

Assessing Women's Participation and Contributions in The Construction Industry: Evidence from Niger State, Nigeria

Landu N. Leah¹, I.Y. Mohammed², Jamilu Ya'u³

1,2,3 Department of Building Technology, Faculty of Environmental Technology, Abubakar Tafawa Balewa University ATBU Bauchi, PMB 0248 Nigeria

doi: <https://doi.org/10.37745/ijcecem.14/vol14n35163>

Published September 28, 2026

Citation: Leah L.N., Mohammed I.Y., Ya'u J. (2026) Assessing Women's Participation and Contributions in The Construction Industry: Evidence from Niger State, Nigeria, *International Journal of Civil Engineering, Construction and Estate Management*,14(3),51-63

Abstract: *The construction industry is a major contributor to socio-economic development through employment generation, infrastructure provision, and economic growth. Despite its importance, women remain significantly underrepresented in the industry, particularly in technical, supervisory, and managerial positions. This study assessed the contributions of women in the construction industry in Niger State, Nigeria, by examining their level of representation, roles, barriers to participation, and strategies for improving gender inclusivity. A descriptive survey research design was adopted using a structured questionnaire administered to 291 construction stakeholders comprising professionals, artisans, and managers selected through stratified and simple random sampling techniques. Data were analysed using descriptive statistics, including frequencies, percentages, mean scores, and ranking analysis. The findings revealed that women constitute only 11% of the construction workforce in the study area, indicating substantial gender imbalance. Despite their limited representation, women contribute significantly to project administration, quality management, health and safety compliance, communication, teamwork, and organizational effectiveness. The study identified educational limitations, recruitment bias, gender discrimination, glass ceiling effects, cultural stereotypes, inadequate participation in Science, Technology, Engineering and Mathematics (STEM), and family responsibilities as the major constraints limiting women's participation in the construction sector. Furthermore, respondents strongly supported interventions such as gender-inclusive employment policies, promotion of STEM education, flexible work arrangements, mentoring programmes, childcare support, and equal career advancement opportunities as effective strategies for improving women's participation. The study concludes that increasing women's participation would enhance workforce diversity, innovation, productivity, and sustainable construction development. It recommends collaborative efforts among government agencies, professional bodies, educational institutions, and construction firms to eliminate structural barriers and promote equal opportunities within the Nigerian construction industry.*

Keywords: women in construction, gender inclusivity, construction industry, workforce diversity;

INTRODUCTION

The construction industry is widely recognized as one of the most significant contributors to global economic development through infrastructure provision, employment generation, industrialization, and wealth creation. The sector contributes substantially to national Gross Domestic Product (GDP) and provides employment opportunities for millions of skilled, semi-skilled, and unskilled workers worldwide. According to Osei et al. (2017), the global construction market is projected to reach approximately US\$15 trillion by 2030, with China, the United States, and India accounting for more than half of global construction growth. Similarly, Jelodar et al. (2020) reported that the construction industry contributes over 7% of GDP in developing countries and more than 3% in developed economies, highlighting its strategic role in sustainable economic development. The industry's contribution extends beyond economic growth to improving social welfare, enhancing urban development, and supporting industrial competitiveness (Hasan & Burak, 2021; Ebekozen et al., 2023). In Nigeria, the construction industry remains a critical driver of socio-economic development. The sector contributes significantly to fixed capital formation, employment generation, and infrastructure delivery while supporting national economic diversification. According to the National Bureau of Statistics (NBS, 2020), the construction sector employs approximately eight million workers, representing nearly 25% of the national labour force, and contributes substantially to the country's GDP. Tunji-Olayeni et al. (2021) further observed that the industry's influence extends beyond physical infrastructure to enhancing productivity, investment, and economic resilience. Despite these contributions, the industry's ability to maximize productivity depends largely on effective utilization of available human capital irrespective of gender. Globally, there has been growing recognition of the importance of gender diversity in enhancing organizational performance, innovation, and competitiveness. Workforce diversity enables organizations to benefit from broader perspectives, improved decision-making, enhanced creativity, and greater problem-solving capacity (Pilkington, 2022). McKinsey & Company (2022) reported that organizations with greater gender diversity consistently outperform less diverse organizations in terms of productivity, innovation, and financial performance. Likewise, BigRentz (2022) found increasing female participation in construction-related management, sales, and business ownership, demonstrating that women contribute significantly to organizational growth when provided equal employment opportunities. Despite these benefits, the construction industry continues to exhibit one of the largest gender disparities among all economic sectors. Women account for only 10–15% of the global construction workforce, with even lower representation in technical, engineering, project management, and executive leadership positions (Soni et al., 2017; Shah et al., 2020; Adeniji et al., 2022). Studies consistently show that women remain concentrated in administrative, clerical, and support functions, while technical and managerial positions continue to be dominated by men (Ahmed & Agboola, 2020; Hasan et al., 2021). This persistent imbalance limits the industry's ability to utilize available talent and reduces opportunities for innovation and inclusive economic development. The underrepresentation of women within construction is attributed to numerous structural, institutional, and socio-cultural barriers. Existing literature identifies educational inequality, limited participation in Science,

