

Sustainable Improvement of Sanitation Access for The Community of Pangkep Regency: Challenges and Solutions

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Abstract

Proper environmental sanitation is a crucial element in improving the quality of life and public health. In Pangkep Regency, although various efforts have been made to improve sanitation access, there are still significant challenges in terms of infrastructure, policy, and public awareness. This article aims to explore the challenges faced in enhancing sustainable sanitation access in Pangkep Regency and the solutions that can be applied to address these issues. This study employs a qualitative approach, gathering data through interviews with relevant stakeholders, field surveys, and literature review. The findings reveal that the main challenges in improving sanitation access in Pangkep Regency include limited regional budget, low public awareness of the importance of sanitation, and poor coordination between related institutions. Therefore, more robust and integrated policies, increased community participation, and the use of environmentally friendly technologies are needed to support sanitation sustainability. The proposed solutions include strengthening sanitation education programs, developing community-based sanitation infrastructure, and implementing efficient and eco-friendly waste management systems. It is expected that these solutions will accelerate the achievement of sustainable sanitation access in Pangkep Regency, which will ultimately have a positive impact on improving public health and community welfare.

Keywords: environmental sanitation, sanitation access, sustainability, challenges, solutions

1. Introduction

Environmental sanitation is an important aspect in efforts to improve the quality of life and health of the community. In Indonesia, including in Pangkep Regency, poor sanitation can have a direct impact on public health, such as increasing the prevalence of environment-based diseases, such as diarrhoea and gastrointestinal infections. Although Indonesia has launched various policies to improve sanitation, access to proper sanitation is still limited, especially in rural areas. Pangkep Regency, located in South Sulawesi, faces major challenges in providing good and sustainable sanitation access for its citizens. According to data from the Pangkep Central Statistics Agency (BPS), around 35% of households in this area do not yet have access to proper sanitation. (BPS, 2023). This indicates a significant gap in achieving optimal sanitation access.

Several previous studies have identified various factors that influence access to sanitation, such as low regional budgets, lack of infrastructure, and limited public awareness of the importance of sanitation. Limited budgets for the construction of sanitation facilities have caused many regions to struggle to provide adequate sanitation infrastructure. In addition, public awareness of the importance of sanitation is still low, which hinders efforts to improve sanitation quality in a sustainable manner. (Labibi & Sukmana, 2025).

Several solutions have been proposed in the literature to improve sanitation access, including strengthening sanitation education programmes, community-based infrastructure development, and the use of environmentally friendly technologies. However, despite various solutions having been tried, major challenges remain in their implementation. Research by Fransiska mentions that despite sanitation development policies, their realisation is often hampered by low community involvement and a lack of support from the government sector. (Fransiska, n.d.). Therefore, it is important to re-evaluate the effectiveness of existing solutions and seek new approaches that are more suited to the local conditions of Pangkep Regency.

An analysis of gaps in previous studies shows that although many solutions have been proposed, effective and sustainable implementation in Pangkep Regency has not been widely discussed. One

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significant gap is the lack of research focusing on how local government policies, community participation, and innovative technologies can support each other in achieving sustainable sanitation access. Therefore, this study aims to explore the challenges faced in improving sanitation access in Pangkep Regency and identify solutions that can be applied to overcome these problems.

The purpose of this study is to provide a deeper understanding of the challenges faced by Pangkep Regency in improving sustainable sanitation access, as well as to identify solutions that can be applied to overcome these problems. This study also aims to provide policy recommendations that can support the achievement of sustainable sanitation targets in this region. Thus, the results of this study are expected to make a significant contribution to efforts to improve sanitation quality in Pangkep Regency and other similar regions in Indonesia.

The importance of this study lies in identifying the problems faced by Pangkep Regency in improving sanitation access and finding solutions that can be implemented effectively. Given the impact of sanitation on public health, the solutions found in this study are expected to provide long-term benefits for improving the quality of life of the people of Pangkep Regency and serve as a reference for other regions facing similar challenges.

2. Literature Review

Sustainable development emphasizes the importance of an approach that considers current needs without compromising the ability of future generations to meet their needs (Brundtland, G.H., 1987). To understand the complexity of achieving this, Social Systems Theory suggests using a systems approach to analyse how various elements in society, such as policy, economy, and culture, interact to influence sanitation policy (Von Bertalanffy et al., 1968). Fundamentally, the development and maintenance of adequate sanitation infrastructure is a key element in providing good and sustainable sanitation access. Infrastructure that includes wastewater disposal systems, the provision of toilet facilities, and clean water management must be properly maintained in order to support adequate sanitation access (Brundtland, G.H., 1987).

