SANITATION AND WASTE MANAGEMENT IN UNIVERSITAS SINGAPERBANGSA KARAWANG'S POJOK KULINER MAINTENANCE FOR SUSTAINABILITY

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ABSTRACT

This study aims to evaluate the sanitation facility management system at the Pojok Kuliner bathroom of Universitas Singaperbangsa Karawang (UNSIKA) by analyzing its infrastructure conditions, water quality, user experiences, and compliance with health and sustainability standards. A qualitative descriptive approach was used with field observations, semi-structured interviews, and laboratory testing of water samples. The data analysis was conducted through data reduction, thematic classification, and conclusion verification techniques. The results revealed that while basic maintenance efforts such as filtration and daily cleaning were in place, water quality remained below acceptable standards, with pH levels of 5.8 and the presence of microbial and chemical contaminants. The bathroom layout lacked inclusivity and accessibility, and no formal complaint mechanism or performance monitoring system was identified. These deficiencies reflect a lack of strategic planning, participatory supervision, and sustainable sanitation practices. The study also found significant user health concerns, especially among female students, linked to exposure to contaminated water. This research highlights the urgent need for an integrated, data-driven sanitation management model in higher education institutions. It contributes a novel evaluative framework that combines facility audit findings, user-based insights, and education management principles to support regulatory compliance, infrastructure improvement, and user wellbeing.

Keywords*: Sanitation, Facility Management, Water Quality, Sustainability, Educational Supervision.*

INTRODUCTION

Effective sanitation is paramount for cultivating a healthy, safe, and supportive learning environment within higher education institutions, with bathroom facilities representing a critical aspect of campus infrastructure that directly influences the health, comfort, and overall well-being of both students and faculty. Beyond their fundamental hygienic role, well-maintained sanitation facilities serve as a tangible indicator of an institution's commitment to public health principles, the provision of inclusive infrastructure, and the delivery of quality services. Initial observations at the Pojok Kuliner area of Universitas Singaperbangsa Karawang (UNSIKA) have revealed visible indicators of inadequate maintenance, including stained floors, unpleasant odors, and the presence of stagnant water, suggesting the existence of substandard management practices that could potentially lead to significant health risks.

Existing scholarly work concerning sanitation facility maintenance within Indonesian universities frequently points to a tendency towards reactive rather than proactive management strategies. For instance, Sari and Sutrisno (2020) documented that institutional responses to sanitation problems often occur only after complaints are lodged, indicating a lack of sustainable and preventative planning mechanisms. Similarly, Pratiwi, Sumarsono, and Hasanah (2021) reported inconsistent cleaning schedules and ineffective monitoring systems, while Nurhadi, Surya, and Fadli (2019) identified deficiencies in supervisory structures as contributing factors to both poor sanitation quality and diminished user satisfaction. On a broader scale, Hakim (2018) has highlighted the prevalent lack of

ergonomic and inclusive design in public university bathrooms, which consequently fails to adequately accommodate the needs of users with disabilities. Furthermore, Prasetyo (2019) has drawn attention to the use of low-quality construction materials that are susceptible to deterioration in humid conditions, thereby elevating the risk of bacterial contamination and infrastructure failure.

Despite this body of research, there remains a notable gap in studies that explicitly connect sanitation issues with broader education management frameworks, such as the integration of planning processes, the implementation of participatory supervision models, and the incorporation of sustainability principles within campus facility governance. This research endeavors to address this critical oversight by investigating the intersection of sanitation maintenance practices with educational planning and quality assurance mechanisms. Moreover, previous studies have often lacked empirical evaluations grounded in user experience data, comprehensive water quality analysis, and thorough assessments of infrastructure compliance with both national and international standards. The novelty of the present study lies in its synthesis of education management principles with a rigorous technical evaluation of sanitation infrastructure, employing a participatory and evidence-based methodological approach. This research aims to be both supportive and corrective in its orientation: it reinforces the need for enhanced sanitation governance while simultaneously critiquing the prevailing top-down administrative approach by proposing a participatory and field-data-driven model for evaluation.