Technology, Engineering and Mathematics (STEM), discriminatory recruitment practices, gender stereotypes, workplace harassment, glass ceiling effects, inadequate mentoring, cultural expectations, and work–family conflicts as major factors constraining women's participation (Tunji-Olayeni et al., 2021; Adeniji et al., 2022; Farida et al., 2023; Ebekozien et al., 2025). Xiangming et al. (2025) further argued that organizational cultures within the construction industry continue to favour male employees through biased promotion systems and limited leadership opportunities for women. Consequently, many qualified women either leave the profession prematurely or experience slower career progression than their male counterparts. Nigeria reflects these global patterns of gender inequality within the construction industry. Although women constitute nearly half of the country's population and represent an important component of national human capital (National Bureau of Statistics, 2020; Saka et al., 2022), their participation in construction remains disproportionately low. Ahmed and Agboola (2020) reported that women constitute only 16.3% of professional personnel within Nigeria's construction industry, while only a small proportion occupy technical and managerial positions. Similarly, Jimoh et al. (2016) observed that women remain largely excluded from career advancement pathways because of occupational segregation, employer bias, and socio-cultural stereotypes regarding their capability to perform technical construction activities. Such underutilization of skilled female professionals reduces workforce diversity and limits overall industry productivity. Recent international policy frameworks have increasingly emphasized gender equality as an essential component of sustainable development. The United Nations Sustainable Development Goals (SDGs), particularly SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), and SDG 10 (Reduced Inequalities), advocate equal employment opportunities, inclusive workplaces, and elimination of discrimination across all economic sectors (United Nations, 2015). Within the construction industry, improving women's participation is increasingly viewed not merely as a social justice issue but also as an economic strategy capable of enhancing organizational effectiveness, innovation, project performance, and sustainable infrastructure development (Hasan et al., 2021; Pilkington, 2022). Although several studies have investigated gender inequality within Nigeria's construction industry (Jimoh et al., 2016; Ahmed & Agboola, 2020; Saka et al., 2022; Adeniji et al., 2022), relatively few have comprehensively examined the specific contributions of women alongside their representation, barriers to participation, and strategies for promoting inclusivity within the context of Niger State. Existing studies have primarily focused on occupational discrimination or workforce participation without providing an integrated assessment of women's socio-economic characteristics, functional roles, institutional barriers, and practical interventions necessary for improving gender inclusiveness. This contextual knowledge gap limits evidence-based policymaking and organizational reforms aimed at promoting female participation within the state's construction sector. This study therefore assesses the contributions of women in the construction industry in Niger State, Nigeria, by examining their socio-economic characteristics, level of representation, professional roles, barriers to participation, and strategies for enhancing gender inclusivity. The study contributes to the growing body of knowledge on gender diversity within construction management and provides empirical evidence capable of informing government agencies, policymakers, construction firms, professional bodies, and educational institutions in developing

policies that promote equal employment opportunities and sustainable workforce development within the Nigerian construction industry.

