

Adaptive Governance and Collaborative Innovation in Global Sustainability Contexts

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ABSTRACT: This narrative review explores the role of sustainability, innovation, and cross-sector collaboration in advancing global development. The study aimed to identify factors influencing collaborative innovation and evaluate best practices for sustainability. A systematic literature search in Scopus, PubMed, and Google Scholar was conducted using predefined keywords, with clear inclusion and exclusion criteria. The analysis shows that governance structures, institutional capacity, and policy coherence shape the effectiveness of sustainability initiatives, while behavioral factors such as readiness and cultural norms influence outcomes. Interventions like university–society partnerships, communities of practice, and co-created adaptive systems consistently demonstrate positive impacts, though results vary across contexts. The review contributes by highlighting adaptive governance, inclusivity, and integrated policies as essential for future sustainability frameworks.

Keywords: Sustainability, Cross-Sector Collaboration, Innovation, Adaptive Governance, Policy Integration, Global Development.



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INTRODUCTION

Over the past decade, research across disciplines has increasingly emphasized the importance of sustainability, innovation, and cross-sector collaboration as strategic responses to global challenges. The integration of technological, economic, and social dimensions has emerged as a critical framework for fostering resilient systems capable of addressing pressing issues such as climate change, economic instability, and public health crises. Scholars have highlighted how collaborative innovation among governments, industries, and academic institutions provides opportunities for addressing complex problems that no single sector can resolve alone. For example, Woźniak-Gientka (2025) stresses the integration of bioeconomy principles within regional policy frameworks, noting the role of behavioral change at the individual level and the importance of multi-stakeholder communication in achieving sustainable outcomes. Similarly, Kanwal et al. (2024) examine the intersections between climate change and mental health, calling for integrated strategies across sectors to enhance community resilience and mitigate long-term social vulnerabilities.

In addition to these thematic developments, localized case studies provide compelling evidence of the relevance of sustainability and collaboration in diverse contexts. Sinaga et al. (2025) conducted a comparative analysis of environmental policy implementation in Southeast Asia, revealing disparities among firms in Indonesia, Malaysia, and Thailand while also emphasizing the necessity for alignment with broader regional sustainability frameworks. Paiva et al. (2025) further demonstrate the effectiveness of collaborative frameworks in rural tourism ecosystems across Spain and Portugal, where cross-border initiatives have supported economic development and employment while reinforcing sustainability goals. Together, these studies underscore how cross-sector collaboration and innovation are becoming central strategies for promoting resilience and sustainable growth in both developed and developing regions.

Empirical findings also point to the strong linkages between technological innovation and economic performance. Sajjad and Dar (2025) highlight the importance of economic infrastructure in fostering sustainable growth, demonstrating how investment in transport, energy, and communication networks directly contributes to economic resilience. Alateeg and Al-Ayed (2025) build on this evidence by analyzing the mediating role of government support in strengthening technological and business innovation within Saudi Arabia's manufacturing sector, showing that policy interventions can create an enabling environment for private-sector-led innovation. These findings align with broader literature that emphasizes the interdependence of governance, innovation ecosystems, and long-term economic viability. As the global community faces multifaceted pressures, the integration of innovation-driven growth strategies within sustainability frameworks is increasingly recognized as a necessary step toward balanced development.

Despite growing recognition of these linkages, significant challenges persist in operationalizing cross-sector collaboration. One prominent issue lies in integrating emerging technologies within traditional institutional frameworks. Ayyoob and Sajeev (2024) highlight how social entrepreneurship can play a pivotal role in advancing sustainable development, but stress that fragmented partnerships and limited policy support often impede the effective implementation of innovative solutions. Similarly, Abdulmuhsin et al. (2025) argue that while communities of practice enhance knowledge exchange and foster innovation in the oil and gas sector, organizational challenges—such as rigid hierarchies and resistance to change—limit the institutionalization of these practices. These examples illustrate how theoretical models of collaboration often struggle to translate into practical outcomes, leaving critical gaps in realizing the potential of innovation ecosystems.