Consequently, this study is guided by four primary objectives: (1) to comprehensively assess the current ergonomic design and physical condition of the bathroom facilities located in the Pojok Kuliner area of Universitas Singaperbangsa Karawang (UNSIKA); (2) to rigorously evaluate the water quality within these bathrooms through the analysis of relevant physical, chemical, and biological parameters; (3) to thoroughly analyze the potential health risks associated with the existing sanitation infrastructure; and (4) to propose a holistic, sustainable, and participatory sanitation management framework that aligns with established national guidelines (Kemenkes, 2017) and recognized international benchmarks (SDG 6) (Rahayu, 2020). By pursuing these objectives, this study seeks to contribute to the enhancement of not only the quality of sanitation infrastructure but also the promotion of institutional accountability and the improvement of student well-being.

RESEARCH METHODS

This research adopted a qualitative descriptive methodology to achieve a comprehensive understanding of the alignment between bathroom infrastructure at the Pojok Kuliner area of Universitas Singaperbangsa Karawang (UNSIKA) and established standards for sanitation and facility management. The selection of a qualitative approach facilitated the exploration of existing conditions and individual perceptions within a natural setting, thereby enabling a richer and more contextually nuanced interpretation of the sanitation challenges and prevailing practices within the university environment. Data collection spanned a three-month period, from February to April 2025, a timeframe chosen to allow for repeated observations and in-depth interviews, ensuring the acquisition of detailed and contextually relevant data. The study site, the Pojok Kuliner at Universitas Singaperbangsa Karawang (UNSIKA), was strategically selected due to its high foot traffic as a central campus area frequented by both students and staff, underscoring the critical importance of accessible and well-maintained bathroom facilities for daily campus life.

The study population comprised all individuals who interact with or hold responsibility for the bathroom facilities at the Pojok Kuliner, including Universitas Singaperbangsa Karawang (UNSIKA) students as primary users, janitorial staff responsible

for routine maintenance, and facility managers overseeing broader infrastructure management. A purposive sampling technique, a non-probability method commonly employed in qualitative research to ensure the selection of knowledgeable and relevant participants, was utilized to select the study sample. A total of twelve participants were involved, consisting of six students, three cleaning personnel, and three facility management staff. The sample size was determined by the principle of data saturation, reached when additional interviews yielded no new insights, thereby ensuring the depth and credibility of the collected information. The purposive sampling approach was deemed appropriate as it focused on individuals with direct experience, facilitating the capture of relevant, nuanced, and actionable data.

Data collection involved the use of several instruments specifically designed for qualitative inquiry. An observation checklist, developed with reference to the Ministry of Health Regulation No. 32 of 2017, which outlines standards for sanitation facilities, was used to assess physical cleanliness, material conditions, lighting, ventilation, and accessibility. Semi-structured interview guides were also created to explore participant experiences and perceptions regarding sanitation, bathroom usage patterns, maintenance routines, and encountered challenges. These instruments underwent a process of validation and reliability testing through expert review and pilot testing. The pilot phase involved conducting a small number of interviews and observations to assess the instruments' effectiveness in capturing the intended data, leading to revisions for enhanced question clarity and coverage based on the feedback received. Validity was ensured through logical consistency and alignment with the research objectives, while reliability was supported by the consistency of responses obtained across different participants and situations. The selection of these instruments was based on their capacity to capture both observable conditions and subjective experiences, rendering them well-suited for qualitative exploration.

In qualitative research, informants serve as crucial sources of data. This study's informants included students who are frequent users of the bathrooms, cleaning staff responsible for their upkeep, and facility managers who oversee planning and repairs. These individuals were selected based on their regular engagement with the facilities, ensuring that the collected data reflected actual usage patterns and management practices. The processing of interview and observation data followed established qualitative procedures. Following transcription, the data were coded using NVivo software to identify recurring themes and subthemes. The coding process involved multiple readings of the transcripts, the assignment of codes to significant statements, and the grouping of related codes into broader categories. This thematic analysis was conducted in stages, commencing with open coding, followed by axial coding to establish connections between categories, and selective coding to integrate the findings into coherent conclusions.

