# Factors Influencing The Sustainability Of Environmental Impact Investment Projects In Piura: A Review Of The Literature

Carlín-Marres, Luis Alberto<sup>1</sup>, Carpio-Mendoza, Janet<sup>2</sup>,
Dioses-Urbina, Sandra Maribel<sup>3</sup>, Rodríguez-Moreano, Carolay Maritza<sup>4</sup>,
Alania Vasquez, Miguel Angel<sup>5</sup>, Ramírez-Valladares, Cristhian Ovidio<sup>6</sup>

<sup>1</sup>Universidad César Vallejo, Lima, Perú. https://orcid.org/0000-0002-2878-4455; e-mail: p7001264543@ucvvirtual.edu.pe <sup>2</sup>Universidad César Vallejo, Lima, Perú. https://orcid.org/0000-0002-5657-7197; e-mail: jcarpiom@ucvvirtual.edu.pe <sup>3</sup>Universidad Cesar Vallejo, Piura, Perú. https://orcid.org/0000-0002-9886-1954; e-mail: smdioses@ucvvirtual.edu.pe <sup>4</sup>Universidad César Vallejo, Lima, Perú. https://orcid.org/0000-0001-8643-4333; e-mail: crodriguezmo1@ucvvirtual.edu.pe <sup>5</sup>Universidad César Vallejo, Lima, Perú. https://orcid.org/0000-0003-0368-6063; e-mail: maalaniaa@ucvvirtual.edu.pe <sup>6</sup>Universidad Cesar Vallejo, Piura, Perú. https://orcid.org/0000-0002-6944-5652; e-mail: cramirezovidio@ucvvirtual.edu.pe

#### Summary

Through this document, it was possible to analyze the main characteristics of the volume of scientific production regarding the study of the variables of sustainability of investment projects in environmental impact in Piura. A bibliometric analysis was proposed to analyze details such as Year of Publication, Country of Origin of the publication, Area of Knowledge in which the published research is carried out and the Type of Publication most frequently used by the authors of each document published in high-impact journals indexed in the Scopus database during the period between 2019 and 2023. Among the main findings, it was possible to determine that, for the

execution of the different research methodologies, the report of 484 scientific documents related to the study of the sustainability of environmental impact investment projects of public entities in Latin America and Spanish-speaking was achieved. The maximum number of publications made in a year was 342 documents submitted in 2020, the same number of publications in 2021. The country of origin of the institutions that reported the highest number of records in Scopus was Spain and Brazil with 289 documents. The area of knowledge with the greatest influence at the time of executing the research projects that resulted in scientific publications was Ecology and Environment, which contributed great theoretical material in a total of 280 publications. Finally, the type of publication most frequently used to publicize findings from the analysis of the aforementioned variables was the Article, which represented 73.5% of the total scientific production.

Keywords: Environment, ecology, sustainability, investment.

#### 1. Introduction

Sustainability is a qualifying aspect of any investment project, especially those with environmental impact. In Piura, several factors influence the sustainability of environmental impact investment projects. One of the most important factors is compliance with environmental regulations. Laws such as Law No. 27308, Forestry and Wildlife Law, and Law No. 27446, Law on the National Environmental Impact Assessment System, and its Regulations, Supreme Decree No. 019-2009, establish the guidelines and procedures for environmental impact assessment and management. (Barrantes et al., 2021; Zhang et al., 2023a). Failure to comply with these regulations can lead to environmental degradation, which can have long-term negative effects on ecosystems and local communities. (Barrio and Rapini, 2023). Compliance with environmental standards is therefore decisive for the sustainability of investment projects.

Another essential factor influencing the sustainability of environmental impact investment projects is community engagement and participation. Community involvement in project design and implementation can help ensure that the project aligns with the needs and values of the local community. This can lead to

greater project support, less resistance, and ultimately greater sustainability. In addition, community participation can help identify potential environmental risks and challenges in the early stages of the project, enabling timely and effective mitigation measures. (Wang et al., 2023). Community engagement and participation are critical to the long-term sustainability of investment projects.

Finally, long-term economic viability and return on investment are decisive factors influencing the sustainability of investment projects in environmental impacts. Economic growth is vital for the development of any region, but it must be balanced with environmental sustainability and social equity [4]. Investment projects that generate short-term economic benefits but have long-term negative environmental impacts are not sustainable. Therefore, investment projects should be designed with a long-term perspective that considers the economic, social and environmental impacts of the project. (Khaleal et al., 2023; Melbourne et al., 2023). By doing so, investment projects can achieve economic growth while maintaining environmental sustainability, leading to greater long-term viability and return on investment.

