

Gender inequality and challenges of women in the construction industry: an evidenced-based analysis from China

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Abstract

Purpose – This research aims to provide an evidence-based depiction of women's participation and career progression in China's construction industry, based on the analysis of the labour force data collected from the National Bureau of Statistics of China for the period 2010–2022 and a representative construction enterprise case study.

Design/methodology/approach – An overarching research method of case study with literature review, descriptive statistics, and literature comparison was implemented to achieve the research aim. Based on data-driven analysis, the theory of systemic, structural gender discrimination and inequality (SSGDI) is also systematically examined in the Chinese construction industry.

Findings – The study highlights significant gender inequality in China's construction industry, with women under-represented in managerial and professional roles, facing higher recruitment standards, limited working hours, fewer promotion opportunities and difficulty attaining senior management positions despite higher educational attainment. The SSGDI in the construction industry has perpetuated gender bias, limiting the recruitment, promotion and recognition of women.

Originality/value – Based on critical evidence, this study examines SSGDI in the Chinese construction industry through theoretical lenses and data-driven analysis. It provides underlying evidence for the phenomenon and offers insights into women's recruitment and career development in the male-dominated construction industry. The findings can inform gender equality policies and practices and promote gender equality in the construction industry in China and elsewhere.

Keywords Construction industry, Gender bias, Gender inequality, Gender discrimination, Women, Male-dominated workplaces

Paper type Research paper

1. Introduction

Gender inequality is one of the key issues that has a profound impact on social and economic development. Gender inequality can be more pronounced in developing countries than in developed countries, as reflected by different levels of economic activity participation and different levels of education of women, while women in developed countries generally have more opportunities to participate in socio-economic activities and can exert better control over their professional lives (Jayachandran, 2015). Newman *et al.* (2023) analysed systemic,

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structural gender discrimination and inequality (SSGDI) through theoretical lenses for gender analysis and multi-country evidence. SSGDI was found to cover widespread, but often masked patterns of gendered behaviour, policies or practices, relations and the social, economic or cultural background conditions that perpetuate disadvantage for some members of a marginalized group.

Even though research has validated the existence of glass walls, glass ceilings and structural discrimination (Acker, 1990), examining the interplay between horizontal and vertical segregation through the lens of gendered organizational theory provides a more nuanced view. The “glass wall” and “glass ceiling” effects are present when women practitioners are concentrated in gender-specific employment areas, have few opportunities for advancement, and are underrepresented in senior leadership positions (Newman *et al.*, 2023; Miller *et al.*, 1999). Together, these two barriers prevent women from gaining access to larger networks, sponsorship, and visibility—all of which are necessary for career advancement. Furthermore, parenting obligations may restrict women’s access to high-visibility projects and ongoing skill development, resulting in human capital attrition despite greater educational levels (Bilbo *et al.*, 2014).

Due to the physically demanding work and low levels of automation, the construction industry has traditionally been seen as a workplace for men. The poor image of construction work has perpetuated gender bias and discouraged women from entering the industry, even though the construction industry has evolved considerably over the last two decades or so. Women constitute a very low proportion of the total workforce in construction-related employment, as exemplified by their representation of 11.0% in the United States (US Bureau of Labour Statistics, 2022), 13.2% in Canada (Statistics Canada, 2022), 10.6% in Europe and 14% in China (Eurostat, 2022; Catalyst, 2021; Juyuan, 2021).

The disproportionate gender representation is also reflected in the senior leadership roles, with no women as corporate board members in most construction organisations (French and Strachan, 2017; Cassells and Duncan, 2020). The low female representation in senior management levels and executive positions is also a key driver of the gender pay gap (RICS, 2022). According to the Royal Institution of Chartered Surveyors (RICS) in the UK (2022), the hourly pay rate for women was 22.5% lower than for men in 2021 in construction-related fields. Similarly, the gender pay gap across indicators, such as average and base salaries, was more than 20% in the Australian construction industry (Workplace Gender Equality Agency, 2024). Moreover, research shows that women receive fewer career development opportunities and support than their male counterparts (Crawford *et al.*, 2013; Hasan *et al.*, 2021).

While many studies have investigated gender inequality in the construction industry, the extant literature mainly focuses on developed countries (Navarro-Astor *et al.*, 2017; Hasan *et al.*, 2021). As a result, there is little information on gender inequality and segregation in the context of developing countries such as China. China is a fast-developing economy with the largest construction sector and, thus, can provide the most significant venue for examining gender inequality and achieving gender equality (Chuai *et al.*, 2021). Against this background, this study aims to bridge the knowledge gap by investigating gender discrimination in the construction sector in China based on the theory of SSGDI. The findings are expected to extend the current understanding of women’s employment and career progression in the construction industry of developing countries.

The rest of the paper is organised as follows. First, a comprehensive literature review of the phenomenon and situation of gender inequality, particularly in the construction industry of both developed and developing countries, is presented. Then, in the next section, the mixed-methods research used in this study is described. The study integrates and analyses the data from the National Bureau of Statistics of China and a large enterprise in China’s construction industry in the subsequent parts. Finally, key findings are discussed and summarised in the last two sections of the paper.

2. Literature review

2.1 Gender inequality in the construction industry

Compared to other industries, the construction industry is characterised by a high-risk and labour-intensive working environment, which drives the sector to prefer strong men as employees (Ling and Ho, 2013). Although the number of women in the construction industry has followed an upward trend in recent years, gender bias has gradually become a prevalent phenomenon in the industry's long-term development. Masculine culture remains dominant and deeply rooted in the employment policies and workplace practices in the construction industry (Naoum *et al.*, 2020; Hasan *et al.*, 2021).

Naoum *et al.* (2020) examined the attitudes of male and female employees in the construction industry and found that 70.9% of women believed that gender diversity in the construction industry is a pressing issue to be resolved, compared to 37.9% of male respondents. Women are generally under tremendous pressure to meet higher benchmarks of performance and promotion (Morello *et al.*, 2018). Broadly, gender inequality for women is manifested in five main aspects: job opportunities, entry conditions, job roles, learning and promotion opportunities, and earnings (Fielden *et al.*, 2000; Shu and Bian, 2003; Estevez-Abe, 2005; Dainty and Lingard, 2006; Navarro-Astor *et al.*, 2017; Rosa *et al.*, 2017; Aboagye-Nimo *et al.*, 2019; Hasan *et al.*, 2021).

Women are often not the first choice for construction employers, even if they possess excellent technical and personal skills and are equally competent as men (Dainty and Lingard, 2006; Hasan *et al.*, 2021). In addition, the “glass walls” against women restrict women from accessing specific positions in the male-dominated construction industry (Miller *et al.*, 1999; Hasan *et al.*, 2021). Navarro-Astor *et al.* (2017) pointed out that companies generally believe that women cannot work adequately on construction sites because of their physical limitations or fear of working at heights. Additionally, they are perceived to have lower endurance against harsh working conditions on construction sites and staying away from home. Finally, they are perceived to have weaker 3D perception skills required for architectural design work. As a result, gender bias leads to employment opportunity inequity for women in the construction industry.

