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Innovation, sustainability and leadership in crisis: integrated strategies for organisational resilience[1]

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Abstract

This systematic review examines how the adoption of emerging technologies, the implementation of sustainable practices, and transformational leadership interact to strengthen organizational resilience in contexts of high uncertainty. The objective was to identify integrated approaches that enable organizations to respond effectively to crises, in alignment with Sustainable Development Goal 9. The methodology followed the PRISMA 2020 guidelines, applying inclusion and exclusion criteria to peer-reviewed literature published between 2020 and 2025 from the Scopus database. Thirty-five studies addressing the dimensions of leadership, sustainability, and digital innovation in complex organizational settings were selected. The results indicate that integrating agile methodologies with digital transformation processes enables rapid and creative responses, while sustainable strategies enhance operational continuity. Transformational leadership fosters cohesion and innovation within teams. It is concluded that a systemic approach that combines technology, sustainability, and leadership is essential to enhance organizational adaptability, reduce risks, and promote responsible management focused on balanced organizational development.

Keywords

Technological innovation; sustainable development; leadership; resilience.

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Innovación, sostenibilidad y liderazgo en crisis: estrategias integradas para la resiliencia organizacional

Resumen

Esta revisión sistemática examina cómo la adopción de tecnologías emergentes, la implementación de prácticas sostenibles y el liderazgo transformacional se articulan para fortalecer la resiliencia organizacional en contextos de alta incertidumbre. El objetivo fue identificar enfoques integrados que permitan afrontar crisis con eficacia, alineados con el Objetivo de Desarrollo Sostenible 9. La metodología se desarrolló bajo los lineamientos PRISMA 2020, aplicando criterios de inclusión y exclusión sobre literatura académica publicada entre 2020 y 2025 en la base de datos de Scopus. Se seleccionaron treinta y cinco estudios que abordaban las dimensiones de liderazgo, sostenibilidad e innovación digital en entornos organizacionales complejos. Los resultados muestran que la integración de metodologías ágiles con procesos de transformación digital favorece una respuesta rápida y creativa, mientras que las estrategias sostenibles fortalecen la continuidad operativa. El liderazgo transformacional impulsa la cohesión y la innovación. Se concluye que un enfoque sistémico que combine tecnología, sostenibilidad y liderazgo es clave para potenciar la adaptabilidad organizacional, reducir riesgos y promover una gestión responsable centrada en el desarrollo equilibrado de las organizaciones.

Palabras clave

Innovación tecnológica; desarrollo sostenible; liderazgo; resiliencia.

[1] This article has been corrected.

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1. Introduction

The integration of innovation, sustainability, and leadership in crisis management strengthens organizational resilience in changing environments. According to Zhang and Zhang (2025), generative artificial intelligence enhances decision-making, fosters sustainability, and stimulates innovation. In parallel, transformational leadership-based on role modeling, personalized attention, and intellectual stimulation-improves team effectiveness (Virgana & Fitriani, 2025). This synergy aligns with SDG 9, which promotes innovative and sustainable practices.

Recent studies demonstrate its application in diverse contexts. In China, a longitudinal econometric analysis shows that digital transformation enables agile strategic adjustments (Ma & Zhang, 2025). In Bahrain, a documentary analysis evidences that the integration of sustainability and technology has improved productivity (Ateeq, 2025). In Indonesia, a bibliometric analysis reveals that leadership adapted to generational differences drives organizational creativity (Imaniyati, Ramdhany, Hadijah, Nurjanah, and Santoso, 2025). However, a qualitative case study identifies obstacles such as cultural gaps (Worakittikul, Mangdindam, Ketkaew, Naruetharadhol, 2025) or multilevel quantitative studies show the lack of integration between environmental leadership and GHRM (Mo, Liu, and Lai, 2025) that limit its impact. Furthermore, a qualitative realist evaluation evidences that inadequate leadership or the absence of clear structures adversely affects resilience (Orgill, Marchal, Harris, Gilson, 2025), while a quantitative analysis using SEM demonstrates that the lack of knowledge sharing undermines innovation and organizational well-being (Prentice, Zeidan, and Prentice, 2025).

