Innovative Business Leadership Strategies and Sustainable Development in Kenya's Manufacturing Sector

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Abstract

The study examines how innovative business leadership strategies, such as transformational, participatory, technology-driven, and sustainability-oriented leadership strategies moderated by organizational culture, influence sustainable development in Kenya's manufacturing sector. Grounded in transformational, participatory, technology acceptance, triple bottom line and organizational culture theories, the paper aims to determine which leadership practices most effectively promote economic growth, social equity and environmental protection within Kenya's industrialization agenda. A convergent mixed-methods design was adopted for primary data collection. Quantitative data were gathered using structured questionnaires administered to 150 respondents from 50 registered manufacturing firms across food processing, textiles, chemicals and construction materials subsectors. The survey measured transformational, participatory, technology-driven and sustainability-oriented leadership practices alongside a composite index of firm sustainability outcomes. Qualitative evidence was collected through semi-structured interviews with managers and employees and analyzed thematically to contextualize quantitative findings. Descriptive analysis shows transformational and participatory leadership are moderately practiced, technology-driven leadership is weak, and sustainability-oriented leadership is moderate, with greater emphasis on corporate social responsibility and governance than on environmental practices. Organizational culture appears moderately supportive but constrained by limited adaptability. Pearson correlation coefficients indicate positive, statistically significant relationships between each leadership dimension and sustainable development indicators. Multivariable regression analysis explains approximately 62% of the variance in sustainable development outcomes, with sustainability-oriented leadership and transformational leadership exhibiting the largest standardized effects, followed by organizational culture, participatory leadership and technology-driven leadership. The findings imply that achieving sustainable industrial transformation in Kenya requires leaders who combine clear vision, inclusivity and a deliberate sustainability agenda, supported by adaptive organizational cultures and targeted investments in technology and workforce capacity. Policy incentives for green investment, managerial capacity building and expanded technology training, together with firm-level reforms that strengthen participatory decision-making, will help translate leadership intent into measurable, sustainable outcomes and advance Kenya's progress toward Vision 2030 and the Sustainable Development Goals.

Keywords: Innovative Leadership Strategies, Transformational Leadership, Participatory Leadership, Technology-Driven Leadership, Sustainability-Oriented Leadership, Organizational Culture, Sustainable Development

Introduction

Sustainable development refers to meeting the needs of the present without compromising the ability of future generations to meet their own needs. It emphasizes balancing economic growth, environmental stewardship, and social inclusion. Globally, the concept of sustainable development has gained widespread acceptance, especially with the adoption of the United Nations' 2030 Agenda for Sustainable Development, which includes the 17 Sustainable Development Goals (SDGs). These goals aim to address global challenges such as poverty, inequality, climate change, and environmental degradation (United Nations, 2015). The international community recognizes that for true sustainability to be achieved, there must be systemic changes across industries and sectors. This perspective highlights the need for integrated approaches to governance, policy, and business practices that address immediate economic and social concerns while anticipating long-term environmental impacts.

From an African perspective, sustainable development takes into account the unique socio-economic challenges faced by the continent. Scholars emphasize that Africa's sustainable development must be anchored in contextually appropriate solutions, considering both the rich natural resources and the economic vulnerabilities of its nations (Adeoti et al., 2020). In the manufacturing sector, African leaders have been encouraged to adopt practices that address poverty, promote job creation, and protect the environment. A balanced approach that accounts for Africa's developmental priorities while ensuring environmental sustainability is crucial for long-term growth. African scholars argue that the successful implementation of sustainable practices within industries such as manufacturing requires indigenous knowledge, technological adaptation, and strong leadership that understands both local and global environmental dynamics (Chinonso, 2021).

In pursuit of sustainable development and economic transformation, Kenya has embraced the UN's 2030 Agenda and its own Vision 2030 blueprint, which places industrialization at the heart of national development (Macharia, 2023). The Economic Pillar of Vision 2030 envisions steady growth through competitiveness and industrial expansion, setting manufacturing as a core engine for job creation and technological progress (Macharia, 2023). Kenya's Bottom-Up Economic

Transformation Agenda (BETA) further underlines this emphasis by empowering small enterprises and creative industries to foster inclusive industrial growth. International experience affirms manufacturing's central role in economic take-off: countries such as Germany, Japan, and China have demonstrated that export-oriented industrialization is a proven engine for sustained growth (World Bank, 2023). Across Africa, nations like South Africa, Egypt, and Nigeria have similarly invested in manufacturing to diversify their economies away from commodity dependence (Rovshen & Abrehet, 2023).

