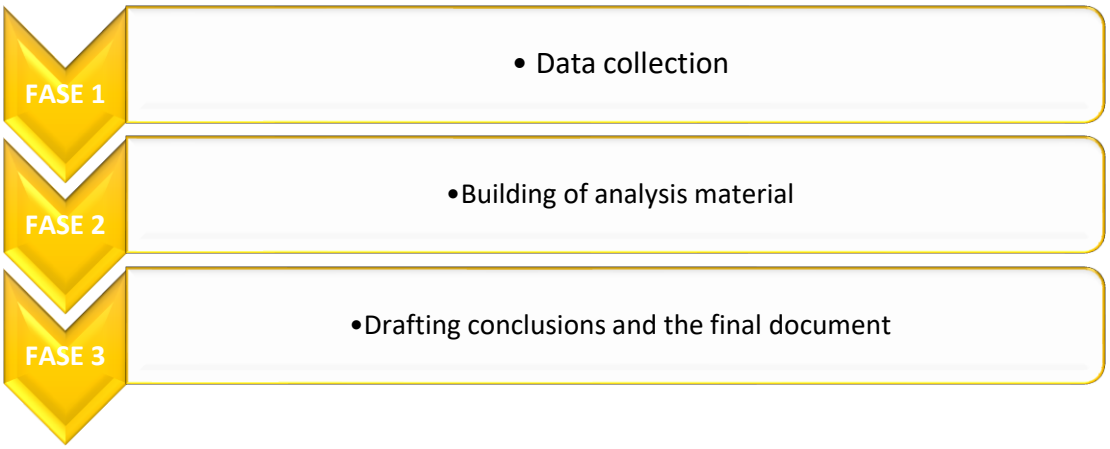

Figure 1. Methodological design
Source: Own elaboration

3.1.1 Phase 1: Data Collection

The data collection was carried out using the Scopus web page search tool, through which a total of 38 publications were identified. For this purpose, search filters were established consisting of:

- ✓ Published documents whose study variables are related to the study of Sustainable Development Indicators.
- ✓ 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 made through graphs, figures and tables based on data provided by Scopus.

- ✓ Word Co-occurrence.
- ✓ Year of publication
- ✓ Country of origin of the publication.
- ✓ Knowledge area.
- ✓ Type of Publication

3.1.3 Phase 3: Drafting conclusions and final document

After the analysis carried out in the previous phase, the study drafted the conclusions and prepared the final document.

4. Results

4.1 Cooccurrence of words

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

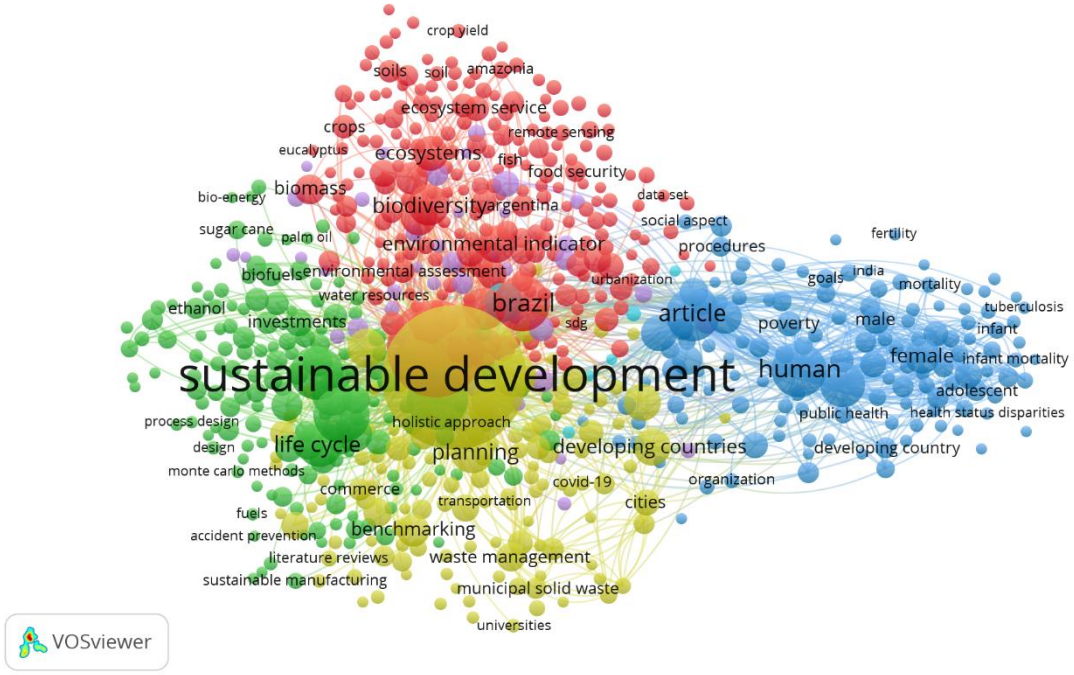

Figure 2. Cooccurrence of words
Source: Own elaboration (2022); based on data provided by Scopus.