Methodologically, this research is supported by PRISMA 2020 and integrative review approaches (Page et al., 2021), ensuring thoroughness, clarity, and critical analysis. Theoretically, it is grounded in organizational resilience as adaptive capacity (Duchek, 2020) and in holistic corporate sustainability (Lozano, 2018). Practically, it responds to the challenges of automation and the green transition (World Economic Forum, 2025). Socially, it aligns with the United Nations 2030 Agenda (United Nations, 2015). This conceptual integration recognizes that organizational resilience emerges through adaptive leadership practices that simultaneously address environmental sustainability, social equity, and economic viability. The holistic approach acknowledges that sustainable organizations develop resilient capacities by fostering leadership systems that navigate complex interdependencies between ecological constraints and organizational performance. This integration enables leaders to build adaptive responses that strengthen both organizational sustainability and systemic resilience across multiple operational dimensions.

Furthermore, it is supported by transformational leadership theory, which emphasizes the positive influence of inspirational leaders (Simonton, 1985), and by the concept of organizational resilience built on shared values and vision (Kantabutra & Ketprapakorn, 2021). This research is methodologically justified by its adherence to the PRISMA 2020 statement, which ensures transparency, rigor, and coherence throughout the systematic review process. This guideline allows for a clear structure of the study, from the formulation of the objective to the synthesis and interpretation of findings (Page et al., 2021).

The review is guided by three key research questions that explore how emerging technologies enhance organizational innovation during prolonged crises, how sustainability contributes to operational stability in adverse scenarios, and what role transformational leadership and effective communication play in contexts of high uncertainty. Accordingly, the following objectives are proposed: to analyze the impact of emerging technologies on organizational response capacity, to explore how sustainability fosters resilience and continuity, and to examine how leadership and team cohesion strengthen decision-making in critical times.

Originality of approach

Unlike previous studies that address innovation, sustainability, or leadership separately, this review simultaneously integrates all three pillars, proposing a systemic and updated perspective to face organizational challenges in times of crisis.

2. Methodology

This review adopts a knowledge-building approach from an interpretative perspective (Hernández & Mendoza, 2018). The methodological design corresponds to an integrative systematic review, developed based on the guidelines of the PRISMA 2020 statement (Rethlefsen & Page, 2022), which ensures rigor, traceability, and transparency across all phases of the process-from the search and selection to the critical analysis of scientific sources (Hermoza Llanos, Corves, Huesing and Saxena, 2025). In terms of scope, the study is descriptive-comprehensive, as it seeks not only to organize the available knowledge but also to interpret how the concepts of leadership, sustainability, and innovation interrelate within current organizational contexts (Blanco, 2005).

For the selection of studies, inclusion criteria prioritized research focused on organizational resilience, emerging technologies, sustainable practices, and leadership competencies in crisis contexts. These criteria aimed to ensure the thematic relevance of the articles and their potential to generate actionable recommendations for organizations seeking to strengthen their adaptive capacity.

The initial search was conducted exclusively in the international Scopus database, restricting the review period to the years 2020 to 2025. Specific descriptors such as “organizational sustainability,” “emerging technologies,” “sustainable practices,” and “organizational resilience” were used, combined with Boolean operators like “AND,” and only open-access articles were filtered. This stage identified 779 records. After removing duplicates, 770 unique articles remained for evaluation. Figure 1 presents the PRISMA flow diagram detailing the steps followed from identification to final selection.