The sustainability of environmental impact investment projects in Piura is influenced by several factors. Compliance with environmental regulations, community engagement and involvement, and long-term economic viability and return on investment are crucial factors determining the sustainability of investment projects. It is important for investors to consider these factors and implement sustainable practices to ensure the success and longevity of their projects. In doing so, they can not only contribute to the protection of the environment but also generate economic benefits for the community and stakeholders involved.

## 2. General objective

Analyze from a bibliometric approach, the characteristics in the volume of scientific production related to the Factors that influence the sustainability of investment projects and environmental impact in Piura, registered in Scopus during the period 2019-2023 by Latin American and Spanish-speaking institutions.

# 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 factors that influence the sustainability of investment projects and environmental impact in Latin American and Spanish-speaking institutions.

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

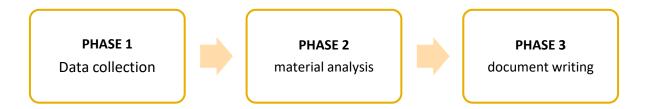


Figure 1. Methodological design

**Source:** Authors.

#### 3.1.1 Phase 1: Data collection

Data collection was executed from the Search tool on the Scopus website, where 484 publications were obtained from the choice of the following filters:

( TITLE ( \*environmental AND impact\* ) OR TITLE ( \*investment AND project AND sustainability\* ) ) AND (EXCLUDE (PUBYEAR, 1958) OR

EXCLUDE (PUBYEAR, 1964) OR EXCLUDE (PUBYEAR, 1968) OR EXCLUDE (PUBYEAR, 1969) OR EXCLUDE (PUBYEAR, 1970) OR EXCLUDE (PUBYEAR, 1971) OR EXCLUDE (PUBYEAR, 1972) OR EXCLUDE (PUBYEAR, 1973) OR EXCLUDE (PUBYEAR, 1974) OR EXCLUDE (PUBYEAR, 1975) OR EXCLUDE (PUBYEAR, 1976) OR EXCLUDE (PUBYEAR, 1977) OR EXCLUDE (PUBYEAR, 1978) OR EXCLUDE (PUBYEAR, 1979) OR EXCLUDE (PUBYEAR, 1979) OR EXCLUDE (pubyear, 1980) OR EXCLUDE (PUBYEAR, 1981) OR EXCLUDE (PUBYEAR, 1982) OR EXCLUDE (PUBYEAR, 1983) OR EXCLUDE (PUBYEAR, 1984) OR EXCLUDE (PUBYEAR, 1985) OR EXCLUDE (PUBYEAR, 1986) OR EXCLUDE (PUBYEAR, 1987) OR EXCLUDE (PUBYEAR, 1988) OR EXCLUDE (PUBYEAR, 1989) OR EXCLUDE (PUBYEAR, 1990) OR EXCLUDE (PUBYEAR, 1991) OR EXCLUDE (PUBYEAR, 1992) OR EXCLUDE (PUBYEAR, 1993) OR EXCLUDE (PUBYEAR, 1993) OR EXCLUDE (pubyear, 1993) 1994) OR EXCLUDE (PUBYEAR, 1995) OR EXCLUDE (PUBYEAR, 1996) OR EXCLUDE (PUBYEAR, 1997) OR EXCLUDE (PUBYEAR, 1998) OR EXCLUDE (PUBYEAR, 1999) OR EXCLUDE (PUBYEAR, 2000) OR EXCLUDE (PUBYEAR, 2001) OR EXCLUDE (PUBYEAR, 2002) OR EXCLUDE (PUBYEAR, 2003) OR EXCLUDE (PUBYEAR, 2004) OR EXCLUDE (PUBYEAR, 2005) OR EXCLUDE (PUBYEAR, 2006) OR EXCLUDE (PUBYEAR, 2007) OR EXCLUDE (PUBYEAR, 2007) OR EXCLUDE (pubyear, 2007) 2008) OR EXCLUDE (PUBYEAR, 2009) OR EXCLUDE (PUBYEAR, 2010) OR EXCLUDE (PUBYEAR, 2011) OR EXCLUDE (PUBYEAR, 2012) OR EXCLUDE (PUBYEAR, 2013) OR EXCLUDE (PUBYEAR, 2014) OR EXCLUDE (PUBYEAR, 2015) OR EXCLUDE (PUBYEAR, 2016) OR EXCLUDE (PUBYEAR, 2017) OR EXCLUDE (PUBYEAR, 2018) OR EXCLUDE (PUBYEAR, 2024) AND (EXCLUDE (SUBJAREA, "ENGI") OR EXCLUDE (SUBJAREA, "BUSI") OR EXCLUDE (SUBJAREA, "BUSI") OR EXCLUDE (SUBJAREA, "MEDI") OR EXCLUDE ( SUBJAREA , "ECON" ) OR EXCLUDE ( SUBJAREA , "MATE" ) OR EXCLUDE ( SUBJAREA , "CENG" ) OR EXCLUDE ( SUBJAREA, "BIOC") OR EXCLUDE (SUBJAREA, "CHEM") OR EXCLUDE (SUBJAREA, "PHYS") OR EXCLUDE (SUBJAREA, "MATH" ) OR EXCLUDE ( SUBJAREA , "DECI" ) OR EXCLUDE ( SUBJAREA , "MULT" ) OR EXCLUDE ( SUBJAREA , "PHAR" ) OR EXCLUDE ( SUBJAREA, "IMMU") OR EXCLUDE (SUBJAREA, "NURS") OR EXCLUDE (SUBJAREA, "VETE") OR EXCLUDE (SUBJAREA, "DENT" ) ) AND ( EXCLUDE ( DOCTYPE , "cp" ) OR EXCLUDE ( DOCTYPE , "re" ) OR EXCLUDE ( DOCTYPE , "ch" ) OR EXCLUDE ( DOCTYPE , "er" ) OR EXCLUDE ( DOCTYPE , "ed" ) OR EXCLUDE ( DOCTYPE , "no" ) OR

