

Sanitation Deficits and Labour Precarity among Urban Women Workers

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Abstract

Urban India has witnessed an increase in women's participation in paid work, largely concentrated in informal and service-sector occupations (Kabeer, 2012; World Bank, 2012). However, this participation remains fragile, shaped by poor working conditions, employment insecurity and inadequate workplace infrastructure (Chen, 2012; ILO, 2018). Among these constraints, access to sanitation and menstrual hygiene management (MHM) at workplaces remains a critical but under-examined determinant of women's labour outcomes, despite evidence that infrastructure deficits affect work continuity and productivity (Duflo, 2012; OECD, 2016). Drawing on a mixed-methods study of 149 women workers across five occupational categories in Tiruchirappalli city, this paper examines how workplace sanitation varies by employment category and how sanitation deficits affect women's work participation, productivity, income and dignity. Anchored in a feminist political economy and social infrastructure framework (Rai et al., 2014; UN Women, 2015), the study shows that informal women workers—particularly construction workers, street vendors and domestic workers—face severe sanitation and MHM deficits that translate into work interruptions, absenteeism, income loss and heightened bodily stress, patterns also observed in related studies on sanitation insecurity (Sahoo et al., 2015; O'Reilly, 2016). The findings reveal a clear gradient in sanitation access aligned with employment status and income, highlighting sanitation as productive social infrastructure rather than a peripheral welfare concern. The paper argues that neglecting workplace sanitation in urban labour and sanitation policy reproduces gendered labour inequalities and undermines inclusive urban economic development (Rai et al., 2019).

Keywords: Workplace sanitation; Women workers; Informal employment; Menstrual hygiene management; Urban labour markets; Gender and development; Social infrastructure.

1. Introduction

Urban India has witnessed a steady expansion of women's participation in paid work, particularly in informal and service-sector occupations (Kabeer, 2012; World Bank, 2012). This participation, however, remains fragile, characterised by low wages, employment insecurity and poor working conditions (Chen, 2012; ILO, 2018). While economic analyses of women's labour participation focus largely on education, wages and household responsibilities, scholars increasingly argue that workplace conditions and infrastructure play a critical role in sustaining women's employment (Duflo, 2012; OECD, 2016). Among

these infrastructural conditions, access to sanitation at workplaces remains a critical but under-analysed determinant of women's labour outcomes.

Sanitation has conventionally been examined within the domains of public health, household welfare and urban service delivery. Extensive research has demonstrated strong links between inadequate sanitation and adverse health outcomes, environmental degradation and household well-being (Hutton & Haller, 2004; Spears, 2013; Coffey et al., 2017). However, this literature rarely conceptualises sanitation as an economic variable shaping labour supply, productivity and work continuity, particularly for adult women workers. Feminist political economy scholars argue that such omissions reflect the systematic separation of bodily needs and social reproduction from analyses of economic production (Rai et al., 2014). For women workers—especially those engaged in informal and mobile occupations—the absence of safe and accessible sanitation at workplaces imposes significant bodily, economic and psychological costs. Empirical studies document how women cope with sanitation deficits by restricting water intake, suppressing biological needs, interrupting work or leaving worksites altogether, resulting in lost work hours, income loss and psychosocial stress (Sahoo et al., 2015; O'Reilly, 2016). These coping strategies contribute to time poverty and labour depletion, limiting women's capacity to sustain paid employment (Ferrant et al., 2014; Rai et al., 2019). Sanitation insecurity is deeply gendered, shaped by concerns of safety, privacy and dignity (Joshi et al., 2011; O'Reilly, 2016). Evidence from urban India shows that inadequate sanitation generates psychosocial stress across the life course, particularly in densely populated and surveilled urban environments (Sahoo et al., 2015). Urban studies further demonstrate that sanitation access is structured by caste, class and spatial planning regimes, often excluding informal settlements and worksites from formal provision (McFarlane, 2008; Desai et al., 2015; Baviskar, 2003).