As shown in Figure 2, the most used keyword is sustainable development, which refers to the actions taken as people and as a society to protect the environment while promoting economic and social development, taking into account the communities and resources of future generations, so implementing it in public policies is of great importance in developing countries such as Latin America. This section offers keywords such as environmental indicators, public policies, UN and investments, which shed light on the reform processes of the action plan of Latin American and Caribbean countries in order to change regional dynamics and thus implement the fulfillment of the 17 sustainable development goals of the UN, thus allowing social and economic progress without neglecting the conservation of natural resources. This also shows the commitment of both the government and the companies to make this a reality, which is why it is important to differentiate them from what has been done in the past.

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 2017 to 2021

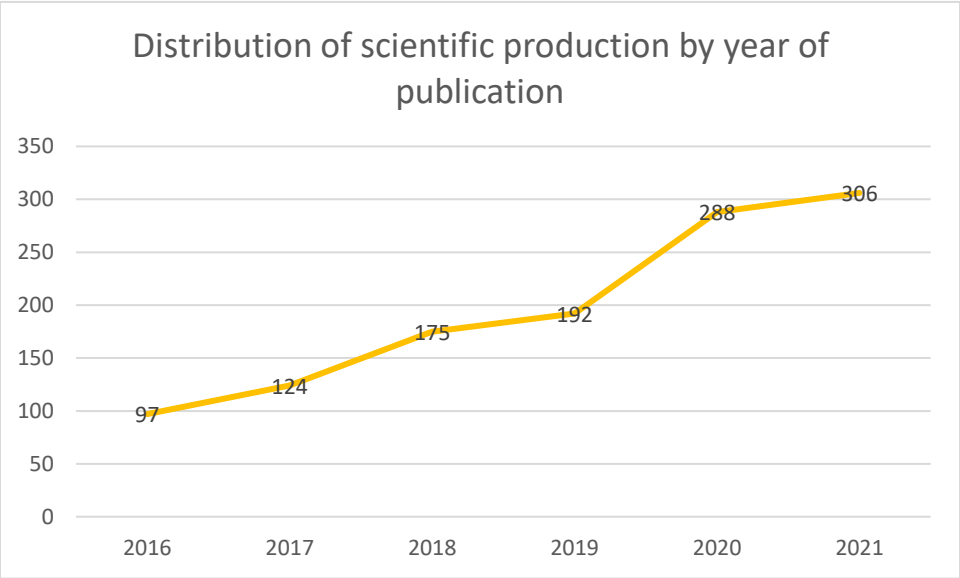

Figure 3. Distribution of scientific production by year of publication.
Source: Own elaboration (2022); based on data provided by Scopus.

2021 was the year with the highest number of publications related to the variables under study, presenting 306 documents, among which is the title "Sustainable mobility scale: a contribution for sustainability assessment systems in urban mobility" (Bebber et al., 2021). The sustainable development of a city is directly connected to urban mobility conditions, so the regional mobility action plans in Latin America lately implement laws and standards that align with the sustainable guidelines established by ISO 37120, ISO 37122 and the UN Sustainable Development Goals. Given the changes needed to promote an effective mobility strategy in South American countries, this document helps to translate citizens' perceptions to identify weaknesses and then plan and propose improvements, contributing to the development of sustainable mobility.

In second place is 2020 with 288 documents, among which is "Diversification of export products and CO2 emissions: contextual evidence from developing and developed economies" (Shahzad et al., 2020). The main objective of this document is to determine cleaner production and sustainability, taking into account the heterogeneous impacts of export product diversification, extensive margins and intensive margins on CO2 emissions for developing and developed countries. It concludes that the three indicators of export diversification significantly reduce CO2 emissions in 63 developed and developing countries as a global sample, showing how the negative impacts of product diversification show that economic sophistication is a vital tool to reduce emissions. How research concludes provides with innovative policies for cleaner production and industrial manufacturing purposes, making policies more effective in achieving the Sustainable Development Goals (SDGs).

