

WOMEN LEADERSHIP AND SUSTAINABLE DEVELOPMENT

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Abstract

This study examined the influence of women's leadership on sustainable development in selected public institutions in Nigeria. The increasing emphasis on inclusive governance and the achievement of the Sustainable Development Goals (SDGs) has heightened scholarly interest in understanding the role of women leaders in driving sustainable development outcomes. Guided by Stakeholder Theory, the study explored how women's leadership contributes to sustainable development through governance effectiveness and SDG implementation effectiveness. A survey research design was adopted, and data were collected from 419 respondents drawn from selected federal and state public institutions across Nigeria. A structured questionnaire served as the primary instrument for data collection, while Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed for data analysis. The findings revealed that women's leadership had a positive and significant influence on sustainable development outcomes. Governance effectiveness and SDG implementation effectiveness also exerted significant positive effects on sustainability outcomes, with SDG implementation effectiveness emerging as the strongest predictor. Furthermore, the model explained 64.2% of the variation in sustainability outcomes, indicating strong explanatory power. Based on these findings, the study concluded that women's leadership serves as an important catalyst for sustainable development when supported by effective governance structures and robust SDG implementation frameworks. The study recommends greater representation of women in leadership positions, stronger governance mechanisms, and deeper integration of SDG objectives into institutional practices. It contributes to the literature on leadership, governance, and sustainability by providing empirical evidence from the Nigerian public sector.

Keywords: Women's Leadership, Sustainable Development, Sustainable Development Goals (SDGs), Governance Effectiveness, SDG Implementation Effectiveness, Stakeholder Theory, Nigeria, PLS-SEM.

1. Introduction

The pursuit of sustainable development has become one of the most important global priorities of the twenty-first century. Governments, organizations, and international development agencies continue to seek innovative solutions to address persistent social, economic, environmental, and governance challenges. The adoption of the Sustainable Development Goals (SDGs) by the United Nations in 2015 further reinforced the need for inclusive and sustainable development strategies aimed at promoting prosperity, reducing inequality, protecting the environment, and ensuring social justice (United Nations, 2015). Achieving these goals requires effective leadership that can mobilize resources, foster stakeholder collaboration, encourage innovation, and promote inclusive decision-making. As a result, leadership has emerged as a critical factor in advancing sustainable development across nations and organizations. In recent years, increasing attention has been given to women's leadership as an important mechanism for promoting sustainable development. Women leaders are widely recognized for their ability to foster inclusive governance, ethical decision-making, stakeholder engagement, collaboration, and long-term strategic thinking (Pierli et al., 2022; Bannò et al., 2023). Unlike traditional leadership models, which often emphasize hierarchical control and short-term performance outcomes, women leaders are frequently associated with participatory leadership styles, social responsibility, transparency, and sustainability-oriented decision-making (Eagly & Carli, 2007; Paustian-Underdahl et al., 2014). These characteristics closely align with the principles of sustainable development and the achievement of the Sustainable Development Goals.

Several studies (Pierli et al., 2022; Smith et al., 2019; Glass & Cook, 2018; Galbreath, 2018; Post & Byron, 2015; Bear et al., 2010; Nadeem et al., 2017; Mansour et al., 2024) have shown that women's leadership contributes significantly to organizational sustainability, environmental responsibility, social inclusion, innovation, and governance effectiveness. Women leaders have been found to champion corporate social responsibility initiatives, strengthen stakeholder relationships, encourage environmentally sustainable practices, and enhance organizational accountability. Similarly, organizations with greater female representation in leadership positions often demonstrate stronger sustainability performance and a deeper commitment to sustainable development objectives (Byron & Post, 2016; Velte, 2016; Liao et al., 2015). Women's leadership can be described as the process through which women influence individuals, groups, organizations, and societies toward the achievement of shared goals while promoting ethical conduct, inclusiveness, social responsibility, and sustainable outcomes (Eagly et al., 2003). It encompasses the active participation of women in leadership and decision-making roles within public institutions, private organizations, political systems, and civil society organizations. Women leaders often emphasize collaboration, stakeholder engagement, community development, equity, and long-term value creation—qualities that are essential for achieving sustainable development goals (Chan & Sapuan, 2023; Kapse et al., 2024). Despite the growing recognition of women's leadership as a driver of sustainable development, women remain significantly underrepresented in leadership positions across many developing economies. Although notable progress has been made in recent decades, structural barriers, gender stereotypes, cultural norms, institutional discrimination, and limited access to leadership

opportunities continue to hinder women's participation in leadership and governance processes (Jalalzai, 2013; O'Brien & Rickne, 2016). These challenges are particularly evident in Sub-Saharan Africa, where women continue to occupy a relatively small proportion of senior leadership positions within public institutions, political systems, and corporate organizations. Nigeria provides an important context for examining the relationship between women's leadership and sustainable development. As Africa's most populous nation and one of its largest economies, Nigeria faces numerous development challenges, including poverty, unemployment, environmental degradation, gender inequality, inadequate healthcare, educational disparities, and governance deficiencies. Although women constitute a substantial proportion of the country's population and workforce, their representation in leadership and decision-making positions remains relatively low. Consequently, policymakers, researchers, and development practitioners have shown increasing interest in understanding how women's leadership can contribute to achieving sustainable development outcomes in Nigeria.