EXCLUDE ( DOCTYPE , "bk" ) OR EXCLUDE ( DOCTYPE , "le" ) OR EXCLUDE ( DOCTYPE , "sh" ) OR EXCLUDE ( DOCTYPE , "sh" ) OR EXCLUDE ( DOCTYPE , "sh" ) OR EXCLUDE ( LANGUAGE , "Chinese" ) OR EXCLUDE ( LANGUAGE , "Portuguese" ) OR EXCLUDE ( LANGUAGE , "Russian" ) OR EXCLUDE ( LANGUAGE , "Polish" ) OR EXCLUDE ( LANGUAGE , "Japanese" ) OR EXCLUDE ( LANGUAGE , "German" ) OR EXCLUDE ( LANGUAGE , "French" ) OR EXCLUDE ( LANGUAGE , "Slovak" ) OR EXCLUDE ( LANGUAGE , "Persian" ) OR EXCLUDE ( LANGUAGE , "Arabic" ) OR EXCLUDE ( LANGUAGE , "Italian" ) OR EXCLUDE ( LANGUAGE , "Hungarian" ) )

- Published documents whose study variables are n relation to the study of in the sustainability of environmental impact investment projects.
- ➤ Works published in journals indexed in Scopus during the period 2019-2023.
- Limited to palatin America.
- Without distinctionin areas of knowledge.
- Without distinction of the publication type.

## 3.1.2 Phase 2: Construction of analysis material

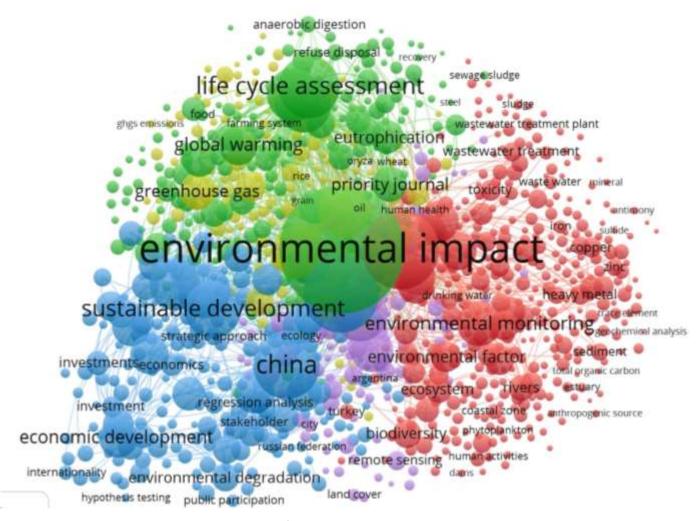
The information collected in Scopus during the previous phase is organized and subsequently classified by graphs, figures and tables as follows:

- Co-occurrence of Words.
- ToNo publication.
- País 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

An analysis of concurrent words in economic factors reveals that financial sustainability is a critical factor in the success of investment projects. Sustainable finance, which integrates environmental, social and governance (ESG) factors, is an approach increasingly adopted by investors and financial institutions to ensure the long-term value generation capacity of projects. (Steinhoff-Wagner et al., 2023). Assessing the economic impact of a project is essential to determine its effectiveness, efficiency, relevance and sustainability. (Samour et al., 2023). Therefore, economic factors play a decisive role in ensuring the sustainability of environmental impact investment projects in Piura.