Despite these insights, sanitation research continues to privilege households, schools and public spaces, leaving workplaces—especially informal and mobile worksites—largely unexamined. This gap is particularly evident in studies of menstrual hygiene management (MHM). While a growing body of literature links inadequate MHM to school absenteeism among adolescent girls (Sommer et al., 2015; Kaur et al., 2018), reviews note a paucity of empirical research on adult women's workplace experiences (Sommer et al., 2015; UNICEF, 2019). These gaps are especially salient in urban India, where informal employment dominates women's work and sanitation governance is fragmented across institutions (Chen, 2012; ILO, 2018). Against this backdrop, this paper examines workplace sanitation as a neglected dimension of women's economic participation in urban labour markets. Focusing on Tiruchirappalli city in Tamil Nadu, it analyses how access to sanitation and menstrual hygiene management varies across occupational categories and how these variations affect women's work participation, productivity and dignity.

Research Questions

1. How does access to workplace sanitation differ across formal and informal occupations for women workers in urban contexts, given documented inequalities in infrastructure provision?
2. In what ways do sanitation and menstrual hygiene management deficits affect women's labour participation, work continuity, productivity and income?

3. How do employment informality, caste and workplace power relations shape responsibility for sanitation provision?
4. Why do existing urban sanitation and labour policies fail to adequately address workplace sanitation for informal women workers?

Research Gap:

Despite extensive research on sanitation and health (Hutton & Haller, 2004; Coffey et al., 2017) and a substantial literature on women's informal employment (Chen, 2012; ILO, 2018), the intersection of sanitation and women's labour outcomes remains weakly theorised and empirically under-explored. Sanitation is rarely conceptualised as a productive input shaping labour participation, particularly in informal and mobile workplaces. Research on menstrual hygiene management has focused primarily on adolescent girls and educational outcomes, leaving adult women's labour experiences largely unexamined (Sommer et al., 2015; UNICEF, 2019). Moreover, urban sanitation policy continues to prioritise households and public toilets, overlooking workplaces as critical sites of gendered infrastructure provision (McFarlane, 2008; Desai et al., 2015). This paper addresses these gaps through an empirical examination of workplace sanitation and MHM in urban informal employment.

This paper contributes to the literature on gender and economic development in three ways. First, it conceptualises workplace sanitation as a form of social infrastructure that shapes women's labour market participation, productivity and dignity, extending feminist political economy debates on social reproduction and labour depletion (Rai et al., 2014; Rai et al., 2019). Second, by combining qualitative evidence with descriptive quantitative indicators, it demonstrates how sanitation and menstrual hygiene management deficits translate into concrete economic outcomes such as absenteeism, income loss and work disruption, particularly in informal employment—an area noted as under-researched in existing reviews (Sommer et al., 2015; UNICEF, 2019). Third, it extends debates on urban sanitation beyond households and public toilets by foregrounding workplaces as critical but neglected sites of gendered infrastructure provision in urban development and labour policy (UN Women, 2015).

Literature Review: Sanitation, Gender, and Economic Development

Research on women's labour participation in developing economies has consistently highlighted the role of education, fertility choices, household norms, and labour market structures in shaping women's work outcomes (Kabeer, 2012; World Bank, 2012). More recent scholarship has emphasised informality as a defining feature of women's employment, characterised by weak regulation, limited social protection, and precarious working conditions (Chen, 2012; ILO, 2018), where infrastructure is increasingly recognised as an enabling factor for women's economic participation, particularly access to transport, energy, water, and childcare services (Ilahi & Grimard, 2000; OECD, 2016; Duflo, 2012). Sanitation, however, remains relatively marginal in economic analyses of labour participation. Studies on sanitation and development have largely focused on health outcomes, environmental sustainability, and household welfare, demonstrating the links between inadequate sanitation and morbidity, child health, and human capital formation (Hutton & Haller, 2004; Spears, 2013; Coffey et al., 2017). While this body of work has been

critical in establishing sanitation as a public health priority, it has paid limited attention to sanitation as a factor shaping labour market participation and work conditions, particularly for adult women workers.