Previous studies have examined women's leadership from various perspectives, including leadership effectiveness (Eagly et al., 2003; Paustian-Underdahl et al., 2014), corporate governance (Post & Byron, 2015; Byron & Post, 2016), sustainability performance (Galbreath, 2018; Pierli et al., 2022), environmental innovation (Mansour et al., 2024), and political leadership (Doan et al., 2024). Most of these studies have reported that women leaders positively influence organizational performance, social responsibility, innovation, sustainability, and governance outcomes. However, empirical studies that specifically examine the contribution of women's leadership to sustainable development in developing economies remain limited. Furthermore, although considerable attention has been devoted to gender equality and women's empowerment under Sustainable Development Goal 5, relatively few studies have empirically explored how women's leadership contributes to the achievement of broader sustainable development objectives. Existing research has largely focused on developed economies, multinational corporations, and board diversity, while studies conducted in developing countries, particularly Nigeria and the wider Sub-Saharan African region, remain scarce. Consequently, significant gaps persist in understanding the mechanisms through which women's leadership influences sustainable development outcomes in emerging economies.

Against this backdrop, the present study examines the influence of women's leadership on sustainable development in Nigeria. Specifically, it investigates five key dimensions of women's leadership inclusive decision-making, transformational leadership, stakeholder engagement, ethical leadership, and innovation orientation and assesses their effects on sustainable development outcomes. Drawing on contemporary literature on women's leadership, sustainability, and governance, the study seeks to provide empirical evidence that can inform policy formulation and organizational practice within developing economies.

Scope of the Study

This study focuses on examining the influence of women's leadership on sustainable development within selected public and private sector organizations in Nigeria. Specifically, it investigates the effects of inclusive decision-making, transformational leadership, stakeholder engagement, ethical leadership, and innovation orientation on sustainable development outcomes. The study adopts a survey research design and utilizes structured questionnaires administered to employees and management personnel within selected organizations.

Geographically, the study is limited to Nigeria. Conceptually, it focuses exclusively on women's leadership and sustainable development. Methodologically, the study employs Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS software to determine the strength and significance of the relationships among the study variables. Other dimensions of organizational performance, such as profitability, market share, operational efficiency, and customer satisfaction, fall outside the scope of this study because its primary focus is on sustainable development outcomes.

Significance of the Study

This study is significant in several ways. First, it contributes to the growing body of literature on women's leadership and sustainable development by providing empirical evidence from Nigeria, a context that remains underrepresented in existing research.

Second, the findings will be valuable to policymakers and government institutions seeking effective strategies for accelerating the achievement of the Sustainable Development Goals. The study highlights the importance of promoting women's participation in leadership and decision-making positions as a means of enhancing sustainable development outcomes.

Third, the study offers practical insights for organizational leaders, managers, and development practitioners by identifying leadership dimensions that can support sustainability initiatives, strengthen stakeholder engagement, encourage innovation, and promote social inclusion.

Fourth, the study contributes to gender and leadership scholarship by expanding current understanding of how women leaders influence sustainable development beyond the traditional focus on board diversity and representation.

In addition, the study serves as a useful reference for academics and researchers interested in leadership, gender studies, sustainability, governance, and development studies. It provides a foundation for future research on women's leadership and sustainable development in developing economies.

Finally, society stands to benefit from the findings of this study, as increased participation of women in leadership positions may contribute to more inclusive governance systems, equitable development outcomes, environmental sustainability, and an improved quality of life for citizens.

This paper is organized into the following sections: introduction, theoretical framework, conceptualization and hypothesis development, methodology, results and discussion, conclusion and recommendations, contribution to knowledge, and suggestions for further research.

2. Theoretical Framework, Conceptualisation and Hypotheses Development

2.1 Theoretical Framework

This study is anchored on the Stakeholder Theory, developed by Freeman (1984). The theory posits that organizations and institutions should create value not only for shareholders but also for all stakeholders affected by their activities. These stakeholders include employees, customers, communities, governments, investors, civil society organizations, and the environment. The

central premise of Stakeholder Theory is that sustainable organizational success depends on balancing the interests of diverse stakeholder groups through inclusive governance, ethical conduct, and responsible decision-making.

Stakeholder Theory is particularly relevant to the study of women's leadership and sustainable development because women leaders are often associated with leadership styles that emphasize inclusiveness, collaboration, participation, social responsibility, and stakeholder engagement (Pierli et al., 2022; Glass & Cook, 2018). Existing research suggests that women leaders tend to adopt participatory leadership approaches that encourage dialogue among stakeholders, embrace diverse perspectives, and promote equitable resource allocation (Eagly & Carli, 2007; Paustian-Underdahl et al., 2014). These characteristics closely align with the principles of sustainable development, which emphasize social inclusion, environmental stewardship, and long-term societal well-being.

