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Leadership and Sustainability in a Globalized World: Emerging Trends, Global Contexts, Key Challenges, and Effective Strategies

Muzhar Javed^{1,2}  | Bilal Bilal^{3,4}  | Nacef Mouri¹ | Muhammad Faisal⁵

¹Rabat Business School, Department of Management Sciences, International University of Rabat, Rabat, Morocco | ²COMSATS University Islamabad, Sahiwal Campus, Sahiwal, Pakistan | ³Durham University Business School, Durham University, Durham, UK | ⁴Department of Financial Intelligence, University of South Africa, Pretoria, South Africa | ⁵College of Business, Abu Dhabi University, Abu Dhabi, United Arab Emirates

Correspondence: Bilal Bilal (bilal.bilal@durham.ac.uk)

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ABSTRACT

This systematic review analyzes 109 studies from top business journals, exploring the connection between leadership and sustainability, including key leadership styles, emerging trends, and challenges in integrating sustainability into organizational strategies and operations. Our analysis reveals responsible leadership, followed by transformational and female leadership, as the most common styles used to drive the integration of sustainability into organizational strategies and operations. Core sustainability practices are more closely aligned with addressing grand societal challenges, particularly “climate action” followed by “quality education,” “innovation,” and “gender equality.” The study highlights key challenges facing the leadership in driving sustainability include stakeholders' resistance to change, financial constraints, capacity building, and regulatory hurdles. Overcoming these requires raising stakeholder awareness, aligning sustainability with business goals, leveraging cross-sectoral collaboration, and regulatory harmonization. This study highlights the transformative role of leadership in promoting sustainability, emphasizing cross-sectoral learning to drive meaningful change.

Sustainability is the right thing to do, the smart thing to do, and the profitable thing to do.

Hunter Lovins

1 | Introduction

The intersection of leadership and sustainability has emerged as a critical area of study as organizations increasingly recognize the importance of integrating sustainable practices into their core operations (Negri et al. 2021). This emphasis aligns with global initiatives like the United Nations' Sustainable Development Goals (SDGs) and the Academy of Management's call for research addressing grand societal challenges, highlighting the critical role of leadership in driving sustainable

change. Over the past decade, scholarly attention to this nexus has increased substantially, with a steady rise in publications exploring the interplay between these two domains (see Figure 1). However, the existing literature is wide-ranging, and fragmented, encompassing diverse discussions on leadership styles, sustainability practices, and the multifaceted challenges faced by leaders. Despite this breadth, no study has yet synthesized these dispersed findings.

Consequently, the field lacks consensus regarding the most common leadership styles, the common sustainability practices, and the common challenges encountered in this context (Boeske 2023). Furthermore, both leadership and sustainability are inherently dynamic, fluid, and highly context-dependent phenomena. As a result, leadership styles, sustainability

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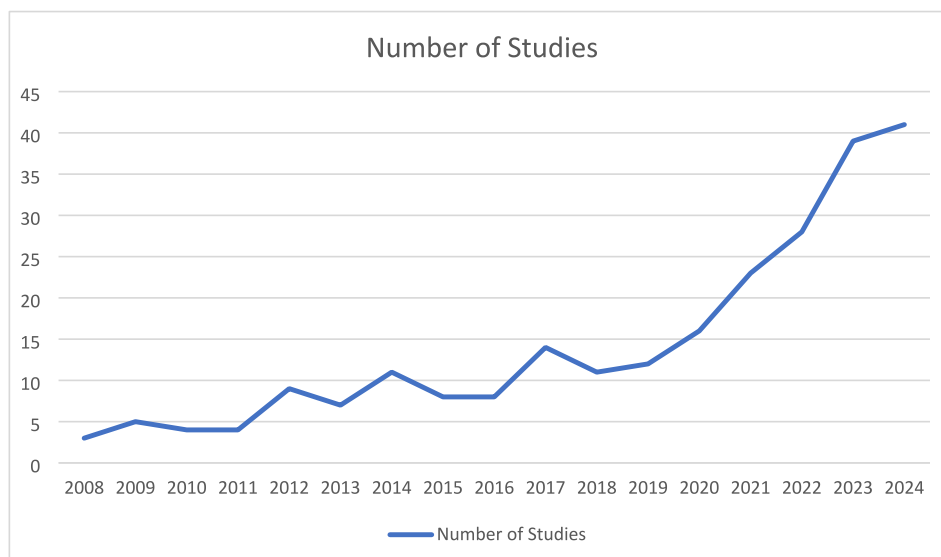


FIGURE 1 | Publication trend.

practices, and key challenges exhibit significant variability across different contexts. To develop effective and contextually appropriate strategies, it is imperative to systematically examine these contextual nuances, an endeavor that remains largely unexplored in the current body of research. Building on this context, the study aims to uncover how the relationship between leadership and sustainability has evolved by addressing four key research questions. First, it examines how different leadership styles shape the integration of sustainability into organizational strategies and daily operations. Second, it explores emerging leadership practices that support progress toward the United Nations SDGs. Third, the study investigates the challenges leaders face in driving sustainability efforts within their organizations. Finally, it considers how leadership for sustainability varies across industries, sectors, and cultural contexts, offering a comprehensive understanding of its contextual dynamics.

The first research question delves into how different leadership styles influence the integration of sustainability within organizational strategies and operations. Leadership styles like transformational, servant, and responsible leadership have been identified as key drivers of sustainability practices (Burawat 2019; Darvishmotevali and Altinay 2022; Javed et al. 2020). Leaders who inspire and engage their teams towards a shared vision of sustainability, such as Paul Polman's work at Unilever, demonstrate how aligning sustainability with core business strategies can lead to substantial long-term benefits for both organizations and society (Murphy and Murphy 2018). Finding the appropriate leadership approach is vital because it helps to align corporate actions with broader societal goals. The second question explores emerging trends in leadership–sustainability practices that contribute to SDGs. Companies like IKEA and Patagonia have aligned their operations with specific SDGs, demonstrating that sustainability can be a source of competitive advantage when properly integrated into organizational strategies (Rangan et al. 2015). Understanding these emerging trends is critical for organizations seeking to align their goals with global sustainability agendas.

The third research question addresses the challenges leaders face in advancing sustainability within their organizations. Despite the growing recognition of sustainability's importance, leaders encounter significant barriers, including resource constraints, lack of organizational buy-in, and the complexity of balancing short-term financial pressures with long-term sustainability goals (Coffay et al. 2024). Strategies such as integrating sustainability into business models, fostering stakeholder engagement, and aligning sustainability goals with organizational values have proven effective in overcoming these obstacles. Leaders like Elon Musk, who has driven Tesla's commitment to electric vehicles and renewable energy, exemplify how overcoming challenges can lead to innovative, sustainable business practices that also generate substantial economic returns (Maradin et al. 2022).

Studying how leadership in sustainability differs across industries, sectors, and cultural contexts is also vital because both leadership practices and sustainability priorities are highly context-sensitive. Different industries face unique environmental and social challenges—what constitutes sustainable leadership in manufacturing may differ significantly from that in services or technology. Similarly, public, private, and nonprofit sectors often operate under distinct institutional pressures and stakeholder expectations, influencing how leaders embed sustainability into decision-making. Cultural values also shape leadership styles, ethical norms, and organizational behaviors, meaning that sustainability leadership in a collectivist society may look markedly different from that in an individualist one. Without accounting for these contextual variations, sustainability strategies risk being ineffective, inauthentic, or culturally misaligned. Therefore, exploring this question can lead to more nuanced, adaptable, and effective leadership models that are responsive to the specific demands of diverse organizational and cultural environments.

This study contributes uniquely to the evolving field of leadership and sustainability in several ways. First, the study contributes to leadership theory by identifying the common leadership styles that play a crucial role in integrating sustainability into

organizational strategies and operations. Second, the study identifies emerging trends in leadership–sustainability practices that reflect the evolving priorities of organizations in aligning with the United Nations' SDGs. This contribution offers new directions for research on leadership and sustainable development. Third, the study sheds light on the significant challenges and barriers leaders face when advancing sustainability within their organizations. This practical insight provides a roadmap for leaders aiming to navigate the complexities of sustainable transitions. Finally, the study bridges academic research and actionable practice by linking leadership efforts to global sustainability frameworks like the SDGs.

To enhance clarity and demonstrate the study's value, it is important to clearly differentiate between the actions undertaken in the research and its actual contributions to the field. The study systematically examines four key areas: leadership styles that facilitate sustainability integration, emerging leadership practices aligned with the SDGs, challenges faced by leaders in advancing sustainability, and the contextual variations in sustainability leadership across industries, sectors, and cultures. These activities form the empirical and analytical foundation of the work. In contrast, the study's contributions lie in synthesizing fragmented literature to develop a more coherent understanding of the leadership–sustainability nexus, offering theoretical insights into the leadership approaches most effective for advancing sustainability, identifying practical trends and barriers relevant to organizational efforts toward the SDGs, and providing a context-sensitive framework for guiding future research and leadership practice. By explicitly separating these elements, the study clarifies how it advances knowledge and addresses critical gaps in the existing literature.

2 | Method

Given the diverse and fragmented nature of leadership and sustainability research, we adopted an inclusive approach in conducting our review. Following established systematic review methodologies (Hoskisson et al. 2017; Shamseer et al. 2015), we adhered specifically to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, 2020. Often, systematic reviews lack standardized procedures, which can impact their credibility and replicability. PRISMA provides a structured methodology with a checklist of specific guidelines to ensure both quality and reproducibility. According to these guidelines, Moher et al. (2015) recommend developing review protocols, detailing search strategies, outlining article selection criteria, and describing data extraction and analysis procedures.

2.1 | Research Questions and Boundaries of the Study

This stage involves framing the research questions, starting with an initial literature review to identify a research gap and subsequently refining it into precise research questions. Through this process, we have formulated four research questions: (1) Which leadership approaches drive the integration of sustainability into organizational strategies and operations? (2) Which

United Nations SDGs are advanced by emerging trends in leadership and sustainability practices? (3) In what ways does the leadership–sustainability nexus differ across industries, sectors, and cultural contexts? (4) What are the key challenges and barriers that leaders face in advancing sustainability within their organizations?

