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Blueprints of change: how women entrepreneurs are reinventing construction

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ABSTRACT

This research aimed to examine the role of women entrepreneurs in the construction industry in Ghana using a concurrent mixed-methods approach. Despite as much as there has been increasing female participation in this traditionally male-dominated sector, little research exists on their contribution, particularly in developing countries. The study involved a qualitative strand comprising semi-structured interviews with 10 women construction entrepreneurs, and a quantitative survey with 32 women entrepreneurs drawn from various sectors of the industry. Audio tapes of the interviews were transcribed and thematically analyzed with MAXQDA (2020), while quantitative data were analyzed with the Relative Importance Index and one-sample t-tests. The findings illustrate that women entrepreneurs make contributions to the sector through gender-inclusive leadership, improved workplace cultures, and gender stereotype challenging. However, gender prejudice challenges, work-family balance issues, and project realization delays still exist. The study recommends targeted policy interventions, capacity-building initiatives, and institutional support to enhance women's involvement and leadership in the construction sector. The conclusions offer actionable lessons to policymakers, stakeholders in the industry, and researchers interested in inclusive development, particularly in contexts such as Ghana. The study contributes to the growing scholarship on gender and entrepreneurship in the Global South.

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Entrepreneurship; women (or female); inclusive practices; gender equality; construction industry

Introduction

Entrepreneurs are those who undertake initiatives, organise, and operate a venture (Al-Qahtani et al. 2022). Thus, they identify an opportunity; take financial risk and decide on how resources are to be managed, coupled with making strategic decisions toward business growth (Crovini et al. 2021). Female entrepreneurs may initiate businesses in every field—be it technology, retail, manufacturing, or services—and quite often strive to work out specific challenges they face in entrepreneurship regarding proper funding, networking opportunities, and balancing business with personal responsibilities (Ghorfi and Jurd de Girancourt 2022). Applying Institutional Theory (Scott 2008), these challenges can be attributed to societal norms, institutional constraints, and organisational policies that either enable or hinder their success. Female entrepreneurs in the construction sector are women who own, manage, or oversee businesses in the construction industry (Fieve and Chrysostome 2024). Women in business, especially in the construction industry, may serve very fundamental functions because of their innovative and resilient characters, normally accompanied by strategic oversight (Hegarty 2020). Constructive Alignment Theory (Biggs and Tang 2011) helps frame their efforts as aligning with broader objectives of promoting innovation, improving diversity, and enhancing sustainability in the construction sector. However, their unique challenges, such as gender biases, limitations in networking, and financing barriers (Emon

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and Nipa 2024), are reflective of systemic institutional barriers that perpetuate inequalities in the sector. They have been involved in different aspects of construction activities involving project management, design, engineering, contracting, and consultancy services (Adinyira et al. 2023; Mohamed et al. 2024). The female entrepreneurs in the construction industry give broadened diversity, better working conditions, and equality in general within the construction industry (Naoum et al. 2020). Most of them, too, are for sustainability, improving safety, and for advanced technologies from which more innovative and efficient practices are considered across the entire industry (Adinyira et al. 2023).

Over the past few years, the influx of more women into this male-dominated construction industry has brought attention to their role (Norberg and Johansson 2021). Despite the progress and development, there is still a very small portion of females in this sector. Institutional Theory provides insight into why progress remains slow with women in the United States, taking about 10-12% of the workforce in the construction industry, and Ghana is no different (Naoum et al. 2020). In the industry, more occupations of women are found in office-based jobs, such as administration, project management, and engineering, and not in field roles (Hasan et al. 2024). It is clear that only about 1-3% work on site construction, which involves a great amount of manual labour and physical demands (Botchway et al. 2023). This underrepresentation limits the alignment of industry practices with broader goals of inclusivity and equality, as outlined in Constructive Alignment Theory. Therefore, such a restricted field position occupancy provides scope for further inclusiveness while more and more women come forward to break barriers in these fields (Mhlanga 2024; Botchway et al. 2025).

Similarly, female entrepreneurship in the field of construction has also grown through an increase in the number of women-owned construction firms (Hasan et al. 2021). These women entrepreneurs bring fresh perspectives into business and address issues which no other leader has encountered (Ajiva et al. 2024). Conversely, females comprise only about 13-15% of construction firm owners, which underlines the fact that more support is required for areas related to funding, networking, and mentorship of potential women entrepreneurs in the field (Kyrgidou et al. 2021). Because of this, interestingly enough, the construction industry holds one of the smaller wage gaps between males and females in that women make, on average, about 95% of their male counterparts' pay for the same position (Blau and Kahn 2020; Perrenoud et al. 2020). Yet this improvement in parity with wages does little to take away from other challenges, as many women are still reporting higher turnover rates (Kabeer 2021). For whatever reason, about 47% of women entering the construction industry tend to leave within the first five years, citing limited career progression, less mentorship, and few females acting as role models in leadership positions (Naoum et al. 2020).

Educational trends provide some hope for better female participation in the future (Barrett 2021). It follows, then, that the number of women studying construction-related fields like engineering and construction management has gone up incrementally, reflecting a shift that, over time, might translate to more women in skilled construction positions and leadership roles (King Lewis and Shan 2024). Similarly, industry organisations like the National Association of Women in Construction (NAWIC) are working to better support and encourage more women into the field through the provision of scholarships, mentorship programs, and other facilitations in this area, making the work environment more inclusive (Milligan 2021). The fact that women continue to contribute to the construction industry would render this industry more diversified and resilient through their professional and entrepreneurial roles (Bagheri et al. 2024). Meeting peculiar challenges that women face in construction cannot only raise retention but also improve innovation, inclusion, and resilience within this vital industry (Meyer 2024). New empirical evidence shows that women entrepreneurs propel the industry through three mechanisms: (1) institutional change, activism and lobbying that reshape procurement and HR practices; (2) organisational practice change, adoption of workplace gender-sensitive policy, scheduling and safety practices that reduce attrition; and (3) technical/market innovation, uptake of new project-management technologies and sustainability practices that transform firm competitiveness. These processes have been observed in Ghana and other comparable developing contexts (Naoum et al. 2020; Adinyira et al. 2023; Mensah and Derera 2023). The main purpose of the study is to examine the impact of female construction entrepreneurs on the construction industry in developing countries, specifically Ghana, through a mixed-method analysis of their contributions, challenges and potential for

fostering industry transformation and economic growth. The subsequent and remaining parts of the study contain the past studies, followed by the methodology. The next section presents the results and explanations of the findings, and the concluding remarks demonstrate the implications and limitations of the study.

Despite the enormous global accumulation of literature on women in construction and female entrepreneurship, much of the research was done in developed economies or was concerned about women as employees rather than as owners of the business. In contexts like Ghana, and others that are also similar, there is still little empirical evidence on women-led construction enterprises in particular, partially because of the prevailing informal structure of the sector, lack of comprehensive gender-disaggregated industry data, and a historical underrepresentation of women in construction ownership and leadership. This leaves the need to further theorize and fill the empirical vacuum of what women entrepreneurial contribution, challenges, and transformation are all about. This study is a gap bridge by actively focusing on women entrepreneurs engaged in various roles (owner, executive director) in the construction sector in Ghana, with a concurrently used design in the field of mixed methods to pick up on the quantitative impacts and life experiences. Unlike traditional studies that see women's membership and barriers in the industry as two different sides of the coin, this study dovetails quantified impacts with qualitative responses today, which would provide a proper and holistic understanding of how women entrepreneurs rewrite the construction process in Ghana.