4.3 Distribution of scientific production by country of origin.

Figure 4 shows the distribution of scientific production according to the nationality of the authors.

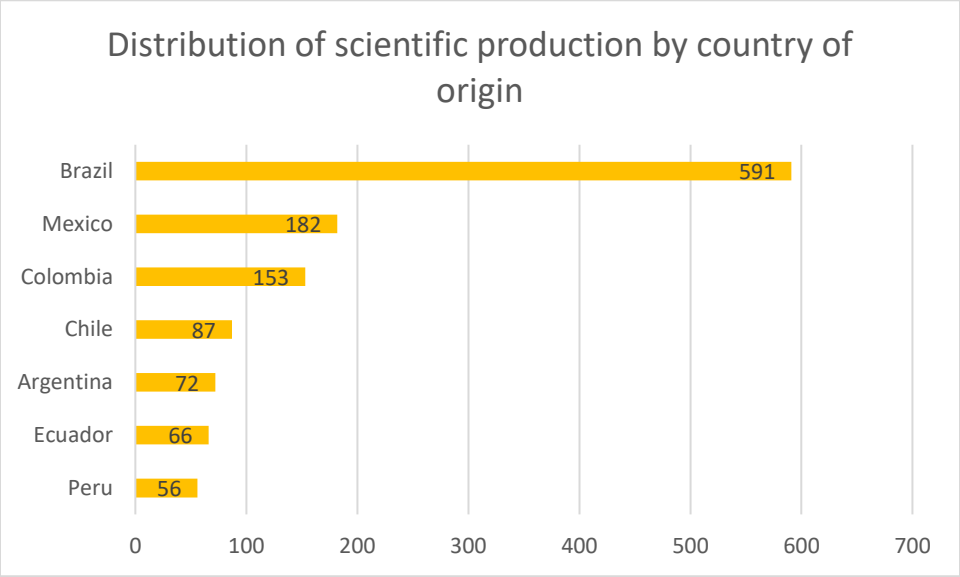

Figure 4. Distribution of scientific production by country of origin.
Source: Own elaboration (2022); based on data provided by Scopus.

Brazil is the Latin American country with the highest scientific production in the period 2016-2021, presenting 591 papers related to the variables under study within which is the paper entitled "Understanding aspects that influence the participation of employees of Brazilian companies in volunteering initiatives: Contributions to sustainable development" (Siltori et al., 2021). This study shows how the indicators present the insufficiency of the economic models of the countries, being the changes implemented to make the processes in line with the fulfillment of the 17 Sustainable Development Goals that the United Nations published to guide companies, countries and people. Therefore, a bibliographic study was conducted to identify the main aspects that influence the participation of company employees in volunteer programs. Therefore, several aspects are analyzed to help determine the aspects that people and companies take into account to opt for volunteering to help determine and align with sustainable development.

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, which can be from the same country or of 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 4, which shows the flow of collaborative works from different countries.