2.2 | Eligibility Criteria/Inclusion and Exclusion

A systematic approach was employed in the selection of studies, guided by five predefined screening criteria. The key inclusion and exclusion criteria were as follows: First, we considered empirical research (qualitative, quantitative, and mixed methods), conceptual studies, review papers, and case studies. Second, we included only articles published in peer-reviewed journals, excluding grey literature, books, conference proceedings, newspaper articles, and practitioner-oriented publications. Third, we included only articles published in journals ranked by Academic Journal Guide (ABS ranking). Fourth, only articles published in English were deemed eligible. Finally, we focused exclusively on articles that specifically addressed the leadership–sustainability nexus.

2.3 | Data Collection and Search Strategy

We compiled a comprehensive list of electronic databases to facilitate our search for pertinent studies. Following an exhaustive search across these databases, we created a curated list of journals where relevant research had been published. Each journal was then meticulously examined to uncover additional studies that may have been overlooked in the initial search, involving a careful review of titles and abstracts within each issue. Furthermore, we scrutinized the references in selected studies to identify any additional relevant literature.

2.3.1 | Identification of Databases and Journals

This step involves selecting databases for data collection, and we adopted a multifaceted approach. First, we identified key databases for a comprehensive search, beginning with the Scopus database, chosen for its extensive scholarly coverage and inclusion of numerous leading journals. To ensure a broad spectrum of literature, we also utilized additional databases such as Emerald, JSTOR, Palgrave Macmillan, Science Direct, SpringerLink, SAGE Journals, Taylor and Francis Online, Wiley Online Library, the Academy of Management, and Google Scholar. In the subsequent phase, we pinpointed key journals. For each journal, we conducted a targeted search, meticulously reviewing individual issues to capture any relevant studies that may have been overlooked initially. Additionally, we scrutinized the reference lists of selected studies to identify further pertinent articles.

2.3.2 | Keywords and Search Terms

We developed a search query—a specific combination of keywords—designed for entry into the Scopus database to retrieve

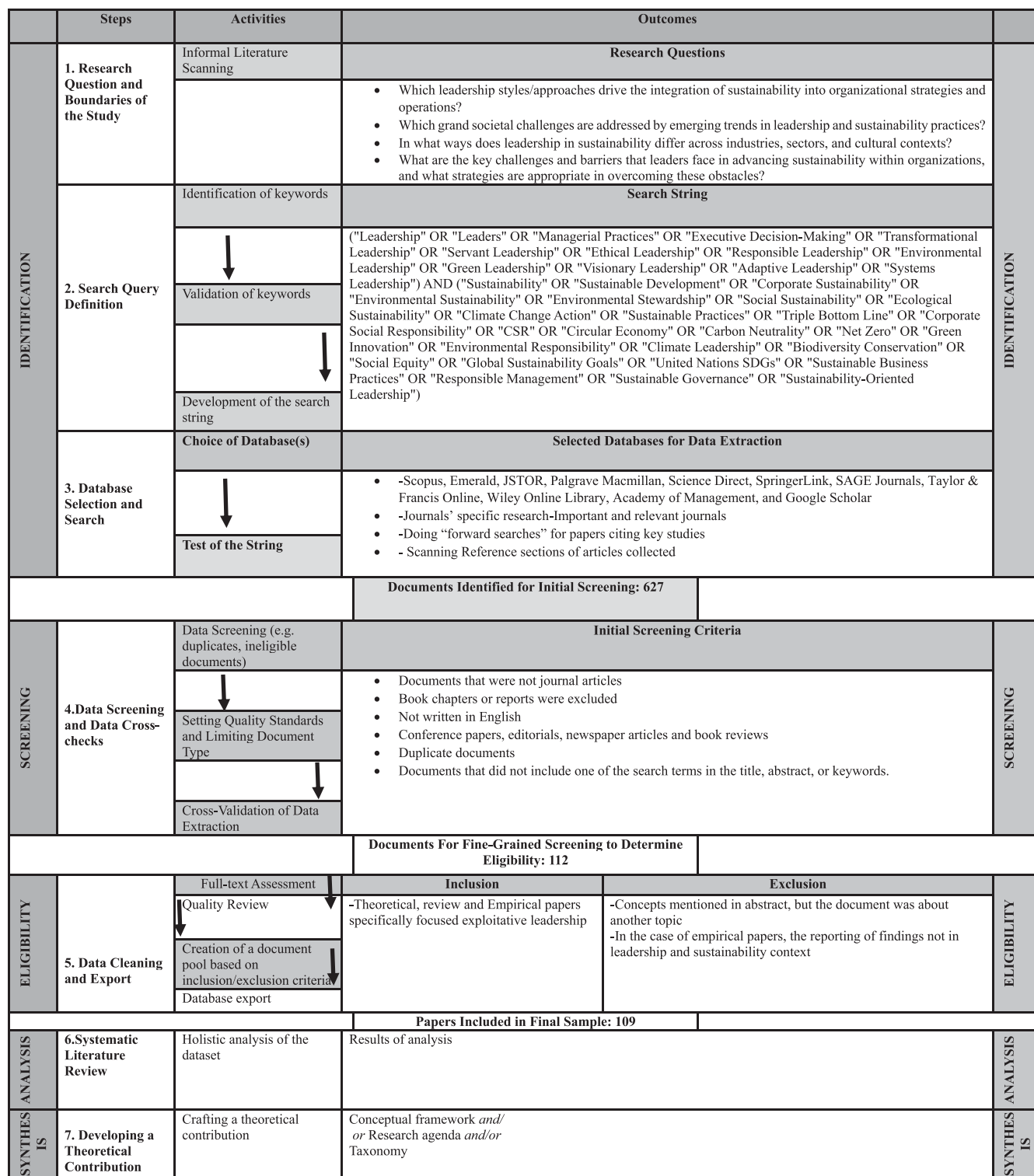


FIGURE 2 | PRISMA flow diagram.

pertinent documents, including articles, book chapters, conference proceedings, and editorials (see Figure 2). To avoid unintentionally omitting valuable resources, we adopted a broad search strategy, allowing for subsequent refinement through manual selection in later stages. Our keywords were carefully crafted to align with our research objectives, facilitating the efficient targeting of relevant research articles. To enhance the search terms, we

reviewed terminology in existing literature, considering alternative terms and concepts that address similar questions.

Using informatics, we strategically refined these keywords and search terms, combining them with Boolean operators to enhance search precision. We constructed a search string that integrated diverse topics using Boolean operators (AND/OR). These

refined terms were systematically applied across databases to retrieve relevant studies from the existing body of literature.

2.3.3 | Data Screening/Elimination of Duplicates

In accordance with established protocols in the literature (Nielsen and Huse 2010; Tranfield et al. 2003), our initial step involved conducting a keyword search within titles and abstracts, which resulted in a preliminary set of 627 articles. Additional targeted searches within relevant journals increased this count to 820 articles. As is commonly encountered in the early phases of systematic literature reviews, duplicate entries were abundant (Bakker 2010). After removing duplicates, we refined the sample to 359 unique titles. To further assess their relevance, PDFs of these articles were downloaded, and two authors independently reviewed each one. Additionally, we scrutinized the reference sections of these articles to ensure comprehensive coverage of the pertinent literature.

2.3.4 | Title and Abstract Analysis

Drawing on the methodology established by Pukall and Calabrò (2014), we conducted a systematic review of titles and abstracts to evaluate their alignment with our core relevance criteria, as advised by Rashman et al. (2009). Studies that failed to meet these criteria were systematically excluded, following the framework outlined by Adams et al. (2016). This process ultimately refined the pool to articles that proceeded to the next stage of review.

2.3.5 | Full-Text Assessment

In the third phase, we retrieved the full texts of the 114 selected articles and conducted a thorough evaluation using Pittaway et al.'s (2004) A/B/C technique, categorizing each article as A (highly relevant), B (potentially relevant), or C (low or no relevance). After categorizing all documents, the items rated B were further deliberated among the authors to ascertain whether they should be reclassified as A or C. Typically, only A-rated items are included in the final sample. This rigorous process culminated in a final selection of 109 articles (see Figure 2). Given the involvement of multiple researchers in this systematic literature review, this phase was conducted independently, with any initial discrepancies subsequently addressed through discussion to reach a consensus.

2.4 | Quality Assessment/Audit

During the data extraction phase, each study was assessed for quality in relation to our research questions. Among the 109 studies, those deemed high quality were evaluated against four key criteria: (1) clarity of the research aim, (2) transparency in articulating the research approach, (3) provision of sufficient contextual information, and (4) a clear presentation of findings.

2.5 | Study Records

We established a dedicated repository to systematically archive the studies identified throughout our search. Four independent

coders participated in the screening, eligibility assessment, and inclusion processes to ensure a rigorous and unbiased selection. Each coder independently extracted data on relevant variables, achieving initial consensus on 75% of the parameters. This was followed by collaborative discussions to finalize the parameters in alignment with our research questions. During the data extraction phase, several variables were identified as relevant for analysis. These included the purpose of the study, the definition of key concepts, the theoretical framework underpinning the research, and the key findings reported. Additionally, the specific leadership style examined, along with the independent and dependent variables, were recorded. The presence of any moderators or mediators influencing the relationships among variables was also noted. Finally, the country or contextual setting in which the study was conducted was considered to capture geographical and cultural nuances. Independent tables of extracted data were then compiled and reviewed through multiple rounds. Initial coder agreement reached 88%, which was subsequently refined to achieve full consensus. Each selected study was organized chronologically and assigned a unique identifier.

2.6 | Data Synthesis

In the final stage, we systematically extracted and synthesized key information from the 109 studies, organizing the findings into thematic insights. Employing a theory-driven content analysis approach, the research team summarized the relevant information to identify trends aligned with the review's objectives. This process culminated in the creation of a comprehensive database to systematically catalog these insights. The synthesized results are presented below.

3 | Findings

Sustainability is a concept with diverse interpretations, as researchers and scholars have defined it from varying perspectives. While these definitions reflect distinct viewpoints, they also converge on common themes, emphasizing its multidimensional nature. Broadly, sustainability is described as a multidimensional concept that integrates environmental, economic, and social considerations. Many scholars emphasize the importance of balancing these dimensions, reflecting the widely recognized “triple bottom line” approach. Responsibility and ethics play a significant role in sustainability, with corporations encouraged to consider stakeholders' interests and adopt ethical practices to create long-term value. Sustainability is also closely linked to innovation, with a focus on developing new processes, products, and business models to address complex challenges. This future-oriented perspective prioritizes the preservation of resources and opportunities for future generations while meeting present needs.

