



Factors affecting women's enrolment in construction field

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ABSTRACT: The issues relating to women in construction exist internationally and, over the years . Construction is traditionally a male industry .It is generally observed that there is a low involvement of female in Indian construction industry. This paper reviews previous literature on factors affected to women on construction and findings from a survey which investigated whether there are significant differences in self-perception between men and women in construction. Purpose of this study to identify and analyse factors that affect the women in construction industry. The data collected were mainly through field survey. Questionnaires were distributed to the professionals. Evidence shows that , The approach of questionnaire survey were conducted with female practitioners in the construction industry. 115 completed questionnaires were received . Stress, family-work balance, High pay grade, sexual! Discrimination, leadership, position, victimization, Culture and environment, Industry Poor Image, long working Hours towards women in construction were the top 10 factors identified.

KEYWORDS: construction site, engineers, work-life balance, women, culture, Questionnaire survey.

INTRODUCTION:

By building infrastructure and creating jobs, the construction industry is one of the pillars of a growing Indian economy. Construction has the highest number of unorganized workers in India after agriculture. Women constitute a significant part of the workforce in India, and the construction industry has a large pool of unskilled Labours.

Since 1996, the overall proportion of women working in the construction industry has been fluctuating between 9 and 10 percent, and it is currently 10.6 percent. However, just 10% of the 8.3 million people working in the extractive and construction sectors' field production in 2022 were women.

Construction workers participation rates are increasing for women. Unorganized sector workers, especially those in construction, face many problems. In many cases, the basic rights and duties of women workers are violated, including sexual harassment at the workplace, occupational hazards, and inadequate safety measures, which negatively affects their mental health and their right to work with dignity.. Due to pregnancy, pregnant construction workers have been unable to receive maternity benefits and remain jobless. Construction women are predominantly casual workers. Their jobs require physical exertion and close supervision, which leads to injuries and industrial accidents. Wage discrimination is prevalent in construction operations, where women perform better. A number of national and international laws have not improved the socioeconomic conditions for women in construction. One of the most serious problems for women in this sector is sexual harassment. The vast majority of sexual harassment on construction sites goes unnoticed since the victims hide their actions. The present study analyses the working conditions and problems facing women workers in the construction industry Having an Equal opportunity and equal treatment in the workplace underpins decent work. However, women around the world still face additional obstacles not only obtaining employment , but obtaining decision making positions and jobs in certain criteria.

OBJECTIVE:

- To explore and examine issues such as discrimination, under-representation of women in construction.glass ceilingeffect.
- To identify initiatives and campaigns that would prolong the lifespan of female engineerswithinthe construction industryin terms ofsupport systems.

RESEARCH METHODOLOGY:

- **LITERATURE REVIEW:**

Literature review was done from previously published research paper on this topic from various international journals to know the previous work done on this type projects.

- **DATA COLLECTION:**

Data collection done by questionnaire survey after identification of various factors from literatures and opinions of experts. Questionnaire will be prepared for the construction professionals in construction companies, consultancies for identify their views on factors affecting women's enrolment in construction field.

- **DATA ANALYSIS:**

Data analysis done on how respondent's respondents rate the questions by the various parameters based on their own experienceand knowledge.

LITRETURE REVIEW:

Many of the practitioners, researchers, authors, voluntary organizations, and Government agencies have undertaken several studies on women's employment and their problems. Women construction workers are exploited because they are illiterate, socially backward, unskilled, unorganized, uninformed and poor (Johri and Pandey) Vinita Shah (1998) found that non-implementation of labour laws. Anand (1998) observes that the wages of the women workers in the unorganized sector, particularly in the construction industries, have been significantly below the minimum wage payable under the Minimum Wages Act 1948. Gender discrimination was well entrenched and women workers were paid less than men workers for similar work (Vettriselvan, R., & Balakrishnan, A, 2013). Over three fourth of the women workers in the construction sector are working for more than 10 to 12 hours every day (Ram Lakhani 2004). Sexual harassment at workplace affected the workers and many seek to opt for other contractors. Vaughn (1999) reported tainted image and reputation of the construction industry and claims that sexual harassment is inherent in the construction sector. Most of the research studies reveal the fact that the conditions of women construction workers were found to be pathetic and their legal rights violated to great extent. The problems pointed out in the previous researchers were taken as a main theme to conduct this present study.

