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UNTRM on the Global Scene: A Bibliometric Analysis of its Scientific Production Indexed in Scopus

Carlos Alberto Hinojosa Salazar[1], Víctor Manuel Valdiviezo Sir[2], Franz Tito Coronel Zubiate[3], Edwin Gonzales Paco[4], Sara Emilia Remuzgo Huamán[5], Sheyla Carmela Coronel Zubiate[6]

Abstract

The purpose of this study is to conduct a comprehensive bibliometric analysis of the publications of authors affiliated with the Universidad Nacional Toribio Rodríguez de Mendoza (UNTRM) indexed in Scopus, in order to understand the scientific approach and research trends of this Amazonian institution. The methodology employed follows a qualitative, descriptive, non-experimental and longitudinal bibliometric approach, using the Scopus database for its broad academic coverage. A total of 455 documents related to the UNTRM were analyzed, including articles, contributions to conferences, reviews and other publications, without temporal restrictions. Data were downloaded in CSV format and processed using spreadsheets, open source software such as VOSviewer and bibliometrix R with Biblioshiny. The results reveal a significant growth in the number of UNTRM publications, with presence in high impact international journals and regional specialized sources. Prolific authors, prominent areas of knowledge such as Agricultural, Biological, Social, Environmental and Medical Sciences were identified, as well as a strong network of inter-institutional collaborations. The trend analysis showed a thematic diversity aligned with the institutional mission, encompassing biodiversity, environmental management, medicine, genetics and education, among others. In conclusion, this bibliometric study reveals a promising outlook for research at UNTRM, with remarkable growth, international presence, strong collaborations and thematic diversity relevant to the Amazon region.

Keywords: *Bibliometric analysis; Universidad Nacional Toribio Rodríguez de Mendoza; Scopus; Scientific production; Research trends.*

Introduction

Bibliometric analysis has established itself as a valuable tool for understanding the evolution and impact of scientific knowledge in various subject areas. As scholarly output grows exponentially, these studies provide a comprehensive view of the trends, key players, and collaborative networks that shape the intellectual landscape of a given field (Ochoa-Tataje et al., 2024; Qadri et al., 2024; Sweileh, 2024; Wang et al., 2024; Yalcinkaya & Cinar Yucel, 2024). By analyzing bibliometric indicators, such as citations, co- authorships, and co-occurrences of terms, it is possible to identify emerging themes, predominant methodological approaches, and research areas that require further attention (Li et al., 2024; Rahman et al., 2024; Sarker & Bartok, 2024).

Bibliometric analyses are essential tools for understanding the structure and trends of knowledge generated in a specific field. By quantifying and analyzing scientific publications, these analyses make it possible to visualize the impact, collaborative networks and emerging patterns in research (Guerrero Velástegui et al.,

[1] D. in Administration. Master in Economic Sciences, mention in Finance. Affiliation: Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Faculty of Economics and Administrative Sciences. Professional School of Accounting. E-mail: carlos.hinojosa@untrm.edu.pe ORCID: https://orcid.org/0000-0001-5603-0979.
[2] Master's Degree in Administration with a major in Human Resources. Affiliation: Universidad Nacional Toribio Rodríguez de Mendoza de Mendoza.Amazonas. School of Economics and Administrative Sciences. Professional School of Accounting. E-mail: victor.valdiviezo@untrm.edu.pe ORCID: https://orcid.org/0000-0003-4348-3076
[3] Doctor in Stomatology. Master in Public Management. Affiliation: Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. E-mail: franz.coronel@untrm.edu.pe ORCID: https://orcid.org/0000-0003-4747-947X.
[4] Doctor in Nursing. Master in Nursing Sciences with mention in women's, children's and adolescent's health. Affiliation: Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. E-mail: edwin.gonzales@untrm.edu.pe ORCID: https://orcid.org/0000-002-7250-6399.

[5] D. in Education (mention in Education). Master in Political Science - mention in Public Management. B.A. in Education - mention in Social Sciences and Philosophy. Affiliation: Universidad Nacional Mayor de San Marcos. Email: sremuzgoh@unmsm.edu.pe ORCID: https://orcid.org/0000-0002-1196-2972

[6] Agro-industrial Engineer. Affiliation: Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. E-mail: sheyla.coronel@untrm.edu.pe ORCID: https://orcid.org/0000-0002-5304-6606

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2024) (Roy et al., 2024). In this context, Scopus stands out as one of the main bibliographic databases worldwide, providing access to a large collection of peer-reviewed scientific literature (Harder, 2024).

In the field of business management and economics, bibliometric analyses have been instrumental in understanding trends in areas such as digital transformation, innovation, and supply chain management (Daril et al., 2024; Stolbov & Shchepeleva, 2024). These studies have identified dominant theoretical and methodological approaches as well as future research opportunities (Manikrishna et al., 2024).

The main types of bibliometric analyses include citation analysis, which measures the impact of a publication or author; co-authorship analysis, which studies collaborations between researchers; and copal analysis, which identifies emerging themes and trends in a research field (Rojas-Briceño et al., 2022; Síbia et al., 2024).

Bibliometric analyses are fundamental for understanding the dynamics of research in academic institutions, identifying strengths and weaknesses, and guiding decision-making and policies related to the promotion of research (Crisostomo-Panuera et al., 2024). However, they also present limitations and challenges, such as biases in the databases, limitations in thematic and regional coverage, and the difficulty of adequately capturing the quality and real impact of research (Park et al., 2023).

In the context of the present research, bibliometric analysis becomes particularly relevant when addressing the scientific production related to the Universidad Nacional Toribio Rodríguez de Mendoza (UNTRM) indexed in the Scopus database. This institution, located in the Amazon region of Peru, has played a fundamental role in the generation of knowledge in key areas such as agriculture, biodiversity and health. By analyzing its scientific production, it is possible to understand the strengths and weaknesses of the UNTRM, as well as its contribution to the advancement of knowledge in its regional and national environment.