Another pressing challenge lies in addressing the social and psychological consequences of climate change. Kanwal et al. (2024) note that climate-induced stressors contribute significantly to psychological distress, yet comprehensive empirical studies examining these intersections remain scarce. The absence of a robust evidence base hampers the development of integrated mental health interventions tailored to climate-related challenges. This gap highlights the broader issue of insufficient interdisciplinary research in areas where environmental and social determinants overlap, constraining the ability of policymakers and practitioners to design holistic responses. Addressing such intersections is essential not only for advancing scholarly knowledge but also for building effective systems of care and resilience.

A further challenge relates to the lack of longitudinal data capturing the long-term impacts of sustainability practices on economic and social outcomes. While Sajjad and Dar (2025) provide evidence of the short-term effects of infrastructure development on growth, they acknowledge the need for studies assessing how these dynamics evolve when coupled with technological advancements and sustainability initiatives. Without longitudinal evidence, policymakers risk implementing strategies that address immediate concerns while overlooking unintended consequences or missed opportunities for sustained improvement. This limitation underscores the necessity of establishing research designs that account for temporal dynamics, thereby enabling a deeper understanding of the enduring implications of collaborative innovation.

The literature also reveals fragmentation in research on cross-sector collaboration itself. While numerous studies document collaborative approaches in domains such as water governance, climate adaptation, and rural development, Compagnucci and Spigarelli (2018) argue that many analyses adopt narrow perspectives that fail to capture the multidimensional nature of these issues. For instance, water governance challenges in Spain illustrate how uncoordinated approaches among stakeholders can dilute the effectiveness of collective efforts, thereby limiting the potential for systemic innovation. This fragmentation poses a significant barrier to advancing comprehensive frameworks that integrate diverse perspectives and align stakeholder interests in pursuit of common goals.

Against this backdrop, there remains a clear research gap justifying the need for systematic review and synthesis of best practices in cross-sector collaboration for innovation. Existing literature highlights the promise of such approaches but also identifies constraints in implementation, particularly in terms of technological integration, interdisciplinary coordination, and long-term sustainability. The absence of cohesive frameworks that consolidate insights across domains prevents the accumulation of robust, transferable knowledge. A critical step forward is to examine how collaborative mechanisms can be structured to maximize inclusivity, adaptability, and resilience, ensuring that innovation processes align with the demands of sustainability and social equity.

The primary objective of this review is to critically examine the current state of research on sustainability, innovation, and cross-sector collaboration, with an emphasis on identifying best practices and persistent gaps. Specifically, the analysis seeks to evaluate the role of governance structures, technological advancements, and social dimensions in shaping collaborative innovation. By drawing on evidence across sectors and regions, this study aims to provide a comprehensive synthesis that informs both scholarly discourse and practical policymaking. In doing so, the review contributes to ongoing efforts to design frameworks capable of addressing complex, interconnected challenges in an era of rapid global transformation.

The scope of this review extends across multiple geographical contexts, reflecting the global nature of sustainability and innovation discourses. While case studies from Southeast Asia (Sinaga et al., 2025), Europe (Paiva et al., 2025; Woźniak-Gientka, 2025), and the Middle East (Alateeg & Al-Ayed, 2025) provide region-specific insights, the review also integrates perspectives from both developed and developing economies. Furthermore, demographic considerations are incorporated, including vulnerable populations affected by adverse childhood experiences (Bethell

et al., 2017) and communities in rural regions dependent on localized economies (Paiva et al., 2025). This diverse coverage ensures that the synthesis reflects not only theoretical advancements but also practical realities, thereby offering a balanced and comprehensive contribution to the academic and policy landscapes.

METHOD

The methodology employed in this review was designed to ensure comprehensive coverage of the existing literature on sustainability, innovation, and cross-sector collaboration while maintaining strict adherence to academic rigor. The process combined systematic and narrative review techniques, which allowed for both structured analysis and interpretive synthesis. This hybrid approach was particularly suited to the interdisciplinary nature of the subject, where empirical evidence, theoretical discussions, and case studies all contribute to shaping an understanding of the dynamics under investigation.

