

Training for sustainability in the Triple Helix: assessment of an intersectoral diploma program

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ABSTRACT: This study's primary objective was to describe and explain the impact of sustainability education within the framework of university-industry-government cooperation. We evaluated an intersectoral diploma program in Corporate Social Responsibility and Sustainability, analyzing the training provided and its applicability across different economic sectors. A case study methodology combining qualitative and quantitative approaches was employed. Data were collected from 189 graduates through surveys, documentary analysis of sustainability plans designed by them, and a literature review. Results indicated that graduates positively valued the training received and the applicable tools acquired, with 85% reporting high satisfaction. While designed sustainability plans were not fully implemented, participants found the knowledge highly applicable (78%). Differences in sustainability adoption were identified by employment sector, with lower integration in the governmental sector, highlighting specific challenges. The study's findings suggest strengthening knowledge transfer mechanisms and establishing post-training follow-up strategies to overcome implementation barriers. This research underscores the potential of intersectoral cooperation in sustainability education and its role in fostering sustainable management practices across diverse organizational contexts.

KEYWORDS: sustainability education, triple helix model, intersectoral cooperation, corporate social responsibility, knowledge transfer

1. INTRODUCTION

Sustainability has been recognized as a global challenge that requires the cooperation of multiple stakeholders for effective implementation (Baranowski et al., 2025; Eiselein & Langenus, 2025). The United Nations 2030 Agenda establishes a framework for action based on the Sustainable Development Goals (SDGs), promoting strategies that integrate economic development, social equity, and environmental protection (Arias-Valle & Coria Augusto, 2024; Elkington, 1998). However, the lack of articulation among universities, businesses, and governments remains an obstacle to the implementation of sustainable policies and practices across sectors (Emon et al., 2025; Guruprasad et al., 2023). Despite growing interest in CSR and the need to strengthen capacities in this area, structural barriers persist that hinder the training of professionals with applicable skills for sustainable management (Kopnina et al., 2025; Strazzullo et al., 2025).

In this context, the Diploma Program in Corporate Social Responsibility and Sustainability emerges as a model of intersectoral cooperation in the province of San Juan, Argentina. This initiative, driven by the National University of San Juan (UNSJ), the Catholic University of Cuyo (UCCuyo), the Ministry of Human Development and Social Promotion, and various local companies, seeks to provide participants with theoretical and practical tools for sustainability management in different organizational settings (Filho et al., 2024a; Trencher et al., 2014). Through interdisciplinary and applied training, this diploma addresses the need to bridge the gap between academic knowledge and its implementation in the productive sector, promoting collaboration among academia, the business sector, and government as a key strategy for advancing regional sustainability (Bouherar & Salem, 2025; Orecchini et al., 2012).

Previous research has demonstrated that alliances among university, industry, and government can generate positive impacts on innovation and the training of professionals with sustainability competencies (Inzelt, 2004). The Triple Helix model (Etzkowitz & Leydesdorff, 2000) has been widely studied as an effective mechanism for knowledge production and transfer. Nevertheless, recent studies have identified challenges in its implementation, including a lack of coordination among actors, limited adaptation of higher education to labor-market demands, and difficulty in measuring the impact of these initiatives on sustainable development (Gomez et al., 2023; Mueller et al., 2024). While global CSR and sustainability training experiences exist, few have been designed with a specific focus on articulating these three sectors in a local context, as is the case in San Juan province (Arias-Valle & Marimon, 2025; Lozano et al., 2017).

This study aims to analyze the implementation and impact of the Diploma Program in Corporate Social Responsibility and Sustainability as an intersectoral cooperation model, contributing to the debate on the effectiveness of such programs in training agents of change. Unlike previous studies that have focused on the conceptualization of sustainability education (Arias-Valle et al., 2024; Arias-Valle & Marimon, 2024b) or univer-

sity-industry linkage experiences in specific environments (Nawaz & Koç, 2020), this work provides empirical evidence on the applicability of acquired knowledge in the productive and governmental sectors, exploring participants' perceptions and the impact of developed sustainability plans.