To achieve the study the following research questions were developed for the study, they are:

1. What are the roles of women entrepreneurs, and how they reinvent the construction industry?
2. What are the impacts of female construction entrepreneurship in developing countries?
3. What impact are the performance and sustainability of women-led construction firms?

The Institutional Theory is the main concept that underpins this study, application upon the principle of how women entrepreneurs' opportunities and constraints are shaped by formal regulations, cultural norms and organizational practices. Insights from the gender role theory thus help understanding stereotype-breaking and leadership perceptions, whereas analysis from social identity theory explains resistance, exclusion, and attribution challenges experienced by women among male-dominated construction environments.

Literature review

Female construction entrepreneurship

Female entrepreneurship in the construction industry faces many challenges, especially in developing nations (Rashid and Ratten 2020; Amponsah-Asante et al. 2025a). These challenges can be understood through the lens of Institutional Theory (Scott 2008), which highlights how societal norms, organisational structures, and cultural practices shape the opportunities and barriers for female entrepreneurs. Besides this, women entrepreneurs also face deep-seated socio-cultural obstacles such as patriarchal attitudes and stereotyping of gender (Tshipani 2021). Despite such hindrances, several women have been able to break their way into this traditionally male-dominated area and had expressed masculine traits as measured through the BEM Sex-Role Inventory (O'Sullivan 2024). Motivational drivers among women entrepreneurs to join construction entrepreneurship represent both push and pull factors equally (Al Matroushi et al. 2020). The strategies used by women entrepreneurs to overcome the problems include partnering with male owners of businesses, on the one hand, and building reliable networks of contacts, on the other (Rudhumbu et al. 2020). However, the low representation of women within the construction industry remains driven by such elements as cultural background, business choice, and confidence (Naoum et al. 2020). Constructive Alignment Theory (Biggs and Tang 2011) provides a framework to explore how strategies like mentorship and networking align with the goal of fostering equitable participation in the industry. Empowerment programs sensitive to gender issues will be called for as an effort to increase their participation in the construction industry through various initiatives of both the public and private sectors (Orser et al. 2021).

Impact of female construction entrepreneurship In developing countries

Female entrepreneurs in developing countries are often women who have to face lower levels of education, safety concerns, and discrimination compared to men (Olarewaju and Fernando 2020). This aligns with Institutional Theory, which explains how structural and cultural constraints limit opportunities for women in these settings. Yet, women entrepreneurs have risen through the barriers and support from associations within the construction industry to be successful (Ajiva et al. 2024). In fact, female entrepreneurship is considered critical to the economic growth of developing countries, while it also provides an unrealised opportunity for creating prosperity and distributing wealth more evenly (Minniti and Naudé 2010). Among the institutional factors that enhance women's decisions to engage in self-employment are post-materialism, autonomy, and respect for human rights (Berthel 2022). Female entrepreneurs contribute more significantly to social mobility than male entrepreneurs do in developing countries (Aparicio et al. 2022). This is further supported by Constructive Alignment Theory, as policies and empowerment initiatives must align with intended outcomes like wealth distribution and gender equality. Thus, the development of female entrepreneurship requires better conditions, reflective policies, and resolute measures that would contribute to women's empowerment (Aparicio et al. 2022; Berthel 2022; Stossier 2023).

Moreover, women-owned construction businesses directly generate employment, drive innovation, and build communities, particularly in low-income communities where formal employment is limited (Hansen-Garshong et al. 2023). Despite financial exclusion and limited access to credit, women resort to adaptive strategies such as collective financing and skill-sharing arrangements that sustain their businesses (Delle 2022). For example, in sub-Saharan Africa, women entrepreneurs own nearly 58% of small businesses, the majority of which are in infrastructure and construction services (Atarah et al. 2023). Not only do these businesses reduce poverty, but they also empower young women by providing role models and mentoring (Adinyira et al. 2023). However, in the face of a lack of strong institutional support, high staff turnover rates and concerns of sustainability still mar long-term impacts. Therefore, enabling gender-sensitive procurement policies, ensuring access to affordable credit, and creating targeted mentorship programs are essential to unleashing the transformational potential of women entrepreneurs in the construction sector in developing countries (Kwasafu et al. 2026).

Women instituting change

Women in developing countries are increasingly driving change in the construction industry by breaking traditional gender stereotypes and introducing new ways of working (Amponsah-Asante et al. 2025b). Previously a man's world, construction is now also home to women entrepreneurs, engineers, and project managers who are changing its culture and functioning (Naoum et al. 2020). Women-owned construction firms in Ghana are increasing gender-sensitive leadership and workplace diversity, creating opportunities for young women to train in skilled trades. Similarly, in Kenya, women's groups such as the Association of Women in Construction (AWC) provide mentorship and training that helps women break down obstacles and advance to leadership positions. In India, initiatives such as Self-Employed Women's Association (SEWA) empowered thousands of women to enter construction jobs with focus on safe work practices, skill development, and collective bargaining. These initiatives enhance workplace cultures with more collaboration, gender-free views, and stricter standards of accountability (Naoum et al. 2020). Despite the system obstacles such as restricted access to finance, discrimination, and juggling family duties, women are always resilient and creative.

Their leadership introduces new concepts that are typically linked with sustainability, community welfare, and diversity. By depicting this, women not only transform the building sector but also play an important role in economic growth, poverty reduction, and social justice in developing countries. In South Africa, women entrepreneurs are spearheading inclusive procurement, connecting women-owned enterprises with large-scale infrastructure developments (Naoum et al. 2020). In Nigeria, women construction CEOs are setting the pace for sustainable construction by incorporating green materials and renewable technology, thereby emerging as industry pioneers in a sector that is revolutionizing (Naoum et al. 2020). These examples are particularly compelling in highlighting that participation by women

extends beyond promoting representation; it also positively improves modernization and competitiveness in the sector (Mensah and Derera 2023). Across the developing world, women's entry is breaking the pattern of exclusion and encouraging a new generation to pursue construction careers. Their ability to make a difference shows that it is not just a principle of fairness but also one of the major strategies for industrial change and achieving national development targets (Mensah and Derera 2023).

Impact of female construction entrepreneurship In Ghana

Entrepreneurial women in Ghana contribute to the economic development process amidst many challenges (Hansen-Garshong et al. 2023). They possess similar personality traits as their counterparts in other parts of the world, yet differ in areas such as educational backgrounds and modes of acquiring skills (Shahzad et al. 2021). These women participate in various economic enterprises, and their activities can be seen to be creating innovation, jobs and reducing poverty (Delle 2022). However, these businesses are usually characterised by vulnerability and relatively low achievement due to complex institutional forces (Forrester and Neville 2021). Despite these limitations, women entrepreneurs in Ghana have remarkable participation rates compared to men (Atarah et al. 2023). Their contributions to socio-economic development remain highly underestimated and untapped. Drawing on Constructive Alignment Theory, it is evident that equal opportunity policies must align with the goal of achieving gender equity and economic transformation (Biggs and Tang 2011). It is believed that equal opportunities policies and support for women entrepreneurs have to be in place if full potential is to be realised in female entrepreneurship in Ghana (Inkumsah 2024). According to Mensah and Derera (2023) and Atarah et al. (2023), it is capable of engendering transformed economic growth in developing economies such as Ghana.