The literature search was conducted across three major databases: Scopus, PubMed, and Google Scholar. Scopus was chosen for its extensive coverage of multidisciplinary peer-reviewed research, particularly in the fields of social sciences, engineering, and environmental studies. PubMed was included to capture studies addressing the health-related dimensions of sustainability and climate change, particularly those linking environmental determinants with mental and physical health outcomes. Google Scholar was utilized as a supplementary source to identify grey literature, book chapters, and conference proceedings that may not be indexed in more specialized databases but nonetheless provide valuable insights into cross-sector innovation. These three databases together ensured both breadth and depth of coverage, enhancing the inclusivity of the literature pool.

The construction of search strings was guided by the need to balance specificity with comprehensiveness. Core keywords included terms such as “sustainability,” “innovation,” “cross-sector collaboration,” and “climate change.” These keywords were systematically combined using Boolean operators to refine the search results. For example, a commonly used query structure was ("sustainability" AND "innovation") OR ("cross-sector collaboration" AND "climate change"). This ensured that the search captured articles at the intersection of environmental sustainability and innovative collaborative practices, while excluding irrelevant studies that may have mentioned these terms in isolation. Additional refinements involved incorporating context-specific terms such as “governance,” “policy,” “economic development,” and “health systems” depending on the thematic focus of the inquiry. This iterative refinement of search terms helped maximize the relevance and comprehensiveness of the retrieved literature.

The review adopted clearly defined inclusion and exclusion criteria to ensure consistency in study selection. Studies were included if they presented empirical findings, theoretical advancements, or case-based evidence that directly addressed the nexus of sustainability, innovation, and collaboration. This included both qualitative and quantitative research, as well as mixed-methods studies that contributed to a holistic understanding of the subject. Particular emphasis was placed on studies reporting cross-sectoral initiatives involving academia, government, industry, or civil

society, as these directly aligned with the review's focus on collaborative frameworks. Exclusion criteria encompassed publications that lacked methodological rigor, such as opinion articles, editorial commentaries, or pieces that did not involve original data collection or analysis. Studies falling outside the geographic or thematic scope of sustainability and innovation, such as those exclusively addressing unrelated technological domains, were similarly excluded to maintain coherence and relevance.

The process of article selection was iterative and multi-staged. Initial searches produced a broad pool of articles, which were first screened by title and abstract to eliminate obviously irrelevant studies. At this stage, duplicates across databases were also removed. The remaining studies underwent a more detailed review of full texts to assess their alignment with the inclusion criteria. This step was crucial in ensuring that studies provided substantive contributions to the themes of sustainability and innovation, rather than merely tangential references. Each selected study was evaluated on the basis of methodological rigor, clarity of objectives, and relevance of findings. Quality assessment was not confined to methodological design alone but also extended to the extent to which studies provided insights into collaborative mechanisms and sustainability-oriented practices.

In terms of study types, the review incorporated a wide spectrum of research designs. Randomized controlled trials and longitudinal cohort studies were relatively scarce in this interdisciplinary field, but when available, they provided robust evidence, particularly in health-related dimensions of sustainability. More commonly, the included literature consisted of cross-sectional studies, policy analyses, and case studies that examined collaborative efforts within specific geographic or sectoral contexts. Narrative reviews and systematic reviews were also included when they offered synthesized insights that informed the broader discourse on cross-sector collaboration. By encompassing this range of study types, the review was able to integrate diverse perspectives while maintaining an overarching analytical coherence.

Geographic scope was a further dimension of methodological consideration. Studies focusing on Southeast Asia, Africa, and Latin America were prioritized because of the unique sustainability challenges and innovative practices emerging in these regions. For example, comparative analyses of environmental policy implementation in Indonesia, Malaysia, and Thailand provide insights into how regional sustainability frameworks are interpreted and applied at the corporate level. Similarly, case studies from Spain and Portugal highlight how rural and cross-border collaboration can stimulate local economies while promoting sustainability. Including this diversity of geographic perspectives allowed the review to account for contextual variations, ensuring that the findings were not overly skewed toward Western-centric frameworks.

The populations and stakeholder groups represented in the selected studies further illustrate the breadth of the review. Policymakers, industry leaders, NGOs, academic researchers, and local communities were all considered as relevant units of analysis. This diversity reflects the multi-stakeholder nature of sustainability challenges, where solutions depend on contributions from across societal sectors. The perspectives of vulnerable groups, such as communities most affected by climate change or populations experiencing adverse health outcomes, were given particular attention to highlight the equity dimensions of sustainability and innovation. Such inclusivity in

stakeholder representation enhanced the review's ability to provide a holistic understanding of cross-sector collaboration.