The present study seeks to answer the central research question: To what extent has the Diploma Program in Corporate Social Responsibility and Sustainability strengthened cooperation among universities, businesses, and government in San Juan, and what has been its impact on building sustainability capacities? To this end, the following objectives are proposed: to evaluate the participation and diversity of stakeholders involved in the diploma program, and to analyze the sustainability plans designed for different sectors. It is hypothesized that the diploma program has been an effective instrument for strengthening university-industry-government articulation, enabling the transfer of sustainability knowledge and promoting concrete changes in participating organizations.

From a methodological perspective, the case study follows an empirical approach, combining documentary analysis. The research adopts a mixed-methods design, combining quantitative and qualitative techniques to evaluate the program's impact and its contribution to regional sustainable development. Official program documents and sustainability plans developed by graduates are analyzed.

The study's relevance lies in its contribution to understanding sustainability training processes from an intersectoral perspective, providing empirical evidence on the outcomes of cooperation among universities, businesses, and governments in local contexts (Inzelt, 2004). It offers a detailed analysis of higher education's role in promoting CSR and sustainability in the business sphere (Akinsemolu & Onyeaka, 2025; El-Bassiouny, 2025), as well as the challenges and opportunities for consolidating applied education models on these topics (Lafuente-González & Leiva, 2021). In a context where sustainability has become a global priority but where gaps still exist in implementing effective strategies, this study offers an innovative perspective applicable to other regions seeking to strengthen sustainability training through intersectoral cooperation (Ali, 2025; Arias-Valle & Mari-mon, 2025c).

This article is organized into four main sections. Following this introduction, Section 2 develops the literature review, addressing a conceptual framework on university-industry-government cooperation and education for sustainability. Section 3 details the methodology used, describing the study's approach, the analyzed population, and data collection techniques. Subsequently, Section 4 presents the results, including analyses of participation in the diploma program and the designed sustainability plans. Finally, Section 5 presents the discussion and conclusions, highlighting the study's main contributions and offering recommendations for future sustainability training initiatives.

2. LITERATURE REVIEW

Higher education (HE) is a fundamental pillar for building sustainable societies (Ali, 2025; Filho et al., 2024b), as it fosters professionals with the necessary competencies to lead sustainable development strategies across diverse sectors (Akinsemolu & Onyeaka, 2025; Gomez et al., 2023). In this context, the integration of sustainability into university curricula has gained significant relevance in recent years, with an increasing emphasis on the need to promote cooperation among universities, businesses, and governments for the effective implementation of CSR principles and the SDGs (Abdou & Ammar, 2025; Alm et al., 2022).

This study is premised on the idea that the Diploma Program in Corporate Social Responsibility and Sustainability represents an innovative model of intersectoral cooperation, capable of overcoming traditional limitations in sustainability training. Drawing from recent literature, this section examines the main theoretical approaches underpinning the study, establishing a relationship between the state of the art in university-industry-government collaboration and sustainability education.

The Triple Helix model, developed by Etzkowitz and Leydesdorff (2000), is one of the most influential theories in the literature on innovation and economic development. This model posits that the interactions among universities, businesses, and governments constitute a dynamic system that drives knowledge production and technology transfer, fostering innovative solutions to sustainable development challenges (Abdullahia, 2025). In this regard, higher education plays a central role, not only by forming human capital but also by serving as a space for generating applied knowledge and fostering linkages with the productive sector (Ali, 2025; Tilbury, 2011).

Recent research has shown that strategic alliances among universities, businesses, and governments can positively impact the implementation of sustainability strategies, leading to more effective public policies and the adoption of responsible business practices (Sánchez & Segovia-Pérez, 2023; Trencher et al., 2013). However, these processes are not without challenges. The literature identifies one of the primary obstacles to implementing intersectoral collaboration models as the lack of alignment among actors' interests, which creates difficulties in coordinating and sustaining these initiatives (Arias-Valle & Marimon, 2025d; Inzelt, 2004).

In this context, the Diploma Program in Corporate Social Responsibility and Sustainability represents a concrete case of articulation among academia, the productive sector, and government. It aims to train professionals with sustainability competencies and promote the implementation of CSR strategies in various organizations (Cembranel et al., 2024; Quirós-Alpera et al., 2025). This training model has the potential to overcome traditionally identified barriers in the literature by integrating active learning methodologies and an applied approach that facilitates knowledge transfer from the university to

the productive and governmental sectors (Achkar, 2025; Agrawalla & Banerjee, 2025).

