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Knowledge, Attitudes, and Practices Associated with Access to Selected Public Toilets - A Case of Nairobi City

Beverlyne Brenda

Department of Engineering and Architecture, Meru University of Science and Technology, Meru, Kenya.

Muchiri Eric

Department of Health Sciences, Meru University of Science and Technology, Meru, Kenya.

Kagendo Dorothy

Department of Nursing and Public Health, Chuka University, Chuka, Kenya and Department of Medical Laboratory Sciences, Meru University of Science and Technology, Meru, Kenya.

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ABSTRACT: Access to safe and hygienic toilet facilities in public spaces is a critical and pressing public health priority. Despite global initiatives, disparities persist across economically developing countries, where inadequate sanitation infrastructure hinders progress toward universal health coverage and the Sustainable Development Goals. In Kenya, particularly within urban areas, ensuring access to functional and hygienic public toilets remains a significant challenge, public toilets are often overlooked, poorly maintained, and insufficient to meet demand. This study examined knowledge, attitudes, and practices associated with access to selected public toilets in Nairobi's Central Business District (CBD). The study employed a cross-sectional design with a descriptive quantitative approach. Participants were randomly selected upon exiting public toilet facilities until the target sample was achieved. Primary data was collected using structured open-ended questionnaires, interviews, and observational spot checks as the main tools, and analysed using SPSS Version 29 with reference to global sanitation standards. Findings revealed that most respondents (76.5%) recognized the importance of public sanitation, while 89.3% reported using public toilets. However, 91.3% considered the facilities inadequate, citing poor maintenance, long distances, and unhygienic or unsafe conditions. Daily use was low (6.7%), with many respondents resorting to alternatives such as urinating behind buildings, a practice also confirmed during spot checks. Accessibility challenges were evident, as some respondents were unaware of exact facility locations. Dissatisfaction was high, with 39.3% highlighting concerns over hygiene and safety. While 88.9% of respondents demonstrated willingness to pay for access, affordability remained a barrier for others, underscoring the equity implications of pay-to-use models. The study concludes that improving sanitation in Nairobi requires both infrastructural and behavioural interventions. Proper maintenance, increased facility coverage, and equitable pricing structures are essential. Additionally, collective responsibility acknowledged by 71.5% of respondents alongside targeted hygiene education campaigns, will be critical for enhancing urban sanitation, safeguarding health, and advancing inclusive development.

KEYWORDS: Public toilets, sanitation access, toilet accessibility, hygiene practices

1. INTRODUCTION

Access to adequate sanitation facilities plays an esential role in improving public health, advancing socio-economic progress, and fostering resilient communities. Despite continuous global initiatives, universal access to equitable availability of clean, affordable water and sanitation services for all, central to Sustainable Development Goal (SDG) 6 remains a complex challenge. By 2022, an estimated 3.5 billion people globally were without access to safely managed sanitation, including 419 million who continued to practice open defecation, highlighting significant disparities within and across nations (WHO & UNICEF, 2023).

Progress in Sub-Saharan Africa has been limited, with sanitation access falling short of Millennium Development Goal (MDG) targets. Despite decades of progress, only 42% of the region's population has gained access to improved drinking water since 1990, while sanitation infrastructure expansion continues to lag behind rapid population growth (Otieno et al., 2022; Kaluli et al., 2023). In response, SDG Target 6.2 was introduced to ensure equitable access to sanitation and hygiene by 2030, prioritizing the elimination of open defecation and addressing targeted inclusion of marginalized populations (United Nations, n.d.).With Africa's population anticipated to rise from 1.4 billion to 2.5 billion by 2050 (UN-Water, 2022), the urgency to develop resilient urban sanitation systems has never been greater. In 2022, over 987 million people on the continent lacked safely managed sanitation, while 193 million continued practicing open defecation (WHO & UNICEF, 2023). Without transformative investments in sanitation planning, the associated health and environmental risks will persist.

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The deterioration of sanitation services across numerous urban and peri-urban settings has severely impacted key sectors including health, education, and housing. Informal settlements frequently lack essential sanitation infrastructure, leading to the spread of preventable diseases, increased healthcare costs, and reduced school attendance especially among girls, who require gender-responsive facilities (UNICEF & WHO, 2023). Additionally, poor drainage and ineffective waste disposal accelerate environmental degradation and declining living standards. In Kenya, approximately 44% of the urban population relies on shared, non-sewered sanitation facilities, many of which suffer from poor hygiene and maintenance due to overcrowding and inadequate management (Malolo et al., 2021). Public toilets remain critical to preserving dignity, hygiene, and health in urban settings; however, challenges such as inconsistent maintenance, limited water supply, and inadequate waste disposal have contributed to deteriorating conditions.