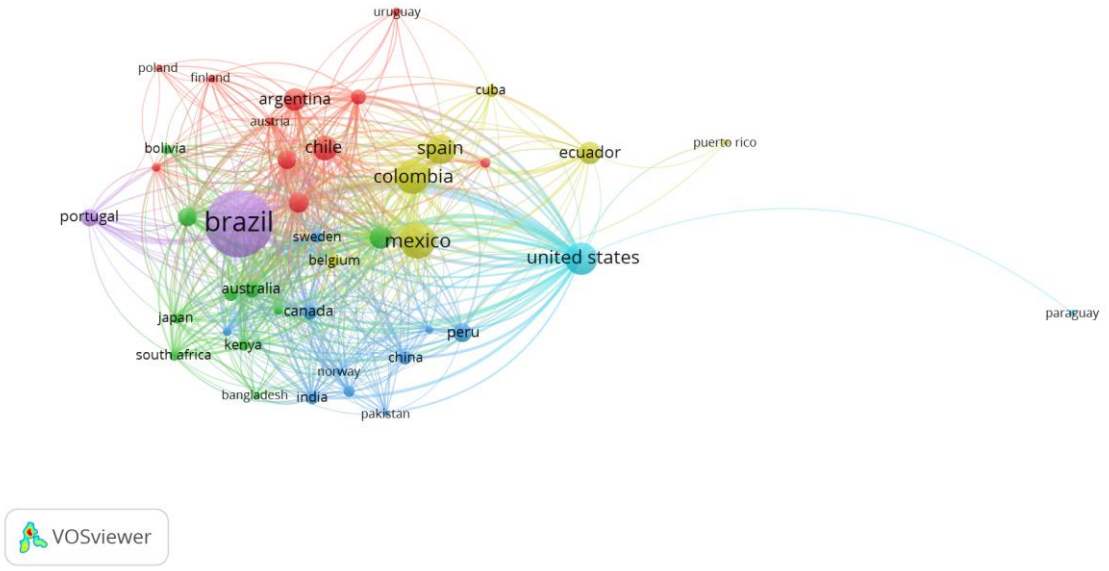

Figure 5. Co-citations between countries.
Source: Own elaboration (2022); based on data provided by Scopus.

As mentioned above, Brazil is the country with the most significant contribution to research related to the variables under study, having research with countries such as Germany and the United States to complement research depending on the experience due to the characteristics of each territory. In second place is Mexico, with 182 documents and numerous collaborations with different countries; within these publications is the one entitled "Does technological innovation divide economic growth from sustainable development?" (Mayenberger & Perez-Castillo, 2021). This article aims to explore whether technological innovation strategies produce incremental economic returns in competitiveness indexes and, at the same time, produce an unfavorable impact on a region's social, environmental and human systems. Therefore, the correlation between innovation performance, environmental recovery, productivity and social quality of life is analyzed, where the need for public policies and the rule of law to make this a reality became evident. However, the impact on environmental regeneration and the social gap is very questionable in the Latin American and Caribbean continents due to their social conditions.

4.4 Distribution of scientific production by area of knowledge

Figure 5 shows how the production of scientific publications is distributed according to the area of knowledge through which the different research methodologies are executed.

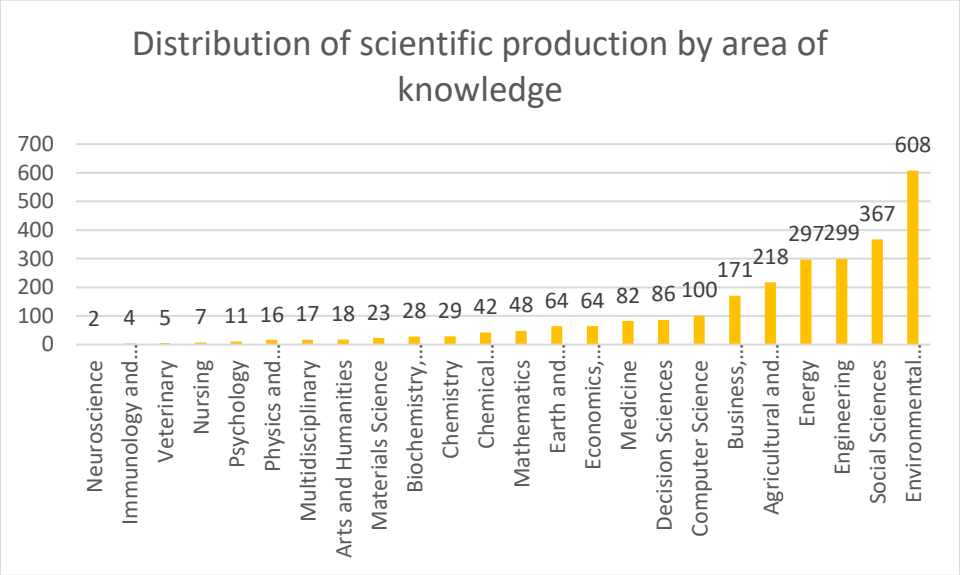

Figure 6. Distribution of scientific production by area of knowledge.
Source: Own elaboration (2022); based on data provided by Scopus.

Environmental sciences were the most influential area of knowledge at the time of researching the study of scientific and technological production and internet use in Latin America, with 608 publications, among which is the paper entitled "Energy, environmental, resource recovery and economic dimensions of MSW routes." This study evaluates fossil energy use, GHG emissions, resource recovery and economic cost dimensions of current and five alternative MSW routes in the CDMX to compare their performance and identify more sustainable practices for the megacity. Thus, the levels of waste generation in Mexico City were investigated and how the incineration-based MSW routes perform best in most of the aspects evaluated, but their high costs appear prohibitive. The results of this analysis suggest that MSW routes with open windrow composting, mechanical-biological pre-treatment, and material recovery facilities may be more appropriate to improve the sustainability of CDMX's MSW management and lower pollution levels,

4.5 Type of publication

Figure 7 shows how the bibliographic production is distributed according to the author's chosen publication type.

