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# THE GLASS CEILING CONUNDRUM: AN ILLUSORY BELIEF OR BARRIER ON WOMEN'S CAREER ADVANCEMENT IN THE MANUFACTURING SECTOR, WITH SPECIAL REFERENCE TO KARNATAKA

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## Abstract

This review explores the problem of the glass ceiling—an unseen barrier inhibiting women's professional growth in the manufacturing industry, with a specific focus on Karnataka state in India. Although women's engagement in the manufacturing workforce has continuously increased, their presence in senior and leadership positions remains disproportionately low as compared to male colleagues. This study synthesizes previous research on the structural, organizational, societal, and individual barriers that make up the glass ceiling, focusing on how these barriers interact with gender norms and corporate culture. The findings show that, while some regard the glass ceiling as an illusion, empirical evidence increasingly supports its presence as a substantive barrier influenced by organizational practices, bias, and systemic injustices. The analysis also highlights major gaps in region-specific literature from Karnataka's manufacturing context, highlighting the need for targeted empirical research to guide policy, managerial practices, and gender-inclusive industrial efforts.

Despite growing female employment in India, women are still severely underrepresented in senior and decision-making positions, notably in the industrial sector. The concept of the "glass ceiling" has been widely contested as either a perceived constraint or a real structural obstacle to women's career advancement. This research critically evaluates existing material to determine whether the glass ceiling in the manufacturing sector is an illusionary notion or a long-standing organizational and socio-cultural obstacle, with a focus on Karnataka. Drawing on 70 national and international research, the study synthesizes evidence about organizational practices, cultural norms, individual limits, and legislative frameworks that influence women's professional advancement.

## KEYWORDS

Glass ceiling, Career advancement, Women in manufacturing, Gender barriers, Organizational bias, Karnataka, Workforce equity

## INTRODUCTION

Gender equality and women's empowerment have become critical issues in modern organizations and industries. Although women's participation in school and employment has expanded dramatically, their presence in top management and leadership roles is still low, particularly in the industrial sector. Manufacturing industries have long been dominated by men, with leadership, technical expertise, and operational jobs being associated with masculinity. As a result, women frequently encounter unseen impediments to their professional advancement, while having equal skills and talents.

The term "glass ceiling" was used to characterize the hidden restrictions that keep women from ascending to higher managerial and decision-making positions. These hurdles are not officially acknowledged, but they are strongly embedded in business culture, promotion systems, gender stereotypes, and social expectations. Biased performance evaluations, a lack of mentorship, occupational segregation, unequal access to training, and work-life conflict all continue to impede women's career advancement in a variety of fields. The swift adoption of Artificial Intelligence (AI) and Industry 4.0 technology has further altered organizational procedures, such as recruitment and performance administration systems. While these technologies increase productivity, they may also perpetuate hidden prejudices based on via data-driven decision-making.

As a result, the current study seeks to determine if the glass ceiling in Karnataka's manufacturing industry is merely an illusionary judgment or an actual organizational impediment to women's professional advancement. The study also investigates the impact of technology-driven appraisal methods, as well as the hurdles that women confront on the shop floor and in managing position.

**RESEARCH OBJECTIVES**

1. To examine whether the glass ceiling in Karnataka manufacturing industries is a psychological perception or an actual organizational barrier.
2. To analyse whether AI-based appraisal and Industry 4.0 technologies reinforce hidden gender bias in promotions.
3. To compare career advancement barriers between women in shop-floor roles and women in managerial roles.