Sustainability is further understood as a “wicked problem,” involving interconnected social, economic, and environmental dimensions that demand systemic and adaptive solutions. It is viewed as both an aspiration and a practical framework for fostering balance and resilience across various human and natural systems.

Sustainability is fundamentally about ensuring the long-term survival and persistence of systems. The Brundtland (1987)

famously defined sustainability as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations General Assembly 1987, 43). A sustainability standard refers to “a set of voluntary predefined rules, procedures, and methods to systematically assess, measure, audit, and/or communicate the social and environmental behavior and/or performance of firms” (Reinecke et al. 2012, 793). The studies analyzed have provided different definitions of sustainability (see Table 1).

3.1 | Which Leadership Styles Drive the Integration of Sustainability Into Organizational Strategies and Operations?

Leadership styles play a pivotal role in shaping how sustainability is integrated into organizational strategies and operations. Among the various leadership styles, responsible leadership stands out as the most common style (see Table 2), reflecting its critical influence in aligning organizational goals with ethical, social, and environmental values. Transformational and female leadership, both highly prevalent, further enhance this integration by fostering innovation, collaboration, and inclusivity, which are key drivers of sustainable practices. Other styles, such as servant, shared, and ethical leadership, promote a holistic approach, empowering individuals and encouraging collective responsibility towards sustainability. Together, these leadership styles create a dynamic environment where sustainability is not merely a strategic goal but a core principle embedded in every facet of the organization.

By aligning organizational goals with ethical, social, and environmental values, responsible leadership redefines success through stakeholder engagement, ethical decision-making, and long-term value creation (Muff et al. 2020). Unlike traditional paradigms prioritizing short-term profitability, it embeds sustainability into organizational identity, emphasizing the interconnectedness of economic, social, and environmental dimensions. Proactive stakeholder collaboration fosters innovation and shared accountability, enabling organizations to address complex challenges and achieve triple-bottom-line performance (Javed et al. 2020). Transparency and values-driven strategies further enhance trust and organizational resilience, aligning operations with societal expectations (Haque 2021).

Transformational leadership promotes sustainability by inspiring employees, fostering innovation, and steering systemic change. By articulating a compelling vision, transformational leaders cultivate collective commitment to ambitious sustainability objectives, such as carbon neutrality and green innovation (Dartey-Baah 2014). Their ability to embed environmental consciousness into organizational culture enhances green work engagement and team resilience. These leaders excel in fostering creativity and aligning capabilities with sustainability goals, as seen in the development of “green dynamic capability,” which drives impactful outcomes (Aslam et al. 2024). Additionally, transformational leadership integrates ethical principles and adaptive strategies to ensure sustainability remains a long-term priority, countering resistance to change and embedding sustainable practices into organizational frameworks (Timmermans et al. 2014; Laureani et al. 2023).

Female leadership offers a transformative approach by blending relational, transformative, and ethical strategies to drive sustainability outcomes. Female leaders often challenge systemic barriers, advocate for inclusivity, and foster collaboration, creating environments aligned with sustainability principles (Shinbrot et al. 2019). Their participative style leverages diverse perspectives and builds robust networks, positively impacting sustainability practices, such as transparency and communication, thereby enhancing organizational credibility (Elaigwu et al. 2024). Women leaders excel in fostering teamwork, employee well-being, and alignment with SDGs, particularly those focused on equity and workplace inclusivity (Gaur et al. 2024). Strategic competence further amplifies their contributions, enabling the navigation of complex sustainability challenges (Dewi et al. 2023). Gender-diverse leadership teams consistently demonstrate greater success in integrating sustainability, highlighting the critical role of empathy, inclusivity, and long-term thinking in achieving holistic progress (Glass et al. 2016). Promoting gender diversity in leadership is essential for enduring and transformative sustainability outcomes.

Educational leadership plays a pivotal role in advancing sustainability by embedding its principles into organizational learning and development. Leaders in this domain influence the integration of sustainability through curricula design, policy formulation, experiential learning, and stakeholder engagement that promote sustainable thinking and practices (Dubey et al. 2024; Uleanya and Naicker 2024). School principals and educators, for example, act as catalysts for change, raising awareness and fostering action on sustainability issues among students and staff (Drysdale et al. 2009). Servant leadership aligns closely with sustainability objectives by prioritizing the needs of the community and stakeholders. Emphasizing ethical practices and community well-being, servant leaders foster a culture of care and accountability, placing long-term benefits over short-term gains—a critical perspective for sustainable development (Abukari et al. 2024). Similarly, shared leadership enhances sustainability efforts through collaborative decision-making, distributing leadership roles and leveraging diverse expertise to address complex challenges effectively (Pearce et al. 2013; Manz et al. 2015).

Visionary leadership plays a transformative role in embedding sustainability into organizational strategies by anticipating future trends and challenges. This strategic foresight enables organizations to align their goals with long-term environmental, social, and economic priorities, ensuring sustainability becomes a core organizational value (Usman et al. 2024). Relational leadership complements this by fostering trust and collaboration through strong interpersonal connections, creating networks that support sustainable practices across diverse stakeholder groups (Kurucz et al. 2017; Nicholson and Kurucz 2019). Inclusive leadership further strengthens sustainability efforts by leveraging diversity and encouraging input from a wide range of stakeholders. This approach ensures the development of comprehensive strategies that address diverse perspectives and promote equity and sustainability (Amjad et al. 2024; Hu et al. 2024). Ethical leadership provides the moral foundation for these initiatives, ensuring that decisions are guided by principles of fairness, responsibility, and integrity. By fostering a culture where sustainability is both a strategic priority and a moral

TABLE 1 | Sustainability definitions.

Sr. no	Definition	Author and year
1.	sustainability focus on improving the quality of human life without harming the environment and the capability of natural systems.	Brundtland (1987)
2.	 an open term, indicating a hope for future state in which humans live without permanently damaging the ecosystems in which they are embedded.	Hawken (1993)
3.	 as being economically feasible, socially valuable and environmentally reliable with an emphasis on a win–win–win approach for the business, the natural balance and society.	Elkington (1994)
4.	Sustainability is made up of three elements: economic, environment, and society.	Elkington (1997)
5.	sustainability stressed that people inside and outside corporations (stakeholders) should be considered and treated ethically, and in a responsible manner while working toward three dimensions of sustainability.	Dyllick and Hockerts (2002)
6.	encompasses maintaining and widening economic advancement, shareholders' value, reputation, customer associations and the quality of products and services.	Székely and Knirsch (2005)
7.	A broad concept commonly signifying the responsibility of the corporation to stakeholders representing the issues of 'people, planet, profit'.	Cramer et al. (2006)
8.	Sustainability primarily refers to long-term financial viability, however, it also mentions the organization as using 'environment' inputted into the human system as a limited resource.	Hazy (2006)
9.	Sustainability is an aspiration, an invitation to discovery, as we seek to exist within our planet's resources.	Harding (2006)
10.	as the capacity of a business to foster and encourage growth by effectively fulfilling the expectancies of various stakeholders.	Neubaum and Zahra (2006)
11.	Sustainable performance involves economic, environmental, and social aspects, following Sustainable Development Theory.	Daly (2007)
12.	 the appropriate balancing of five notions of capital—natural, human, social, manufactured and financial.	Porritt (2012)
13.	 to respond strategically to pressures and opportunities, with innovation in processes, products and services, business models and partnerships.	Nidumolu et al. (2009)
14.	 to simultaneously consider the economic, environmental and social impacts of their business decisions.	Hannon and Callaghan (2011)
15.	Corporate sustainability involves financial performance, employee satisfaction, customer satisfaction, and governance (Elkington 2012)	Elkington (2012)
16.	 as organizational approaches aimed at achieving a balance between short-term organizational goals and long-term enterprise and social responsibility.	Pearce et al. (2013)
17.	 sustainability involves corporations' taking into consideration their environmental and social impacts in concert with their economic objectives.	Strand (2014)
18.	 sustainability literally refers to the preservation of the state and function of the ecological system. Meanwhile, sustainability is considered as the maintenance and improvement of the lives of humans by economists.	Dartey-Baah (2014)
19.	 the ability of firms to respond to their short-term financial needs without compromising their (or others') ability to meet their future needs.	Bansal and DesJardine (2014)
20.	Sustainability implies regenerating and maintaining the capacity of ecological systems that are relied upon to support social and economic systems.	Wolfgramm et al. (2015)
21.	as living and working by utilising a modus operandi, which meets and combines the prevailing ecological, economic and societal requirements with no compromise for the well-being of the future cohorts.	Ong et al. (2015)

(Continues)

TABLE 1 | (Continued)

Sr. no	Definition	Author and year
22	<i>... .. as achieving economic growth, social benefit, and environmental conservation simultaneously.</i>	Markman et al. (2016)
23	<i>... .. sustainability issues are ‘wicked’ or complex problems with multiple dimensions—ecological, social, and economic—and emerge from efforts to protect and govern commonly held resources such as climate, water and energy.</i>	Nicholson and Kurucz (2019)
24	<i>... .. refers to the ideal business strategy for encouraging sustainable behavior for remaining relevant and competitive.</i>	Biswas et al. (2022)
25	<i>... .. means an allocation of resources dedicated to achieving sustainable objectives considering the economic, environmental, and societal benefits.</i>	Roosa and Mischen (2022)
26	<i>... .. as the ability to fulfill the demands and anticipations of customers and other stakeholders in the long term while maintaining a balance between efficient management, staff awareness and learning and implementing relevant innovations and improvements.</i>	Piwowar-Sulej and Iqbal (2025)
27	<i>United Nation’s sustainability refers to efforts such as sustainable development goals (SDGs) necessitating the participation from the industries to adopt sustainability practices aimed to resolve global grand challenges such as poverty, inequality, employment insecurity and climate change.</i>	United Nations Global Compact (UNGC) (2020)

obligation, ethical leaders underscore its importance as a fundamental organizational value (Agyabeng-Mensah et al. 2023). Together, these leadership styles collectively drive meaningful and impactful progress toward sustainability.

