



Community-Based Environmental Sanitation Management in the Working Area of the Bahodopi Community Health Center, Morowali Regency, Central Sulawesi Province

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ABSTRACT

Environmental sanitation in the working area of the Bahodopi Community Health Center faces serious challenges due to rapid industrial development and high population mobility. This situation has led to an increase in sanitation problems such as limited access to clean water, waste disposal, and liquid waste management. This study aims to analyze the factors that influence community sanitation behavior and formulate community-based management strategies. The research method used is a quantitative approach through a survey of 98 heads of families selected using the Proportional Stratified Sampling technique. Data analysis was conducted using Structural Equation Modeling (SEM) to test the relationship between variables and SWOT analysis to formulate environmental sanitation strategies. The results showed that attitude was the most influential factor on environmental sanitation behavior, while environmental knowledge, sanitation knowledge, and income did not have a significant direct influence. However, knowledge still played an important indirect role through attitude formation. The SWOT analysis shows that the Bahodopi region has strong internal capacity and great external opportunities, so the recommended strategies are a diversification strategy for wastewater management and an aggressive strategy for waste and drainage issues

INTRODUCTION

According to reports, from 2014 to 2021, economic growth in this region continued to show a consistent upward trend. The Morowali Industrial Area is part of the National Strategic Project (PSN) based on the decision of the Coordinating Minister for Economic Affairs No. 9 of 2022. Therefore, the central government, through the Ministry of Public Works and Public Housing (PUPR), continues to develop and build infrastructure in the area. In 2020, the Ministry of PUPR carried out drainage revitalization along the Bungku-Bahodopi road up to the Southeast Sulawesi border. Furthermore, during the 2021–2022 period, road construction from Bahodopi to the Southeast Sulawesi border was carried out, and from 2020 to 2023, road preservation was implemented along the same route. The total budget for these activities reached IDR 135.8 billion, which is expected to support economic growth in the Morowali region, especially in Bahodopi District (Lampe, 2021; Masyam et al., 2025)

The presence of PT IMIP has been proven to have a positive impact on income. Based on research conducted by (Nardia, 2023), it was found that there was an increase in the income of the community, which initially consisted of farmers earning only around Rp.600,000 – 2,500,000, rising to Rp.6,000,000 – 8,000,000 after working at PT IMIP. Based on this data, the presence of PT IMIP evidently brings a positive impact on the income of the community. However, on the other hand, the industrialization process that is commonly carried out often causes widespread environmental degradation, including pollution of water, soil, and air. Environmental pollution occurs due to the disruption of the ecosystem balance, such as soil, air, and water, which has harmful effects on humans, animals, and plants. This disturbance arises from the entry of foreign substances, including garbage, industrial waste, oil, and hazardous heavy metals originating from human activities, which damage the natural functions of the environment. The presence of industries in an area will lead to a migration process from a sparsely populated to a more densely populated area, which certainly has a significant impact on environmental health, particularly on environmental sanitation (Adjei et al., 2023; Yamamura, 2022)

Poor sanitation in industrial areas such as Bahodopi not only contributes to an increase in environment-related diseases, such as diarrhea and acute respiratory infections (ARI), but also reflects weak regulation and implementation of waste management systems. According to (Husnah, 2020), Poor sanitation conditions in densely populated settlements or industrial areas are closely related to low public knowledge and limited physical sanitation infrastructure such as drainage and fecal management. The Community-Based Total Sanitation (STBM) program adopted by the central and regional governments has not been fully effective in Bahodopi. The) notes that although STBM pillar verification has been carried out, the coverage of communities implementing the five STBM pillars is still low. Factors such as the lack of hygienic latrine facilities, limited clean water, and lifestyle changes due to industry make it difficult to implement sanitation interventions comprehensively (Haryanti et al., 2022; Sumiati et al., 2021)

In addressing this issue, various strategies for environmental sanitation management have been developed, one of which is community participation in maintaining the balance between humans and the use of natural and artificial resources (Aditto et al., 2012; Alqudah et al., 2022). This balance can be achieved if the community is more concerned about their environment. The unclean condition of the environment can be seen from the fact that only a few people have access to clean water, waste management, garbage disposal, unfit housing conditions, and inadequate handling of liquid waste. In addition to affecting health, human behavior also impacts the quality of life. Many people still practice unhealthy habits, such as defecating in gardens or rivers with dirty water, or washing in polluted rivers. The environment greatly affects health levels, followed by community behavior. Sanitation and environmental health in residential areas can become environmental problems if not properly managed. Therefore, to solve sanitation issues in residential areas in Indonesia, appropriate strategies and management are required.

