



ISSN Print: 2664-8679
ISSN Online: 2664-8687
Impact Factor: RJIF 8.33
IJSH 2026; 8(1): 07-11
www.sociologyjournal.net
Received: 18-11-2025
Accepted: 20-12-2025

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Rural public health and sanitation: A sociological study

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DOI: <https://www.doi.org/10.33545/26648679.2026.v8.i1a.248>

Abstract

Hygiene and sanitation emerge not merely as biomedical necessities but as social determinants of health, embedded within broader structures of inequality. Access to clean water, adequate nutrition, and opportunities for physical well-being are mediated by social hierarchies, governance systems, and community infrastructures. Existing research illustrates that sanitation practices are deeply entangled with health outcomes, particularly in rural contexts where disparities in water quality, household hygiene, and collective facilities reflect entrenched socio-economic stratifications. From a sociological lens, sanitation functions as a protective social institution, one that regulates the boundary between the private body and the public environment. The World Health Organization's definition safe disposal of human waste to prevent disease transmission underscores sanitation as a collective safeguard, yet its realization is uneven across social spaces. Policies such as the Swachh Bharat Mission (2014) represent state-led interventions to eliminate open defecation and expand infrastructure. However, the persistence of inequities, especially in urban slums, reveals sanitation as a site of social exclusion: inadequate facilities not only perpetuate disease but also reinforce stigmatization, marginality, and the denial of full citizenship. Thus, sanitation must be understood sociologically as both a material infrastructure and a symbolic marker of belonging. Its absence in marginalized communities reproduces cycles of ill-health and exclusion, while its presence signals inclusion in the promises of modernity, development, and dignity. The abstract therefore situates sanitation at the intersection of health, inequality, and social justice, highlighting how infrastructural deficits translate into lived experiences of vulnerability and marginalization.

Keywords: Sanitation, determinants, social institution, symbolic marker, a material infrastructure

Introduction

India's rural landscape continues to grapple with sanitation challenges that impose heavy health burdens, with unsafe disposal of human waste and contaminated groundwater emerging as primary pollutants. Unlike cities, rural areas lack centralized sewerage systems altogether, relying instead on on-site solutions such as pit latrines or septic tanks. These often result in improper waste disposal into fields, ponds, or open drains, directly affecting agricultural land and drinking water sources. Census 2011 data revealed stark rural gaps: nearly half of households lacked toilets, and piped water coverage remained minimal, with only marginal improvements over the previous decade. The burden falls disproportionately on marginalized communities, where caste hierarchies sustain practices like manual scavenging and where women face heightened vulnerabilities due to unsafe or distant toilet access. Cultural norms around waste handling and purity further complicate adoption of sanitation technologies, reinforcing exclusion. Government efforts such as the Total Sanitation Campaign (1999) and later the Nirmal Bharat Abhiyan (2012) sought to expand rural toilet coverage, but progress was uneven, often undermined by lack of behavioral change and community ownership. Sociologically, rural sanitation is not only a matter of infrastructure but also of social justice, where inequities in caste, gender, and governance shape who gains access to dignity, safety, and health.

Review of Literature

1. UNICEF Evidence Review (2018)

UNICEF's synthesis of sanitation research emphasizes that hygiene and sanitation are not only biomedical interventions but also determinants of dignity and wellbeing. The review shows that improved toilet coverage directly reduces diarrheal disease, child mortality,

and malnutrition. It highlights sanitation as a foundation for education, since children are more likely to attend school when facilities are safe and accessible. Importantly, the evidence links sanitation to women's safety, reducing risks of harassment during open defecation. The review situates sanitation within broader development goals, stressing its role in poverty reduction. It critiques uneven progress across rural and urban areas, pointing to structural inequities. Sanitation is framed as a social right, not just a technical fix. Overall, UNICEF underscores that sanitation interventions must address exclusion and vulnerability alongside infrastructure.