Feminist scholarship has drawn attention to the gendered dimensions of sanitation, foregrounding concerns of safety, privacy, dignity, and bodily integrity (Joshi et al., 2011; O'Reilly, 2016). Studies document how women's sanitation insecurity generates psychosocial stress across the life course, with particularly acute effects in urban contexts marked by congestion, surveillance, and social control (Sahoo et al., 2015). Urban and political ecology scholarship further highlights how access to sanitation infrastructure is shaped by spatial planning regimes, caste hierarchies, and class relations, often reproducing exclusion in informal settlements (McFarlane, 2008; Desai et al., 2015; Baviskar, 2003). However, these analyses rarely engage directly with labour markets or women's paid work.

A small but growing body of research suggests that inadequate sanitation can adversely affect work hours, absenteeism, and productivity, especially for women engaged in informal and low-paid occupations (Ferrant et al., 2014; Rai et al., 2019). The burden of managing sanitation needs—often invisibilized as part of unpaid care and bodily labour—can contribute to time poverty and depletion, limiting women's capacity to sustain paid employment (Rai et al., 2014). While menstrual hygiene management has received increasing attention in relation to school absenteeism among adolescent girls (Sommer et al., 2015; Kaur et al., 2018), its implications for adult women's labour participation and workplace dignity remain under-explored.

This gap is particularly pronounced in studies of informal employment, where workplaces are dispersed, mobile, or located in public spaces beyond the reach of conventional regulation (Chen, 2012; ILO, 2018). For women workers in such contexts, the absence of accessible and safe sanitation facilities can exacerbate vulnerability, reinforce gendered inequalities, and undermine economic security. By linking sanitation to labour outcomes, this paper contributes to an emerging perspective that conceptualises sanitation as a form of social infrastructure—one that underpins economic activity by enabling workers to participate fully, safely, and with dignity in paid work (Rai et al., 2014; UN Women, 2015). This perspective is especially relevant in urban India, where rapid urbanisation, informalisation of work, and gendered labour markets coexist with ambitious state-led sanitation initiatives.

Theoretical Framework and Conceptual Approach

This paper draws on an interdisciplinary theoretical framework that integrates feminist political economy, labour market informality, and social infrastructure theory to analyse workplace sanitation as a determinant of women's economic participation.

Feminist Political Economy of Work and the Body

Feminist political economy foregrounds the ways in which economic systems are structured through gendered power relations and the differential valuation of bodies, care and reproductive labour. From this perspective, women's paid work cannot be analysed independently of the bodily and social conditions under which it is performed. Sanitation and menstrual hygiene management (MHM) are central to women's embodied labour experiences, yet they remain systematically excluded from mainstream economic analysis. The absence of sanitation at workplaces transfers the costs of managing bodily needs onto women themselves, reinforcing gendered labour inequalities and rendering these costs invisible within labour markets.

Informality and Labour Regulation

The paper is also informed by theories of labour market informality, which emphasise weak regulation, fragmented employment relations and the shifting of risks from employers to workers. Informality is not merely a sectoral characteristic but a condition that shapes access to rights, protections and workplace infrastructure. In informal employment settings, responsibility for sanitation provision is diffuse or absent, leading to systematic neglect of workers' basic needs. This framework helps explain why sanitation deficits are most acute among construction workers, street vendors and domestic workers, despite urban sanitation reforms.

Social Infrastructure and Economic Development

Building on recent scholarship that conceptualises infrastructure beyond physical assets, this paper treats sanitation as a form of social infrastructure that enables productive economic activity. Social infrastructure supports labour supply by safeguarding health, time use and dignity. When sanitation is absent or inadequate, women workers experience disruptions that translate into reduced labour supply, lower productivity and income loss. Viewing sanitation through this lens allows the paper to link micro-level experiences to broader debates on inclusive economic development. Bringing these perspectives together, the study conceptualises workplace sanitation as a mediating factor between employment and women's labour outcomes. Gendered bodily needs intersect with informality and weak regulation to produce unequal access to sanitation, which in turn shapes work participation, absenteeism and earnings. This integrated framework enables the analysis to move beyond descriptive accounts of sanitation deficits to explain their persistence and economic consequences within urban labour markets.