In designing strategies, research on the conditions needs to be conducted using a SWOT analysis approach, which includes internal and external analysis. The goal is to identify and explain various factors that become strengths and weaknesses. Internal analysis involves checking and assessing the situation, performance, and problems that arise in the implementation of health strategies. Meanwhile, external analysis aims to identify various factors that become opportunities and challenges. Internal factors in strategic analysis include elements that support strengths and weaknesses (Hasan & Udawatta, 2023; Mohezar et al., 2017). Therefore, SWOT analysis not only helps in developing evidence-based strategies but also strengthens the alignment of actions with the social, economic, and geographical context in the working area of the Bahodopi Health Center.

The urgency of this research is also increasing because data on environmental sanitation status in Bahodopi District is still limited, so appropriate measures cannot yet be formulated comprehensively. In fact, accurate mapping of sanitation problems is very important for public health policy planning, especially by the Health Center as the frontline of primary health services in the area. Thus, this study is important to identify the current environmental sanitation conditions, examine the factors causing sanitation problems, and formulate effective handling strategies amid the development of the industrial area. This research is expected to serve as a scientific foundation for policymakers in designing sustainable and equitable sanitation improvement programs, as well as making a tangible contribution to the integration of economic development and public health.

Problem Formulation

Based on the background above, the problem formulation in this study is how community-based environmental sanitation is managed in the working area of Bahodopi Health Center, Morowali Regency, Central Sulawesi Province.

Research Objectives

1. General Objective

To understand how community-based environmental sanitation is managed in the working area of Bahodopi Health Center, Morowali Regency, Central Sulawesi Province.

2. Specific Objectives

- a. To determine the relationship between the level of knowledge and community behavior in sanitation management in the working area of Bahodopi Health Center, Morowali Regency, Central Sulawesi Province.
- b. To determine the relationship between the level of knowledge of environmental sanitation and community behavior in sanitation management in the working area of Bahodopi Health Center, Morowali Regency, Central Sulawesi Province.
- c. To determine the relationship between attitudes and community behavior in sanitation management in the working area of Bahodopi Health Center, Morowali Regency, Central Sulawesi Province.
- d. To determine the relationship between income level and community behavior in sanitation management in the working area of Bahodopi Health Center, Morowali Regency, Central Sulawesi Province.

To determine community-based environmental sanitation management using SWOT analysis in the working area of Bahodopi Health Center, Morowali Regency, Central Sulawesi Province.

Research Benefits

Based on the research objectives above, it is expected that this study can provide theoretical and practical benefits, as follows:

Theoretical Benefits

It is expected that this research can contribute to the development of knowledge, especially in public health science, and can be used as a reference to enhance understanding of environmental health related to knowledge, attitudes, and behaviors of the community towards environmental sanitation.

Practical Benefits

This study certainly provides benefits for enhancing scientific understanding for researchers in the field of environmental health, particularly related to community-based environmental sanitation management.

LITERATURE RIVIEW

Gunarto et al. (2024) Research Title: The Impact of Nickel Mining Waste Pollution on Coastal Community Life. Nickel mining waste pollution has significant effects on the quality of the coastal environment, particularly concerning seawater pollution and coral reef damage. Several studies in coastal areas affected by nickel mining activities have shown that seawater quality and the condition of coral reef ecosystems have experienced considerable decline. The Concept of Environmental Sanitation Environmental sanitation is a series of efforts to create a clean and healthy environment through the control of environmental factors that can cause disturbances to human health. This definition includes technical and social actions such as providing clean water, waste management, disease vector control, and improvement of hygienic behavior. Sanitation is not only related to the development of physical facilities but also to the social understanding and behaviors associated with it. (Hyun et al., 2019)