3.2 | Which Grand Societal Challenges Are Addressed by Emerging Trends in Leadership and Sustainability Practices?

Grand societal challenges or grand challenges are multifaceted problems spanning multiple levels and dimensions, requiring coordinated efforts from public, and private sectors to effectively address them (Voegtlin et al. 2022). George et al. (2016) define grand challenge as “specific critical barrier(s) that, if removed, would help solve an important societal problem with a high likelihood of global impact through widespread implementation.” They contended that the SDGs established by the United Nations (UN) are among the most universal and widely embraced grand challenges. Grand challenges (GC) such as climate change, gender equality, quality education, and good health represent complex and interlinked issues that threaten the well-being of humanity and the planet. Addressing these challenges requires collaborative efforts across governments, businesses, and civil society to develop innovative, sustainable, and inclusive solutions (Kunisch et al. 2023). These challenges emphasize the need for shared responsibility while demanding long-term strategic thinking, systemic change, and strong leadership to drive meaningful progress (Seelos et al. 2022).

A critical analysis reveals (see Table 3) that emerging sustainability practices are more aligned with and contribute to SDGs, such as Goal 13 (Climate Action) followed by Goal 4 (Quality Education), Goal 9 (Industry, Innovation, and Infrastructure), and Goal 5 (Gender Equality). Emerging trends in leadership and sustainability practices are playing a leading role in advancing the United Nations’ SDG 13, which focuses on climate

action. Organizations are adopting proenvironmental leadership styles that align their objectives with SDG 13, emphasizing the importance of green innovations, the Triple Bottom Line (TBL) framework, inclusivity, and stakeholder engagement in tackling climate-related challenges. Leadership practices such as green transformational leadership, green inclusive leadership, and responsible leadership are central to fostering environmental awareness and promoting sustainable actions within organizations (Çop et al. 2021; Javed et al. 2020). Green transformational leadership, for instance, encourages employee engagement in environmentally conscious behaviors, while green inclusive leadership creates a psychological climate conducive to climate-related initiatives, further reinforcing SDG 13 (Çop et al. 2021; Biswas et al. 2022).

The TBL framework has become a key strategy for balancing economic, social, and environmental goals, with leadership-driven green knowledge management enhancing environmental stewardship while maintaining economic growth (Al-Faouri 2023). Responsible leadership is also contributing to positive TBL outcomes by fostering innovation that drives sustainable practices, which aligns closely with SDG 13 (Abraham 2024). Green innovation, supported by organizational learning, experimentation, and participatory decision-making, is particularly important in advancing climate action, with visionary innovation leadership and green social capital playing key roles in promoting green product innovation (Usman et al. 2024). Furthermore, the adoption of blockchain technology by senior leadership is enhancing organizational sustainability and contributing to environmental resilience, supporting SDG 13’s objectives (Chaudhuri et al. 2024).

Stakeholder collaboration has also emerged as a crucial element in addressing climate action, as organizations expand their influence beyond their boundaries to engage with diverse stakeholders. Collaborations between organizations and stakeholders have been shown to drive the adoption of

TABLE 2 | Dominant leadership styles driving the integration of sustainability into organizational strategies and operations.

Sr. no	Leadership style	Key findings
1.	Responsible leadership	Responsible leadership (RL) plays a pivotal role in embedding sustainability into organizational strategies and operations through various mechanisms. Studies reveal that RL promotes stakeholder engagement, ethical decision-making, and long-term value creation, all of which are essential for sustainability (Javed et al. 2020). Leaders who practice RL often embed sustainability values into corporate vision and culture, encouraging inclusive and ethical business practices that align with the UN Sustainable Development Goals (Muff et al. 2020). RL fosters accountability and responsiveness, enhancing the alignment between governance and sustainable outcomes (Haque 2021). Empirical findings also indicate that RL strengthens the relationship between corporate social responsibility (CSR) and organizational performance, especially in state-owned enterprises (Kra and Bhat 2024). Moreover, RL enhances sustainable development by influencing green human resource practices, such as green recruitment and training, that support environmental goals (Zhao et al. 2024). By emphasizing a moral obligation toward diverse stakeholders, responsible leaders act as catalysts in institutionalizing sustainability within operational and strategic frameworks (Abraham 2024; Nakra and Kashyap 2024).
2.	Transformational leadership	Transformational leadership (TL) drives the integration of sustainability into organizational strategies and operations by inspiring change, fostering innovation, and aligning organizational goals with broader environmental and social objectives. Transformational leaders play a crucial role in shaping sustainability-oriented values and behaviors among employees, often serving as role models who articulate a compelling vision for sustainable development (Dartey-Baah 2014). By leveraging traits such as openness, conscientiousness, and agreeableness, they cultivate a culture of trust and motivation that supports sustainable practices (Timmermans et al. 2014). Empirical evidence indicates that green transformational leadership positively influences green creativity and green innovation, which are vital for embedding sustainability in core business activities (Çop et al. 2021). Moreover, TL facilitates stakeholder engagement and supports a proactive orientation towards corporate sustainability initiatives (Gil-Barragan et al. 2023). Leaders who adopt transformational behaviors are also found to strengthen organizational learning and continuous improvement in quality and environmental performance (Laureani et al. 2023). Additionally, TL enhances employees' green behaviors and proenvironmental attitudes, which collectively contribute to sustainability integration at operational levels (Aslam et al. 2024).
3.	Female leadership	Female leadership enhances sustainability in organizations by prioritizing social justice, equality, and environmental responsibility (Marshall 2011). Gender-diverse leadership teams are more effective in implementing sustainable strategies (Glass et al. 2016), though barriers like patriarchal structures and self-confidence issues persist (Shinbrot et al. 2019). Organic leadership by women significantly boosts corporate sustainability, while visionary leadership has less impact (Dewi et al. 2023). Transformational female leadership fosters equitable workplaces and teamwork, aligning with sustainable development goals (Gaur et al. 2024). Institutional support and international experience further strengthen women's leadership roles in sustainability (Saeed et al. 2023), and their presence improves transparency in sustainability reporting (Elaigwu et al. 2024). Overall, female leadership drives sustainability through inclusive and ethical approaches.

(Continues)

TABLE 2 | (Continued)

Sr. no	Leadership style	Key findings
4.	Educational leadership	Educational leadership plays a key role in embedding sustainability into organizational strategies and operations. Principals who adopt consultative, empathetic, and inspirational leadership styles can drive school turnaround and sustain performance by fostering teamwork and strong relationships (Drysdale et al. 2009). Business leaders increasingly recognize sustainability as a strategic priority, emphasizing the need for education to develop future leaders with the skills and mindset to integrate sustainability into core practices (Lacy et al. 2012). Self-efficacy, influenced by leadership effectiveness, enhances goal performance among educators, though equating success and failure does not significantly impact outcomes (Dubey et al. 2024). In underdeveloped and developing regions, future-fit leadership requires investments in human capital, curriculum updates, and technology to meet Fourth Industrial Revolution (4IR) demands (Uleanya and Naicker 2024). Collectively, educational leadership advances sustainability by cultivating collaborative, adaptive, and skill-focused approaches.
5.	Shared leadership	Shared leadership drives the integration of sustainability into organizational strategies and operations by distributing leadership responsibilities across multiple levels of the organization rather than concentrating them solely at the top. This approach challenges the traditional tendency to either glorify or blame top executives for sustainability outcomes, which Pearce et al. (2013) argue is an overly simplistic view. Instead, they advocate for developing leadership capacity throughout the organization in line with shared leadership theory, which can create a more resilient and adaptable management system better equipped to support sustainability goals. Furthermore, the integration of shared and self-leadership fosters a balance between individual initiative and collective responsibility, which Manz et al. (2015) suggest is essential for achieving sustainable service outcomes. By empowering employees at all levels to take ownership of sustainability initiatives, shared leadership promotes broader engagement, accountability, and innovation in embedding sustainability into core organizational practices.
6.	Servant leadership	Servant leadership drives the integration of sustainability into organizational strategies and operations by fostering a people-centered approach that enhances interpersonal trust, psychological empowerment, and employee engagement. By prioritizing the needs of others and emphasizing ethical and community-oriented behavior, servant leaders mobilize resources effectively and align stakeholders toward sustainability objectives. This leadership style also cultivates creativity and psychological resilience among employees, which serve as key mediators in promoting organizational sustainability outcomes (Batool et al. 2022). In the context of quality management, servant leadership traits have been linked to stronger quality cultures, greater employee involvement, and the successful adoption of sustainability-focused practices such as ISO 9001 standards and Quality 4.0 initiatives (Laureani et al. 2023). Overall, servant leadership enables the alignment of individual and organizational values, creating a foundation for long-term sustainable development.

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Sr. no	Leadership style	Key findings
7.	Relational leadership	Relational leadership drives the integration of sustainability into organizational strategies and operations by fostering moral reflection, dialogue, and mutual engagement among stakeholders. Rooted in a caring and reflective approach, this leadership style promotes a relational logic of effectiveness that emphasizes connection, ethical consideration, and colearning as foundations for sustainable action (Nicholson and Kurucz 2019). Through conversation and moral education, relational leadership cultivates the capacity for individual well-being, organizational resilience, and broader societal flourishing. Kurucz et al. (2017) further advance this perspective by proposing a conceptual model of relational leadership for strategic sustainability, identifying practical capabilities and actions that enable organizations to fulfill the transformational goals of the Framework for Strategic Sustainable Development. Their work also highlights the role of tools such as the Strongly Sustainable Business Model Canvas and the Future-Fit Business Benchmark in translating relational leadership principles into actionable strategies that support long-term sustainability outcomes.
8.	Inclusive leadership	Inclusive leadership drives the integration of sustainability into organizational strategies and operations by fostering an environment of openness, collaboration, and empowerment that supports green initiatives and sustainable performance. It has been shown to significantly enhance the effectiveness of green human resource management practices, thereby strengthening their impact on organizational sustainability outcomes (Amjad et al. 2024). The mediating roles of green corporate social responsibility engagement and green supply chain engagement further demonstrate how inclusive leadership facilitates the alignment of HRM and operational practices with sustainability goals. In the context of the iron-ore mining industry, green inclusive leadership has a direct and significant influence on firm-level sustainability, with the presence of supportive green policies amplifying this effect (Hu et al. 2024). These findings suggest that inclusive leadership, particularly when embedded within a framework of green innovation and policy support, creates the necessary cultural and structural conditions for sustainable development to thrive across diverse organizational settings.
9.	Green leadership	Green leadership drives the integration of sustainability into organizational strategies and operations by promoting environmentally responsible behaviors, fostering employee engagement, and enhancing organizational resilience. Green leadership has been shown to significantly influence sustainability outcomes in higher education by aligning leadership values with environmental goals and ethical practices (Srivastava et al. 2020). Similarly, green transformational leadership positively impacts green work engagement and team resilience, with green work engagement fully mediating the relationship, indicating that leaders inspire and mobilize employees to actively participate in sustainable initiatives (Çop et al. 2021). Furthermore, green leadership, exerts a direct influence on voluntary environmental behavior (VEB) and an indirect effect through the mediation of perceived green climate (PGC), demonstrating how green leaders shape organizational culture to support sustainability (Biswas et al. 2022). Collectively, these findings underscore the critical role of green leadership in embedding sustainability into both individual behaviors and institutional frameworks.
10.		Visionary leadership contributes to the integration of sustainability into organizational strategies and operations primarily through indirect pathways. Although it may not exert a direct influence on corporate sustainability outcomes, its impact is realized through the enhancement of business competence, which acts as a full mediator (Dewi et al. 2023). This suggests that visionary leaders play a critical role in building strategic capabilities that, in turn, support sustainability integration. Moreover, visionary innovation leadership has been shown to significantly influence green product innovation both directly and indirectly via the mediation of green innovation strategies (Usman et al. 2024).