The theory further suggests that organizations that actively involve stakeholders in decision-making processes are more likely to achieve sustainable outcomes. Women leaders often demonstrate a stronger sensitivity to stakeholder concerns and a greater commitment to ethical governance, corporate social responsibility, and sustainability initiatives (Bear et al., 2010; Byron & Post, 2016). Through effective stakeholder engagement, women leaders can mobilize resources, strengthen institutional legitimacy, and facilitate the successful implementation of sustainable development programmes.

Another important proposition of Stakeholder Theory is the need to balance economic, social, and environmental objectives. Sustainable development requires leaders who can integrate these competing interests while ensuring fairness, equity, and inclusiveness. Studies have shown that women leaders frequently promote long-term strategic thinking, environmental responsibility, and social accountability, thereby contributing to both organizational and societal sustainability (Galbreath, 2018; Mansour et al., 2024).

Therefore, Stakeholder Theory provides a suitable theoretical foundation for examining the relationship between women's leadership and sustainable development. It supports the argument that women leaders can enhance sustainable development outcomes through inclusive decision-making, transformational leadership, stakeholder engagement, ethical leadership, and innovation-oriented leadership practices.

2.2 Conceptualisation and Hypotheses Development

Women's leadership has emerged as an important area of scholarly and policy interest because of its potential contributions to governance, organizational effectiveness, gender equality, and sustainable development. Growing recognition of women's leadership capabilities has challenged traditional assumptions about leadership effectiveness and has encouraged researchers to examine the distinctive contributions women make across various sectors (Eagly et al., 2003; Post & Byron, 2015).

Women's leadership refers to the ability of women to influence individuals, groups, organizations, and societies toward the achievement of shared goals while promoting inclusiveness, collaboration, innovation, and ethical conduct (Northouse, 2022). It encompasses

women's participation in strategic decision-making, governance structures, policy implementation, and organizational leadership. Contemporary studies indicate that women leaders often exhibit leadership qualities that are particularly supportive of sustainable development, including stakeholder orientation, transformational leadership, ethical behavior, and innovation (Pierli et al., 2022; Kapse et al., 2024).

Sustainable development, on the other hand, refers to development that meets present needs without compromising the ability of future generations to meet their own needs (United Nations, 2015). It involves balancing economic growth, social inclusion, environmental protection, and institutional effectiveness. Achieving sustainable development requires leadership capable of fostering collaboration, encouraging innovation, promoting social justice, and ensuring the responsible use of resources.

In this study, women's leadership is conceptualized through five dimensions: inclusive decisionmaking, transformational leadership, stakeholder engagement, ethical leadership, and innovation orientation. These dimensions are regarded as critical pathways through which women leaders contribute to sustainable development outcomes.

Inclusive Decision-Making

Inclusive decision-making refers to the active involvement of diverse stakeholders in organizational and policy decisions. Women leaders frequently encourage participatory governance, consultation, and collaborative problem-solving approaches (Chan & Sapuan, 2023). Such practices ensure that multiple viewpoints are considered, thereby improving policy quality, stakeholder acceptance, and development effectiveness.

Research has shown that inclusive leadership promotes social cohesion, institutional legitimacy, and sustainable governance outcomes (Smith et al., 2019). By encouraging broader participation in decision-making processes, women leaders can improve development interventions and ensure that marginalized groups are adequately represented.

H1: Inclusive decision-making significantly influences sustainable development in Nigeria.

Transformational Leadership

Transformational leadership refers to a leadership style that inspires followers to achieve higher levels of performance through vision, motivation, intellectual stimulation, and individualized consideration (Bass & Avolio, 1994). Studies consistently indicate that women leaders tend to exhibit transformational leadership behaviours more frequently than their male counterparts (Eagly et al., 2003).

Transformational leaders inspire innovation, strengthen organizational commitment, and motivate stakeholders to pursue collective objectives. These qualities are essential for addressing complex development challenges and driving sustainable societal transformation.

H2: Transformational leadership significantly influences sustainable development in Nigeria.

Stakeholder Engagement

Stakeholder engagement involves actively involving relevant stakeholders in planning, implementation, monitoring, and evaluation activities. Effective engagement promotes collaboration, facilitates resource mobilization, and encourages collective ownership of development initiatives (Freeman, 1984).

Women leaders are often associated with stronger stakeholder relationships, improved communication, and collaborative governance practices (Glass & Cook, 2018). Effective stakeholder engagement can enhance programme implementation and contribute to better sustainable development outcomes.

H3: Stakeholder engagement significantly influences sustainable development in Nigeria.

Ethical Leadership

Ethical leadership involves demonstrating integrity, fairness, accountability, transparency, and responsible conduct in leadership roles (Brown et al., 2005). Ethical leaders foster trust, strengthen institutional legitimacy, and encourage ethical behaviour among followers.

Women leaders are frequently perceived as exhibiting high ethical standards and greater sensitivity to social and environmental concerns (Bear et al., 2010). Ethical leadership contributes to sustainable development by promoting responsible governance, reducing corruption, and strengthening stakeholder confidence.