Furthermore, gender inequality in the construction industry is evidenced by various entry barriers for women. Due to the prevalence of masculine culture, construction companies deliberately impose a higher recruitment and selection threshold and qualification requirements for women (Fielden *et al.*, 2000; Barreto *et al.*, 2017). In addition to higher personal competency requirements, entry barrier inequality can take more subtle forms in the hiring process. Patel and Pitroda (2016) argued that the majority of recruitment brochures and many professional presentations seemed to correlate exclusively with male work patterns.

Women have a lower human capital value than men in the construction labour market (Dainty and Lingard, 2006). The human capital theory argues that family responsibilities, such as raising children, can reduce the human capital value of women by constraining their work participation. Therefore, companies prefer to choose women with higher skills, qualifications and experience to balance the gap between male and female human capital values (Dainty and Lingard, 2006). Moreover, women seem to be recruited according to different criteria as employers have different expectations for them, namely, to meet short-term “male” manpower shortages.

In addition, there are persistent concerns within the construction industry regarding women balancing family responsibilities and work. Although both male and female workers need to balance work and family life, women remain primarily responsible for household chores and caring responsibilities in most families (Barreto *et al.*, 2017). The frequent workplace changes in the construction industry may result in women being away from home, which may pose severe challenges regarding caring responsibilities (Worrall *et al.*, 2010). Morello *et al.* (2018) noted that even when women do not have families, managers still assume they have such conflicts, influencing their recruitment decisions.

Gender bias also affects job role assignments as well as women's training and career development. Many organisations marginalise women, forcing them to work in non-technical or service-oriented positions, such as administrative and documentation roles (Naoum *et al.*, 2020). In addition, in the absence of family-friendly policies, women have to shorten working hours, change their job profile or quit to make more time for family demands such as raising children (Loosemore and Waters, 2004; Dainty and Lingard, 2006; Hasan *et al.*, 2021), which affects their career growth and income. Bilbo *et al.* (2014) found that marriage and children negatively correlated with the salary of female construction project managers.

In contrast to men, women are typically perceived to have a higher probability of interrupting jobs to accommodate family demands (Estevez-Abe, 2005). As a result, female practitioners are treated differently in terms of the types of skills they acquire and the methods of acquiring these skills. Gender inequality and a pervasive double standard within organisations make administrators unwilling to grant women skill acquisition and training opportunities (Navarro-Astor *et al.*, 2017). In other words, female practitioners, especially those nearing childbearing age, are not attractive to organisations in terms of skills training. Navarro-Astor *et al.* (2017) point out that when it comes to women, there is an excessive demand in terms of the qualities required for engineering jobs, and they must prove themselves all the time in order to get the same attention as men. However, they are always one step behind their male colleagues in receiving career advancement opportunities and promotions (Navarro-Astor *et al.*, 2017). It is difficult for female workers to break through the "career ceiling" and reach a senior management position in companies (Barreto *et al.*, 2017). Men are 4.5 times more likely to be promoted to executive levels than women (Naoum *et al.*, 2020).

2.2 Recent research and research limitations

As noted in recent review articles (Navarro-Astor *et al.*, 2017; Hasan *et al.*, 2021), most existing studies on gender diversity in the construction industry have focused on developed countries such as the US, the UK, and Australia. In comparison, few studies have been conducted in the context of developing countries, such as Afghanistan, Bangladesh, China, Nigeria, Sri Lanka and Tanzania.

Research in developing countries has found that rigid gender roles informed by sociocultural and ideological norms and sexist attitudes, along with parenting and caring obligations, often do not allow women to work for long hours at male-dominated workplaces and limit their career progression (Choudhury, 2013; Eliufoo, 2006; Enshassi *et al.*, 2008; Tunji-Olayeni *et al.*, 2021; Kakar and Hasan, 2024). Additionally, misinformation about construction careers and the qualification requirements affected the entry of women into the construction industry (Vijayaragunathan and Rasanthi, 2019). Shu and Bian (2003) showed that the gender gap in earnings due to educational inequality was more pronounced in large cities. Shu *et al.* (2007) argued that it is difficult for women to enter high-paying joint venture companies and jobs. In addition, in the construction industry, male migrant workers were found to be paid, on average, about 30% more than female migrant workers (Magnani and Zhu, 2012).

There is a growing call for more research on gender inequality in the construction industry in the context of developing countries (Hasan *et al.*, 2021, 2024). Choi *et al.* (2022) stressed the importance of maintaining diversity in the construction industry, creating a diverse and equitable work environment and including more women. However, a lack of a robust employment data collection system is often considered a challenge when investigating gender discrimination in construction in developing countries. In the Chinese construction industry, the critical issue of gender inequality remains understudied, even though the country has a much larger population base of working women, and this should be the subject of more attention. Few studies that have analysed gender inequality in the Chinese construction industry, to some extent, are outdated and do not effectively reflect the current disparities between men and women in the Chinese construction industry. In addition, the existing

research lacks long-term data analysis on the employment situation of men and women in the construction industry, which limits the validity and accuracy of the research results.

This research focuses on the Chinese construction industry, which is a vital component of China's national industries, a labour-intensive industrial sector with great contributions to economic progress as well as employment, and also an industry whose development is affecting a wide range of other industries and the labour market in the whole country. By 2018, the output value of China's construction industry reached 23.5 trillion yuan (approximately US \$3.4 trillion), covering nearly 90 trillion yuan of GDP that year (Zhou *et al.*, 2019). In particular, it is worth emphasizing the role of the construction industry in the national economy – it accounted for one-quarter of the total GDP. The tremendous evolution of the construction sector has created a wealth of employment opportunities. Nevertheless, female engagement, difficulties experienced, and career progression within the construction industry are yet to be thoroughly studied with evidence-based data. Thus, this paper will research this phenomenon of gender inequality by means of case studies of the construction industry in China.

3. Research methodology

The study utilises an overarching research method of case study with literature review, descriptive statistics, and literature comparison, within the specific context of China, to analyse gender inequality in the construction industry. Case studies provide an in-depth understanding of complex issues (Gagnon, 2010), while quantitative analysis can significantly reflect the extent of gender inequality in the industry (Burchell, 1996).

The national employment database from the National Bureau of Statistics (NBS) of China was selected for collecting data for the quantitative analysis, given its broad coverage in terms of the survey population and its long history of consistent statistical documentation. The NBS labour statistics are collected via nationwide governmental surveys and published through the China Population and Employment Statistics Yearbook (NBS, 2023). It is categorised into 19 industries, with the construction sector comprised of four sub-industries, including building construction, civil engineering, building (service) installation, building (interior) fit-out and other construction.