TABLE 3 | Emerging trends in leadership and sustainability practices contributing to SDGs.

Sr. no	Grand challenge and exemplary literature	Key findings
1.	Climate action (Harris and Tregidga 2012; Guziana and Dobers 2013; Johannsdottir et al. 2015; Bayle-Cordier et al. 2015; Glass et al. 2016; Xing and Starik 2017; Jang et al. 2017; Javed et al. 2020; Haney et al. 2020; Srivastava et al. 2020; Foo et al. 2021; Domínguez-Escrig and Mallén-Broch 2023; McKim and Goodwin 2021; Biswas et al. 2022; Agyabeng-Mensah et al. 2023; Al-Faouri 2023; Amorelli and García-Sánchez 2023; Shaikh et al. 2024; Chaudhuri et al. 2024; Kra and Bhat 2024; Zhao et al. 2024; Abraham 2024; Amjad et al. 2024; Aslam et al. 2024; Gao 2024; Hu et al. 2024; Usman et al. 2024)	The grand societal challenge of climate action is increasingly being addressed through innovative leadership and sustainability practices that emphasize both strategic and cultural shifts within organizations. Gender-diverse leadership teams have proven more effective in implementing environmentally friendly strategies, highlighting the role of inclusive leadership in driving sustainability (Glass et al. 2016). Transformational and servant leadership styles foster employee engagement and green behaviors, with Taoist leadership, for instance, nurturing proenvironmental attitudes (Xing and Starik 2017). Ethical and responsible leadership further strengthens sustainability outcomes, particularly when aligned with triple-bottom-line (TBL) performance, though corporate reputation may not always mediate environmental results (Javed et al. 2020; Abraham 2024). Organizational learning and green knowledge management, supported by knowledge-based leadership, enhance sustainability by enabling radical innovations and operational coherence (Domínguez-Escrig and Mallén-Broch 2023; Al-Faouri 2023). The COVID-19 pandemic underscored the stabilizing role of women leaders in maintaining sustainability commitments, particularly in governance and social responsibility (Amorelli and García-Sánchez 2023). Technological adoption, such as blockchain, improves sustainability performance, especially when backed by senior leadership and adaptive policies (Chaudhuri et al. 2024). Green HR practices and inclusive leadership amplify sustainability efforts, with mediating roles played by green skills, creative self-efficacy, and organizational ambidexterity (Zhao et al. 2024; Amjad et al. 2024). In resource-intensive sectors like mining, green policies reinforce the impact of inclusive leadership on sustainability, demonstrating the importance of regulatory alignment (Hu et al. 2024). However, challenges persist, such as the gap between conceptual and operational coherence in policy implementation (Gao 2024), and the need for systemic integration of sustainability across supply chains (Agyabeng-Mensah et al. 2023). Collectively, these trends illustrate that addressing climate action requires multifaceted leadership approaches—combining ethical, inclusive, and innovation-driven strategies—to embed sustainability into organizational DNA.

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Sr. no	Grand challenge and exemplary literature	Key findings
2.	Quality education (Drysdale et al. 2009; Gitsham 2012; Lacy et al. 2012; Nicholson and Kurucz 2019; Haney et al. 2020; André 2020; Srivastava et al. 2020; Kra and Bhat 2024; Dubey et al. 2024; Hickey et al. 2024; Uleanya and Naicker 2024)	In addressing the grand societal challenge of ensuring quality education, organizations place a strong emphasis on relational, experiential, and holistic approaches to learning and development. Leadership, particularly in underperforming institutions, benefits from consultative, empathetic, and inspirational styles that foster teamwork and sustained performance (Drysdale et al. 2009). Distributed leadership has proven effective in alleviating administrative overload and ensuring role sustainability among school principals, as seen in Irish post-primary schools (Hickey et al. 2024). Experiential learning programs, such as those at IBM and HSBC, equip leaders with sustainability mindsets by immersing them in real-world challenges, highlighting the importance of reflective, action-based learning (Gitsham 2012; Haney et al. 2020). Integrative learning frameworks in management education, like climate leadership courses, combine social sciences to prepare leaders for decision-making that balances environmental and societal needs (André 2020). Ethical leadership grounded in the “ethics of care” theory promotes relational practices that prioritize well-being and societal flourishing, aligning sustainability with moral education (Nicholson and Kurucz 2019). In higher education, green authentic leadership and internal branding significantly enhance sustainability outcomes, particularly when supported by training (Srivastava et al. 2020). Corporate initiatives, such as CSR programs aligned with SDGs, demonstrate how responsible business leadership can advance education-related goals, as evidenced by Indian public sector enterprises (Kra and Bhat 2024). Future-fit leadership in African schools underscores the need for human capital investment, curriculum innovation, and technology adoption to meet 4IR demands (Uleanya and Naicker 2024). Additionally, self-efficacy derived from ethical principles, such as those in the Bhagavad Gita, enhances leadership effectiveness and goal performance among educators (Dubey et al. 2024). Collectively, these trends reveal that quality education requires leadership models that are adaptive, inclusive, and rooted in sustainability—bridging individual development with systemic change to create equitable and resilient educational ecosystems.

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Sr. no	Grand challenge and exemplary literature	Key findings
3.	Innovation (Guziana and Dobers 2013; Kurucz et al. 2017; Javed et al. 2020; Domínguez-Escrig and Mallén-Broch 2023; Boorman et al. 2023; Laureani et al. 2023; Ahmadi Ghobadbezani and Bello Pintado 2024; Aslam et al. 2024; Usman et al. 2024)	To tackle the grand societal challenge of fostering innovation, organizations adopt relational, strategic, and systems-oriented approaches that promote collaboration and long-term impact. Sustainability leaders are increasingly aware of environmental aspects in production and product development, integrating these considerations into corporate communications (Guziana and Dobers 2013). Relational leadership models, such as those advancing strategic sustainability, leverage practices like the Strongly Sustainable Business Model Canvas to drive transformative innovation (Kurucz et al. 2017). Responsible leadership significantly enhances triple-bottom-line (TBL) performance, with innovation acting as a key mediator in this relationship, though corporate reputation does not similarly influence environmental outcomes (Javed et al. 2020). Organizational learning capabilities fully mediate the link between stewardship leadership and radical innovation, highlighting the importance of continuous knowledge development for sustainable breakthroughs (Domínguez-Escrig and Mallén-Broch 2023). Place leadership methodologies, such as Collective Impact and Mission-Oriented Innovation, are instrumental in localizing SDGs by fostering equity-centered partnerships and systemic change (Boorman et al. 2023). Transformational and servant leadership traits are critical for sustaining quality management, with digitalization and Quality 4.0 playing pivotal roles in modern quality culture (Laureani et al. 2023). Supply chain leadership enhances sustainability outcomes by moderating the impact of internal and external practices on supplier performance (Ahmadi Ghobadbezani and Bello Pintado 2024). Green transformational leadership (GTL) drives green innovation (GI), with green dynamic capabilities (GDC) partially mediating this relationship, offering multiple pathways to improve green performance (Aslam et al. 2024). Visionary innovation leadership directly and indirectly boosts green product innovation, particularly when supported by green social capital, underscoring the role of collaborative networks in sustainable innovation (Usman et al. 2024). Collectively, these trends demonstrate that innovation for sustainability thrives under leadership that fosters collaboration, learning, and systemic integration, ensuring that transformative solutions align with long-term environmental and social goals.

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Sr. no	Grand challenge and exemplary literature	Key findings
4.	Gender equality (Marshall 2011; Shinbrot et al. 2019; Amorelli and García-Sánchez 2023; Dewi et al. 2023; Gaur et al. 2024; Saeed et al. 2023; Elaigwu et al. 2024)	The grand societal challenge of achieving gender equality is being tackled through leadership and sustainability practices that prioritize inclusivity, empowerment, and transformative systemic change. Research highlights that women's leadership fosters sustainability by prioritizing social justice, equality, and collaborative practices, offering an alternative to traditional leadership models (Marshall 2011). However, patriarchal structures and lack of self-confidence continue to hinder women's access to leadership roles, underscoring the need for male allies and targeted support (Shinbrot et al. 2019). During crises like the COVID-19 pandemic, women leaders played a stabilizing role, mitigating setbacks in corporate sustainability and maintaining commitments to governance and social responsibility (Amorelli and García-Sánchez 2023). Organic leadership by women significantly enhances corporate sustainability, particularly when mediated by organizational competence, while visionary leadership shows limited impact (Dewi et al. 2023). Transformational leadership by women aligns with sustainable development goals by creating equitable work environments, promoting self-motivation, and fostering teamwork (Gaur et al. 2024). Institutional quality, international experience, and institutional ownership further amplify women's representation in leadership roles, especially in emerging markets (Saeed et al. 2023). Additionally, female leadership improves the transparency and quality of sustainability disclosures, reinforcing accountability (Elaigwu et al. 2024). Collectively, these trends demonstrate that advancing gender equality requires dismantling structural barriers, leveraging women's unique leadership strengths, and integrating gender perspectives into sustainability strategies to create more inclusive and resilient organizations.