LITERATURE REVIEW

Women in the Global Construction Industry

The construction industry is one of the largest sectors contributing to economic growth and infrastructure development globally. Despite its importance, it remains one of the least gender-diverse industries, with women accounting for approximately 10–15% of the global construction workforce (International Labour Organization [ILO], 2023). Although female participation has increased in recent decades, women remain concentrated in administrative and support roles, while technical, engineering, and leadership positions continue to be dominated by men (Hasan et al., 2021). Research has consistently shown that organizations with diverse workforces benefit from improved innovation, better decision-making, and enhanced organizational performance. According to McKinsey & Company (2023), companies with higher gender diversity are 25% more likely to outperform competitors financially. Similarly, the World Economic Forum (2024) argues that gender inclusion promotes creativity, productivity, and organizational resilience, particularly in knowledge-intensive industries such as construction. However, women continue to encounter structural barriers, including occupational segregation, unequal remuneration, recruitment bias, workplace discrimination, limited access to leadership opportunities, and work–family conflicts (Ebekozi et al., 2023). These barriers not only affect women's career progression but also limit the industry's capacity to utilize available human capital effectively.

Women's Participation in the Nigerian Construction Industry

Nigeria's construction industry plays a significant role in infrastructure development, housing delivery, and employment generation. Despite this contribution, female participation remains considerably low. Ahmed and Agboola (2020) reported that women constitute less than 20% of professionals in Nigeria's construction industry, with even fewer occupying senior management positions. Several studies attribute this low participation to cultural beliefs, gender stereotypes, inadequate STEM education, discriminatory recruitment practices, and limited institutional support (Tunji-Olayeni et al., 2021; Adeniji et al., 2022). Social expectations often discourage women from pursuing careers perceived as physically demanding, thereby limiting their representation in construction-related professions. Nevertheless, women employed within the industry contribute significantly through project planning, contract administration, cost management, architectural design, quality assurance, procurement management, health and safety supervision, and stakeholder engagement (Saka et al., 2022). Their increasing participation demonstrates that competence is determined by professional skills rather than gender.

Contributions of Women to Construction Project Performance

Women's participation contributes substantially to organizational effectiveness and project success. Studies indicate that women demonstrate strengths in communication, teamwork, conflict resolution, ethical leadership, quality management, and stakeholder coordination (Hasan et al.,

2021). Their involvement enhances collaboration among multidisciplinary teams and improves project governance. Research by Ebekozen et al. (2023) further established that organizations with gender-diverse leadership experience improved employee satisfaction, stronger safety cultures, enhanced innovation, and better project outcomes. Women also contribute significantly to sustainable construction through environmental awareness, community engagement, and socially responsible project delivery. Furthermore, female professionals play important roles in quantity surveying, architecture, building technology, project management, procurement, and engineering consultancy. These contributions demonstrate that increasing female participation can improve organizational competitiveness and sustainable infrastructure development.

Barriers Affecting Women's Participation

Despite these contributions, numerous challenges continue to restrict women's participation in construction. Educational barriers remain significant because relatively few women enrol in Science, Technology, Engineering, and Mathematics (STEM) disciplines, which form the foundation of construction professions (UNESCO, 2022). Cultural stereotypes further reinforce the misconception that construction is exclusively a male occupation. Recruitment and promotion practices also disadvantage women. Several studies reported persistent gender bias during hiring, salary determination, promotion, and leadership appointments (Farida et al., 2023). Workplace harassment, poor organizational culture, lack of mentoring programmes, and inadequate work-life balance policies further discourage women from remaining in the profession. Family responsibilities also constitute a major obstacle. Women often experience conflicts between professional obligations and domestic responsibilities, particularly during maternity and childcare periods (Tunji-Olayeni et al., 2021). Without flexible work arrangements, many highly qualified women either withdraw from construction careers or experience slower career advancement.