Despite advancements in sanitation technologies, systemic barriers continue to hinder their effectiveness. Many shared facilities remain unhygienic and poorly maintained, with over half reported as unclean (Simiyu et al., 2020). These challenges underscore the need to assess user knowledge, attitudes, and practices to drive meaningful sanitation improvements. This study examines the knowledge, attitudes, and practices influencing access to and use of selected public toilets in Nairobi City. Understanding these factors is fundamental to shaping inclusive, sustainable, and user-centred urban sanitation policies in Kenya.

2. METHODOLOGY

The study was carried out within Nairobi's Central Business District (CBD), a densely populated urban centre governed by the city's administrative leadership and encompassing 17 parliamentary zones. This area is home to roughly 4.4 million residents, with an additional influx of about half a million daily commuters (KNBS, 2019). The Nairobi City Water and Sewerage Company (NCWSC) serves as the principal utility responsible for water and sanitation provision in the city, though only around 40% of households are linked to the sewer network (World Bank, 2020). Public restrooms are mainly situated in busy transit and recreational zones such as bus terminals, train stations, and parks with 18 officially recognized facilities citywide (Simiyu et al., 2020). Four public toilets strategically located and heavily frequented were purposively chosen for the study, Railways, Latema Road, Accra Road, and Temple Road.

A descriptive quantitative cross-sectional approach was employed, focusing on individuals who either frequent the CBD or run businesses there and utilize public sanitation amenities. The methodology unfolded in structured phases. Initially, trained field staff conducted observational assessments at each of the selected sites. These checks aimed to identify peak usage times, crowd dynamics, and the overall state of the facilities. The findings from these observations guided the sampling strategy. In the next phase, participants were chosen at random as they exited the restrooms, ensuring that only actual users were included and reducing selection bias. Selection intervals were adjusted based on crowd and size. Before participating, individuals were briefed on the study's objective, and their informed consent obtained prior to data collection.

The study employed a semi-structured questionnaire as its core data collection tool administered through interviews. It captured demographic characteristics such as age, gender, education, occupation, and detailed information on knowledge, attitudes, and practices regarding public toilet access. The study delved into users' views on the adequacy, hygiene, cost, safety, and their openness to contributing to the upkeep of these facilities. Open-ended prompts were included to gather more personalized feedback.

A diverse sample of users were surveyed across all four locations. The data collected was coded and analysed using SPSS Version 29. Descriptive statistics were used to summarize the findings. Data visualization tools, including tables and graphs, were employed to illustrate the findings.

3. RESULTS AND DISCUSSION

Out of the 400 questionaries distributed, 298 were completed and met the criteria for analysis, resulting in a participation rate of 74.5%. The gender split among participants was balanced, and a significant portion fell within the 20 to 40 age brackets, indicative of a young and economically engaged population. Educational attainment was generally strong, with the majority having completed higher education. Among the various professions represented, independent workers formed the largest segment.

Analysis of demographic variables alongside perceptions of sanitation importance revealed no notable differences across gender or age groups. This suggests a broadly shared understanding of public sanitation as vital infrastructure. As illustrated in Table 1, over 75% of participants rated public toilets as "very important," with only a marginal number viewing them as unimportant. These findings echo observations from urban contexts in Ghana and Kisumu, where such facilities are widely regarded as indispensable across heavily populated urban zones (Amoah et al., 2021; Simiyu et al., 2019).

Table 1. Perceived Importance of public toilets among respondents

Importance	Frequency	Percent
Not important	2	0.7
Slightly important	7	2.3
Moderately important	16	5.4
Important	45	15.1
Very important	228	76.5
Total	**298**	**100.0**

*Importance of public toilets

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Most respondents indicated familiarity with toilet locations and reported having used them at some point. However, daily usage was relatively uncommon. The majority cited emergencies or convenience as the main drivers for use, pointing to a pattern of reactive rather than routine engagement. Table 2 highlights that access typically occurred during urgent situations, underscoring the sporadic nature of utilization.

