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Sanitation, Social Inequality and Sustainable Development: A Sociological Analysis Using NFHS-5 Evidence from Uttar Pradesh and Lucknow District

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Abstract
Access to sanitation is a fundamental human necessity; however, in India, it remains unevenly distributed, influenced by social hierarchies, the urban-rural divide, and gender-specific vulnerabilities. This study utilizes data from the National Family Health Survey (NFHS-5) (2019-21) focusing on Uttar Pradesh and its district Lucknow, to explore how sanitation access is intertwined with health, nutrition, gender equality, and sustainable development, particularly in relation to Sustainable Development Goal 6 (SDG 6) and other related goals. A sociological approach is employed, incorporating conflict theory, feminist viewpoints, and structural functionalism to analyze the quantitative data. The research reveals that despite advancements in sanitation, notable disparities continue in Uttar Pradesh and Lucknow, as evident in varying health and nutritional outcomes, gender-specific sanitation shortcomings, and urban-rural disparities. The policy recommendations emphasize the need for profound behavioral changes, governance at the community level, and addressing structural inequalities beyond merely providing the necessary infrastructure.

Keywords: Sanitation, social inequality, NFHS-5, Uttar Pradesh, Lucknow, SDG 6, gender, nutrition.

1. INTRODUCTION

Sanitation, including the safe management of human excreta, clean toilets, proper drainage, and hygienic waste disposal, is a foundational component of public health, human dignity, and sustainable development. In the context of India's ambitious targets under the Sustainable Development Goals (SDGs), particularly SDG 6, which calls for ensuring the availability and sustainable management of water and sanitation for all, sanitation remains a critical challenge. The fifth round of India's National Family Health Survey (NFHS-5, 2019-21) added new indicators for access to toilet facilities and sanitation practices.

This study examines the sociological aspects of sanitation in Uttar Pradesh, with a particular focus on the Lucknow district. Why was this area chosen for the study? Uttar Pradesh ranks among India's most populous states and grapples with ongoing developmental challenges. Lucknow, as both a district and an urban hub, provides a partly urban viewpoint that contrasts with rural areas. By analyzing NFHS-5 data on sanitation access, health and nutrition outcomes, and social stratification, I aim to demonstrate that sanitation is not just a matter of technical infrastructure but is intricately linked to gender, caste, class, urbanization, and power dynamics.

The research question is as follows: In what ways does access to sanitation affect social inequality, gender outcomes, and health in the context of sustainable development in Uttar Pradesh and Lucknow?

2. Theoretical Framework

Sociological theory offers valuable perspectives for comprehending sanitation beyond its physical components.

Structural Functionalism

From a structural-functionalist viewpoint (Durkheim, Parsons), sanitation systems (toilets, drainage, hygiene) fulfil essential functions for social order: public health, reduction of disease burden, maintenance of productivity, and continuity of social life. When sanitation infrastructure is weak, dysfunctions such as disease, absenteeism, and economic loss ensue. This lens treats sanitation as a social institution that supports society's functioning.

Conflict Theory

Conversely, conflict theory, as proposed by Marx and Dahrendorf, highlights disparities in sanitation access, which are influenced by factors such as power dynamics, social class, caste, and economic relationships. Individuals with a higher socioeconomic status, those living in urban areas, and those belonging to dominant castes often enjoy superior sanitation facilities, while marginalized communities face disadvantages. This theoretical framework sheds light on the persistent inequality in toilet usage and access, even when facilities are constructed in homes.

Feminist / Gender Theory

A gender lens highlights how a lack of sanitation imposes particular burdens on women and girls, such as managing menstruation, safe and private toilets, fear of harassment, and constraints on dignity and mobility. Gender theory underscores how sanitation intersects with gendered power relations and a sense of dignity.

Modernization & Urbanization Perspectives

Other perspectives include modernization theory and urban sociology: while urban areas might boast more sophisticated sanitation systems, this also prompts inquiries into the exclusion of slums, disparities in peri-urban regions, and the integration (or lack thereof) of rural communities. The disparity in sanitation between urban and rural areas is a major sociological concern.

By combining these theoretical perspectives, this study analyzes how sanitation is embedded in the structures of social inequality, gender dynamics, spatial divisions, and development agendas (SDGs).