This bibliometric study focuses on analyzing the scientific production related to the Universidad Nacional Toribio Rodríguez de Mendoza (UNTRM) indexed in Scopus, examining its scope and orientation. Its main objective is to carry out an exhaustive analysis of the existing academic production in this subject.

This rigorous approach will provide a detailed and updated view of the state of knowledge, serving as a solid platform for future research and contributing to the informed design of related public policies. The study determines the scientific approach at UNTRM through a historical analysis of publications in Scopus, including trends, predominant approaches, contributors and intellectual collaboration networks. The methodology is a qualitative, descriptive and longitudinal bibliometric research, obtaining data from Scopus. This provides an understanding of the state of the art, qualifies the scientific process and provides relevant information for new lines of research, allowing managers, researchers and authorities to make informed decisions.

Finally, the article is structured in the following key sections: introduction, theoretical review, methodology, results and conclusions. The introduction establishes the context and relevance of the study. The theoretical development reviews the existing literature on bibliometrics and research at UNTRM. The methodology details the steps followed to collect and analyze the data. The results present the main findings, and the conclusions offer a synthesis of the findings.

Theoretical Review

Bibliometric analysis in the digital era

Bibliometric analyses have gained relevance in the field of education, especially in t h e context of inclusion and the use of information and communication technologies (ICT) (Ancaya-...

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Martinez et al., 2024). These studies provide insight into how ICTs can facilitate equitable access and participation in educational settings, as well as identify the main trends and approaches in this area (Ratnayake et al., 2024; Wetinhoun et al., 2024).

Bibliometrics is a field of study that quantitatively analyzes scientific production through indicators such as citations, impact, collaboration, among others. It is based on laws and principles such as Lotka's Law, which describes the frequency of productivity of scientific authors; Bradford's Law, which focuses on the dispersion of publications in journals; and Social Network Analysis, which examines the relationships and collaborations between researchers or institutions (Cárdenas et al., 2023).

In the field of health care, bibliometric analyses have been instrumental in tracking the development of innovative technologies and their impact on clinical practice (Dexter et al., 2024). For example, these studies have made it possible to assess the adoption and trends in the use of artificial intelligence and machine learning in the diagnosis and treatment of diseases (Abushamma & Zyoud, 2024; Laita et al., 2024).

Bibliometrics and Sustainability

Bibliometric analyses have been widely used in the field of sustainability and natural resource management through the analysis of scientific publications, it is possible to identify the main topics addressed, as well as the collaboration networks among researchers and the most influential institutions (de Enrique Arnau & Pinillos-Costa, 2024; Ebrahiem et al., 2024).

In the field of water management, bibliometric analyses reveal innovative approaches that seek to improve the efficiency and sustainability of water resources. Sustainable agriculture, another key area, benefits from these studies by highlighting agricultural practices that promote soil conservation and biodiversity. Furthermore, in the context of urban development, the analyses allow the identification of urban strategies that promote resilience and sustainability of cities (Abdulwahid Mohammad Noor et al., 2024; Kusnoto et al., 2024).

These studies not only show current trends, but also illuminate emerging areas of research. For example, topics such as the circular economy, climate change adaptation and green technologies are gaining prominence in the scientific literature. Likewise, bibliometrics facilitates the identification of international collaborations, highlighting how global cooperation can drive progress in sustainability.

Institutional Applications of Bibliometric Analysis

Bibliometric analyses are particularly valuable for academic institutions, as they make it possible to evaluate the dynamics of research, identify strengths and weaknesses, and guide decision-making and policies related to the promotion of research (Denegri-Velarde et al., 2024). By analyzing the scientific production of an institution, it is possible to identify prominent research areas, national and international collaborations, and the influence of researchers and publications (Eyzaguirre & Fernandes, 2024; Salouw et al., 2024).

However, it is crucial to recognize the limitations and challenges associated with bibliometric studies. Databases may have biases in terms of subject, regional, or language coverage (Năstasă et al., 2024; Rebello et al., 2024). In addition, bibliometric indicators, such as citations, can be influenced by external factors, such as journal prestige or the effect of self-citations (Prahani et al., 2024; Salgado-García et al., 2024). These factors can distort the true quality and impact of research.

Despite these limitations, bibliometric analyses remain essential tools for understanding research dynamics and guiding institutional strategies. They provide detailed insight into current and emerging trends as well as collaborative networks, which can help strengthen research capabilities and foster new opportunities for collaboration (Andrade-Arenas & Yactayo-Arias, 2024; Dzhunushalieva & Teuber, 2024).

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Methodology

In order to comprehensively understand the scientific focus of publications by authors affiliated with the Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas (UNTRM), a bibliometric methodology was used. Tamala et al., (2022) define it as the use of mathematical and statistical methods to analyze bibliographic data, exploring connections between journal citations to understand a topic. This method quantitatively evaluates attributes such as publications and citations, with indexes such as Scopus and Web of Science.

The research follows a descriptive qualitative approach, with a non-experimental and longitudinal design, allowing natural observation of phenomena for temporal analysis (Arispe et al., 2020).

The search does not impose temporal restrictions, exploring the evolution over time. Scopus was chosen for its academic breadth. The execution of the search strategy yielded 455 documents up to May 13, 2024, covering various categories such as articles, contributions to conferences, reviews and other documentary manifestations, which is as follows: (AFFIL ("universidad nacional toribio rodriguez de mendoza de amazonas" OR "universidad nacional toribio rodriguez de mendoza de amazonas" OR "universidad nacional toribio rodriguez de mendoza" OR "universidad nacional toribio rodriguez de mendoza" OR "untrm" OR "untrm-a") OR AFFILORG ("universidad nacional toribio rodriguez de mendoza de amazonas" OR "universidad nacional toribio rodriguez de mendoza de amazonas" OR "universidad nacional toribio rodriguez de mendoza" OR "universidad nacional toribio rodriguez de mendoza" OR "untrm" OR "untrm-a")). In addition, the analysis of the results of the total of 147,344 documents provided by the database was considered for the general analysis of Scopus.