The labour statistics of the urban public sector gathered over the period between 2010 and 2022 were exploited for this study. The statistical records for the rural areas were excluded since these areas were in a stage of industrial upgrade, and the employment data were documented with a different set of industry classification systems. Also, the urban private entities were excluded as the country was undergoing a major economic structure transformation in recent years, and the industry-specific employment figures for private enterprises and self-employed individuals were not made available at the national level until 2018. Within the urban public domain, there were three types of enterprises: state-owned entities, collective-owned entities, and other types of ownership entities, such as unincorporated enterprises. The aggregate of the population employed by these three groups of enterprises formed the data sample for analysis.

The database offered a wide range of demographic information for the populations employed by different industries in the urban public sphere at a national scale. In this study, the gender gap in the employment of the construction industry was investigated through analysis of the following indicators: gender participation rates, gender differences in educational attainments, and gender inequality in working hours.

A large construction enterprise was also chosen as a case example to explore the potential obstacles to the career development of female employees. The case organisation is one of the Fortune 500 Global and Top 500 Prominent Brand Companies worldwide. Its business scope covers an extensive range of construction services, including civil engineering, infrastructure construction, building design, real estate development, and other construction-related projects. At the time of data collection, it had more than 290,000 employees, representing a good mix of different professionals in construction-related fields working in different regions of China.

Thus, it was an ideal case study for further evaluating gender inequality in China’s construction industry. In the case example, female representation ratios in managerial positions and the professional roles in the industry were evaluated, and the relevant factors contributing to the gender divergence in promotion opportunities were discussed in combination with the gender differences identified through the national employment data analysis. Based on the data-driven analysis, this study also examines the theory of SSGDI for gender inequality in the construction industry in China.

The overall research methodology of this study is shown in Figure 1.

4. Results

4.1 Low participation rates of women in the Chinese construction industry

By the end of 2022, the employment in the construction industry was 18.4 million, which was 11% of the total employment in China when considering the workforce employed in urban public entities alone (NBS, 2023). Correspondingly, the female labour force constituted 13.6% of the employment in the construction companies registered within the urban public domain, significantly lower than the 40% participation rate for the female workforce across all industries in 2022 (NBS, 2023). As is shown in Figure 2, within the urban public sector, the ratio of female employees in construction was the lowest one among all the industries in both 2022 and 2010 (13.1%), while the mining industry came in second with a gender composition for female workers of 16% in 2022 and 18.80% in 2010 respectively. Consequently, construction is one of the four industries in the urban public sector remaining below the 30% gender-neutral threshold (Froehlicher et al., 2021). It is also one of the only two industries that failed to reach the 25% gender mix ratio, and thus, construction workplaces are vulnerable to a male-dominated workplace culture that could reinforce harmful gender inequality (Campuzano, 2019).

*T: Total; 1: Construction; 2: Mining; 3: Transport, storage and postal service; 4: Production and supply of electricity, gas and water; 5: Agriculture, forestry, animal, husbandry

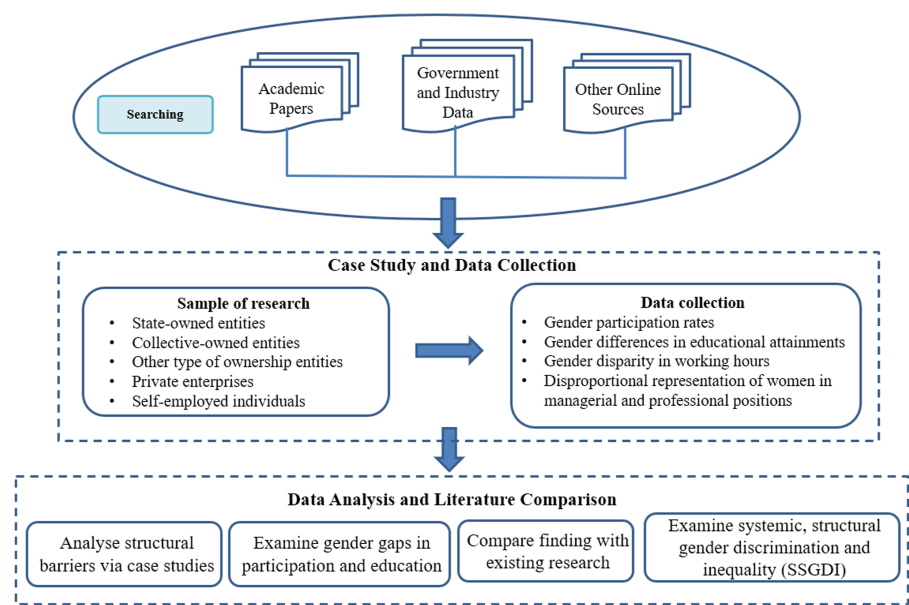


Figure 1. Research methodology. Source: Authors’ own work

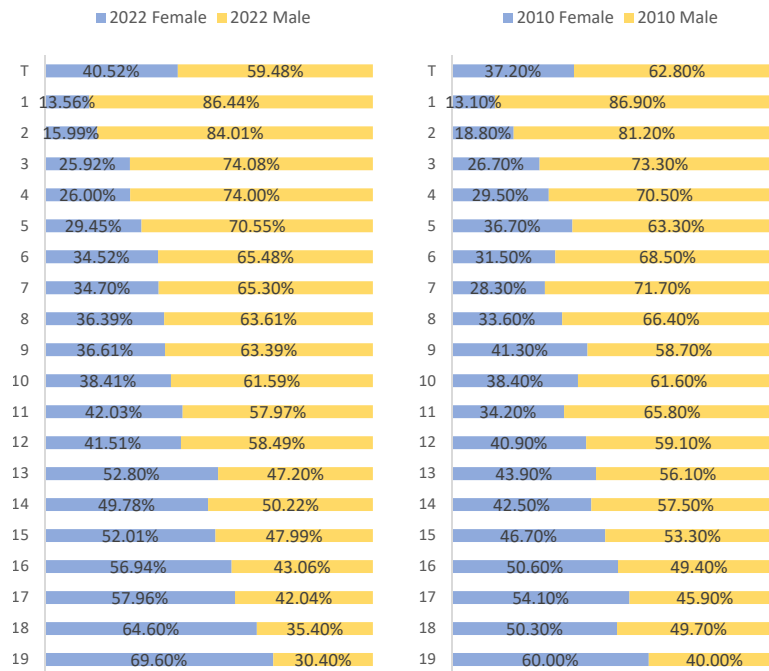


Figure 2. Gender composition of the employed population in the urban public entities by industries (2022 and 2010). Source: Authors' own work

and fishery; 6: Scientific research and technical service; 7: Public management, social security and organisation; 8: Leasing and business service; 9: Manufacturing; 10: Information transmission, software, and IT; 11: Real Estate; 12: Environment, water and public facility management; 13: Household, repair and other services; 14: Culture, sports and entertainment; 15: Wholesale and retail trades; 16: Finance; 17: Hotels and catering services; 18: Education; 19: Health and social services.