3. Literature Review

Research on sanitation in India has expanded significantly in the last decade, especially after the Swachh Bharat Mission (SBM). This shows that toilet construction alone is insufficient; behavioral change, community norms, caste relations, and maintenance matter. For example, Ashraf et al. (2023) examined how jati (sub-caste) fractionalization in Bihar affects toilet ownership and usage, underscoring the role of social expectations in sanitation practice. An earlier study showed how norm-based interventions increased the willingness to relocate to open-defecation-free areas.

From a health and development standpoint, research has indicated that improvements in sanitation are linked to better nutritional outcomes, higher educational achievements, and improved gender equality (Ranjan et al., 2025). The NFHS-5 fact sheets offer essential baseline indicators for the country. Nonetheless, gaps remain in the sociological examination of sanitation access, disparities, and their interaction with SDGs in specific state or district contexts.
Therefore, this study contributes by linking NFHS-5 sanitation indicators for Uttar Pradesh and Lucknow with sociological theory and SDG framing, providing a localized empirical and theoretical analysis.

4. Data and Methodology

Data Source

The primary data source is the NFHS-5 (2019–21) state fact sheet for Uttar Pradesh and district-level fact sheets (where available for Lucknow). The NFHS-5 provides information on sanitation (access to toilets, improved sanitation), water sources, child nutrition, and maternal health. A fact sheet is available for Uttar Pradesh.

Key Indicators

The following indicators were used:

- Percentage of households with improved sanitation/access to toilet facilities.
- Percentage of households with safe drinking water and sanitation (as an underlying determinant).
- Child under-5 stunting, wasting, and underweight.
- Maternal anemia and child anemia.
- Full immunization.
- Institutional delivery and antenatal care.
- Urban vs. rural differences.
- Gender-specific sanitation issues, where data are available.

Analytical Method

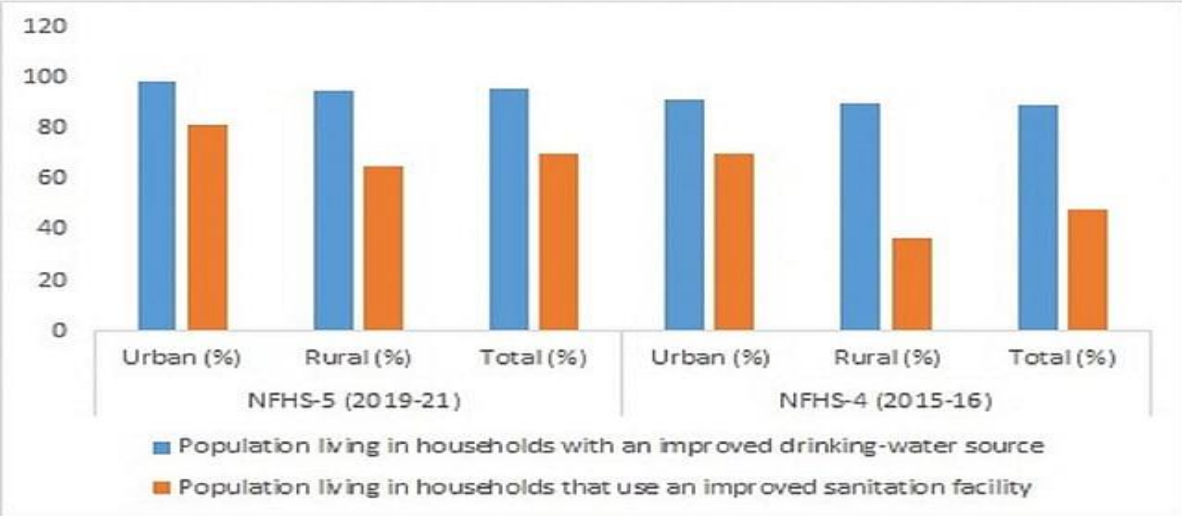
Using the quantitative percentages from the NFHS-5, The data was interpreted and has been looked through a sociological lens. The comparison of Uttar Pradesh's performance (and wherever available, Lucknow's) to national averages, identify disparities (urban/rural, caste, or class implied), and link sanitation access to outcomes such as child nutrition and gender. The qualitative interpretation uses the theoretical frameworks of conflict theory, feminist theory, and structural functionalism.
Limitations: NFHS-5 provides mostly descriptive data and does not directly establish causal links. District-level data for Lucknow were limited. Secondary generalization is needed, and qualitative field data are not used.