Besides, findings show that 47% of females who enter Ghana's construction sector leave within five years due to institutional barriers, gender discrimination, and poor finance (Naoum et al. 2020). The high attrition rate requires the need for targeted intervention that not only develops capacity, but also dismantles socio-cultural barriers to women's advancement. Practically, mentorship initiatives, financial inclusion, and gender-responsive procurement policies have the potential to empower women-owned businesses to compete fairly and sustainably (Orser et al. 2021; Kwasafu et al. 2026). Women entrepreneurs additionally bring in diverse viewpoints that stimulate innovation and inclusive development, rendering economic transformation not only growth-oriented but socially inclusive (Adinyira et al. 2023).

Methodology

Research design

The study adopted a concurrent mixed-method approach to research. Its design involves combining quantitative and qualitative approaches to provide an intensified analysis of a number of complex issues (Dawadi et al. 2021). As clarified by Harbers and Ingram (2020) and Matović and Ovesni (2023), this research design, by its nature, embeds data collection, its analysis, and interpretation through both approaches. This, therefore, gives a view of the issues that are more extensive in scope than one taken through either one of the approaches in isolation. A concurrent mixed-methodology was carried out for this research in order to capture both effects of women entrepreneurs (quantitative strand) and the mechanisms and meanings that determined them (qualitative strand) simultaneously. Because of the explorative nature and less research done on women-led construction entrepreneurship in Ghana, collecting both datasets at the same time allowed for more triangulation while reducing the risk of one strand significantly influencing the other.

Survey

The quantitative part involved an online survey that was administered to female construction professionals and female entrepreneurs in the construction industry to get information on demographic variables

and responses to closed-ended questions from the literature-identified variables. First, survey questionnaires were piloted for validity (Taherdoost 2021) with three experts in the construction industry, all of whom had over 15 years of working experience in the construction industry. It was also piloted for clarity of the instructions, logical flow of questions, and appropriateness of question wording/response scale. Three experts were assigned to fill out the questionnaires and provide feedback. Feedback included their impressions of familiarity with the identified variables, suggesting minor changes in the wording of a few questions for clarity. A total of 32 female construction professionals and entrepreneurs completed surveys were received and analysed. The impact items were all measured using a 5-point Likert scale as follows: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree. RII and means were computed from the ordinal ratings. Cronbach's alpha ($\alpha = 0.875$) indicates good internal consistency for the composite impact scale. In the qualitative part, semi-structured interview protocol was used to interview 10 female construction professionals and entrepreneurs with the intention of retrieving in-depth narrations of views concerning the research topic. All the interviews were audio-recorded and subsequently transcribed for analysis. The population frame was derived from the Ghana Contractors Association and the Registrar General's Department. A purposive sampling technique was directed at female professionals and entrepreneurs with active operations (owners/managing directors). The survey instrument was an online survey with demographic questions, Likert scales on impacts (1–5), and closed-ended questions. The interview instrument was a semi-structured template for themes: innovation, team dynamics, finance, and discrimination. Ethics and consent: Informed consent from all participants; interview participants also permitted audio-recording and transcription. Purposive sampling ensured the inclusion of relevant and information-rich cases. Potential participants were selected based on the following criteria: (1) being a woman-owned or women-led construction enterprise, (2) having ownership or senior managerial role, and (3) having active operations within Ghana's construction sector during the study period. The sampling frame included records and databases of the Ghana Contractors Association, and also the Registrar General's Department. The sample size was chosen to represent the relatively small and hard-to-reach population of women construction entrepreneurs in Ghana. Completely systematic, a combination of 32 survey responses and 10 in-depth interviews was acceptable for an exploratory mixed-methods research study and at least allowed for generalisation in analytical, rather than statistical terms. Survey items and interview questions were developed based on an extensive review of prior literature on entrepreneurship of females, gender from a construction perspective, and institutional barriers. Leadership impact, stereotype-breaking, working conditions, finance or discrimination were adapted from the constructs studied in several contexts (Naoum et al. 2020; Orser et al. 2021). Content validity was further improved by expert review by three senior figures from the construction field, each having acquired a minimum of 15 years of experience. Subjects were not only tried for clarity, relevance, and logical flow, but also for minor wording refinements before undertaking it fully.

Analysis of data

Data were analysed by using both quantitative and qualitative approaches in an integrated way. Descriptive statistics through SPSS.VS 27 were used to analyse the trend and relationship that exist between variables from survey data. Qualitative interview transcripts were analysed using the qualitative data analysis software MAXQDA, 2020. Initial codes were developed deductively based on research questions and themes derived from the literature. Coding was then continued inductively in order to allow new themes to emerge from the data. Relationships within and between codes were determined with the assistance of code reports generated in MAXQDA 2020. Integration of quantitative and qualitative analyses occurred during the interpretation phase to achieve a deeper understanding than either form of data could have provided exclusively. Key findings from both datasets that converged, complemented each other, or led to new insights were highlighted in the results and discussion sections of this study. Hence, this concurrent mixed-methods design allowed triangulation to enhance the validity, credibility, and trustworthiness of overall findings and conclusions that were drawn in view of the problem statement. Integration took place in the interpretation and discussion phase by concurrent comparison and weaving of findings. Quantitative results offered a tool for indicating significant and

high-rank impacts, while those from qualitative analysis gave the explanation, contextualisation, and sometimes elaboration to the patterns found. It articulated merging, mutuality, and difference between datasets to support the belief in these results.

The thematic analysis followed a clear, systematic process involving procedural steps designed for familiarization, initially coding the data, and theme development refinement. Higher-order themes were formed when the codes started coming up with conceptual similarities based on the focus in coding, conceptual relevance, or specific intentions. To use MAXQDA to control consistency in coding and to generate co-occurrence summaries of the codes, and to facilitate more refined coding practice.

Data analysis

Internal reliability of the variables and scale reliability were measured using Cronbach's alpha coefficient test. Tavakol and Dennick (2011) believe that a scale may be reported to be reliable if the Cronbach's Alpha coefficient is >0.700 – for the present study, a Cronbach's alpha of 0.875 was observed, hence reliable for analysis.

Mean score ranking and relative importance index (RII)

A few researchers of construction management have applied mean score ranking in their studies (Asiedu et al. 2025). It is useful while comparing the relative importance of variables in a survey. The primary data collected from the studies were processed with descriptive statistics (means, frequencies and standard deviations) and inferential tools (relative importance index and one-sample t-test). In this section, the relative importance of impacts of the variables were assessed with the relative importance index (RII). The RII facilitates the identification of the most critical criteria from the responses of the survey respondents, and it is also an appropriate tool to rank the effects (Rooshdi et al. 2018) rated on the applied Likert scale. The mean rating and RII ranking of the impacts are as reported in Table 1.