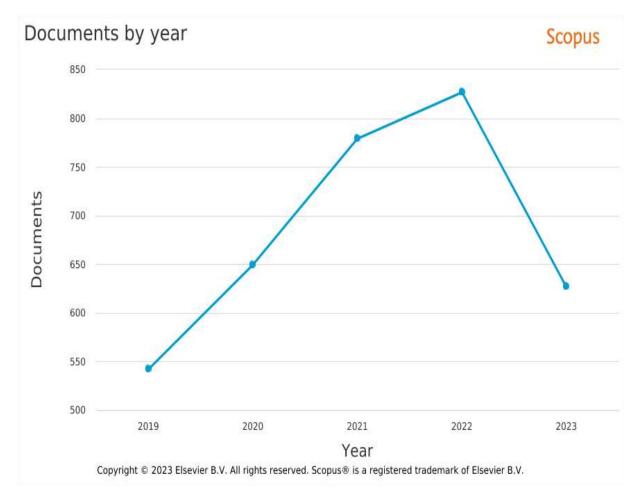
Social factors also have a significant impact on the sustainability of investment projects. Strong project management focused on impact is crucial to achieving the United Nations Sustainable Development Goals (Panta and Peña, 2020). Peruvian companies that prioritize impact on sustainability have shown significant development in their environmental reporting, indicating the growing interest in investing to achieve social and environmental impact. (Barrantes Mann et al., 2021). In addition, ESG management is essential to maintain the long-term value generation capacity of projects. (Harat and Jaguś, 2020). Therefore, social factors must be considered to ensure the sustainability of environmental impact investment projects in Piura.

Environmental factors are perhaps the most critical factors in ensuring the sustainability of investment projects. The Environmental Impact Assessment (EIA) is an environmental management instrument that helps decide investment projects to minimize their environmental impact (Barrio and Rapini, 2023). Scientific evidence indicates that human activities have caused environmental impacts such as global warming, which can have serious consequences for the sustainability of investment projects. (Markiewicz-Keszycka et al., 2023). In addition, the environmental impact on protected areas is a growing concern for investors, indicating the need to consider environmental factors in investment decision-making. (Liza et al., 2021). Therefore, great importance must be given to environmental factors to ensure the sustainability of environmental impact investment projects in Piura.

The sustainability of environmental impact investment projects in Piura is influenced by a combination of economic, social and environmental factors. The coexistence of words in these factors sheds light on the specific issues that need to be addressed to ensure sustainable development in the region. Concurrent word analysis in economic, social and environmental factors provides insight into the challenges and opportunities to be considered when planning and implementing investment projects. By taking a holistic approach and addressing all three factors, stakeholders can work to achieve sustainable development in Piura.

# 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, the number of publications registered in Scopus is notorious stable in the years 2021, 2022, reaching a total of 720 documents published in journals indexed in said platform.

An analysis of the distribution of scientific production by year of publication can shed light on research trends related to the factors that influence the sustainability of environmental impact investment projects in Piura. Despite the importance of sustainability-related issues such as environmental impact, scientific publications on these topics represent a small percentage of total scientific output. (Panta and Peña, 2020). However, examining trends in scientific output over time can help identify areas of interest and potential gaps in research.

Environmental factors play an important role in the production of vegetables, such as lettuce, in farming communities. The manipulation of these factors can impact the sustainability of investment projects and the environment in Piura (Harat and Jaguś, 2020). Therefore, it is essential to consider the factors that influence changes in scientific production related to environmental impact, such as the development of infrastructure to support production, the promotion of scientific and technological knowledge and free initiative. (Wang et al., 2023). Understanding these factors can help identify opportunities to promote sustainable investment projects and protect the environment in Piura.

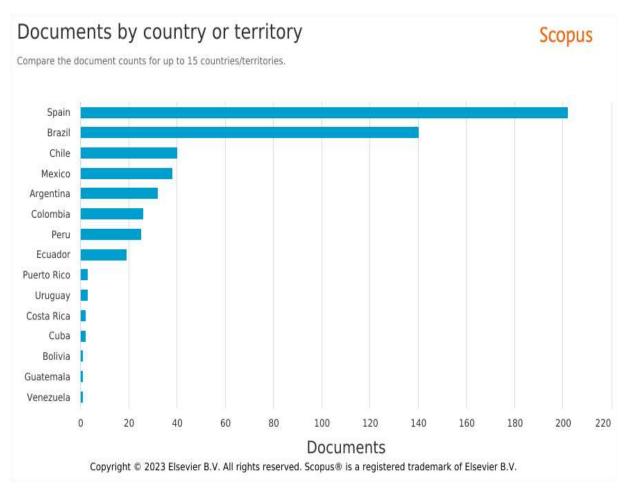
The implications of changing scientific production related to environmental impact in Piura are significant. It is essential to measure the impacts on human well-being and ecosystem services caused by changes in the state of the environment (Barrio and Rapini, 2023). Research on factors influencing the agribusiness food sector, such as agribusiness, marketing, production, growth and development, can inform sustainable investment projects that protect the environment and promote economic growth. (Markiewicz-Keszycka et al., 2023). Therefore, examining the distribution of scientific production by year of publication can provide valuable information on the status of research related to environmental impact and sustainability in Piura and inform future research and investment decisions. (Liza et al., 2021; Zhang et al., 2023b).