Over the period between 2010 and 2022, the participation rate for females in the urban public construction sector in China fluctuated but generally remained within the range between 10% and 14%. [Figure 3](#) reveals that the female workforce ratio in this domain experienced an evident and continuous decline of 3% from 13.1% in 2010 to 10.1% in 2013 and a slow but overall steady rise afterwards, reaching 13.6% in 2022. The data shows that the participation rate of women in the Chinese construction industry is similar to that of developed countries and remains below 14% overall ([Hasan et al., 2021](#)). This changing trend ran parallel to the proportional variations found in the total female labour force employed by the urban public entities, which dropped from 37.2% in 2010 to 35% in 2013 and then increased consistently to a historical high of 40.5% in 2022, as is illustrated in [Figure 4](#). Meanwhile, an inverse pattern was identified in the entire employment-population recruited by the urban public construction enterprises that remained stable with a minor reduction in the latter half of the decade after a rapid expansion between 2010 and 2013. During these three years, China's economy achieved tremendous growth, which prompted a greater influx of rural people into cities, causing a rapid rise in construction employment ([Mai et al., 2013](#)).

4.2 Higher level of education backgrounds of women in the Chinese construction industry

The profile of the educational background of the workers in the construction sector of urban public entities reflected a higher level of educational achievements for the female workers

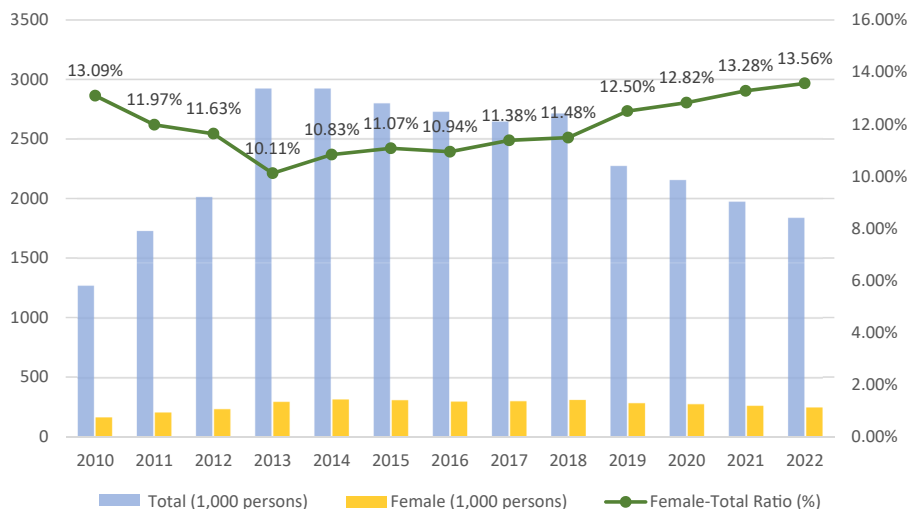


Figure 3. Trends for the employment changes in the construction industry of the Chinese urban public sector and female workforce ratio (2010–2022). Source: Authors’ own work

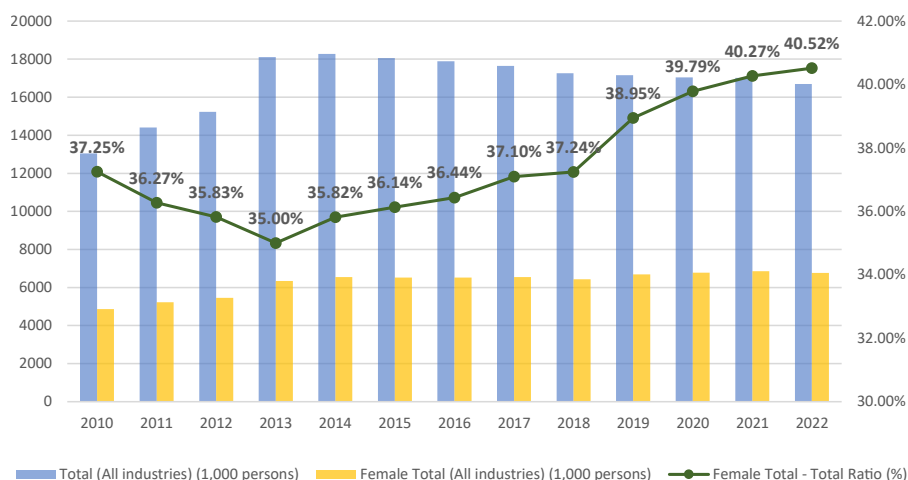


Figure 4. Total employment by urban public entities in China and the corresponding female workforce ratio (2010–2022). Source: Authors’ own work

compared to their male counterparts. Figure 5 presents the compositions of the educational levels of the workers employed in the urban public construction domain in 2022. Most male employees (67.8%) fell into the category of secondary educational degree. Meanwhile, the distribution of the educational levels among the female workforce was relatively even, but the balance tilted towards the higher end of the spectrum. Within the female group, 36.3% had gained a tertiary education degree, outpacing the male workers by a significant margin of more than 20%.

Figure 6 displays the further breakdown of education degrees completed among the construction-related employment in urban public enterprises. The top four education degrees

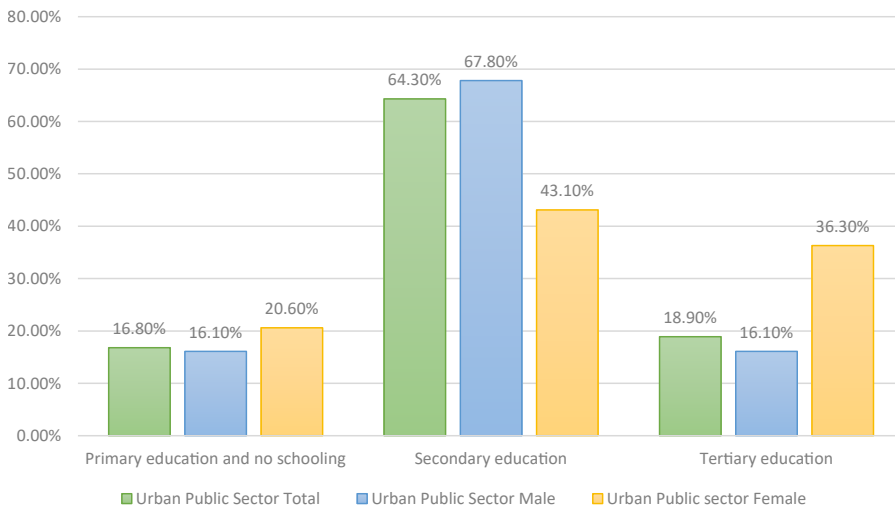


Figure 5. Education level of the workers in the construction industry (urban public sector) in 2022. Source: Authors' own work

