OmniaScience

Intangible Capital

IC, 2026 – 22(1): 1-20 – Online ISSN: 1697-9818 – Print ISSN: 2014-3214

https://doi.org/10.3926/ic.3221

The state of sustainability research in Argentine: An analysis of universities and their strategies

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Received February, 2025

Accepted June, 2025

Abstract

Purpose: This study analyzes the state of sustainability research in Argentine universities, identifying its level of integration into the academic agenda, differences between public and private universities, and existing gaps. Sustainability is a key pillar in higher education, yet its adoption in university research in Argentine remains limited and fragmented.

Design/methodology: A quantitative-descriptive approach was used, based on an analysis of information available on the official websites of 132 Argentine universities. Six key variables were examined: strategic sustainability plans, specialized observatories, research institutes, scientific journals, research projects, and academic production in sustainability.

Findings: The results show that only 26% of universities have incorporated sustainability into some aspect of their scientific production. Public universities lead in research projects and institutes, while private institutions stand out in the formulation of strategic plans. However, academic output remains low, with only 4% of universities publishing specialized journals and 6% maintaining observatories dedicated to sustainability.

Research limitations: The study relies exclusively on institutional sources, which may introduce biases due to outdated or incomplete information. Future research should incorporate qualitative approaches and international comparative studies.

Practical implications: The findings can guide universities and governmental bodies in designing policies and strategies to strengthen sustainability research.

Social implications: Developing sustainability strategies in universities contributes to knowledge generation and the training of professionals committed to sustainability.

Originality/value: This study provides a detailed diagnosis of the commitment of Argentine universities to sustainability, offering key insights for institutional strategy formulation and public policy development.

Keywords: Sustainability, Higher education, University research, Argentine universities, Sustainable development

Jel Codes: I23, Q01, Q56

To cite this article:

Arias-Valle, M.B. (2026). The state of sustainability research in Argentine: An analysis of universities and their strategies. *Intangible Capital,* 22(1), 1-20. https://doi.org/10.3926/ic.3221

1. Introduction

Sustainability is a fundamental axis in the international agenda, especially since the approval of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) of the United Nations (Arias-Valle & Coria-Augusto, 2024; Sachs, 2012). In this context, universities are essential factors for the development and prosperity of societies in all fields, constituting one of the guiding forces for sustainability (Filho, Sierra, Price, Eustachio, Novikau, Kirrane et al., 2024; Ruano-Borbalan, 2024). Their role is active and fundamental in guiding sustainability systems through the activation of their basic roles in education, scientific research, and community service (Lozano, Merrill, Sammalisto, Ceulemans & Lozano, 2017). The Rio+20 Conference (2012) already highlighted the importance of universities in generating knowledge and innovation oriented towards sustainability, emphasizing the need to strengthen academic, scientific, and technological cooperation, especially in developing countries (Yarime, Trencher, Mino, Scholz, Olsson, Ness et al., 2012). The biggest challenge for both public and private universities is to balance their fundamental functions with the protection of the environment, society, and their resources, without affecting them negatively (Filho, Salvia & Eustachio, 2022). This requires a drastic change in university policies, plans, duties, objectives, performance, and structures, which must differentiate themselves from traditional academic models (Filho, Frankenberger-Silva, Salvia, Shiel, Paço, Price et al., 2023; Sanches, Campos, Gaio & Belli, 2022).

Starting in the 2000s, University Social Responsibility (USR) was conceived in Latin America as a new university management model committed to the social problems of the community (Vallaeys, 2019). This approach transcended the vision of the traditional "third mission" of university extension, seeking to integrate social responsibility into the core functions of education and research. The discussion on USR, driven by corporate social responsibility in the private sector and the launch of the Millennium Development Goals (precursors to the SDGs), highlighted the need for universities to generate knowledge for sustainable development and manage their impacts responsibly. International organizations such as UNESCO and the Inter-American Development Bank, along with Latin American university networks like URSULA, have promoted a responsible management method in higher education. URSULA, for example, was created in 2016 and brings together more than 180 universities from 14 Latin American countries, proposing a comprehensive management model that covers the internal and external impacts of campus administration, professional training, research, and solidary social participation, with the goal of achieving the SDGs (Vallaeys, 2019). The success of this approach is based on the ability of Higher Education Institutions (HEIs) to conduct an honest self-assessment that drives organizational learning and continuous improvement.

Sustainability research, for its part, is inherently multidisciplinary, covering environmental, social, economic, political, governance, and urban development dimensions, which allows for addressing complex problems from diverse perspectives (Filho, Simaens, Paço, Hernandez-Diaz, Vasconcelos, Fritzen-Gomes et al., 2023). This type of research is crucial for generating knowledge, shaping effective public policies, and fostering public awareness of sustainable practices. Despite its global relevance and the consensus on the fundamental role of universities, the integration of sustainability into university research varies significantly between countries and regions (Alfirević, Malešević-Perović & Mihaljević-Kosor, 2023; Filho, Simaens et al., 2023). In Argentina, this commitment is still incipient and is characterized by isolated initiatives, which translates into significant gaps in the institutionalization, financing, and consolidation of research lines (Arias-Valle, Lillo-Murcia, Perez-Armendariz, Ocampo-Abadía, Gamez, Arias-Marquez, 2024; Arias-Valle & Marimon, 2024a). This situation, while showing an intention to align with the global agenda, represents a relevant problem, as it creates significant gaps in the production of knowledge necessary to address global and local challenges (Lunag, Posadas, Lamadrid, Ducas, Teehankee, De-Guzman et al., 2024; Oliveira, Alves & Leitão, 2024). The lack of solid institutionalization directly affects the training of professionals and the implementation of public policies, limiting the country's capacity to respond to specific problems such as water resource management, soil degradation, or multidimensional poverty (Corrêa-dos-Santos-Benites, Ribeiro-Alves & Almeida-Viana, 2025; Sánchez & Segovia-Pérez, 2023). Previous studies in other regions, such as Jordan, have identified similar challenges, including the persistence of traditional teaching methods, outdated curricula, and insufficient research funding, which negatively impacts contributions to sustainability (Badrakhan, Mbaydeen, Ogilat & Al-Nnuaimat, 2022). The scarce presence of strategic plans, observatories, and specialized sustainability institutes in most

Argentine universities limits their capacity to generate a significant impact and adapt to the changing demands of the global environment (Huepe, 2024; Shava, Mkwelie, Ndlovu & Zulu, 2023).