H4: Ethical leadership significantly influences sustainable development in Nigeria.

Innovation Orientation

Innovation orientation refers to a leader's willingness and ability to encourage creativity, experimentation, knowledge sharing, and the adoption of new ideas. Sustainable development challenges often require innovative solutions capable of addressing social, environmental, and economic issues simultaneously.

Research indicates that women leaders contribute significantly to innovation, sustainability initiatives, and environmental performance through their diverse perspectives and collaborative leadership approaches (Mansour et al., 2024; Nadeem et al., 2017). Innovation-oriented leadership can improve institutional adaptability and strengthen problem-solving capacity, thereby supporting sustainable development.

H5: Innovation orientation significantly influences sustainable development in Nigeria.

Sustainable Development

Sustainable development serves as the dependent variable in this study. It refers to the achievement of economic prosperity, social inclusion, environmental sustainability, and institutional effectiveness in a manner that promotes long-term societal well-being (United Nations, 2015).

Achieving sustainable development requires effective leadership capable of balancing diverse stakeholder interests, encouraging innovation, promoting social equity, and ensuring responsible

governance. Women's leadership is increasingly recognized as a vital contributor to sustainable development because of its emphasis on collaboration, inclusiveness, ethical conduct, and stakeholder engagement.

To assess the overall impact of women's leadership, this study combines the five dimensions discussed above—inclusive decision-making, transformational leadership, stakeholder engagement, ethical leadership, and innovation orientation—and examines their collective influence on sustainable development.

H6: The dimensions of women's leadership have a significant combined effect on sustainable development in Nigeria.

This framework provides the theoretical and conceptual basis for the methodology section, where the identified dimensions of women's leadership are operationalized and empirically tested using Partial Least Squares Structural Equation Modelling (PLS-SEM).

2.3 Hypotheses Formulation

Drawing on the theoretical foundations and empirical evidence relating to women's leadership and sustainable development, this study develops testable hypotheses to examine the influence of women's leadership on the achievement of the Sustainable Development Goals (SDGs) in selected public institutions in Nigeria.

Previous studies consistently suggest that women in leadership positions are more likely to promote inclusive governance, environmental responsibility, and sustainability-oriented decision-making (Pierli et al., 2022; Bannò et al., 2023; Glass & Cook, 2018). Evidence also indicates that female leadership enhances environmental innovation, strengthens organizational alignment with sustainability goals, and improves governance quality through participatory decision-making processes (Mansour et al., 2024; Kapse et al., 2024; Sam & Zibima, 2024). Similarly, women leaders have been associated with stronger ethical standards, greater accountability, and improved institutional responsiveness to development priorities (Umemezia, 2015; Caviedes-Rubio et al., 2020).

Based on these insights, the following hypotheses are proposed:

Hypothesis One

Ho1: Women's leadership has no significant effect on SDG implementation in selected public institutions in Nigeria.

Ha1: Women's leadership has a significant effect on SDG implementation in selected public institutions in Nigeria.

Hypothesis Two

Ho2: Women's leadership does not significantly influence governance effectiveness in selected public institutions in Nigeria.

Ha2: Women's leadership significantly influences governance effectiveness in selected public institutions in Nigeria.

Hypothesis Three

Ho3: Governance effectiveness does not significantly affect SDG implementation in selected public institutions in Nigeria.

Ha3: Governance effectiveness significantly affects SDG implementation in selected public institutions in Nigeria.

Hypothesis Four

Ho4: SDG implementation effectiveness does not significantly influence sustainability outcomes in selected public institutions in Nigeria.

Ha4: SDG implementation effectiveness significantly influences sustainability outcomes in selected public institutions in Nigeria.

Hypothesis Five

Ho5: Women's leadership does not have a significant indirect effect on sustainability outcomes through governance effectiveness and SDG implementation effectiveness.

Ha5: Women's leadership has a significant indirect effect on sustainability outcomes through governance effectiveness and SDG implementation effectiveness.

Theoretical Linkage of the Hypotheses

The hypotheses are grounded in leadership and sustainability literature, which suggests that women leaders often adopt transformational and participatory leadership styles that enhance organizational sustainability performance (Eagly et al., 2003; Eagly & Carli, 2007). Meta-analytic evidence further indicates that women in leadership positions are positively associated with corporate social performance and the quality of sustainability reporting (Post & Byron, 2015; Velte, 2016; Bear et al., 2010).

Within public governance contexts, inclusive leadership has been linked to improved environmental decision-making, greater social inclusion, and more effective policy implementation, particularly in developing economies (Doan et al., 2024; Sam & Zibima, 2024). These findings support the proposition that women's leadership may influence SDG implementation both directly and indirectly through governance effectiveness and institutional alignment mechanisms.