Sanitation, according to the Indonesian Dictionary, is an effort to improve and realize optimal health conditions, especially for public health. In general, sanitation can be understood as a way to maintain and care for the human living environment, particularly the physical environment such as soil, water, and air. In a broader sense, sanitation includes behaviors aimed at promoting healthy lifestyles as well as strategies to prevent direct human contact with harmful and dirty substances, thereby maintaining cleanliness and improving public health. Clean Water Water is an essential component of life that plays a vital role in maintaining ecosystem balance, supporting human health, and fostering sustainable development. In the context of environmental science and public health, water that is categorized as clean must be free from biological, chemical, and physical contamination, and comply with established health standards, such as WHO or national regulations on drinking water quality (Jiang et al., 2024). Definition of a Toilet A toilet is a basic sanitation facility designed for the hygienic disposal of human fecal waste. According to Arthono (2022), a toilet is a structure or facility used to collect and dispose of human waste, in order to prevent the spread of disease and maintain environmental hygiene. A toilet is a building that functions to contain human waste so that it does not pollute the environment and serves as an important means to protect public health. Environmental Sanitation Management Strategy The term strategy comes from the Greek language, *strategos*, which originally referred to a plan to achieve victory in a military context in the past. However, today, strategy is commonly used in various aspects of activities. Strategy can also be interpreted as planning generally carried out by top management, with a focus on the long-term goals of an organization or company. This approach includes thinking, ideas, implementation, planning, and execution of activities according to a specified timeframe (Wardhana, 2024). Sanitation development strategy is an overall approach related to the implementation of ideas, planning, and execution of sanitation development that is intended to be developed in a certain area. One type of strategy that is often used is SWOT analysis. SWOT analysis is based on logic that can maximize strengths and opportunities while simultaneously minimizing weaknesses and

threats. The strategic decision-making process is always related to the development of an institution's mission, goals, strategies, and policies. Therefore, strategic planning must analyze the institution's strategic factors (strengths, weaknesses, opportunities, and threats) under the current conditions(Phadermrod et al., 2019)

Revenue

Income is one of the important indicators that shows the level of economic well-being of an individual or group in society. Income refers to the amount of money or compensation a person receives as a result of participating in economic activities. Income also plays a role in influencing health behavior. In general, higher income can increase attention and actions related to public health. High income often reflects the health status of an individual or group, so it can be concluded that the lower a household's income, the less likely it is to provide adequate sanitation facilities. Conversely, the higher the economic status, the greater the likelihood of providing adequate sanitation facilities (Firdiansyah et al., 2025)

Income plays an important role in meeting basic needs and serves as an external factor that influences how a person maintains hygiene and health. The level of income also affects how a person manages their health(Gragnano et al., 2020) Higher income tends to support better health behavior and attention to public health. Income is the ability of a household or individual to obtain goods or services. The income a person earns affects their way of life and reactions within society because the size of the income will influence purchasing power for fulfilling life needs.

Research Conceptual Framework



Figure 1. Conceptual Framework

Research Hypothesis

Hypotheses are formulated based on a framework of thinking, which serves as a temporary answer to the problems posed. The hypotheses in this research are as follows:

1. There is an influence of environmental knowledge on community behavior in managing environmental sanitation in the working area of Bahodopi Health Center, both directly and indirectly.

2. There is an influence of environmental sanitation knowledge on community behavior in managing environmental sanitation in the working area of Bahodopi Health Center, both directly and indirectly.

METHODOLOGY

Type of Research

This type of research is quantitative research conducted through a field survey stage. In surveys, the research is not conducted on all objects being studied or the population, but only takes a portion of the population (sample) of the community to describe the characteristics of environmental sanitation and the management of environmental sanitation in the working area of the Bahodopi Health Center, Morowali Regency, Central Sulawesi Province. This research is conducted to address the problems that have been formulated in the previous chapter and the research objectives to be achieved.

Research Design

The research design was created based on the dependent variable (Y), which is environmental sanitation behavior in the working area of the Bahodopi Health Center, Morowali Regency, Central Sulawesi, and the independent variables, which consist of environmental knowledge (X1), environmental sanitation knowledge (X2), attitude in managing the environment (X3), and income level (X4). This research design is based on the SEM model, assuming that all variables are considered to have direct or indirect relationships (Aqil et al., 2024; Phadermrod et al., 2019). Meanwhile, in determining strategies for handling environmental sanitation, the researcher used a SWOT approach.

Research Location and Time

This study was conducted in the working area of the Bahodopi Health Center, Morowali, Central Sulawesi, in August 2025.

Population and Sample

Population

The population in this study consisted of all villages within the service area of Bahodopi Health Center, which consists of 12 villages.

Sample

Sampling was used to obtain information regarding the research subject. In this study, to identify characteristics in the research area, a sample of community respondents living within the service area of Bahodopi Health Center, Morowali Regency, Central Sulawesi Province, was used, employing the Probability Sampling technique. The sample used in this study was the number of heads of households.

Sampling was conducted using the Probability Sampling method, which means that every member of the population has an equal chance of being selected as a research sample. The sampling technique used was Proportional Stratified Sampling, as the population was taken based on representation from each family. The author uses the Proportional Stratified Sampling technique because the population is divided into 12 villages. However, the researcher only takes samples from 6 villages, as those villages are passed through by PT Imip..