The data synthesis process combined thematic analysis with narrative synthesis. Each study was first coded according to key themes such as governance structures, technological integration, policy frameworks, social dimensions, and health impacts. These codes were then grouped into broader categories to identify recurring patterns and divergences across studies. Thematic synthesis allowed for the identification of critical success factors, such as the role of government support in enabling innovation or the importance of knowledge-sharing practices in fostering collaboration. At the same time, narrative synthesis provided an interpretive layer, connecting disparate findings into a cohesive argument about the role of cross-sector collaboration in advancing sustainability. This dual approach ensured that both empirical evidence and theoretical insights were adequately represented.

Throughout the methodology, attention was given to ensuring transparency and replicability. Search strategies, inclusion criteria, and analytical frameworks were explicitly documented, enabling future researchers to replicate or adapt the process. Limitations, such as potential publication bias and the difficulty of capturing non-English literature, were acknowledged as inherent constraints. Nevertheless, the careful design and systematic implementation of the methodology enhanced the reliability and validity of the review's findings.

In conclusion, this methodology provided a rigorous and comprehensive foundation for synthesizing the diverse and interdisciplinary body of literature on sustainability, innovation, and cross-sector collaboration. By employing a multi-database search strategy, carefully crafted keywords, explicit inclusion and exclusion criteria, and a combination of thematic and narrative synthesis, the review ensured both breadth and depth of analysis. This methodological approach allowed for the integration of diverse study types, geographic perspectives, and stakeholder groups, producing findings that are both academically robust and practically relevant to the ongoing discourse on sustainability and innovation.

RESULT AND DISCUSSION

The analysis of the reviewed literature reveals several critical themes that explain how sustainability, innovation, and cross-sector collaboration intersect to address global challenges. The findings are presented under three main themes: systemic or structural factors, individual or behavioral factors, and interventions or solutions that have been attempted. Each theme provides insight into both the enablers and barriers of innovation across contexts, highlighting comparative perspectives between developed and developing nations.

Systemic or structural factors consistently emerge as crucial determinants of success in collaborative innovation. Empirical evidence suggests that structural frameworks involving governance, institutional capacity, and policy integration directly influence the effectiveness of sustainability initiatives. Olsson et al. (2020) demonstrate that research collaboration between universities and society enhances social impact and local innovation, particularly when mechanisms

of commitment, communication, and trust are embedded in collaborative processes. Woźniak-Gientka (2025) extends this understanding by emphasizing that embedding circular economy principles within regional policy frameworks requires systemic behavioral change among producers and consumers. This illustrates how systemic interactions at both institutional and societal levels catalyze transitions toward sustainability. These studies collectively highlight that systemic design is not only about regulatory frameworks but also about embedding shared values and responsibilities across diverse stakeholders.

Comparisons between developed and developing countries illustrate sharp contrasts in the application and effectiveness of systemic factors. Sinaga et al. (2025) show that in advanced economies within Southeast Asia, manufacturing sectors benefit from progressive environmental policies and effective communication channels, which lead to measurable reductions in carbon footprints. Conversely, Alateeg and Al-Ayed (2025) reveal that in developing contexts such as Saudi Arabia, systemic challenges remain deeply tied to insufficient government support and infrastructural limitations, which obstruct technological innovation and economic efficiency. These disparities suggest that while systemic factors are universally important, their effectiveness is mediated by the political, economic, and institutional maturity of each context. Developed countries often leverage robust infrastructures and policy mechanisms, while developing countries struggle with foundational systemic barriers.

In addition to structural issues, the literature highlights the decisive influence of individual and behavioral factors. Ayyoob and Sajeev (2024) observe that social entrepreneurship can significantly advance sustainability outcomes, but its success hinges on the proactive attitudes and intentions of individuals engaged in cross-sector partnerships. The behavioral commitment of entrepreneurs to build networks and foster collaborative relationships often determines the success of sustainability initiatives more than institutional frameworks alone. Similarly, Ogorean et al. (2024) report that organizational behavior toward adopting digital technologies depends heavily on the readiness and willingness of individuals within organizations. This indicates that even when systemic frameworks are in place, the agency of individuals remains pivotal in determining the success of collaborative efforts.

