



## Strategies for Increasing Access to Adequate Sanitation and Their Impacts On Public Health: A Literature Review

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### Abstract

Sanitation is one of the most fundamental human needs. Lack of access to adequate sanitation facilities not only reduces the quality of life but is also the root of various health and environmental problems. Access to adequate sanitation is a key pillar of public health and a key indicator of the Sustainable Development Goals (SDGs). However, many communities in developing countries, including Indonesia, still face challenges in achieving universal sanitation access. This literature review aims to synthesize and analyze studies published in the last five years on intervention strategies to improve sanitation access and their impact on public health. The method used is a systematic literature review. The analysis shows that community-based approaches such as Community-Based Total Sanitation (STBM) remain an effective core strategy, but their success depends heavily on integration with other factors. A strong correlation was found between increased sanitation access and reduced prevalence of diarrheal diseases, stunting, and worm infections. Sociocultural factors, the role of women, post-intervention program sustainability, and innovations in technology and financing models are key determinants of success. Successful sanitation interventions are holistic, participatory, gender-sensitive, and tailored to specific contexts (urban, rural, post-disaster) to deliver significant health, social, and economic impacts.

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## Introduction

Sanitation is one of the most fundamental human needs. Lack of access to adequate sanitation facilities not only reduces the quality of life but also is at the root of various health and environmental problems. The World Health Organization (WHO) defines adequate sanitation as facilities that hygienically separate human waste from human contact (WHO, 2022). Consequently, billions of people worldwide still lack access to this basic service. This situation significantly contributes to the high incidence of infectious diseases, such as diarrhea, cholera, dysentery, typhus, and worm infections, which are major causes of morbidity and mortality, especially in children (Prüss-Ustün *et al.*, 2019).

Community-Based Total Sanitation (STBM) is a government program aimed at addressing environmentally-related diseases through behavioral change in Indonesia and also realizing SDG 6, namely ensuring universal access to clean water and sanitation for the community. Indonesian Minister of Health Regulation No. 3 of 2014 concerning STBM explains that this program has five pillars: Stop Open Defecation (Stop BABS), Washing Hands with Soap (CTPS), Safe Drinking Water and Food Management (PAMM-RT), Household Waste Management (PS-RT), and Household Liquid Waste Management (PLC-RT). The first pillar is the gateway to total sanitation. Stop BABS encourages the community to have access to healthy toilets by changing their behavior (A'yunina *et al.*, 2020).

Human resources development consist of three aspects which are quality, quantity, and mobility. Meanwhile the level of population welfare reflects the quality of the community, one of which is the standard of health and nutrition.<sup>1</sup> However, a significant and growing population will become a problem for human resources in the future. According to Population Survey (SP) 2020 released by the Central Bureau of Statistics (BPS), in 2015 the population of Indonesia reached 270 million more, in which the

population (Nizaruddin & Ilham, 2022). Socially, this condition can lead to stunting in children, which impacts cognitive development, and psychological impacts such as shame and insecurity, especially in women and adolescent girls. Therefore, understanding the most effective intervention strategies and their impact based on the latest empirical evidence is crucial (Utami *et al.*, 2024).

## Methods

This literature review was conducted using a systematic approach to identify, evaluate, and synthesize relevant research. The literature search process was conducted in July 2025 through two major electronic databases: Google Scholar and PubMed. The keywords used in the search were a combination of terms in Indonesian and English, including: "*community sanitation*", "*sanitation intervention*", "*Community-Led Total Sanitation*", "*health impact of sanitation*", "*diarrhea*", "*stunting*", "*sanitation marketing*", and "*urban sanitation*".