Table 2. Reasons for using public toilets

Reasons	Frequency	Percent
Convenience	87	29.2
Emergency	172	57.7
No access to private toilets	32	10.7
All the above	7	2.3
Total	**298**	**100.0**

*Usage and access

Further breakdowns revealed a clear link between income levels and frequency of use. Individuals in stable employment were more inclined to use public toilets daily relative to those in casual or informal work, or those without employment. This pattern suggests that the cost of access plays a significant role in shaping usage habits, a conclusion that aligns with findings from Ethiopia and Malawi (Adugna et al., 2022; Malolo et al., 2021).

Across the board, respondents expressed dissatisfaction with the current state of facilities. Concerns centred on cleanliness, water availability, and safety. Roughly two-thirds rated services as "fair," while about a quarter considered them "poor." Notably, education appeared to influence perceptions: those with tertiary qualifications were more critical of hygiene standards and management practices than those with less formal education. This trend mirrors insights from Lusaka and Accra, where greater awareness often leads to heightened scrutiny of sanitation conditions (Seidu et al., 2022).

When fees were required, most respondents indicated a willingness to pay. Nonetheless, many, especially from low-income backgrounds adopted coping strategies such as delaying use or resorting to open urination. Willingness to pay was significantly linked to both occupation and education level. While better-educated individuals were generally more open to paying for improved services, informal workers and economically disadvantaged groups faced barriers to access. These disparities reflect broader concerns about exclusion in pay-to-use models, as highlighted by Mutuku et al., 2021).

DISCUSSIONS

The findings clearly affirm that public toilets serve as indispensable infrastructure within Nairobi's central business district. Nearly all respondents acknowledged their importance, echoing global perspectives that place sanitation at the heart of public health and urban equity (WHO & UNICEF, 2021). Yet, despite widespread recognition, actual usage patterns reveal a persistent disconnect, awareness alone does not translate into consistent access.

Usage trends show that public toilets are typically used in moments of urgency or when no other options are available. This points to a reliance driven by necessity rather than preference. Similar situations have been documented in cities like Kampala and Addis Ababa, where residents continue to use substandard facilities simply because alternatives are lacking (Adugna et al., 2022). Concerns around cleanliness and upkeep were frequently raised, reinforcing the idea that service quality is just as vital as physical availability.

Importantly, the data challenges the notion that poor sanitation outcomes stem from a lack of knowledge. Respondents were well aware of health risks such as cholera and urinary tract infections. However, their choices were shaped by deeper structural issues, limited infrastructure, unaffordable fees, and weak oversight. This mirrors findings from Kisumu and Accra, where systemic shortcomings, rather than individual behaviour, were found to be the main barriers to improved sanitation (Simiyu et al., 2019; Yeboah & Appiah-Effah et al., 2024).

The fact that most respondents expressed a willingness to pay for better services opens the door to cost-sharing approaches. Still, the issue of affordability cannot be ignored. Studies from South Asia and Sub-Saharan Africa caution that pay-to-use models often leave out the most vulnerable, deepening existing inequalities (Kim et al., 2022; Peletz et al., 2021). Nairobi's current pricing structure, though relatively low, does not adequately reflect the financial realities of many users. When compared to cities like Singapore and London, the contrast is stark. In those contexts, sanitation services are free, safe, and well-managed thanks to strong municipal leadership and sustained investment (Simiyu et al., 2020). Nairobi's fragmented and semi-commercialized approach falls short of these standards, underscoring the need for more cohesive and inclusive reforms.

Taken together, the results point to a clear path forward: expand infrastructure, raise hygiene standards, strengthen management, and ensure affordability. Without these changes, the city's sanitation system will continue to mirror broader social and economic divides compromising public health and limiting urban resilience.

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4. CONCLUSION

This study underscores that public toilets in Nairobi are not mere conveniences, they are essential infrastructure tied directly to public health, social equity, and the city's overall functionality. The widespread recognition of their significance and the health risks tied to poor sanitation suggests that residents are ready for change. Yet, access remains hindered by persistent challenges: limited availability, unhygienic conditions, weak oversight, and fees that many cannot afford. The data shows that people use these facilities out of necessity rather than satisfaction, a trend echoed in cities like Kampala and Accra, where dependence on public toilets is matched by frustration over their poor standards.