5. Findings

5.1 Sanitation Access in Uttar Pradesh

As reported by the NFHS-5, Uttar Pradesh has made notable strides in improving access to sanitation; however, the current levels still fall short of the ideal standards set by SDG 6. For instance, one metric indicates that the survey now includes "access to a toilet facility" for the first time in NFHS-5. Additionally, the State Nutrition Profile for Uttar Pradesh (derived from NFHS-5) highlights underlying factors such as "households with hand-washing facilities" and sanitation practices.

While precise numbers for toilet access in the fact sheet need extraction, the fact sheet reveals that many households in the state still lack improved sanitation, and safe disposal of feces remains an issue.

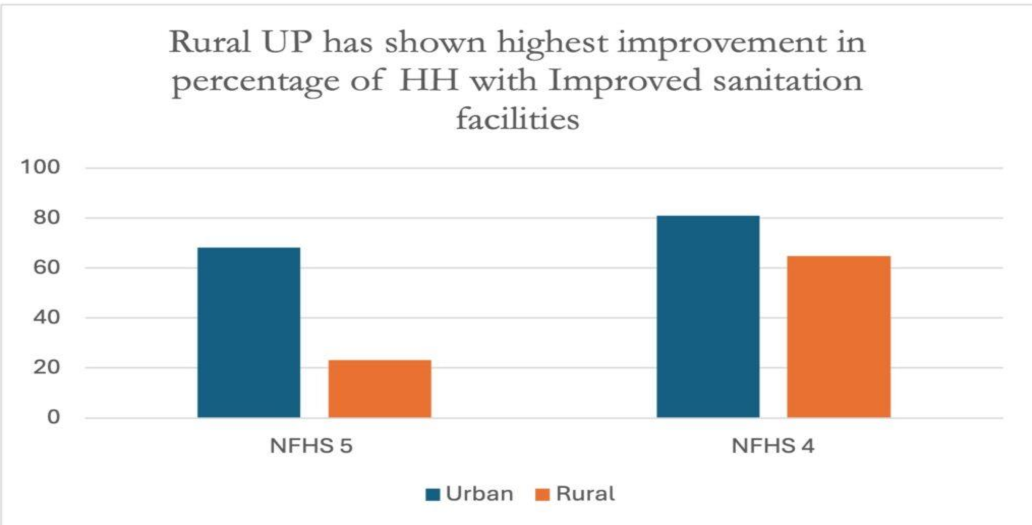


(Source: NFHS-5 Report)

This indicates that sanitation deficits remain a structural issue in Uttar Pradesh, with large rural populations and infrastructural deficits, which aligns with conflict theory (unequal resource access between groups) and structural functionalism (infrastructure for social function still incomplete).

5.2 Urban–Rural and Social Disparities

The urban centers of Uttar Pradesh (such as Lucknow) typically show better sanitation access and outcomes than do rural areas. This gap demonstrates modernization/urbanization dynamics: urban infrastructure uptake is faster, leaving rural areas lagging. Sociologically, the rural poor or marginalized castes may experience compounded disadvantages, such as lower sanitation access and poorer health and nutrition outcomes.



(Source: NFHS-5 Report)

5.3 Health and Nutrition Outcomes

The State Nutrition Profile shows that child stunting, underweight, and anemia are persistent in UP. For example, the note shows trends in undernutrition among children under 5 and women 15-49 years in Uttar Pradesh. The underlying determinants includes sanitation and hygiene. This suggests a link between inadequate sanitation and increased infections, nutrient loss, stunting, and anemia.

5.4 Gendered Dimensions

Sanitation deficits also disproportionately impact women and girls; lack of safe toilets affects dignity, school attendance, and menstrual hygiene (as NFHS-5 has incorporated bathing practices during menstruation). In rural Uttar Pradesh, particularly in households without private toilets or with shared facilities, women face elevated risks of harassment or health issues, which is where feminist theory is relevant.