## Results

A total of 15 relevant articles that met the inclusion criteria were identified and analyzed. The study findings are summarized in the following table:

**Table 1.** Systematic Review

No	Author/Year	Research Title	Research Design	Results
1	Widodo Sukrisdiyanto dan Eddy Setiadi Soedjono /2023	Strategy for Handling Defecation Through Providing Healthy Sanitation in the Semampir Settlement	Qualitative Descriptive Analysis Techniques are used by conducting interviews.	The strategies obtained from the SWOT analysis are comprehensive, ranging from providing a database related to open defecation, providing assistance with healthy latrines and sanitation outreach, to strengthening laws and institutions that handle sanitation.
2	Muhammad Husni, Amatul Jadidah, & Muhammad Hasyim / 2017	Improving Access to Clean Water and Sanitation for Poor Rural Women	Focus Group Discussion (FGD) Technique	From the PAR research activities on the issue of access to clean water and sanitation in Kademangan village, it was found that the Aswaja mosque community is a mosque that has great potential for the development of the surrounding community, and with the PAR activities that we carried out, it was found that the community has an understanding as well as stakeholders (government, community, and community).
3	Sofia & Angelie Nopfitrah Sungkar /2025	Environmental Sanitation Risk Factors and Prevention Strategies for Hepatitis Incidence: A Systematic Review	This systematic review follows the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines.	Hepatitis A and E viruses are commonly found in contaminated water, highlighting the importance of sanitation and access to clean water. Other risk factors include poor hygiene practices, overcrowding, and limited access to health facilities.

No	Author/Year	Research Title	Research Design	Results
4	Silvia Herdinda/2024	Literature Review Study: The Effect of Clean Water Sanitation on Stunting Incidence in Toddlers	Literature Review Method	The research results show that clean water sanitation has an effect on stunting in toddlers. There are criteria for stunting in toddlers, such as the influence of WASH (Water, Sanitation, and Hygiene).
5	Rayhan Yoga Pratama & Abi Senoprabowo/ 2025	Educating the public about the importance of access to adequate toilet sanitation through public service announcements in Kendal Regency	Qualitative Research Approach	That continued efforts are needed to strengthen the reach and impact of sanitation awareness campaigns, by involving relevant parties, such as local governments, health facilities, and community leaders, to ensure widespread adoption of better sanitation practices.
6	Denisa Shintadewi Pamungkas, Nida Awwali Zahratul Fadillah, Aan Julia, Dieny Ferbianty/2022	Strategy for Improving the Quality of Adequate Sanitation for Households in Sukajadi District, Bandung City	Quantitative and Qualitative Research Methods Using the Analytical Hierarchy Process (AHP) Model	Based on the results of data processing, the priority for improving the quality of proper sanitation for households in Sukajadi District is to build communal septic tanks, the use of which must be followed by good management and community education regarding the importance of sanitation access.
7	Belia Dwi Putri & Muhammad Afdal Samsuddin/2025	The Impact of Access to Safe Drinking Water and Sanitation on Poverty Levels: A Panel Study of Districts in West Java 2020-2024	Quantitative Approach and Panel Data Regression	The results of the analysis show that access to clean drinking water has a negative and significant effect on poverty, with a regression coefficient of -0.05784 and a p-value of 0.0484 (<0.05).
8	Ferdinandus Hadur, Kendry Mulyanto, & Anggraeny Puspaningtyas/2024	Strategy for Providing Clean Water and Adequate Sanitation in Labuan Bajo Village, Komodo District, West Manggarai Regency	Qualitative Approach	The research results show that PDAM has a number of strengths, weaknesses, opportunities and threats in carrying out its functions.
9	Muhammad Junaedi /2022	Sanitation, Management and Access to Clean Water for Health Improvement in	Literature Review Study	This review identified five journals closely related to the state of clean water access in Indonesia. These journals