Education for sustainability is an evolving field that seeks to develop key competencies in students for managing sustainable development challenges (Lozano et al., 2017; Shih et al., 2025). UNESCO (2022) has emphasized the importance of adopting teaching approaches that enable students not only to comprehend sustainability principles but also to apply this knowledge in practice. To this end, the adoption of active teaching methodologies, such as project-based learning, service-learning, and interdisciplinarity, has been promoted and has proven effective in training sustainability leaders (Lozano et al., 2017; Sánchez Reyes & Del Valle Cermeño Guaina, 2022).

Recent literature indicates that higher education programs in sustainability should focus on developing transversal skills, such as systemic thinking, complex problem-solving, and informed decision-making (Lechuga-Jimenez et al., 2024; Tójar-Hurtado et al., 2024). These approaches align with international recommendations for sustainability education, which emphasize fostering teamwork, creativity, and adaptability to changing contexts (UNESCO, 2022).

The impact of sustainability education extends beyond the academic sphere, directly influencing graduates' employability and professional performance (Gomez et al., 2023; Zientara et al., 2025). Recent studies have identified that professionals with sustainability training have greater opportunities for labor market integration, as companies and organizations increasingly require experts capable of managing their sustainability strategies and ensuring compliance with environmental and social regulations (Hang & Zhang, 2025; Nijhawan et al., 2025).

From this perspective, the Diploma Program in Corporate Social Responsibility and Sustainability is configured to align with international best practices in sustainability education. Its curriculum design combines theoretical modules with practical applications, facilitating the acquisition and application of specialized knowledge in real-world settings. This approach contributes to developing a new generation of professionals with leadership capacity in the transition towards more sustainable management models (Gomez et al., 2023; Shih et al., 2025).

CSR has evolved from a philanthropic vision to a strategic approach that integrates environmental, social, and governance (ESG) criteria into business management (Dmuchowski et al., 2023; Kandpal et al., 2024). The literature demonstrates that adopting CSR practices not only enhances corporate reputation but also generates sustainable competitive advantages in the long term (Maheshwari et al., 2025; Ragazou et al., 2025). In this sense, CSR training is crucial to ensure that professionals and business leaders possess the necessary tools to design and implement effective sustainability strategies (Aversano & Nicoliello, 2025; Guruprasad et al., 2023).

Recent studies have highlighted that one of the main challenges for adopting CSR strat-

egies in companies is the lack of specific training and capacity building in these areas (Arias-Valle & Marimon, 2024a; Quirós-Alpera et al., 2025). Although sustainability has become a business imperative, many organizations still lack personnel trained to integrate these principles into their business models (Sancak, 2023; Torres de Oliveira et al., 2023). In this context, sustainability training programs, such as the diploma analyzed in this study, play a fundamental role in building capacities within the productive sector (Li, 2024; Singh et al., 2022).

The impact of CSR training is observed not only at the organizational level but also positively affects companies' cultural transformation and their relationships with the community (Bedoya et al., 2025; Chen et al., 2024). Research has shown that incorporating ESG criteria into business decision-making fosters the creation of shared value and strengthens the bond between organizations and their stakeholders (Lehmann, 2006; Quirós-Alpera et al., 2025).

The literature review evidences that cooperation among universities, businesses, and governments is a key mechanism for promoting sustainability, but it faces challenges that hinder its effective implementation (Ali, 2025; Othman & Omar, 2012). Furthermore, sustainability education has been identified as having a positive impact on transforming organizational environments, yet its integration into higher education remains limited in many contexts (Benlaria & Almawishir, 2025; Chen et al., 2025).

This study provides an empirical analysis of the impact of a training program designed to strengthen intersectoral cooperation and the implementation of sustainability strategies. Unlike previous research that has approached these topics from a theoretical perspective, this work provides concrete data on the experience of the Diploma Program in Corporate Social Responsibility and Sustainability in San Juan, enabling its evaluation for applicability in other contexts.

The following sections present the methodology used to analyze the program's impact, as well as the results from analyzing graduates and their integration into the productive sector.

3. METHODOLOGY

This study follows a case study approach, aiming to analyze the implementation and impact of the Diploma Program in Corporate Social Responsibility and Sustainability in the province of San Juan, Argentina. According to Yin (2013), the case study is an appropriate research strategy for examining a phenomenon in its real-life context and for requiring an in-depth understanding of its processes and effects. The selection of the case study responds to the need to understand how an educational program can strengthen the linkages among universities, the productive sector, and the government to promote sustainability.