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Sr. no	Grand challenge and exemplary literature	Key findings
5.	Responsible consumption and production (Guziana and Dobers 2013; Johannsdottir et al. 2015; Boorman et al. 2023; Laureani et al. 2023; Ahmadi Ghobadbezani and Bello Pintado 2024)	To address the grand societal challenge of responsible consumption and production, organizations prioritize systemic collaboration, active stakeholder involvement, and innovative practices that drive sustainable change. Companies are increasingly integrating environmental considerations into production and product development, demonstrating a heightened awareness of sustainability in corporate activities (Guziana and Dobers 2013). Effective implementation of environmental strategies requires a dual approach, combining top-down directives with bottom-up employee engagement, as seen in Nordic insurance companies, where leadership extends beyond organizational boundaries to influence stakeholders (Johannsdottir et al. 2015). Place leadership methodologies, such as Collective Impact and Mission-Oriented Innovation, are proving instrumental in localizing SDGs by fostering equitable partnerships and driving systemic change, which is critical for advancing responsible consumption and production (Boorman et al. 2023). Transformational and servant leadership traits are essential for sustaining quality management, with digitalization and Quality 4.0 playing key roles in maintaining high standards and reducing waste (Laureani et al. 2023). Additionally, supply chain leadership enhances sustainability outcomes by moderating the relationship between buyer practices and supplier performance, ensuring responsible production through collaboration and monitoring (Ahmadi Ghobadbezani and Bello Pintado 2024). Together, these trends highlight the importance of leadership that fosters cross-sector collaboration, innovation, and accountability to promote sustainable consumption and production patterns globally.

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Sr. no	Grand challenge and exemplary literature	Key findings
6.	Good health and well-being (Timmermans et al. 2014; Amorelli and García-Sánchez 2023; Nicholson and Kurucz 2019; Kra and Bhat 2024)	The grand societal challenge of good health is being addressed through leadership and sustainability practices that emphasize personality-driven policy entrepreneurship, crisis resilience, and operational excellence. Policy entrepreneurs in sustainability transitions, particularly in healthcare, exhibit personality traits such as extraversion, agreeableness, and openness to experience, combined with transformative leadership styles, which are critical for driving systemic health innovations (Timmermans et al. 2014). During the COVID-19 pandemic, women leaders played a stabilizing role in multinational corporations, mitigating setbacks in sustainability commitments and maintaining focus on good governance and health-related policies (Amorelli and García-Sánchez 2023). In healthcare settings, lean daily management practices—such as daily huddles and KPI monitoring—are essential for sustaining lean initiatives, with lean leadership enhancing their effectiveness and long-term impact (Nicholson and Kurucz 2019). Corporate social responsibility (CSR) initiatives, aligned with SDGs, further support health outcomes by addressing sanitation, well-being, and education, as demonstrated by responsible business leadership in Indian public sector enterprises (Kra and Bhat 2024). Collectively, these trends highlight the importance of adaptive leadership, crisis-responsive governance, and operational efficiency in advancing global health sustainability.
7.	Partnerships for the goals (Papa and Gleason 2012; Jha and Arora 2013; Hernandez et al. 2015; Boorman et al. 2023)	The grand societal challenge of “Partnerships for the Goals” (SDG 17) is increasingly addressed by emerging leadership and sustainability practices that emphasize collaboration, systems thinking, and shared responsibility. Emerging powers demonstrate early forms of global leadership through policy coordination, incentive creation, and diplomatic coalition-building in sustainable development, particularly in areas like clean energy (Papa and Gleason 2012). This signals a shift toward a multipolar leadership model that relies on strategic alliances rather than unilateral action. Corporations like the Tata Group exemplify this ethos through their commitment to collaborative growth, reinforcing the idea that sustainable development requires the collective engagement of business, government, and civil society actors (Jha and Arora 2013).

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Sr. no	Grand challenge and exemplary literature	Key findings
8.	Sustainable cities and communities (Jha and Arora 2013)	In response to the grand societal challenge of “sustainable cities and communities,” organizations are prioritizing collective responsibility, engaging stakeholders, and focusing on long-term societal impact. As highlighted by the Tata Group’s commitment to collaborative growth, achieving sustainable development requires more than isolated corporate action; it demands the active participation of all stakeholders across society and the global economy (Jha and Arora 2013). This inclusive and integrative leadership approach promotes partnerships between businesses, governments, and communities to develop resilient infrastructure, support urban development, and enhance quality of life. By aligning corporate strategies with societal needs, leaders like those at the Tata Group demonstrate how responsible leadership can contribute to building sustainable, inclusive, and thriving cities and communities. These trends reflect a broader shift in leadership thought—from profit-centered models to sustainability-driven paradigms that prioritize shared value and systemic transformation.
9.	No poverty KRA and Bhat, 2024	Emerging trends in leadership and sustainability practices have increasingly focused on addressing grand societal challenges such as “no poverty”. In terms of addressing no poverty, responsible business leadership in Maharatna companies has led to sustained efforts in poverty alleviation through contributions to welfare funds and community development programs, demonstrating a commitment to inclusive growth and equitable resource distribution (Kra and Bhat 2024).
10.	Affordable and clean energy Papa and Gleason (2012)	Pertaining to the grand societal challenge of “affordable and clean energy” organizations are emphasizing global policy coordination, coalition-building, and strategic diplomacy, particularly among emerging powers. Countries in the Global South are increasingly leveraging their influence to shape sustainable development agendas by fostering collaboration, aligning incentives, and participating actively in global negotiations. While they have yet to fully assert global leadership, their growing engagement in clean energy diplomacy signals a shift toward more inclusive and diversified leadership in the global sustainability landscape. According to Papa and Gleason (2012), the clean energy sector presents a significant opportunity for these emerging powers to lead by example, using their policy innovation and diplomatic capacity to promote equitable access to renewable energy and drive the transition toward low-carbon economies. These efforts reflect a broader movement in sustainability leadership that prioritizes not only national development goals but also collective action and shared accountability in tackling global energy challenges.

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Sr. no	Grand challenge and exemplary literature	Key findings
11.	Zero hunger Kra and Bhat 2024	Regarding the grand societal challenge of 'zero hunger', corporate sustainability initiatives have prioritized food security and nutrition-related projects, which align with broader Sustainable Development Goals (SDGs) by aiming to eliminate hunger and malnutrition among underprivileged populations. These actions are driven by leadership that emphasizes ethical responsibility and social impact (Kra and Bhat 2024).
12.	Life on land Kra and Bhat 2024	Concerning the grand societal challenge of 'life on land', leadership practices rooted in the triple bottom line (TBL) framework have promoted environmental sustainability through conservation and reforestation efforts, reflecting a strategic commitment to preserving biodiversity and land ecosystems. These emerging practices reflect a shift from traditional profit-driven approaches to holistic leadership that integrates social, environmental, and economic goals in pursuit of sustainable development (Kra and Bhat 2024).

sustainable practices, as seen in the restaurant industry (Jang et al. 2017). Leadership that fosters diversity, particularly gender diversity, strengthens corporate environmental strategies, which is consistent with SDG 13's inclusive focus (Glass et al. 2016). Additionally, ethical leadership within supply chains promotes circular practices and fosters an environmentally conscious culture, further reinforcing SDG 13 (Agyabeng-Mensah et al. 2023). Green Human Resource Management (Green HRM) plays a pivotal role in advancing SDG 13 by aligning individual behaviors with broader sustainability goals. By cultivating green behaviors and enhancing employee competencies, Green HRM contributes to the long-term sustainability of organizations (Amjad et al. 2024; Zhao et al. 2024). Furthermore, organizations are investing in developing green dynamic capabilities and green skill competencies, which embed climate action into daily operations and foster a culture of sustainability (Aslam et al. 2024; Amjad et al. 2024). These leadership and sustainability practices, collectively, are advancing SDG 13 by promoting climate action through innovation, stakeholder engagement, and organizational sustainability initiatives.

Key trends in leadership-nexus practices also advance United Nations Sustainable Development Goal 4 (SDG 4), which seeks to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. These trends emphasize innovative leadership styles that integrate sustainability, ethics, and collaboration into educational frameworks. For example, Drysdale et al. (2009) demonstrate that a consultative and relational leadership style can revitalize underperforming schools, underscoring the importance of school leaders in fostering a shared vision and collaborative teamwork among educators to sustain educational improvements. These trends also highlight the interconnectedness of ethics, experiential learning, and distributed responsibilities in advancing SDG 4. Experiential learning has become a key practice in equipping organizational leaders with the necessary skills and mindsets to address sustainability challenges. Gitsham (2012) shows that immersive learning programs offer leaders transformative insights that

deepen their personal connections to sustainability. Haney et al. (2020) argue that this form of learning empowers leaders to act with conviction, integrating sustainability into their decision-making, thereby supporting SDG 4's educational methodologies that foster critical thinking, adaptability, and the ability to navigate complex sustainability issues.

Integrating ethical perspectives into leadership practices also supports SDG 4 by addressing the moral dimensions of leadership. Nicholson and Kurucz (2019) explore the ethics of care in relational leadership, emphasizing the importance of moral education and reflective practices in building capacity for sustainable leadership. This style encourages leaders to engage in dialogues that promote individual well-being and organizational flourishing, aligning with SDG 4's call for inclusive and equitable education. Beyond individual leadership, emerging trends also extend sustainability into broader organizational and societal strategies. Srivastava et al. (2020) show how green authentic leadership positively influences sustainability in higher education, ensuring that educational institutions themselves become models of sustainable practice. Similarly, Lacy et al. (2012) highlight the strategic importance of embedding sustainability into business education programs, where CEOs advocate for educational initiatives that prepare future leaders with the skills and mindsets necessary to address global challenges.