It is widely acknowledged that the construction industry has a problem with its image, which causes both men and women to be unwilling or uninterested in it ([Bennett et al, 1999](#); [Fielden et al, 2000](#)). Research shows that the image of the industry militates against female entry. The industry is generally viewed as a male-dominated field that requires brute strength and a tolerance for harsh weather conditions, inclement weather, and bad language ([Agapiou, 2002](#)). According to [Court and Moralee \(1995\)](#), the under-representation of women in construction began to become a problem in the 1980s. In 1988, women made up less than 7% of the full-time construction industry workforce in Britain. The Equal Opportunities Commission ([EOC](#)) published its annual report in 1995, highlighting the fact that women are underrepresented in most sectors of the economy, including agriculture, energy, and water, as well as manufacturing and transport. There have been numerous studies conducted since then that show women are underrepresented in the construction industry ([Gale, 1994a](#); [Fielden et al, 2000](#)).

Development and developing nations have different distributions of women workers in these three groups. A study conducted in the United Kingdom revealed that 84% of women in construction hold secretarial posts, only 10% hold professional positions, and 6% work as craft and trade workers on construction sites ([Amaratunga et al., 2006](#)). According to [Adeyemi et al. \(2006\)](#), only 16.3 percent of Nigerian construction workers are women, of whom 50 percent are administrative staff, 10 percent are professional and managerial staff, and 2.5 percent are craftsmen. Whereas, in India, women construction workers constitute 25% of the construction workforce in India. In the construction industry, there are 32,6 million people employed, of which 8.2 million are women, and 1.4% are engineers, architects, designers, and administrators ([Chittibabu, 2007](#)). The remainder work as construction laborer. Consequently, in India studies are primarily focusing on the women from the third group, as they are the majority.

In Indian urban and rural populations face extreme poverty conditions, and single mothers and destitute women who are struggling to support their children need regular income sources. As a result of the seasonal demand for labour in agriculture, most of these women are forced to work on construction sites. There have also been reports of women belonging to poor and disadvantaged castes being forced to work at construction sites for a living ([Madhok, 2005 as quoted in Barnabas et al., 2009](#)). All such women constitute the third group. Although women are employed in semi-skilled, and sometimes skilled, jobs in other industries, they are mainly employed as unskilled laborers in the construction industry ([Baruah, 2010](#)). Their work entails mainly physical labor, such as carrying material on and off higher floors and cleaning. There is no opportunity for them to learn skills such as carpentry and masonry work, and they are not allowed to advance within the hierarchical system. According to a study conducted across four countries, India, Mexico, Ghana and Jamaica, the sharpest differences occurred in India in terms of gender roles ([Habitat, 1997 as quoted in Barnabas et al., 2009](#)).

The predominant barrier is related to the perception of sexual harassment. Because the industry is dominated by men, [Amaratunga et al. \(2006\)](#) noted that these values become the standard in the industry, including prolonged working hours, competition among colleagues, and self-sufficiency. [Amaratunga, et al. \(2006\)](#) indicated that because the industry is. Other issues include negative perceptions of women capabilities ([Chun, Arditi and Balci, 2009](#)); minimal recognition on project sites ([Menches and Abraham, 2007](#)); expectations to mimic males aggressive behaviors ([Maskell-Pretz and Hopkins, 1997](#)); absence of positive influences such as lack of role models/mentors ([Yates, 2001](#)); difficulty in finding a balance between personal goals and professional goals (quality of work life, family/work life balance) ([Hatipkarasulu and Roff, 2011](#)); slow career progression ([English and Lejeune, 2012](#)); high stress levels linking to career, lack of recognition and encouragement from supervisors, asked to do repetitive minor tasks, undervalued and low potential for career advancement ([Loosemore and waters](#)); discrepancies between women's perceived societal roles and the image of the image of the construction industry, unfair judgement of training needs, misjudged on performance compared with male counterparts, being restricted to clerical/administration roles ([Dainty and Lingard, 2006](#)).