The data analysis technique employed in this research was qualitative content analysis, complemented by descriptive interpretation. This process involved data reduction, wherein irrelevant or redundant data were discarded, followed by data display using thematic matrices to visualize relationships among different aspects of the findings. The final stage involved conclusion drawing and verification, where findings were interpreted within the context of sanitation regulations and campus facility management standards. Research procedures commenced with preliminary observations to identify key areas of concern, followed by the development of the research instruments. Field visits were subsequently conducted to observe facility conditions and gather data through interviews and document analysis. Following data collection, the material was transcribed, coded, and analyzed as previously described. Ethical considerations were integral to this research, with all

participants being informed of the study's purpose and providing their voluntary consent. Confidentiality was maintained through the anonymization of participant identities in all records and reports. Triangulation, involving the cross-verification of data from observations, interviews, and documents, was employed to enhance the validity of the findings. This methodological design aims to ensure the potential for replication by future researchers under similar conditions and to contribute to the improvement of university sanitation policy based on direct field evidence and stakeholder perspectives (Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative data analysis: A methods sourcebook (3rd ed.). SAGE Publications.).

RESULTS AND DISCUSSION

Gambar 1. Bathroom conditions at the Pojok Kuliner of Universitas Singaperbangsa Karawang

Field observations and interviews conducted with Mr. Angga Vikar, the Pojok Kuliner Manager at Universitas Singaperbangsa Karawang (UNSIKA), corroborated that the water source for sanitation facilities is a 32-meter-deep borehole equipped with a carbon and sand filtration system. Despite monthly cleaning protocols for this system, the filtered water consistently exhibited turbidity, a brownish discoloration, and a notable fishy odor. Mr. Angga reported instances of skin irritation, particularly itching in sensitive areas of the body, among students following bathroom use, although no formal complaints have been officially registered. Cleaning procedures are carried out bi-weekly using chemical agents, and internal waste disposal occurs three times per week. Notably, a formal documentation system for sanitation complaints or maintenance evaluations is currently absent. The filtration unit has remained in service since its initial installation, and Mr. Angga also indicated that maintenance resources are limited to two staff members working until 11 PM daily.

Tabel 1. Sanitation and Maintenance Conditions

Maintenance Indicator	Actual Condition	Maintenance Frequency
Water Source	Jet pump, 32 meters depth	Fixed, not yet replaced
Filtration System	Carbon & sand filter	Cleaned once per month
User Complaints	Itching, cloudy water, fishy odor	Not officially recorded
Toilet Cleaning	Using chemical agents	Twice per week (Tuesday & Thursday)
Solid Waste Removal	Done internally	Three times a week (Mon, Wed, Fri)

Gambar 2. Water Quality at Pojok Kuliner Universitas Singaperbangsa Karawang

The collected data reveal significant discrepancies between the bathroom maintenance practices observed at Universitas Singaperbangsa Karawang (UNSIKA) Pojok Kuliner and established national sanitation standards, particularly those outlined in Permenkes No. 32 Tahun 2017. While the presence of a filtration system and scheduled maintenance suggests some level of attention to hygiene, the persistent poor water quality—characterized by its distinct fishy odor and visible turbidity—underscores the inadequacy of these efforts. According to the Environmental Protection Agency (2020), water with a pH level below 6.5 is considered corrosive and unsafe, especially when coupled with the potential presence of microbial contaminants such as E. coli. Mr. Angga's acknowledgment of user discomfort, including reports of itching and irritation, aligns with these potential health risks, although the lack of formalized complaint documentation indicates a significant oversight in participatory quality control mechanisms.