This study analyzes the current state of sustainability research in Argentine universities, identifying its level of development, the differences between public and private universities, and the existing gaps. The hypothesis is: "Given the still incipient and fragmented nature of the integration of sustainability into the Argentine university system, it is hypothesized that, despite the critical role of universities in sustainable development, sustainability research in Argentine institutions is in an initial phase, evidenced by the low prevalence of institutional structures (such as strategic plans, observatories, and specialized institutes) and limited scientific production, with significant differences between the public and private sectors, where public universities will show greater activity in research projects and institutes, while private ones will stand out in strategic formalization and academic publications."

To this end, the following research questions are raised: To what extent have Argentine universities incorporated sustainability into their research?; Are there differences between public and private universities in the development of sustainability research?; And which provinces show significant progress in this area? To answer these questions, six key variables were examined that allow evaluating both the institutional commitment to sustainability and the production of knowledge in this area: strategic sustainability plans, specialized observatories, research institutes, scientific journals, research projects, and academic production in sustainability. The selection of these variables is based on their use in previous studies on sustainability in higher education and their combination allows for a comprehensive evaluation by considering the institutionalization of sustainability and its impact on scientific production. This analysis seeks not only to diagnose the current state of sustainability research in Argentine but also to provide evidence for the design of institutional and public policies that promote a more solid commitment to sustainability. In a context of urgent environmental, social, and economic challenges, understanding the strengths and limitations of the Argentine university system is an essential step to promoting sustainability as a strategic axis of higher education. The structure of the document is organized as follows: section 2 presents the literature review; section 3 describes the methodology used; section 4 presents the results; section 5 discusses the findings; and section 6 concludes the study, highlighting the implications and future lines of research.

2. Literature Review

Sustainability, defined as the ability to meet the needs of the present without compromising the needs of future generations (Brundtland, 1987), is not merely an ideal but an urgent necessity in the face of the environmental, social, and economic crisis facing the planet (Arias-Valle & Coria-Augusto, 2024; Elkington, 1998). Universities, as key institutions in the generation and dissemination of knowledge, have the potential to play a transformative role by integrating sustainability into all their functions, particularly in research (Pfeifer & Helming, 2024; Radinger-Peer & Pflitsch, 2017). However, in the Argentine university system, sustainability is still not perceived as a strategic priority (Arias-Valle, Marimon, Coria-Augusto & Apaza-Canquí, 2024; Arias-Valle & Marimon, 2024a), which creates significant gaps in the production of knowledge needed to address global and local challenges (Bautista-Puig, Lozano & Barreiro-Gen, 2023).

2.1. Sustainability in Higher Education and its Relationship with Scientific Production

Sustainability research is a strategic pillar for universities, as it allows for addressing complex problems with an interdisciplinary approach (Grammenou, 2024; Yarime et al., 2012). It is not an end in itself, but a means to address challenges such as climate change, biodiversity loss, and social inequalities; problems that cannot be solved from isolated perspectives (Korzeb,Alonso-Fariñas, Irimia-Diéguez, Naharro, Kobylińska, di-Pietro et al., 2024). This research promotes interdisciplinary approaches that integrate natural, social, and technological sciences, generating more complete and applicable solutions (Filho, Eustachio, Ávila, Dinis, Hernandez-Diaz, Batista et al., 2025; Idahosa, Belluigi & Dhawan, 2025). This type of research is inherently multidisciplinary, encompassing environmental, social, economic, political, governance, and urban development dimensions (Filho, Frankenberger-Silva, et al., 2023).

Universities have a social responsibility to contribute to the well-being of their communities (Adnan, Praptiningsih, Program, Pertolongan, Pesawat & Penerbangan, 2024). Sustainability research provides scientific

evidence to formulate effective public policies, design local interventions, and promote responsible business practices (Cortese, 2003; Deblonde, 2015). The SDGs establish specific goals that require research to measure progress, identify gaps, and design implementation strategies (Abdalla, Ramadan, Al-Belushi & Al-Hooti, 2024; Holst, Singer-Brodowski, Brock & de Haan, 2024). Argentine universities, by aligning their academic production with the SDGs, would not only fulfill a global mandate but also strengthen their institutional relevance in an increasingly competitive world (IESALC; & UNESCO, 2021). The dissemination of research findings through publications in journals, conferences, and community outreach is vital for knowledge transfer and the growth of the discussion on the topic (Aleixo, Leal & Azeiteiro, 2018).

Sustainability is linked to innovation, especially in areas such as the circular economy, renewable energies, and natural resource management (Hysa, Kruja, Rehman & Laurenti, 2020; Suchek, Fernandes, Kraus, Filser & Sjögrén, 2021). Universities that lead in sustainability research not only respond to social demands but also position themselves as key players in the economic development of their regions (Mills, Gandolfi, Taylor, Tereshchenko & Hardman, 2025; Shu & Tian, 2024). Furthermore, sustainable development research contributes to education and public awareness of environmental issues and social responsibility (Hallinger & Chatpinyakoop, 2019; Kopnina, 2020).

2.2. Institutional Structures of Sustainability and Scientific Production: Levels of Analysis

The Argentine university system has the potential to contribute to the transition towards a sustainable development model, but it faces multiple structural barriers (Arias-Valle & Marimon, 2024a). Among them are a lack of funding, a scarce institutional culture around sustainability, and a weak articulation between research, teaching, and extension (González-Gaudiano, 2016; Huepe, 2024).

At the international level, successful experiences show that universities that prioritize sustainability not only obtain better results in global rankings but also achieve greater social impact (Alfirević et al., 2023; Findler, Schönherr, Lozano, Reider & Martinuzzi, 2019). For example, institutions such as Harvard University and Cambridge University have developed sustainability research centers that generate knowledge applied to real problems, from energy transition to climate justice (Filho, Will, Salvia, Adomßent, Grahl & Spira, 2019). In contrast, in Argentine, the focus on sustainability is often perceived as a secondary concern, limited to isolated initiatives without a clear institutional strategy (Arias-Valle, Marimon et al., 2024). This not only hinders the generation of relevant knowledge but also reduces the ability of universities to respond to the country's specific challenges. Sustainability research should not be seen as an option, but as an urgent necessity for Argentine universities to respond to global and local challenges (Kohl, Hopkins, Barth, Michelsen, Dlouhá, Razak et al., 2022). Studies in other regions, such as Jordan, have identified similar challenges in private universities, including the persistence of traditional teaching methods, outdated curricula, and insufficient research funding, which negatively impacts contributions to sustainability (Badrakhan et al., 2022).