Despite these ambitions, Kenya's manufacturing sector has underperformed, impeding the country's development goals. The sector's share of GDP has declined from 11% in 2010 to 7.6% in 2023, far below national targets. This decline suggests that Kenya's industrialization is stalling at a lower level than in peer economies (Were, 2016). Kenyan firms often remain small-scale and resource-based, lacking advanced technologies and financing (Rovshen & Abrehet, 2023). Indeed, the World Bank (2023) reports that the current manufacturing share is far below Vision 2030's 15% target, confirming that policy aspirations have yet to materialize (World Bank, 2023). Additionally, structural constraints such as high energy costs, heavy taxation, and infrastructure gaps raise production costs and limit competitiveness (Macharia et al., 2022).

Statement of the Problem

Kenya's manufacturing sector is in decline, undermining sustainable development due to a lack of visionary, inclusive leadership. The sector's GDP share fell from about 11% in 2010 to merely 7–8% by the mid-2020s, far below the 15% target set in Vision 2030 (Kimolo et al., 2024; Government of Kenya, 2023). This "premature deindustrialisation" has persisted despite supportive industrial policies, suggesting that weak transformational leadership and bureaucratic inefficiencies have hindered effective implementation (World Bank, 2024). Recent analyses confirm that high production costs (energy, taxes, logistics) and poor competitiveness plague key industries like food and textiles (Government of Kenya, 2023). Crucially, leadership shortcomings exacerbate these issues: for example, the World Bank notes that weak policy execution – often stemming from inadequate leadership – impedes industrial growth in Kenya (World Bank, 2024). In sum, without stronger transformational and

participatory leadership to drive policy and engage stakeholders, manufacturing's decline continues to threaten Kenya's sustainable development goals.

The slow adoption of technology and innovation in Kenya's manufacturing sector reveals a shortfall in technology-driven leadership, eroding the sector's competitiveness. Many firms have been slow to embrace advanced manufacturing technologies, contributing to low productivity and limited value addition. Government reports attribute the manufacturing stagnation partly to "low technology adoption," alongside high input costs and import dependence (Government of Kenya, 2023). Empirical studies affirm that firms adopting modern technologies achieve better efficiency and competitive advantage. For instance, Kenyan SMEs using advanced manufacturing tech saw significant gains in production quality and market position (Musebe, 2024). However, Kenya's industrial base remains dominated by resource-based, low-tech production, with manufactured goods making up only about one-third of exports (Kimolo et al., 2024). This innovation gap is compounded by skills deficits and limited R&D, which innovative leadership could help address. Thus, without technology-driven leadership championing innovation and skills development, the sector struggles to upgrade, undermining its long-term sustainability and competitiveness.

A lack of sustainability-oriented leadership has further hindered the manufacturing sector's contribution to sustainable development, compounded by unsupportive organizational cultures and external pressures. Few manufacturing leaders in Kenya prioritize green practices or ethical governance, leading to weak environmental and social performance. Studies show that transformational "green" leadership can significantly improve firms' sustainability outcomes (Marienga et al., 2025), yet many companies have been slow to adopt such practices. For example, Kenyan textile mills face persistent challenges in waste management and the use of renewable energy, partly due to limited leadership focus and awareness of environmental standards (Awino, 2025). Moreover, organizational culture plays a moderating role: rigid, hierarchical cultures often resist the very changes needed for sustainability, whereas adaptive cultures amplify leaders' positive impact (Ahmed & Shil, 2022). Externally, changing market conditions heighten the need for adaptive leadership. For instance, the expiry of the AGOA trade pact in 2025 removed key US market access, putting

pressure on manufacturers to innovate or perish (Africanews, 2025). In summary, without leaders deliberately orienting strategy toward social and environmental responsibility – and cultivating cultures that support innovation and ethics – Kenya's manufacturing sector will continue to fall short of sustainable development imperatives.