The absence of formalized reporting systems and regular water quality audits suggests a reactive approach to maintenance rather than a preventative model. This contradicts the principles of educational management frameworks, which emphasize planned supervision, systematic monitoring, and reflective improvement processes, as articulated by Mulyasa (2009). Effective sanitation governance within an educational context, according to Glickman, Gordon, and Ross-Gordon (2017), necessitates the integration of administrative planning with user-centered supervision, a synergy that appears to be lacking in the current practices at Universitas Singaperbangsa Karawang (UNSIKA). Furthermore, the observed absence of accessible sanitation infrastructure, as both witnessed and confirmed by Mr. Angga, contravenes the principles of inclusive and universal design, potentially marginalizing users with disabilities and diminishing equity on campus (Hakim, 2018).

The potential health risks, particularly for female students, are considerable. The field data corroborate concerns raised by the World Health Organization (2019) and the Centers for Disease Control and Prevention (2022), which have linked prolonged exposure to contaminated water with reproductive health issues, including urinary tract infections, hormonal disruption, and dermatological conditions. These findings are consistent with Mr. Angga's testimony and the symptoms reported by students. Furthermore, a study by Smith and Green (2019) has associated waterborne phthalates and microbial exposure with menstrual irregularities and potential long-term impacts on fertility.

The implications of these findings necessitate a fundamental shift toward an integrated and sustainable sanitation management system. Immediate actions should include the replacement of outdated filtration units, the implementation of digital feedback platforms to facilitate user reporting, and the establishment of routine microbiological testing protocols for water samples. Prasetyo (2019) has emphasized the potential of digital sanitation monitoring, when combined with active stakeholder engagement, to significantly improve response times and the precision of maintenance efforts. The implementation of such

systems at Universitas Singaperbangsa Karawang (UNSIKA) could more effectively address the recurring issues reported by Mr. Angga, contributing to a safer and more inclusive learning environment.

Ultimately, this research supports the findings of previous scholarly work that has highlighted the existing gap between policy guidelines and their practical implementation (Sari, 2020; Widodo, 2022). However, it also offers a unique contribution by providing firsthand insights from both facility managers and users, underscoring the critical disconnect between technical sanitation efforts and their perceived effectiveness. Through this integration of educational management theory with a direct evaluation of sanitation practices, this study contributes to a more comprehensive understanding of campus infrastructure governance and proposes a model grounded in health equity, active stakeholder involvement, and sustainable practices.

CONCLUSION

Drawing upon the analysis of the sanitation infrastructure at the Pojok Kuliner bathroom facility of Universitas Singaperbangsa Karawang (UNSIKA), this study concludes that the prevailing system of maintenance and water management significantly deviates from established standards for educational facilities management across both technical and managerial domains. Notwithstanding the presence of a rudimentary filtration system and a defined cleaning schedule, the water quality remains compromised, facility accessibility is insufficient, and there is a notable absence of structured supervision or user feedback mechanisms. The innovative aspect of this research resides in its synthesis of empirical user-generated data with fundamental principles of education management, thereby illuminating the interconnectedness of public health considerations, infrastructure governance frameworks, and participatory supervision within the context of higher education. This study substantiates that inadequate sanitation is not solely a technical deficiency but also a manifestation of deficient planning processes, limited stakeholder engagement, and the lack of a comprehensive long-term sustainability strategy. The implications of these findings underscore the imperative for institutional reform in sanitation management, particularly through the integration of user-centric reporting systems, rigorous water quality monitoring protocols, and the adoption of inclusive design principles in university facilities. These recommendations not only align with national health regulations but also contribute to the broader objectives of global sustainability initiatives. The outcomes of this study offer valuable insights for campus policy revisions, serve as a potential framework for sanitation audits across other public universities, and provide direction for future research investigating the intricate relationships between infrastructure quality, student well-being, and institutional accountability (Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative data analysis: A methods sourcebook (3rd ed.). SAGE Publications.).

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