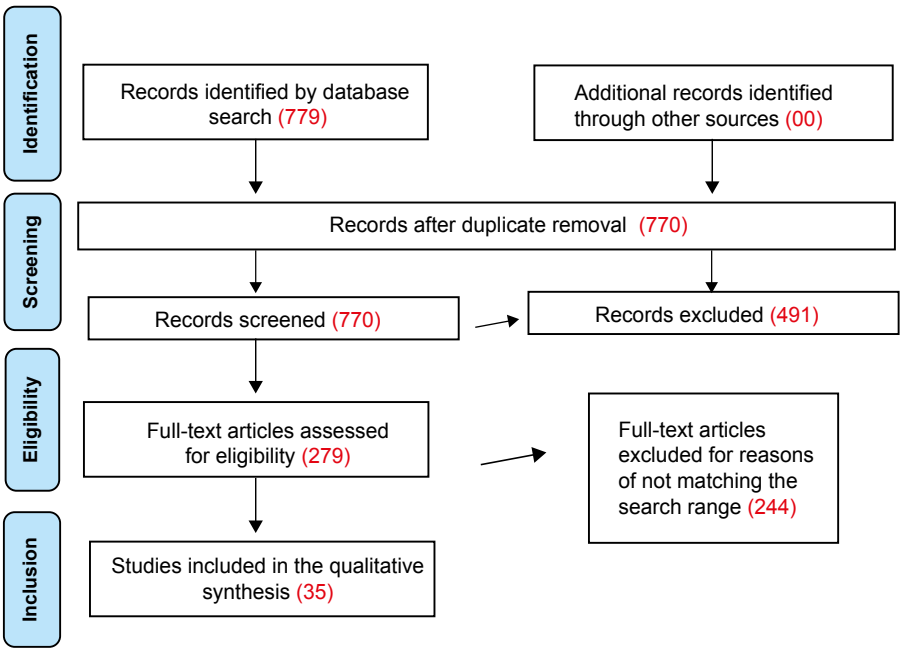

Figure 1. PRISMA Method.
Note: Adapted from the PRISMA method.

Table 1 complements this visualisation by quantitatively detailing the stages of the review process: records identified, selected, excluded and finally included. This reinforces methodological transparency by showing how the final 35 studies were arrived at.

Tabla 1.
Database and stages of data collection.

Database	1. N° Of items identified	2. N° Of items selected	3. N° Of full-text items excluded because they do not match the search range	4. N° Of items included
Scopus	779	279	244	35

Note: Adapted from the PRISMA method.

The selected articles were systematically organized into thematic categories: objective O1 - emerging technologies (12 articles), objective O2 - sustainable practices (11 articles), and objective O3 - leadership competencies (12 articles). This thematic organization follows a deductive approach, where articles are classified according to their primary contribution to each research objective, facilitating systematic evidence analysis and ensuring comprehensive coverage of all study dimensions. Figure 2 illustrates the temporal distribution of publications across these objectives, showing research trends over the analyzed period.

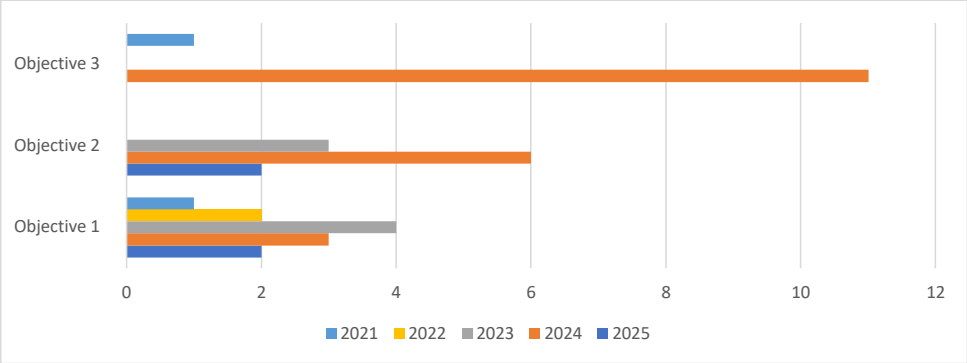

Figure 2. Number and year of publication by objective.
Note: Own elaboration.

The Scopus academic repository was used, limiting the search to the 2020–2025 period and focusing on the subject areas of Business, Management and Accounting, as well as Economics, Econometrics and Finance. Keywords such as “organizational sustainability,” “sustainable practices,” “emerging technologies,” and “organizational resilience” were used, combined with the Boolean operator “AND” and restricted to open-access publications. To illustrate the volume of articles reviewed and their temporal distribution, a graph was created (Figure 3) showing the number of publications reviewed by year and by database.