From Equation 1: RII was calculated based on the following formula as applied by Owusu-Manu et al. (2019). [W – respondent weighting of each statement from 1 to 5; A – larger response integer (5); N – number of respondents].

$$RII = \frac{\sum W}{A \times N} \quad (1)$$

In addition, data normality was also tested by using univariate skewness and kurtosis in the analysis. Kline (2015) reiterated that data normality can be confirmed by the use of univariate skewness and kurtosis if the absolute skewness value and kurtosis are less than 3.0 and 8.0, respectively. By inspection, Table 1 confirms that the study had acceptable normality of data.

Consistent with the literature, the impacts of construction female entrepreneurs on the construction industry of Ghana were statistically assessed and ranked according to their perceived severity by the respondents using the RII as shown in Table 1. Consistent with Owusu-Manu et al. (2019) and Kissi

Table 1. Ranking of the mean scores of the identified effects.

SN	Identified Impacts	Mean	Std. Deviation	Skewness	Kurtosis	RII	Rank
IMP4	Promotion of gender equality in leadership roles in construction.	4.28	.851	-0.930	.032	0.856	1 st
IMP3	Better working conditions for women in the construction industry.	4.25	.916	-1.075	.367	0.850	2 nd
IMP2	Breaking stereotypes in the construction industry for women.	4.19	1.148	-1.345	.869	0.838	3 rd
IMP1	Increased financial independence among the woman entrepreneurs.	4.03	1.150	-1.423	1.542	0.806	4 th
IMP7	Increased economic growth through women-owned construction firms.	3.91	1.329	-1.314	.689	0.782	5 th
IMP5	Increased number of females serving as role models for young women to pursue a career in the construction industry	3.63	1.497	-0.780	-0.910	0.726	6 th
IMP6	Poverty alleviation through income generation	3.59	1.434	-0.621	-0.954	0.718	7 th

Source: Authors' own work (2025).

et al. (2020), if two or more variables have the same RII, the variable with the highest mean is given the higher ranking. In addition, when two or more variables share a common mean, the one with the smallest standard deviation takes precedence in the ordering. This is due to the fact that standard deviation calculates the level of agreement consistency between the respondents' understandings, and therefore the smaller the number of the standard deviation the better (Altman and Bland 2005; Ahadzie 2007; Owusu-Manu et al. 2019).

Improvement of gender equality in leadership roles in construction was highly valued by the respondents as the highest impact with an RII of 0.856 and high mean score of 4.28. Improving working conditions for women in construction had the second highest impact of RII 0.850 and almost a mean value of 4.25 to the highest-ranked impact. Third position was breaking stereotypes within the construction industry for women with an RII of 0.838 and a mean of 4.19. Greater economic independence of women entrepreneurs [RII = 0.806, mean = 4.03], greater economic development through women-owned construction businesses [RII = 0.782, mean = 3.91], more women as role models for young women to follow a career path in the construction industry [RII = 0.726, mean = 3.63] were listed fourth, fifth and sixth respectively. Conversely, the least ranked effect was the fear of shoulders touching the males in the field due to high discrimination with an RII of 0.718 and a mean score of 3.59.

One sample T-test

One-sample t-test is a statistical technique for testing the difference of the sample mean with a known population mean. Population mean in one-sample t-test is always known (Lani 2016).

In line with Ahadzie (2007) and Ross and Willson (2017), the one-sample t-test showed the test degrees of freedom (approximation of the sample size), the test value (the power of the test) and p-value (probability that the test is significant). With a 95% confidence level and p-value < 0.05, and test value 3.5 (hypothesized mean), the one-sample t-test was used to further determine the significance of the factors to the study. For this research, the null hypothesis (H_0) is "the mean value does not have a statistically significant impact", and the alternative hypothesis (H_a) suggests that "the mean value has a statistically significant impact". As in Owusu-Manu et al. (2018), the 95% confidence level interval was an approximation of the difference between the test value (3.5) and the population mean weight. For all variables, the null hypothesis was that the variable was not a significant factor ($H_0: U = U_0$). U_0 is the critical rating above which the variable would be significant. The p-value is the probability that the random variables are at a distance from the mean, conditional on the truth of the null hypothesis. From this, the p-value was used to accept or reject the null hypothesis (Kissi et al. 2020). In general, the null hypothesis was not rejected since the p-value was less than 0.05 after conducting the one-sample t-test (Owusu-Manu et al. 2020).

The positive t-values (test strength) variables were indicative that the means are significantly higher than the hypothesised mean. Moreover, all of the barriers with p-value (test significance) less than 0.05 were significant to the study meaning that the means of these variables are not significantly different from the hypothesised mean of 3.5. Table 2 below is a summary of the findings of one-sample t-test.

From Table 2, the identified impacts had positive t-values (power of the test) that were indicative that their means were statistically different from the hypothesised mean. The impacts with p-values (test significance) below 0.05 were significant to the study meaning that the means of these variables

Table 2. One sample t-test of the identified impacts.

Test Value = 3.5 (95% Confidence Interval of the Difference)					
SN	Identified Impacts	t	Df	p	Null Hypothesis
IMP1	Increased financial independence among the woman entrepreneurs	2.614	31	.014	Rejected
IMP2	Breaking stereotypes in the construction industry for women	3.387	31	.002	Rejected
IMP3	Better working conditions for women in the construction industry.	4.633	31	.000	Rejected
IMP4	Promotion of gender equality in leadership roles in construction.	5.191	31	.000	Rejected
IMP5	Increased number of females serving as role models for young women to pursue construction as a field,	.472	31	.640	Accepted
IMP6	Poverty alleviation through income generation	.370	31	.714	Accepted
IMP7	Increased economic growth through women-owned construction firms.	1.730	31	.094	Accepted

Source: Authors' own work (2025).

are not significantly different from the hypothesised mean of 3.5. Apparently, the null hypothesis was not accepted for IMP1, IMP2, IMP3 and IMP4, the impacts identified pointing out that the aforementioned impacts shape female entrepreneurs in the construction sector in Ghana. IMP5, IMP6 and IMP7 were accepted indicating that they were not statistically accepted since their p-values were greater than 0.05.

Thematic analysis

In an effort to contribute to a better insight into the complexity of the impacts of the female entrepreneurs on the construction industry in Ghana, the responses from the interviews were coded to generate key themes of the impact of female entrepreneurs on the construction industry in Ghana.

Table 3 below is an overview of the themes identified from the thematic analysis of the interview responses.

Theme 1: Gender discrimination in management

Women entrepreneurs in the construction industry face significant challenges due to gender-based discrimination in management positions. **Respondent 1** points out the forced delegation of responsibility: “Women delegate work to their husbands or other trusted employees, but results do not always meet her expectations as a manager.”

Respondent 5 points to the concrete consequences for business, saying, “Her gender has caused her to lose many contracts,” while **Respondent 7** notes the existence of client skepticism, saying, “Clients believe that women do not have the necessary knowledge, so they charge more, delay payments, and have to do extra cross-checks.”