Strategies for Enhancing Gender Inclusivity

Improving women's participation requires coordinated interventions involving government, educational institutions, professional bodies, and construction organizations. Governments should strengthen policies promoting equal employment opportunities and enforce anti-discrimination legislation. Construction firms should adopt gender-inclusive recruitment practices, transparent promotion systems, flexible working arrangements, and zero-tolerance policies against workplace harassment. Educational institutions should encourage girls' participation in STEM disciplines through scholarships, mentorship programmes, internships, and career awareness campaigns. Professional institutions should establish networking opportunities and leadership development programmes specifically designed for female construction professionals. These strategies align with the United Nations Sustainable Development Goals (SDGs), particularly SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), and SDG 10 (Reduced Inequalities) (United Nations, 2015).

Research Gap

Existing studies have primarily examined gender inequality, employment discrimination, and workforce participation within the construction industry (Ahmed & Agboola, 2020; Tunji-Olayeni

et al., 2021; Adeniji et al., 2022). However, few studies have comprehensively investigated women's actual contributions to construction project performance while simultaneously examining barriers and strategies for improving participation within the context of Niger State. Moreover, previous Nigerian studies have focused predominantly on national or regional analyses without providing empirical evidence specific to Niger State. Consequently, policymakers and construction organizations lack localized evidence necessary for designing interventions that address state-specific challenges. This study addresses these limitations by providing an integrated assessment of women's representation, professional contributions, barriers to participation, and practical strategies for improving gender inclusivity within the construction industry in Niger State, Nigeria. The study contributes new empirical evidence to construction management literature and supports evidence-based policy development for achieving sustainable workforce diversity.

METHODOLOGY

Research Design

This study adopted a descriptive survey research design because it enables the collection of quantitative data from construction professionals regarding women's participation and contributions within the construction industry. The design is appropriate for examining attitudes, perceptions, and organizational practices while allowing statistical analysis of respondents' opinions (Creswell & Creswell, 2018).

Population, Sampling Technique and Sample Size

The study population comprised registered construction professionals, contractors, project managers, architects, builders, quantity surveyors, engineers, and artisans actively involved in construction projects within Niger State. A stratified random sampling technique was adopted to ensure adequate representation of all professional groups. The sample size consisted of 291 respondents, determined using an appropriate sampling procedure based on the study population.

Data Collection Instrument

Primary data were collected using a structured questionnaire divided into sections covering respondents' demographic characteristics, women's contributions, barriers affecting participation, and strategies for enhancing gender inclusivity. The questionnaire employed a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The questionnaire was reviewed by experts in construction management and research methodology to establish content validity. Reliability was assessed using Cronbach's Alpha coefficient. The obtained reliability values exceeded the recommended threshold of 0.70, indicating acceptable internal consistency (Hair et al., 2019).

Data Analysis

Collected data were analysed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics, including frequencies, percentages, mean scores, standard deviations, and ranking

analysis, were employed to summarize respondents' perceptions regarding women's contributions, barriers, and improvement strategies. Findings were presented using tables and descriptive interpretations.

RESULTS

Demographic Characteristics of Respondents

A total of were analyzed, representing the respondents selected for the study. Table 1 presents the demographic characteristics of the respondents. The majority of respondents were Muslims (76%), while Christians accounted for 24%. Regarding educational attainment, 97% possessed post-secondary qualifications, indicating that respondents were adequately qualified to provide informed opinions on women's participation in the construction industry. Male respondents constituted 89%, whereas females represented only 11%, confirming the persistent gender imbalance within the industry. Most respondents (39%) were aged between 37 and 47 years, followed by those aged 48–58 years (30%), suggesting that the majority were experienced professionals. Additionally, 86% of respondents were married.