Women had a negligible presence in the field of engineering in India until the early 1980s. It is only in the last 15 years that their enrollment has increased. Movements of this nature began in the southern states and spread to other parts of the country over time. Despite an increase in the quantity of female engineers, these people are experiencing difficulties in their careers. These issues must be identified and evaluated. The two studies on female engineers at IIT Bombay were funded by the science and technology department. This paper summarizes the key conclusions of these studies. The goal of the first study ([Parikh and Sukhatme 1992, 1994, 1997](#)) was to collect, compile, and analyze data about female BE, BTech, and BSc (Eng)'s degree recipients from across the country from 1975 to 1990. The study focused on the following issues: (1) Data on enrolment and out-turn, state wise and discipline wise; (2) Job opportunities, job status, nature of work, career profiles and career problems of women engineer. [Parikh and Sukhatme \(2002\)](#) recently completed the second study. The women who graduated with a bachelor's degree in civil engineering, computer science/engineering, electrical engineering, electronics engineering, and mechanical engineering¹ in the years 1994-98 were the subjects. This study was more specific than the previous one, which was more general in nature. Andhra Pradesh, Delhi, Gujarat, Karnataka, Kerala, Maharashtra, and Tamil Nadu were the states where these women lived and studied

METHODOLOGY:

➤ DATA COLLECTION:

1.GENERAL:

- Data collection, which may be divided into two categories, quantitative approach and qualitative approach, generally refers to a plan of action that allows the objectives of the study to be questioned.
- Qualitative and quantitative approaches are the two categories into which the information received is split in order to create a plan that can be reviewed in order to accomplish the study goal
- The less systematic research method known as a qualitative survey is used to gather information about people's innermost thoughts and sources of inspiration

2.SURVEY PLANNING:

The Survey are sent through email and online platform is used for data collection work. The main goal is gathered information of factors affecting women's enrolment in construction field.

3. QUESTIONNAIRE DESIGN :

To obtain the opinions of diverse respondents in the construction business, questionnaire surveys were undertaken. The results of the survey are utilised to enhance the capabilities of construction MSMEs.

1	2	3	4	5
Very Low	Low	Medium	high	Very High

Table 1. Liker Scale

➤ DETERMINATION OF QUESTIONNAIRE & SAMPLE SIZE DETERMINATION:

Several Owners, Engineers, Partners, and Project Managers received the questionnaire after being informed of the study's goals and having their agreement to participate in the study sought. Once the respondents in Ahmedabad demonstrated their initial consent. Calculate net is used to determine the sample size. Here 99% confidence level is taken.

The sampling error to be estimated is 12%

Sample Size Calculator

Find Out The Sample Size

This calculator computes the minimum number of necessary samples to meet the desired statistical constraints.

Result

Sample size: **116**

This means 116 or more measurements/surveys are needed to have a confidence level of 99% that the real value is within $\pm 12\%$ of the measured/surveyed value.

SR.NO	FACTOR
1	To what extent do you expect the introduction of pay gap reporting to have an impact on reducing the difference in pay ,over the next 5 years
2	In what timeframe have you experienced harassment or victimization
3	After having children did you Resign to look for more flexible work
4	After having children did you Take a part- time role or role as a lower pay grade
5	After having children did you Become self employed
6	After having children did you Change role but remain at the same level
7	After having children did you Get promoted to a more senior role/higher pay grade
8	After having children did you Stay in the same role with the same working hours
9	Do you think you and your equally capable , colleagues are paid/rewarded in an equal manner regardless of gender
10	In what timeframe have you experienced sexual discrimination in the workplace during your career
11	Are the same career opportunities available to men and women where you work
12	Are you sometimes given different jobs or tasks to do compared with the men you work with
13	Have you ever experienced disadvantage in the construction industry because of your gender
14	Have you had any negative experiences being a woman working in the construction industry
15	Do you feel you are treated the same as men at work
16	If you are treated differently, how often does this happen
17	Do you feel you are recognized for the good work you do
18	In comparison with your male counterparts do you feel more, less or equally recognized
19	Do you feel that attitudes and behavior towards women in construction have changed during your career
20	Do you think you are being paid, or have in the past been paid, differently to your male colleagues at the same level
21	Are you provided with the right equipment (including the right size) to carry out your role, including Personal Protective Equipment (PPE) if required
22	Have you ever felt isolated working in a predominantly male environment
23	have never worked in a predominately male environment
24	Were you ever discouraged from choosing construction as a career
25	Do you believe having children negatively affects a woman's career in construction
26	Do you feel women and men have equal opportunity for career progression in your current organization
27	Do you feel secure in your job
28	Have you ever experienced sexual! discrimination in the workplace during your career
29	Do you aspire to a senior leadership position (director or board level), in construction