Methodology

The study was conducted in Tiruchirappalli city, a major urban centre in Tamil Nadu with a population exceeding one million and a diversified urban economy comprising construction, services, retail trade and public administration. The city has been an active participant in national urban sanitation initiatives, including the Swachh Bharat Mission (Urban) and city-wide inclusive sanitation planning. Despite reported improvements in household sanitation coverage, access to sanitation at workplaces—particularly informal and mobile worksites—remains uneven. The research adopted a mixed-methods design with a qualitative-dominant approach, supplemented by descriptive quantitative analysis. This design was chosen to capture both the prevalence of sanitation access across occupations and the lived experiences of women workers in managing sanitation and menstrual hygiene in work settings.

Sample and Data Collection

Primary data were collected from 149 women workers across five occupational categories: construction workers, domestic workers, street vendors, retail shop workers and clerical staff in private and government offices. A stratified purposive sampling strategy was adopted to ensure representation across age groups, caste categories and employment arrangements. Data collection methods included:

- Focus group discussions (FGDs) with occupational groups to capture shared experiences and norms;
- In-depth interviews (IDIs) with women facing specific vulnerabilities, including disability, chronic illness and post-hysterectomy status;

- Key informant interviews (KIIs) with employers, labour representatives, trade union leaders and urban officials;
- Physical observation and documentation of sanitation facilities at or near worksites.

In addition, a structured schedule was used to collect basic quantitative information on sanitation access, distance to facilities, frequency of usage, menstrual hygiene practices and work disruptions. Qualitative data were transcribed, coded and thematically analysed using an inductive approach. Quantitative data were analysed using simple descriptive statistics to identify occupational patterns in sanitation access and work-related outcomes. Triangulation across methods enhanced the robustness of findings. Ethical clearance was obtained from the institutional ethics committee, and informed consent was secured from all participants. Anonymity and confidentiality were maintained throughout the research process.

Workplace Sanitation and Women's Labour Experiences

Table 1: Sample Distribution by Occupation

Occupation	Number of Women	Percentage
Construction workers	38	25.5
Domestic workers	34	22.8
Street vendors	29	19.5
Retail shop workers	26	17.4
Clerical/office staff	22	14.8
Total	149	100.0

Source: Primary data

Table 1 shows that a substantial majority of women in the sample are concentrated in informal occupations—construction work, domestic work and street vending together account for nearly 68 per cent of all respondents. It may be inferred that women's employment in the city is heavily informalised. Any infrastructure deficit in informal workplaces will therefore affect a majority of working women, not a marginal group. It establishes the structural relevance of work place sanitation rather than treating it as an exceptional problem.

Table 2: Access to Sanitation at Workplace by Occupation (Percent)

Occupation	No toilet access	Shared/public toilet	Dedicated workplace toilet
Construction workers	71	29	0
Domestic workers	38	47	15
Street vendors	62	38	0
Retail shop workers	12	46	42
Clerical/office staff	0	18	82

Table 2 reveals a sharp occupational gradient in sanitation access where over 70 per cent of construction workers and 62 per cent of street vendors report no access to toilets at the workplace. In contrast, 82 per cent of clerical workers and 42 per cent of retail workers have access to dedicated workplace toilets. It may be asserted that sanitation access closely mirrors employment nature and workplace stability. Informal and mobile worksites systematically fall outside sanitation provisioning and the absence of sanitation is not accidental but institutionally patterned.

Table 3: Work Disruption and Income Loss Due to Inadequate Sanitation (Percent)

Occupation	Reported work interruption	Reported wage/income loss	Reduced work hours
Construction workers	68	54	61
Domestic workers	47	42	38
Street vendors	59	63	56
Retail shop workers	21	15	18
Clerical/office staff	9	5	7

Table 3 demonstrates that sanitation deficits translate into direct economic penalties where between 54–63 per cent of construction workers and street vendors report income loss due to sanitation-related work interruptions. Reduced work hours and frequent interruptions are significantly lower among retail and clerical workers. It should be underlined that sanitation deficits function as a labour market constraint, reducing effective labour supply. The economic cost of inadequate sanitation is privatised onto women workers, particularly those in informal employment. This supports the argument that sanitation should be analysed as productive infrastructure, not merely a welfare service.

Table 4 shows that lack of MHM facilities results in systematic loss of workdays. It is observed that the construction workers lose an average of 2.8 days per month, followed closely by street vendors (2.5 days). This is for those who are in reproductive age group.