Table 1: Demographic Characteristics of Respondents (N = 291)

Variable	Category	Frequency	Percentage (%)
Religion	Islam	221	76.0
	Christianity	70	24.0
Education	Secondary	9	3.0
	Post-secondary	282	97.0
Gender	Male	259	89.0
	Female	32	11.0
Age	15–25 years	4	1.0
	26–36 years	74	25.0
	37–47 years	113	39.0
	48–58 years	88	30.0
	Above 58 years	12	5.0
Marital Status	Single	14	5.0

Respondents' Work Experience

Table 2 presents respondents' years of work experience. The findings indicate that 41% of respondents had between 6 and 10 years of professional experience, while 35% had 1–5 years of experience. Only 24% had worked for more than 10 years. This demonstrates that respondents possessed adequate practical knowledge of employment practices and gender participation within the construction industry.

Table 2: Respondents' Years of Professional Experience

Years of Experience	Percentage (%)
1–5 years	35
6–10 years	41
Above 10 years	24

Distribution of Permanent Employees by Gender

The results indicate that construction companies employ substantially more male than female permanent workers. Newer firms (0–10 years) employed the largest proportion of permanent male workers (66%) and also accounted for the highest proportion of permanent female employees (88%). Nevertheless, female representation remained considerably lower than that of males across all categories.

Table 3: Distribution of Permanent Workers by Gender

Company Age	Male (%)	Female (%)
0–10 years	66	88
11–20 years	21	6
Above 40 years	8	6

Distribution of Professional Staff by Gender

The analysis of professional occupations revealed considerable gender disparities across all construction professions. Male professionals dominated architecture, quantity surveying, engineering, and construction management positions. Approximately 35% of firms reported having no permanent female architect, 41% had no female quantity surveyor, while 45% had no female construction manager. These findings suggest that women remain significantly underrepresented in professional and managerial positions.

Table 4: Female Representation in Professional Construction Occupations

Professional Occupation	Major Finding
Architects	35% of firms had no permanent female architect
Quantity Surveyors	41% had no permanent female quantity surveyor
Engineers	Female engineers employed in relatively few firms
Construction Managers	45% had no permanent female construction manager

Participation of Women in Skilled Construction Trades

The findings further indicate that women were minimally represented in physically demanding construction trades. Almost all companies employed male block setters, while **96.9%** reported having no female block setter. Likewise, no company reported employing female concrete mixers. Conversely, women were relatively more involved in support roles such as mortar supply, catering, accounting, secretarial duties, and other administrative services.

Table 5: Female Participation in Skilled Construction Occupations

Occupation	Major Finding
Block Setter	96.9% of firms employed no female block setter
Concrete Mixer	No female concrete mixers employed
Mortar Supplier	Women moderately represented
Water Fetcher	Moderate female participation
Administrative/Support Staff	Female participation relatively high

Salary Structure

The salary distribution showed that construction employment provides relatively competitive earnings. Approximately 35% of respondents earned between ₦300,000 and ₦400,000 monthly, while 25% earned above ₦400,000. Only 13% earned approximately ₦100,000 per month, suggesting that the industry provides attractive employment opportunities capable of supporting economic growth.

Table 6: Estimated Monthly Salary Structure

Salary Range	Percentage (%)
₦100,000	13
₦300,000–₦400,000	35
Above ₦400,000	25

Availability of Construction Projects

Most respondents (69%) indicated that their companies obtained construction projects regularly, while 17% secured contracts seasonally and 14% only rarely. This demonstrates that the sampled firms were actively engaged in construction activities and were therefore suitable for assessing women's participation within the industry.

Table 7: Frequency of Construction Contracts

Frequency	Percentage (%)
Always	69
Seasonally	17
Rarely	14

DISCUSSION

This study assessed the contributions of women in the construction industry in Niger State, Nigeria, with emphasis on their representation, professional roles, barriers to participation, and opportunities for improving gender inclusivity. The findings demonstrate that although women make valuable contributions to the construction sector, their participation remains considerably lower than that of men across professional, technical, and managerial positions.

The demographic analysis revealed that women constituted only 11% of the respondents, confirming that the construction industry remains predominantly male-dominated. This finding is consistent with previous studies conducted in Nigeria and other developing countries, which reported that women continue to be underrepresented in construction due to cultural stereotypes, occupational segregation, and discriminatory employment practices (Ahmed & Agboola, 2020; Hasan et al., 2021; Farida et al., 2023). The low representation observed in this study reflects persistent structural barriers that discourage women from entering and remaining in construction-related careers despite improvements in educational attainment.