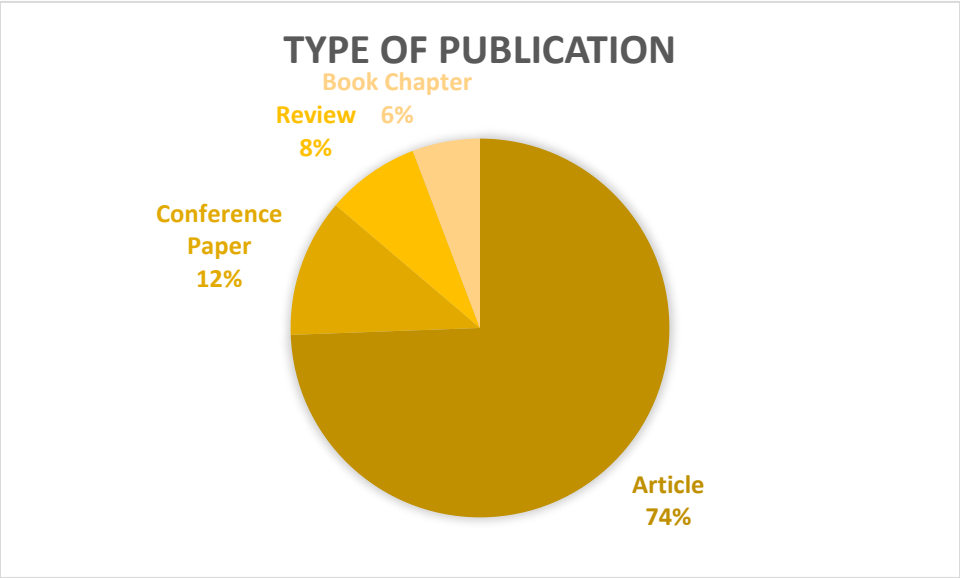

Figure 7. Type of publication
Source: Own elaboration (2022); based on data provided by Scopus.

As shown in Figure 7, within the different types of publications, 56% of the total number of documents identified through Phase 1 of the Methodological Design correspond to journal articles, among which is the one entitled "Operationalization and measurement of well-being from the capabilities approach: The case of Latin America" (Perdomo et al., 2021). Starting from the capabilities approach, this paper develops the concept of sustainable well-being, which highlights the importance of incorporating temporal sustainability in the well-being analysis with intergenerational justice. Therefore, indicators were analyzed to determine how policies can be implemented to support sustainability in Latin America and help meet UN goals. The results show the feasibility of operationalizing the capabilities approach and its potential to support the formulation of associated policies.

5. Conclusions

Thanks to the bibliometric analysis carried out in this article, it is possible to determine that within the main characteristics in the volume of scientific production referring to the study of Indicators of sustainable development in Latin America and the Caribbean, it is established that Brazil, was the Latin American country with the highest number of reports through its institutions to Scopus with a total of 591 documents registered during the period 2016-2021. Due to the nature of the study, which seeks to Determine the Indicators of sustainable development in Latin America and the Caribbean, it is established that Environmental Sciences was the area of knowledge with the greatest influence in the research identified since 680 of the 112 publications related for the present analysis, actively participate with theories framed in that area of knowledge. Similarly, and following the nature of the study and the educational component, social sciences also played a fundamental role in the execution of 367 publications. It is worth noting that, within the analysis presented regarding the position of different authors for the study of the topic proposed in this research, it can be concluded that

sustainable development is all the actions aimed at implementing economic growth without wasting the natural resources of future generations, allowing to have a conscious and more friendly economy with the planet earth. The objectives of sustainable development set forth by the UN help the countries' policies to re-direct themselves to comply with these goals and thus guarantee a good quality of life. In Latin America, although we present certain delays in the policies used in the regions, these rules have changed in recent years, seeking to make economic management more sustainable and creating awareness among citizens and large companies. That is where corporate social responsibility comes in and helps to repay society for the damage caused by economic activity, thus having the profits in the same territory. This is why the educational entities of change, such as universities, are increasingly opting for the realization of projects that determine the indicators of sustainable development in Latin America and the Caribbean; however, it is expected that from bibliographic and bibliometric reviews as the one proposed in this document, the current situation of the literature on the subject is considered and that the investigative community and the educational community and authors in economics help in the generation of new knowledge in this regard to have more scientific material to determine the indicators of sustainable development in Latin America and the Caribbean.

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