The impact extends beyond individual businesses to broader industry development. **Respondent 8** points out that “Due to the above reason, it hinders the potential knowledge from the female entrepreneurs to be cultivated and made use of in the industry.” **Respondent 9** elaborates on this general impact by stating “It deters most women from entering into the construction industry.” **Respondents 6** and **10** further reinforce this concern by stating that “It hinders the upcoming females who dream to be in the construction industry” and “It is very severe that it can prevent and discourage females who dream to take a career in the construction industry.”

The findings are aligned with conclusions reached by Naoum et al. (2020) about gender-related barriers in the construction industry, which further solidified their argument that the lack of women in this male-dominated industry reflects cultural heritage, organisational choices, and levels of confidence. Similarly, respondent feedback mirrors the discussion by Tshipani (2021) on deep-seated socio-cultural issues and patriarchal attitudes that influence women’s employment in construction.

Theme 2: Communication challenges

Communication becomes one of the major obstacles to project success and effective team functioning. This data demonstrates the basic communication issues between men and women. **Respondent 4** said directly: “there is inadequate communication between the males and females.” **Respondent 3** indicates how these problems blight the reputation of the business: “A workplace perceived as unwelcoming to women can damage the company’s reputation, affecting client relationships and recruitment efforts.” **Respondent 1** also shows how the problems in communication affect how clients view the company:

Table 3. Thematic analysis.

SN	Theme	Respondent
1	Gender Discrimination in Management	1, 5, 7, 8, 9, 6, 10
2	Communication Challenges	1, 3
3	Project Delays	4, 3
4	Financial and Planning Challenges	3
5	Poor Team Dynamics	4, 2
6	Lower Team Morale	3, 1, 8, 2, 10, 7
7	Loss of Diverse Perspectives	7, 5, 4, 6
8	Decreased Productivity	9, 7

Source: Authors’ own work (2025).

“Projects affected by communication failures may lead clients to question the firm’s professionalism and capabilities.”

This corroborates the findings of Emon and Nipa (2024) on the prevailing issues in networking and communication that female entrepreneurs are facing within the construction industry. These communication barriers exemplify the larger system problems discussed in the literature relating to gender integration in construction. This non-communicative behaviour impacts on individual’s willingness and enthusiasm to work leading to mental stress (Amponsah-Asante et al. 2025b).

Theme 3: Project delays

One of the major impacts of gender-related challenges in the construction industry is project delays. **Respondent 4** points out biological causes that delay project timelines: *“Delays in work due to pregnancy and childbirth. If pregnant employees take maternity leave or need time off for medical appointments, their absence may slow down project progress, especially in specialised or leadership roles.”* Also, **Respondent 3** emphasises workforce management challenges on the part of female entrepreneurs in the construction industry: *“Sudden or unplanned absences create a gap in the workforce that delays the completion of a task.”*

This corroborates Kabeeb’s (2021) discussion of the struggles in balancing professional obligations and personal responsibilities. The findings also corroborate Naoum et al. (2020) suggestions when they indicate that approximately 47% of women who enter into the building profession tend to leave in the first five years. This may mean that this element of delay contributes to some of the higher turnover observed.

Theme 4: Financial and planning challenges

Financial obstacles are a critical theme that emerges in affecting the success of female entrepreneurs in the construction industry. According to **Respondent 3**, it can be observed how gender bias influences pricing strategies and profitability: *“Poor planning; due to no or little trust, she had to reduce her prices to the barest minimum, in which she ends up making losses.”* This single but powerful statement encapsulates the financial struggles faced by female entrepreneurs.

These experiences align with Delle’s (2022) observation that women’s businesses in Ghana are usually characterised by vulnerability and relatively low achievement due to complex institutional forces. The finding also supports Hansen-Garshong et al. (2023) research on how women entrepreneurs in Ghana contribute to economic development amidst many challenges.

Theme 5: Poor team Dynamics

Team dynamics become a significant factor that influences the success or failure of the project within female-owned construction firms. **Respondent 4** cites stress leading to interpersonal problems: *“Stress can lead to interpersonal conflicts, creating a less cohesive and collaborative team environment.”* **Respondent 2** further explains the impact on morale: *“Team members may feel demoralised when working in a high-stress environment, reducing overall enthusiasm and commitment to the project.”*

These observations reflect the findings by Hegarty (2020), about the challenges that women face to maintain effective team relationships in construction environments, while also supporting research on persistent challenges in networking and maintaining business relationships conducted by Emon and Nipa (2024).

Theme 6: Lower team Morale

Work-life balance has a great impact on team morale and overall success of the project. The demanding time commitments are well described by **Respondent 3**: *“It takes so much time, and she had to work from Monday to Sunday in order to finish projects on time and avoid delays and breach of contracts.”* This is succinctly put by **Respondent 1**, capturing the personal cost: *“Female entrepreneurs in the construction sector get small time with family which sometimes reduces their enthusiasm to work.”*

Other participants elaborate on the implications. As stated by **Respondent 8**, *“Women managing complex construction jobs with family or other personal commitments may develop a sense of burnout*

that affects their productivity and engagement at work.” **Respondent 2** continues with the concern that “time-management issues between work and family obligations may result in late performance and low-quality results.” Finally, **Respondents 10** and **7** raised issues about the team: “Bad time management may cause stress to teams if others think there is an imbalance of workload distribution” and “Poor work-life balance results in general loss of morale within a team, reducing collaboration and innovation.”

These findings are in line with the research of Kabeer (2021) on gender equality and inclusive growth, particularly with regard to challenges in balancing professional and personal responsibilities.

Theme 7: Loss of diverse perspectives

Another major industry-wide impact is the loss of diverse perspectives. **Respondent 7** points out the innovation costs: “Discrimination limits participation from women, who bring diverse viewpoints and innovative approaches to problem-solving.” **Respondent 5** emphasises decision-making implications: “A lack of inclusivity in bidding and leadership processes can result in one-sided decision-making, potentially overlooking critical aspects of the project.”

Respondent 4 identifies underutilisation of resources: “When women are excluded or face barriers in the bidding process, their skills and expertise are underutilised, leading to inefficiencies.” **Respondent 6** notes the workforce impact: “Discrimination discourages women from entering or staying in the industry, exacerbating labour shortages.”

These observations thus support Adinyira et al. (2023), who found that diversity matters in construction industry innovation and development, while also reflecting the arguments of Mensah and Derera (2023) on how transformed economic growth could be possible by better support for women entrepreneurs.

Theme 8: Decreased productivity

Productivity impacts emerge as a huge concern in the performance of the industry. According to **Respondent 9**, “Female entrepreneurs are mostly bullied and also many men feel for you, thinking you are stressed and making you feel like you don’t belong in construction.” According to **Respondent 7**, “there is discouragement of females who have the potential from entering the construction.”

These findings agree with the research done by et al. (2023) on institutional barriers and how they impede women’s productivity and success in the construction industry. The responses also support the observations made by Delle (2022) about the vulnerability of women’s businesses in Ghana due to complex institutional forces.

Discussion of findings

Through an institutional lens, it becomes clearer how a set of norms and procurement practices that are embedded do nothing to the rightfulness of women entrepreneurs, who are competent and innovative.