Data obtained from the Scopus repository were downloaded in CSV format to facilitate manipulation in spreadsheets, allowing customization of tables and graphs to address the research questions. Both raw and processed data are available through a link provided, ensuring transparency and accessibility, thus promoting reproducibility and independent analysis of the results, which are available through the link https://zenodo.org/records/11479537.

Bibliometric analysis, with the open source software VOSviewer developed by the Centre for Science and Technology Studies at Leiden University, facilitates the creation of scientific maps and the exploration of citation patterns. It is crucial for understanding scientific activity and its global evolution (Ruananukun & Komonhirun, 2022).

In addition, the use of bibliometrix R, with its Biblioshiny interface, allows detailed bibliometric analysis and data visualization, addressing publication and collaboration trends (Martinez & Collazo, 2023).

Results

The most relevant data on Scopus bibliometric research are presented below:

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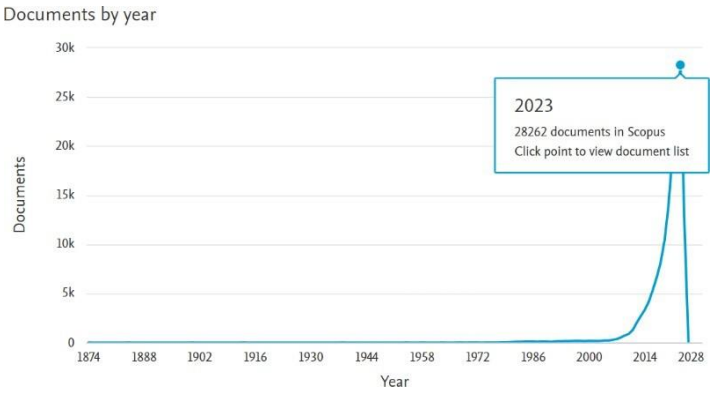

Figure 1: Annual evolution of publications in Scopus

Note: Main bibliometric indicators obtained based on Scopus metadata.

There has been a clear increase in the number of publications in recent years, with a peak in 2023 and a significant projection for 2024. This increasing trend is consistent with the overall increase in research activity and scientific output over time. It is important to note that the most recent data may be incomplete due to delays in the indexing and peer review process. In addition, the projection for 2024 may be a preliminary estimate and subject to change. This information is valuable for understanding temporal trends in knowledge generation and the evolution of research areas.

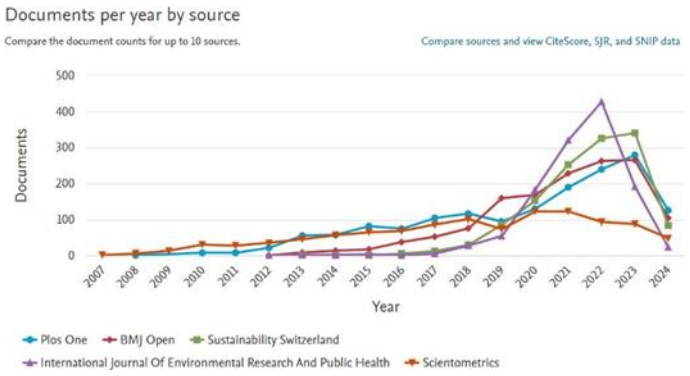

Figure 2: Main journals in which publications are made in Scopus

Note: Main bibliometric indicators obtained based on Scopus metadata.

High impact and prestigious journals stand out, such as PLoS One (Quartile 2), BMJ Open (Quartile 2), Sustainability Switzerland, International Journal of Environmental Research and Public Health (Quartile 1), and Scientometrics (Quartile 1), among others. In addition, there is the presence of specialized sources in specific areas, such as the Journal of Clinical Medicine (Quartile 1), Nutrients (Quartile 1), and Systematic Reviews (Quartile 2) in the field of medicine and nutrition. This diversity of sources reflects the thematic breadth and global reach of the Scopus database, as well as the importance of open access publications in the dissemination of scientific knowledge.

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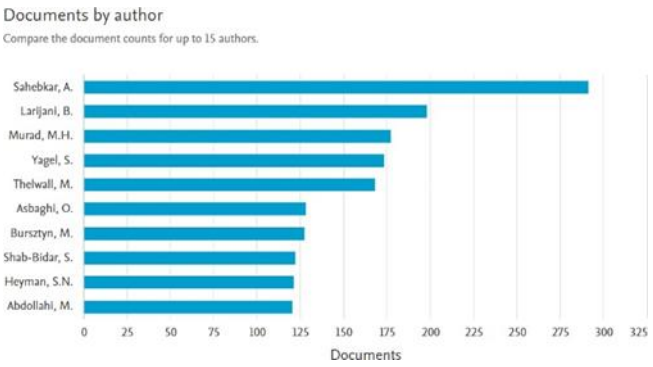
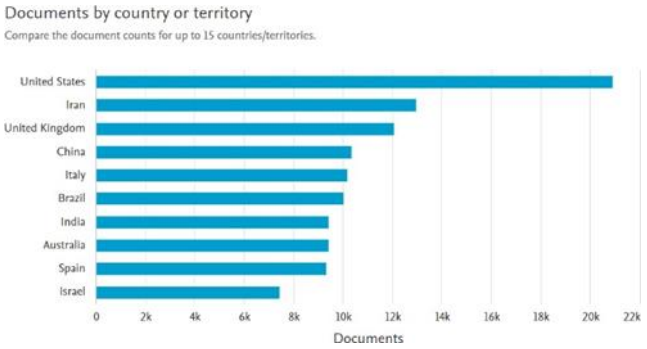


Figure 3: Main researchers publishing in Scopus

Note: Main bibliometric indicators obtained based on Scopus metadata.

The most prolific authors present in the Scopus search results include names such as Sahebkar, A., Larijani, B., Murad, M.H., Yagel, S., and Thelwall, M., among others. The presence of these highly productive authors suggests consolidated lines of research and specific thematic areas with significant scientific production. It is important to bear in mind that the productivity of an author does not necessarily imply higher quality or impact, but simply a greater number of publications indexed in Scopus.