To understand the current state of sustainability research in Argentine, this study examines the fundamental elements that are grouped into two main dimensions: the institutional structures of sustainability and scientific production in sustainability. The choice of these elements is based on their relevance in previous studies on sustainability in higher education, and their joint analysis allows for a comprehensive evaluation that considers both the institutionalization of sustainability and its impact on knowledge generation (Arias-Valle, Berbegal-Mirabent & Marimon-Viadiu, 2021a, 2021b; Escobar, Arias-Valle & Akhmedova, 2020).

Within the first dimension, the institutional structures of sustainability, crucial aspects that reflect the formal commitment of institutions are identified (Filho et al., 2025; Mills et al., 2025). Firstly, strategic sustainability plans are considered a fundamental manifestation of institutional commitment, as they outline clear objectives and strategies for the integration of sustainability (Castillo & Roberts, 2024; (Filho, Frankenberger-Silva, et al., 2023). The literature indicates that successful strategic plans incorporate specific goals, performance indicators, and financing strategies that mainstream sustainability as an institutional priority (Lozano, Lozano, Mulder, Huisingh & Waas, 2013; Lu, Xie, Xu & Cao, 2023). Secondly, sustainability research institutes are recognized as essential pillars, functioning as centers of excellence that concentrate resources and academic talent to drive interdisciplinary projects (Corrêa-dos-Santos-Benites et al., 2025; Cubas, Provin, Dutra, Andrade-Guerra & Mussi, 2024). These institutes not only promote scientific production and inter-institutional collaboration but

also strengthen the relationship between academia and the productive and governmental sectors (Fontes & Franco, 2025; Shrestha, 2024). Finally, specialized sustainability observatories emerge as vital tools that enable the continuous monitoring of progress and the generation of crucial information (Cubas et al., 2024; Grunwald, Kara & Spillan, 2024). This information is indispensable for political and academic decision-making and is key to evaluating the impact of sustainability policies both at the internal level of universities and in their contribution to society in general (Cubas et al., 2024; Osman, Abdirahman-Ahmed & Abdi, 2025).

The second dimension, scientific production in sustainability, focuses on how a conducive university environment significantly favors the generation and dissemination of specialized knowledge. The existence of specialized scientific journals on sustainability within a university, for example, is a determining factor for the visibility and impact of sustainability research (Fontes & Franco, 2025). These platforms not only guarantee the dissemination of generated knowledge but also validate academic findings, facilitate global dialogue, and consolidate the institution's reputation in this crucial field (Bautista-Puig et al., 2023; Filho, Simaens et al., 2023). In fact, the absence of such journals can seriously limit the dissemination of knowledge generated by universities. Furthermore, the presence and support for ongoing research projects related to sustainability, especially those that have funding (whether national, regional, or international) and are aligned with the 2030 Agenda, are a clear indicator of institutional investment and priority in this area (Grunwald et al., 2024; Idahosa et al., 2025). The literature highlights that these projects are of vital importance because they allow researchers to address local problems from a global perspective, which drives the generation of innovative solutions and directly connects academic work with the urgent needs of society (Idahosa et al., 2025; Lozano & Barreiro-Gen, 2023).

Finally, academic production in sustainability in its various forms–including articles indexed in high-impact databases such as Scopus and Web of Science, as well as peer-reviewed books and book chapters–is the tangible result of research and a catalyst for the advancement of the field (Filho, Simaens et al., 2023; Shu & Tian, 2024). The justification for including these various forms of publication is that, in the Latin American context, the dissemination of knowledge in sustainability is not restricted solely to scientific articles but extends to other validated academic forms, which demonstrates the ability of universities to generate knowledge applicable to sustainable development (Corrêa-dos-Santos-Benites et al., 2025). Publication in high-impact media not only favorably positions institutions in the global scientific community but, crucially, facilitates the transfer of knowledge to the public and private sectors, closing the loop between the generation of research and its practical application (Blom & Karrow, 2024; Corrêa-dos-Santos-Benites et al., 2025).

In this context, the institutionalization of sustainability in higher education transcends the mere creation of organizational structures, actively involving the generation of knowledge that supports the transition towards sustainable development models (Blom & Karrow, 2024; Lozano, Barreiro-Gen, Lozano & Sammalisto, 2019). The strengthening of these elements is, therefore, indispensable for universities not only to consolidate their commitment to sustainability but also to amplify their impact both nationally and internationally, contributing decisively to the SDGs of the 2030 Agenda (González-Gaudiano, 2016; Lozano & Barreiro-Gen, 2023).

3. Methodology

This work uses a quantitative-descriptive design, characterized by analyzing patterns and trends in the state of sustainability research in Argentine universities. The methodology follows a non-experimental scheme, as variables are not manipulated, but existing data are described and analyzed through basic statistical tools. The objective is to evaluate whether universities in Argentine have integrated sustainability into their research function.

This study focuses on Argentina due to the scarcity of previous research addressing the integration of sustainability into university research in the country. Unlike international studies that have analyzed sustainability in higher education in terms of teaching or institutional management (Filho, Amaro, Avila, Brandli, Damke, Vasconcelos et al., 2021; Lozano, Barreiro-Gen, Pietikäinen, Gago-Cortes, Favi, Jimenez-Munguia et al., 2022), this one focuses on scientific research as an indicator of the commitment of Argentine universities to sustainability. Furthermore, considering the growing relevance of sustainability in public and academic policies at a global level, understanding the current state of sustainability research in Argentine is fundamental to

identifying opportunities for improvement, strengthening the research agenda, and promoting alignment with international standards in higher education.

3.1. Research Design and Population

The research is structured as a descriptive and cross-sectional study, which aims to explore the current state of sustainability research within Argentine universities. A quantitative approach was used due to the nature of the analysis, which requires the collection and examination of numerical data on institutional characteristics related to sustainability. The target population includes all universities in Argentine, both public and private. The 132 institutions of the Argentine university system are analyzed. The inclusion of all universities ensures that the results obtained are representative of the Argentine university system as a whole and allow for comparisons between different types of institutions.