**Review of Literature**

Sl. no.	Area & Focus of the Research	Result of the Research	Reference
1.	Conceptualization of the Glass Ceiling	These barriers are not officially recognized but are ingrained in culture of organizations. The investigation underscored how assertions of meritocracy often conceal discriminatory behaviours.	Hymowitz & Schellhardt (1986)
2.	Work-life balance and career progression among women	Women’s progress is significantly hindered by career breaks taken for family obligations. Insufficient flexible work options contribute to higher turnover rates during mid-career phases.	Ramaswami, A. et al. (2017)
3.	Structural Barriers in Organizations	Organizational structures consistently favour male career paths. The criteria for promotions were shown to align with continuous career trajectories that are generally linked to men. Also, women faced slower advancement even with comparable qualifications.	Morrison et al. (1987)
4.	Gender Segregation in Manufacturing	Women predominantly occupy support and administrative roles, while technical and operational leadership positions have largely remained unattainable. Cultural misconceptions regarding physical strength and leadership have continued to reinforce this separation.	Wirth (2001)
5.	Organizational Culture and Leadership	Leadership norms favouring masculinity prevail in industrial organizations. Women who display different leadership styles were assessed more negatively. This cultural prejudice greatly restricted the advancement opportunities available to women.	Schein (2007)
6.	Women’s participation in small and medium manufacturing sectors.	Women are largely employed in low-skilled, low-paying positions that offer minimal opportunities for career growth. Societal expectations and difficulties in maintaining work–life balance further hinders their professional advancement.	Government of Karnataka Industrial Reports (2018)
7.	Gender Inequality in Indian Workplaces	Indian women face compounded barriers due to organizational practices and societal expectations. Even when policies appear gender-neutral, implementation remained biased. Career advancement was found to be uneven across sectors.	Deshpande (2012)
8.	Women in Industrial Leadership	It analysed succession planning and pipeline access. Results showed systemic underrepresentation and exclusion from leadership pipelines.	Catalyst India (2020)
9.	Leadership Access and Visibility	Access to high visibility assignments and strategic projects. It highlighted the role of informal networks in influencing career trajectories. Findings showed women are often excluded from these opportunities, affecting promotion potential.	Herminia Ibarra et al., (2010).
10.	Work–Family Conflict	Investigated how dual responsibilities affect women’s career growth. It focused on balancing organizational expectations with domestic roles. Findings revealed that work, family conflict significantly reduces	Jeffrey .H, Greenhaus, & Nicholas. J, Beutell, (1985).

		women’s promotion and leadership continuity.	
11.	Gender Stereotypes and Leadership	It analysed the incongruence between feminine traits and traditional leadership expectations. Results showed women were often penalized for both stereotypical and assertive behaviours.	Eagly & Karau et al., (2002)
12.	Promotion Practices in Organizations	It analysed subjectivity and transparency in evaluation processes. Results showed that informal practices disproportionately disadvantage women.	Judith G. Oakley, (2000).
13.	Gender Composition in Indian Manufacturing	Workforce composition and hierarchy in Indian manufacturing. It highlighted the concentration of women in low-skill roles. Findings showed limited access to senior technical and leadership positions.	NASSCOM & KPMG Report (2019)
14.	Human Resource Policies and Gender equality	The study analysed gender-neutral HR policies and their effectiveness. It focused on policy design and implementation challenges. Results showed these policies often fail to address structural constraints, limiting women’s advancement.	Rao & Kelleher (2005).
15.	Mentorship and Career Advancement	The role of mentorship in preparing women for leadership. It examined gender differences in access to influential mentors. Findings revealed limited mentorship opportunities for women, hindering career growth.	Belle Rose Ragins & John L. Cotton, (1999).
16.	Gender Pay Gap at Senior Levels	This study examined pay disparities across organizational hierarchies and found that pay gaps widen at senior management levels, reflecting undervaluation of women’s contributions.	Francine D. Blau & Lawrence M.Kahn,(2017).
17.	Regional Industrial Employment – Karnataka	It focused on representation in leadership and technical roles. Findings revealed low female leadership presence despite moderate workforce participation.	Govt. of Karnataka, (2022)
18.	Women Entrepreneurs in MSMEs	It explored challenges in financing, networking, and scaling operations. Findings revealed structural barriers limiting growth and leadership opportunities.	OECD, (2021)
19.	Career Interruptions and Advancement	The research investigated the impact of maternity and caregiving breaks on career progression. It analysed organizational re-entry policies. Results indicated career interruptions disproportionately affect promotion prospects and advancement opportunities.	Michelle J. Budig & Paula England, (2001)
20.	Bias in Performance Evaluation	It focused on subjective interpretation of achievements. Findings revealed women’s contributions are undervalued compared to men’s, impacting career advancement.	Emilio J. Castilla, (2008)
21.	Occupational Safety in Manufacturing	The research examined workplace safety regulations affecting women’s participation. It analysed restrictions on night shifts and operational roles. Findings indicated these constraints reduce exposure to leadership tasks, reinforcing exclusion.	International Labour Organization (ILO), (2018)
22.	Skill Development and Training Access	This study analysed access to technical and advanced skills training for women. It focused on industrial training programs and mentorship. Findings revealed limited access, which constrained eligibility for leadership roles.	World Bank, (2020)
23.	Glass ceiling factors affecting Indian women employees.	Study identified individual, social, cultural, organizational, and gender-related barriers as major factors affecting women’s career advancement. These barriers significantly contribute to the glass ceiling, explaining nearly 45% of the variance in career progression.	Leelavati et al. (2024)