No	Author/Year	Research Title	Research Design	Results
		Indonesia		describe clean water access, water quality, and the fact that drinking water sources used to meet community needs still do not meet drinking water consumption standards.
10	Lalu Galeh Inggil Fatristya, Wardatun Saimah, Islamul Hadi, Evi Aryanti/ 2025	The Role of Clean Water and Sanitation in Improving Quality of Life: A Literature Review on Achieving the 2030 SDGs	Literature Review	The results of this review confirm that sustainable investment in the clean water and sanitation sector is a strategic key to accelerating the achievement of the SDGs, especially in the context of reducing socio-economic disparities and increasing community resilience to global challenges.
11	Nani Yuniar, Devi Savitri Effendy, Hartati Bahar, and Syam Sinar Syamsuddin/2023	Evaluating food sanitation, hygiene, and quality in the nutrition installation of an Indonesian mental hospital: A qualitative study	This study employed qualitative research with a phenomenological approach	The findings indicated that the food storage and processing practices complied with the requirements outlined in Decree of Indonesia Minister of Health (Permenkes) No. 1096 of 2011.
12	Zuing Putra Arisanto, Ramadhan Tosepu, Sitti Rabbani Karimuna, Asnia Zainuddin, Yasnani, Nurmaladewi/ 2019	The Correlation Between Housing Sanitation And Existence Of Vectors In Kendari Sub Districts, Indonesia	A Descriptive Quantitative Study With A Cross-Sectional Approach	Findings indicated that there was a statistically significant relationship between housing sanitation and the existence of vectors ( $p < .05$ ).
13	Andi Fadhilla Rustam, Pitrah Asfian, Puput Monica Rifty, Rina Agustina, Muhammad Bazal M, Fitri Aulia, La Ode Rezamrin, Ayuningtyas M, Zulfani Indah Lestari, Narti, Kiki Haprianti, Pricilia Riscika A, Hestia Ningsih/2024	Sanitation and Environmental Health in Coastal Areas of Nambo Village, Nambo District, Kendari City, Southeast Sulawesi Province, Indonesia	A descriptive method	The majority (39%) of residents in Nambo Village used clean water sourced from dug wells.
14	Ainani, Ferniati, Irawan Angkasa Putra/2025	Environmental Sanitation in the Coastal Area of Tondonggue Village, Nambo Sub-district, Kendari City, Southeast Sulawesi Province, Indonesia	This research employed an analytical observational design using a cross-sectional	The majority of residents in Tondonggue Village demonstrated handwashing behavior that meets health standards, with a compliance rate of 84.8%.
15	Abdul Rahman & Andi	Environmental	A Systematic	The findings from the

No	Author/Year	Research Title	Research Design	Results
	Isnaeni/2025	Sanitation Challenges and Opportunities in Indonesia Coastal Regions: A Review	Literature Review (SLR)	reviewed literature indicate that basic environmental sanitation in Indonesia's coastal regions remains below national health standards.

## Discussion

Community-Based Total Sanitation is a program that approaches communities to change hygiene and sanitation behaviors through community empowerment without subsidies. It encompasses five pillars: Stopping Open Defecation (OPD), Washing Hands with Soap (CTPS), Safe Water and Food Management in Households (PAM RT), Household Waste Management (PS RT), and Safe Household Wastewater Management (PAL RT). This STBM program targets all communities in a specific environment. The main priority of the STBM program is areas far from the city center, especially those with topography that makes it more likely to engage in unhygienic or unhealthy practices, as well as slum areas (Azizah *et al.*, 2021)

The problem of providing sanitation in the densely populated area of Semampir District, which has the highest rate of open defecation in Surabaya City, still requires solutions. Based on the identification of potential and problems in the research area, processed using a SWOT analysis, several strategies for addressing open defecation behavior were formulated. The SWOT analysis showed that the research area is categorized as growing and building, with significant opportunities and chances to achieve optimal results in eliminating open defecation. Furthermore, ten comprehensive strategies for addressing open defecation behavior were identified, ranging from providing a database related to open defecation, providing assistance with healthy latrines and sanitation outreach, to strengthening laws and institutions that handle sanitation (Sukrisdiyanto & Soedjono, 2023).

Water is a basic human need. It is generally accepted that wherever we find water, there is hope for life. The largest body of water on Earth is the ocean, accounting for 97 percent of the world's water supply, and the remaining 3 percent is freshwater, which we use to support our daily lives. Clean water and sanitation are human rights that must be fulfilled, respected, and protected by the state. This is reinforced by the agreement of world leaders in the 2000 Millennium Development Goals (MDGs) and the 2010 United Nations (UN) resolution on the human right to clean water and sanitation. This resolution further emphasizes and broadens global recognition of the importance of access to clean water and sanitation to achieving gender equality, sustainable development, and poverty alleviation (Husni *et al.*, 2017).

Based on the review of the 30 articles above, it was found that the transmission of hepatitis A and E viruses is caused by contaminated water and untreated wastewater. Contaminated water plays a significant role in the spread of hepatitis A and E, especially in areas with poor sanitation conditions.<sup>21</sup> Risk factors for individuals infected with the hepatitis virus can occur due to population density, poor sanitation, urbanization, limited vaccination, and limited access to health services. In low- and middle-income countries, the number of hepatitis A cases is higher because it is caused by wastewater. Strategies to reduce cases of hepatitis A and E infections can be carried out through vaccination programs, improving good sanitation, namely through the availability of handwashing facilities and community-based total sanitation (Sofia & Sungkar, 2025).