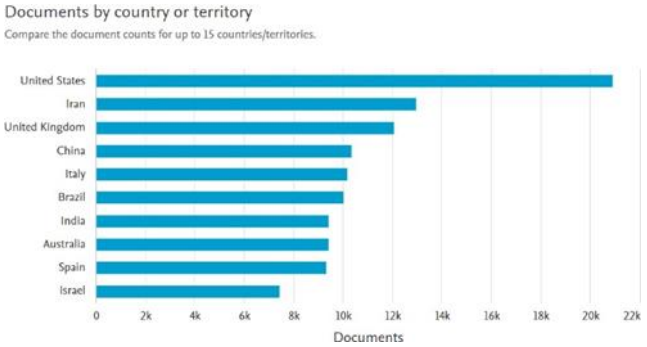


Figure 5: Main countries that conduct research in Scopus

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Note: Main bibliometric indicators obtained based on Scopus metadata.

The United States, Iran, United Kingdom, China and Italy top the list, reflecting the leadership of these nations in scientific production at the global level. In addition, there is a broad representation of countries from all regions of the world, demonstrating the international reach of the Scopus database and the diversity of scientific contributions from different geographical and cultural contexts.

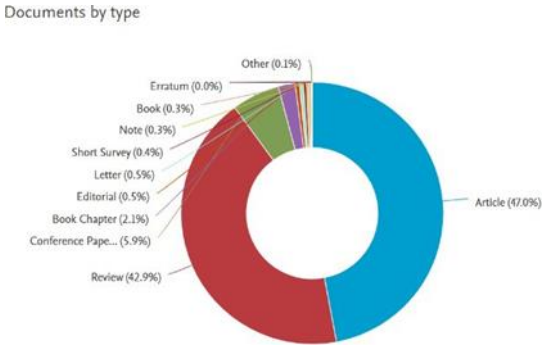

Figure 6: Main types of documents published in Scopus

Note: Main bibliometric indicators obtained based on Scopus metadata.

There is a clear predominance of scientific articles, which represent 47% of the total, followed by reviews (42.9%) and conference papers (5.9%). This distribution is typical in bibliographic databases, since articles and reviews are the predominant forms of dissemination of scientific knowledge. It is important to highlight the presence of other types of documents, such as book chapters, editorials, letters and notes, which enrich the diversity of information sources and formats available in Scopus.

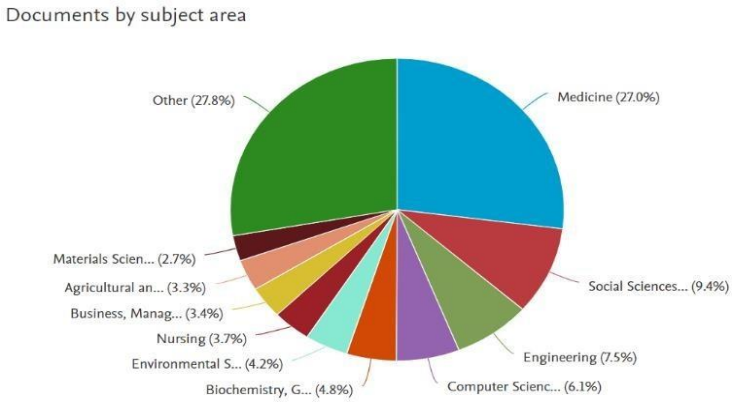

Figure 7: Main areas of knowledge in which the company publishes in Scopus

Note: Main bibliometric indicators obtained based on Scopus metadata.

Clearly the area of Medicine stands out as the most represented, followed by Social Sciences, Engineering and Computer Science. This distribution suggests a strong presence of research related to health, biomedical sciences and associated social and technological aspects. Other areas such as Biochemistry, Genetics and Molecular Biology, Environmental Sciences, Nursing and Business Management also have significant representation, reflecting the multidisciplinary nature of current research. It is important to consider that

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many publications may be classified in multiple thematic areas, given the increasing convergence of disciplines in the generation of knowledge.

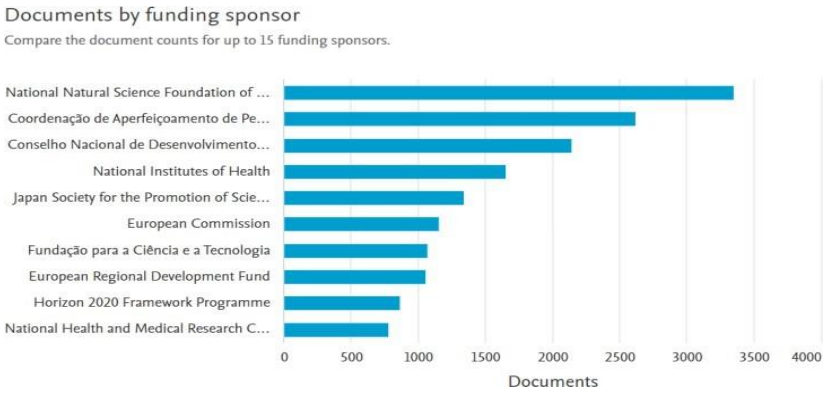

Figure 8: Main sponsors of the publications in Scopus

Note: Main bibliometric indicators obtained based on Scopus metadata.

The National Natural Science Foundation of China, the Coordination for the Improvement of Higher Level Personnel of Brazil and the National Council for Scientific and Technological Development of Brazil are the main funders. In addition, the presence of important governmental agencies and international organizations, such as the National Institutes of Health of the United States, the Japan Society for the Promotion of Science, the European Commission, the Medical Research Council of Australia and the National Science Foundation of the United States, among others, can be observed. This diversity of funding sources reflects the global nature of scientific research and the importance of public and private funds to support the advancement of knowledge.