The Slovin formula is as follows:

N

$$n = 1 + N(\pi)^2$$

Description: n = Sample Size

N = Population Size

π = Margin of error limit in sampling using (10%)

SEM Analysis

The data analysis technique used is Structural Equation Modeling (SEM). SEM is a multivariate statistical analysis capable of analyzing complex relationships between variables. This allows for a comprehensive explanation of the relationships between variables in the study. SEM is very useful for testing and validating a model (Chin, 2010; Farahani et al., 2010)

In this study, SEM analysis was created with a causal relationship pattern between the dependent variable (Y), which is Strategy in handling environmental sanitation, and four (4) independent variables: knowledge (X1), attitudes in managing the environment (X2), behavior (X3), and Income (X4). The concept of the causal relationship between variable Y and the X variables, as well as the direct and indirect relationships of all X variables toward Y, is built based on the theory presented in the form of a diagram.

SWOT Analysis

Determining strategies for managing environmental sanitation in the working area of Bahodopi Health Center, Morowali Regency, Central Sulawesi Province is carried out using SWOT analysis. This analysis is conducted by systematically identifying factors to formulate a strategy based on logic that can maximize strengths and opportunities while simultaneously minimizing weaknesses and threats.

Data Collection Method

The data collection technique used in the process of identifying the characteristics of the research location is the result of primary surveys through observation and questionnaires. The observation stage carried out is passive observation, where the researcher comes directly to the study area to observe, but does not actively or directly participate in any activities conducted in the study area. In addition to observing, the researcher also collects data in the form of field documentation such as photos to complement the data and also provide a visual presentation related to it with the existing conditions in the study area. Meanwhile, data collection using questionnaires is conducted by creating a list of questions related to the research focus, which is made based on previous literature reviews. Data collection is carried out using instruments as guidelines for in-depth interviews, direct observation, surveys in the working area of Bahodopi Health Center, and documentation. The sources of research information include community members, community leaders, and government officials.

RESULT AND DISCUSSION

Community Behavior in Environmental Sanitation Management (Y)

Table 1. Frequency Distribution of Behavior in Environmental Sanitation Management

No	Interval	Category	frequency	Percentage
1	very High	73-86	24	24%
2	High	59-72	67	68%
3	Busy	45-58	7	7%
4	Low	31-44	0	0%
5	very Low	17-30	0	0%
	Amount		98	100%

Source : Primary data, 2025

Based on Table 1, the frequency distribution of behavior in environmental sanitation management is very high at 24 (24%), followed by the highest percentage in the high category at 67 (68%) and the moderate category at 7 (7%). These results indicate that public behavior in environmental sanitation management falls into the high category.

Environmental Knowledge (X1)

Table 2. Frequency Distribution of Environmental Knowledge

No	Interval	Category	frequency	Percentage
1	very High	20-24	49	50%
2	High	15-19	34	35%
3	Busy	10-14	15	15%
4	Low	5-9	0	0%
5	very Low	0-4	0	0%
	Amount		98	100%

Source : Primary data, 2025

Based on Table 2. Frequency distribution of environmental knowledge, the community is categorized as having very high knowledge at 49 (50%), high knowledge at 34 (35%), and moderate knowledge at 15 (15%). It can thus be concluded that the community's knowledge related to the environment

Environmental Sanitation Knowledge (X2)

Table 3. Frequency Distribution of Environmental Sanitation Knowledge

No	Interval	Category	Frequency	Percentage
1	very High	16-20	83	85%
2	High	12-15	14	14%
3	Busy	8-11	1	1%
4	Low	4-7	0	0%
5	very Low	0-3	0	0%
	Amount		98	100%

Source : Primary data, 2025

Based on Table 3, the frequency distribution of environmental sanitation knowledge shows that the community with very high knowledge has the highest percentage, namely 83 (85%), followed by the high category 14 (14%) and the medium category 1 (1%). Thus, the community's knowledge of environmental sanitation in the Bahodopi Health Center area is very good.

Attitude in Environmental Management (X3)

Table 4. Frequency Distribution of Attitudes in Environmental Management

No	Interval	category	Frequency	Percentage
1	very High	104-120	21	21%
2	High	84-103	70	71%
3	Busy	64-83	7	7%
4	Low	44-63	0	0%
5	very Low	24-43	0	0%
			98	100%

Source : Primary Data, 2025

Based on Table 4, the frequency distribution of attitudes in environmental management. The community with very high attitudes towards environmental management is 21 (21%), high category is 70 (71%), and moderate category is 7 (7%). It can be concluded that the community's attitude toward environmental management in the working area of Puskesmas Bahodopi is still considered very good.