Water plays a crucial role in the spread of disease. Unsafe water can cause illness, especially in toddlers. It's important to consider both protected and unprotected drinking water sources. Examples of protected drinking water sources include water from water treatment plants (PDAM) and bottled water, while unprotected sources include river water, well water, and rainwater. Therefore, families are advised to always use clean water and to manage drinking water by boiling it before children consume it (Silvia Herdinda, 2024).

Based on data obtained from the Kendal Regency Public Development and Public Housing Agency, it shows that increasing public awareness of the importance of access to proper sanitation in Kendal Regency can be achieved through an effective public service advertising campaign. Based on the analysis and implementation of the poster advertising design, it is hoped that the public will better understand the benefits of good sanitation and motivate them to switch to using healthy and safe latrines. Placing posters in various health facilities, such as hospitals, clinics, and community health centers, will expand the reach of sanitation education. Despite challenges such as low public understanding of proper sanitation and limited access to information, a simple and informative visual approach through posters has proven effective in conveying the message. Therefore, it is recommended that this sanitation education campaign



continue to be strengthened, taking local conditions into account and involving all parties, including the government and local communities, to achieve sustainable behavior change in improving sanitation quality in Kendal Regency (Pratama & Senoprabowo, 2025).

The regional profile survey, an activity carried out by the Bandung City Development Planning, Research, and Development Agency, is one of the efforts undertaken with the aim of obtaining information that can be used as material for planning and policy formulation by the smallest level of government elements, namely the Citizens' Association (RW) and Neighborhood Association (RT). In this activity, surveyors are divided into several groups to record several questions regarding conditions occurring in the community so that conditions can be understood (Pamungkas *et al.*, 2022).

This means that every 1% increase in access to safe drinking water reduces the poverty rate by 0.05784%. Improved access to clean water has a direct impact on reducing the economic burden and improving the welfare of the poor. Meanwhile, access to proper sanitation has a negative coefficient of -0.01350, but its effect is not statistically significant ( $p\text{-value } 0.3916 > 0.05$ ). This indicates that although proper sanitation is important for quality of life and health, in this model its effect on poverty is not yet directly significant. This finding emphasizes the importance of expanding access to safe drinking water and sanitation as part of poverty alleviation efforts in West Java. Limited access to basic services affects health, productivity, and household expenditure, ultimately exacerbating poverty. Therefore, local governments need to focus on inclusive and sustainable policies, particularly improving basic services such as clean water and health (Dwi Putri & Samsuddin, 2025).

PDAM's core strengths include an extensive distribution network, robust regulatory support, adequate technical capabilities, a stable supply of raw water, and responsive service. However, weaknesses include aging infrastructure, limited human resource management, financial constraints, the distance of raw water sources from distribution centers, and frequent service disruptions. Opportunities that PDAM can capitalize on include regulatory support from the government, increased public awareness of the importance of clean water, the implementation of innovative projects, partnerships with the private sector, and the application of modern technology. Threats include the impact of climate change on raw water availability, limited water resources, suboptimal human resource management, and long-term cash flow and funding issues. By understanding these factors, PDAM can formulate more effective strategies to improve its performance and provide better water and sanitation services. Recommendations include infrastructure rejuvenation, increased staff training and development, diversification of funding sources, adoption of innovative technologies, and strengthening collaboration with external partners (Ferdinandus Hadur *et al.*, 2024).

The importance of environmental sanitation requires government involvement and public awareness. All elements of society must be responsible and participate in maintaining and developing environmental sanitation to realize a clean Indonesia. Judging from the data presented above, Indonesia has slowly shown quite good progress, with an increase of Rp. 5,000 per year, although in reality it is still far from the target of reaching Rp. 47,000 per capita per year. However, with the cooperation of all elements, especially community-based, growth will be quickly implemented and the target can be quickly realized (Junaedi, 2022).