➤ DATA ANALYSIS:

For the data analysis Frequency Index Method was used and, formula of FI is given below;

$$\text{Frequency Index FI (\%)} = \sum a \times \frac{n}{N} \times \frac{100}{5}$$

Where,

a is the constant weight given to each response (range from 1 to 5),

n is the frequency of the index and

N is the total number of responses.

➤ SAMPLE SIZE DETERMINATION:

No. of Questionnaire distributed	Total Responses	Responses in %
116	115	99.13%

Table -3: Details of Responses

➤ Reliability Test:

A researcher study's or a measuring test's consistency is referred to as its reliability, under this work, excel was used for analysis using CRONCHBAND'S METHOD.

$$\alpha = \frac{K}{K-1} \left[1 - \frac{\sum s^2 y}{s^2 x} \right]$$

$$\alpha = \frac{29}{29-1} \left[1 - \frac{39.3}{305} \right]$$

$$\alpha = 0.89$$

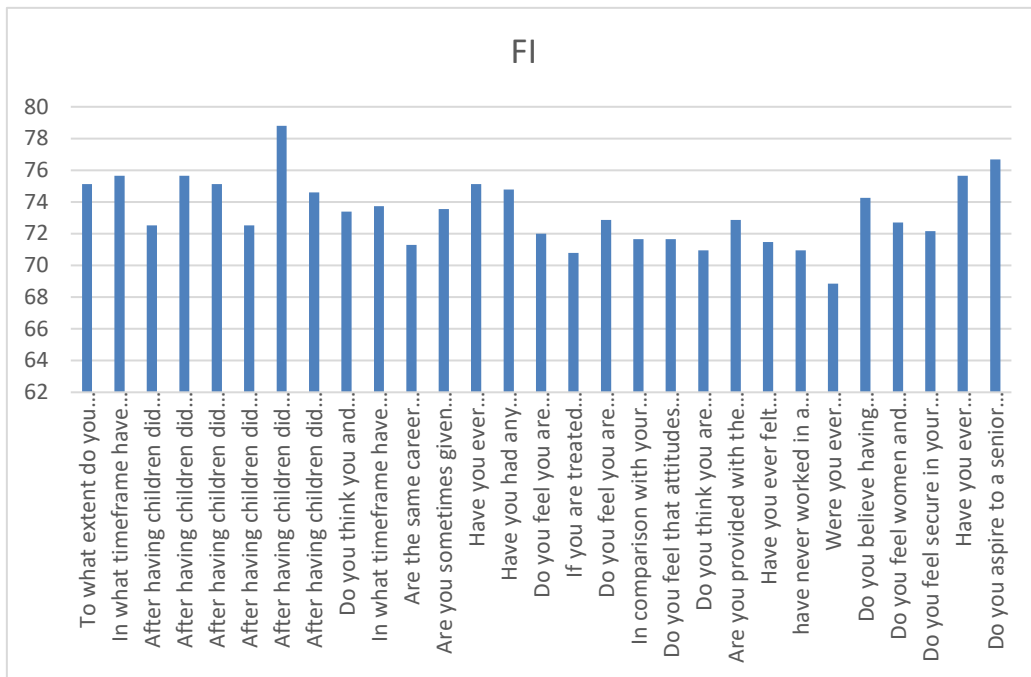
Variables	Description	Values	Internal Consistency
K	No. of items	39	Good
$\frac{\sum s^2 y}{s^2 x}$	Sum of the item variance	38.3	
$s^2 x$	Variance of total	305	
α	Cronbach's alpha	0.89	