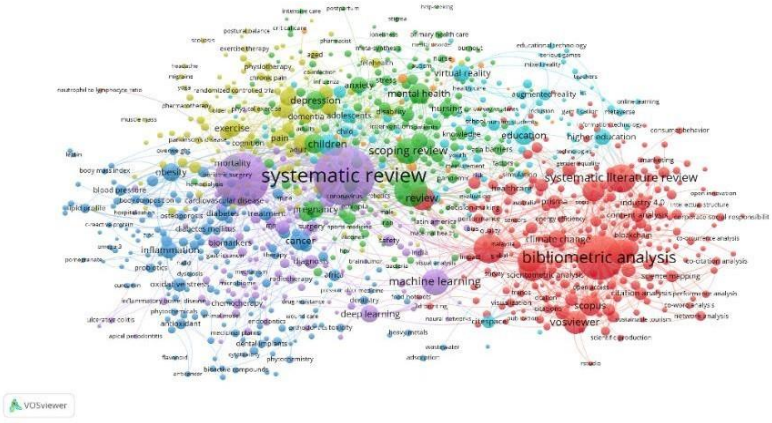

Figure 9: Semantic map of the publications in Scopus

Note: Visual map prepared with VOSViewer, based on the keyword metadata of the collection extracted from Scopus.

Analysis of Scopus bibliometric data demands a comprehensive understanding of research and publication trends. The dataset covers a wide range of topics, each represented by specific attributes such as average publication year, citations and normalized citations. Key trends observed include a diversity of research areas, including 3D printing, academic performance, artificial intelligence, aging, and diseases such as

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Alzheimer's and autism. Emerging fields such as artificial intelligence, augmented reality and big data are evident, with notable research interest reflected in high citation counts and publication averages. In health and medicine, topics such as ADHD, AIDS, asthma and cancer show continued scientific attention and significant publication activity. The importance of areas such as bibliometric analysis, bibliometrics and bibliometric mapping is highlighted by their high citation counts, indicating their relevance in the academic community. A trend towards interdisciplinary research is evident, as well as a global perspective in research, with emphasis on regions such as Africa, Asia and Australia. In addition, the usefulness of the dataset for bibliometric analysis is highlighted, as well as the application of network analysis and temporal analysis techniques to understand the evolution of research interests and impacts.

The most relevant data on the bibliometric research of publications related to the Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas (UNTRM) are presented below:

Figure 10: Summary of the main information in the collection of publications related to UTNRM

Note: Collection summary prepared with Bibliometrix software, based on metadata extracted from Scopus.

The data analyzed covers a period from 2014 to 2024, suggesting the inclusion of future projections. A total of 216 different sources have been considered, generating a set of 455 documents. The average annual growth of these documents is 36.53%, indicating a remarkable increase in scientific production. With an average age of 2.45 years, a focus on publications is evident recent. Each document has received an average of 4,545 citations, reflecting a moderate impact in terms of citation. A total of 2,242 Keywords Plus and 1,670 Author Keywords have been identified, highlighting the diversity of terms used. With 1,776 authors identified, the average number of co-authors per paper is 6.74, highlighting a high level of collaboration, with 41.76% of these collaborations being international in nature. Most of the documents are articles (421), followed by book chapters, conference papers, reviews, notes and other types of documents to a lesser extent, revealing a wide range of publication formats.

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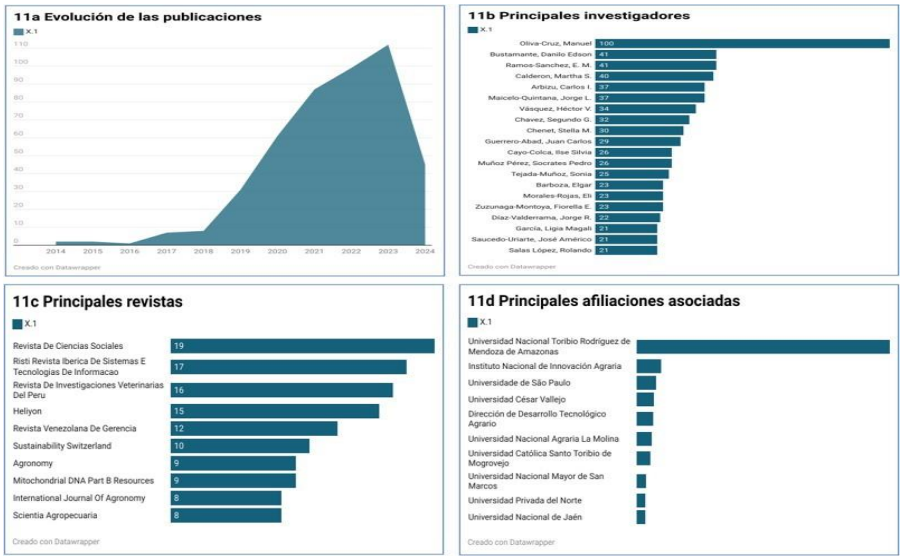

Figure 11: Evolution, authors, journals and affiliations of publications related to UTNRM

Note: Main bibliometric indicators related to the evolution of publications, authors, journals and affiliations, based on Scopus metadata, processed in the app https://app.datawrapper.de/.

Data analysis shows significant growth in UNTRM publications in Scopus, peaking in 2023 and projecting 45 by 2024, driven by available resources, international collaborations and research promotion. The prolific contribution of researchers such as Oliva, M. (100 records), Bustamante, D. (41), Ramos, E.

(41) Calderón, M. (40), Arbizu, C. (37), Maicelo, J. (37), Vásquez, H. (34), Chavez, S. (32), Chenet (30) and Guerrero, J. (29), stand out in the top 10 of a total of 414 authors affiliated to UNTRM. (29), stand out in the top 10 of affiliated authors out of a total of 414 authors affiliated to the UNTRM, highlighting the research capacity of the aforementioned university and its national and international collaborations. Relevant journals for UNTRM include Revista de Ciencias Sociales (Quartile 2), Revista Ibérica de Sistemas e Tecnologias de Informação (Quartile 4) and Revista de Investigaciones Veterinarias del Perú (Quartile 3), along with high impact journals such as Heliyon, Sustainability Switzerland (Quartile 1) and Agronomy (Quartile 1), indicating an outstanding contribution to the international scientific literature. Finally, the main institutional affiliations associated with these publications are analyzed, where UNTRM tops the list, followed by the National Institute for Agrarian Innovation (42) and the University of São Paulo (33), along with other Peruvian and foreign institutions. This diversity of affiliations suggests a strong network of inter-institutional research collaboration at both national and international levels.