3.2. Selection, Definition of Variables and Data Collection

Table 1 presents the details of the selected variables, their operational definitions, and the sources used for data collection. These six variables were chosen for their relevance in capturing both the institutional commitment to sustainability and the academic production linked to this field, allowing for a comprehensive analysis of the state of sustainability research in Argentine universities. The selection is based on theoretical and methodological precedents from previous studies on sustainability in higher education (Arias-Valle et al., 2021a, 2021b).

The time horizon of the analysis includes the year 2024, allowing for an evaluation of sustainability research in Argentine universities, while the results are presented with a comparative approach that analyzes the relationships between variables to identify patterns and trends in scientific production and the institutionalization of sustainability in higher education (Bautista-Puig et al., 2023; Filho, Simaens et al., 2023).

Variable	Measurement Method	Variable Type	Justification for Selection
Sustainability Strategies	Presence of a strategic plan that includes aspects of sustainability.	Dichotomous (1 if present, 0 if absent)	They indicate the formal commitment of institutions and outline clear objectives for the integration of sustainability. The lack of these plans can compromise universities' ability to effectively contribute to the SDGs.
Specialized Observatories	Presence of observatories or monitoring programs dedicated to sustainability.	Dichotomous (1 if present, 0 if absent)	They are vital tools that enable continuous monitoring of progress and the generation of crucial information for political and academic decision-making, and for evaluating the impact of sustainability policies.
Research Institutes	Presence of research institutes specialized in sustainability.	Dichotomous (1 if present, 0 if absent)	They act as essential pillars, concentrating resources and academic talent to drive interdisciplinary projects, scientific production, and inter-institutional collaboration.
Scientific Journals	Existence of university-owned journals dedicated to sustainability or that include articles on the topic.	Dichotomous (1 if present, 0 if absent)	They are a determining factor for the visibility and impact of sustainability research, ensuring the dissemination of knowledge and consolidating the institution's reputation.
Research Projects	Development of research projects related to sustainability that have funding and are aligned with the 2030 Agenda.	Dichotomous (1 if the university develops projects, 0 if not)	They allow researchers to address local problems from a global perspective, driving the generation of innovative solutions and connecting academic work with the urgent needs of society. This is the most active variable in terms of institutional commitment.
Academic Production	Number of articles indexed in high-impact databases (Scopus and Web of Science), as well as peer-reviewed books and book chapters.	Quantitative	It is the tangible result of research and a catalyst for the advancement of the field, favorably positioning institutions and facilitating the transfer of knowledge to the public and private sectors.

Table 1. Study variables: measurement method, type, and justification

The data was collected through an exhaustive review of institutional documents, including strategic plans, annual reports, and academic publications available on the official websites of each university. The data collection was based on information available on the official websites of universities in December 2024. To ensure the accuracy and reliability of the information, these data were cross-referenced with official institutional documents, such as strategic plans, management reports, and academic publications, ensuring that they faithfully reflected the reality of each institution in the field of sustainability.

3.3. Data Analysis Process

The analysis of the collected data was carried out in several stages, following a systematic and rigorous approach to ensure the accuracy and relevance of the findings. Qualitative variables were coded into numerical values to facilitate statistical analysis. For example, the existence of a strategic plan was coded as 1 if the university had one that included sustainability and 0 otherwise. For quantitative variables, such as the number of publications on sustainability, the values directly extracted from the reviewed reports and documents were used.

For data analysis, Microsoft Excel was used, which allowed for the efficient organization, processing, and visualization of the collected information. The validation of the data obtained from the institutional websites was carried out through a two-stage consistency verification procedure: first, a manual review of the official sources of each university was carried out to ensure the accuracy and timeliness of the information; subsequently, the data were compared with institutional reports and available government databases, in order to detect possible inconsistencies or duplicate records.

An initial descriptive analysis was performed to identify the frequency and distribution of key variables among Argentine universities. For this, absolute and relative frequencies, as well as measures of central tendency (mean) and dispersion (standard deviation) for each variable were calculated. This analysis allowed for an overview of the characteristics of universities in relation to their commitment to sustainability.

To evaluate whether there were significant differences between public and private universities regarding the integration of sustainability into their research activities, statistical tests were used. The same process was used for geographical analysis. To ensure the validity and reliability of the data, cross-checks of the information obtained were carried out and compared with other secondary sources, such as reports from national and international organizations on higher education and sustainability in Argentine.

4. Results

The analysis of Argentine universities in relation to their commitment to sustainability research reveals that most institutions are in an initial stage regarding the integration of practices, projects, and publications in this area. Of the 132 universities evaluated, only 34 (26%) have incorporated sustainability into some aspect of their research, which reflects a low level of commitment to this topic. In fact, 74% of universities have not yet prioritized sustainability as a central axis of their research activities.

This finding is particularly worrying, given the growing role of sustainability on the global agenda and its critical relevance in the training of professionals and the production of scientific knowledge to face current challenges. The general panorama shows an unequal integration and an incipient stage, with a limited number of institutions achieving significant progress in strategic plans, research institutes, projects, and scientific publications. Most universities (more than 85%) lack essential components such as strategic plans, observatories, or specialized journals, which limits their ability to generate a significant impact in the field of sustainability. Critical variables, such as scientific publications in specialized journals and the existence of observatories, show a particularly low representation (4% and 6%, respectively).

The study of Argentine universities in relation to their commitment to sustainability reveals an unequal panorama and an initial stage, with some institutions standing out for their ability to integrate multiple key variables in this area. Among the 132 universities analyzed, only a limited number have made significant progress in areas such as strategic plans, research institutes, projects, and scientific publications.

In terms of institutional leadership, the National University of Luján and the Catholic University of Cuyo stand out (Arias-Valle & Marimon, 2024b). These universities have included all the evaluated variables, which positions

them as references in the incorporation of sustainability into their institutional agendas. The National University of Luján and the Catholic University of Cuyo have managed to integrate sustainability both at a strategic level and in research activities and academic dissemination.

Likewise, institutions such as the National University of Córdoba, the Catholic University of Santa Fe, and the National University of Cuyo have important strengths in research projects and scientific production, although they lack some key elements, such as observatories or specialized journals. This performance reflects a partial commitment that could be strengthened with greater institutional integration.