Income Level (X4)

Based on the total score from the data tabulation of the research results, the income of the respondents studied ranges from 1,501,000 to more than 3,716,000.

Table 5. Frequency Distribution of Income Levels

No	Income Level	Frequency	Percentage
1	<750.000	0	0%
2	750.000-1.500.000	0	0%
3	1.501.000-3.715.000	8	8%
4	>3.716.000	90	92%
	Amount	98	100%

Based on Table 5. Frequency Distribution of Income Levels. The results of the study found that based on the income levels of the community in the working area of Bahodopi Health Center, most people are still classified as having high income, namely 90 (92%) with an income of >3,716,000 and 8 (8%) with an income between 1,501,000-3,715,000.

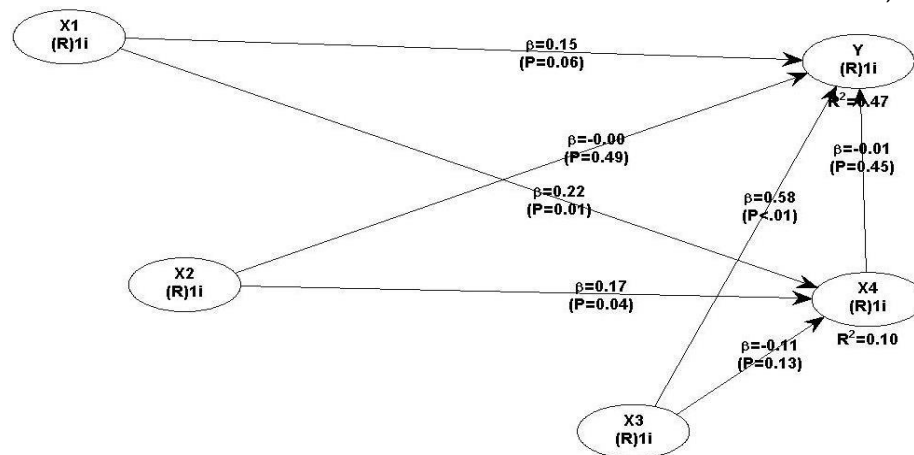


Figure 2. SEM Analysis Results

Research Variables

This study used five main variables, namely X1 (Environmental Knowledge), X2 (Environmental Sanitation Knowledge), X3 (Attitude in Environmental Management), X4 (Income), and Y (Environmental Sanitation Behavior). Overall, the average values (mean) for X1, X2, X3, and Y are around 4.8 to 5.0 on the measurement scale used. This indicates that the respondents have a relatively good to good level of environmental knowledge, sanitation knowledge, attitude toward environmental management, and sanitation behavior. The standard deviation values, which range around 1.4 to 1.5, indicate a moderate variation among respondents, meaning that not all respondents have the same level of knowledge, attitude, and behavior.

Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis Results
Based on the results of the determination of priority areas, an environmental sanitation handling plan was formulated, covering three main sectors, namely domestic wastewater, waste management, and drainage systems. The environmental sanitation handling strategy is developed based on the level of needs of villages within the research area, so that it aligns with programs that have been implemented previously, thereby creating continuity in accelerating

environmental sanitation management. To achieve this acceleration and support the vision of health centers and villages, various appropriate and targeted sanitation management strategies are needed.

The strategy formulation is carried out using an analysis of Strengths, Weaknesses, Opportunities, and Threats (SWOT) based on the SWOT matrix. The resulting strategy not only focuses on technical aspects but also includes non-technical aspects such as institutional issues, funding, communication, community participation, and business sectors. This analysis is developed based on the analysis of strategic issues from each sector, which are then grouped into two main categories: internal factors and external factors. Internal factors include strengths and weaknesses, while external factors include opportunities and threats.