3.1 CASE STUDY DESIGN

The research design is structured around a holistic, embedded model that considers both the educational experience of the diploma program and its impact on graduates, as well as the development of sustainability plans. Multiple sources of evidence were utilized, enabling data triangulation that strengthens the validity of the findings and provides a comprehensive understanding of the analyzed phenomenon.

3.2 UNIT OF ANALYSIS AND SAMPLE

The study's unit of analysis is the Diploma Program in Corporate Social Responsibility and Sustainability, focusing on its academic design, the profile of its graduates, the applicability of the acquired knowledge, and its contribution to sustainability across different productive sectors. The sample comprises the 189 graduates who completed the diploma program, representing diverse productive sectors and organizational levels.

3.3 SOURCES OF EVIDENCE AND RESEARCH PROTOCOL

To ensure the reliability and internal validity of the study, diverse sources of evidence were employed:

- (i) Documentary Analysis: Institutional documents of the diploma program were reviewed, including the curriculum, module contents, approval resolutions, and evaluation criteria. The 189 sustainability plans designed by the graduates were also analyzed, classifying them by productive sector and thematic area.
- (ii) Satisfaction Survey: A structured survey was administered to graduates, featuring a Likert scale and open-ended questions. Its objective was to evaluate their perceptions of program quality, the applicability of the knowledge they acquired, and cooperation among the university, business, and government.
- (iii) Evaluation of Knowledge Applicability: The designed sustainability plans and graduates' intention to implement them in their organizations were analyzed, identifying barriers and opportunities for execution.

The research protocol was designed to ensure methodological coherence by establishing criteria for data inclusion and exclusion, procedures for data collection, and strategies to ensure analytical objectivity.

3.4 DATA ANALYSIS STRATEGY

A mixed-methods analysis strategy was adopted, combining qualitative and quantitative techniques to interpret the obtained data:

- Classification of Sustainability Plans: Plans were grouped according to productive sector and intervention axis using an analysis matrix to identify patterns and trends.
- Analysis of Graduate Perception Trends: Frequencies and percentages of survey responses were calculated to assess the level of satisfaction, knowledge applicability, and perception of intersectoral cooperation.
- Source Triangulation: Findings from the survey were contrasted with documentary analysis and the evaluation of the designed plans, ensuring a substantiated and objective interpretation.

3.5 RELIABILITY AND INTERNAL VALIDITY

To ensure data reliability, rigorous criteria were established for information collection and analysis, avoiding biases in result interpretation. Furthermore, it is acknowledged that the findings are subject to limitations in internal validity, as graduates' perceptions and the applicability of their acquired knowledge may evolve over time.

3.6 CONCURRENT THEORIES

The study engages with prior theories on sustainability education and intersectoral cooperation, framed within the Triple Helix model (Etzkowitz & Leydesdorff, 2000), which describes the interaction among university, industry, and government as a driver of innovation and sustainable development. It also draws on competency-based education and experiential learning, which emphasize integrating theory and practice in professional training.

The adopted methodological approach offers an integrated view of the diploma program's impact, providing evidence of its relevance in training professionals capable of applying sustainability strategies across various productive sectors.

4. RESULTS

The results of the analysis of the Diploma Program in Corporate Social Responsibility and Sustainability reflect its impact at different levels, from the participation and diversity of stakeholders to the training of graduates and the design of sustainability plans for various organizations. Although the sustainability plans were not ultimately implemented, their design enabled participants to apply their knowledge in a practical context and develop strategies tailored to each organization's needs and characteristics.

4.1 PARTICIPATION AND DIVERSITY OF REPRESENTED SECTORS

The program had 468 registrants, of whom 189 participants successfully completed the

diploma, fulfilling the academic requirements and submitting a sustainability plan as their final integrative project. Registrants were classified according to the Triple Helix model, with the government represented by 20%, universities by 19%, and the business and industrial sector by 61%.

The diversity of sectors represented in the diploma program highlights the program's relevance across various organizational and productive spheres. The business-industrial sector, in turn, is further divided by activity type. Among the organizations for which sustainability plans were designed, the following are noteworthy:

Industry and Manufacturing: ARCOR San Juan, Acer San Juan SRL, Los Azules Mining Company.