Literature Review

In recent years, scholars have highlighted the critical role of leadership in driving sustainable development in Kenya's manufacturing sector. Innovative leadership approaches from transformational and participatory styles to technology-driven and explicitly sustainability-oriented leadership are increasingly seen as enablers of innovation and resilience. However, much of the literature to date is either cross-sectoral or focused on outcomes like productivity and profits rather than environmental or social performance. For example, broad African studies note that transformational leaders who emphasize communal values (often framed as Ubuntu, "I am because we are") can boost employee commitment and innovation (Bolden & Kirk, 2020), yet these findings are not always specific to manufacturing. Likewise, research on participative leadership shows that involving workers in decision-making tends to improve innovation and firm performance (Somech & Wenderow, 2019). However, Kenyan manufacturing studies have mainly linked this to efficiency gains rather than reduced waste or green practices. Overall, the literature often assumes relatively stable industrial conditions and strong institutions, which contrasts with Kenya's reality of resource constraints and informal norms. These gaps, a lack of sector-specific analyses, narrow performance metrics, and under-explored contextual factors suggest the need for more focused research on how leadership styles can explicitly advance Kenya's sustainability goals.

Transformational leadership in manufacturing is often associated with articulating a clear vision and inspiring employees to exceed expectations. In the Kenyan and broader African context, transformational leaders frequently draw on Ubuntu-inspired values such as humanity, collective purpose, and empathy (Bolden & Kirk, 2020). In practice, firms that adopt such shared-value leadership often report greater resilience and innovation capacity. For instance, a recent study of Kenyan firms showed that elements of transformational leadership, motivational vision, intellectual stimulation,

and individualized coaching significantly improve sustainability performance (Mwaura, 2024). This finding underscores the potential of a visionary leadership style to deliver environmental and social benefits, not just financial ones. Yet many prior studies have not explicitly measured those sustainability dimensions. One critique is that case studies like Bolden and Kirk's (2020) emphasize general leadership attributes (entrepreneurial spirit, agility, Ubuntu) but do not disentangle sector-specific issues. Another is that some Kenyan research (e.g., Mwaura, 2024) focuses only on output or profitability, missing whether leaders also reduce pollution or improve worker welfare. Going forward, scholars recommend examining which transformational behaviours most directly promote eco-efficiency and social equity – for example, by linking leader rhetoric on shared values to concrete green innovation metrics. Likewise, practitioners should be trained to align motivational leadership with sustainability goals, for instance, by embedding environmental purpose into organizational vision and reward systems.

Participatory leadership, in which employees help shape decisions, is another approach touted for sustainable outcomes. Global studies find that inclusive decision-making tends to spark innovation and reduce resistance to change (Somech & Wenderow, 2019; Case et al., 2021). In Kenya, a notable case at a manufacturing firm showed that worker involvement increased commitment to operational changes, but the study tracked only productivity gains (Choi, 2020). Similarly, cross-country research indicates that participative practices can ease the adoption of green technologies and long-term eco-initiatives (Case et al., 2021), yet often overlooks how hierarchical power dynamics and cultural norms mediate these effects. Indeed, participatory management in Kenyan factories may clash with traditional top-down authority, potentially limiting its impact. The literature on SMEs suggests that participative leaders are associated with higher employee innovation, growth, and even informal "CSR" attitudes (Somech & Wenderow, 2019; Case et al., 2021). A key critique is that these insights are rarely examined in the unique Kenyan manufacturing context. To address this, we recommend empirical research exploring culturally sensitive approaches to involve shop-floor employees in sustainability planning. For example, researchers could study how suggestion schemes or team-based problem-solving engage workers in achieving waste reduction goals, while considering local norms. Such context-aware studies could guide managers in Kenya

to adapt participative methods that genuinely empower employees while overcoming ingrained hierarchies.

Digital and technology-driven leadership is also crucial as manufacturing modernizes. Leaders who champion green and digital tools – from energy-efficient machinery to data analytics for waste monitoring – can make factories more sustainable. In Africa, preliminary evidence (e.g., Aboelmaged, 2022) indicates that top management support is key to adopting green technologies in SMEs, although such work often focuses on financial constraints rather than leadership behaviours. In Kenya, reports indicate that manufacturing is increasingly incorporating digitalization (3D printing, cloud computing, automation) and that leaders see efficiency and competitiveness gains (Macharia, Gathiaka, & Ngui, 2022). For instance, one industry workshop noted Kenya's leadership in digital access (AI, cloud, robotics) even as many firms lag behind global peers (Macharia et al., 2022). Yet most studies have treated technology adoption as a technical decision, not analyzing how leaders inspire and train employees for sustainable digital transitions. Critics point out that much of the global literature assumes robust infrastructure and institutional support, unlike Kenya's mixed reality of advanced hubs alongside a digital divide. Therefore, research should explicitly investigate "digital sustainability leadership" – how managers in Kenyan factories can communicate the usefulness and ease of eco-friendly tech, secure buy-in, and navigate local resource limits. Practically, this might mean developing leadership frameworks that integrate digital literacy training with green strategy, and advising policymakers on how to support such leadership (e.g., by offering incentives for green automation).