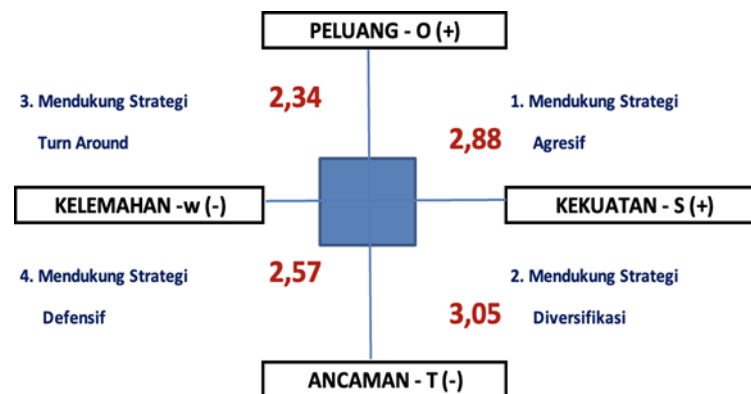


Figure 3. SWOT Quadrant of Domestic Wastewater

In determining the strategic conclusion in the quadrant above, it starts with calculating the internal factor scores and external factor scores. The internal factor score $S (1.68) > W (1.14)$, which means strengths are more dominant compared to weaknesses. The external factor score $T (1.37) > O (1.20)$, which means threats are greater than the available opportunities. Therefore, the strategic position is in quadrant II, which is a diversification strategy utilizing the Strength-Threat strategy. In this condition, internal strengths are high, but external threats are greater than opportunities, so the area must use existing resources and capacity to withstand and reduce the impact of threats, especially those related to increasing waste volume, population density, and pollution potential.

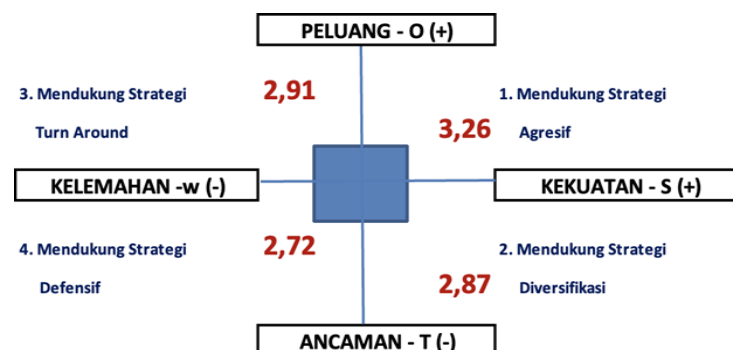


Figure 4. SWOT Quadrant of Drainage

In determining the strategic conclusions in the quadrant above, it begins with calculating the internal factor scores and external factor scores. The internal factor score $S (1.70) > W (1.35)$, which means strengths are more dominant compared to weaknesses. The external factor score $O (1.56) > T (1.17)$, which means opportunities are greater than the existing threats. Therefore, the strategy position is in Quadrant I, which is an aggressive strategy (Growth Oriented Strategy) by utilizing a Strength-Opportunities strategy. Through the SO strategy, drainage management efforts can be focused on strengthening institutional collaboration, namely local government, health centers, and also village authorities, in order to accelerate the construction and maintenance of drainage channels. In addition, the aggressive strategy emphasizes the importance of optimizing the construction of channels with designs and technical specifications according to standards, so that opportunities for government support and regional development can be utilized effectively maximum for improving drainage capacity. Discussion Based on Research Variables on Community Behavior in Environmental Sanitation Management (Y) Based on the results of this study, the distribution of environmental sanitation behavior shows that the majority of respondents (68%) are in the high category, while (24%) are in the very high category and only around (7%) are in the medium category. These findings indicate that the level of community environmental sanitation behavior in the operational area of Bahodopi Health Center is relatively very good. Such community behavior suggests that the public has been quite good in sanitation practices such as using MCK facilities, managing waste, and maintaining environmental cleanliness. However, although the majority are in the high and very high categories, there is still a small portion (7%) that is only in the medium category. This becomes a concern, as suboptimal sanitation behavior could be a source of risk higher environmental health. This can also be caused by differences in access, resources, or levels of understanding among individuals. Further evaluation could focus on specific barriers for groups to elevate them to high or very high categories. Other studies also show that poor sanitation behavior is closely related to the incidence of environment-based diseases, such as diarrhea. For example, in a systematic review of coastal communities, it was found that sanitation behaviors such as waste disposal and waste management greatly determine the incidence of diarrhea in those communities (Fatimah et al., 2020)

Environmental Knowledge (X1)

Based on research data, the environmental knowledge of the community in the Bahodopi Health Center area is classified as very high, with 50% of respondents in the very high category, 35% in the high category, and 15% in the moderate category. This indicates that the community in six villages The research shows that there is sufficient awareness and understanding of environmental issues such as public cleanliness, waste disposal, and the impact of sanitation on health. Based on Bloom's Taxonomy theory, it can be concluded that the community in the Bahodopi Health Center area has reached the level of understanding, meaning that the community can be considered to have good comprehension and is able to provide general responses to the questions given

during the questionnaire filling process. This is also supported by the education level of the community in the Bahodopi Health Center working area, the majority of whom in this study have a high school education or equivalent. Therefore, it can be concluded that in this study, the respondents' education level is directly proportional to the level of knowledge possessed by the community.