3. Methodology

This study adopted a survey research design. The design was considered appropriate because it enabled the systematic collection of quantitative data for examining the relationship between women's leadership and the achievement of the Sustainable Development Goals (SDGs) in selected public institutions in Nigeria. The study was informed by existing empirical and theoretical literature, which emphasizes the significant role of women in leadership positions in promoting sustainability-oriented decision-making, environmental innovation, and inclusive governance structures (Pierli et al., 2022; Bannò et al., 2023; Mansour et al., 2024; Mansour, E'leimat, & Tabash, 2025). The target population comprised employees of selected federal and state public institutions in Nigeria, particularly those involved in policy implementation and sustainability-related programmes. These institutions were chosen because of their direct involvement in SDG-related activities, including environmental management, social welfare delivery, and institutional governance reforms (Sam & Zibima, 2024; Umemezia, 2015). Given

the large and indeterminate nature of the population, the Raosoft sample size determination technique was employed using a 95% confidence level and a 5% margin of error. This resulted in a minimum sample size of 400 respondents. To address potential non-response and incomplete questionnaire returns, an attrition rate of 15% was incorporated, increasing the number of questionnaires distributed to 460 respondents. This adjustment helped ensure that the final number of valid responses remained adequate for reliable statistical analysis and meaningful generalization of the findings.

Instrument for Data Collection

Data were collected through a structured questionnaire divided into five sections. Section A captured the demographic characteristics of respondents, while Sections B to E measured the major constructs of the study. The questionnaire items were developed based on insights from existing literature on women's leadership and sustainability outcomes, particularly studies that highlighted the influence of female leadership on governance quality, environmental innovation, and alignment with the Sustainable Development Goals (Smith et al., 2019; Caviedes-Rubio et al., 2020; Doan et al., 2024; Kapse et al., 2024).

Table 1: Questionnaire Contents

A. Women Leadership (WL)

1. Women in leadership positions actively influence sustainability-oriented decisions in my institution.
2. Female leaders promote inclusive and participatory governance.
3. Women leaders prioritize environmental and social development outcomes.
4. Gender diversity in leadership enhances policy implementation effectiveness.

B. SDG Implementation Effectiveness (SDGIE)

1. My institution effectively integrates SDGs into its operational activities.
2. SDG targets are clearly reflected in institutional policies and programmes.
3. There is consistent monitoring and evaluation of SDG-related initiatives.
4. Adequate resources are allocated for SDG implementation.
5. Staff members are aware of SDG priorities and objectives.

C. Governance Effectiveness (GE)

1. Decision-making processes in my institution are transparent and inclusive.
2. Leadership ensures accountability in sustainability programmes.
3. Stakeholder participation is encouraged during policy formulation.
4. Institutional leadership supports ethical governance practices.

D. Sustainability Outcomes (SO)

1. My institution contributes to environmental protection initiatives.
2. Social inclusion is prioritized in institutional programmes.
3. Institutional activities promote long-term sustainable development.
4. There is measurable improvement in sustainability performance outcomes.

Validity of the Instrument

The validity of the research instrument was established through both face validity and content validity procedures. Face validity was achieved through a careful review of the questionnaire items to ensure their alignment with the study objectives. Content validity was further assessed by experts in leadership, governance, and sustainable development studies.

The Content Validity Index (CVI) was calculated using the formula:

$$CVI = n/N$$

where:

- n = number of items rated as relevant by experts
- N = total number of items assessed

Only questionnaire items that achieved acceptable relevance ratings were retained for the final analysis.

Reliability of the Instrument

The reliability of the instrument was evaluated using Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) to assess internal consistency and construct reliability (Hair et al., 2011). The constructs measuring Women Leadership, SDG Implementation Effectiveness, Governance Effectiveness, and Sustainability Outcomes all recorded Cronbach's Alpha values above the recommended threshold of 0.70.

These results indicate that the instrument possessed satisfactory reliability and adequate internal consistency, making it suitable for empirical analysis.

Model Specification

The functional relationship for the study was expressed as:

$$SO = f(WL, GE, SDGIE)$$

The econometric model was specified as:

$$SO = \beta_0 + \beta_1 WL + \beta_2 GE + \beta_3 SDGIE + \mu_i$$

Where:

SO = Sustainability Outcomes

WL = Women Leadership

GE = Governance Effectiveness

SDGIE = SDG Implementation Effectiveness

β_0 = Intercept

$\beta_1 - \beta_3$ = Coefficients of the explanatory variables

μ_i = Error term

The model was designed to empirically examine how women's leadership influences sustainability outcomes through governance effectiveness and SDG implementation structures. This approach is consistent with previous studies that found women leaders to be instrumental in improving sustainability performance and organizational alignment with development goals (Bannò et al., 2023; Kapse et al., 2024; Mansour et al., 2025).

Data Analysis Technique

The data were analyzed using both descriptive and inferential statistical techniques. Descriptive statistics, including frequencies and percentages, were used to summarize respondents' characteristics and describe the distribution of the study variables. For inferential analysis, Structural Equation Modelling (SEM) based on Partial Least Squares (PLS-SEM) was employed to test the hypothesized relationships among the variables. This analytical technique was considered appropriate because it is effective in examining complex relationships involving multiple constructs and latent variables. It has also been widely applied in sustainability and governance studies (Pierli et al., 2022; Doan et al., 2024).