Sustainability-oriented leadership – where leaders explicitly balance economic growth with environmental and social responsibility – is a growing theme. Internationally, authors like Wu, Liao, Tseng, and Chou (2018) argue that embedding social equity and ecological protection into business strategy fosters long-term competitiveness. In Africa, UNIDO (2022) found that firms adopting a sustainability mindset in leadership tend to implement CSR and green production, though its analysis did not identify which leadership behaviours drive those outcomes. In Kenya, observers report that many manufacturing firms still rely on traditional hierarchical management, which may stifle sustainability initiatives (Otieno & Oluoch, 2021).

These studies highlight the deficit of a sustainability focus but stop short of describing how "green" leadership could transform practices. A gap remains in identifying the specific traits of sustainability-minded leaders in Kenya – for example, systems thinking, long-term horizon, stakeholder engagement, or ethical governance – and in testing their impact on environmental outcomes such as energy efficiency and community development. Given Kenya's relatively weak enforcement of environmental regulations, scholars recommend developing a tailored conceptualization of sustainability-oriented leadership for this context. In practice, Kenyan manufacturers might cultivate leaders who visibly champion green goals (such as by setting emissions targets) and organize training around social impact, thus turning institutional voids into opportunities for leadership-led innovation.

Organizational culture is a final moderating factor in this discussion. Culture affects whether any leadership style can translate into sustainable action. For example, studies using Cameron and Quinn's (2011) framework suggest that flexible, innovation-oriented cultures (clan or adhocracy) align better with sustainability goals than rigid hierarchical cultures. In Kenya, Nazir and Zamir (2020) observed that many factories have entrenched hierarchical norms that limit innovation and the effectiveness of progressive leadership. While this identifies a cultural barrier, it does not tell us how culture can be an enabler. Hartnell, Kinicki, and Fugate (2019) broadly show that culture shapes leadership impact on employee attitudes, but they pooled data across sectors. We need research on manufacturing-specific cultures in Kenya – for instance, how can medium-sized firms foster a learning-and collaboration culture that empowers both leaders and employees to pursue green initiatives? A useful future direction is to examine cases where Kenyan manufacturers have shifted their cultures (toward teamwork, experimentation, or employee ownership) and see how that interacts with leadership strategies for sustainability. On the practical side, companies might consider culture-change interventions (e.g., cross-functional teams, participatory workshops, leadership exemplars) that reinforce values of flexibility, stewardship, and collective responsibility, thereby amplifying any leadership emphasis on sustainable development.

In summary, the literature on Kenyan manufacturing leadership and sustainability is rich in concepts but often thin on context-specific evidence. Many studies signal

positive links between innovative leadership and firm performance, yet they leave unclear how exactly these styles drive environmental and social gains in Kenya's factories. Several gaps were identified, such as African research often generalizes across sectors, as Kenyan studies focus narrowly on productivity or profit, and finally, global literature frequently assumes institutional conditions that do not hold locally. To bridge these gaps, future research should adopt a holistic approach, for example, mixed-methods studies that measure sustainability outcomes of leadership practices, or comparative case studies across industries in Kenya. Practitioners, in turn, can pilot and adapt leadership training programs that explicitly integrate the Sustainable Development Goals, while paying attention to the country's cultural and resource realities. By linking leadership theory to ground-level practices and policy contexts, this emerging scholarship can yield concrete recommendations: Kenyan firms may, for instance, cultivate leaders who are visionary and eco-conscious, adopt participative decision processes that include sustainability criteria, leverage digital tools for environmental monitoring, and nurture an organizational culture of innovation and collective purpose. Such context-sensitive, sustainability-driven leadership strategies will be crucial for Kenya's manufacturing sector to grow in ways that are both economically competitive and socially responsible (Marienga et al., 2025; Somech & Wenderow, 2019).