The significance of cultural and regional differences is also underscored in the literature. Ghauri and Rosendo-Ríos (2016) argue that cultural norms and values significantly shape public–private collaborations, particularly in Asia and Africa where traditional norms often moderate cross-sector partnerships. These findings demonstrate that collaboration cannot be understood in purely structural terms but must account for the embeddedness of cultural expectations. In Spain, Compagnucci and Spigarelli (2018) note that limited education and awareness about the benefits of collaboration posed a barrier to effective water governance, illustrating how behavioral learning within specific cultural contexts can influence innovation. Such insights emphasize that local norms, cultural predispositions, and education systems play essential roles in determining how individuals and organizations engage with cross-sector collaborations.

The third theme concerns interventions or solutions trialed across different regions and sectors, which shed light on what works and under what conditions. One prominent intervention identified is the research-based collaboration model between universities and communities. Olsson et al. (2020) emphasize that when research institutions work in tandem with local communities,

outcomes are both socially impactful and sustainable, with trust, coordination, and commitment acting as vital components. This model illustrates how collaborative research serves as both a tool for knowledge production and an engine for societal transformation.

Saviano et al. (2025) add to this by conceptualizing sustainability as a co-created service embedded within complex adaptive systems. Their work highlights how systemic adaptability and cross-sector partnerships reinforce sustainability outcomes by enabling iterative learning and feedback-driven adjustments. Similarly, Abdulmuhsin et al. (2025) provide evidence that Communities of Practice (CoPs) function as dynamic platforms for knowledge exchange, enhancing organizational learning and embedding social and environmental sustainability within everyday practices. These interventions collectively demonstrate the effectiveness of participatory, trust-based, and adaptive models in addressing sustainability challenges.

However, the effectiveness of these interventions varies depending on context. In advanced economies, research-driven collaborations often flourish due to strong institutional infrastructures and reliable funding mechanisms. Björklund et al. (2019) highlight how European universities have leveraged design factories as hubs of co-creation, enabling interdisciplinary partnerships that produce innovative solutions. In contrast, developing countries frequently face obstacles rooted in inadequate resources and fragile policy support. Zubari and Sherman (2024) demonstrate that while corporate–NGO partnerships in renewable energy sectors within developing countries can generate meaningful impacts, they often falter due to infrastructural weaknesses and organizational inefficiencies. These findings reveal that while interventions have universal potential, their success is heavily conditioned by contextual readiness.

Southeast Asia provides further insights into intervention outcomes. Sinaga et al. (2025) report that environmental policy interventions within the manufacturing sector of Indonesia, Malaysia, and Thailand have produced effective outcomes but require further standardization of performance indicators such as Key Performance Indicators (KPIs). The lack of harmonized measures undermines long-term cross-border collaborations and dilutes the impact of otherwise successful initiatives. By contrast, Chaher et al. (2025) show how in Tunisia, interventions integrating circular economy principles into tourism sectors were effective due to the establishment of centralized coordination bodies and the development of strong public–private partnerships. These examples illustrate the necessity of tailoring interventions to institutional and cultural contexts in order to optimize outcomes.

Overall, interventions that prioritize collective problem-solving and inclusivity are consistently identified as the most effective. The research suggests that trust-building, adaptability, and alignment of stakeholder interests are the defining characteristics of successful collaborative interventions. Yet, the variance in effectiveness across contexts underscores the importance of contextualizing strategies to local realities. Developed nations may focus on refining systemic alignment and technological integration, while developing nations must prioritize foundational capacities such as governance support, infrastructural development, and institutional coordination.

In summary, the results of this narrative review highlight the multifaceted nature of sustainability and cross-sector collaboration. Systemic factors set the stage for innovation, but without proactive individual engagement and culturally sensitive approaches, their effectiveness remains limited. Behavioral and cultural dynamics play a critical role in shaping how collaborative practices unfold,

while interventions demonstrate that adaptability, inclusivity, and strong governance are necessary for success. Comparative evidence from diverse geographical contexts underscores that while lessons can be shared globally, strategies must be carefully tailored to local systemic, behavioral, and institutional conditions. These findings provide a comprehensive picture of how collaborative innovation unfolds across regions and offer insights into the factors that enable or constrain its success.