Roles of women entrepreneurs in the construction sector

The construction industry experiences different operational patterns because women entrepreneurs establish different roles which change when they operate in Ghanaian environments that traditionally assign construction work to men. The research discovered transformative possibilities which remain unfulfilled because women experience ongoing obstacles, which they encounter through their daily work. **Respondents** showed strong agreement about the need for “promotion of gender equality in leadership roles” which resulted in their choice of this option as their top selection (RII = 0.856, mean = 4.28). The statistical significance matches Constructive Alignment Theory (Biggs and Tang 2011) which shows the societal objective to enhance both diversity and equality through its connection to research by Naoum et al. (2020) about women’s essential presence in leadership positions and decision-making roles. The optimistic statistics about women’s leadership positions face critical challenges because qualitative data shows that women experience barriers to their leadership roles. The interview participants shared their ongoing battle against gender bias, which creates difficulties for them when they try to maintain their power as managers. Respondent 1 stated that “Women hand over jobs to their husbands

or any of their trusted employees but things don't always go well for her in terms of management" while **Respondent 7** reported that "*Clients feel women don't know what they are doing so it results in cost overruns, due delay in payments and cross-checks.*" The respondents recognized women's leadership roles as important yet faced actual barriers from their organizations which stopped them from making these roles operational in practice. The system creates obstacles for women to achieve equality because it combines cultural and institutional factors which maintain existing gender inequalities (Scott 2008) according to this tension which supports Institutional Theory. The combination of two data types shows important insights about how organizations need to enhance their workplace environment. The study found that "*improving working conditions*" received high support because it ranked second as an option with an RII value of 0.850 and a mean score of 4.25, which proves that women-owned businesses establish better work environments. **Respondent 4** stated that "*Stress can lead to interpersonal conflicts which create a less cohesive and collaborative team environment,*" which resulted in the emergence of "*Poor Team Dynamics*" and "*Lower Team Morale*" as two separate themes from the interviews. Women entrepreneurs seek to establish work environments that support their teams, yet systemic pressures force them to balance their professional and personal lives while coping with biological challenges, which hinder their capacity to sustain these supportive work environments. The discussion about productivity reveals its complicated nature through a specific example. **Respondents 4 and 7** described biological impacts on project timelines: "*Delays in works due to pregnancy and childbirth. The employees who are pregnant need to take time off for maternity leave and medical appointments which will decrease work progress because they will not be at work.*" The study found that practical difficulties arise from women's leadership, which promotes equality in the workplace. The research shows that women need support for their professional development in construction because their productivity reaches its peak only when institutional obstacles are removed according to the research conducted by Hansen-Garshong et al. (2023). Women entrepreneurs function as agents of change in the construction industry through their innovative approaches, yet their potential to create significant change remains blocked by enduring traditional social customs and patriarchal power structures (Tshipani 2021). The high RII scores for their contributions represent genuine recognition of their potential to reshape workplace culture, dispel stereotypes, and create inclusive environments (Adinyira et al. 2023). The actual life experiences captured in interviews show that organizations need to solve fundamental problems about gender bias and organizational support systems and rigid company structures if they want to turn this potential into solid results. The integration of data presents a more detailed view of women's entrepreneurship because it reveals their value to society while showing how their needs go unmet, which creates a situation that needs resolution through specific actions in three areas, which include policy, support from institutions, and changes in societal attitudes.

Impacts of female construction entrepreneurship on developing countries

The effects of women's construction entrepreneurship in developing countries show economic and social and cultural effects which combine quantitative and qualitative evidence to demonstrate both major changes and ongoing limitations. The statistical findings demonstrate strong consensus on women's positive contributions: stereotype-shattering scored high (RII = 0.838, mean = 4.19), and improving working conditions ranked even higher (RII = 0.850, mean = 4.25). The data reveals that people generally accept the idea that women's presence at work creates challenges for traditional male-dominated work environments which leads to more equitable employment practices that match Constructive Alignment Theory's requirements for innovative and inclusive work environments (Biggs and Tang 2011) and Naoum et al. (2020) research which shows how women affect society. The interview data shows that institutional barriers create systematic challenges which lead to negative results because these barriers block positive effects. **Respondent 5's** observation that "*her gender has cost her a lot of contracts*" provides concrete evidence of economic opportunity loss that quantitative measures of impact fail to capture fully. **Respondent 9's** statement that such problems "*discourage most women from venturing into the construction business*" shows how discrimination creates a feedback loop which limits business growth through two negative effects. The analysis shows that women have high RII scores for positive contributions yet their presence in the industry remains low because only 13-15% of

construction businesses in Ghana are women-owned and less than 3% of women work in on-site positions (Naoum et al. 2020; Botchway et al. 2023).

The economic empowerment results from dataset integration reveal their most productive effects. The financial independence achieved by women entrepreneurs received a moderately high rating because 86 women business owners achieved independence through their enterprises (RII = 0.806, mean = 4.03). The optimistic statistic shows a stark contrast with the qualitative reports about financial insecurity. **Respondent 3** described a common experience as *“poor planning; because there was no or little trust, she had to reduce her prices to the minimum level, where she ends up getting losses.”* The financial independence created by women’s businesses faces critical challenges because discriminatory practices push women towards lower sustainable prices which lead to reduced business success. People face financial challenges which prevent them from reaching their financial goals as their actual monetary status remains below their documented achievements. The measurement of economic growth through women’s businesses received lower results because economic growth through women’s enterprises scored (RII = 0.782, mean = 3.91) and poverty reduction received its lowest score. The qualitative data provides essential context: when women entrepreneurs are systematically forced to undersell services, incur losses to gain client trust, and operate with minimal financial cushion, their businesses struggle to generate the broader economic multiplier effects captured in these lower-scoring items. The difference between RII scores for individual empowerment (0.806) and collective economic impact (0.718–0.782) thus reflects real structural constraints rather than simply measurement variation. Women entrepreneurs show exceptional strength while they help people achieve higher social status even though many obstacles confront them. The research shows that women’s entrepreneurship creates economic development through various channels which produce both immediate financial advantages and long-term job creation and skills development and cultural advancement according to Aparicio et al. (2022). Women display their strength through qualitative data which shows their determination to overcome discrimination and financial exclusion and lack of institutional help (Scott 2008; Delle 2022). Their ongoing engagement in activities that disadvantage them showcases what Adinyira et al. (2023) describe as transformative leadership which uses different thinking methods to create open work environments. Women entrepreneurs create real social gains which institutional barriers reduce to lesser degrees according to the integrated research results. The structural problems which qualitative data presents need to become resolved to achieve maximum outcomes.