4.1. Institutional Characteristics Related to Sustainability

The analysis of the institutional characteristics of universities reveals a mixed picture regarding the integration of sustainability into the research function. Figure 1 shows the overall results. A detailed breakdown of the findings by analyzed variable follows.

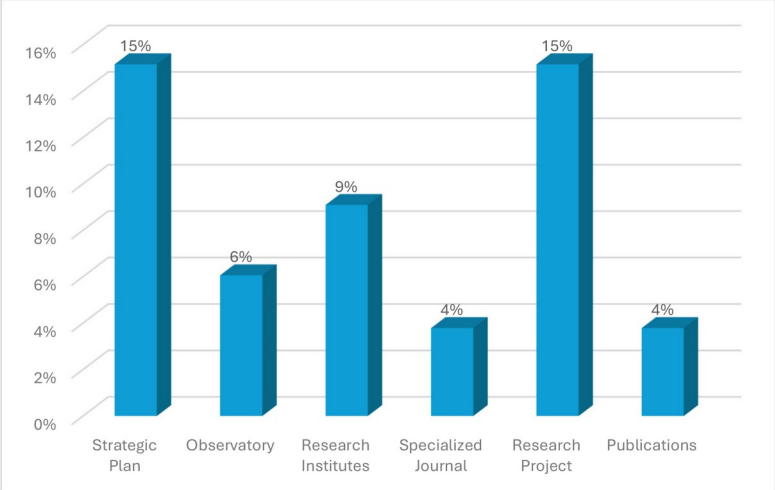

Figure 1. Sustainability in research at Argentine universities

The analysis of Argentine universities reveals that the institutional commitment to sustainability is still in an incipient state and faces significant challenges. A key indicator is the inclusion of sustainability in institutional strategic plans. Only 15% of universities (20 institutions) have a strategic plan that incorporates sustainability, showing a moderate level of formal recognition of the topic in long-term planning. However, 85% of institutions lack this type of planning, representing a significant gap that could hinder their ability to effectively contribute to the SDGs.

A notable lack of institutional mechanisms for monitoring and evaluating sustainability was also identified. Only 15% of universities have established specific programs or units for this purpose, and only 6% have specialized observatories. This limited presence of systematic monitoring bodies significantly restricts the institutions' ability to generate relevant data, make informed decisions, and adapt their actions to a changing global environment. Furthermore, the few existing observatories are concentrated in regions with greater economic and academic dynamism, such as Buenos Aires and Córdoba, which highlights regional inequalities in institutional development.

The situation is similar regarding specialized research institutes. Only 9% of universities have formed units dedicated to the study of sustainability or have specific institutes in this area. While these spaces have high strategic value for promoting interdisciplinary research and facilitating collaboration with external stakeholders, their low representation reflects a limited prioritization of sustainability as a scientific field. Most of these institutes are also located in provinces like Buenos Aires, San Juan, and Mendoza, once again reproducing geographical asymmetries.

Another critical indicator is the universities' capacity to generate and disseminate knowledge on sustainability through their own academic outlets. In this regard, only 4% of institutions publish specialized journals on the

topic, representing a significant structural weakness for showcasing national scientific output and participating in international academic discourse. Likewise, only five universities (also 4%) have produced indexed publications on sustainability, a finding that confirms the limited link between institutional commitment and the generation of impactful knowledge. Universities in Buenos Aires and San Juan are slightly more prominent in this indicator, suggesting that some regions are beginning to position themselves in the field.

Despite this general landscape, one of the most dynamic indicators is that of research projects. Currently, 15% of universities (20 institutions) are conducting research related to sustainability. This activity reveals a growing interest in the topic, especially when approached from an applied and multidimensional perspective. The surveyed projects address environmental, social, and economic impacts. On the environmental front, the most common topics include water management, climate change, mammalian ecology, ecosystem biogeochemistry, and noise pollution reduction. In the social sphere, studies focus on inclusion, child welfare, university social responsibility, and gender-based approaches. Finally, in the economic realm, notable proposals promote the circular economy, SME competitiveness, sustainable rural tourism, and the development of management tools for various productive sectors. These thematic areas reflect a fertile ground for strengthening the link between research and sustainability, although it still requires greater articulation and institutional support.

Taken together, the results show a partial institutional commitment, with some concrete but scattered advances and an academic structure that is still weak for sustaining a solid and systematic sustainability agenda in Argentine universities.

4.2. Public-Private Comparison

The comparative analysis between public and private universities in Argentine reveals significant differences in the approach and implementation of sustainability research strategies. While public universities lead in the number of research projects and the creation of specialized institutes, private universities stand out for their strategic planning and the formalization of organizational structures focused on sustainability.

The breakdown of data by institution type shows that public universities have a slightly higher participation in sustainability-related research (15%) compared to private universities (11%); Figure 2 illustrates the overall results. This pattern could be explained by factors such as differences in access to funding, institutional mandates, and the priority given to research in the public versus private sector. Nevertheless, the limited participation in both sectors underscores the urgency of implementing more robust policies and incentive strategies to drive institutions to address this topic more effectively and with greater commitment.

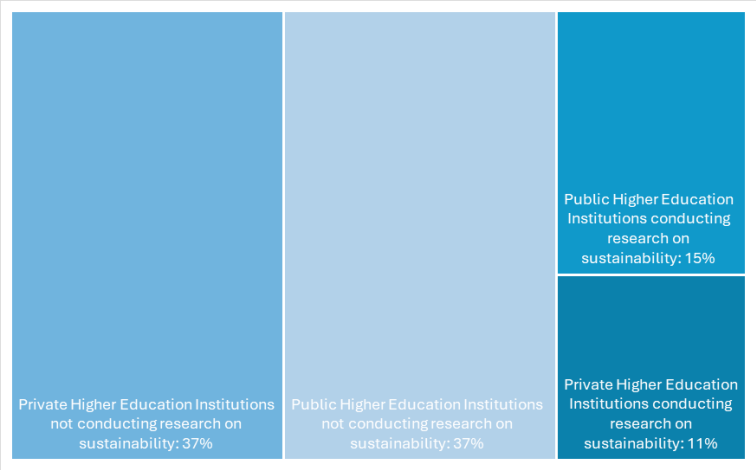

Figure 2. Sustainability Research in Argentine Universities

Public universities lead in most variables, especially in research projects and institutes, while private universities perform better in formulating strategic plans. Public universities show greater adoption of strategic plans for sustainability (11 universities) compared to private universities (9 universities). This difference suggests that

public institutions may be more aligned with governmental or international policies on sustainability. However, the presence of these plans in both types of institutions indicates a growing awareness of the need to structure long-term sustainability strategies.