Health and Wellness: Sanatorio Argentino, Hospital Rawson Pharmacy, San Juan Orthopedics and Traumatology Association.

Trade and Production: Grupo Libertad, Elebe Producciones, Seralico S.A., Portogellato.

Construction and Financial Services: SJB Finanzas Expertas, Constructora Valdivieso y Debandi, Construcciones Ivica y A. Dumandzic S.A.

Education and Governmental Organizations: Catholic University of Cuyo, National University of San Juan, UCCuyo Copy Center, Directorate of Social Economy of the Ministry of Family and Human Development.

These data indicate that the diploma program not only attracted participants from the academic sector but also generated interest among professionals from the private and public sectors, reinforcing its potential to influence various societal domains.

4.2 EVALUATION OF KNOWLEDGE TRANSFER ACROSS SECTORS

The registration form included questions about participants' existing knowledge or training in CSR, their sustainability plans, and their experience implementing those plans. Figure 1 illustrates these findings.

4.3 DESIGN OF SUSTAINABILITY PLANS FOR ORGANIZATIONS

One of the main outputs of the diploma program was the design of 189 sustainability plans, developed by participants as part of their final project. Although these plans were not implemented, their development enabled graduates to apply the knowledge they acquired in the program in a real organizational context. The results regarding course satisfaction are as follows:

The results of the satisfaction survey administered to the 189 graduates of the Diplo-

ma Program in Corporate Social Responsibility and Sustainability reflect a highly positive evaluation of the program, emphasizing its relevance, applicability, and pedagogical quality. Overall, 85% of graduates reported being very satisfied or satisfied with the training received, highlighting the clarity of the content, the program's modular structure, and the relevance of the topics addressed.

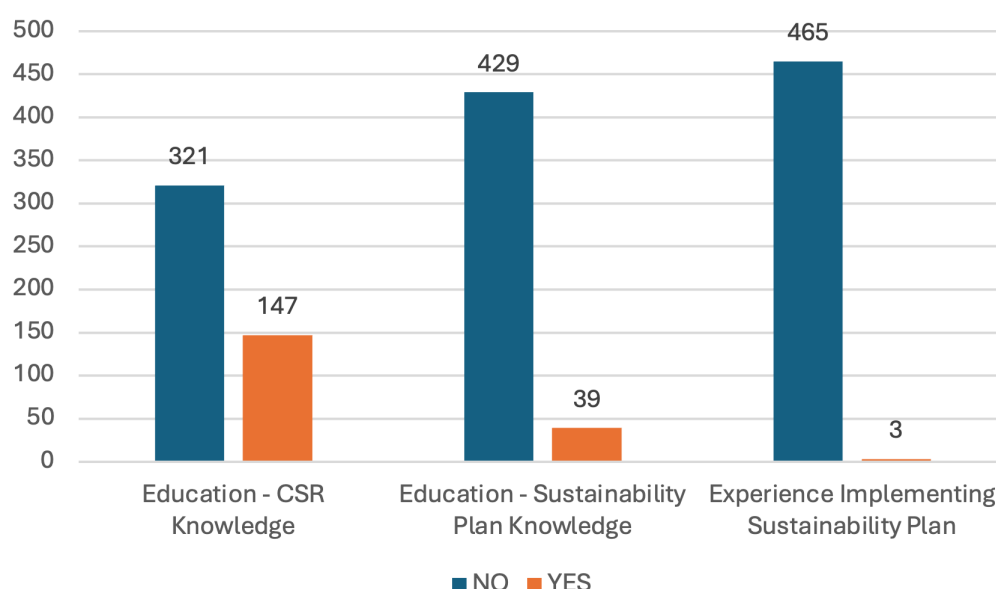


Figure 1. Participant Training and Experience
Source: Own elaboration

Regarding the applicability of acquired knowledge, 78% of participants indicated that the tools and strategies learned are viable and applicable in their organizations. Furthermore, 65% noted that the diploma program enabled them to identify opportunities to improve the sustainable management of their workplaces, thereby promoting the incorporation of environmental, social, and governance (ESG) criteria into their professional practices. 42% of graduates expressed their intention to present the sustainability plans designed during the diploma program to their organizations' authorities for future implementation.