Distributed leadership is another emerging trend supporting SDG 4. By sharing responsibilities among principals and deputy principals, distributed leadership helps alleviate administrative burdens, improving decision-making and fostering more resilient educational systems (Hickey et al. 2024). Uleanya and Naicker (2024) further emphasize the need for leadership practices aligned with the demands of the Fourth Industrial Revolution, advocating for investments in human capital and curriculum innovation to prepare students for a rapidly evolving technological landscape. Teacher self-efficacy also plays a critical role in advancing SDG 4. Dubey et al. (2024) highlight how work-related variables influence teachers' self-efficacy, underscoring the need for supportive environments that empower

educators to excel. This directly supports SDG 4 by ensuring that teachers are competent and motivated, essential for delivering quality education and promoting lifelong learning opportunities. These leadership and sustainability practices collectively contribute to advancing SDG 4, creating educational systems that are not only inclusive and equitable but also responsive to the challenges of sustainability and global change.

Emerging trends are also promoting United Nations Sustainable Development Goal 9 (SDG 9), which focuses on building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation. These trends integrate leadership models with innovative sustainability practices, addressing contemporary challenges in industry and technology. Green transformational leadership (GTL), for example, is shown to significantly influence green innovation (GI), with its impact mediated by green dynamic capability (GDC). Aslam et al. (2024) highlight how this leadership style enables organizations to achieve green performance (GP), directly aligning with SDG 9's emphasis on sustainable industrialization. Moreover, visionary innovation leadership (VIL) further amplifies sustainability by promoting green product innovation (GPI). Ahmadi Ghobadbezani and Bello Pintado (2024) find that VIL's effectiveness is enhanced by green innovation strategies and green social capital, underscoring leadership's role in cultivating a culture that values collaboration and sustainable innovation.

The importance of leadership in supply chain sustainability also contributes to SDG 9. Ahmadi Ghobadbezani and Bello Pintado (2024) demonstrate that leadership positively influences supplier sustainability performance through collaboration and monitoring mechanisms, essential for creating resilient industrial networks that foster infrastructure and technological advancements. Leadership models such as relational leadership and responsible leadership (RL) further support this goal by creating environments conducive to innovation and sustainability. Kurucz et al. (2017) developed a relational leadership model that integrates tools like the Strongly Sustainable Business Model Canvas, helping organizations embed sustainability into their strategies and drive innovation aligned with global goals. Technological advancements, including Quality 4.0 and digitalization, benefit from leadership sustainability practices as well. Laureani et al. (2023) emphasize the role of transformational and servant leadership in sustaining quality management systems, particularly in deploying technologies that enhance efficiency and sustainability. By fostering a culture that supports innovation, these leadership styles contribute to infrastructure development that aligns with SDG 9. Additionally, place leadership, as explored by Boorman et al. (2023), contributes to localized innovation and infrastructure development by utilizing methodologies like Collective Impact (CI) and Mission-Oriented Innovation (MOI), further supporting SDG 9's objectives.

Lastly, stewardship leadership plays a vital role in advancing radical innovation by promoting experimentation, participative decision-making, and interaction with external environments, as noted by Domínguez-Escrig and Mallén-Broch (2023). These leadership practices are key to driving innovation in industry, infrastructure, and technology, ultimately advancing the goals of SDG 9 by fostering resilience, inclusivity, and sustainable growth across industrial sectors.

Emerging trends in leadership and sustainability practices are playing a pivotal role in advancing United Nations' SDG 5, which aims to achieve gender equality and empower all women and girls. These trends emphasize breaking down patriarchal structures, promoting inclusive leadership, and addressing the specific challenges women face in leadership roles while leveraging their unique contributions to sustainability. The persistent dominance of male perspectives in corporate social responsibility (CSR) and sustainability discourses has been noted by Marshall (2011), highlighting the need for gender-sensitive leadership paradigms that integrate themes such as social justice, equality, and diverse ways of knowing. These leadership models align more closely with the principles of SDG 5, fostering environments that empower women in leadership positions. Shinbrot et al. (2019) discuss the barriers women face in leadership, such as patriarchal constraints and a lack of self-confidence, which hinder their access to top positions. However, when these barriers are overcome, women bring unique contributions to sustainability efforts. Women leaders often approach challenges with a nuanced understanding of equity and inclusivity, which are essential for sustainable development. Dewi et al. (2023) demonstrate that women's leadership positively influences organizational sustainability, while Gaur et al. (2024) highlight the transformational leadership style of women, which fosters intrinsic motivation, enhances mental well-being, and cultivates supportive work environments. This leadership style promotes equitable workplace cultures that value collaboration, aligning with SDG 5's broader goal of gender equality.

In terms of corporate governance, Elaigwu et al. (2024) reveal that female leadership enhances the quality of sustainability disclosures and underscores the importance of representation in leadership roles. Women leaders often prioritize transparency, accountability, and ethical governance, all of which contribute to sustainable and equitable practices. Furthermore, the COVID-19 pandemic underscored the resilience and adaptability of women leaders. Amorelli and García-Sánchez (2023) found that the social identity of female directors helped mitigate business sustainability setbacks during the pandemic. Saeed et al. (2023) highlight how institutional factors in home markets influence the representation of women in leadership positions, particularly within emerging market multinational corporations (EM-MNCs), where international experience and institutional ownership amplify this effect. These studies collectively emphasize that empowering women in leadership is not only a matter of social justice but also a strategic imperative for sustainable development. Women leaders bring perspectives that prioritize inclusivity, equity, and long-term well-being, which are integral to advancing SDG 5.

3.3 | In What Ways Does Leadership in Sustainability Differ Across Industries, Sectors, and Cultural Contexts?

The critical analysis of the data reveals that leadership in sustainability varies significantly across industries, sectors, and cultural contexts due to the diverse challenges and opportunities inherent in each setting. In the educational sector, leadership often emphasizes the role of principals and their ability to align personal philosophies with collaborative efforts among

stakeholders, including staff, parents, and students. For instance, Drysdale et al. (2009) highlight the importance of a principal's leadership style in fostering an inclusive environment where sustainability initiatives can thrive. In contrast, the corporate sector, exemplified by IBM's Corporate Service Corps, emphasizes experiential learning to address global sustainability challenges. Gitsham (2012) observed that participants in such programs value learning experiences that directly contribute to solving real-world problems, showcasing how corporate leadership integrates sustainability into professional development.

The industry-specific nature of sustainability leadership is evident in how different sectors prioritize their efforts (Marshall 2011). For example, technical or systems-based approaches might dominate industries like manufacturing or agriculture, where tangible environmental impacts need addressing. Conversely, the service sector often focuses on stakeholder engagement and corporate social responsibility, highlighting the softer dimensions of sustainability leadership. Cultural contexts also play a crucial role in shaping sustainability leadership. The gendering of leadership brings attention to the varying ways in which societal norms and values influence leadership styles.

Leadership in sustainability differs significantly across cultural contexts such as Eastern and Western contexts due to varying cultural values and societal priorities (Dartey-Baah 2014). In the East, leadership often draws from collectivist traditions, emphasizing harmony, community, and long-term well-being. Eastern leaders typically adopt relational and inclusive styles to sustainability, fostering collaboration and shared responsibility among stakeholders. Responsible and female leadership styles dominate in Eastern contexts (Javed et al. 2020). This focus on the collective aligns with broader sustainability goals, such as environmental preservation and social equity, as they resonate with community-centered values (Schaltegger and Burritt 2010).

In contrast, Western leadership is generally rooted in individualism and a results-oriented mindset. Western leaders are more likely to prioritize innovation, efficiency, and measurable outcomes when addressing sustainability (Domínguez-Escrig and Mallén-Broch 2023). Transformational and educational leadership styles dominate in Western contexts, as they align with the emphasis on personal initiative and strategic foresight. This focus often translates into pioneering technological advancements and innovative business models that drive sustainability (Marshall 2011).

Eastern leaders typically involve a wide range of stakeholders in decision-making, reflecting the collectivist culture (Javed et al. 2020). For instance, sustainability initiatives often include input from local communities, governments, and employees, fostering a sense of ownership and shared commitment. This contrasts with the Western approach, where decision-making tends to be more hierarchical and focused on expert-driven solutions (Strand 2024). While Western leaders also engage stakeholders, the process often emphasizes efficiency and goal alignment over inclusivity.

Another key difference lies in temporal orientation. Eastern leadership tends to prioritize long-term planning, reflecting values of patience and sustainability for future generations. This

perspective aligns closely with environmental conservation and intergenerational equity, foundational to sustainability (Aslam et al. 2024). Western leadership, while increasingly adopting long-term perspectives, often balances them with short-term performance metrics and shareholder expectations, creating a dual focus that can sometimes dilute sustainability goals (Hickey et al. 2024).

Ethics and relationships play a central role in Eastern leadership approaches to sustainability (Nicholson and Kurucz 2019). Guided by philosophies such as Confucianism and Buddhism, Eastern leaders often view sustainability as an ethical imperative tied to moral duties and social harmony (Nakra and Kashyap 2024). In Western contexts, ethical leadership in sustainability focuses more on transparency, accountability, and corporate social responsibility, driven by regulatory frameworks and stakeholder advocacy (Schaltegger and Burritt 2010).

In some regions, care ethics and social justice themes may be more prominent, reflecting local cultural priorities. Regional variations further illustrate this diversity. Australian examples, such as those from Drysdale et al. (2009) demonstrate a strong emphasis on stakeholder inclusion and addressing practical sustainability challenges. Collaborative efforts between Germany and Australia, as seen in the work of Schaltegger and Burritt (2010), delve into theoretical frameworks like sustainability accounting, showcasing the academic and applied dimensions of leadership in sustainability.

3.4 | What Are the Key Challenges and Barriers That Leaders Face in Advancing Sustainability Within Organizations, and What Strategies Are Appropriate in Overcoming These Obstacles?

Our analysis highlights that leaders encounter diverse and multifaceted challenges in driving sustainability within their organizations (see Figure 3). One of the most significant challenges leaders face is resistance to change within organizations. Employees and stakeholders often view sustainability initiatives as disruptive, costly, or misaligned with immediate business goals. Resistance can arise from a lack of awareness or understanding of sustainability's benefits, leading to skepticism and a reluctance to adopt new practices (Harris and Tregidga 2012). Leaders frequently encounter opposition when attempting to shift organizational culture toward sustainability-focused values.