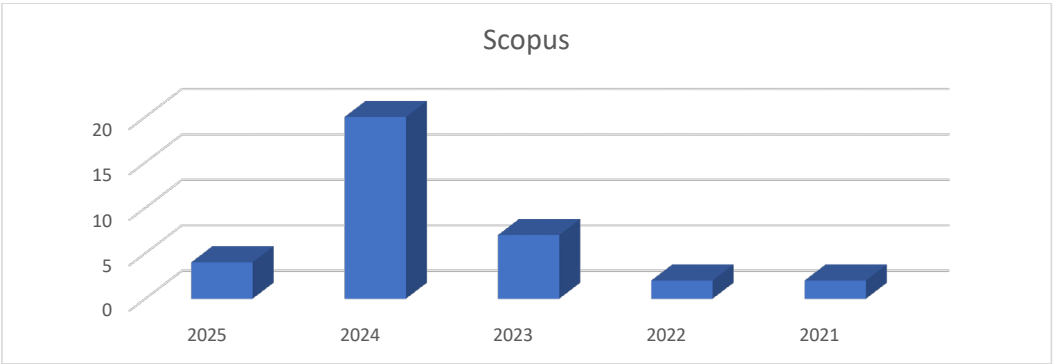

Figure 3. Database.
Note: Own elaboration.

Figure 4, a pie chart, shows the percentage distribution of scientific publications by continent. Asia leads with 52% of the total, reflecting its prominent role as a knowledge generator. This dominance can be attributed to several interconnected factors: aggressive national R&D policies in countries like China, Malaysia, Vietnam, Thailand, Pakistan, Saudi Arabia, and Iran, which have significantly increased public and private investment in research infrastructure; the establishment of universities and research institutes that prioritize scientific production as a pathway to economic competitiveness and regional technological development; and government initiatives that promote research in strategic areas such as sustainability, organizational leadership, and emerging technologies. Additionally, these countries have developed researcher incentive policies and academic collaboration programs that have strengthened their scientific publication capacity. Africa ranks second with 20%, positioning itself as an emerging region in scientific production. Europe accounts for 14%, while the Americas and Oceania have lower shares, with 11% and 3%, respectively. This distribution highlights opportunities to strengthen scientific output in regions with lower global visibility.

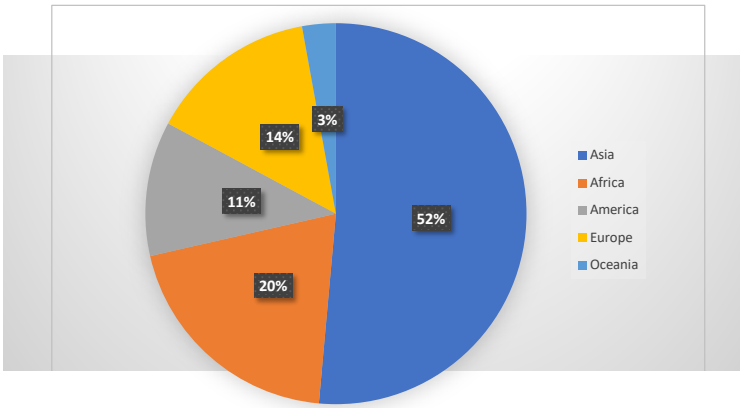

Figure 4. Study locations.
Note: Own elaboration.

Finally, rigorous ethical considerations were applied to ensure the integrity of the study. These included the use of anti-plagiarism tools to verify the originality of sources, as well as strict adherence to the ICONTEC citation style. The methodological procedure was systematically documented using the PRISMA method, thereby ensuring transparency and replicability of the analysis (see Table 2).

Table 2.
Ethical Considerations.

Ethical Aspect	Description
Scientific Integrity	Originality verified using anti-plagiarism tools.
Regulatory Compliance	Application of the ICONTEC citation style in all in-text citations and references.
Transparency	Detailed documentation of each phase using the PRISMA method.