Table 4: Average Number of Workdays Lost per Month Due to Lack of MHM Facilities

Occupation	Average days lost (per month)
Construction workers	2.8
Domestic workers	2.1
Street vendors	2.5
Retail shop workers	0.9
Clerical/office staff	0.4

Losses are minimal among clerical and retail workers as they are equipped with better sanitation facilities. It may be inferred that menstrual hygiene constraints significantly affect work continuity for informal women workers. These losses accumulate over time, contributing to lower monthly earnings and employment instability. MHM-related absenteeism represents a gender-specific labour penalty that is invisible in conventional employment statistics

Table 5: Cross-tabulation of Occupation, Monthly Income and Access to Sanitation (Percent)

Occupation	Monthly income < ₹8,000 & No sanitation	Monthly income ₹8,000–15,000 & Shared/public sanitation	Monthly income > ₹15,000 & Dedicated sanitation
Construction workers	64	36	0
Domestic workers	41	44	15
Street vendors	52	38	10
Retail shop workers	12	46	42
Clerical/office staff	0	18	82

Table 5 informs the occupation, income and sanitation access, revealing a strong association among those variables. Women earning below ₹8,000 per month are overwhelmingly located in occupations with no sanitation access. Higher-income women are disproportionately represented in workplaces with dedicated toilets. It is revealed that sanitation access and income are mutually reinforcing. Poor sanitation contributes to lower earnings through absenteeism and reduced work hours, while low-income occupations are least likely to receive sanitation investments. This creates a self-reinforcing cycle of deprivation

Table 6 captures the intersection of social, economic and infrastructural vulnerabilities. Construction and street vending combine:

- Higher SC/ST representation
- Lower education levels
- Longer commuting distances
- Irregular work availability
- Highest rates of toilet inaccessibility

Table 6: Distribution of Women's Vulnerability by Type of Work (Percent)

Type of work	Currently married	SC/ST	Education up to primary	Travel >5 km	Monthly income < ₹8,000	Reports frequent work challenges	Irregular availability of work	No access to toilet at workplace
Construction workers	72	58	61	67	64	71	62	71
Domestic workers	69	44	56	41	41	53	48	38
Street vendors	63	39	49	52	52	66	57	62
Retail shop workers	58	21	27	24	12	29	18	12
Clerical/office staff	55	14	9	18	0	17	9	0

The data informs that there are vulnerabilities cluster rather than operate independently. Sanitation deficits intersect with caste, education and spatial mobility to deepen labour precarity. Informal women workers experience compound disadvantage, not single-issue deprivation.

An Analysis of marital status as a critical axis of vulnerability particularly single women are more concentrated in retail and clerical work, but those in informal occupations remain largely confined to low-income brackets. Single women in construction, domestic work and vending overwhelmingly earn below ₹8,000 per month. Single women lack household income buffers and are therefore more exposed to income shocks arising from sanitation-related work disruptions. Sanitation deficits disproportionately affect women who are economically self-reliant. Workplace sanitation thus has implications not only for gender equality but also for women's livelihood security. Taken together, the data analysed above provide a coherent quantitative picture of how women's labour market position, income, and sanitation access intersect to produce layered vulnerabilities, particularly under conditions of informality.

There are three central patterns emerge:

1. Informality structures sanitation access -Women in informal occupations consistently face the worst sanitation conditions.
2. Sanitation deficits have measurable economic effects -Absenteeism, reduced work hours and income loss are systematically associated with poor sanitation and lack of MHM facilities.
3. Vulnerability is intersectional -Caste, marital status, education, income and spatial mobility interact with infrastructure deficits to shape women's labour outcomes.

The quantitative evidence demonstrates that inadequate workplace sanitation is not merely a dignity or health issue but a structural constraint on women's economic participation, particularly for informal and

low-income workers. By imposing hidden costs on women's labour, sanitation deficits reproduce gendered inequalities within urban labour markets.

Summary of discussion Category of Workers wise - Construction Workers

Women construction workers face the most severe sanitation deficits among the occupational groups studied. Construction sites are typically temporary and lack basic facilities, with toilets either absent or poorly maintained. Women reported avoiding water intake, suppressing the need to use toilets and relying on distant public facilities or open spaces. Menstrual hygiene management was almost entirely absent at worksites, forcing women to manage menstruation under highly constrained conditions. These practices resulted in physical discomfort, health risks and occasional work absenteeism.