Rather than blaming poor sanitation outcomes on a lack of awareness, this study reveals that knowledge alone doesn't solve the problem. Nairobi's residents understand the risks, but systemic shortcomings prevent meaningful progress. Cities such as Singapore, Tokyo, and London show what's possible when sanitation is treated as a public good backed by steady investment and strong governance. Nairobi, by contrast, suffers from a disconnect between public awareness and actual access, with vulnerable groups like women, older adults, and people with disabilities facing the greatest risks.

Although many residents are willing to support better services, public toilet usage patterns reveal a stark disparity. Fragmented leadership and profit-driven pricing models have failed to turn that willingness into lasting improvements. Current pricing models have failed to reflect socioeconomic realities, the exclusion of low-income users due to high fees highlights the flaws in current approaches and points to the need for a rights-based model, one that centre's affordability, inclusion, and dignity. Cities like Cape Town, Kigali, and Kampala offer promising examples, where coordinated policies, inclusive design, and professional management have led to better outcomes.

To fulfill the goals of SDG 6.2 and ensure fair access to sanitation in urban areas, Nairobi must move past isolated efforts. Expanding infrastructure, enforcing accountability, subsidizing access for vulnerable groups, and embedding participatory governance are all critical. Elevating public toilets to the same level of importance as roads, water, and electricity will allow the city to build a system that is robust, inclusive, and respectful of everyone's needs.

REFERENCES

1) Adjibolosoo, S. V., Ofori, B. D., Adongo, P. B., Afranie, S., & Yirenya-Tawiah, D. R. (2020). The influence of culture on open defecation in some basic schools in selected districts in Ghana: A preliminary study. PLoS One, 15(10), e0239491
2) Adugna, d. (2023). challenges of sanitation in developing counties: evidenced from a study of fourteen towns, Ethiopia. Heliyon, 9(4), e12932. https://doi.org/10.1016/j.heliyon.2023.e12932
3) Ahuma-Smith, C., Bavuno, S., & Dokyi, G. O. (2020). The Characteristics and Management Practices of Public Toilets in Wa, Ghana. Civil and Environmental Research, 12(6), 85-95.
4) Ali, S. M., Rashid, S. F., & Islam, M. (2020). Are awareness and practice of hygiene linked? Evidence from urban slums in Dhaka, Bangladesh. Journal of Water, Sanitation and Hygiene for Development, 10(4), 768–778. https://doi.org/10.2166/washdev.2020.126
5) AlSakkaf, K. A., Bahattab, A. A., & Bawazir, A. A. (2023). Knowledge and Practices Related to Water, Sanitation, and Hygiene among Household Residents in Selected Districts, Abyan Governorate. Yemeni Journal of Medical and Health Research, 12(1/2), 1-17.
6) Amadi, S. N., Eze, M. E., & Okafor, J. I. (2022). Community awareness and sanitation practices: Implications for public health in urban slums. African Journal of Environmental Health, 28(3), 112–124.
7) Amato, H. K., Martin, D., Hoover, C. M., & Graham, J. P. (2022). Somewhere to go: assessing the impact of public restroom interventions on reports of open defecation in San Francisco, California from 2014 to 2020. BMC Public Health, 22(1), 1673. https://doi.org/10.1186/s12889-022-13904-4
8) Amoah, p., Frempong, g. k., & Donkor, e. (2021). sanitation services in Ghanaian cities: a comparative analysis of user satisfaction. international journal of environmental health research, 31(5), 535–547. https://doi.org/10.1080/09603123.2020.1778457
9) Appiah-Effah, E., Boakye, K. B., Salihu, T., Duku, G. A., Fenteng, J. O., Boateng, G., … & Nyarko, K. B. (2024). Determinants of open defecation among rural women in Ghana: Analysis of Demographic and Health Surveys. Environmental Health Insights, 18, Article e12932. https://doi.org/10.11786302241226774
10) Babbar, K., Das, U., Ashraf, D., Shpenev, A., & Bicchieri, C. (2023). Unlocking the Role of Social Norms: How They Shape Women's Public Toilet Usage in India. American Journal of Tropical Medicine and Hygiene, 109(5), 1177–1186 doi:10.4269/ajtmh.23-0220
11) Barker, T., Capone, D., Amato, H. K., Clark, R., Henderson, A., Holcomb, D. A. & Brown, J. (2023). Public toilets have reduced enteric pathogen hazards in San Francisco. PLOS Water, 2(8), e0000152. https://doi.org/10.1371/journal.pwat.0000152
12) Bartlett S. (2003). Water sanitation and urban children: The need to go beyond improved provision. Environ Urban, 15(2):57–70.
13) Bishoge, O. K. (2021). Challenges facing sustainable water supply, sanitation and hygiene achievement in urban areas in sub-Saharan Africa. Local Environment, 26(7), 893-907. https://doi.org/10.1080/13549839.2021.1931074
14) Bongfen, M. (2024). Toilet availability and use in public places in Buea: Implications for public health. Occupational Diseases and Environmental Medicine, 12(3), 161–171. https://doi.org/10.4236/odem.2024.123013
15) Burian, S. J., Nix, S. J., Pitt, R. E., & Durrans, S. R. (2000). Urban wastewater management in the United States: Past, present, and future. Journal of Urban Technology, 7(3), 33-62.
16) Chandana, N., & Rao, B. (2021). Status of sustainable sanitation chain in rural, semi-urban, and urban regions: a case study of Maharashtra, India. Journal of Water, Sanitation and Hygiene for Development, 11(1), 112-125. https://doi.org/10.2166/washdev.2020.020
17) Chinkaka, M., Brooke, A., & Fenner, R. (2025). Assessing the vulnerability of districts to waterborne diseases in Harare, Zimbabwe. Journal of Water, Sanitation and Hygiene for Development. https://doi.org/10.2166/washdev.2025.009