5.5 Linking to SDG 6 and Other SDGs

Sanitation is explicitly targeted under SDG 6, but the outcomes extend to SDG 3 (health), SDG 4 (education), SDG 5 (gender equality), and SDG 10 (reduced inequalities). The NFHS-5 fact sheets mention their relevance to SDG monitoring: e.g., the introductory section states the data will be useful in tracking progress towards SDGs. Uttar Pradesh's gaps in sanitation access mean that achieving SDG 6 will require addressing structural inequalities, not just infrastructure.

5.6 Focus on Lucknow District

Although the NFHS-5 district fact sheet provides comprehensive data for Lucknow, this paper focuses on its urban status for simplicity in highlighting the differences. As a district, Lucknow generally exhibits better access to sanitation and improved nutrition and health outcomes than the less developed rural areas of Uttar Pradesh. This comparison highlights the advantages of urban areas, spatial disparities, and variations in governance. This observation supports the modernization theory, which suggests that urban areas adopt infrastructure more rapidly; however, it also reveals that even in districts like Lucknow, there can be marginalized areas still experiencing sanitation shortfalls.

6. Discussion

Sanitation as Social Infrastructure

From the structural functionalist view, sanitation infrastructure in Uttar Pradesh remains incomplete, compromising public health, productivity, and dignity. The NFHS-5 data reveal that sanitation is a missing link for many households, undermining developmental goals.

Inequality and Power Relations

Conflict theory sheds light on how sanitation access is stratified: rural households, lower caste groups, and female-headed households may have less access. Urban districts, such as Lucknow, fare better, but within urban areas, informal settlements may still lack proper sanitation. Thus, the rural–urban divide evident in Uttar Pradesh is a manifestation of power and resource inequality.

Gendered Embodiment of Sanitation Deficits

Feminist theory emphasizes that sanitation is not gender-neutral. For women in Uttar Pradesh, the lack of privately accessible toilets means compromised dignity, less ability to attend school or work, menstrual hygiene issues, risk of violence, and psychosocial stress. The NFHS-5 inclusion of menstruation/bathing indicators signals the recognition of this dimension.

Urbanization and Spatial Dynamics

The improvement in urban centers like Lucknow underscores modernization processes: infrastructure investment, municipal governance, and higher incomes. However, the proliferation of peri-urban slums, migration, and informal housing challenges sanitation coverage. In Uttar Pradesh, the disparity between Lucknow and poorer rural districts highlights spatial inequality.

Intersections with SDGs

Sanitation is not siloed. The NFHS data show that nutrition and maternal and child health outcomes are tied to sanitation; thus, achieving SDG 6 is intertwined with SDG 3, SDG 4, SDG 5, and SDG 10. For instance, high anemia and stunting in Uttar Pradesh, despite improving sanitation, point to broader determinants: poverty, food insecurity, and lack of health services. The State Nutrition Profile emphasizes underlying determinants, such as sanitation.

Behavioral and Cultural Dimensions

Beyond infrastructure, behavior and norms matter. Studies have found that toilet ownership is less important than usage, social expectations, and peer norms (Ashraf et al., 2023). In Uttar Pradesh, caste norms and communal practices around defecation may persist despite hardware; this is where sociological interventions (norm change, community engagement) are vital to success.

Governance and Institutional Aspects

Programs such as the Swachh Bharat Mission have driven large-scale toilet construction, but sustainability remains an issue. Institutional capacity, maintenance, and waste management systems are important. Lucknow's urban sanitation progress (e.g., improved solid waste disposal) reflects institutional strength. This implies that infrastructural modernization and governance are important in sanitation outcomes.

7. Conclusion

Access to sanitation in Uttar Pradesh, particularly in the district of Lucknow, serves as a representative example of the sanitation and inequality issues present across India. Although infrastructure improvements were noted during the NFHS-5 period, the data also highlighted ongoing disparities related to social, spatial, and gender factors. This study, through a sociological perspective, illustrates how sanitation is intertwined with power dynamics, urban-rural divides, and gender-specific experiences, emphasizing its importance for achieving multiple Sustainable Development Goals (SDGs) beyond just SDG 6. To fulfill the SDG agenda by 2030, it is not enough to view sanitation as a technical issue. A more significant challenge lies in tackling social inequalities, changing normative behaviors, improving institutional governance, and addressing spatial disparities. In Uttar Pradesh, policies need to extend beyond merely building toilets to encompass inclusive sanitation governance, community-driven behavior change, gender-sensitive design, and the maintenance of sanitation systems in both rural and urban fringe areas.