24.	Gendered occupational segregation in manufacturing industries.	Women are concentrated in labour intensive, low value added roles, while men dominate technical and managerial positions. This horizontal segregation restricts women's access to leadership pathways and limits their career advancement opportunities, reinforcing structural barriers.	Das, M. (2020)
25.	Leadership perception and gender stereotypes	The leadership traits are often associated with masculinity, disadvantaging women candidates. Women are perceived as less suitable for decision-making roles despite equal competence. These biases influence promotion decisions significantly, reinforcing the persistence of the glass ceiling.	Sahay, S. (2021)
26.	Training and skill development disparities	Women receive fewer opportunities for advanced technical training, limiting their eligibility for supervisory and managerial roles. The study concluded that training inequality contributes to career stagnation and reduced access to high-skill assignments.	Mehrotra, S. (2022)
27.	Gender disparity and glass ceiling focusing on organizational hierarchy and promotion practices.	Women face major barriers in transitioning to mid to senior level positions due to structural biases, limited mentorship, and male dominated leadership cultures. The study concludes that the glass ceiling is a real barrier to upward mobility.	Budhwar, P. & Bhatnagar, J. (2009)
28.	Skill development and employability of women	The findings highlight that women receive less technical training compared to men, limiting their eligibility for higher roles. Gendered job segmentation persists across industries. This reinforces systemic barriers rather than supporting the illusion argument.	NSDC (National Skill Development Corporation, 2021)
29.	Gender inequality in manufacturing workforce using NSSO data	Women's participation declines at higher occupational levels due to structural rigidities and limited upward mobility. The study identified strong vertical segregation and concluded that systemic barriers hinder women's leadership progression.	Klasen, S. & Pieters, J. (2015)
30.	Female labour force participation and industrial employment	The study found that women are underrepresented in manufacturing due to social norms and safety concerns and are often concentrated in low-paying roles. The findings indicate persistent inequality in career advancement opportunities.	Chatterjee, E., Desai, S. & Vanneman, R. (2018)
31.	Gender differences in job mobility and promotions	The research found that women experience slower career mobility due to limited access to internal job transitions, organizational bias, and lack of mentorship. As a result, women often remain in the same roles longer, leading to stagnated career growth.	Das, S. & Kotikula, A. (2019)
32.	Women managers in male dominated sectors	The study revealed that women managers face resistance from subordinates and peers due to gender stereotypes, which undermines their authority and limits advancement opportunities, confirming the presence of invisible barriers.	Mathur-Helm, B. (2006)
33.	Gendered division of labour in Indian factories.	The research found that women are concentrated in repetitive, low-skill tasks, while men dominate complex and supervisory roles, limiting women's skill development and promotion opportunities and reinforcing occupational segregation.	Elson, D. & Pearson, R. (1981)