Environmental Sanitation Knowledge (X2)

Environmental sanitation knowledge (X2) in this study is very Outstanding: 85% of respondents fall into the very high category, 14% in the high category, and 1% in the medium category. This indicates that the majority of the community has a good understanding of more technical sanitation concepts such as public sanitation facilities (MCK), wastewater, excreta disposal, and the importance of proper sanitation installations. The high level of understanding of environmental sanitation provides great potential for community-based sanitation development. Communities that understand sanitation risks are likely to be more cooperative in developing local sanitation facilities (healthy latrines, drainage channels) and more consistent in their use.

Attitudes in Environmental Management (X3)

The research results for the attitude variable (X3) indicate that 71% of respondents fall into the high category, and 21% into the very high category, while 7% are in the moderate category. This indicates that, in general, the community has a very positive attitude towards environmental management, reflecting concern, responsibility, and internal motivation to maintain cleanliness. This positive attitude is crucial in the context of community-based sanitation. A supportive attitude will facilitate the mobilization of residents in sanitation activities: they are more likely to participate in toilet construction programs, manage waste, maintain water channels, and take part in collective decisions regarding sanitation. This aligns with the literature on the implementation of the Community-Based Sanitation Movement in Perning Village (Nganjuk), where active community participation is greatly influenced by community awareness and support from local policymakers (Bryła et al., 2022)

Income Level (X4)

In this study, the income variable (X4) shows that the majority of respondents (91.8%) have an income of more than > 3,716,000 per month, while only 8.2% fall within the range of 1,501,000–3,715,000. This is a very interesting finding because it indicates that most respondents are in a relatively high-income group compared to the income categories defined in this study. High community income can be an important driving factor in the success of community-based sanitation. With sufficient income, they are more capable of financing the construction of sanitation facilities (such as healthy latrines), maintaining waste disposal systems, and participating in active sanitation programs. In theory, this financial capital strengthens the community's self-reliance capacity to contribute to local sanitation efforts.

Discussion Based on Structural Equation Modeling Analysis

Based on the results of the research above, the findings indicate that attitude in environmental management is the strongest determinant of environmental sanitation behavior (Y). The dominance of this attitude role shows that sanitation behavior is largely influenced by other structural factors. These

results are in line with the RANAS behavior model and the Theory of Planned Behavior, which emphasize that attitude is the primary determinant of an individual's actions (Stoler et al., 2019). As in the study conducted by Oktora (2022), which showed that a positive attitude increases the likelihood of better sanitation behavior. The research findings by Novita (2017) also indicate that the frequency distribution of attitudes in waste management in RW 03, Sindang Barang Village, from 260 respondents showed that 134 respondents (51.5%) had a positive attitude.

Overall, the discussion of the SEM test confirms that improving community environmental sanitation behavior in the working area of Bahodopi Health Center requires strategies that emphasize attitude change rather than merely increasing knowledge or income. These findings open opportunities for the development of more comprehensive, community-based behavior change programs that are sensitive to local social norms. In addition, integrating psychosocial approaches, education, and the provision of sanitation facilities will serve as a strategic foundation to maximize sustainable change.

Discussion of Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis

Domestic Wastewater

Based on the SWOT analysis results above, the rapid development of the nickel industrial area in Morowali attracts tens of thousands, even hundreds of thousands of workers, which drives the growth of temporary housing (dormitories and boarding houses). This population growth leads to an increase in domestic waste without being matched by adequate sanitation infrastructure. The onsite sanitation conditions found in Morowali (individual/communal septic tanks) are not watertight, lack absorption areas, and are not managed regularly, posing a risk of groundwater and surface water pollution. This can also cause and increase the incidence of environmentally-related diseases (such as diarrhea, skin infections, and hepatitis).

The results of IFAS and EFAS align with the conditions observed in the field, with the internal score indicating relatively strong management ($S=1.68 > W=1.14$), meaning that the internal capacity to carry out interventions is still quite robust. The role of the community is very important, as in the PASIMAS program, which heavily relies on community participation in establishment and maintenance, as well as consistent community involvement. On the other hand, the external environment is more risky ($T=1.37 > O=1.20$), so strategies need to be defensive and adaptive to external pressures (for example, rapid urbanization, industrial/household waste). From the discussion above, domestic wastewater sanitation conditions in the working area of Bahodopi Health Center face challenges arising from both internal factors (limitations in facilities and infrastructure, institutional capacity, funding, and the role of local stakeholders) and external factors (significant population growth, industrial pressures), changes in spatial planning and the lack of regulatory supervision). Based on this, it appears that internal factors play the largest role in determining the quality of sanitation in the working area of Bahodopi Health Center.