Performance and sustainability of women-owned construction companies impact

The performance and sustainability of women-owned construction companies demonstrate how leadership abilities interact with existing organizational limitations to create both potential growth areas and operational weaknesses. Research findings show that women’s leadership and their efforts to improve workplace conditions (RII = 0.850, mean = 4.25) create pathways for organizational growth. The leadership practices show quantitative advantages because research indicates they increase employee morale and improve teamwork and create new ideas (Naoum et al. 2020; Adinyira et al. 2023). Women-owned construction companies create actual business benefits which receive recognition through their high assessment scores. The interview data shows important performance limitations which statistical data cannot detect, thus helping to explain the challenges which sustainability faces. **Respondent 8’s** observation that *“females doing complex construction work with family or other domestic responsibilities may accumulate a sense of burnout that affects their productivity and engagement in the workplace”* identifies a fundamental tension. The very inclusive, relationship-oriented leadership style that scores highly quantitatively also creates vulnerabilities when combined with inadequate support systems. The qualitative research demonstrates why organizations with strong leadership values (high RII scores) fail to achieve sustained performance because they experience structural hindrances which existing statistics do not demonstrate. The work-life balance challenge becomes essential when both datasets need to combine into one integrated system. **Respondent 2’s** statement that *“time-management issues between work and family duties may cause tardy performance and low-quality results”* directly contradicts the positive picture painted by high RII scores for improving working conditions. The apparent contradiction between two statements becomes clear when we recognize that women business owners sacrifice

their personal health for achieving their business goals while maintaining high standards of workplace quality for their staff. As **Respondent 3** described: “*It takes so much time, and she had to work from Monday to Sunday in order to finish projects on time and avoid delays and breach of contracts.*” The quantitative evidence shows how women create beneficial results for others while the qualitative evidence shows the personal sacrifices women make to achieve these results because they lack proper institutional backing. Financial sustainability metrics show that tension between two opposing forces creates problems for organizations. The financial independence assessment reached high values (RII = 0.806, mean = 4.03), which demonstrated that women’s enterprises achieve economic self-sufficiency, but the sustainability indicators showed significant deficiencies because both economic growth (RII = 0.782, mean = 3.91) and poverty alleviation (RII = 0.718, mean = 3.59) scored below 0.8, which indicates strong agreement. The 8.8-point gap between financial independence and poverty alleviation RII scores demonstrates that women entrepreneurs gain personal economic independence, but their businesses encounter systemic challenges which restrict their ability to create economic progress. **Respondent 3’s** account of being forced to “*cut down her prices to the barest minimum, in which she ends up incurring losses*” provides the qualitative mechanism explaining this quantitative pattern: systematic undervaluation erodes profit margins, reducing capacity for business expansion, employee development, and community investment that drive poverty alleviation. The integrated findings thus reveal what Delle (2022) identified as structural vulnerabilities affecting women-owned firms. The combination of high scores for leadership quality and working conditions (RII > 0.85) with lower scores for sustainability outcomes (RII < 0.78) reflects a fundamental asymmetry: women entrepreneurs create value that benefits employees and challenges industry norms, but systemic barriers prevent them from capturing equivalent financial returns. The specific mechanisms which connect strong leadership inputs to limited sustainability outputs include burnout and work-life conflict and forced under-pricing and limited client trust, according to the qualitative data. The process of achieving sustainability improvement demands more than growing women’s entrepreneurial skills; organizations need to implement system-wide solutions which eliminate the structural obstacles that have been identified through qualitative research. Mentorship programs and gender-responsive procurement policies and financial support mechanisms serve as vital components that translate women’s leadership advantages into lasting business success according to Orser et al. (2021). The financial sustainability problems which women-owned businesses face will continue to exist because organizations need to complete specific interventions.

Women entrepreneurs reinventing the construction industry in Ghana and their peculiarities

The women entrepreneurs in Ghana are revolutionizing the construction industry by rebuilding leadership pyramids, organizational culture, and practice in a male-dominated field. Female leaders like Valerie Labi of Wahu Mobility are transforming Ghana’s built environment as they integrate EV solutions with physical infrastructure. Their work, creating over 500 jobs and planning a 200,000-job green EV zone in Accra, links sustainable transport directly with built environment development and charging infrastructure expansion (Akomea-Frimpong et al. 2025a). The quantitative data of the study confirms that their most significant contribution is enabling gender equality in leadership, which was the highest-rated item (RII = 0.856; mean = 4.28). This is in accordance with the common agreement that women’s entry into decision-making positions is crucial in transforming industry culture (Naoum et al. 2020). Women entrepreneurs’ leadership is historically characterized by teamwork and mutual support, which create more positive organizational environments, boost morale, and enhance productivity even under continued structural challenges (Kabeer 2021). Better working conditions were the second most significant (RII = 0.850; mean = 4.25), highlighting women’s commitment to the creation of supportive and balanced workplace environments. Care, safety, and collaboration, values all too frequently ignored by men-owned businesses, are priorities for women-owned firms. This quantitative finding is rather interesting when juxtaposed with the qualitative themes of “Poor Team Dynamics” and “Lower Team Morale” emerging from the interviews. **Respondent 4** asserted, “*Stress can lead to interpersonal conflicts, creating a less cohesive and collaborative team environment,*” while **Respondent 3** explained how “*It takes so much time, and she had to work from Monday to Sunday in order to finish projects on time and*

avoid delays and breach of contracts.” These challenges also align with Institutional Theory, highlighting how systemic barriers such as work-life balance and organisational norms create challenges for women. This corroborates the work of Kabeer (2021) regarding the challenges of balancing professional obligations with personal responsibilities. Stereotype-shattering was third (RII = 0.838; mean = 4.19), evidencing how women business owners work to break entrenched cultural presuppositions that construction work is off-limits to women (Adinyira et al. 2023).

However, qualitative findings reveal entrenched challenges. **Respondent 5** explained how *“her gender has resulted in her losing many contracts,”* and **Respondent 7** elaborated further that *“clients feel that women do not have the necessary know-how, so they overcharge, delay payment, and need to perform extra cross-checks.”* These are forms of prejudice that undermine not only individual businesses but also industry-wide growth, as indicated by **Respondent 6**: *“It discourages the next generation females who want to be in the construction industry.”* Consonant with these observations, evidence shows that nearly 47% of women entering the construction industry leave within five years due to discrimination, financial exclusion, and career stagnation (Naoum et al. 2020). Economically, women-owned businesses are important towards financial independence, since financial independence was very high (RII = 0.806; mean = 4.03). However, more in-depth sustainability impacts are less strong: economic growth through women’s enterprises was lower (RII = 0.782; mean = 3.91), while poverty alleviation was lowest (RII = 0.718; mean = 3.59) (Delle 2022). This is an indication of structural constraints like limited financing and institutional support. **Respondent 3** vividly explained the financial pressure: *“Because of no or minimal trust, she was forced to cut down her prices to the barest minimum, in which she ends up incurring losses.”* Women are often forced to undersell services in order to win contracts at the cost of future sustainability. These dynamics resonate with Institutional Theory, where emphasis is placed upon how entrenched organizational and cultural norms buttress inequality (Scott 2008).

Despite these challenges, women entrepreneurs in Ghana continue to revolutionize the sector with resilience, diversity in thinking, and innovation. **Respondent 8** explained that in managing construction while meeting family obligations, *“women may develop a sense of burnout that affects their productivity,”* yet still, many persevere, serving as role models and agents of change for the next generation. Their leadership style, grounded in inclusivity, moral values, and adaptability, positions them as transformative leaders in an industry that continues to be defined by gender bias. To achieve their full potential, targeted systemic action is required (Akomea-Frimpong et al. 2025b). Gender-sensitive procurement policies, mentorship initiatives, and tailor-made financial assistance are essential to level the playing field (Orser et al. 2021). While 13-15% of Ghanaian construction firms are owned by women and fewer than 3% of women occupy on-site roles (Naoum et al. 2020; Botchway et al. 2023), their impact is disproportionately significant. Female entrepreneurial leadership, as rare as they can be, are spearheading the way to a more inclusive, innovative, and sustainable construction industry in Ghana.