Domestic Workers

For domestic workers, access to sanitation is mediated by employer attitudes and household norms. While some women are permitted to use household toilets, others face restrictions or feel uncomfortable doing so, particularly during menstruation. In several cases, women reported being asked not to report to work during menstruation, resulting in wage loss. Sanitation access in this sector is thus shaped less by physical availability and more by power relations and social hierarchies within private households.

Street Vendors

Street vendors, who are self-employed and work in public spaces, rely heavily on public toilets. Distance, poor maintenance and user fees often discourage usage, leading women to minimise toilet breaks to avoid losing customers. During menstruation, the lack of nearby facilities exacerbates stress and health concerns. Women reported that sanitation constraints directly affect their ability to sustain long working hours, thereby limiting earnings.

Retail Shop Workers and Clerical Staff

Women employed in retail shops and offices generally reported better access to sanitation, particularly in larger establishments. However, even in these settings, access is regulated through break times and supervisory control. Menstrual hygiene facilities, such as disposal mechanisms and emergency sanitary products, were unevenly available. While these workers face fewer constraints than informal workers, sanitation remains a controlled rather than unconditional workplace resource.

Sanitation, Informality and Labour Outcomes

The findings reveal a clear gradient in access to workplace sanitation, closely aligned with employment formality. Informal women workers—particularly construction workers and street vendors—bear the highest sanitation deficits and associated economic costs. These deficits manifest as reduced work hours, absenteeism, health risks and psychological stress, all of which undermine productivity and income stability.

Urban sanitation reforms have largely focused on household toilets and public facilities, with limited attention to workplaces outside the formal sector. The contractualisation and fragmentation of employment relationships further obscure responsibility for providing sanitation. As a result, sanitation remains a private coping problem for women workers rather than a public policy concern. By framing sanitation as social infrastructure, this study highlights its centrality to inclusive economic development. Failure to address workplace sanitation perpetuates gendered labour inequalities and undermines the potential gains from women's increased participation in urban economies.

Policy Recommendations

The findings establish workplace sanitation as productive social infrastructure that directly shapes women's labour participation, productivity and income security. Policy responses must therefore move beyond household-focused sanitation frameworks to address workplaces, particularly in informal employment.

First, sanitation—including toilets, water and menstrual hygiene management (MHM)—should be explicitly recognised as a basic workplace right, irrespective of employment status. Labour regulations and occupational safety standards must be extended to informal and mobile worksites such as construction sites, vending zones and domestic work settings.

Second, urban sanitation planning must incorporate workplaces as sites of provision. Urban local bodies should map women-intensive worksites and ensure accessible sanitation facilities, including mobile toilets for construction sites and vending areas, as part of city sanitation plans.

Third, employer responsibility must be clearly defined. Principal employers and contractors should be legally accountable for sanitation at worksites, while guidelines for domestic work should ensure dignified access to household toilets without wage penalties.

Fourth, menstrual hygiene management should be integrated into workplace sanitation standards, including safe disposal facilities and access to water. Treating MHM as optional perpetuates gender-specific labour penalties.

Finally, public provisioning of sanitation near informal workplaces should be treated as an economic investment rather than welfare expenditure, as it reduces absenteeism, work disruption and income loss among low-income women workers.

Conclusion

This paper demonstrates that workplace sanitation is a hidden but critical determinant of women's economic participation in urban India. Evidence from Tiruchirappalli shows that sanitation and MHM deficits are systematically concentrated among informal women workers and translate into absenteeism, reduced work hours and income loss. These outcomes are structurally produced through informality, weak regulation and fragmented employer responsibility. By conceptualising sanitation as social infrastructure, the study highlights how the costs of managing bodily needs are privatised onto women workers,

reinforcing gendered labour inequalities. Addressing workplace sanitation is therefore essential not only for dignity and health but for sustaining women's participation in urban labour markets. Integrating sanitation into labour regulation and urban governance is a necessary condition for gender-equitable and inclusive urban development.

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