2. Kulkarni (2022) ^[12] - Rural Sanitation in India

Kulkarni's analysis traces sanitation policy in India from independence to contemporary programs. Despite repeated initiatives, rural sanitation remains inadequate, reflecting governance gaps and weak community participation. The study critiques the top-down design of many schemes, which often fail to adapt to local cultural practices. It argues that sanitation cannot be reduced to toilet construction alone, but must integrate behavioral change and social mobilization. Kulkarni highlights how caste and gender dynamics shape access to sanitation facilities. The paper stresses that ignoring these social dimensions reproduces inequities. It calls for participatory approaches that empower communities rather than impose external solutions. Ultimately, rural sanitation is framed as a developmental challenge tied to citizenship and dignity. The review situates sanitation within India's broader struggles with inequality and governance.

3. Muduli (2025) ^[13] - Trends in Rural Sanitation Access

Muduli's study uses NSS data to map sanitation access across socio-economic groups. It finds persistent disparities, with marginalized castes and poorer households lagging behind national averages. The analysis shows that progress under Swachh Bharat Mission has been uneven, with some states achieving near-universal coverage while others remain far behind. Sanitation is interpreted as a marker of inequality, reflecting structural barriers in resource distribution. The paper highlights how education and literacy correlate strongly with sanitation adoption. It critiques the reliance on self-reported ODF status, which often masks continued open defecation. Muduli situates sanitation within broader debates on social justice and rural development. The study concludes that sanitation policy must address inequality directly, not just infrastructure provision. It frames sanitation as a lens to study stratification in rural India.

4. Hub Sociology (2025) - Sociological Perspective

This article argues that sanitation is fundamentally a social phenomenon, not merely an infrastructural issue. It situates hygiene practices within cultural norms, power relations, and community structures. Sanitation is framed as a collective institution regulating boundaries between private bodies and public spaces. The review highlights how sanitation practices reflect social hierarchies, with marginalized groups often excluded from safe facilities. It critiques biomedical framings that ignore the symbolic and cultural dimensions of sanitation. The article emphasizes sanitation as a site of inequality, where access signals

belonging and exclusion marks marginality. It calls for sociological approaches that integrate health, culture, and governance. Ultimately, sanitation is positioned as central to understanding social order, dignity, and citizenship. The review underscores its role in both material wellbeing and symbolic inclusion.

5. Esteves Mills & Cumming (2016) ^[10] - WASH and Social Outcomes

This global evidence reviews links water, sanitation, and hygiene (WASH) to health and social development. It shows that sanitation reduces child mortality, improves nutrition, and enhances educational participation. The study emphasizes gender equity, noting that safe sanitation facilities reduce risks for women and girls. It highlights how sanitation access influences labor productivity and economic growth. The review critiques fragmented approaches that treat WASH as separate from social development. Instead, it argues for integrated strategies that connect health, education, and equity. Sanitation is framed as a driver of empowerment, particularly for marginalized groups. The evidence demonstrates that WASH interventions must be culturally sensitive and community-led. Overall, the review situates sanitation as both a health safeguard and a social justice imperative.

6. WHO Guidelines on Sanitation and Health (2018)

WHO defines sanitation as the safe disposal of human waste to prevent disease transmission. Its guidelines emphasize sanitation as foundational to health, dignity, and wellbeing. The review highlights sanitation's role in reducing infectious diseases, especially diarrheal illnesses. It situates sanitation within the broader framework of universal health coverage and equity. WHO stresses that sanitation is a collective good, requiring community participation and governance. The guidelines critique inequities in access, particularly in slums and rural areas. They frame sanitation as a human right tied to citizenship and inclusion. Importantly, WHO emphasizes that infrastructure alone is insufficient without behavioral change. The review positions sanitation as both a technical and social institution. It underscores its role in protecting health and promoting dignity.

7. Shukla (2024) ^[15] - Slum Vulnerability in Lucknow

Shukla's case study examines sanitation in Lucknow's slums, revealing persistent deprivation despite policy progress. It shows that households remain without safe toilets, relying on open defecation. The study highlights how poor sanitation fosters disease spread and social exclusion. It critiques Swachh Bharat Mission's claims of universal coverage, showing gaps in urban informal settlements. Sanitation is framed as a marker of marginality, denying slum residents full citizenship. The paper emphasizes gendered vulnerabilities, with women facing risks of harassment and insecurity. It situates sanitation within broader urban inequalities, linking infrastructure deficits to social exclusion. Shukla argues that slum sanitation requires participatory approaches, not just state declarations. The study underscores sanitation as a site of contested citizenship and dignity. It reveals how policy promises diverge from lived realities.