The analysis of the distribution of scientific production by year of publication on the factors that influence the sustainability of environmental impact investment projects in Piura provides valuable information on changing trends and implications for the region (Barrantes et al., 2021). The historical context and background of the research highlights the importance of

sustainable investment projects in Piura, and analysis of factors affecting sustainability helps identify key areas for improvement. Trends in scientific production over time and factors influencing changes in scientific output indicate a growing interest in the subject and a need for continuous research and development. Overall, this research can help inform policy decisions and guide future efforts to promote sustainable investment projects and protect the environment in Piura.

# 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

Spain, as the country of that community, with the highest number of publications indexed in Scopus during the period 2019-2023. The distribution of scientific production by country of origin is influenced by a variety of factors. One such factor is the level of economic development and investment in research within a country. Countries with higher levels of economic development tend to have more resources available for research and development, as well as a greater emphasis on innovation and scientific advancement. (Arhuire and Carreon, 2020). For example, in Peru, the deterioration of the environment and natural resources is a concern due to high levels of pollution and poor management of resources. (Saldarriaga, 2020). As a result, there may be less investment in research related to environmental impact and sustainability.

Government policies and research funding also play an important role in the distribution of scientific output. Governments that prioritize research and development and allocate funds for scientific projects tend to have higher levels of scientific output. (Zhang et al., 2023b). In the case of Piura, the Provincial Municipality is aware of the environmental and natural resource management issues, but it is important to consider the role of local governments in promoting research and development related to sustainability. (Rincon, 2022).

Access to resources and infrastructure for research is another important factor influencing the distribution of scientific output. Countries with better access to resources and infrastructure, such as research facilities, libraries and technology, are more likely to produce a greater volume of scientific research (Liza et al., 2021). Therefore, improving access to these resources and infrastructure could help promote research related to sustainability and environmental impact in Piura and other regions.

Environmental Impact Assessment (EIA) and mitigation measures are critical factors influencing the sustainability of environmental impact investment projects in Piura. The EIA process involves identifying and assessing potential negative impacts on the environment that may result from the project and proposing a set of mitigation measures to minimize those impacts. (Markiewicz-Keszycka et al., 2023). The EIA process is an essential tool to ensure

that investment projects are environmentally sustainable and socially responsible (Barrio and Rapini, 2023). However, the process of accepting EIA at national and international levels can be complex and challenging. (Wang et al., 2023). It is therefore essential to ensure that the EIA process is carried out in a thorough and transparent manner to ensure that the environmental impacts of the project are minimised and its sustainability is ensured.

Stakeholder engagement and community participation are also critical factors influencing the sustainability of environmental impact investment projects in Piura. Involving stakeholders and the community in the decision-making process can help ensure that project interests align with the needs and priorities of the local community. (Harat and Jaguś, 2020). In addition, it can help build trust and foster a sense of ownership and responsibility for the success of the project. (Zhang et al., 2023a). It is therefore crucial to involve stakeholders and the community in the planning, implementation and monitoring phases of the project to ensure its long-term sustainability and success. (Zhang et al., 2023a).

Long-term planning and monitoring of project impacts are essential factors influencing the sustainability of environmental impact investment projects in Piura. The environmental quality of the area may be affected by effluents and residues from the project's environmental activities and liabilities (Khaleal et al., 2023). Therefore, it is necessary to develop a long-term plan to monitor and mitigate the environmental impacts of the project to ensure its sustainability. Monitoring should be done periodically to identify potential negative impacts and take corrective action promptly. By doing so, you can ensure the sustainability of the project and maximize its positive impacts.

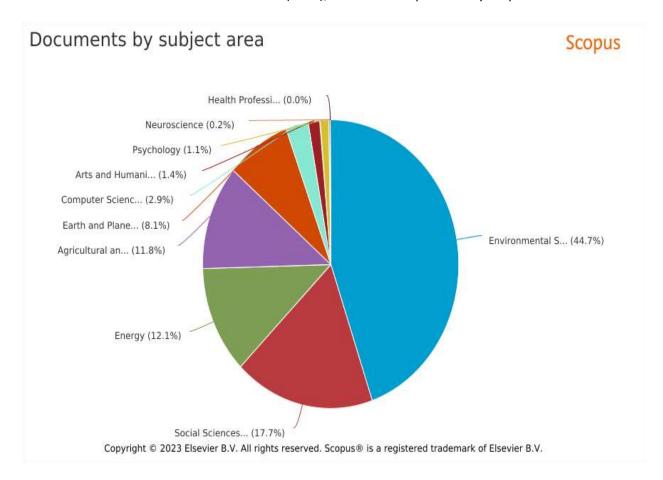
The distribution of scientific production by country of origin is influenced by various factors such as economic development, government policies and access to resources and infrastructure for research. Similarly, the sustainability of environmental impact investment projects in Piura is influenced by factors such as environmental impact assessment and mitigation measures, stakeholder engagement, and long-term planning and monitoring of project impacts. It is crucial that governments and organizations consider these factors to ensure that investment projects are

sustainable and have a positive impact on the environment and communities. In doing so, we can work towards a more sustainable future for all.