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18) Colombo, V. P., Orina, F., Meme, H., Koffi, J. A., Koné, B., & Utzinger, J. (2023). Environmental determinants of access to shared sanitation in informal settlements: A cross-sectional study in Abidjan and Nairobi. Infectious Diseases of Poverty, 12(34). https://doi.org/10.1186/s40249-023-01078-z
19) Demartoto, A., Zunariyah, S., & Pujihartati, S. H. (2022). Clean and Healthy Public Toilet in Amenities Development in Surakarta Tourist Destinations. Proceedings of the First Australian International Conference on Industrial Engineering and Operations Management, Sydney, Australia, December 20-22, pp. 899-906.
20) Deshmukh, S., Ghooli, S., & Kurle, R. S. (2020). A study to assess the awareness and practice regarding utilization of sanitary toilet in the rural villages of Kalaburagi district. Int J Community Med Public Heal [Internet], 7(3), 1184. http://dx.doi.org/10.18203/2394-6040.ijcmph20200988
21) Fadairo, O., Alabi-Adelakun, O., & Adetunji, A. (2020). Promoting community-led water, sanitation and hygiene interventions in rural settlements in Oyo state, Nigeria: Lessons from Agele and Mogba communities of Ibarapa-East Local Government Area. Rural-Urban Link Sustain Dev, 163, 176-201.
22) Ginja, S., Gallagher, S., & Keenan, M. (2021). Water, sanitation and hygiene (WASH) behaviour change research: why an analysis of contingencies of reinforcement is needed. International Journal of Environmental Health Research, 31(6), 715-728.
23) Guterres, A. (2020). The sustainable development goals report 2020. United Nations publication issued by the Department of Economic and Social Affairs, 1-64.
24) Gwimbi, P., George, M., & Moyo, T. (2020). Sanitation service delivery in small towns: Understanding community preferences and willingness to pay in Zimbabwe. Journal of Environmental and Public Health, 2020, Article ID 7812340. https://doi.org/10.1155/2020/7812340
25) Hallberg, O. (2021). Public toilets in an intersectional perspective – The call for change. Unpublished degree project. Kth Royal Institute of Technology. Stockholm, Sweden.
26) Handan T. E., Maimuna, A. A., Shekari, V., Shamsudeen, U., & Davou, H. D. (2023). Assessment Of Knowledge, Attitudes and Practices on Water, Sanitation and Hygiene in Zaria Local Government Area, Kaduna State. Science World Journal,18(3), 422-428. https://dx.doi.org/10.4314/swj.v18i3.15
27) Kaluli, j. w., Kabubo-Mariara, j., & Mutune, j. (2023). inequalities in access to improved sanitation in kenya: a spatial and socio-economic analysis. African journal of environmental science and technology, 17(1), 1–13. https://doi.org/10.5897/ajest2022.3151
28) Kenya National Bureau of Statistics. (2019). 2019 Kenya Population and Housing Census, Volume i: Distribution of Population by County and Sub-County, Number of Households, and Average Household Size. KNBS.
29) Kim, J., Hagen, E., Muindi, Z., Mbonglou, G., & Laituri, M. (2022). An examination of water, sanitation, and hygiene (WASH) accessibility and opportunity in urban informal settlements during the COVID-19 pandemic: Evidence from Nairobi, Kenya. Science of the Total Environment, 823, 153398. https://doi.org/10.1016/j.scitotenv.2022.153398
30) Malolo, R., Kumwenda, S., Chidziwisano, K., Kambala, C., & Morse, T. (2021). Social outcomes of community-based water, sanitation and hygiene intervention. Journal of Water, Sanitation and Hygiene for Development, 11(3), 483-493. https://doi.org/10.2166/washdev.2021.264