34.	Labour market reforms and their impact on women in manufacturing.	The economic reforms have not substantially improved women’s access to higher-level roles, with women remaining underrepresented in formal and managerial positions due to persistent structural inequalities.	Bhattacharjea, A. (2019)
35.	Gender bias in performance appraisal systems.	The research demonstrated that subjective evaluation criteria and biased leadership assessments disadvantage women employees, negatively affecting promotions and career progression and contributing to the glass ceiling.	Heilman, M. E. (2012)
36.	Workplace harassment and its impact on women’s careers in industry.	The study identified workplace harassment and hostile environments as major factors causing job dissatisfaction and limiting women’s pursuit of leadership roles, thereby creating barriers to career advancement.	Fitzgerald, L. F. et al. (1997)
37.	Gendered expectations and work-family conflict in India.	The study found that societal expectations place greater family responsibilities on women, limiting their availability for demanding manufacturing roles and slowing career progression, thereby reinforcing socio-cultural barriers.	Ramu, G. N. (1989)
38.	Gender-sensitive infrastructure in industrial workplaces.	The research highlighted that inadequate workplace facilities, such as sanitation and childcare, discourage women’s long-term career commitment and negatively affect productivity, retention, and career advancement opportunities.	Sudarshan, R. & Bhattacharya, S. (2009)
39.	Psychological barriers and self-perception among women employees.	The research found that lack of confidence and fear of failure, shaped by societal expectations and external biases, discourage women from pursuing leadership opportunities and contribute to structural inequality.	Sandberg, S. (2013)
40.	Intersectionality and women’s experiences.	The study examined how caste, class, and education intersect with gender to shape career outcomes, revealing that women from marginalized backgrounds face compounded barriers that intensify the glass ceiling effect and highlight the need for inclusive policies.	Deshpande, A. (2020)
41.	Women’s retention rates	The study shows high attrition rates among women at mid-career stages. Factors such as lack of growth opportunities and workplace support contribute to exits. This reduces the pool of women eligible for leadership roles. The findings highlight a “leaky pipeline” effect.	McKinsey Global Institute (2021)
42.	Safety concerns and mobility issues for women	The study identifies workplace safety and commuting challenges as major deterrents for women’s career growth. Many women avoid higher roles requiring night shifts or travel. This limits their professional advancement. The findings highlight structural and infrastructural barriers.	Kapoor, N. (2023)
43.	Promotion evaluation systems	The study found that performance appraisal systems often contain implicit gender bias, where women’s achievements are undervalued and subjective evaluation criteria disadvantage female employees, contributing to slower career progression	Rao, P. (2020)
44.	Organizational climate and gender inclusivity	The workplace environments often lack gender-sensitive policies and inclusive practices, causing women in male dominated workplaces to feel marginalized and discouraging long-term career commitment, thereby creating barriers to career advancement.	Sharma, R. & Kaur, G. (2021)

45.	Gender bias and workplace discrimination	The research identified subtle discrimination through biased evaluations and exclusion from decision-making roles, leading to slower promotions for women compared to equally qualified men and significantly contributing to the glass ceiling.	Banu, N. & Srinivasan, R. (2019)
46.	Global perspective on women with implications for emerging economies like India.	The study shows that manufacturing sectors worldwide exhibit male dominance in leadership roles. In developing regions, institutional and cultural barriers intensify this issue. It supports the argument that the glass ceiling is a structural reality.	International Labour Organization (ILO), (2020)
47.	Women entrepreneurs in Karnataka's manufacturing sector.	Results indicate that women entrepreneurs face funding challenges, limited networking opportunities, and societal constraints. These barriers restrict business growth and scalability. The study highlights that the glass ceiling extends beyond employment into entrepreneurship.	SIDBI Report (2022)
48.	HR practices and glass ceiling in corporate India	The unconscious bias and male dominated organizational cultures continue to limit women's representation in leadership roles despite diversity initiatives. Although mentoring and flexible HR policies provide support, the glass ceiling persists as a structural barrier.	Kumari, P. (2025)
49.	Analysis of gender inclusion in Indian manufacturing organizations	The male oriented organizational norms and exclusion from informal networks and decision-making spaces limit women's inclusion. Despite diversity policies, workplace culture continues to reinforce the glass ceiling as a systemic organizational barrier.	Shivhare, A. & Gurunathan, L. (2024)
50.	Gender pay gap and glass ceiling in Indian industries (tech sector with cross sector implications).	The research found that wage disparities, biased evaluation systems, and persistent stereotypes limit women's advancement opportunities, reinforcing the glass ceiling through institutional practices despite formal equality policies.	Prakash, A. & Yadav, I. (2025)