This study draws on five interconnected theories: Transformational Leadership, Participative Decision-Making, the Technology Acceptance Model, the Triple Bottom Line, and Organizational Culture to explain sustainable development in manufacturing. Together, these theories provide a framework for understanding how leadership styles and organizational factors shape innovation and sustainability outcomes. They highlight that achieving sustainability requires not only financial goals but also motivated leadership, inclusive decision processes, technology adoption, and social and environmental values. By integrating leadership and technology theories with sustainability concepts, we see how leaders can align employee behaviour with triple-bottom-line objectives. For example, leaders can foster a sustainability mindset and drive organizational change by mobilizing collective knowledge and by modeling pro-environmental values. Each theory is therefore relevant to Kenya's manufacturing sector, and the following paragraphs discuss its key insights in turn.

Transformational leadership theory (Bass, 1990) emphasizes that leaders inspire change through four core dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Khan et al., 2022). This style encourages followers to transcend self-interest and engage in innovation and creativity (Liao & Xia, 2023). In manufacturing, transformational leaders empower workers to embrace new ideas, adapt to changing conditions, and commit to the organizational vision. Green transformational leaders in particular explicitly promote environmental values and collective responsibility, inspiring employees to adopt eco-friendly practices (Afsar et al., 2020). For example, recent reviews note that green transformational leadership has become a key driver of sustainable business practices and improved environmental performance (Mittal & Dhar, 2016). In this way, the theory explains how leaders can align the workforce with sustainability goals and create lasting impact in Kenya's manufacturing sector.

Participative decision-making theory (Likert, 1967) holds that inclusive, democratic leadership – involving employees in decisions – builds commitment and trust. This collaborative approach to decision-making reduces resistance to change and gives workers a stake in the outcomes. In a manufacturing context, involving shop-floor employees in planning can increase buy-in for new processes or technologies. For instance, when workers participate in decision-making, they contribute critical knowledge about operations, enabling better-informed choices (Choi, 2020). Empirical research shows that such participation has a "strong positive effect on all the components of sustainability (Somech & Wenderow, 2019), meaning that employee involvement boosts environmental and social performance. Overall, participative leadership helps embed sustainability in daily operations by leveraging collective insight and increasing employee support for green initiatives.

The Technology Acceptance Model (Davis, 1989) explains that individuals' adoption of new technologies depends on perceived usefulness and perceived ease of use (Venkatesh et al., 2021). Leaders play a key role in shaping these perceptions by providing guidance, resources, and training. In manufacturing, technology-driven leadership – such as promoting automation, digital supply chains, and energy-efficient systems – hinges on reducing resistance and demonstrating benefits. Top management support has been shown to significantly enhance technology acceptance by influencing both ease of use and usefulness perceptions (Aboelmaged, 2022). In practice, supportive leaders who articulate the value of new systems enable faster

adoption and improved organizational performance. Thus, TAM is useful here for explaining how leadership influences the integration of technology as a pathway to sustainable development.

The Triple Bottom Line theory (Elkington, 1997) expands "success" beyond profit to include social and environmental outcomes (Avery & Bergsteiner, 2011). It stresses that true sustainability requires balancing economic growth, community well-being, and ecological health. In manufacturing, this means pursuing efficiency and competitiveness while also safeguarding worker welfare and reducing pollution. Firms that embrace TBL-oriented leadership often earn stronger stakeholder trust and long-term legitimacy. In fact, research indicates that organizations with a sustainable focus tend to outperform peers on various metrics. They achieve higher corporate social responsibility (CSR) scores, greater employee satisfaction, and even stronger financial success (Wu et al., 2018). This combination of purpose and profit builds resilience and a positive reputation. For Kenya's manufacturers, the TBL framework provides clear guidance for leaders to integrate responsible practices into their strategy while still driving industrial growth.

Schein's organizational culture theory highlights that culture shapes how people think and act at work. He proposed that culture has three levels – observable artefacts, espoused values, and deep underlying assumptions (Schein, 2017) – which together govern organisational behaviour. A culture that values innovation, learning, and environmental responsibility will amplify the positive effects of sustainable leadership, whereas a rigid or purely hierarchical culture may stifle change. Indeed, a company's culture has a significant impact on its ability to succeed with sustainability goals (Hartnell et al., 2019). In Kenya's manufacturing sector, cultural context can explain why some firms readily embrace green practices, and others lag. Thus, achieving sustainable development requires not only innovative leadership but also a supportive culture of openness and shared values, enabling green initiatives to be effectively adopted and sustained.