➤ **FI & THE RANKING OF FACTORS AFFECTING WOMEN'S ENROLMENT IN CONSTRUCTION:**

Table 5. FI & Ranking of Factors

SR.NO	FACTOR	FI	RANK
1	After having children did you Get promoted to a more senior role/higher pay grade	78.81	1
2	Do you aspire to a senior leadership position (director or board level), in construction	76.69	2
3	In what timeframe have you experienced harassment or victimization	75.65	3
4	After having children did you Take a part- time role or role as a lower pay grade	75.65	4
5	Have you ever experienced sexual! discrimination in the workplace during your career	75.65	5
6	To what extent do you expect the introduction of pay gap reporting to have an impact on reducing the difference in pay ,over the next 5 years	75.13	6
7	After having children did you Become self employed	75.13	7
8	Have you ever experienced disadvantage in the construction industry because of your gender	75.13	8
9	Have you had any negative experiences being a woman working in the construction industry	74.78	9
10	After having children did you Stay in the same role with the same working hours	74.6	10
11	Do you believe having children negatively affects a woman's career in construction	74.26	11
12	In what timeframe have you experienced sexual discrimination in the workplace during your career	73.73	12
13	Are you sometimes given different jobs or tasks to do compared with the men you work with	73.56	13
14	Do you think you and your equally capable , colleagues are paid/rewarded in an equal manner regardless of gender	73.39	14
15	Are you provided with the right equipment (including the right size) to carry out your role, including Personal Protective Equipment (PPE) if required	72.86	15
16	Do you feel you are recognized for the good work you do	72.86	16
17	Do you feel women and men have equal opportunity for career progression in your current organization	72.71	17
18	After having children did you Resign to look for more flexible work	72.52	18
19	After having children did you Change role but remain at the same level	72.52	19
20	Do you feel secure in your job	72.17	20
21	Do you feel you are treated the same as men at work	72	21
22	Do you feel that attitudes and behavior towards women in construction have changed during your career	71.65	22
23	In comparison with your male counterparts do you feel more, less or equally recognized	71.65	23
24	Have you ever felt isolated working in a predominantly male environment	71.47	24
25	Are the same career opportunities available to men and women where you work	71.3	25
26	have never worked in a predominately male environment	70.95	26
27	Do you think you are being paid, or have in the past been paid, differently to your male colleagues at the same level	70.95	27
28	If you are treated differently, how often does this happen	70.78	28
29	Were you ever discouraged from choosing construction as a career	68.86	29