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Figure 12: Types of documents, areas of knowledge, funders and countries of publications related to UTNRM

Note: Main bibliometric indicators related to the evolution of publications, authors, journals and affiliations, based on Scopus metadata, processed in the app https://app.datawrapper.de/.

This analysis reveals the distribution of document types in UNTRM publications indexed in Scopus, where scientific articles predominate with 421 records, followed by reviews (14), notes (7), book chapters (5) and conference papers (5), enriching the variety of information sources available.

It also highlights the main areas of research at UNTRM, led by Agricultural and Biological Sciences, followed by Social, Environmental and Medical Sciences, reflecting the importance of research in agriculture, biodiversity and health in the Amazon region, with a broad spectrum of additional interests such as Biochemistry, Genetics, Informatics, Immunology and Microbiology.

In terms of financing, entities such as the Conselho Nacional de Desenvolvimento Científico e Tecnológico and the Fondo Nacional de Desenvolvimento Científico, Tecnológico e de Inovação Tecnológica are identified as the main funders, evidencing the active participation of the UNTRM in the financing of its research, with additional contributions from international entities such as the World Bank Group and the European Union.

Finally, the geographical distribution of publications is analyzed, with Peru standing out, followed by Brazil, the United States, Chile and Mexico. The presence of other countries in Latin America, Europe, Asia and Africa suggests international collaborations, although scientific production is mainly concentrated at the national and regional level.

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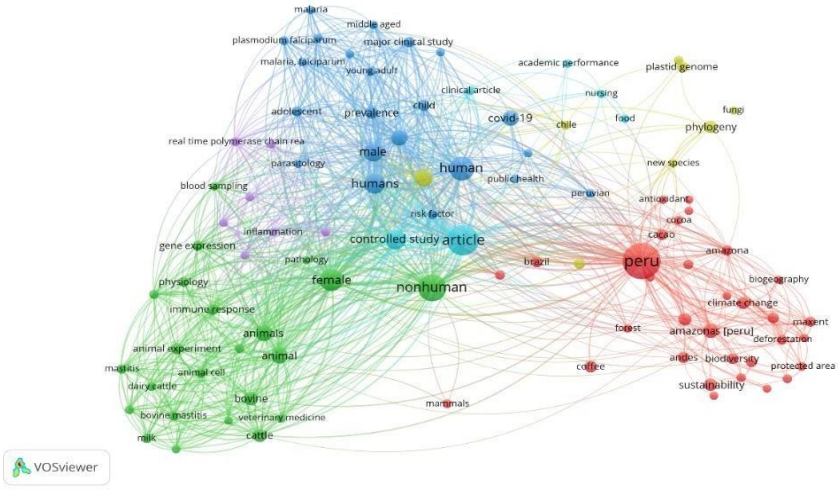

Figure 13: Semantic map of publications related to UTNRM

Note: Visual map elaborated with VOSViewer, based on the keyword metadata of the collection extracted from Scopus on publications related to UTNRM.

Based on the bibliometric analysis provided by VOSviewer, the publications of authors from the Universidad Nacional Toribio Rodríguez de Mendoza (UNTRM) reveal a thematic diversity remarkably structured in six main clusters. These range from biodiversity and environmental management to medicine and human health, including genetics, microbiology, education and social sciences. Recurring themes include terms such as Peru, the Amazon, various aspects related to animals and humans, as well as biological processes such as gene expression and inflammation, and specific diseases such as malaria. There is a glimpse of international collaboration, evidenced by terms linked to Brazil, hinting at participation in joint projects. The research techniques employed range from conventional methods such as ELISA and real-time PCR to advanced technologies such as flow cytometry and remote sensing. Regarding publication metrics, an average year of recent publication stands out, indicating up-to-date research activity, and a moderate average number of normalized citations, around 1.0, although some specific topics show higher figures, such as biogeography, morphology and genetics.

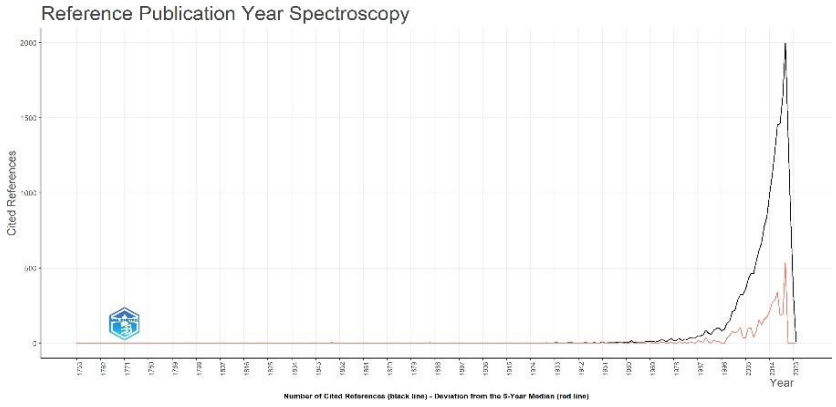

Figure 14: Spectroscopy of references publications related to UTNRM

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Note: Figure elaborated with Bibliometrix, based on metadata extracted from Scopus, on publications related to UTNRM.

The annual evolution of the number of citations received by the publications is shown, together with the differences with respect to the 5-year and annual medians. A gradual growth in the number of citations is observed starting in the 1960s, with a significant increase starting in the 1990s. The years with the highest number of citations were 2020 and 2017. The differences with the medians show periods of higher and lower relative citation. This analysis makes it possible to visualize the temporal evolution of the impact of publications and to detect possible patterns or trends.