Regarding perceptions of intersectoral cooperation among universities, businesses, and government, 82% of respondents valued the linkages generated throughout the program, indicating that interactions across sectors enriched their perspectives on sustainability and social responsibility. Of these, 40% stated that participation in the diploma program strengthened their networks of contacts with key actors from the productive and governmental sectors, opening opportunities for future joint project implementation.

Another notable aspect in the program's evaluation was the quality of the faculty and teaching methodology. 88% of participants considered that instructors demonstrated a high level of expertise in sustainability and social responsibility. In comparison, 75% affirmed that the combination of theory and practice facilitated the understanding and

application of the concepts discussed. Likewise, 70% of graduates positively valued the integrative final project, highlighting it as an opportunity to develop concrete solutions aligned with sustainability challenges in their respective sectors.

The survey included an open section for comments and suggestions, where several participants expressed interest in continuing their sustainability education, suggesting the creation of specialization programs or post-diploma mentorships to support the implementation of the plans developed. Additionally, an opportunity was identified to strengthen graduate follow-up, aiming to evaluate the adoption of sustainability strategies in their organizations and foster their effective long-term application.

These findings confirm the positive impact of the Diploma Program in training professionals with sustainability competencies, underscoring its contribution to strengthening cooperation among universities, businesses, and governments. The high valuation by graduates and their intention to transfer the knowledge they acquire to their organizations suggest that the program represents a successful model of applied sustainability education, with potential for replication in other contexts.

4.3.1 TYPOLOGY OF DESIGNED SUSTAINABILITY PLANS

The results regarding the distribution of sustainability plans by productive sectors reflect significant interest in key areas for implementing social responsibility and sustainable development strategies. The health sector accounted for the largest number of designed plans, representing 23% of the total. This suggests that participants identified opportunities in environmental management in hospitals and clinics, reducing the impact of biomedical waste, and incorporating energy efficiency practices in the healthcare sector.

Secondly, the food industry accounted for 18% of the planned initiatives, indicating a concern for sustainability in food production, distribution, and consumption. Trends towards circular economy models, food waste reduction, and the use of responsible inputs may have influenced this choice.

Sectors such as communication and construction, each with 13%, also had a significant presence in sustainability strategy planning. In communication, the need for campaigns and dissemination strategies promoting responsible practices across various organizational settings stands out. In construction, interest may stem from the growing demand for sustainable building, energy efficiency, and eco-efficient materials in infrastructure projects.

Sectors including mining, finance, transport, and metallurgy each accounted for 7% of the designed sustainability plans. Although these sectors have a high environmental and social impact, their relatively low distribution compared to health and food might indicate that barriers still exist in adopting sustainable strategies within these industries. Nevertheless, the presence of these sectors suggests an emerging interest in implement-

ing changes towards more sustainable models in these areas.

Conversely, the gastronomy sector, with 6% of the plans, showed moderate interest in sustainability strategies, which could be linked to the adoption of waste reduction practices, responsible input consumption, and improved water and energy management in restaurants and food services.

In the government sector, only 5% of the planned projects were oriented towards this area. This could indicate a lower representation of governmental actors in the diploma program or the need to strengthen the public sector's commitment to implementing sustainable strategies. Given the government's key role in formulating sustainability policies, this data highlights an opportunity for improvement in future editions of the program.

Finally, the security sector, with barely 1%, had the fewest sustainability plans designed. This result may be related to the perception that sustainability has less applicability in this domain, reinforcing the importance of continuing to promote a holistic vision of sustainability across all productive sectors.

These findings indicate that the diploma program successfully addressed sustainability transversally across various organizational settings. However, the uneven distribution of plans suggests that some sectors require greater impetus to integrate sustainable strategies, offering an opportunity to adapt the content of future program editions and strengthen training in areas with less sustainable development. Figure 2 presents these results.