The findings of this review align closely with established conceptual models of collaboration and innovation, demonstrating the interdependence between systemic structures, individual behaviors, and intervention strategies. The model developed by Olsson et al. (2020), which frames university–society research collaboration as a mechanism to enhance social innovation, underscores the role of commitment, communication, and trust as fundamental elements of effective collaboration. These findings resonate with theories of social interaction and networked innovation, which emphasize the centrality of relationships among stakeholders in fostering sustainable change. In parallel, Woźniak-Gientka (2025) highlights the integration of bioeconomy into regional policy frameworks, suggesting that systemic change requires not only regulatory instruments but also behavioral participation from producers and consumers. Together, these contributions reflect the broader application of complex systems theory, where multiple interdependent elements interact dynamically to generate outcomes that are greater than the sum of their parts.

The empirical evidence also reveals that systemic barriers often undermine the implementation of innovative strategies. Sinaga et al. (2025) demonstrate that within ASEAN, disparities in environmental policy adoption across member states present substantial barriers to harmonized sustainability initiatives. Fragmented policy environments reduce the effectiveness of cross-border interventions and impede collaborative innovation. Dzingirai (2025) further emphasizes that in developing economies, weak infrastructure represents a fundamental constraint, limiting the capacity of institutions to adopt and sustain innovative practices. The literature also identifies limited engagement from the private sector as a systemic shortcoming. Mousavi and Bossink (2020) show that without corporate involvement in environmentally sustainable innovation, particularly in contexts like aviation biofuels, partnerships risk stagnation. These findings collectively underscore that systemic factors, while necessary for supporting innovation, are also sources of fragility when fragmented, underdeveloped, or lacking coordination.

Beyond systemic challenges, policy-level constraints exacerbate the difficulties of implementing effective solutions. Many regions face the absence of integrated government strategies that align sustainability with economic development and social well-being. For instance, Alateeg and Al-Ayed (2025) reveal that government support mediates the relationship between innovation and economic performance in the manufacturing sector, suggesting that policies are essential enablers of growth. Yet, in contexts where policies are inconsistent or narrowly focused, the transformative potential of cross-sector collaboration is significantly diminished. Such limitations highlight the importance of developing coherent and multi-level governance structures that recognize the interdependence of environmental, economic, and social systems.

The literature also points to behavioral and cultural dynamics that further complicate collaboration. Ghauri and Rosendo-Ríos (2016) identify cultural orientations and organizational norms as determinants of the success of public–private partnerships, particularly in regions with strong

traditions and hierarchical values. This cultural embeddedness influences not only individual willingness to engage but also the structural design of collaborative frameworks. Compagnucci and Spigarelli (2018) demonstrate in the context of water governance in Spain that limited awareness and education around collaboration impede innovation, reinforcing the need to address cultural and educational barriers alongside systemic reforms. These findings suggest that systemic and behavioral challenges are interwoven, with structural reforms requiring parallel shifts in individual and cultural practices to achieve sustainability goals.

Potential solutions to these challenges emerge in both short- and long-term strategies. In the short term, Kanwal et al. (2024) recommend integrating mental health services into climate adaptation plans, addressing the immediate psychological impacts of climate change while building resilience across communities. This integration provides a model of how sector-specific interventions can complement systemic reforms, ensuring that urgent needs are not overshadowed by long-term goals. In the long term, Saviano et al. (2025) propose embedding sustainability within adaptive systems that thrive on continuous feedback between governments, businesses, and civil society. Such approaches reflect principles of adaptive governance, where institutional flexibility and cross-sector coordination are prioritized to respond effectively to changing environmental and social conditions. Dzingirai (2025) further advocates for strengthening institutional cultures of collaboration and innovation, arguing that regional policy integration is critical for scaling up successful initiatives.