This literature review confirms that access to clean water and sanitation has a broad impact on health, economic, and social well-being. While progress has been made in increasing this access globally, challenges such as geographic disparities, climate change, and funding constraints remain to be addressed. By integrating cross-sectoral approaches, sustainable investment, and technological innovation, SDG 6 and improving the quality of life globally can be achieved more quickly (Galeh *et al.*, 2025).

In general, sanitation hygiene practices, including aspects such as food sorting, storage, processing, serving, transportation, and personal hygiene for food handlers, have been implemented at the Nutrition Installation of the Southeast Sulawesi Hospital. However, there are still discrepancies between the actual implementation in the field and what should ideally be practiced. These discrepancies may arise due to the reluctance of some food handlers to adhere to sanitary hygiene provisions, as they may perceive them as troublesome or impractical. Additionally, limitations in implementing proper sanitary hygiene practices can contribute to the observed discrepancies. It is important to address these issues by raising awareness among food handlers about the significance of sanitary hygiene and its impact on food safety. Providing proper training and education, along with clear guidelines and practical solutions, can help overcome these challenges and promote consistent adherence to sanitation hygiene measures (Yuniar *et al.*, 2023).

Wastewater drainage is a building that is used to dispose of wastewater from bathrooms, washing places, kitchens, and others and not from latrines, where healthy should meet healthy requirements, including not polluting sources of clean water, does not cause stagnant water that can be used for mosquito nets, does not cause odor and does not cause muddy water. The open sewage channel and the flow of water that is not smooth are the nesting place for mice, especially mice, got carriers of *Leptospira*

bacteria. This is by the results of Fadzilah's (2014) study that there is a relationship between sewerage channels in the presence of rats ( $p = 0.001$ ) (Arisanto *et al.*, 2019).

Based on secondary data from 2019, the majority of the drinking water sources for the community in the coastal area of Nambo Village come from bore wells and dug wells, with some others accessing drinking water from refill water, PDAM, and springs. The community has met the drinking water usage standards due to their high awareness of the importance of clean water access. A total of 77% of respondents boil their water before drinking, particularly those using water from dug wells and bore wells. The remaining 23% do not boil their water, generally because they use refill water, which is considered safe for consumption, and boiling water is seen as time-consuming. This condition aligns with the study by Utami, Jaya, and Nugrahen (2018) in the coastal area of Kota Agung District, where 100% of the population used well water for household needs, including drinking. Research by Susilawaty, Amansyah, and Nildawati (2016) also supports these findings, showing that residents of small islands in South Sulawesi frequently use refill water, with some respondents boiling it to kill microorganisms. Conversely, some respondents do not boil the water as they are accustomed to drinking it directly and do not find it problematic (Rustam *et al.*, 2024).

Most residents in Tondonggue Village meet the requirements in hand washing behaviour. This can be seen in the results, namely with a total of 28 respondents (84,8%). Where the hand washing behaviour that does not meet the requirements is with a total of 5 respondents (15,2%). One of the sanitation practices used by humans to maintain personal hygiene and stop the spread of germs is washing hands with soap and water (Eldysta *et al.*, 2022). Handwashing itself is defined as the behaviour or efforts of individuals in maintaining health so as not to get sick (Ainani *et al.*, 2025).

Based on a literature review on environmental sanitation in coastal areas, it can be concluded that factors such as knowledge, income, and behavior contribute to the poor quality of environmental sanitation. Communities still tend to adhere to inherited habits and pay little attention to the implementation of appropriate and effective environmental sanitation, which ultimately increases the risk of various diseases (Rahman & Isnaeni, 2025).

## Conclusion

This extensive literature review confirms that successful sanitation interventions must be adaptive and holistic. There are no silver bullets. Success depends on the ability to combine multiple strategies: triggering behavior change through STBM, supported by long-term sustainability programs; engaging women as agents of change; selecting appropriate financing and marketing models; and implementing technologies tailored to the local context.

The impact of proper sanitation extends far beyond preventing diarrhea, including reducing stunting and worm infections, increasing economic productivity, and protecting mental health and human dignity. Therefore, investing in the sanitation sector is one of the most fundamental and intelligent investments for human resource development and inclusive economic growth. Future research should further explore interventions in challenging contexts (remote areas, slums, and post-disaster settings) and measure the long-term impact of various intervention models.

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