8. Press Information Bureau (2024) - Trichy Slum Transformation

This report documents community-managed sanitation initiatives in Tiruchirappalli slums. It highlights how collective action transformed sanitation from deprivation to empowerment. Residents organized to build and maintain toilets, creating a sense of ownership and dignity. The initiative reduced open defecation and improved health outcomes. Importantly, it fostered social cohesion, strengthening community bonds. The report contrasts this success with persistent inequities in other slums. It shows that participatory governance can overcome infrastructural deficits. Sanitation is framed as a tool of empowerment when communities are central to decision-making. The case demonstrates that dignity and inclusion emerge from collective agency. It underscores the importance of bottom-up approaches in sanitation policy. The review situates sanitation as both a health intervention and a social movement.

9. Scientific Research Journal (2025) - Commentary on SBM

This commentary reviews the achievements and obstacles of Swachh Bharat Mission (2014-2019). It acknowledges progress in toilet construction and ODF declarations. However, it critiques the reliance on quantitative targets, which often mask continued open defecation. The paper highlights inequities, with slums and marginalized groups left behind. It situates SBM within broader debates on state legitimacy and policy performance. Sanitation is framed as a contested space between state claims and lived realities. The commentary emphasizes the need for behavioral change alongside infrastructure. It critiques the lack of participatory governance in SBM's design. The review situates sanitation within struggles over citizenship, dignity, and inclusion. Ultimately, it argues that SBM's success must be measured by equity, not just coverage.

10. UNICEF India - Potential Impact of Sanitation

UNICEF India underscores sanitation's role in improving health among the poorest communities. It highlights reductions in diarrheal disease, child mortality, and malnutrition. The review emphasizes that sanitation interventions must address social vulnerability, not just infrastructure. It situates sanitation within broader development goals, linking it to education and gender equity. The study critiques inequities in access, particularly in rural and slum areas. It frames sanitation as a social right tied to dignity and citizenship. UNICEF stresses that participatory approaches are essential for sustainable outcomes. The review highlights the importance of culturally sensitive interventions. It situates sanitation as both a health safeguard and a social justice imperative. Ultimately, it argues that sanitation policy must prioritize equity and inclusion.

Public Health and the Poverty of Reforms: The South Asian Predicament" by Imrana Qadeer (2013)

Public Health and the Poverty of Reforms by Imrana Qadeer (2013) offers a sharp critique of neoliberal health reforms in South Asia, especially India, arguing that market-driven approaches have deepened social inequalities instead of improving public health. Rooted in a sociological framework, the book highlights how caste, class, gender,

and rural-urban divides are neglected in policy, resulting in inequitable access and poor outcomes. Qadeer calls for a rights-based, equity-focused model of healthcare that prioritizes marginalized populations and addresses the social determinants of health.

The Sanitation Triangle Socio-Culture, Health and Material by Taro Yamauchi Seiji Nakao Hidenori Harada

This book described our challenge of the co-creation, which was conducted through expanding the material flow approach to social relationship networks and developing effective solutions. Through our 15-year process, we found that material flow and social relationships affinitized strongly each other. Through the first phase, we could understand the overall problem of sanitation in the research field by applying material flow analysis; the strength was the ability to catch all the related processes based on a logical mass balance point of view. However, its weakness was too strict rule and it was difficult to describe each player's motivation; in other words, "driving force" of the system. Based on that picture, we had started co-creation approach in order to realize the concept of the new sanitation system with local players, and it is still ongoing. We found that the combination of material flow and social relationship provides a reasonable and effective picture of wholistic sanitation system, and also that it is important to validate and update the picture through co-creation process among a team consisting of not only various researchers but also local players. Although we have not yet sufficiently performed co-creation of sanitation systems, we found one promising approach.