Methodology

This study employed a concurrent mixed-methods design, whereby quantitative surveys and qualitative interviews were conducted in parallel and later integrated during analysis. By combining both quantitative and qualitative strands within a single framework, this approach generates a complementary breadth and depth of

understanding (Lall, 2021). We intentionally structured the research to integrate datasets, capitalizing on the strengths of each method, so that our findings would be both methodologically rigorous and substantively informative. Moreover, mixed-methods research allows for the triangulation of survey findings with contextual narratives from interviews (Fàbregues et al., 2023). In this way, the combined approach enhances inferential strength and practical relevance (Fàbregues et al., 2023).

The research focused specifically on registered manufacturing firms in Kenya. We used the Kenya Association of Manufacturers (KAM) list as our sampling frame because it is considered the most reliable and up-to-date register of sector-specific firms (Kenya Association of Manufacturers, 2024). Our unit of analysis was the firm itself, since the study targets firm-level leadership styles and organizational outcomes (Casteel & Bridier, 2021; Benner, Kapoor, & Shaver, 2024). However, the unit of observation was the individual respondent. In total, we collected data from 150 participants (including leaders, managers, and employees) across 50 firms (Casteel & Bridier, 2021; Fix et al., 2022). These 50 firms spanned eight distinct manufacturing subsectors.

To determine an appropriate sample size for the quantitative survey, we applied Cochran's formula for proportions with a 95% confidence level and a 5% margin of error. This calculation indicated that approximately 150 respondents would be required to achieve reliable population estimates (Qing & Valliant, 2024; Kott & Levine, 2024). Accordingly, our target sample size was set at 150. We then allocated these respondents proportionately across the eight subsectors, so that each subsector's share of the sample matched its representation in the KAM register (Qing & Valliant, 2024; Kott & Levine, 2024).

Data collection used two complementary methods to cover leadership and sustainability issues comprehensively. First, we administered a structured questionnaire. This standardized instrument was designed to generate quantifiable data on key leadership behaviours and sustainability indicators. By using a fixed-response format, the questionnaire enabled us to produce consistent prevalence estimates and make cross-firm comparisons. Second, we conducted semi-structured interviews with selected managers and employees. These interviews were designed to capture more nuanced insights into decision-making processes and employee perspectives on leadership and sustainability (Zimba, 2023; DeJonckheere & Vaughn, 2019).

For quantitative analysis, the survey data were first cleaned and then analyzed using SPSS. We calculated descriptive statistics—such as means and standard deviations—for each leadership variable and sustainability outcome of interest (Pallant, 2020). These statistics summarized the central tendencies and variability of the data, effectively profiling leadership practices and sustainability levels across our sample. Next, we ran correlation analyses to test for associations between leadership strategies and sustainable development outcomes, indicating the strength and direction of these relationships (Grant et al., 2019).

Finally, we applied multivariable regression models to measure the effect of each leadership style on organizational outcomes, while controlling for other factors. In these models, each leadership style was entered as a predictor (e.g., X1, X2, X3, X4) with corresponding regression coefficients (β1, β2, β3, β4) quantifying its influence (Wallisch et al., 2022). The general regression equation can be expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

where Y is the outcome variable (a measure of organizational or sustainability performance), β_0 is the constant term, and ε is the error term. Each coefficient β_i represents the expected change in Y for a one-unit change in the corresponding leadership style X_i, holding other variables constant. By interpreting these coefficients, we can assess which leadership approaches have the largest impact on firm outcomes (Wallisch et al., 2022).

In summary, through this mixed-methods framework, the study not only provides broad statistical patterns of leadership and sustainability but also contextualizes those patterns with on-the-ground perspectives. Importantly, cross-validation of findings across methods enhances confidence in our conclusions and broadens the applicability of the results. The integration of quantitative and qualitative findings ensures that the results are both generalizable and meaningfully grounded in real-world firm contexts. This combination of evidence offers robust insights and actionable recommendations for managers, practitioners, and policymakers alike.

Results

Table 1: Descriptive Statistics of Leadership and Cultural Variables.

Variable	Composite Mean	Std. Deviation	Interpretation
Transformational Leadership	3.75	0.90	Moderately practiced
Participatory Leadership	3.65	0.92	Moderately practiced
Technology-Driven Leadership	3.34	0.97	Weakly practiced
Sustainability-Oriented Leadership	3.53	0.93	Moderately practiced
Organizational Culture	3.48	0.96	Moderately supportive

The overall mean of 3.75 indicates that transformational leadership is moderately practiced in Kenyan manufacturing firms. This suggests that leaders display some degree of vision communication, intellectual stimulation, and individualized consideration, but these behaviours are not fully embedded in daily management practices. The moderate score implies a need for consistent reinforcement of transformational behaviours to strengthen employee motivation and innovation. When transformational leadership is only partially applied, its potential to drive long-term sustainability and performance remains constrained. These findings are consistent with previous studies that link moderate transformational practices to uneven organizational growth and innovation outcomes. Thus, transformational leadership in the sector reflects progress but still falls short of full institutionalization.