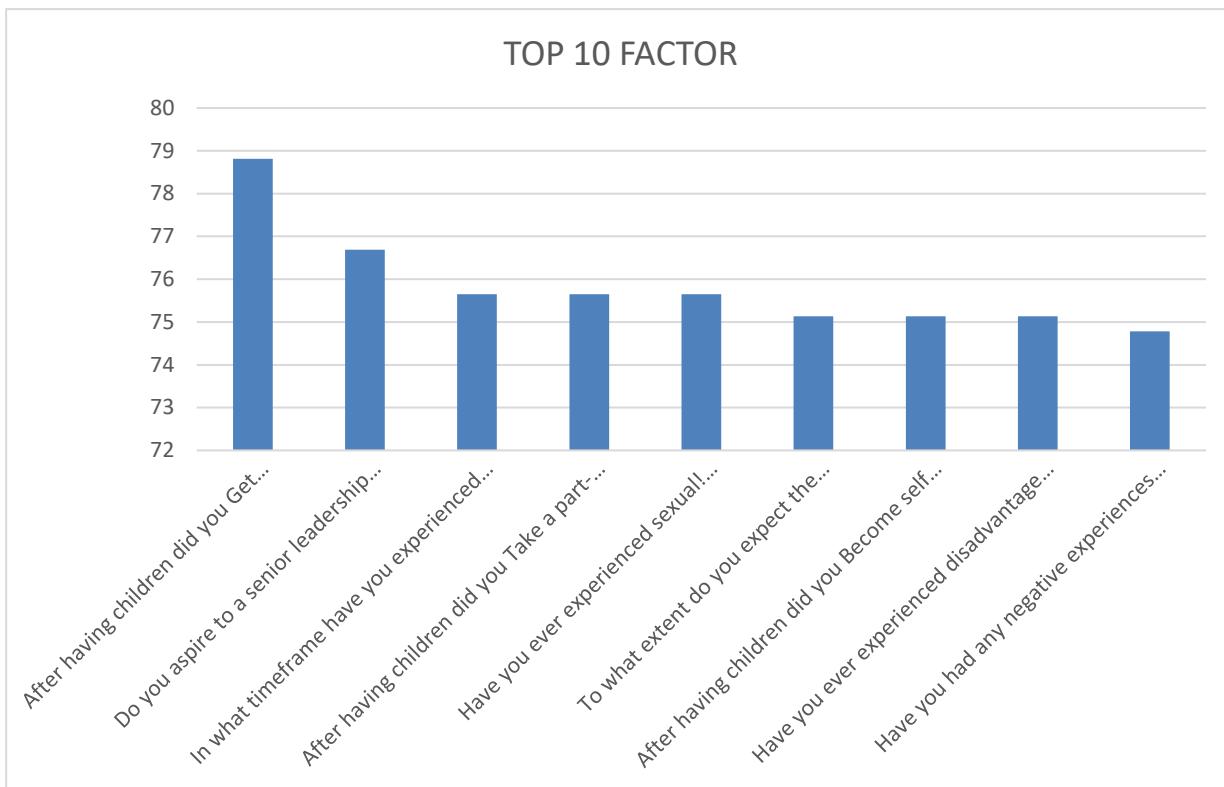
Chart 1 – FI factors



➤ **TOP 10 FACTORS AFFECTING WOMEN’S ENROLMENT IN CONSTRSTRUCTION FIELD.**

Table 6 –top 10 factors

After having children did you Get promoted to a more senior role/higher pay grade	78.81
Do, you aspire to a senior leadership position (director or board level), in construction	76.69
Have you ever experienced sexual! discrimination in the workplace during your career	75.65
In what timeframe have you experienced harassment or victimization	75.65
After having children did you Take a part- time role or role as a lower pay grade	75.65
To what extent do you expect the introduction of pay gap reporting to have an impact on reducing the difference in pay ,over the next 5 years	75.13
After having children did you Become self employed	75.13
Have you had any negative experiences being a woman working in the construction industry	74.78
After having children did you Stay in the same role with the same working hours	74.6
Do you believe having children negatively affects a woman's career in construction	74.26



CONCLUSION:

some factors which are affect the women's in construction field. My thesis work on identifies the factors that affect the women's in construction and analyse the top factors I collected the factors which affects the women. And prepare a questionnaire with help of 4 industry experts that will help me to get my desire calculation. In data validation with the help of experts add some factors and remove some factors and finalize some factors for survey create Google form and distributed to construction professionals people. My sample size is 116, in all form 115 responses are receive and after all that I collection and analysis data from respondent send. In all data collection & analysis done major finding is top 10 factor are affected.

In all data collection & analysis done major finding is top 10 factor are affected in construction industry.

- After having children did you get promoted to a more senior role /higher pay grade.
- Do, you aspire to a senior leadership position (direct or boardlevel) in construction.
- Have you ever experienced sexual!! Discrimination in the workplace during your career.
- In what time frame have you experienced harassment or victimization
- After having children did you take a part-time role or role as a lower pay grade.
- To what extend do you expect the introduction of pay gap reporting to have an impact on reducing the difference in pay , over the next 5 year.
- After having children did you become self employed
- Have you had any negative experiences being a woman working in the same construction industry.
- After having children did you stay in the same role with the same working hours.
- Did you believe having children negatively affects a women's career in construction.

To conclude, career of women in construction industries has faced many challenges since the beginning of construction era which includes mental and physical stress, work-life imbalance, demeaning perception towards women's skill and capability, long working hours, mental and physical absurd behaviour from other gender towards women etc.

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FUTURE SCOPE:

A gender-sensitive approach to workplace health and safety takes into account the distinctions between men and women employees, recognising the variations in risk exposures and working circumstances, and devising methods that would satisfy everyone's demands in terms of health and safety. In order to incorporate the unique requirements of women in the formulation of health and safety promotion policies, consideration should be given to the impact of gender on workplace health and safety as well as the experiences of women.

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