Note: Own elaboration.

3. Results and discussion

3.1. Objective 1: Emerging technologies and agile methodologies to strengthen crisis response.

The adoption of emerging technologies, such as artificial intelligence (AI), has enhanced crisis response capabilities by enabling task automation and decision-making based on predictive analysis (Al-Romeedy & Alharethi, 2024). Such capacity is amplified when technologies like IoT, autonomous robotics, and mobile

solutions are integrated with ambidextrous organizational structures that balance opportunity exploration and operational efficiency (Aslam et al., 2024). In the Latin American context, for example, the development of digital competencies in SMEs in Lima has improved their competitiveness and sustainability (Espina-Romero et al., 2024).

However, this technological modernization brings new challenges, such as vulnerability to cyberattacks, which demands the implementation of protection mechanisms, encryption, and cybersecurity training (Saeed, Altamimi, Alkayyal, Alshehri and Alabbad, 2023). High-complexity sectors like the Royal Australian Navy require advanced simulation models to anticipate critical scenarios (Jnitova, Joiner, Efatmaneshnik and Chang, 2021), confirming that digital transformation is not merely about adopting technologies, but fundamentally redesigning business models (Carroll, Hassan, Junglas, Hess and Morgan, 2023).

During the pandemic, organizations with existing digital capabilities showed greater responsiveness (Browder, Dwyer and Koch, 2024). Nevertheless, accelerated digitalization without a clear strategy may prove ineffective. Bohorquez-Lopez (2022) identifies five key factors that condition effective digital transformation: prior knowledge, available tools, social dynamics, the effects of the pandemic, and post-pandemic adjustments. Accordingly, Reuschl, Deist and Maalaoui (2022) emphasize the importance of leadership, continuous training, and process review.

In this context, Nkomo and Kalisz (2023) propose a strategy focused on the "3Ps" (people, processes, and plant), recommending horizontal leadership and agile methodologies that prioritize employee well-being as the foundation for generating sustainable value. Similarly, the study by Alqahtani, Badi, and Nasaj (2025) shows that adaptive marketing capabilities-such as environmental scanning and rapid experimentation-are aligned with organizational agility to effectively respond in B2B contexts. This finding reinforces prior claims about the need to combine emerging technologies with agile structures to enhance responsiveness. Supporting this, evidence from Latin American organizations, such as SMEs in Lima (Kanaan, AL-Hawamleh, Aloun, Alorfi and Alrawashdeh, 2025), indicates that digital transformation strengthened operational sustainability-provided it was accompanied by collaborative leadership and iterative methodologies.

Critical discussion: Despite the reported progress in adopting emerging technologies as key tools to enhance organizational response capacity, significant limitations remain in their effective implementation within public institutions. Many of the reviewed studies focus on private or corporate contexts with advanced technological and human resources, which reduces the ability to extrapolate these findings to public organizations with more rigid structures or digital backwardness. Furthermore, there is a theoretical gap regarding how to integrate these technologies in an inclusive and sustainable manner within institutional environments with low levels of digital maturity. On a practical level, the findings suggest that technological adoption must be accompanied by horizontal leadership processes, continuous training, and structural redesign-elements that are rarely addressed in an integrated way. Further research is recommended to explore how these technologies can be gradually appropriated by public institutions, considering their actual capacities and avoiding one-dimensional approaches.

3.2. Objective 2: Implementation of Sustainable Practices and Their Contribution to Resilience and Continuity

Agricultural producer organizations (APOs) in India exemplify how the combination of efficient resource management and social cohesion, through collaborative leadership, can enhance sustainability (Suresh & SS, 2024). However, lack of training and capital limits their impact. In response to this challenge, Almuqrin Mutambik, Alomran and Zhang (2023) suggest clear guidelines, increased public awareness, and regulatory frameworks that promote social responsibility accounting (SRA), contributing to both profitability and socio-environmental impact.