Waste Management

Based on the IFAS analysis results, it was found that the strength score (2.10) is greater than the weakness score (1.05), resulting in a total score of 3.15. This condition indicates that waste management in the area has a fairly good internal capacity. The strengths (Jannah Nasution et al., 2025) come from coordination between institutions, the role of the village government, as well as the availability of human resources and ongoing programs for waste handling. Success in waste management also heavily depends on community behavior. Therefore, one strategy in this study is to increase public knowledge and habits in reducing waste at its source as an appropriate step. This finding is also supported showing that public awareness significantly contributes to the successful management of waste sustainabl In addition,(Farawansa & Gultom, 2024) effective supervision regarding waste disposal is necessary. In the working area of Bahodopi Health Center, there are still many practices of disposing of waste into rivers, the sea, and swamps, so on this basis, an effective legal enforcement response is needed. Overall, the SWOT analysis results show that the position of waste management is in a condition that supports the development of aggressive strategies. Internal factors have significant strengths and can reinforce program implementation, while opportunities External factors provide space for collaboration and innovation. However, weaknesses and threats still need to be considered so that they do not hinder efforts to improve waste management services. The strategies formulated are relevant and aligned with previous research findings, so their implementation has the potential to make a significant impact on improving the waste management system in the operational area of Bahodopi Health Center.

Drainage System

The IFAS analysis results show that the internal factors of the drainage system have a total score of 3.05, with a strength value of 1.70, which is higher than the weakness value of 1.35. This condition indicates that internally, the drainage system in the operational area of Bahodopi Health Center, where the study was conducted, is in the fairly strong category, especially because some drainage channels still exist and can be reactivated through rehabilitation programs. Although there are weaknesses such as damaged channels, reduced dimensions, and poor maintenance, the internal strengths remain dominant, so the opportunities The improvement of the drainage system is very effective if carried out in a targeted manner. Next, in terms of external factors, it received a score of 2.73 with an opportunity value of 1.56, which is higher than the threat value of 1.17. This indicates that the external conditions are quite supportive of the development of the drainage system, both through funding support (regional budgets, national budgets, village funds, and corporate social responsibility from industries), availability of land for the development of new channels, and governmental institutional support. This situation strengthens the likelihood that strategies for the revitalization and strengthening of drainage can be implemented effectively. From the overall research, it is evident that the SWOT-based strategies in this study have a strong foundation; the function of the drainage is significantly influenced by the physical condition of the channels, maintenance, funding, and institutional aspects. With sufficient internal

strengths and substantial external opportunities, strategic steps such as rehabilitation, The construction of channels that meet technical dimensions, regular monitoring, and institutional strengthening is an appropriate comprehensive solution that can immediately provide tangible impacts in improving drainage function. Therefore, it can be concluded that the most suitable strategy is a diversification strategy or using strength to overcome threats.

CONCLUSIONS

1. Attitude is the most influential factor on environmental sanitation behavior. In the SEM analysis findings, attitude shows the strongest determinant in shaping environmental sanitation behavior.
2. Public knowledge regarding environmental awareness and sanitation is very high, but it cannot be fully applied into good behavior.
3. Income does not have a direct effect on environmental sanitation behavior.
4. The biggest challenge in managing environmental sanitation is the rapid growth of industry and population mobility.
5. The internal capacity based on the SWOT analysis results is quite strong in handling community-based environmental sanitation. The SWOT results suggested a diversification strategy for handling domestic wastewater and an aggressive strategy for waste management and drainage issues.

RECOMMENDATIONS

The recommendations that can be proposed based on the research results are as follows:

Recommendations for the Morowali Regency Government

- a) Strengthen the development of basic sanitation infrastructure such as drainage, closed SPAL (sewage treatment plants), TPS/TPA (temporary/central waste disposal sites), and domestic waste treatment facilities (IPAL/communal IPAL), particularly in Bahodopi District, which is experiencing population growth due to industrial areas.
- b) Improve regulations and supervision of industrial and domestic waste, including the implementation of sanctions and an environmental quality monitoring system periodically to prevent water, soil, and air pollution.

FURTHER STUDY

This research still has limitations so further research is needed on the topic of Community-Based Environmental Sanitation Management in the Working Area of the Bahodopi Community Health Center to perfect this research and increase insight for readers and writers.

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