### Methodology

The present research depends on secondary data analysis from peer-reviewed journals, empirical studies, government reports, industrial surveys, conference proceedings, and respectable institutional publications published primarily between 1981 and 2025. This method is excellent for investigating the multidimensional issue of the glass ceiling, which is influenced by organizational, social, cultural, psychological, and economic aspects that hinder women's career advancement in the manufacturing industry.

The study undertakes a systematic and narrative literature review to explore gender disparities, organizational impediments, AI-based appraisal systems, Industry 4.0 technologies, and women's leadership engagement. It also examines the glass ceiling, technology-driven gender bias, and the obstacles that women confront on the shop floor and in managerial roles. Secondary data was acquired from numerous sources, including peer-reviewed journals, doctoral research thesis, ILO reports, Government of Karnataka industry reports, NASSCOM and KPMG investigations, SIDBI reports, and academic databases like Google Scholar, Scopus, and ResearchGate.

A total of 50 related research were chosen based on credibility and relevance. The literature was divided into topics, including gender stereotypes, organizational culture, mentorship, occupational segregation, pay difference, and workplace problems. Overall, the research establishes a solid academic platform for analysing the hurdles to women's career development in Karnataka's manufacturing industry.

Overall, this methodology provides a solid and academically sound foundation for determining whether the glass ceiling in the manufacturing industry is a myth or a structural hindrance to women's professional advancement. It also encourages the creation of evidence-based recommendations for organizations, politicians, and industry

stakeholders to improve gender equality, inclusive leadership, and long-term career advancement prospects for women in Karnataka's manufacturing sector.

## Discussion

The analysed literature offers in depth understanding of the glass ceiling phenomenon within the manufacturing industry, especially concerning the advancements of women's careers in Karnataka. The results show that women's advancement into managerial, technical, and leadership roles is affected by a mix of organizational, socio-cultural, psychological, and structural factors, rather than solely by their merit or capabilities. Even though numerous organizations advocate for gender equality through formal policies, the literature clearly indicates that invisible obstacles persist, hindering women's progress, which supports the notion that the glass ceiling is more of a structural hurdle than a mere illusion.

## Impact of Organizational Structure and Promotion Practices

A frequent pattern in the research demonstrates that organizational structures and promotion processes continue to encourage men's career pathways. Morrison et al. (1987) and Oakley (2000) observed that promotion criteria frequently promote long-term careers, prolonged work hours, and unspoken managerial expectations, all of which disadvantage women. Similarly, Rao (2020) and Heilman (2012) noted that subjective performance appraisals and subtle gender biases harmed women's prospects of development. Women's accomplishments are routinely disregarded in manufacturing industries, where leadership is generally cast in a masculine mould, even when their talents and qualifications match those of their male contemporaries. Schein (2007) and Sahay (2021) claimed that leadership attributes are typically associated with masculinity, causing women leaders to face harsh reality.