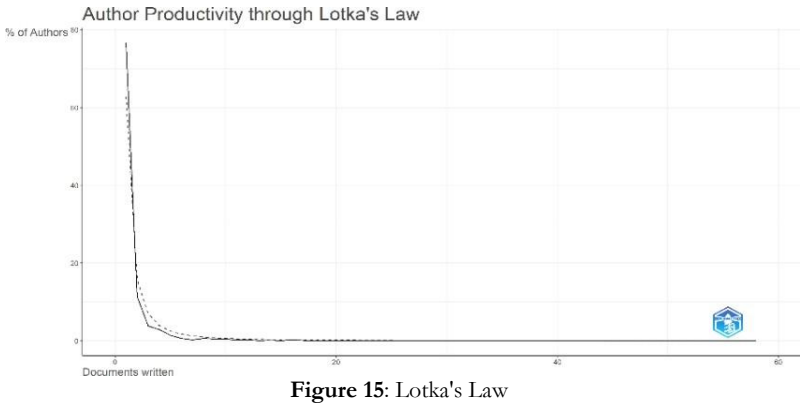

Figure 15: Lotka's Law

Note: Based on metadata extracted from Scopus and processed in Bibliometrix.

The distribution of the authors according to the number of papers they have published is shown. Most authors (76.6%) have published only one paper, while a small percentage (about 5%) have published 5 or more papers. This distribution follows Lotka's Law, where a significant proportion of authors contribute a small fraction of the scientific output. This analysis allows us to understand the distribution of author productivity and to identify the most prolific authors.

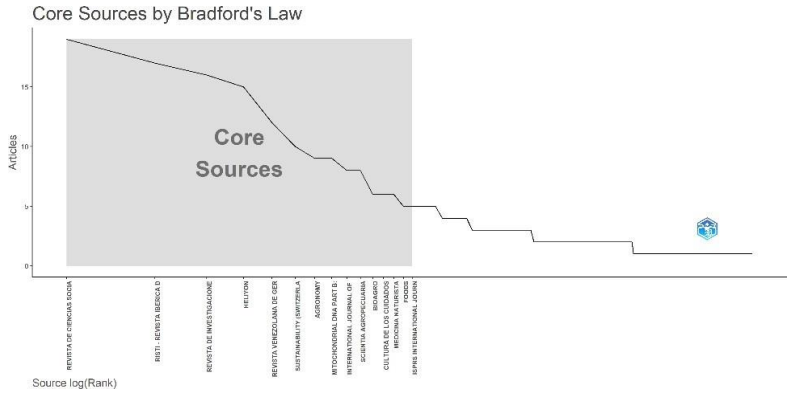

Figure 16: Bradford's Law

Note: Based on metadata extracted from Scopus and processed in Bibliometrix.

The ranking of publication sources (journals) according to their frequency of published articles is shown. Zone 1" contains the 10 most productive journals, headed by "Revista de Ciencias Sociales", "RISTI - Revista Ibérica de Sistemas e Tecnologias de Informacao" and "Revista de Investigaciones Veterinarias del Perú". This distribution follows Bradford's Law, where a core group of journals concentrates most of the publications. This analysis makes it possible to identify the main sources of publication and their relative importance within the scientific production analyzed.

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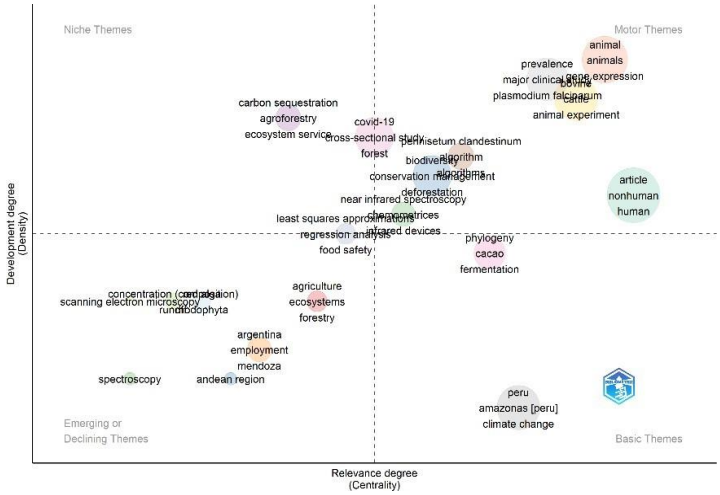

Figure 17: Structural Map (Analysis of research trends related to UTNRM)

Note: Figure elaborated with Bibliometrix, based on metadata extracted from Scopus, on publications related to UTNRM.

Information on the thematic clusters identified is shown, including their centrality, density, ranking and frequency. The clusters with the highest centrality and density are "article", "animal", "bovine" and "prevalence", suggesting that they are central and well connected topics. The cluster "Peru" also stands out for its high centrality. Other relevant clusters are "biodiversity", "phylogeny" and "near infrared spectroscopy". This analysis allows us to understand the thematic structure of the publications, to identify the most important topics and to explore the relationships between them.

Discussion

The bibliometric analysis of UNTRM publications indexed in Scopus reveals outstanding trends and key findings that provide a comprehensive understanding of the research landscape at this Amazonian institution. The results show significant growth in the number of publications, peaking in 2023 and projecting an increase by 2024. This positive trend reflects the promotion of research and the resources available at UNTRM, which coincides with Guerrero Velástegui et al. (2024) on the importance of quantifying scientific production to visualize its impact.

A noteworthy aspect is the presence of publications in high impact journals such as Sustainability Switzerland, Agronomy and Heliyon, which demonstrates the contribution of UNTRM to the international scientific literature, in line with the findings of Stolbov and Shchepeleva (2024) in the field of business management. In addition, specialized sources relevant to the Amazon region were identified, such as the Revista de Ciencias Sociales and the Revista de Investigaciones Veterinarias del Perú, suggesting a focus on local and regional issues.

The analysis of the most prolific authors revealed names such as Oliva, M., Bustamante, D., Ramos, E., Calderón, M., Arbizu, C., Maicelo, J., Vásquez, H., Chavez, S., Chenet and Guerrero, J., who lead the scientific production of the UNTRM. This suggests consolidated lines of research and specific thematic areas with significant production, as proposed by Laita et al. (2024) and Abushamma and Zyoud (2024) in the field of medicine and health, as well as agriculture and biological sciences.