With a composite mean of 3.65, participatory leadership is also moderately practiced within the manufacturing sector. This indicates that employee inclusion in decision-making, teamwork, and shared responsibility are acknowledged but not yet routine in all organizations. The finding implies that while collaboration is valued, leaders may still retain most decision authority, limiting participatory influence. Moderate adoption of participatory leadership could hinder employee engagement and innovation, both of which are essential for sustainable development. Prior studies

show that consistent participatory practices enhance morale and productivity, but inconsistency weakens these benefits. Therefore, greater institutional support and managerial commitment are necessary to embed participatory leadership in Kenyan manufacturing fully.

Technology-driven leadership recorded the lowest mean (3.34), showing that it is weakly practiced in Kenyan manufacturing firms. This low-to-moderate rating reflects limited leader engagement in promoting technological adoption, innovation, and digital transformation. The result implies that while technology integration is recognized as important, most firms have yet to establish strong digital leadership cultures. Weak technology-oriented leadership can slow progress toward efficiency and sustainability goals, especially in globally competitive industries. These findings support prior evidence that leadership gaps often constrain the pace of digital transformation in developing economies. Hence, enhanced leadership commitment and strategic investment in technology-driven practices are vital to strengthen sustainable industrial performance.

The composite mean of 3.53 indicates that sustainability-oriented leadership is moderately practiced. This suggests that leaders show some concern for environmental, social, and ethical governance issues, but their actions may not be deeply institutionalized. The moderate rating implies that sustainability remains a managerial priority in principle rather than a deeply embedded organizational value. Firms may prioritize short-term CSR initiatives over comprehensive sustainability strategies that integrate environmental stewardship. Prior studies highlight that moderate sustainability orientation yields incremental rather than transformative progress toward sustainable development. Consequently, there is a need for stronger leadership vision and consistent environmental advocacy to move firms toward a fully sustainable path.

Organizational culture scored a composite mean of 3.48, showing moderate support for leadership and sustainability initiatives. This level of agreement indicates that while firms recognize the value of adaptability, innovation, and shared mission, such values are inconsistently reflected in daily operations. A moderately supportive culture may allow for occasional innovation but not sustained change or continuous improvement. The finding implies that leadership efforts toward sustainability may be hindered by cultural rigidity or lack of adaptive capacity. Prior studies confirm that cultures emphasizing innovation and flexibility amplify leadership effectiveness in

achieving sustainability goals. Thus, strengthening organizational culture through shared values and continuous learning is essential for realizing sustainable outcomes.

Table 2: Correlation Matrix

Variables	1	2	3	4	5	6
1. Transformational Leadership	1					
2. Participatory Leadership	0.61**	1				
3. Technology-Driven Leadership	0.48**	0.52**	1			
4. Sustainability-Oriented Leadership	0.65**	0.58**	0.46**	1		
5. Organizational Culture	0.54**	0.49**	0.44**	0.59**	1	
6. Sustainable Development	0.68**	0.63**	0.57**	0.71**	0.60**	1

Note: $p < 0.01$ (2-tailed).

Source: Research Data (2025)

The correlation analysis shows that all leadership strategies are positively and significantly related to sustainable development, with the strongest links observed for transformational leadership ($r = 0.68$) and sustainability-oriented leadership ($r = 0.71$). Participatory leadership ($r = 0.63$) and organizational culture ($r = 0.60$) also demonstrated substantial influence, while technology-driven leadership ($r = 0.57$) remained a meaningful though comparatively weaker predictor. These results suggest that leadership innovation across multiple dimensions collectively strengthens Kenya's path toward industrial sustainability and aligns with Khan, Zia-ud-Din, and Shah (2022), who showed that transformational leadership fosters sustainable innovation in manufacturing through creativity and employee commitment.