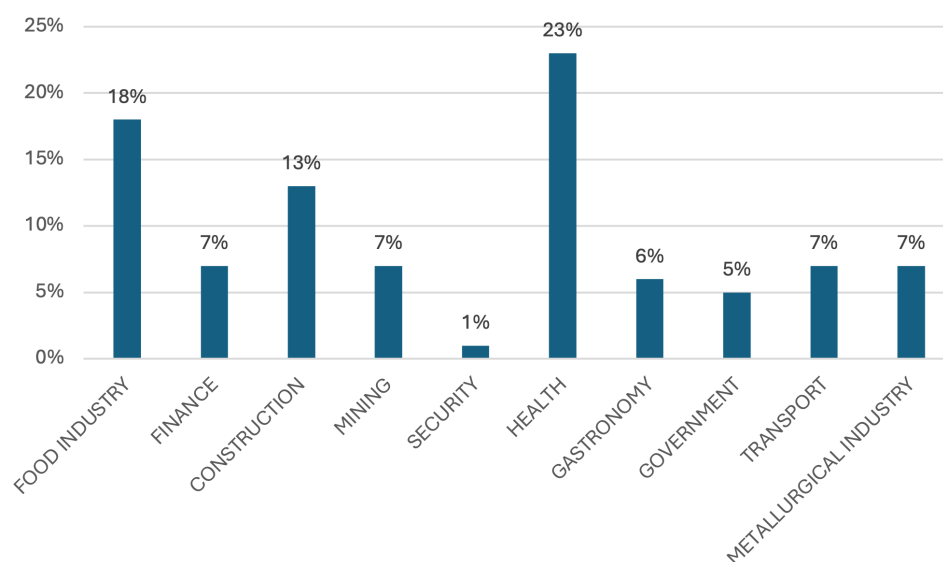


Figure 2. Sustainability Plans by Productive Sector
Source: Own elaboration

5. DISCUSSION

The Diploma Program in Corporate Social Responsibility and Sustainability has successfully established itself as an innovative model of sustainability education with an intersectoral approach that involves universities, businesses, and government. This study significantly contributes to the field of sustainability education by addressing a gap in the literature on intersectoral cooperation for training professionals with sustainable development competencies (Baranowski et al., 2025). While numerous investigations analyze the implementation of sustainability in higher education and its impact on human capital formation (Achkar, 2025; Arias-Valle & Marimon, 2025b), few studies have empirically explored how a diploma program model articulated among these three sectors can generate learning applicable to diverse organizational contexts.

The results obtained throughout the study demonstrate that sustainability training can contribute significantly to the development of competencies applicable to various productive and management sectors, aligning with previous studies that have highlighted the importance of higher education in promoting sustainable development (Filho et al., 2024). However, despite the high level of satisfaction expressed by graduates, the effective implementation of the designed plans remains a challenge, reinforcing the need to explore strategies that facilitate the transition from theory to practice (Arias-Valle & Marimon, 2025b).

One of the key findings of this study is the relevance of the Triple Helix model (Etzkowitz & Leydesdorff, 2000), which posits that collaboration among universities, industry, and government constitutes a strategic axis for generating innovation and integrating sustainability into organizational management. While the diploma program has fostered this synergy through its training structure and participant diversity, the data reflect that difficulties in articulation among these actors still persist. Previous research has indicated that intersectoral cooperation in sustainability faces barriers related to disparities in strategic objectives, implementation timelines, and resource availability for launching sustainable initiatives (Trencher et al., 2013). In this sense, the diploma program's experience demonstrates that the formation of specialized human capital is a fundamental step, but not sufficient if it is not accompanied by institutional policies and strategies that incentivize the implementation of sustainable practices within organizations.

From an educational perspective, the results confirm the need to adopt active pedagogical approaches that allow participants not only to acquire theoretical knowledge but also to develop applicable competencies in sustainability management. Previous studies have shown that sustainability education programs should include methodologies such as project-based learning, interdisciplinarity, and real-world problem-solving to ensure that graduates can translate acquired knowledge into concrete actions (Lozano et al., 2017). In this regard, the diploma program has incorporated these elements by developing sustainability plans as part of its training process.

One factor that can influence the gap between training and the application of sustainability is institutional resistance to change. Sterling (2011) argues that education for sustainability, while capable of generating individual-level transformations, faces significant barriers in translating these learnings into organizational practices. The results of this study reinforce this idea. Although graduates have expressed high satisfaction with the training received and have acquired tools for sustainable management, the lack of incentives and supportive structures within their organizations hinders the effective implementation of the plans. Another limitation identified in this study is the underrepresentation of the government sector in the developed sustainability plans. Although the government plays a key role in promoting sustainability through regulations and policies, evidence suggests that its adoption within public management structures remains limited (Filho et al., 2024). This aligns with previous research indicating that, while sustainability has become a strategic objective in many countries, its integration into public management often faces obstacles such as a lack of political will, bureaucracy, and inadequate funding for long-term projects (Baranowski et al., 2025; Sánchez & Segovia-Pérez, 2023). In this regard, future editions of the diploma program could strengthen the inclusion of governmental actors and design specific strategies for implementing sustainability in public administration.