Khodamipour, Yazdifar, Shahamabad and Khajavi (2024) agree on the importance of standardization and government incentives to strengthen organizational resilience. In Saudi Arabia, Vision 2030 promotes

innovative practices aligned with sustainability and competitiveness (Allui & Rawshdeh, 2024), while in Thailand, the sufficiency economy philosophy encourages moderation and efficient use of resources as a pathway to ensuring operational continuity (Rungruang, Tanitteerapan, Jitgarun, Sunthonkanokpong and Leekitchwatana, 2024). Nevertheless, these approaches require robust institutional contexts and significant resources, which raises questions about their applicability in the public sector or countries with budgetary constraints and less developed institutional infrastructure.

Similarly, in the fisheries sector, the adoption of responsible practices-such as adequate resource use and ecological management-helps mitigate risks and enhance corporate reputation (Zhang, Jiang and Chu, 2024). Other studies emphasize the importance of supply chain collaboration as a key mechanism to strengthen sector sustainability (Gouiferda & Iddik, 2024), as well as the implementation of sustainable policies and digital tools that enable adaptation to dynamic regulatory scenarios (Pînzaru, Dobrescu, Vitelar, Moldoveanu and Săniuță, 2023). Kara, Akbaba, Yakut, Çetinel and Pasli (2023) demonstrate that green orientation and the ecological management of human resources simultaneously improve innovation and resilience in the face of environmental challenges.

Complementing this perspective, Singh, Martins and Tefera (2025) highlight that sustainable project management-anchored in ethical principles and participatory practices-enables organizations to navigate organizational change more resiliently. Such integrative approach supports strategic alignment and promotes institutional learning as a key mechanism for responding to emerging environments. Likewise, Huzooree and Yadav (2025) propose that strengthening sustainable management competencies not only enhances preparedness for change but also transforms organizational structures into more adaptive and responsible models.

Taken together, the findings support that the strategic implementation of sustainable practices-backed by public policies, collaborative leadership, and ethical management frameworks-is essential to consolidate operational continuity, institutional resilience, and active contribution to the Sustainable Development Goals.

Critical discussion: Although the analyzed studies show significant progress in articulating sustainability and resilience, theoretical gaps remain regarding how these practices are adapted in public contexts with low institutional capacity. Most approaches originate from private sectors or countries with high investment in innovation, limiting their direct applicability to institutions facing budgetary constraints. On a practical level, the findings highlight the need to design policies that integrate sustainability from the strategic planning stage, rather than as a reactive component. Accordingly, further research is needed to understand how regulatory frameworks, organizational culture, and technical capabilities interact to achieve real and sustained operational resilience over time.

3.3. Objective 3: Leadership Competencies and Styles for Team Cohesion and Decision-Making in Times of Crisis.

In volatile environments, ethical, consistent leadership with clear communication is key to building cohesive teams that are agile in decision-making (Resanovich, Hopthrow and de Moura, 2024). Harison and Lahav (2024) emphasize that decisions grounded in a deep understanding of the operational context improve the management of complex projects and strengthen competitive resilience. At the same time, employee empowerment fosters innovation in uncertain contexts (Wang, Jin, Yoo, 2024), and an organizational culture centered on continuous learning reinforces adaptation in times of crisis (Cai, Zhu and Jin, 2024).

In Vietnam, studies show that a green organizational culture, combined with environmentally oriented transformational leadership, drives both innovation and sustainable performance (Thuy, 2024; Alghfeli, Sohaimi and Chik, 2024). Likewise, green human resource management and ambidextrous leadership-balancing strategic vision with implementation-enhance technology adoption and operational efficiency even in demanding industries like mining (Ngoc Huynh, Thanh Nguyen and Y Vo, 2024; Sampene, Li, Esther Agyeiwaa, 2024; Mokganya, Webber-Youngman, Uys and Olwagen, 2024).