## 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.



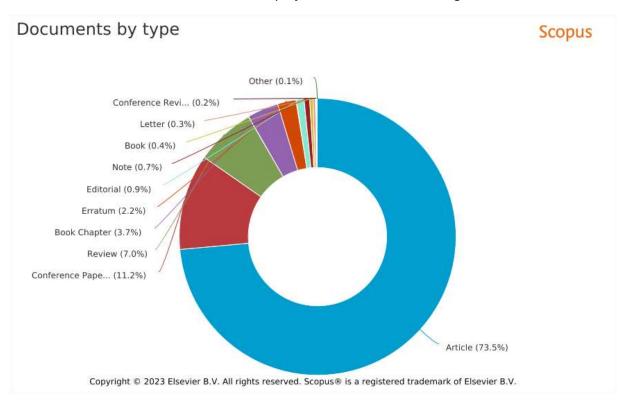
The sustainability of environmental impact investment projects in Piura is influenced by various areas of knowledge. Environmental sciences and ecology play a decisive role in understanding the environmental impact of investment projects. The Institute of Ecology and Environmental Sciences (IECA) of Piura aims to

generate scientific knowledge on environmental issues and natural resources (Morales-Jasso, 2019). Economic growth without environmental sustainability can lead to the depletion of natural resources, environmental degradation and a decline in people's quality of life. (Ryder, 2019). Thus, it is essential to consider the environmental impact of investment projects in Piura, and incorporating knowledge of environmental sciences and ecology can help ensure sustainable development. (Saavedra, 2019).

Economics and finance are also important areas of knowledge that influence the sustainability of environmental impact investment projects in Piura. Economic development and the promotion of technological and scientific knowledge are essential for the growth of investment projects. However, it is crucial to ensure that economic growth is sustainable and does not harm the environment or social equity. (Arhuire and Carreon, 2020). Sustainability is often given the least importance in project design and evaluation, but it is probably the most important aspect. (Saldarriaga, 2020). Therefore, incorporating knowledge of economics and finance can help ensure that investment projects are sustainable and benefit the environment and society.

Engineering and technology are also essential areas of knowledge that affect the sustainability of environmental impact investment projects in Piura. Environmental, economic and social impact assessments are decisive in project planning and management, and sustainable development has been considered a priority in Piura (Harat and Jaguś, 2020). In rural areas, other factors such as resource availability, access to technology and community participation can also influence the sustainability of investment projects. (Saldarriaga, 2020). Therefore, incorporating engineering and technology knowledge can help ensure that investment projects are sustainable and benefit the environment, society and rural communities.

The distribution of scientific production by area of knowledge on the factors that influence the sustainability of environmental impact investment projects in Piura highlights the importance of interdisciplinary collaboration. Environmental sciences and ecology provide the necessary knowledge of the natural environment, while economics and finance offer information on the financial viability of projects. Engineering and technology play a crucial role in the design and implementation of sustainable solutions. Therefore, a multidisciplinary approach is necessary to ensure the success of investment projects that aim to mitigate the



environmental impact in Piura.

# 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.

**Source:** 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 the Journal Article with 73.5% of the total production identified for analysis, followed by Conference Articles with 11.2%. Book Chapters are part of this classification, representing 3.7% of research papers published in journals indexed in Scopus.

We can say that research that seeks to have a positive environmental impact in Piura must consider a series of factors that influence its sustainability. Economic factors play an important role in the sustainability of these projects, as they affect the financial viability of the project. The Provincial Municipality of Piura recognizes the importance of sustainable economic development and has implemented policies to promote investment in environmentally friendly projects (Harat and Jaguś, 2020). For example, the availability of finance and financial incentives can encourage private sector investment in sustainable projects. It is therefore important to assess the economic viability of investment projects to ensure their long-term sustainability.

Social factors also play a decisive role in the sustainability of environmental impact investment projects in Piura. The success of these projects depends on the level of community involvement and support. Social factors include the level of education and awareness of the local population, as well as their willingness to participate in the project. In this sense, it is essential to engage with local communities and involve them in the planning and implementation of the project. This can help build trust and ensure the long-term sustainability of the project. (Panta and Peña, 2020).