The results also highlight the implications of interventions across different geographic contexts. In Europe, the success of design factories as collaborative hubs demonstrates how structural investments and institutional support can foster co-creation and innovation (Björklund et al., 2019). In contrast, contexts in the Global South often struggle to replicate such successes due to resource constraints and governance challenges, as evidenced by Zubari and Sherman (2024), who document how infrastructural weaknesses hinder the sustainability of corporate–NGO partnerships in renewable energy. These contrasts underline the importance of tailoring solutions to context, recognizing that while best practices may be transferrable, their implementation depends heavily on local conditions, capacities, and institutional frameworks.

Another critical implication of the reviewed findings is the role of measurement and standardization in ensuring the sustainability of interventions. Sinaga et al. (2025) emphasize the necessity of standardized performance indicators to evaluate the effectiveness of environmental policies across ASEAN manufacturing sectors. Without such benchmarks, it is difficult to assess the comparative success of interventions or to facilitate cross-border collaboration. This aligns with broader calls in the literature for evidence-based policymaking, where measurable outcomes are prioritized to strengthen accountability and inform iterative improvements. Similarly, Chaher et al. (2025) highlight how centralized coordination bodies in Tunisia facilitated the integration of circular economy principles into tourism, underscoring the importance of institutional mechanisms that enhance coherence and monitoring.

Nevertheless, the existing body of research exhibits notable limitations that require further exploration. A persistent gap lies in the lack of longitudinal studies examining the long-term impacts of collaborative interventions. Sajjad and Dar (2025) identify the role of infrastructure in enabling economic growth but note the absence of sustained assessments that capture how

infrastructural development interacts with technological change and sustainability practices over time. The scarcity of longitudinal analyses constrains the ability to forecast future dynamics and undermines efforts to design policies that anticipate evolving challenges. Another limitation is the fragmentation of research across sectors, which often isolates findings within specific domains such as health, energy, or tourism, without integrating them into broader systemic frameworks. This siloed approach prevents the development of holistic solutions that address interconnected sustainability challenges.

Further research is also needed to examine how digital technologies can be integrated more effectively into collaborative frameworks. Ogreaan et al. (2024) point to organizational readiness and individual behaviors as determinants of successful digital adoption, but the literature remains underdeveloped in terms of identifying strategies that overcome barriers to digital transformation in sustainability contexts. Similarly, the mental health implications of climate change remain insufficiently studied, as noted by Kanwal et al. (2024), suggesting the need for interdisciplinary research that bridges environmental science, psychology, and policy studies. Expanding the evidence base in these areas is critical for advancing comprehensive strategies that address the multifaceted nature of sustainability challenges.

Overall, the discussion illustrates that systemic and behavioral factors jointly shape the possibilities and limitations of cross-sector collaboration. The interplay between supportive policies, institutional infrastructures, cultural norms, and individual agency determines the extent to which innovative solutions can be successfully implemented. While existing studies offer valuable insights into successful interventions and contextual variations, significant gaps remain that call for further empirical and theoretical investigation.

CONCLUSION

This review has highlighted the central role of systemic, behavioral, and intervention-based factors in advancing sustainability and cross-sector collaboration. Empirical evidence shows that systemic structures, including governance frameworks, infrastructural readiness, and policy coherence, significantly shape the success or failure of innovation initiatives. At the same time, behavioral dimensions, such as individual attitudes, organizational readiness, and cultural norms, strongly influence how collaborative practices are enacted and sustained. Interventions that prioritize inclusivity, adaptability, and shared trust—such as university–society collaborations, communities of practice, and co-created sustainability frameworks—demonstrate the most consistent effectiveness across diverse contexts. Yet, significant barriers remain, particularly fragmented policies, weak infrastructure in developing regions, and insufficient integration of digital technologies. These challenges underscore the urgent need for policies that harmonize governance across sectors, strengthen institutional capacities, and expand community engagement. Long-term strategies must focus on adaptive systems that enable continuous learning and feedback among governments, industry, and civil society, ensuring resilience in the face of evolving sustainability challenges. Future research should prioritize longitudinal studies, interdisciplinary integration, and context-specific analyses to address gaps in the literature, particularly in under-researched regions and populations. By reinforcing systemic reforms, fostering behavioral engagement, and tailoring

interventions to local realities, collaborative innovation can serve as a strategic pathway for advancing global sustainability goals.

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