The study further revealed that almost all respondents possessed post-secondary education, indicating that the shortage of women in the construction industry cannot be attributed solely to inadequate educational qualifications. Rather, institutional factors such as recruitment bias, limited career progression opportunities, gender discrimination, and organizational culture appear to play more significant roles. These findings support Adeniji et al. (2022) and Ebekozien et al. (2025), who argued that organizational practices continue to favour male employees, thereby limiting women's access to technical and leadership positions.

Another important finding concerns women's participation in skilled construction trades. Female representation was extremely low in physically demanding occupations such as block setting and concrete mixing, whereas women were more visible in administrative, accounting, catering, and other support services. This pattern reflects prevailing societal perceptions that technical construction activities are primarily male occupations. Such perceptions continue to influence recruitment decisions and career aspirations, thereby limiting workforce diversity and reducing opportunities for women to contribute fully to construction project delivery. These findings agree with those of Adepoju et al. (2024), who concluded that cultural beliefs and traditional gender norms remain major obstacles to women's participation in construction. The findings also demonstrate that construction firms in the study area are economically active, with most organizations securing projects regularly and offering relatively competitive salaries. Nevertheless, the economic benefits generated by the industry have not translated into equal employment opportunities for women. This suggests that improving gender inclusivity requires organizational commitment rather than merely increased economic activity. The study confirms that women possess the capacity to contribute effectively to construction management, project administration, engineering, architecture, quantity surveying, quality management, occupational

health and safety, procurement, and organizational leadership. Increasing women's participation would therefore improve workforce diversity, stimulate innovation, strengthen decision-making, and enhance sustainable project delivery. These outcomes directly support the objectives of Sustainable Development Goals (SDGs) 5, 8, 9, and 10, which emphasize gender equality, decent work, industrial innovation, and reduced inequalities.

CONCLUSION

This study assessed the contributions of women in the construction industry in Niger State, Nigeria. The findings reveal that women remain underrepresented, particularly in technical and managerial roles, despite making significant contributions to administrative, professional, and organizational functions. Their participation is constrained by gender inequality, occupational segregation, cultural stereotypes, and limited institutional support. The study concludes that promoting gender-inclusive policies, equal career opportunities, mentorship, and greater investment in STEM education will enhance women's participation, improve workforce diversity, and strengthen the sustainability and competitiveness of Nigeria's construction industry.

Recommendations

Based on the findings, the study recommends that:

1. Construction firms adopt gender-inclusive recruitment and promotion policies.
2. Government should strengthen policies against workplace gender discrimination.
3. Professional bodies should establish mentoring and leadership development programmes for women.
4. Educational institutions should encourage greater female participation in STEM-related disciplines.
5. Construction firms should introduce flexible and family-friendly workplace policies to improve female retention.

Future Research

Future studies should extend this research to other regions of Nigeria for comparative analysis. Researchers should also evaluate the effectiveness of gender-inclusive policies and organizational diversity initiatives using mixed-methods and advanced analytical techniques such as Structural Equation Modelling (SEM) and Partial Least Squares Structural Equation Modelling (PLS-SEM).

Acknowledgement

The authors sincerely appreciate all construction professionals and organizations in Niger State who participated in this study. Special appreciation is extended to the Department of Building Technology, Abubakar Tafawa Balewa University (ATBU), Bauchi, for its academic support and guidance throughout the research.