Organizations often prioritize short-term financial performance over long-term sustainability goals. Sustainability initiatives, such as adopting renewable energy sources or restructuring supply chains, may require substantial upfront investments. Leaders face pressure from shareholders and investors who expect immediate returns, making it challenging to justify expenditures on sustainability (Schaltegger and Burritt 2010). Implementing sustainability within organizational strategies is inherently complex due to the multifaceted nature of environmental, social, and governance (ESG) issues. Leaders must navigate conflicting priorities, such as balancing profitability with environmental conservation or addressing diverse stakeholder needs. This complexity is further exacerbated by the

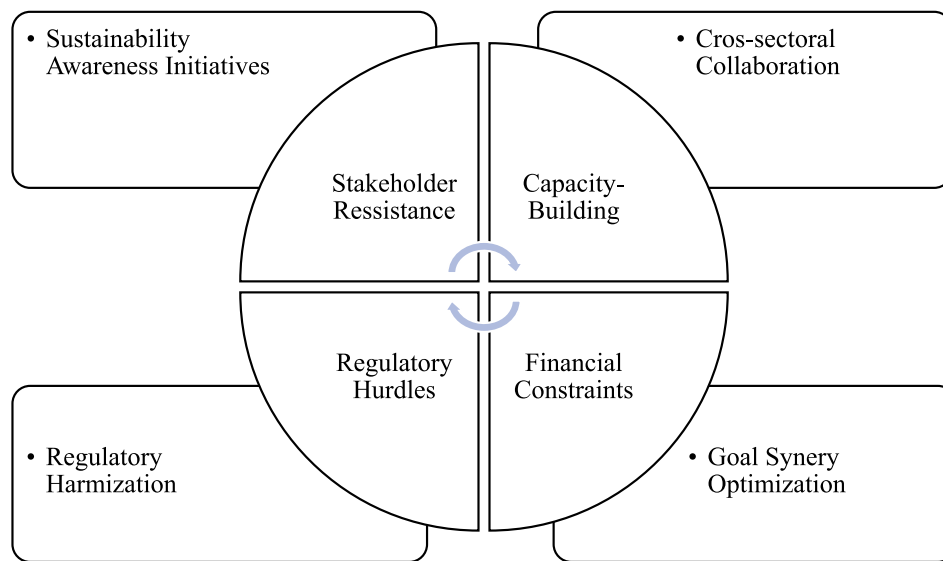


FIGURE 3 | Challenges and strategies.

lack of standardized metrics and benchmarks for measuring sustainability performance, creating confusion and inefficiency (Shinbrot et al. 2019).

Another barrier is the knowledge gap regarding sustainability practices and their integration into business operations. Many leaders lack the expertise required to design and implement effective sustainability strategies. Similarly, organizations may lack access to the resources or technical skills needed to innovate and adapt to sustainable models, further hindering progress (Drysdale et al. 2009). Regulatory frameworks for sustainability are often inconsistent or underdeveloped, creating uncertainty for leaders. Rapidly changing policies and market conditions can complicate strategic planning, making it difficult for organizations to commit to long-term sustainability goals. Additionally, the lack of global consensus on sustainability standards can lead to fragmented efforts and diminished impact (Boorman et al. 2023). Increased capital cost is the most significant challenge facing construction organizations in an attempt to adopt sustainability practices in the delivery of construction projects (Opoku and Ahmed 2014).

The above challenges can be overcome using appropriate strategies (see Figure 3). Leaders can overcome resistance to change by building awareness of sustainability's benefits and engaging stakeholders in meaningful ways. Educational programs, workshops, and transparent communication can help employees and stakeholders understand the importance of sustainability and their role in advancing it. Encouraging collaboration across departments can also foster a sense of shared responsibility (Gitsham 2012).

To address short-term financial pressures, leaders must demonstrate how sustainability aligns with broader business objectives. Highlighting cost savings from energy efficiency, market opportunities in green products, and enhanced brand reputation can help justify sustainability investments. Leaders should frame sustainability as a driver of innovation and competitive advantage rather than a financial burden (Marshall 2011). Collaborations with external partners, such as non-governmental organizations

(NGOs), academic institutions, and industry alliances, can provide organizations with the expertise and resources needed to advance sustainability. Leveraging networks allows leaders to share knowledge, adopt best practices, and address complex challenges collectively. This approach also enhances credibility and stakeholder trust (Schaltegger and Burritt 2010).

Embedding sustainability into organizational structures and processes is critical for long-term success. Leaders should integrate sustainability into the organization's vision, mission, and performance metrics. Establishing dedicated teams or departments for sustainability can ensure accountability and continuous progress. Additionally, adopting international standards such as ISO 14001 can provide a structured framework for implementation (Drysdale et al. 2009).

4 | Limitations and Future Research Agenda: Advancing the Leadership—Sustainability Nexus

Although this systematic literature review offers valuable insights into the intersection of leadership and sustainability, certain limitations must be acknowledged to enhance transparency and guide future inquiry. First, the review was limited to peer-reviewed journal articles published in English and indexed in ABS-ranked journals, which may exclude relevant contributions from other languages, grey literature, or emerging interdisciplinary journals. Second, database and journal coverage, although extensive, may not fully capture all nuances, particularly from underrepresented regions or niche disciplines. Third, potential publication bias—favoring studies with positive findings—may skew the synthesized insights.

These limitations also point toward promising future research directions. Scholars could broaden the scope of future reviews by incorporating grey literature, non-English sources, and practitioner-oriented publications to enrich the diversity of perspectives. Conceptually, future research could explore lesser-known or hybrid leadership models (e.g., paradoxical, regenerative, or indigenous leadership) in relation to sustainability

goals. Methodologically, longitudinal studies and multi-level modeling are needed to unpack the causal mechanisms between leadership styles and sustainability outcomes across micro, meso, and macro levels. Furthermore, cross-cultural and cross-sector comparative analyses could shed light on how contextual variables moderate these relationships. Finally, integrating insights from behavioral science, systems thinking, and digital transformation can help design more adaptive and resilient leadership frameworks for sustainability.

The future research agenda is structured around four interrelated dimensions: conceptual expansion, contextual sensitivity, methodological advancement, and practical integration.

4.1 | Research Avenue 1. Conceptual Expansion and Theoretical Innovation

Most current research focuses on transformational, servant, and responsible leadership. Future studies should explore underexamined or emerging styles such as *adaptive leadership*, *systems leadership*, *distributed leadership*, *regenerative leadership*, and *spiritual or indigenous leadership* and how these approaches address complex sustainability challenges. There is a need for deeper integration between leadership theories and sustainability frameworks such as the *Planetary Boundaries*, *Doughnut Economics*, *Circular Economy*, or the *Future-Fit Business Benchmark*. Bridging these perspectives can offer more holistic insights into sustainable leadership. Future research should examine how leadership operates across organizational levels (individual, team, organizational, and institutional) to support sustainability transformation, including the roles of middle managers, informal leaders, and board members.

4.2 | Research Avenue 2. Contextual Sensitivity and Cross-Cultural Comparisons

There is a paucity of research comparing how leadership for sustainability differs across industries such as manufacturing, technology, healthcare, and extractives. Sector-specific barriers, opportunities, and leadership responses deserve deeper investigation.

The majority of current studies are situated in Western or Global North contexts. Future research should examine leadership-sustainability linkages in Global South regions (e.g., Africa, Latin America, and South Asia), where sustainability imperatives and leadership norms may differ significantly. More empirical work is needed to investigate how national culture, institutional pressures, or regulatory environments influence the effectiveness of sustainability-oriented leadership practices.

4.3 | Research Avenue 3. Methodological Advancement and Rigorous Design

Most studies in the current review adopt cross-sectional designs. Longitudinal research can uncover causal pathways and leadership evolution over time. Mixed-methods and multi-level studies are also needed to triangulate findings and offer

richer explanations. Future studies should consider experimental designs or scenario-based simulations to test how different leadership interventions influence sustainability-related decision-making under uncertainty.

Incorporating tools from behavioral science, neuroscience, or psychometrics may yield novel insights into the cognitive and emotional drivers of sustainable leadership behavior.

4.4 | Research Avenue 4. Practical Relevance and Policy Integration

There is a need to evaluate how leadership development programs integrate sustainability competencies and whether these programs produce measurable organizational outcomes. Partnerships between academia and business schools can cocreate actionable frameworks for leadership training. While many studies mention the SDGs broadly, few explore how leadership contributes to specific goals like climate action (SDG 13), gender equality (SDG 5), or decent work (SDG 8). Future research could explore these linkages in greater depth. As organizations undergo digital transformation, new questions arise about how digital leadership intersects with environmental and social goals. Research could examine how digital technologies (e.g., AI, blockchain, and big data) empower or constrain sustainable leadership. The COVID-19 pandemic and climate emergencies highlight the need for resilient and adaptive leadership. Research should investigate how leaders navigate sustainability during crises and their long-term effects on organizational sustainability trajectories.

5 | Conclusion

This study underscores the transformative role of leadership in advancing sustainability and demonstrates that leadership styles such as responsible, transformational, and female leadership play a critical role in embedding sustainability into organizational practices. By synthesizing 109 peer-reviewed studies, the review reveals how these leadership styles align with the SDGs, particularly in addressing climate action, quality education, gender equality, and innovation. It also identifies the key barriers leaders face—including resistance to change, financial constraints, and regulatory inconsistencies—and the strategies used to overcome them. This study revisits key research questions to clarify which leadership styles are most effective for integrating sustainability, how these styles contribute to specific SDGs, the contextual variations in sustainability leadership across different sectors and cultures, and the practical challenges and solutions leaders encounter in real-world settings. These insights not only advance theory but also provide actionable guidance for business leaders, practitioners, and policymakers. For business leaders, the findings emphasize the need to adopt leadership styles—such as responsible, transformational, and servant leadership—that align organizational purpose with societal and environmental values. Embedding sustainability into core strategy, rather than treating it as a peripheral activity, enhances long-term performance and stakeholder trust. Practitioners, including HR and sustainability officers, can use these insights to design leadership development programs that

build competencies in ethical decision-making, stakeholder engagement, and systems thinking—skills essential for navigating complex sustainability challenges. For policymakers, the review underscores the importance of creating enabling regulatory environments and incentives that support sustainability leadership. Encouraging cross-sector collaboration, promoting transparency, and recognizing leadership-driven sustainability outcomes can accelerate progress toward national and global sustainability targets, including the SDGs.

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