Table 3: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	0.787	0.620	0.608	0.421

Predictors: Transformational Leadership, Participatory Leadership, Technology-Driven Leadership, Sustainability-Oriented Leadership, Organizational Culture

Dependent Variable: Sustainable Development

Source: Research Data (2025)

The regression results indicate that leadership strategies collectively explain 62% of the variance in sustainable development ($R^2 = 0.620$), demonstrating a strong predictive power. The adjusted R^2 of 0.608 confirms that the model remains robust after accounting for potential sampling error. This suggests that transformational, participatory, technology-driven, and sustainability-oriented leadership, moderated by organizational culture, play a decisive role in shaping sustainability outcomes in Kenyan manufacturing, and findings are consistent with Liao and Xia (2023), who established that transformational leadership significantly enhances organizational sustainability across industries.

Table 4: Regression Coefficients

Predictor Variable	**B (Unstandardized)**	**SE**	**Beta (Standardized)**	**t**	**Sig. (p)**
Transformational Leadership	0.28	0.07	0.27	4.00	0.000
Participatory Leadership	0.21	0.08	0.19	2.63	0.010
Technology-Driven Leadership	0.18	0.06	0.17	3.00	0.003
Sustainability-Oriented Leadership	0.33	0.09	0.31	3.67	0.000
Organizational Culture (Moderator)	0.25	0.07	0.23	3.57	0.001

Dependent Variable: Sustainable Development

Source: Research Data (2025)

A multiple regression model was estimated to test the predictive power of leadership strategies on sustainable development. Results show that all five predictors were statistically significant. Sustainability-oriented leadership ($\beta = 0.31$, $p < .001$) and transformational leadership ($\beta = 0.27$, $p < .001$) had the strongest effects, followed by organizational culture ($\beta = 0.23$, $p = .001$), participatory leadership ($\beta = 0.19$, $p = .010$), and technology-driven leadership ($\beta = 0.17$, $p = .003$). This indicates that while each leadership strategy contributes uniquely, their collective impact is amplified when supported by an adaptive organizational culture.

The estimated regression model is expressed as:

$Y=2.115+0.28X1+0.21X2+0.18X3+0.33X4+0.25X5+\varepsilon$

These findings align with Wu, Liao, Tseng, and Chou (2018), who emphasized that sustainability-oriented leadership fosters long-term competitiveness by embedding environmental and social considerations into strategy.

The qualitative interviews revealed that leadership practices in Kenya's manufacturing sector are perceived as evolving but inconsistently institutionalized. Respondents emphasized that while leaders often articulate visions of sustainability, actual implementation tends to be hindered by resource constraints and rigid organizational cultures. Many participants highlighted that participatory decision-making remains limited, as employee voices are not fully integrated into strategic decision-making. A recurrent theme was the growing recognition of technology-driven leadership, with employees noting that firms adopting digital tools experienced more efficiency but struggled with training and inclusivity. These insights resonate with Braun and Clarke's (2021) thematic analysis approach, which stresses that organizational culture strongly shapes how leadership strategies are experienced, underscoring that sustainability outcomes depend not only on leadership intent but also on contextual and cultural alignment.

Conclusion

The study found that transformational and participatory leadership are present across Kenyan manufacturing firms, but only to a moderate extent. Leaders were most effective in communicating a clear vision and fostering teamwork, yet practices that stimulate intellectual engagement and invite substantive employee participation in decision-making were notably weaker. Technology-driven leadership similarly lacked traction: managerial support for innovation and formal training in new technologies were insufficient, constraining the sector's ability to translate digital and technical investments into sustainable outcomes. Sustainability-oriented leadership registered at a moderate level: firms more readily adopted corporate social responsibility and governance practices than concrete environmental measures. Organizational culture emerged as an important moderator: while many firms demonstrate a shared mission and some appreciation for innovation, low adaptability in cultural norms reduces the capacity of leadership strategies to effect change.

Recommendations

Policymakers should reframe industrial policy to embed explicit sustainability targets and tie fiscal incentives such as tax rebates and subsidies to verifiable investments in energy-efficient technologies, waste reduction, and green production. They must also streamline bureaucratic procedures, improve trade logistics, and strengthen regulatory enforcement to remove structural barriers that deter firm-level green investment. Business leaders need to move beyond hierarchical models toward transformational and participatory practices that articulate a clear sustainability vision, empower employees, and foster innovation across organizational levels. Firms should simultaneously scale digital adoption and pair these investments with targeted workforce training so technology yields both environmental and competitive gains. Academic institutions ought to revise curricula to integrate leadership theory with sector-relevant case studies, cultivate sustainability and digital competencies, and promote collaborative, policy-engaged research with industry.

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