## Gender Segregation and Occupational Inequality in Manufacturing

The available literature clearly demonstrates major occupational segregation in the manufacturing business. In accordance with Wirth (2001), Elson and Pearson (1981), and Das (2020), women tend to be clustered in repetitive, low-skilled, and administrative roles, whereas men are more prone to hold technical, operational, and management positions. This type of horizontal and vertical isolation denies women access to skill development, visibility, and progression to leadership positions. Research on Karnataka and the Indian manufacturing sector, including the Government of Karnataka Industrial Reports (2018), NASSCOM & KPMG Report (2019), and the Government of Karnataka (2022), has revealed that women remain underrepresented in senior technical and leadership roles, despite a moderate level of workforce participation. These data suggest that structural disparities continue to influence women's career prospects in manufacturing firms.

## Role of Socio-Cultural Expectations and Work-Family Conflict

The impact of sociocultural expectations and domestic responsibilities on women's career progress is a common issue across the literature. According to Ramaswami et al. (2017), Greenhaus and Beutell (1985), and Ramu (1989), women regularly experience job interruptions as a result of caring responsibilities and domestic responsibilities. Such disruptions limit possibilities for progression and contribute to delayed career advancement. In India, traditional conventions still perceive women as primary caregivers, limiting their availability for demanding industrial professions that involve travel, night shifts, or long hours. According to Kapoor (2023) and the International Labour Organization (2018), concerns about workplace safety and problems with mobility are additional obstacles to women's inclusion in leadership roles. These socio-cultural limitations strengthen the ongoing presence of the glass ceiling in manufacturing industries.

## Mentorship, Networking, and Leadership Visibility

The literature additionally highlights the relevance of mentorship, networking, and visibility for career advancement. Ragins and Cotton (1999) discovered that women had fewer opportunities for influential mentorship than men, which impedes their professional development and preparation for leadership positions. Similarly, Ibarra et al. (2010) found that women are commonly omitted from informal networks and important high-visibility projects required for advancement and acclaim in leadership. Catalyst India (2020) and Shivhare & Gurunathan (2024) argued that being excluded from critical decision-making arenas and informal organizational networks reduces women's access to leadership opportunities. The results of these studies indicate that career advancement in the manufacturing business is impacted not just by individual performance but also by social and organizational relationships.

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## Skill Development and Training Disparities

Several studies have identified unequal access to technical training and advanced skill development opportunities as a significant barrier to women's advancement in the manufacturing sector. The World Bank (2020), Mehrotra (2022), and NSDC (2021) discovered that women have fewer opportunities for specialised technical training than men. As a result, women are underrepresented in managerial and administrative tasks demanding technical skills. The findings show that gendered job dispersion and unequal training opportunities exacerbate structural barriers and impede women's access to higher-level roles. This lack of technical experience notably contributes to career stagnation among female employees in the manufacturing industries.

## Psychological Factors and Gender Stereotypes

Psychological barriers and gender stereotypes have also emerged as significant influences on women's career advancement. According to Eagly and Karau (2002), women are regularly punished for both displaying traditional feminine characteristics and engaging in assertive leadership behavior. Sandberg (2013) went on to describe how societal conditioning contributes to women's lack of confidence and fear of failure, discouraging them from pursuing leadership positions. Mathur Helm (2006) observed that female managers in male-dominated businesses frequently face pushback from subordinates and coworkers, undermining their authority and preventing professional advancement. These findings imply that psychological and social biases continue to reinforce the notion that men are better suited to leadership roles.

## Workplace Environment, Safety, and Inclusivity

The findings reveal the importance of inclusive workplace cultures in promoting women's career advancement. Sudarshan and Bhattacharya (2009) discovered that inadequate workplace infrastructure, such as sanitation and childcare services, has a detrimental influence on women's retention and long-term commitment. Sharma and Kaur (2021) also discovered that many industrial firms lack gender-sensitive organizational climates, causing women to feel isolated in male-dominated settings. Workplace harassment and hostile corporate cultures have also been identified as major factors of job dissatisfaction and reduced leadership aspirations among female employees (Fitzgerald et al., 1997). These obstacles, when combined, restrict women's participation in leadership roles and contribute to high turnover rates in mid-career stages, resulting in what McKinsey Global Institute (2021) refers to as a "leaky pipeline" effect.