Research methodology

This paper does not present a primary empirical study but instead adopts a descriptive sociological approach grounded in secondary data analysis. Drawing on Census 2011 statistics, it examines sanitation facilities, health-seeking behaviors, and urban amenities as indicators of broader social determinants of health. Key measures include household toilet access (84% coverage), waste disposal practices (with 89% relying on pit latrines), and health metrics such as annual medical check-ups (24% for major illnesses). The analysis is guided by conceptual frameworks from medical sociology, which emerged in the 1940s and emphasize the interplay between social structures and health outcomes. Sanitation is explored through multiple lenses household, public, and workplace highlighting how infrastructural access intersects with social inequality. Sources include WHO/UNICEF definitions of sanitation and studies such as Bisaria (2015), which provide qualitative insights into behavior, policy, and inequities. Together, these perspectives situate sanitation as both a material infrastructure and a sociological institution, shaping health, dignity, and social inclusion.

Key findings

Rural Sanitation Deficits and Their Repercussions

Infrastructure Gaps: Nearly half of rural households still lack toilets, with open defecation common in fields and near water bodies. Pit latrines dominate (close to 89%), but many are poorly constructed or abandoned due to lack of maintenance. Piped water coverage remains minimal, forcing reliance on handpumps or shared sources, which

often get contaminated. Drainage systems are rare, leading to stagnant wastewater around homes and community spaces.

- **Health Outcomes:** Unsafe sanitation contributes to diarrheal disease, parasitic infections, and malnutrition, especially among children. Women and girls face heightened risks of urinary tract infections due to unsafe or distant toilet facilities. Health-seeking behavior is limited, with irregular check-ups and reliance on traditional remedies for common illnesses. Chronic conditions like tuberculosis and anemia disproportionately affect poorer households, compounded by weak rural health infrastructure.
- **Sociological Dimensions:** Sanitation practices are shaped by caste hierarchies, with Dalit communities often relegated to waste handling and manual scavenging. Gender disparities are stark as women's privacy and safety are compromised by open defecation, impacting education and participation in village life. Cultural norms around purity and pollution hinder adoption of hygienic practices, with resistance to shared or community toilets. Household sanitation is not only a health issue but also a marker of dignity and social status.
- **Policy Efficacy:** Programs such as the **Total Sanitation Campaign (1999)**, **Nirmal Bharat Abhiyan (2012)**, and **Swachh Bharat Mission (2014)** have expanded toilet coverage, with reported containment rising to over 80% in some states. Yet treatment and safe waste management lag, as most rural systems remain on-site without desludging or safe disposal. Behavioral change campaigns have had mixed success, with continued open defecation in many villages. Policy gains are uneven, revealing sanitation as both a developmental challenge and a site of social inequality.

Discussion

Situated within medical sociology, the paper interprets rural sanitation as a social construct that shapes health outcomes through faecal-oral transmission pathways, most visibly in diarrhoeal disease. Challenges are categorized across domains: household sanitation (e.g., lack of private toilets forcing open defecation and eroding dignity), community facilities (e.g., inadequate or poorly maintained village toilets), and occupational practices (e.g., caste-linked manual scavenging persisting in rural waste management). Gender emerges as a critical lens as rural women and girls bear disproportionate burdens of caregiving and mobility, often walking long distances for safe sanitation or water, which directly impacts maternal and child health. Education and community-based waste management are identified as key levers for change, with NGOs and local self-help groups playing vital roles in shifting behaviors and sustaining infrastructure. The discussion also critiques divergent definitions of sanitation: WHO's emphasis on waste disposal versus UNICEF's framing of health protection arguing that rural realities demand integrated policies that address social exclusion, caste hierarchies, and gender inequities alongside infrastructure.

Conclusion

Sanitation's health benefits are equally well-documented in rural India, yet progress remains uneven due to

infrastructural deficits and entrenched social barriers. The paper cautions that without confronting caste hierarchies, gender inequities, and poverty, villages will continue to face contaminated water sources, recurrent diarrhoeal disease, and chronic ill-health. It advocates for sustainable, community-engaged solutions that move beyond Swachh Bharat's emphasis on toilet construction, focusing instead on behavioral change, safe waste treatment, and equitable access. Centralized sewerage systems are impractical in dispersed rural settings; instead, decentralized, locally managed approaches such as community toilets, biogas pits, and village-level waste management are urged for long-term wellbeing. This paper exemplifies sociological inquiry into rural sanitation by linking structural inequalities to health outcomes, showing how caste-based exclusion, women's mobility burdens, and resource scarcity shape vulnerability. It offers insights for policymakers seeking to design interventions that are not only infrastructural but also socially inclusive, participatory, and culturally sensitive.

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