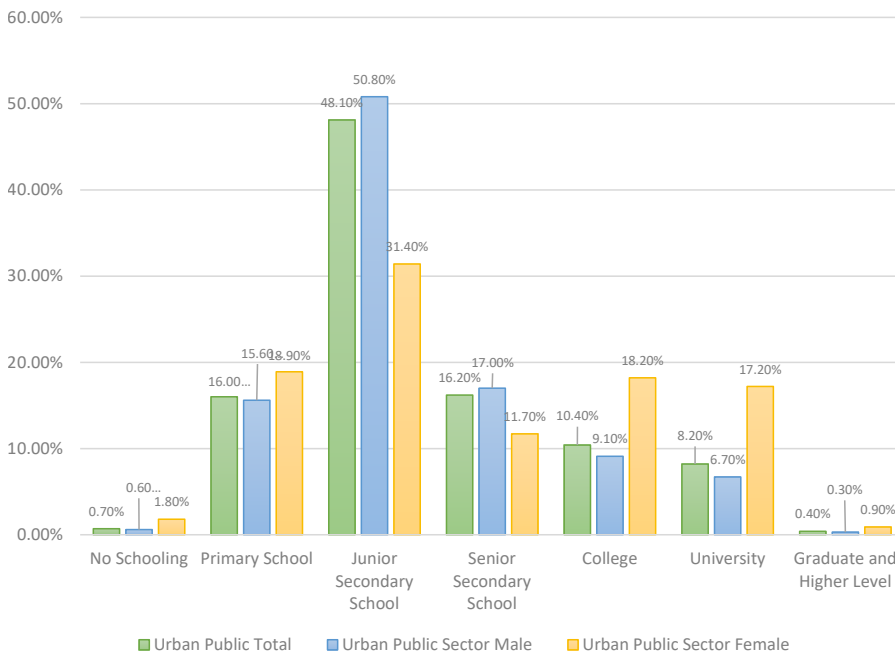


Figure 6. Education attainment of the workers in the construction industry (urban public sector) in 2022. Source: Authors' own work

attained by male workers in construction were junior secondary school, senior secondary school, primary school and college, which constituted 50.8%, 17.0%, 15.6% and 9.1% of the total male workforce, respectively. In contrast, for the females, the top four educational

attainments achieved were junior secondary school, primary school, college, and university, each comprising 31.4%, 18.9%, 18.2% and 17.2% of the entire population of the construction-related female workforce. Therefore, it can be concluded that female workers possess higher education qualifications in the Chinese construction industry, with a higher proportion of females than males with college and university degrees in their respective categories.

4.3 Less working hours for women in the Chinese construction industry

Figure 7 presents the breakdown of employees in construction according to their reported weekly working hours. Of the female workforce, most of them (46.6%) worked for 40–48 hours each week. Meanwhile, females working more than 48 hours per week also constituted a significant proportion of this employment group (38.2%). Similar to the female workforce, it was found that most of the male employees worked above 48 hours per week (56.0%). However, the proportion of males working between 40–48 hours each week (30.9%) was much lower than the corresponding figure for the female workers. For both female and male employees, the proportion of those working for less than 40 hours was fairly low, but the figure for female workers (15.2%) was slightly higher than their male counterparts (13.2%). Therefore, a significant drop in the number or representation of female workers can be noted when the weekly work hours exceed 48.

4.4 Disproportional representation of women in managerial and professional positions

The statistics for gender representation in the management committee and the professional positions of the case enterprise are summarised and presented in Tables 1 and 2. The case study construction corporation had a total employment population of 293,197 people, among which 80.1% were males (234,853 people), and the remaining 19.9% were female (58,344 people).

For this study, the executive members in the organisation were categorised into four distinctive official ranks, i.e., deputy division chief, division chief, deputy director and director and above, respectively, in ascending order. In the aggregate, there were 404 females and 7,138 males appointed as supervisory officers, reflecting a women representation ratio of 5.4% on the corporate management board. As illustrated in Figure 8, the female participation percentage dropped from 6% to 2.7% as the officer rank moved up from deputy division chief

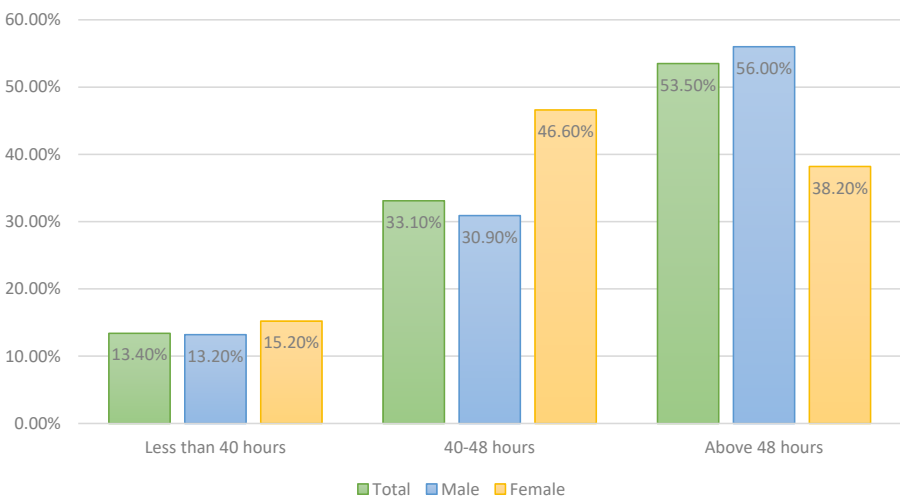


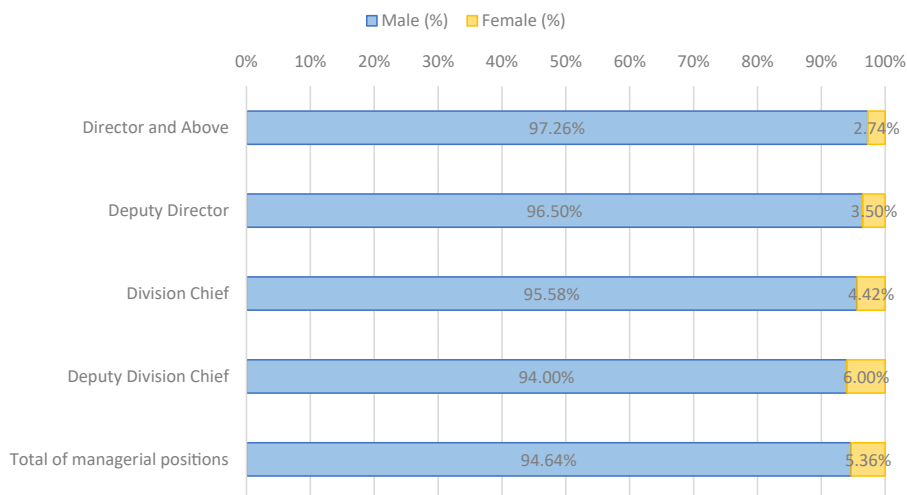
Figure 7. Breakdown of employees by reported weekly workload in the construction industry of urban public sector in 2022. Source: Authors' own work

Table 1. Employment statistics for gender representation on the corporate management board

Officer ranks	Total People	%	Male People	%	Female People	%
Total managerial positions	7,542	2.57%	7,138	3.04%	404	0.69%
Director and above	73	0.02%	71	0.03%	2	0.00%
Deputy director	457	0.16%	441	0.19%	16	0.03%
Division chief	2,194	0.75%	2,097	0.89%	97	0.17%
Deputy division chief	4,818	1.64%	4,529	1.93%	289	0.50%
Total enterprise employees	293,197	100%	234,853	100%	58,344	100%