Alshahrani (2023) concludes that transformational leadership fosters a collaborative environment that facilitates innovation and decision-making. This is supported by Mach, Ferreira and Abrantes (2022), who demonstrate that transformational leadership directly impacts team performance through cohesion and collective commitment, especially under pressure. Similarly, Armesto-Céspedes et al. (2024) argue that emotional intelligence significantly influences the effective application of leadership styles, emphasizing that empathetic and emotionally competent leadership is essential for addressing post-crisis scenarios such as those experienced in the Peruvian context. Taken together, these findings suggest that the development of ethical, emotionally intelligent, and strategically ambidextrous leadership is a key component for sustaining organizational performance in uncertain environments. However, theoretical gaps remain regarding how these leadership styles adapt to highly bureaucratic public structures or institutions with low organizational maturity. Such represents a valuable opportunity for future research aimed at designing leadership models applicable to emerging contexts with significant structural limitations.

Critical discussion: From a theoretical perspective, the studies analyzed expand the understanding of leadership by incorporating key dimensions such as emotional intelligence, strategic ambidexterity, and environmentally oriented transformational approaches. These perspectives enrich the field by showing that effective leadership in times of crisis does not rely solely on technical competencies, but also on relational, ethical, and adaptive skills. On a practical level, it is evident that empathetic and cohesive leadership styles increase team engagement and strengthen decision-making. However, gaps remain in the effective application of these approaches within public organizations characterized by rigid hierarchical structures. This opens a line of inquiry into how to adapt resilient leadership models in institutional environments with low response capacity or high resistance to change.

3.4. Comparative Synthesis of Results

Table 3.
Key Findings Across Research Objectives.

Dimension	Objective 1: Emerging Technologies	Objective 2: Sustainable Practices	Objective 3: Leadership Competencies
Main Enablers	AI, IoT, autonomous robotics, digital competencies, ambidextrous organizational structures	Efficient resource management, solid regulatory frameworks, government incentives, intersectoral collaboration	Ethical and transformational leadership, emotional intelligence, clear communication, employee empowerment
Primary Benefits	Automated crisis response, advanced predictive analysis, improved operational efficiency	Sustained operational continuity, strengthened institutional resilience, active contribution to SDGs	Consolidated team cohesion, agile and effective decision-making, facilitation of innovative processes
Critical Challenges	Cybersecurity vulnerabilities, high implementation complexity, significant institutional digital divide	High financial and human resource requirements, dependence on robust institutional capacity	Adaptation to rigid hierarchical structures, organizational resistance to change, low institutional maturity
Contextual Limitations	Reduced applicability in public institutions with technological backwardness and limited resources	Limited transferability to countries with budgetary constraints and low institutional development	Diminished effectiveness in bureaucratic environments with inflexible structures and low response capacity
Practical Implications	Technology adoption must be systemically integrated with structural and leadership changes	Sustainability requires robust institutional contexts, supportive public policies, and collaborative leadership	Effective crisis leadership demands emotional competencies, strategic adaptability, and structural flexibility

Note: Own elaboration

Cross-Cutting Themes

- Institutional Context Dependency: All three objectives show reduced effectiveness in public organizations with limited resources.

- Leadership as Integrating Factor: Collaborative and adaptive leadership emerges as a critical transversal element across all dimensions.
- Need for Systemic Integration: Isolated implementation proves insufficient; articulation between technology, sustainability, and leadership is required.
- Contextual Adaptation Imperative: Findings emphasize the importance of context-specific models rather than universal solutions.

Contributions to knowledge

This study contributes to an integrated understanding of how innovation, sustainability, and leadership work together to strengthen organizational resilience in crisis contexts. It also broadens the theoretical approach by highlighting the interaction between adaptive capacities, ethical frameworks, and transformational leadership in different sectors and industries.