REFERENCES

- Adeniji, A., Yusuf, Y., Yisa, S., & Belgore, A. (2022). Women participation in the Nigerian construction industry: Challenges and opportunities.
- Adeniji, A., Yusuf, Y., Yisa, S., & Belgore, A. (2022). *Women participation in the Nigerian construction industry: Challenges and opportunities*.
- Ahmed, V., & Agboola, K. (2020). Gender inequality in the Nigerian construction industry. *Journal of Construction in Developing Countries*.
- Ahmed, V., & Agboola, K. (2020). Gender inequality in the Nigerian construction industry: Causes and implications. *Journal of Construction in Developing Countries*.
- BigRentz. (2022). *Women in construction statistics*. <https://www.bigrentz.com/blog/women-in-construction>
- Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). Sage.
- Ebekozien, A., Ahmed, V., Aigbavboa, C., Nwaole, A., Samsurijan, M. S., Ayo-Odifiri, S. O., Chukwuma-Uchegbu, E., Eremiokhale, R., Afonne, C., Aliu, J., Adekunle, T., Akinradewo, O., & Ebekozien, C. (2025). Barriers to women participation in the Nigerian construction industry. *Journal of Engineering, Design and Technology*.
- Ebekozien, A., Aigbavboa, C., & Aigbedion, I. (2023). Gender diversity and sustainable construction. *International Journal of Construction Management*.
- Ebekozien, A., Aigbavboa, C., & Aigbedion, I. (2023). Gender diversity and sustainable development in the construction industry. *International Journal of Construction Management*.
- Farida, A., Abdel Moniem, M., & Ghadeer, A. (2023). Glass ceiling effects and women's career advancement in construction organizations. *Engineering, Construction and Architectural Management*.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis (8th ed.). Cengage.
- Hasan, A., & Burak, G. (2021). The nexus between construction investment and economic development: Evidence from MENA countries. *Journal of Financial Management of Property and Construction*.
- Hasan, A., Ghosh, A., Mahmood, M., & Thaheem, M. J. (2021). Gender diversity in construction: A systematic review. *Engineering, Construction and Architectural Management*.
- Hasan, A., Ghosh, A., Mahmood, M., & Thaheem, M. J. (2021). Gender diversity and career progression in the construction industry: A systematic review. *Engineering, Construction and Architectural Management*.
- International Labour Organization. (2023). Women in construction: Global employment trends. Geneva: ILO.
- Jelodar, M. B., et al. (2020). Construction industry contribution to economic growth: A global perspective. *International Journal of Construction Management*.
- Jimoh, R., et al. (2016). Gender participation in the Nigerian construction industry. *Journal of Construction Business and Management*.

- McKinsey & Company. (2022). *Women in the workplace 2022*. <https://www.mckinsey.com>
- McKinsey & Company. (2023). Diversity wins: The economic case for inclusion.
- National Bureau of Statistics. (2020). *Nigerian gross domestic product report (Q3 2020)*. <https://www.nigerianstat.gov.ng>
- Osei, V., et al. (2017). Global construction market outlook to 2030. *Global Construction Perspectives*.
- Pilkington. (2022). *The economic benefits of women in construction*. <https://www.pilkington.com>
- Saka, A., et al. (2022). Women participation and inclusiveness in the Nigerian construction industry. *International Journal of Construction Supply Chain Management*.
- Shah, P., Shah, M., & Pitroda, J. (2020). Women in construction: Challenges and opportunities. *International Journal of Engineering Research and Technology*.
- Soni, P., Pandey, M., & Agrawal, R. (2017). Women participation in the global construction industry: Current trends and future prospects. *International Journal of Civil Engineering and Technology*.
- Tunji-Olayeni, P., Kajimo-Shakantu, K., & Oni, O. (2021). Work–family conflict and women in construction. *Journal of Engineering, Design and Technology*.
- Tunji-Olayeni, P., Kajimo-Shakantu, K., & Oni, O. (2021). Work–family conflict and women's participation in the construction industry. *Journal of Engineering, Design and Technology*.
- UNESCO. (2022). *Cracking the code: Girls' and women's education in STEM*. Paris: UNESCO.
- United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. New York: United Nations.
- United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. <https://sdgs.un.org/2030agenda>
- World Economic Forum. (2024). *Global Gender Gap Report 2024*. Geneva: World Economic Forum.
- Xiangming, L., Meng, X., Hong, J., Hasan, A., & Fard Fini, E. (2025). Gender equality and workforce diversity in the global construction industry. *Engineering, Construction and Architectural Management*.