Ethical Considerations

Ethical principles were strictly observed throughout the study. Participation was entirely voluntary, and informed consent was obtained from all respondents before data collection commenced. Participants were assured of confidentiality, anonymity, and the exclusive use of the information provided for academic purposes. No personally identifiable information was collected during the study. All responses were aggregated and securely stored to prevent unauthorized access and ensure data protection. Respondents were also informed of their right to withdraw from the study at any stage without facing any negative consequences.

These measures ensured that the study complied with established ethical standards and best practices in social science research.

4. Results and Discussion

This section presents the empirical findings of the study on the influence of women's leadership on the achievement of the Sustainable Development Goals (SDGs) in selected public institutions in Nigeria. The analysis begins with the response rate and demographic characteristics of the respondents, followed by hypothesis testing using Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings are interpreted in relation to existing empirical literature on women's leadership and sustainability outcomes (Pierli et al., 2022; Bannò et al., 2023; Mansour et al., 2024; Kapse et al., 2024).

Distribution and Retrieval of Questionnaires

Table 2: Distribution and Retrieval of Questionnaires

States	Distributed Questionnaires	Retrieved Questionnaires
Lagos State	115	103
Rivers State	115	112
Anambra State	115	106

States	Distributed Questionnaires	Retrieved Questionnaires
Abuja (FCT)	115	98
Total	460	419

Source: Field Survey (2026)

A total of 460 questionnaires were distributed across selected public institutions in Nigeria. Out of this number, 419 questionnaires were properly completed and returned, representing a response rate of approximately 91 percent. The remaining 41 questionnaires, accounting for 9 percent, were either not returned or were unusable for analysis. The high response rate indicates strong participation by respondents and provides a reliable basis for statistical analysis, interpretation, and generalization of the study findings.

Respondents' Years of Service

Table 3: Duration of Service of Respondents in Public Institutions

Working Experience	Number of Respondents
1–5 years	96
6–10 years	201
Over 10 years	122
Total	419

Source: Field Survey (2026)

Table 3 shows the distribution of respondents according to their years of service in public institutions. The results indicate that 96 respondents had between one and five years of work experience, 201 respondents had between six and ten years of experience, while 122 respondents had worked for more than ten years.

These findings reveal that the majority of respondents (323) had more than five years of professional experience within their respective institutions. This suggests that the respondents possessed adequate knowledge of organizational leadership structures, governance processes, and SDG implementation activities. Consequently, their responses can be considered credible and relevant for assessing the relationship between women's leadership and sustainable development outcomes.

Measurement Model and Structural Analysis

The study hypotheses were tested using Partial Least Squares Structural Equation Modelling (PLS-SEM), following the iterative regression-based approach proposed by Wold (1982). The model examined the relationships among Women Leadership (WL), Governance Effectiveness (GE), SDG Implementation Effectiveness (SDGIE), and Sustainability Outcomes (SO).

The structural model results indicate that the constructs are interconnected and collectively explain variations in sustainability outcomes. This finding suggests that women's leadership, governance effectiveness, and SDG implementation processes operate as complementary elements within an integrated system that influences sustainability performance in public institutions.

Structural Model Results

The PLS-SEM results demonstrate that all hypothesized relationships are statistically significant at the 5 percent significance level ($p < 0.05$).

Specifically:

- Women Leadership has a positive and significant effect on Sustainability Outcomes ($\beta = 0.172$, $p < 0.05$).
- Governance Effectiveness has a stronger positive and significant effect on Sustainability Outcomes ($\beta = 0.231$, $p < 0.05$).
- SDG Implementation Effectiveness exhibits the strongest positive effect on Sustainability Outcomes ($\beta = 0.498$, $p < 0.05$).

The coefficient of determination (R^2) shows that 64.2 percent of the variation in Sustainability Outcomes is jointly explained by Women Leadership, Governance Effectiveness, and SDG Implementation Effectiveness. This indicates substantial explanatory power and suggests that the model provides a strong representation of the factors influencing sustainability outcomes in public institutions.

Table 4: Structural Model Results

Variables	Path Coefficient (β)	Standard Deviation	T-Statistics	P-Values
Women Leadership → Sustainability Outcomes	0.172	0.058	2.965	0.003
Governance Effectiveness → Sustainability Outcomes	0.231	0.067	3.448	0.001
SDG Implementation Effectiveness → Sustainability Outcomes	0.498	0.055	9.054	0.000

R-Square = 0.642

Source: Field Survey (2026)

Model Fit Indices

Model Fit Indicators	Value	Threshold	Remark
SRMR	0.069	< 0.08	Good Fit

Model Fit Indicators	Value	Threshold	Remark
NFI	0.781	> 0.70	Acceptable
Chi-square	438.216	—	Acceptable

Source: Field Survey (2026)

The model fit indices confirm that the structural model is both adequate and reliable for explaining the relationships among the study variables. The Standardized Root Mean Square Residual (SRMR) value of 0.069 falls below the recommended threshold of 0.08, indicating a good model fit. Similarly, the Normed Fit Index (NFI) value of 0.781 exceeds the minimum acceptable threshold of 0.70, suggesting that the model adequately represents the observed data.