Environmental factors are also significant in the sustainability of environmental impact investment projects in Piura. The impact of the project on the environment should be assessed and measures taken to mitigate any negative effects. For example, the environmental quality of Lake Chincha and Cocha and its surroundings is affected by effluents and residues from various activities, including agriculture and mining, which can have a detrimental impact on the local ecosystem. (Saldarriaga, 2020). Therefore, investment projects must take into account the environmental impact of their activities and implement measures to minimize their negative effects. (Manuel and Calero, 2022). By considering economic, social and environmental factors, investment projects can achieve long-term sustainability and contribute to the sustainable development of Piura.

The sustainability of environmental impact investment projects in Piura is influenced by various factors such as economic, social and environmental. Economic factors such as financing and profitability are crucial to the success of investment projects. Social factors such as community involvement and stakeholder involvement are also important for sustainable project outcomes. Finally, environmental factors such as the impact on natural resources and ecosystems must be considered to ensure the long-term sustainability of investment projects. Therefore, it is critical to take a holistic approach and consider all these factors when planning and implementing investment projects in Piura to achieve sustainable development.

#### 5. Conclusions

Through the bibliometric analysis carried out in this research work, it was established that Spain and Brazil were the country with the highest number of records published regarding the variables sustainability of investment projects and environmental impact 484 publications in the Scopus database.

It is clear that a comprehensive analysis of sustainability factors is decisive for the success of environmental impact investment projects in Piura. This analysis must take into account not only the environmental impact of the project, but also the economic, social and cultural factors that may affect its sustainability. In addition, it is important to involve all stakeholders in the project, including local communities, government agencies and private sector entities, to ensure that the project is aligned with their needs and priorities. In doing so, investment projects can be designed and implemented in ways that maximise their positive impact on both the environment and local communities. The sustainability of environmental impact investment projects in Piura is influenced by several factors, including the lack of political and institutional priority given to environmental management, the need for a comprehensive analysis of sustainability factors and the legal frameworks in place. It is crucial to prioritize sustainability in investment projects to ensure the long-term economic and social development of the region. Efforts should be made to address the challenges facing the region and promote sustainable investment practices

Collaboration between actors is essential to improve the sustainability of investment projects in Piura. This collaboration should involve continuous communication and consultation

throughout the project lifecycle, as well as the sharing of knowledge and resources. In particular, the Provincial Municipality of Piura (MPP) has an important role to play in facilitating collaboration among stakeholders and ensuring that investment projects are aligned with the municipality's sustainability goals. By working together, stakeholders can identify and address potential challenges to the sustainability of investment projects and develop innovative solutions that benefit both the environment and local communities.

Based on our analysis of sustainability factors and stakeholder collaboration in Piura, we recommend several actions to improve the sustainability of future investment projects in the region. These include: prioritizing the sustainable use of natural resources, including forests and water resources; promote the adoption of sustainable practices in crop and livestock production; and investing in renewable energy and other clean technologies. In addition, it is important to ensure that investment projects are designed and implemented in a way that takes into account the needs and priorities of local communities and is aligned with the **Following** municipality's sustainability goals. these recommendations, investment projects in Piura can be designed and implemented in ways that maximize their positive impact on the environment and local communities, and contribute to the sustainable development of the region.

In conclusion, the sustainability of environmental impact investment projects in Piura is influenced by various factors, including socioeconomic, environmental, political and legal factors. A comprehensive analysis of these factors is crucial to ensure the long-term sustainability of investment projects in the region. Collaboration among stakeholders is also essential to achieving the Sustainable Development Goals. To improve sustainability, it is recommended that future investment projects in Piura prioritize environmental protection, social responsibility and community engagement. By implementing these recommendations, Piura can achieve sustainable development while promoting economic growth and improving the quality of life of its inhabitants.