The institutional affiliations associated with these publications show a strong inter-institutional collaboration network, with the participation of national entities such as the National Institute for Agrarian Innovation and foreign universities such as the University of São Paulo. This is consistent with the findings

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of Dzhunushalieva and Teuber (2024) and Andrade-Arenas and Yactayo-Arias (2024), who highlight the importance of collaborations to strengthen research capacities.

The analysis of the areas of knowledge highlights the prominence of Agricultural and Biological Sciences, Social, Environmental and Medical Sciences, reflecting the importance of research in agriculture, biodiversity and health in the Amazon region, as pointed out by Enrique Arnau and Pinillos- Costa (2024) and Ebrahiem et al. (2024) in the area of sustainability and natural resource management. In addition, there is a significant presence of areas such as Biochemistry, Genetics, Informatics, Immunology and Microbiology, evidencing the multidisciplinary nature of current research.

In terms of funding, entities such as the Conselho Nacional de Desenvolvimento Científico e Tecnológico and the Fondo Nacional de Desenvolvimento Científico, Tecnológico e de Inovação Tecnológica were identified as the main funders, demonstrating the active participation of UNTRM in obtaining resources for its research. This is consistent with the findings of Denegri-Velarde et al. (2024) and Eyzaguirre and Fernandes (2024) on the importance of funding to promote research in academic institutions.

The semantic map and the analysis of research trends revealed a thematic diversity structured in clusters ranging from biodiversity and environmental management to medicine and human health, including genetics, microbiology, education and social sciences. These findings are consistent with the approaches of Ancaya-Martínez et al. (2024) and Ratnayake et al. (2024) on the importance of bibliometric analyses in the field of education and the inclusion of ICT, as well as with those of Kusnoto et al. (2024) and Abdulwahid Mohammad Noor et al. (2024) in the field of sustainability and natural resource management.

In addition, recurring themes were identified such as Peru, Amazon, animal and human related aspects, biological processes such as gene expression and inflammation, and specific diseases such as malaria. This suggests a clear orientation towards local and regional topics, which coincides with the mission of the UNTRM as an Amazonian institution.

On the other hand, Lotka's Law and Bradford's Law analyses provided valuable information on the distribution of authors' productivity and the main sources of publication, respectively. These findings align with the bibliometric principles established by Cárdenas et al. (2023) and allow us to identify the most prolific authors and the most relevant journals in the context of the UNTRM.

Finally, this bibliometric analysis provides a detailed understanding of the research landscape at UNTRM, highlighting trends, predominant approaches, contributors, intellectual collaboration networks and key thematic areas. The results obtained converge with the findings of other bibliometric studies in various fields, underscoring the importance of this tool for understanding research dynamics and guiding institutional strategies, as suggested by Salouw et al. (2024) and Crisostomo-Panuera et al. (2024). However, it is important to take into account the limitations inherent to bibliometric studies, such as biases in the databases and the difficulty to adequately capture the real quality and impact of research, as warned by Năstasă et al. (2024) and Salgado-García et al. (2024).

Conclusions

Significant growth in the number of UNTRM publications is evident in recent years, reaching a peak in 2023 and projecting an increase by 2024. This positive trend reflects the promotion of research and the availability of resources at the institution, which contributes to strengthening its position as a generator of knowledge in the Amazon region.

UNTRM publications are present in high impact and prestigious international journals, such as Sustainability Switzerland, Agronomy and Heliyon, which demonstrates the institution's contribution to the global scientific literature. In addition, specialized sources relevant to the Amazon region were identified, such as the Revista de Ciencias Sociales and the Revista de Investigaciones Veterinarias del Perú, suggesting a focus on local and regional issues.

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Prolific authors such as Oliva, M., Bustamante, D., Ramos, E., Calderón, M., Arbizu, C., Maicelo, J., Vásquez, H., Chavez, S., Chenet and Guerrero, J., who lead the scientific production of the UNTRM, stand out. This suggests the existence of consolidated research lines and specific thematic areas with significant production.

UNTRM publications show a strong inter-institutional collaboration network, both nationally and internationally, with the participation of entities such as the National Institute for Agrarian Innovation and foreign universities such as the University of São Paulo. These collaborations are fundamental to strengthen the research capabilities of the institution.

Agricultural and Biological Sciences, Social, Environmental and Medical Sciences emerge as the most prominent areas of knowledge in UNTRM publications, reflecting the importance of research in agriculture, biodiversity and health in the Amazon region. In addition, there is a significant presence of areas such as Biochemistry, Genetics, Informatics, Immunology and Microbiology, evidencing the multidisciplinary nature of current research.

Entities such as the Conselho Nacional de Desenvolvimento Científico e Tecnológico and the Fondo Nacional de Desenvolvimento Científico, Tecnológico e de Inovação Tecnológica were identified as the main funders of UNTRM research, demonstrating the institution's active participation in obtaining resources for its projects.

The analysis of research trends revealed a thematic diversity structured in clusters ranging from biodiversity and environmental management to medicine and human health, including genetics, microbiology, education and social sciences. Recurring themes such as Peru, Amazon, animal and human aspects, biological processes such as gene expression and inflammation, and specific diseases such as malaria were identified, suggesting a clear orientation towards local and regional topics.

Lotka's Law and Bradford's Law analyses provided valuable information on the distribution of authors' productivity and the main sources of publication, respectively, allowing the identification of the most prolific authors and the most relevant journals in the context of the UNTRM.

Finally, this bibliometric study has revealed a promising outlook for research at UNTRM, with a remarkable growth in publications, a presence in high impact journals, a strong network of collaborations, a thematic diversity aligned with the institutional mission and an active participation in obtaining funding for its projects. These findings highlight the fundamental role played by the UNTRM in the generation of knowledge in the Amazon region and its contribution to scientific advancement at the national and international level.

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