Discussion of Findings

The findings reveal that women's leadership has a positive and significant influence on sustainable development outcomes in selected public institutions in Nigeria. This result supports previous studies which argue that women leaders often prioritize inclusive governance, environmental responsibility, stakeholder engagement, and long-term sustainability objectives (Pierli et al., 2022; Bannò et al., 2023; Smith et al., 2019). The finding reinforces the view that women's participation in leadership positions can contribute meaningfully to the achievement of sustainable development goals. The study further reveals that SDG Implementation Effectiveness is the strongest predictor of sustainability outcomes. This suggests that while women's leadership is important, its influence becomes more pronounced when institutions possess effective mechanisms for implementing, monitoring, and evaluating SDG-related programmes. In other words, leadership effectiveness alone may not be sufficient to guarantee sustainability outcomes unless it is supported by well-structured institutional frameworks. This finding is consistent with the work of Kapse et al. (2024), who emphasized that sustainability-oriented leadership achieves greater impact when aligned with institutional commitment to SDG implementation. Governance Effectiveness also demonstrates a significant positive relationship with sustainability outcomes. This finding suggests that transparent decision-making, accountability, ethical conduct, and stakeholder participation play important roles in promoting sustainable development. The result aligns with the findings of Mansour et al. (2024) and Mansour et al. (2025), who reported that gender-inclusive leadership structures contribute to improved governance quality, environmental innovation, and organizational sustainability performance.

Although Women Leadership recorded a significant positive effect, it produced the lowest path coefficient among the three predictors. This finding indicates that women's leadership, while important, may not independently drive sustainable development outcomes without supportive governance systems and effective SDG implementation structures. The result supports the argument of Bannò et al. (2023), who contend that the sustainability contributions of women leaders are maximized when they operate within institutions that provide enabling governance and policy frameworks. The findings confirm that women's leadership plays a catalytic role in advancing sustainable development within public institutions. However, its effectiveness is

strengthened when combined with robust governance mechanisms and efficient SDG implementation systems. This conclusion is consistent with the findings of Doan et al. (2024), who emphasized the critical role of women leaders in promoting sustainable development and supporting green transitions in developing economies. The results therefore provide empirical support for the study's theoretical framework and reinforce the argument that women's leadership, governance effectiveness, and SDG implementation effectiveness are mutually reinforcing factors that contribute significantly to sustainable development outcomes in Nigeria.

5. Conclusion, Recommendations

Conclusion

This study concludes that women's leadership is a significant driver of the achievement of the Sustainable Development Goals (SDGs) in selected public institutions in Nigeria. The findings reveal that institutions with stronger female representation in leadership positions are more likely to record improved sustainability outcomes, enhanced governance effectiveness, and stronger alignment with SDG implementation frameworks (Pierli et al., 2022; Bannò et al., 2023; Kapse et al., 2024). These findings suggest that women's leadership should not be viewed merely as a gender or governance issue but as a strategic resource for promoting sustainable development and improving institutional performance.

The study further demonstrates that women's leadership, governance effectiveness, and SDG implementation effectiveness are closely interconnected and collectively contribute to sustainability outcomes. This finding highlights the importance of adopting a holistic approach to sustainability governance. Sustainable development outcomes are not achieved solely through the presence of women in leadership positions; rather, they emerge from the effective interaction of inclusive leadership, institutional accountability, stakeholder participation, and well-structured SDG implementation mechanisms (Mansour et al., 2024; Mansour et al., 2025). When these elements operate together, public institutions are better positioned to deliver meaningful and measurable development outcomes. The results also reveal that SDG implementation effectiveness exerts the strongest influence on sustainability outcomes, followed by governance effectiveness and women's leadership. This indicates that although women's leadership plays an important catalytic role, its impact is strengthened when institutions possess effective governance structures and robust implementation frameworks for sustainability initiatives. The finding supports the argument that leadership effectiveness must be complemented by strong institutional systems and policy mechanisms in order to achieve meaningful sustainable development outcomes (Doan et al., 2024).

Furthermore, while women's leadership was found to have a significant positive effect on sustainability outcomes, its influence was comparatively lower than that of governance effectiveness and SDG implementation effectiveness. This suggests that increasing women's representation in leadership positions alone may not be sufficient to achieve sustainable development objectives unless accompanied by institutional reforms that enhance governance quality, accountability, transparency, and SDG integration. Consequently, public institutions that combine gender-inclusive leadership with effective governance systems and well-coordinated SDG implementation strategies are more likely to achieve long-term sustainability goals and institutional effectiveness.

The study provides empirical evidence that women's leadership plays a vital role in advancing sustainable development in Nigeria's public sector. However, its effectiveness is maximized when supported by sound governance practices and strong institutional commitment to SDG implementation.

Recommendations

Based on the findings of this study, the following recommendations are proposed to strengthen women's leadership and enhance the achievement of the Sustainable Development Goals within public institutions in Nigeria.