Both types of universities have the same number of sustainability observatories (4 in each case), which reflects a balance in the development of these spaces dedicated to monitoring and promoting initiatives on this topic. However, the low overall number of observatories suggests that sustainability has not yet been incorporated as a priority dimension in university research in Argentine. In this regard, private universities surpass public ones, with 8 institutes compared to 4 in the public sector. This indicates that the private sector has advanced in the institutionalization of sustainability within its academic structures, possibly due to a greater degree of autonomy for creating research units and securing external funding.

Regarding specialized sustainability journals, private universities lead with 3 journals compared to only 2 in public universities. Although the difference is small, it reinforces the idea that private institutions are allocating more resources to the dissemination of sustainability knowledge. Academic publications: In terms of scientific output, private universities also outperform public ones (4 to 1). Despite public universities having more research projects, this does not necessarily translate into a greater number of publications.

Public universities show a larger number of research projects in sustainability (11 universities) compared to private ones (9 universities). This could be due to the nature of public institutions, which typically receive state funding and are subject to policies that prioritize research for the benefit of society. Public and private universities have different approaches to sustainability research. While public universities lead in the generation and practical implementation of research projects, private ones show greater institutional formalization and better scientific output.

This finding highlights the need to establish collaboration mechanisms between both sectors to leverage their respective strengths. Public universities could benefit from more robust scientific publication and dissemination strategies, while private ones could learn from the experience of public universities in executing research projects with social impact. Combining these approaches would strengthen the role of Argentine universities in sustainability research, contributing more effectively to the SDGs and the transformation of higher education in the country. The distribution of the analyzed variables based on the ownership of Argentine universities is presented in Figure 3. This Figure allows for visualizing the number of institutions that incorporate each of the variables considered, differentiated by whether they are public or private.

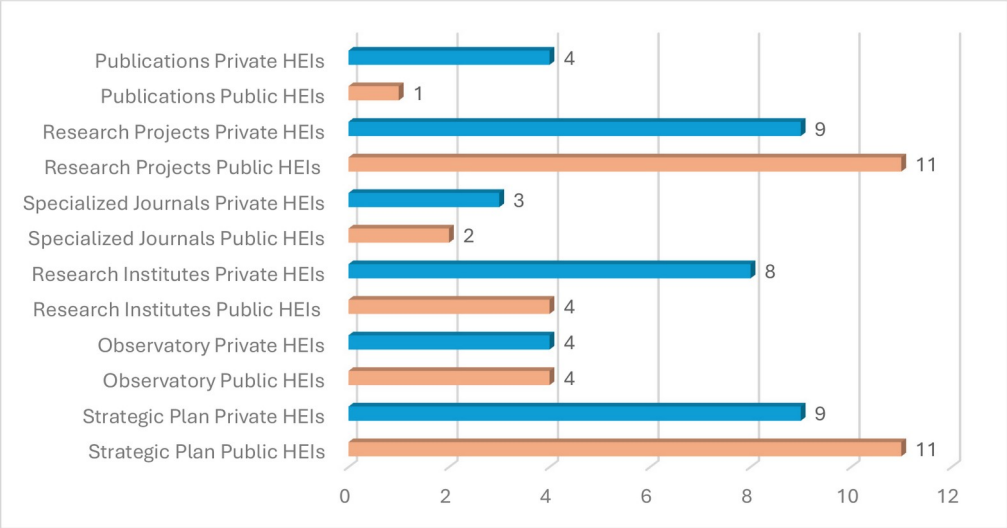

Figure 3. Sustainability in research at Argentine universities by ownership

4.3. Regional Analysis

The regional analysis reveals significant differences in the commitment of Argentine universities to sustainability research. To classify the level of commitment, the following scale was used: very high (more than three committed universities per province), high (three committed universities per province), moderate (two committed universities per province), low (one committed university per province), and zero (no committed universities per province). Figure 1 shows the findings.

The results show that Buenos Aires has the highest number of universities with sustainability initiatives (22 universities), placing it in the very high commitment category. Other provinces with relevant progress include San Luis, Córdoba, and Neuquén, where institutional initiatives are observed in multiple dimensions, such as research projects, specialized institutes, and scientific publications. In contrast, regions such as northern and southern Argentina show zero levels of commitment to sustainability research. Several provinces do not have any universities with active strategies in this area, indicating an inequality in the distribution of initiatives and resources allocated to integrating sustainability into the university agenda. The map created for this study visually shows this regional distribution, highlighting the provinces in central Argentina with a greater commitment to sustainability. These results confirm that the adoption of sustainability in university research in Argentine remains limited, polarized, and fragmented, with isolated efforts led by a small group of institutions. Despite the progress of some universities, significant gaps persist in knowledge production and academic dissemination, which underscores the need for more coordinated strategies and an adequate allocation of resources to strengthen this field nationwide.