Source(s): Authors' own work**Table 2.** Employment statistics for professionals in the case study construction enterprise

Professional title	Total People	%	Male People	%	Female People	%
Total of professional	142,908	48.74%	109,926	46.81%	32,982	56.53%
Senior professional	1,723	0.59%	1,574	0.67%	149	0.26%
Associate senior professional	17,390	5.93%	14,130	6.02%	3,260	5.59%
Mid-level professional	48,657	16.60%	37,592	16.01%	11,065	18.97%
Junior professional	75,138	25.63%	56,630	24.11%	18,508	31.72%
General employees	150,289	51.26%	124,927	53.19%	25,362	43.47%

Source(s): Authors' own work**Figure 8.** Gender representation ratios for different official ranks in the case study enterprise. Source: Authors' own work

to director and above. This proportion was much lower than the representation rate of female participants amongst the entire population employed by the company, as mentioned above. It reveals that women were significantly underrepresented in the management body. Essentially,

they were marginalised from the top-tier managerial roles in the case study establishment, which confirmed the existence of the glass ceiling phenomenon in the entity.

Imbalanced gender representation in supervisor positions implies limited promotion opportunities and increased competitive pressure among female members. As shown in Table 1, the managerial positions made up 2.6% of the total labour force of the entity. Among the female workforce, 0.7% held a top managerial position. However, for the male workforce, the corresponding figure was 3%, which was substantially higher. In other words, the chances for male staff being promoted to the corporate board were more than three times higher than their female colleagues.

The glass ceiling phenomenon and the limited promotion opportunities were also observed in the career development paths for staff in professional roles. To offer comprehensive service for the delivery of major infrastructure projects, the case study enterprise employed a wide range of experts specialising in construction-related professions. The advanced specialists were promoted through a four-tier accreditation scheme that was comprised of junior professionals, mid-level professionals, associate senior professionals, and senior professionals in sequence. The aggregate of employees holding a professional title involved a population of 142,908 people, constituting 48.7% of the total labour force of the corporation.

As is displayed in Figure 9, the gender composition for the accredited professional workforce was 23.1% women and 77% men. This female representation rate was higher than the entity-wide women’s employment ratio (19.9%), and it may be due to the increased proportion taken up by the female workforce in low-ranked professional positions. The women practitioners had a share of 23.1% and 24.6% in the junior and mid-level professional categories, respectively. This, in part, could be attributed to the higher level of educational achievements presented by the female fellows, among other factors such as better job support for women in these roles. Another possible contributor to this phenomenon might be the fact that many of the professional positions are office-based, which is potentially easier for female participants to successfully apply for and may offer a better work-life balance. However, the participation rate for females shrank to 18.8% when the rank was raised to the associate senior professional and drastically decreased to 8.6% when it came to the level of senior professional. Hence, female practitioners in the company were underrepresented in the high-ranking professional roles.

Figure 10 exhibits the composition of staff with different professional titles among male and female employees of the firm. Most women participants had acquired a professional title,

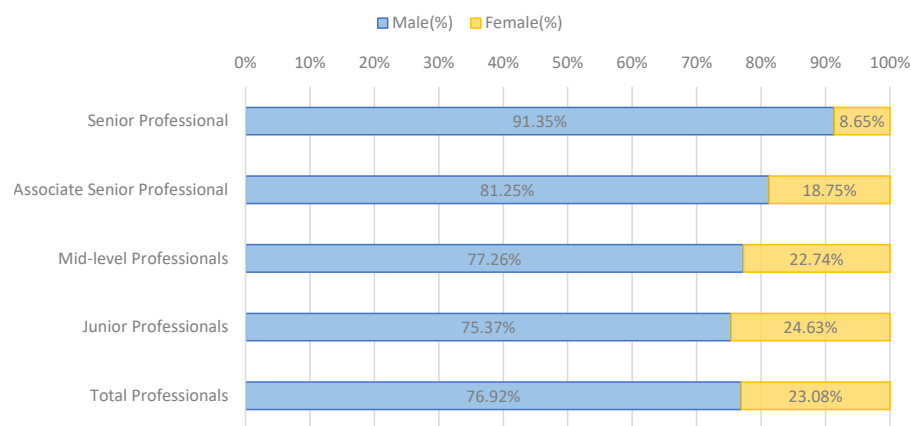


Figure 9. Gender proportions for professional positions in the case study enterprise. Source: Authors’ own work

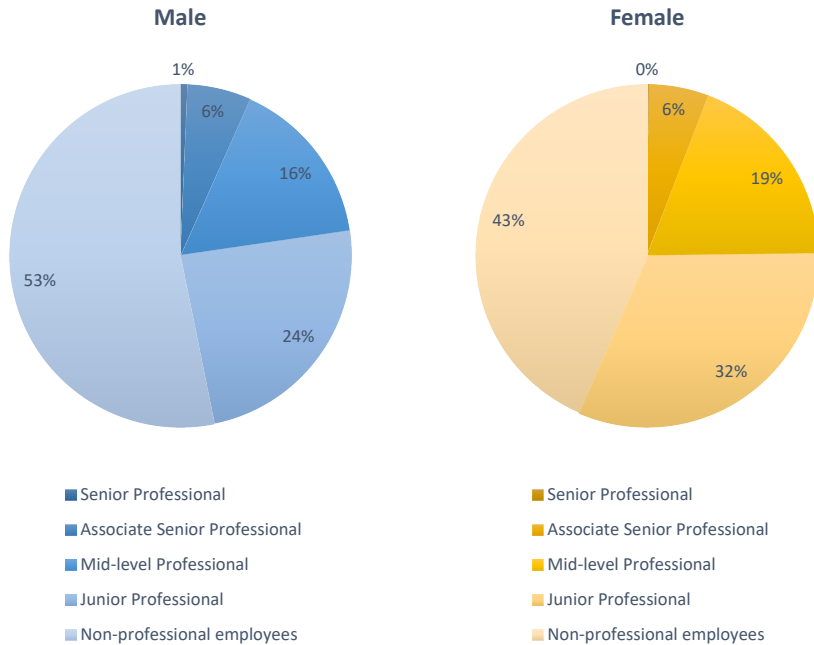


Figure 10. The professional rank composition for different genders. Source: Authors' own work

as only 43% were contracted as non-professional staff. Meanwhile, the non-professional staff made up 53% of the male workers. 32% and 19% of the females were promoted to junior and mid-level professionals, respectively, while the corresponding figures for their male counterparts were 24% and 16%. That indicated a more positive chance of promotion at this stage for the female practitioners compared to their male fellows, which might be the consequence of the gendered educational gap identified earlier in the workforce profile. However, the female representation rate in associate senior professional roles was balanced out by the male one, which was 6%. Moreover, the representation ratio of men at the level of senior professional was 1%, outpacing that of female employees. Though 149 female practitioners had attained a senior professional position, the opportunities for women being promoted to this range remained close to 0% statistically. It signified that female professionals might have benefited from their better education background in their early career development, but they were subject to the impacts of the glass ceiling in the later stages of their careers.