From a practical perspective, the results of this study have important implications for the design of future sustainability training programs. Evidence suggests that integrating participatory and problem-solving methodologies is key to ensuring that graduates not only acquire knowledge but also develop competencies for managing change in their organizations (Lechuga-Jimenez et al., 2024). Furthermore, establishing alumni networks and mentorship programs is recommended to facilitate the exchange of experiences and mutual support in implementing sustainability strategies.

Methodologically, the study presents certain limitations that must be considered in future research. Firstly, the investigation is based on graduates' perceptions of knowledge and competency acquisition, which may introduce biases related to self-assessment and social desirability. Additionally, the lack of a control group prevents comparisons between diploma participants and other professionals who have not received sustainability training. Future studies could adopt a longitudinal design to analyze the actual implementation of sustainability plans and evaluate the impact of the training over time.

Finally, a relevant line of research would be the comparison of different models of sustainability training. The results indicate that graduates consider the training has provided them with concrete tools for sustainable management, although practical implementation still faces structural barriers (Shih et al., 2025). This would allow identifying which methodologies are most suitable for different contexts and organizational levels.

In conclusion, the Diploma Program in Corporate Social Responsibility and Sustainability has proven to be an effective initiative for training agents of sustainability change.

Still, its results highlight the need to strengthen mechanisms that facilitate the effective implementation of acquired knowledge. Education for sustainability must go beyond the transmission of theoretical knowledge and focus on creating support structures that enable graduates to materialize their learning into concrete actions. As sustainability continues to consolidate as a central axis in business and governmental management, it will be fundamental to continue exploring training strategies that facilitate its effective integration and long-term impact.

6. CONCLUSION

The Diploma Program in Corporate Social Responsibility and Sustainability has demonstrated to be an innovative model of sustainability training, solidifying the linkage among academia, the productive sector, and government. Based on the analysis of its results, its impact on the acquisition of applicable knowledge and the design of sustainability strategies aligned with organizational needs has been evidenced. However, it is recognized that the effects of sustainability training are subject to changes in institutional dynamics, the prioritization of sustainability on business and governmental agendas, and graduates' capacity to influence their work environments over time. The lack of implementation of the designed plans underscores the need to establish follow-up mechanisms to evaluate their viability and adaptability in changing contexts, ensuring that formulated strategies do not remain theoretical but can translate into concrete transformations.

The relevance of this study lies in its contribution to understanding how higher education can play a key role in building capacities for sustainability, overcoming the limitations previously identified in the literature regarding the gap between academic training and practical application. Unlike more traditional approaches to sustainability education, the diploma program has incorporated active methodologies that foster the development of skills for designing responsible organizational strategies. This finding addresses the need to advance educational models that not only transmit knowledge but also foster the capacity for action in trained professionals.

While this study has allowed for identifying advancements in the field of sustainability education, it also underscores the need to strengthen the link between training and the effective implementation of organizational strategies. The challenges related to the adoption of sustainable practices in the analyzed institutions demonstrate that organizational transformation does not depend solely on individual training, but also on institutional commitment and the availability of incentives and resources that facilitate the application of acquired knowledge. In this regard, future research should delve deeper into the impact of similar training programs, accounting for their evolution over time and the influence of external factors on the adoption of sustainability strategies.

In conclusion, the Diploma Program in Corporate Social Responsibility and Sustainability represents a replicable model for sustainability education, standing out as a formative

experience that has enabled its graduates to develop competencies in social responsibility and sustainable organizational management. Nevertheless, the scope of its impact will depend on the continued support for graduates and the integration of sustainability strategies into the institutional policies of the organizations involved. This study reaffirms the importance of education as a driver of change towards sustainability. It highlights the need to consolidate intersectoral mechanisms for articulating knowledge generated in the academic sphere to ensure its effective application.

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