4. Conclusions

- Practical implications: Public institutions could adopt models of empathetic leadership and sustainability strategies grounded in collaborative management to respond more effectively to uncertain scenarios. Likewise, businesses may incorporate emerging technologies and agile methodologies aligned with ethical and sustainable principles, thus strengthening their adaptability and operational continuity.
- Regarding the first objective, the present study demonstrated that the adoption of emerging technologies and agile methodologies strengthens organizational response capacity during crises, provided these are accompanied by flexible structures, collaborative leadership, and continuous training frameworks. This approach enables organizations to anticipate risks, adapt strategic processes, and maintain operational continuity even under conditions of high uncertainty.
- Furthermore, the implementation of sustainable practices not only contributes to institutional resilience but also enhances operational continuity when articulated with clear regulatory frameworks, participatory leadership, and a culture of social responsibility. The findings underscore the importance of promoting ethical, integrative, and socially and environmentally responsive management.
- Concerning leadership, the study concludes that transformational, green, and emotionally intelligent leadership styles strengthen team cohesion and decision-making in volatile environments. These approaches allow human capabilities to align with the strategic objectives of organizations, providing stability in constantly changing contexts.
- This systematic review contributes to the state of the art by delimiting for the first time the specific mechanisms through which emerging technologies, sustainable practices, and transformational leadership interact synergistically to build organizational resilience in crisis contexts. The study systematized evidence from 35 studies, identifying three key integration patterns: (1) the need for ambidextrous organizational structures that balance technological opportunity exploration with operational efficiency, (2) the critical importance of collaborative leadership as a moderating factor between technology adoption and institutional sustainability, and (3) the contextual dependency of resilience strategies according to institutional development level and available resource capacity. Additionally, an integrated conceptual framework was established demonstrating how the systemic articulation of these three pillars—as opposed to their isolated implementation—generates superior adaptive capacities to face prolonged uncertainties. This theoretical-empirical contribution fills a gap in the literature by providing systematic evidence on the conditions under which the technology-sustainability-leadership convergence effectively strengthens organizational resilience.

5. Study limitations

This systematic review presents methodological, conceptual, and scope limitations that should be considered when interpreting the findings. From a methodological perspective, the study is exclusively constrained to the Scopus database during the 2020-2025 period, which may introduce temporal and repository selection biases that exclude relevant research from other academic sources, foundational studies from previous periods, or grey literature that could provide complementary perspectives.

The studies included in the review present inherent limitations that affect the validity and generalization of findings. A marked geographical bias toward Asian contexts (52% of studies) is observed, which significantly limits the transferability of results to Western, Latin American, or African environments with different institutional, cultural, and economic frameworks. Additionally, there is a predominance of research focused on private sector organizations, particularly in industries such as tourism, manufacturing, and financial services, restricting the applicability of findings to public institutions that operate under different budgetary constraints, bureaucratic structures, and organizational objectives. The absence of robust longitudinal studies limits understanding of the long-term impact of integrated strategies, while the predominance of correlational and cross-sectional studies prevents establishing definitive causal relationships between technology, sustainability, and leadership in building organizational resilience.

From a theoretical perspective, the conceptual integration between emerging technologies, sustainable practices, and leadership competencies represents an emerging research area that requires further theoretical development to fully understand their synergistic effects. The identified leadership and sustainability practices may not be universally applicable because organizational behavior is deeply influenced by cultural values, institutional frameworks, and socioeconomic contexts that vary significantly across regions and sectors.

Finally, the methodological heterogeneity among included studies combining qualitative, quantitative, bibliometric, and mixed-methods approaches presents substantial challenges for comparative synthesis and limits the ability to draw definitive conclusions about the relative effectiveness of different approaches to strengthening organizational resilience. This methodological diversity, while providing comprehensive coverage of the phenomenon, hinders systematic evaluation of evidence quality and may introduce interpretive biases in the synthesis of findings.

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Data availability

The authors declare that the article contains all the data necessary and sufficient for understanding the research.

Disclosure statement

The authors declare that there is no potential conflict of interest related to the article.

Disclaimer

The authors declare that the expressions, opinions, or interpretations presented in the article are their personal views and do not represent the official position of their institutions.

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Co-authorship

Ricardo Rafael Díaz-Calderón: conceptualization, methodology, supervision, project management.
Hipatia Arlet Torres-Serna: writing, original draft, validation, resources.
Dante Hartman Cieza-León: formal analysis, data curation, visualization.
Juan Fernando Yalta-Vallejos: writing (review and editing), methodology, research.
Grimaldo Heredia-Pérez: data curation, visualization, research, writing: review and editing.

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