5. Discussion

Gender equality in the workplace is one of the top global aims of the United Nations' (U.N.) 2030 Agenda for Sustainable Development. It is the fifth goal among the 17 sustainable development goals (SDGs) that the U.N. is committed to transforming by 2030 (UN SDGs, 2015). Since women represent half of the world's total population, their equal participation in the labour force is crucial for the development of the economy and societies. Given the significant contribution of the construction industry to GDP (gross domestic product) and employment, gender equality in construction organisations can facilitate the realisation of greater shared prosperity (U.N. SDGs, 2019; World Economic Forum, 2019). The findings of the present study make several insights based on the SSGDI, as illustrated in Figure 11 and discussed below.

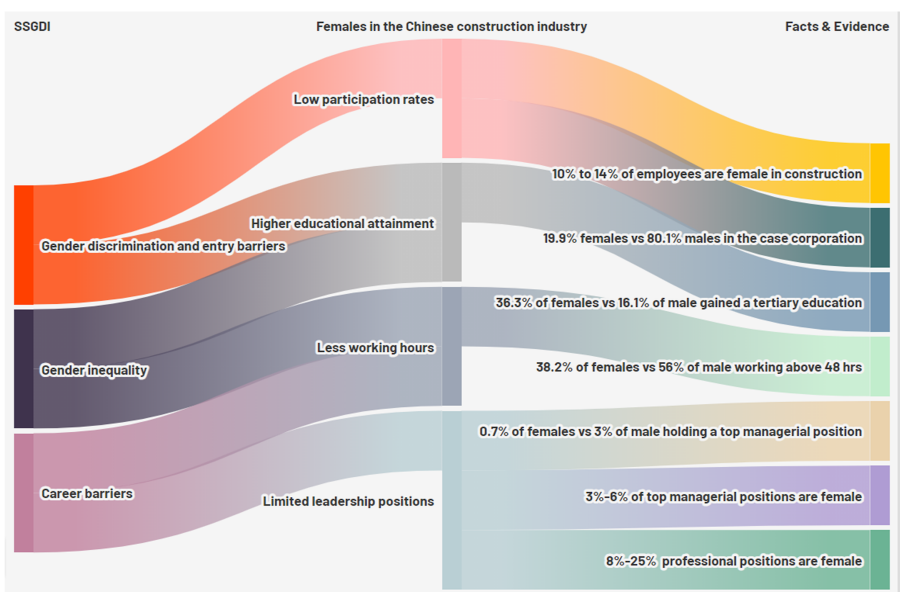


Figure 11. SSGDI evidenced in the Chinese construction industry. Source: Authors’ own work

5.1 Gender discrimination and entry barriers in the Chinese construction industry

The theory of SSGDI covers practices and policies that disadvantage discriminated groups even in the absence of individual discrimination (Newman *et al.*, 2023). These rules, policies and procedures intentionally or unintentionally limit the rights and opportunities of the discriminated group (Angermeyer *et al.*, 2014). The construction industry is a traditionally male-dominated industry that perpetuates stereotypes and structural gender discrimination, limiting women’s participation, advancement and recognition in the construction industry. The present study establishes that women have suffered serious and systemic injustices in two areas: hiring and career advancement.

According to Watts (2007), gender discrimination (e.g., gendered job roles) prevents women from entering the industry. The present study shows that over the period between 2010 and 2022, the participation rate for females in the urban public construction sector in China remained between 10% and 14%. Similarly, only 19.9% of females in the case study organization were hired compared to 80.1% of males, indicating that significant inequality still exists in hiring ratios. This disparity reflects the unequal distribution of recruitment policies, culture and career opportunities within the industry.

5.2 Gender inequality in the Chinese construction industry

With a female participation rate constantly remaining below 14% between 2010 and 2022, the construction industry in the Chinese urban public sector is highly gender-segregated. A major contributor to gender inequality in this area could be the entry barriers presented to females. The masculinity ideology of the construction sector and the gender bias of women being physically weak restrict them from choosing the pertinent jobs as the starting points of their careers in the first place.

Other than the site workers, gender bias also raises the entry standards into the construction professions for females in China. The findings of this study reveal that, within the construction entities registered under the urban public sector, the average education level of the female practitioners is significantly higher than that of their male counterparts. For instance, in 2022,

36.3% of the female employees had attained a tertiary education degree, while the population with tertiary education only constituted 16.1% of their male counterparts. Wang (2018) indicated that the gendered difference in the educational profile of the labour force in major Chinese constructional companies was the consequence of a more stringent recruitment benchmark applied towards female entrants. Women will often need to prove that they are capable of working in the industry in order to gain the same respect as men in the industry (Norberg and Johansson, 2021). For instance, a top female civil engineering graduate who managed to obtain an employment opportunity in a state construction enterprise emphasised the importance of taking up internships since the junior years to accumulate work experience well ahead of her classmates, through which she built up her personal competence to mitigate the disadvantages posed by gender bias in the recruitment process (Xinhua, 2021). This highlights the existence of gender inequality in the construction sector within the non-private domain and reveals the impacts of gender inequality (Miller *et al.*, 1999). Past research works noted the prejudice of intellectual inabilities, such as logical thinking, mathematical calculation, 3D perception, etc., against female applicants in the employment practises for architectural design jobs and civil engineering positions (Fielden *et al.*, 2000). Similar kinds of presumptions regarding gender-typed attributes are prevalent in the workplace culture of relevant trades in China (Xinhua, 2021), which inevitably contributes to gender-biased employment and adversely reinforces gender inequality in the industry.

Meanwhile, the workload for female employees in construction was highly demanding, with weekly average working hours reaching up to 45.7 hours, which was beyond the weekly allowance of normal working hours (Piat, 2018). Finding a work-family balance could be very challenging in this situation. However, it is important to note that while women in the Chinese construction industry work fewer hours than men, their work hours are considerably higher than those of women in some other countries. For instance, in Australia, the percentage of women in the industry who work part-time (41%) is significantly higher than that of men in part-time roles (only 16%) (Master Builders Australia, 2024). Only 33% of women in the Australian construction industry worked 40 hours or above, compared to 84.8% of women in the same category in the Chinese construction industry (Figure 7).

Wang (2018) found that female participants were constantly under pressure to trade off personal time intended for skill advancement and self-improvement against household chores and caring tasks for children and elderlies. Family responsibilities also hinder the career development of women in construction by limiting their workplace position choices. Traditionally, the stability needed for family care is regarded as inherently disagreeing with the project-based nature of construction activities. The largest sources of stress for women in the construction industry are the cumulative effects of a lack of personal development opportunities, lower wage rates and small tasks. These differences reflect the traditional and continuing subordination of women in the construction industry (Loosemore and Waters, 2004; Hasan *et al.*, 2024). A lack of on-site experience, in turn, obstructs the promotion pathway for women labourers in the long run.