Implications

Implications for policymakers

The study identifies women entrepreneurs as improving leaders, employee practices, and financial inclusion. However, their contributions are constrained by institutional restrictions and structural ones. Thus, policymakers must prioritize gender-responsive public procurement policies that reserve for women-owned businesses a set portion of tendered construction contracts, as reflected in previous inquiries into inclusive procurement. These steps would allow the parties owning businesses on the marginalized side to step onto the platform within the highest value chain and stop the under-pricing strategies observed on the qualitative end. Moreover, credit guarantee as per targeted schemes and concessional loan facilities meant for women contractors should establish them by arrangement among the authorities and financial agencies. Ghana signifies that a lack of collateral and leveraging on gender differential lending orientation are two main barriers women entrepreneurs face. Women operated businesses ought to expand access to finance and policymakers to enable collection of gender-disaggregated data in the construction sector to support evidence-degree-informed interventions in a more analytical and more cautious manner moving forward on the ladder of inclusive growth.

Implications for industry associations and professional bodies

The industry bodies like the Ghana Contractors Association and related professional organizations are indispensable in influencing norms and access within the construction sector. The findings point to a crucial necessity: the establishment of mentoring and sponsorship initiatives towards linking seasoned operators to the budding women to share knowledge and build credentials and networks. While this type of endeavor has been found to increase the entrepreneurship resilience and performance in periods characterized by constraint, the execution of the unique support link is from organizations like this one, clearly some of the few opportunities in an enjoined space deriving from skepticism, which often feeds upon women entrepreneurs. These professional bodies could establish a system of recognition or certification to acknowledge the performances set by gender-inclusive firms, thus making them adopt fair employment practices and inclusive leadership. These initiatives would help in breaking down some deep-rooted cultural norms that make women's leadership in construction questionable at present.

Implications for institutes of training and learning

Institutions providing training, such as technical universities, polytechnics, and vocational centers, should create flexible and modular training programs integrated with women's care responsibilities. This qualitative evidence has pointed out the urgent need for leadership training, proficiency in financial management, and contract administration that target indeed women entrepreneurs who engage in construction. Integrating the entrepreneurship discipline into technical and vocational education would enhance the long-term development of a pipeline, corroborating earlier sequential evidence from the Ghanaian scene related to skills formation. Fostering mentorship and internship experiences with female-led enterprises could also promote experiential learning and give added retention opportunities.

Implications for women entrepreneurs

Women entrepreneurs themselves could gain by organizing cooperatives or professional networks in few ways to increase bargaining power to pool resources and engage cooperatively in bidding for bigger projects. These collective strategies had been created for sustaining resource-poor environments.

Limitations and future research direction

Despite the contributions of this study, there are several limitations that should be taken into account when interpreting the results. First, the sample size is relatively small (32 survey responses and 10 interviewees), restricting the statistical generalisability of the quantitative results. However, this small sample is consistent with the size and ease of obtaining the population of women entrepreneurs in the construction industry in Ghana, a topic that has been under-researched. This is well in line with the exploratory objectives of mixed-method research.

Consequently, this study could not venture into the rural geographies, including this unresolved paucity of women's entrepreneurial experiences, in view of the massive differences between the infrastructural and institutional environments that compliment business environment and are peculiar to those rural environments. Third, self-reporting data involve the host of social biases, such as response bias and social desirability bias, particularly with discussion and sensitive subjects regarding entrepreneurship, discrimination, leadership challenges, and financial performance. Fourth, the cross-sectional design might suffice for capturing the momentary experiences, missing in depth dynamic change inherent in the entrepreneurial trajectory over the different life and business stages. The subsequent research could be utilized for exploring the changing roles, challenges, and impacts of entrepreneurial women through longitudinal designs. Comparative studies between regions of Ghana or within West African countries could give insight into some really context-specific and some highly transferable policy lessons. Further research could also focus on the evaluation of targeted interventions such as gender-responsive procurement policies, mentorship programmes, and financing schemes in order to assess their effectiveness.

Conclusions

This paper provides credible evidence that shows that women are equally involved in the fight for gender equality, change of work conditions and social transformation in the industries. Quantitative analysis helped the study to determine that the greatest effect was on increased representation of females in leadership positions, seconded by improved working conditions and busting stereotype perception of construction careers. Still, the elements of gender discrimination, poor communication, and financial problems, which were also identified during the qualitative analysis, remain crucial facilitating barriers to women's engagement and their performance on the job market.

The changes highlighted in the research show that there is much positive socio-cultural change in progress, coupled with unchanging traditional problems. Although the female entrepreneurs appeared to be on the right direction of improving the industry by carving out niches, they still are struggling with challenges, which need collective justice and assistance. This paper finds that while it is evolving in terms of financial freedom, business, and new female construction firms, aspects like conflicts between career and family, job scheduling and its implications, and the construction team are of concern.

The use of mixed-methods contributed to gaining systematised data and valuable information as to how much and in what manner women in construction and entrepreneurship are affected by the existing circumstances. The quantitative results proved that the hypotheses showing a positive correlation between the increase in the number of female entrepreneurs and important positive impacts, such as the support of industry equality and enhancement of work conditions, were statistically significant. In contrast, the qualitative results showed that these entrepreneurs work hard to overcome multiple and diverse obstacles that are as persistent as ever – such as discrimination based on gender and limitations regarding funding.

The implications of the study are that, although female entrepreneurship in Ghana's construction industry has the potential of stimulating a number of positive changes that are responsive to the social institution and culture, this possibility is yet to be achieved owing to bounds in the social institution. This explains why efforts need to be made to come up with elaborate mapping frameworks and ensure that appropriate policies are put in place to support the solution of these issues. More especially, the survival and growth of women engaged in the construction business not only bring diversity in the construction industry but also influence the overall progress of the economy and the society in Ghana.

Consequently, based on the findings, the following recommendations are proposed

- i. Development of Targeted Support Programs: Collaborative efforts within the construction industry associations and educational institutions should be taken to develop proper mentorship projects, initiate a fund for the women construction firms through a public-private partnership model and design technical training programs that are specific to the construction business.
- ii. Policy Implementation: Engage in the development and implementation of gender-responsive procurement policies with government agencies; ensure quotas on women-led projects in public construction are set; and introduce tax incentives for companies meeting gender diversity targets.
- iii. Industry Cultural Transform: Develop industry-wide awareness campaigns through trade associations, implement mandatory gender sensitivity training in construction companies, and develop certification programs for gender-inclusive workplace practices.
- iv. Networking and Collaboration: Establishment of a national association of female entrepreneurs in construction, quarterly industry networking events, and an online resource-sharing and business-matching portal.

Author contributions

CRediT: **Leonora Nana Adwoa Amponsah-Asante:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing; **Emmanuel Adinyira:** Writing – original draft, Writing – review & editing; **Benjamin Botchway:** Writing – original draft, Writing – review & editing.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The data that support the findings will be made readily available on request from the corresponding author [L N A A-A].

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