## Glass Ceiling: Illusionary Belief or Structural Barrier?

The literature clearly supports the argument that the glass ceiling is a long-standing structural and institutional obstacle to women's professional advancement in the manufacturing sector. While some businesses foster formal equality through diversity efforts and gender-neutral human resource policies, Kumari (2025), Rao & Kelleher (2005), and Prakash & Yadav (2025) discovered that implementation gaps, unconscious prejudice, and organizational culture continue to disadvantage women.

The data indicate that the glass ceiling operates on multiple interlinked levels, including organizational bias, occupational segregation, socio-cultural expectations, unequal access to mentorship and training, workplace safety issues, and psychological obstacles. In Karnataka's manufacturing sector, these barriers have a strong foundation in industrial structures and societal norms, limiting women's access to senior leadership and decision-making roles.

## Research Gap

### 1. Limited Research on the Glass Ceiling as Perception or Reality.

Most previous studies have identified the glass ceiling as a barrier to women's career advancement, but very few have examined whether it is a psychological perception or an actual organizational barrier in manufacturing industries. Existing study focuses on general disparity between genders rather than the "glass ceiling conundrum" in Karnataka's industrial sector.

### 2. Lack of Research on AI-Based Appraisal Systems and Industry 4.0

Organizations' recruitment, evaluation, and promotion methods have transformed as AI-based appraisal systems and Industry 4.0 technologies become more widely used. However, couple of studies has explored whether technology-driven processes promote latent gender bias against female employees in manufacturing firms. This technological aspect is underexplored in current studies.

### 3. Limited Comparative Studies Between Shop-Floor and Managerial Roles.

Most studies consider female employees as a homogeneous group, failing to compare the hurdles that women come across on the shop floor to those in managerial positions. There is a lack of understanding about how job issues, career possibilities, safety concerns, and leadership access differ at the operational and managerial levels.

### 4. Lack of Region-Specific Studies in Karnataka

Although various national and international studies have addressed the glass ceiling, little research has focused on Karnataka's manufacturing industry. Existing research rarely looks into how regional industrial culture, organizational practices, and socio-cultural elements affect women's professional advancement within the state.

#### Findings

- The glass ceiling in Karnataka's industrial sector serves as a genuine organizational impediment to women's career advancement.
- Male employees are still given preferential treatment in organizational culture and advancement methods.
- AI-powered rating systems may amplify concealed gender prejudice in promotions.
- Women in shop floor and administrative positions experience significant career progression hurdles.
- Work-family conflict limits women's leadership opportunities.
- Women's professional development is limited due to a lack of mentorship and technical training.
- Gender-neutral rules alone are insufficient to reduce workplace inequity.

#### Conclusion

The current study suggests that the glass ceiling in Karnataka's manufacturing industry is more than just an illusion, but a persistent structural and organizational obstacle to women's professional advancement. The literature study clearly shows that, despite growing female labor force participation, women continue to be underrepresented in technical, managerial, and leadership roles. Organizational culture, gender stereotypes, biased promotion systems, unequal access to training, a lack of mentorship, and work-family conflict all impede women's advancement in manufacturing industries.

The study also finds that male-dominated industry structures and informal organizational practices continue to benefit men's advancement in their careers. The introduction of AI-based assessment systems and Industry 4.0 technologies, while designed to promote efficiency and impartiality, may unintentionally perpetuate underlying gender prejudices through data-driven decision-making processes. In addition, women in shop-floor occupations face more impediments to safety, skill development, and occupational segregation than women in managerial positions.

The findings indicate that gender-neutral rules are ineffective unless they are accompanied by an inclusive company culture, transparent promotion methods, mentorship opportunities, and gender-responsive workplace infrastructure. Overall, the study emphasizes the critical need for regulatory reforms, organizational accountability, and inclusive leadership approaches to guarantee women have equitable career progression chances in Karnataka's manufacturing industry.

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