5.3 Gender roles and career development challenges for female practitioners in construction

The study identified a positive change in the female representation rate in low-ranked professional jobs. Female participants constituted 23.08% of the workforce with professional titles, higher than the enterprise-wide female employment percentage (19.9%). This growth, in part, could be attributed to the advantages brought about by the better educational background presented by the female employees, as discussed in the previous section. However, the educational advantages failed to sustain the further career development of female practitioners due to the gender inequality incurred by the masculine culture in the workplace.

The case study showed that women were significantly underrepresented in the corporate management committee and high-ranking professional positions. For the managerial team, the

female representation ratio was only 5.36%, and the chances of being promoted to the executive level were 3.04% for men and 0.69% for women. Hence, male employees had a much more optimistic outlook for their future promotion towards leadership roles. In the case of professional practitioners, the constitution of female members in the senior associate professional and senior professional levels was 18.75% and 8.65%, lower than the entity-wide women's participation proportion. Regardless of management or professional career development, the opportunity of promotion to the top-tier ranks among the female members was close to 0%, highlighting the existence of a strong glass ceiling for women in the Chinese construction industry. Other researchers have also found that structural barriers in the construction industry, masculine organisational culture, absence of family-friendly policies and lack of mentoring opportunities severely hinder women's career development (Bilbo *et al.*, 2014; Galea *et al.*, 2015; Wang, 2018; Bryce *et al.*, 2019).

Due to the patriarchal workplace culture, crucial roles such as project managers, technical directors, and technology developers were pre-dominated by men, and the majority of the female staff were assigned service roles such as logistics assistants, and contract managers (Wang, 2018). Furthermore, the less direct ways in which women are excluded are manifested in the hiring of individuals, and when women return to work after maternity leave, they are often assigned to professional positions that do not match their skill levels (Norberg and Johansson, 2021). Gender inequality against women deeply rooted in long-lasting superstitions may also limit their participation in practises on the construction site. For example, it was reported that female participants were forbidden to enter tunnel construction sites as there was a superstitious belief that women would bring back luck, leading to tunnel collapse (Ji, 2021). Consequently, female practitioners found it difficult to build up critical work experience that led to further promotion and had to lower their career expectations (Wang, 2018). Hence, the present study further establishes the continuation of the glass ceilings and walls in the Chinese construction industry with their origins in institutional norms and organizational culture, which still favour male career paths as the norm in male-dominated workplaces.

In comparison, in the construction industry of a developed country such as Australia, women constitute 6% of CEOs, 15% of heads of business and more than 20% of key management personnel, executives and senior managers in private sector employers with 100 or more employees (Workplace Gender Equality Agency, 2024). One of the reasons behind the higher representation of women in leadership positions in the Australian construction industry could be the fact that around 77% of employers have a policy for flexible work that supports part-time work, working from home, flexible hours and carer's leave (Workplace Gender Equality Agency, 2024). Moreover, more than 80% of employers had a formal policy or strategy on gender equality (Workplace Gender Equality Agency, 2024). Similar initiatives can be implemented in the Chinese construction industry to support the career progression of women.

6. Conclusion

This study provides an evidence-based and updated depiction of gender inequality in China's construction industry, a major developing country, based on the latest labour force data collected from the National Bureau of Statistics of China for the period from 2010 to 2022. By collecting and analysing data related to the female workforce in China's construction industry, this research identified three prominent issues related to gender inequality in China's construction industry. SSGDI in the construction industry has perpetuated gender bias, limiting the recruitment, promotion and recognition of women. Women face unequal hiring ratios, limited promotion opportunities and perpetuation of a masculine culture. The statistical evidence and underlying reasons indicate that:

- (1) The construction industry in China's urban public sector is highly gender segregated. The female participation rate has remained stagnant at a level below 14%. The dominant underlying reason is the prevalent masculine culture and gender bias in the construction industry, which raises the barrier for women to enter the industry, thus exacerbating gender inequality.
- (2) Female workforce is markedly underrepresented in corporate management committees and senior professional positions. Based on the case study, the chance of being promoted to executive levels is 3% for male employees, while only 0.7% for female employees. In terms of professional practitioners, female members of the associate senior professional level and senior professional level are 18.75% and 8.65%.
- (3) Gender inequality is also evidenced in the Chinese construction industry. 36.3% of the female employees had attained a tertiary education degree, while only 16.1% of male employees attained a tertiary education degree, as a consequence of a more stringent recruitment benchmark applied towards female entrants. The workload for female employees in construction was highly demanding, with weekly average working hours reaching up to 45.7 hours, and a significant drop in the number or representation of female workers can be noted in the Chinese construction industry when the weekly work hours exceed 48 (38.2% vs 56%).

These findings confirm the existence of the glass walls and glass ceiling phenomena in the Chinese construction industry. The structural and cultural barriers severely limit women's employment and career opportunities and upward mobility later in their careers. Women may only benefit from their higher education attainment in their early career stages. Gender inequality in the construction industry in developing countries such as China is a critical issue that requires more policy, organisational, and community support to ensure the equal rights of female workers are protected. In order to break through the glass ceiling and wall, the following strategies are recommended for policy makers, organisational managers, researchers, and the community: (1) gender equality lens is utilised to guide institutional recruitment, employment and promotion policies to achieve gender balance and equality; (2) equal opportunities and compensation are applied to all levels of employment in the construction industry; (3) flexible working hours and work arrangements are offered to employees who have special needs and family care duties to balance gender inequality; and (4) female professionals are supported to reach more senior levels in the construction industry.

Based on the theory of SSGDI, this study provides critical evidence of gender bias and inequality in the Chinese construction industry, with women underrepresented in managerial and professional roles, facing higher recruitment standards, limited working hours, fewer promotion opportunities, and difficulty attaining senior management positions despite higher educational attainment. Structural discrimination in the construction industry has perpetuated gender bias, limiting the recruitment, promotion and recognition of women.

Through theoretical lenses and data-driven analysis, this study reveals gender inequality and provides underlying evidence for the phenomenon of gender inequality in the construction industry. In addition, this research offers insights into women's recruitment and career development in the male-dominated construction industry. The findings can inform gender equality policies and practices and promote gender equality in the construction industry in China and elsewhere. This study enriches the global discourse on gender equality and provides practical strategies for promoting a more inclusive construction industry in China and other developing countries.

Although this study provides useful insights into gender inequality in the construction industry of developing countries, there are still some limitations. Up-to-date data on the number of male and female workers within companies and the ratio of males to females in different professional positions are confidential, which is, therefore, difficult to obtain.

Besides, the fragmented labour situation in rural areas creates pressure for data statistics. There are few macro-level statistics or studies on employment inequality and employment numbers in the construction industry's rural areas. Therefore, this study was conducted only for the urban public sector based on the limited data available at present, which is a limitation of this study. More unit-level data instead of aggregate data could provide new insights into the complex relationships of various factors leading to gender inequality in the Chinese construction industry.

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