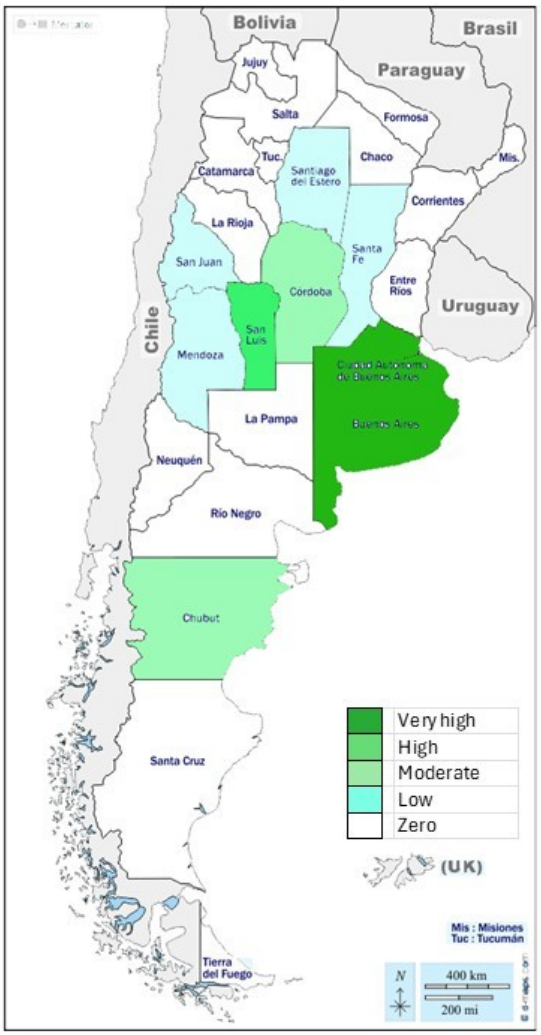

Figure 1. Geographic Distribution

5. Discussion

This study aimed to diagnose the state of sustainability research in Argentine universities, revealing a landscape of integration that is still incipient and fragmented. This central finding, characterized by limited progress and an unequal distribution of efforts across institutions and regions, is consistent with previous observations on the lack of homogeneity in the adoption of sustainability as a cross-cutting theme in the Argentine academic sphere (Arias-Valle & Marimon, 2024a). The magnitude of this problem is evidenced by the low prevalence of key institutional elements: only 15% of universities have included sustainability in their strategic plans, which implies an absence of systemic planning and consolidated strategies, a critical factor for true institutionalization (Holst, 2023). Likewise, the scarce existence of specialized observatories (only 6%) and sustainability research institutes (just 9%) severely limits the capacity for data-driven monitoring, evaluation, and the concentration of interdisciplinary talent, unlike in international contexts where these structures are pillars of research quality and collaboration with the public sector (Fehrenbach & Huisman, 2024; Pfeifer & Helming, 2024)). This situation is reflected and amplified in scientific production and dissemination, with a mere 4% of universities publishing in specialized journals or generating indexed academic publications on sustainability, which reduces Argentina's international visibility and its capacity to actively participate in the global debate on sustainable development (Filho, Simaens et al., 2023; Fontes & Franco, 2025). Although some leading institutions, such as the National University of Luján and the Catholic University of Cuyo (Arias-Valle & Marimon, 2024b), demonstrate more comprehensive integration, and public universities show a greater number of projects, this strength in projects does not consistently translate into greater indexed scientific production. This indicates that the lack of cross-cutting institutionalization and more robust support mechanisms still hinders the full realization of research impact.

5.1. Differences Between Public and Private Universities in Sustainability Research

The results obtained show a significant gap between public and private universities in integrating sustainability into their research strategies. While public universities have a larger number of research projects and specialized sustainability centers, private universities have more efficiently structured strategic planning and knowledge dissemination through scientific publications. This finding aligns with previous studies that have noted that public universities, by receiving state funding, tend to develop more sustainability research projects, though with less strategic planning compared to their private counterparts (Filho et al., 2019; Lozano, Ceulemans, Alonso-Almeida, Huisingh, Lozano, Waas et al., 2015).

However, the scarcity of sustainability observatories in both types of institutions indicates a structural weakness in measuring and monitoring sustainability progress in the academic field (Alfirević et al., 2023). In international contexts, the presence of these observatories has proven to be a key tool for monitoring research trends and strengthening the articulation between academia and the public sector (Findler et al., 2019). In Argentina, the lack of these mechanisms limits the universities' ability to evaluate the impact of their initiatives, hindering data-based decision-making (Christou, Manou, Armenia, Franco, Blouchoutzi & Papathanasiou, 2024).

Moreover, the difference in research approaches between public and private universities suggests that sustainability has not been incorporated homogeneously into the Argentine university system. In other countries, such as the United States and some members of the European Union, sustainability has been institutionalized more equitably in both sectors, promoting inter-institutional collaborations to optimize available resources (Ghani, Teo, Ho, Choo, Kelana, Adam et al., 2022). This lack of articulation between public and private universities in Argentina could be an obstacle to the development of interdisciplinary research, which is fundamental to addressing the complexity of contemporary environmental and social problems (Filho et al., 2024; Shetty, 2024).

5.2. Structural Limitations in the Integration of Sustainability

The data analysis reveals that only 15% of Argentine universities have included sustainability in their strategic plans, indicating a lack of institutionalization of this approach. The absence of clear strategic planning implies that many sustainability initiatives arise from individual or departmental efforts, rather than responding to a consolidated institutional strategy (Al-Filali, Abdulaal, Alawi & Makki, 2024; Christou et al., 2024). This

fragmentation aligns with the findings of Holst (2023), who argues that sustainability in higher education can only be consolidated when it is incorporated as a cross-cutting theme in the institutional mission and vision.

A critical aspect is the low scientific production in sustainability in Argentine. Only 4% of the analyzed universities have specialized scientific journals on sustainability, which reduces the international visibility of knowledge produced in the country and makes collaboration with researchers from other regions difficult (Filho, Simaens et al., 2023). Compared to leading universities in this field in Europe and North America, where multiple indexed journals regularly publish sustainability research, Argentina faces a significant barrier to positioning itself in the global academic debate on sustainable development (Fontes & Franco, 2025; Huepe, 2024).

Another worrying point is the low presence of sustainability research institutes. Only 9% of the analyzed universities have specialized centers in this area, suggesting that sustainability research remains a scattered initiative without a consolidated structure in most Argentine institutions (Arias-Valle & Marimon, 2024b). In countries like Germany and the United Kingdom, the creation of research institutes dedicated to sustainability has been key to promoting interdisciplinary collaboration and the transfer of knowledge to the productive sector (Fehrenbach & Huisman, 2024; Pfeifer & Helming, 2024). The absence of these structures in Argentina limits the universities' ability to generate applied knowledge and design sustainable development strategies based on scientific evidence (Shava et al., 2023).

Finally, regional inequalities are identified in the integration of sustainability into higher education. Provinces like Buenos Aires, San Juan, and Córdoba show significant progress, while other regions, especially in the north and south of the country, show low levels of implementation in all variables analyzed. These disparities reflect differences in access to resources and funding, which perpetuates structural gaps that limit the equitable development of sustainability research in the country (González-Gaudiano, 2016; Prego, 2023).