31) Mutuku, F., Khush, R., & Peletz, R. (2021). Willingness to pay for improvements in rural sanitation: Evidence from a cross-sectional survey of three rural counties in Kenya. PLOS ONE, 16(5), e0251500. https://doi.org/10.1371/journal.pone.0251500
32) Otieno, m. a., Onyango, g. m., & Wamicha, w. n. (2022). barriers to water, sanitation, and hygiene in sub-saharan africa: a systematic review. journal of water, sanitation and hygiene for development, 14(7), 497–508. https://doi.org/10.2166/washdev.2022.212
33) Peletz, R., MacLeod, C., Samuel, E., Easthope-Frazer, A., Khush, R., & Others. (2021). Will households invest in safe sanitation? Results from an experimental demand trial in Nakuru, Kenya. International Journal of Environmental Research and Public Health, 18(9), Article 4462. https://doi.org/10.3390/ijerph18094462
34) Seidu, A. A., Arthur, S., Yawson, A., & others. (2022). Demographic disparities in unimproved drinking water and sanitation in Ghana: a nationally representative cross-sectional study. BMJ Open, 12(7), e0605954. https://doi.org/10.1136/bmjopen-2021-0605954
35) Simiyu, S. N., Kweyu, R. M., Antwi-Agyei, P., et al. (2020). Barriers and opportunities for cleanliness of shared sanitation facilities in low-income settlements in Kenya. BMC Public Health, 20, Article 1632. https://doi.org/10.1186/s12889-020-09768-1
36) Simiyu, s., Mumma, j., & Cumming, o. (2021). user perspectives on shared sanitation facilities in informal settlements: a study from Nairobi, Kenya. international journal of environmental health research, 31(4), 426–437. https://doi.org/10.1080/09603123.2020.1743704
37) UNICEF & WHO. (2023). progress on household drinking water, sanitation and hygiene 2000–2022: africa regional snapshot. who/unicef joint monitoring programme (jmp)https://cdn.who.int/media/docs/default-source/wash-documents/sanitation/jmp-africa-snapshot_v3final_3nov.pdf
38) United Nations Water (2022). GLAAS 2022: Global Analysis and Assessment of Sanitation and Drinking-Water — Strong systems and sound investments: Evidence on accelerating progress on sanitation, drinking-water and hygiene. WHO. https://www.who.int/publications/m/item/glaas-2022-report
39) WHO & UNICEF joint monitoring programme (jmp). (2023). progress on household drinking water, sanitation and hygiene 2000–2022: africa regional snapshot. https://cdn.who.int/media/docs/default-source/wash-documents/sanitation/jmp-africa-snapshot_v3final_3nov.pdf
40) WHO/UNICEF joint monitoring programme (2023). progress on household drinking-water, sanitation and hygiene 2000-2022: special focus on gender. https://www.who.int/publications/m/item/progress-on-household-drinking-water--sanitation-and-hygiene-2000-2022---special-focus-on-gender

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41) WHO/UNICEF joint monitoring programme (2023). sanitation. https://washdata.org/monitoring/sanitation
42) World Bank. (2020, February 19) Providing Sustainable Sanitation and Water services to Low-income Communities in Nairobi. Retrieved from-https://www.worldbank.org/en/news/feature/2020/02/19/providing-sustainable-sanitation-and-water-services-to-low-income-communities-in-nairobi

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Corresponding Author: Beverlyne Brenda