First, government authorities and institutional policymakers should actively promote gender-inclusive leadership by increasing the representation of women in strategic decision-making positions. This can be achieved through the implementation of gender-sensitive policies, leadership quotas, mentorship programmes, and capacity-building initiatives designed to empower women and enhance their participation in governance processes.

Second, public institutions should strengthen their SDG implementation frameworks by integrating sustainability objectives into strategic planning, budgeting processes, performance management systems, and institutional policies. This will ensure that SDG targets become core organizational priorities rather than peripheral policy commitments.

Third, efforts should be made to improve governance effectiveness through the promotion of transparent decision-making processes, stakeholder participation, accountability mechanisms, and ethical leadership practices. Strengthening these governance structures will enhance institutional capacity to achieve sustainability objectives and improve overall development outcomes.

Fourth, leadership development programmes should be established to build the capacity of both male and female leaders in areas such as sustainability governance, SDG implementation, strategic leadership, and inclusive decision-making. Such programmes will enhance leadership competence and improve institutional responsiveness to emerging sustainability challenges.

Finally, public institutions should encourage collaborative leadership structures that foster cooperation among women leaders, policymakers, civil society organizations, and other key stakeholders. Such collaboration will improve policy coherence, strengthen implementation effectiveness, and increase the overall impact of sustainability initiatives.

Practical Implications

The findings of this study have important implications for policymakers, public administrators, development practitioners, and institutional leaders. The significant relationship identified between women's leadership and sustainability outcomes suggests that gender-inclusive leadership should be regarded as an essential component of sustainable development strategies in Nigeria.

The finding that SDG implementation effectiveness is the strongest predictor of sustainability outcomes underscores the importance of moving beyond policy formulation to effective policy

execution. Public institutions should therefore focus on translating sustainability policies into actionable programmes supported by clear implementation plans, monitoring mechanisms, and measurable performance indicators.

The significant influence of governance effectiveness further highlights the need for transparency, accountability, stakeholder engagement, and ethical leadership in achieving sustainable development objectives. Strengthening institutional governance systems can therefore enhance the effectiveness of leadership and improve sustainability performance.

These findings imply that public institutions that successfully combine gender-inclusive leadership, effective governance structures, and robust SDG implementation mechanisms are more likely to achieve sustainable development outcomes, improve service delivery, and enhance long-term institutional performance.

Contribution to Knowledge

This study makes several important contributions to the literature on women's leadership and sustainable development.

First, it provides empirical evidence on the relationship between women's leadership and the achievement of the Sustainable Development Goals within Nigeria's public sector. Despite increasing global interest in gender-inclusive leadership and sustainability, empirical studies examining this relationship within the Nigerian context remain limited (Smith et al., 2019; Umemezia, 2015). The study therefore contributes valuable context-specific evidence to the existing body of knowledge.

Second, the study extends previous research by examining women's leadership alongside governance effectiveness and SDG implementation effectiveness as multidimensional determinants of sustainability outcomes. This integrated approach offers a broader understanding of the mechanisms through which leadership influences sustainable development performance (Bannò et al., 2023; Kapse et al., 2024).

Third, the study identifies SDG implementation effectiveness as the strongest predictor of sustainability outcomes. This finding contributes new insight to ongoing discussions regarding the relative importance of leadership and institutional systems in achieving sustainable development objectives. The results suggest that while leadership is important, strong implementation structures play a more decisive role in determining sustainability performance (Mansour et al., 2025).

Fourth, the study enriches the growing literature on gender, governance, and sustainable development in developing economies by providing empirical evidence from Nigeria's public institutions. This strengthens the applicability of existing leadership and sustainability theories within emerging economy contexts (Doan et al., 2024; Sam & Zibima, 2024).

Finally, the application of Partial Least Squares Structural Equation Modelling (PLS-SEM) contributes methodologically to sustainability and governance research by demonstrating the

usefulness of advanced statistical modelling techniques in examining complex relationships among leadership, governance, and sustainability variables within the public sector.

Suggestions for Further Study

Future studies can build on the findings of this research in several ways.

First, similar studies should be conducted in other sectors, such as education, healthcare, local government administration, and private organizations, to determine whether the relationships identified in this study remain consistent across different institutional contexts.

Second, future research could incorporate additional variables such as organizational culture, political influence, technological capability, financial resources, and institutional capacity to provide a more comprehensive understanding of the factors influencing SDG achievement.

Third, comparative studies involving multiple countries within Sub-Saharan Africa could be undertaken to examine cross-national variations in women's leadership and sustainability outcomes. Such studies would provide broader insights into regional patterns and contextual differences.

Fourth, future researchers may adopt longitudinal research designs to examine the long-term effects of women's leadership on SDG implementation effectiveness, governance quality, and sustainability performance. This would provide a deeper understanding of how leadership influences sustainable development over time.

Finally, future studies should investigate potential mediating and moderating variables, such as leadership style, policy stability, institutional capacity, organizational support, and stakeholder engagement, to better understand the mechanisms through which women's leadership influences sustainable development outcomes.

These recommendations will help expand the current body of knowledge and provide deeper insights into the role of women's leadership in promoting sustainable development within developing economies.

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