5.3. Recommendations to Strengthen Sustainability Research

To overcome the identified barriers, three key strategies are proposed. The first is to promote inter-university collaboration networks. Cooperation between public and private universities could boost scientific production in sustainability, allowing for the sharing of resources, experiences, and best practices (Filho et al., 2024; Pereira, Leitão, Oliveira & Peirone, 2023). Experiences in other countries have shown that these networks can facilitate the development of interdisciplinary projects, improve research quality, and strengthen the training of new sustainability researchers (Lozano et al., 2015).

Second is the allocation of specific financial and human resources for sustainability research. The creation of specific funding programs for sustainability would allow for the strengthening of existing research institutes and encourage the publication of specialized journals in this field (Filho, Simaens et al., 2023; Raman, Nair & Nedungadi, 2023). In Argentina, funding in this area is still limited, which makes it difficult to consolidate research groups and ensure the continuity of long-term projects (Huepe, 2024).

Finally, the incorporation of sustainability into university accreditation processes. The inclusion of sustainability indicators in institutional evaluation could incentivize universities to develop more structured strategies in this área (Holst et al., 2024). In countries like Canada and Finland, sustainability is part of the accreditation criteria, which has prompted universities to adopt more solid policies in sustainability research and training (Cărăuşan, 2024; Janssens, Kuppens, Mulà, Staniskiene & Zimmermann, 2022).

In addition to these strategies, it is fundamental that universities work on training faculty and researchers in sustainability research methodologies (Leal, Eustachio, Ávila, Dinis, Hernandez-Diaz, Batista et al., 2024). Training in interdisciplinary approaches and the promotion of sustainability as a cross-cutting theme in curricula could generate a new generation of academics specialized in this topic (Gomez, Luna & Avila, 2023; Lozano et al., 2017).

This study contributes to the literature by differentiating, for the first time, the relationship between institutional sustainability structures and scientific production in Argentine universities. Its relevance lies in providing a replicable methodological framework to evaluate university commitment to sustainability, allowing for the identification of patterns and gaps in the integration of this approach. The research offers a comprehensive

diagnosis of the Argentine university system on sustainability, analyzing key variables together for the first time, which allows for the identification of patterns and gaps that have not been addressed in previous research. Beyond the Argentine case, it expands the global debate on the factors that favor sustainability research and offers key evidence for the design of university policies aligned with the 2030 Agenda.

This research presents certain limitations that must be considered when interpreting the results. First, data collection was based exclusively on information available on official university websites, which may lead to biases due to a lack of updates, availability, or transparency in the publication of institutional information on sustainability. This implies that some universities may be implementing sustainability initiatives that were not recorded in this analysis. Furthermore, as a descriptive study based on documentary data, it does not delve into the motivations, challenges, and strategies of universities for incorporating sustainability into the research function. Future research could complement these findings with qualitative methodologies, such as interviews with academic managers and researchers, to better understand the internal dynamics that influence the integration of sustainability into the research agenda. Likewise, a comparative analysis with universities from other countries would allow for evaluating the positioning of the Argentine university system in an international context. Finally, the development of longitudinal analysis models would help to identify trends and evaluate the evolution of Argentine universities' commitment to sustainability over time, providing key information for the formulation of more effective institutional and public policies.

6. Conclusion

This study aimed to diagnose the state of sustainability research in Argentine universities, revealing a landscape that is still incipient and fragmented. Of the 132 universities analyzed, only 34 (26%) have integrated sustainability into some aspect of their research, which indicates a low level of generalized commitment. Specifically, it is observed that most institutions (over 85%) lack essential components such as strategic plans (only 15% include them), specialized observatories (only 6%), or scientific journals on sustainability (just 4%), with a limited number of universities achieving significant progress. These structural gaps severely limit the ability of Argentine universities to generate a significant impact in sustainability research, which in turn affects the quality of training for future professionals and the relevance of public policies to address global and local challenges. The low prevalence of these essential institutional structures suggests a lack of systemic planning and consolidated strategies, which are fundamental for a true institutionalization of sustainability in the university sphere.

The contribution of this research lies in offering a comprehensive and detailed diagnosis of the Argentine university system regarding sustainability, analyzing for the first time key variables together that allow for the identification of patterns and gaps not addressed in previous studies. This methodological framework is replicable and expands the global debate on the factors that favor sustainability research, providing key evidence for the design of university policies aligned with the 2030 Agenda.

To overcome the identified limitations and strengthen sustainability research, several practical recommendations are proposed. First, it is crucial to foster inter-university collaboration networks, both among public and private institutions and with external stakeholders. This would allow for the sharing of resources, experiences, and best practices, boosting interdisciplinary projects that are currently hindered by a lack of articulation. A specific mechanism could be the creation of joint research platforms that promote the co-creation of knowledge and mentoring between universities with more and less development in this area. Second, the allocation of specific financial and human resources is required for sustainability research, including funding programs for institutes and observatories, as well as incentives for publishing in specialized journals. Finally, the integration of sustainability indicators into university accreditation processes could act as a powerful incentive for universities to develop and institutionalize more solid strategies in this field, promoting an academic culture oriented toward sustainability.

It is important to acknowledge the limitations of this study. Data collection was based exclusively on information available on official university websites, which may lead to biases due to a lack of updates, availability, or transparency in the publication of institutional information. This could imply that some sustainability initiatives were not recorded in this analysis. Furthermore, as a descriptive study based on documentary data, it does not

delve into the motivations, challenges, and internal strategies of universities for incorporating sustainability. Therefore, future research could complement these findings with qualitative methodologies, such as interviews with academic managers and researchers, to better understand the internal dynamics. Likewise, a comparative analysis with universities from other countries would allow for an evaluation of the positioning of the Argentine university system in an international context. Finally, the development of longitudinal analysis models would contribute to identifying trends and evaluating the evolution of Argentine universities' commitment to sustainability over time.

This study emphasizes that sustainability should not be seen as an additional option but as an urgent necessity for Argentine universities to fulfill their transformative role in society. The integration of strategic plans, the strengthening of research capacities, and the promotion of an academic culture oriented toward sustainability are essential steps to position the Argentine university system as a relevant actor in the transition toward sustainable development.

Declaration of Conflicting Interests

The author have not declared any potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

This research was funded by the National Scientific and Technical Research Council (CONICET) and the Catholic University of Cuyo.

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