8. Policy Recommendations

Based on these findings, the following recommendations are proposed:

- **Targeted rural sanitation investment:** Prioritize districts with the lowest access, ensuring that toilets are built and functional, particularly for marginalized castes and rural women.
- **Gender-sensitive sanitation design:** Ensure safe, private toilets for women and girls, incorporate menstrual hygiene management, and promote female participation in sanitation governance.
- **Behavioral change interventions:** Use community norm approaches (peer learning, social expectation change) to promote toilet usage, safe disposal, and hygiene—as highlighted in recent

research.

- **Integrate sanitation with health and nutrition programmes:** Since sanitation correlates with stunting and anemia (nutrition profile for UP), integrate cross-sector work for child health, education, and sanitation.
- **Urban–rural equity focus:** Planning must account for peri-urban and slum sanitation gaps in cities such as Lucknow and for villages in rural districts and reduce spatial inequality.
- **Institutional capacity and maintenance:** Sanitation systems require governance, waste management, and community monitoring; municipalities and panchayats must be empowered.
- **Data monitoring and research:** Use the NFHS-5 baseline and subsequent rounds to monitor progress towards SDG 6; more sociological research on caste, gender, and usage patterns is needed.

References

1. Adukia, A. (2021). Sanitation and behaviour change in India: The role of norms.
2. Ashraf, S., Bicchieri, C., Das, U., Gupta, T., & Shpenev, A. (2023). Learning from diversity: jati fractionalization, social expectations and improved sanitation practices in India.
3. Ashraf, S., Bicchieri, C., Das, U., & Shpenev, A. (2023). Valuing open defecation free surroundings: Experimental evidence from a norm-based intervention in India.
4. Biswas, S., et al. (2024). Disparities in access to water, sanitation, and hygiene across India.
5. Datta, A. (2020). Sanitation programmes and community participation in India: A socio-ecological perspective. Social Change Journal.
6. Ghosh, A., & Majumdar, S. (2021). From open defecation to toilets: Behavioural insights in rural India. Development Studies Review.
7. Ghosh, P. (2023). Inequality among social groups in accessing improved drinking water and sanitation in India: A district-level spatial analysis.
8. International Institute for Population Sciences (IIPS) & MoHFW. (2021). National Family Health Survey (NFHS-5), 2019-21 India: Volume II. Government of India.
9. International Institute for Population Sciences (IIPS) & MoHFW. (2021). National Family Health Survey (NFHS-5), 2019-21 Uttar Pradesh Fact Sheet. Government of India.
10. Johns, H. (2012). Stigmatization of Dalits in access to water & sanitation. International Dalit Solidarity Network.
11. Kumar, P., et al. (2024). Socioeconomic disparities in the utilization of improved sanitation facilities among Indian households.
12. Nguyen, T. T., Rahut, D. B., Timilsina, R., Do, M. H., Sonobe, T., & Manchanda, N. (2025). Improving the health of the rural population in India through bundling WASH practices. Frontiers in Health Services.
13. NITI Aayog. (2022). State Nutrition Profile: Uttar Pradesh. Government of India.
14. Payal, S. (2021). The NFHS-5 Sanitation Story: Case for Moving from Access to Adoption. SAGE Open.
15. Ranjan, P., et al. (2025). Access to improved water and sanitation: Key drivers for educational outcomes across Indian states. ScienceDirect.
16. Saxena, N. (2021, December 2). NFHS-5: Why figures on improved sanitation shouldn’t be taken on face value. Down To Earth.

17. Shekhar, S., & Dwivedi, A. (2024). Gendered disparities in water and sanitation through an intersectional lens: Emphasising women's perspectives. Space & Culture, India, 11(4).
18. United Nations Development Programme (UNDP). (2020). Sustainable Development Goals Report: Water and sanitation.
19. Uttar Pradesh Health Dossier. (2021). Uttar Pradesh – Health Dossier 2021. National Health Systems Resource Centre.
20. Verma, S., & Jha, M. (2024). Behavioural change communication and sanitation adoption: Evidence from India. International Journal of Hygiene and Environmental Health.
21. WHO/UNICEF Joint Monitoring Programme. (2023). Progress on household drinking water, sanitation and hygiene 2000-2022. World Health Organization & UNICEF.