## References

Arhuire, C., & Carreon, E. (2020). A review of the technical and

- economic evaluation in the generation of biogas from household waste for family use. Professional School of Environmental Engineering.
- https://alicia.concytec.gob.pe/vufind/Record/UEPU\_e762e571a7 3f7f4bc7976d93799e413c
- Barrantes Mann, G. A. L., Flores-Olivos, A. J., Liza-Zatti, S. A., & Santa-Cruz Arévalo, J. E. (2021). Public policies for the agricultural sector in Peru. Journal of Business and Entrepreneurial Studie. https://doi.org/10.37956/jbes.v0i0.235
- Barrio, I., & Rapini, A. (2023). Plants under pressure: the impact of environmental change on plant ecology and evolution. BMC Ecology and Evolution, 23(1), 13. https://doi.org/10.1186/s12862-023-02115-z
- Harat, A., & Jaguś, A. (2020). Procedure for the Transboundary
  Environmental Impact Assessment of Contemplated Investment
  Projects in the Polish Legal System. Journal of Ecological
  Engineering, 21(8), 285–291.
  https://doi.org/10.12911/22998993/126881
- Khaleal, F. M., El-Bialy, M. Z., Saleh, G. M., Lasheen, E. S. R., Kamar, M. S., Omar, M. M., El-Dawy, M. N., & Abdelaal, A. (2023). Assessing environmental and radiological impacts and lithological mapping of beryl-bearing rocks in Egypt using high-resolution sentinel-2 remote sensing images. Scientific Reports, 13(1), 11497. https://doi.org/10.1038/s41598-023-38298-0
- Liza, S., Flores, A., Barrantes, G., & Cruz, J. (2021). Sustainable tourism models applicable to the district of Incahuasi. Journal of Business and Entrepreneurial Studies, 1–19.
  - http://journalbusinesses.com/index.php/revistaclimático
- Manuel, J., & Calero, G. (2022). Ecology Cover. In Ecologia (Issue October).
  - https://doi.org/https://www.researchgate.net/publication/36426 6200
- Markiewicz-Keszycka, M., Carter, A., O'Brien, D., Henchion, M., Mooney, S., & Hynds, P. (2023). Pro-environmental diversification of pasture-based dairy and beef production in Ireland, the United Kingdom and New Zealand: a scoping review of impacts and challenges. Renewable Agriculture and Food Systems, 38, e5. https://doi.org/10.1017/S1742170522000382
- Melbourne, L. A., Brodie, J., Rayfield, E. J., Titelboim, D., Lord, O. T., & Schmidt, D. N. (2023). Environmental impacts on the structural integrity of British rhodoliths. Scientific Reports, 13(1), 13473. https://doi.org/10.1038/s41598-023-40292-5
- Morales-Jasso, G. (2019). Environmental sciences. A characterization from systemic epistemology. Nova Scientia, 9(1)(18), 646–697. https://n9.cl/vhyxw

- Panta, J., & Peña, R. (2020). Energy Recovery by Coprocessing of Municipal Solid Waste: Systematic Review. Andean University of Cusco, 1–118.
  - http://repositorio.ucv.edu.pe/bitstream/handle/20.500.12692/47 102/Gutierrez\_RS-SD.pdf?sequence=1&isAllowed=y
- Rincon, I. (2022). I International Congress on Multidisciplinary Research.
- Ryder, G. (2019). Environmental sustainability with employment.

  https://www.ilo.org/global/research/globalreports/weso/greening-with-jobs/lang--es/index.htm
- Saavedra, G. (2019). Environmental sciences and ecology. Mundo siglo XXI, Revista del CIECAS-IPN, IX, 63–79. http://www.filosofia.org/aut/gbm/1995qc.htm
- Saldarriaga, M. (2020). The performance of Peruvian banana exports in the Piura region. Universidad Privada del Norte, 1–35. https://repositorio.upn.edu.pe/handle/11537/11291
- Samour, A., Adebayo, T. S., Agyekum, E. B., Khan, B., & Kamel, S. (2023). Insights from BRICS-T economies on the impact of human capital and renewable electricity consumption on environmental quality. Scientific Reports, 13(1), 1–11. https://doi.org/10.1038/s41598-023-32134-1
- Steinhoff-Wagner, J., Mateus-Vargas, R. H., Haupt, R., & Heinemann, C. (2023). Critical review of the default values used in the environmental impact assessment of biocidal products applied in livestock production systems. Environmental Sciences Europe, 35(1). https://doi.org/10.1186/s12302-023-00766-9
- Wang, X., Liu, S., Cao, P., Song, J., Wang, C., Xu, S., & Zhu, S. (2023).
  SACTI model in prediction and assessment of large scale natural draft cooling tower environmental impact of nuclear power plant.
  Scientific Reports, 13(1), 11171. https://doi.org/10.1038/s41598-023-38283-7
- Zhang, H., Xue, B., Li, S., Yu, Y., Li, X., Chang, Z., Wu, H., Hu, Y., Huang, K., Liu, L., Chen, L., & Su, Y. (2023a). Life cycle environmental impact assessment for battery-powered electric vehicles at the global and regional levels. Scientific Reports, 13(1), 1–12. https://doi.org/10.1038/s41598-023-35150-3
- Zhang, H., Xue, B., Li, S., Yu, Y., Li, X., Chang, Z., Wu, H., Hu, Y., Huang, K., Liu, L., Chen, L., & Su, Y. (2023b). Life cycle environmental impact assessment for battery-powered electric vehicles at the global and regional levels. Scientific Reports, 13(1), 7952. https://doi.org/10.1038/s41598-023-35150-3