However, infrastructure alone is insufficient; Community Participation Theory states that the success of sanitation development is highly dependent on active community participation in the planning and implementation of sanitation programmes (Cohen, J. M., & Uphoff, N. T., 1977). Community participation can raise awareness of the importance of sanitation and accelerate the implementation of sustainable sanitation policies. Furthermore, community involvement in the development of sanitation infrastructure can also increase a sense of ownership and maintenance of sanitation facilities at the household and community levels (Cohen, J. M., & Uphoff, N. T., 1977). Simultaneously, local government policy plays a very important role in directing resources and public policy to support sanitation development. Policies that support sanitation development must be based on real needs in the field, including adequate budgeting and effective monitoring systems (Nugroho, 2021). In addition, coordination between local government, the community, and the private sector is also an important aspect in realising sustainable sanitation.

From an economic perspective, Natural Resource Economics Theory describes the relationship between effective natural resource management and sustainable sanitation development, with a focus on efficiency and sustainability in the use of natural resources (Pearce et al., n.d.). Social and economic factors, such as household income and community education, are closely related to their ability to access proper sanitation. According to natural resource economics theory, sanitation sustainability also depends on efficient and sustainable resource management, as well as community awareness of the importance of sanitation in supporting public health (Pearce et al., n.d.). To support these efforts, the utilisation of innovative, environmentally friendly technology can help improve the effectiveness of sanitation systems in areas with limited infrastructure. The development of these technologies must be adapted to local conditions so that they are accepted and properly implemented by the community (Hadi et al., 2020). Consequently, the conceptual framework in this study aims to describe the relationship between various factors that influence the improvement of sustainable sanitation access in Pangkep Regency, as the improvement of sustainable sanitation access is not only influenced by sanitation infrastructure development, but also by social, economic, and supportive government policy factors.

3. Method

Type of Research

This research uses a qualitative method with a descriptive approach. This method was chosen because it aims to explore and gain an in-depth understanding of the challenges and solutions related to improving sustainable sanitation access in Pangkep Regency. The qualitative approach allows researchers to collect exploratory information and gain a more holistic understanding of sanitation issues in this area. In addition, this approach also provides an opportunity to explore the perspectives of various related parties, such as local government, community, and non-governmental organisations (NGOs). The type of research used is field research, in which data is collected directly from the source through interviews, observation, and document study. This field research allows researchers to observe the existing sanitation conditions in Pangkep Regency and obtain information directly from the community and policy makers involved in the sanitation sector.

Research Approach

The research approach used was a qualitative approach with a case study design. This approach aimed to analyse in depth the issues and solutions related to sustainable sanitation in the context of Pangkep Regency. The case study enabled researchers to identify factors affecting access to sanitation and seek relevant and effective solutions to the challenges in the region.

Data Collection

The data collection techniques used in this study include In-depth Interviews: Interviews were conducted with various relevant parties, including local government, relevant agencies, community organisations, and residents living in areas with limited sanitation access. These interviews aimed to obtain first-hand insights into the sanitation issues faced and the efforts made to address them. Observation: Observations were conducted in the field to directly observe sanitation conditions in Pangkep Regency, including sanitation infrastructure, environmental hygiene, and community behaviour related to sanitation. These observations provided a concrete picture of the conditions in the area. Document Study: Researchers also collected data from documents related to sanitation policies, local government annual reports, and data from non-governmental organisations involved in sanitation programmes in Pangkep Regency. This document study provides an overview of existing policies and efforts that have been made to improve sanitation in the area.

Data Analysis

Data obtained through interviews, observations, and document studies will be analysed using thematic analysis techniques. In thematic analysis, researchers will identify the main themes that emerge from the data, then group the information according to relevant categories. The researcher will analyse the relationships between these themes to understand the challenges and solutions in improving sustainable sanitation access in Pangkep Regency. The results of this thematic analysis will be used to formulate policy recommendations in line with regional conditions and needs.

Data Validity

Data validity in this study was tested using several techniques, namely: Triangulation: Triangulation was carried out by comparing the results of interviews, observations, and document studies to ensure the consistency and suitability of information obtained from various sources. Thus, the data obtained will be more valid and reliable. Member Check: After the interviews were conducted, the researchers checked back with the informants to ensure that the information obtained was accurate and in line with their views. This was done to avoid misinterpretation and ensure the validity of the data collected. Audit Trail: Researchers will also record in detail the entire research process, from data collection to analysis, to ensure transparency and reliability in this study. An audit trail allows readers to track the steps taken in the study and ensure that the conclusions drawn are based on valid and accountable data.

4. Results

Results and Discussion This study aims to identify challenges and solutions in improving sustainable sanitation access in Pangkep Regency. Based on data collection through interviews, observations, and document studies, several key findings related to sanitation issues in Pangkep Regency were discovered. These findings cover three main aspects: sanitation infrastructure, community participation, and local government policies.

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Sanitation Infrastructure

The results of the study show that sanitation infrastructure in Pangkep Regency is still very limited and inadequate to meet the basic needs of the community, especially in rural areas. In this context, sanitation facilities include bathing, washing and toilet facilities (MCK), wastewater disposal systems, and proper clean water management. Based on data obtained from field surveys, around 35% of households in rural areas of Pangkep Regency do not yet have access to proper sanitation facilities. This is a major challenge, given the importance of sanitation in maintaining public health, especially in areas with high population density and limited resources.

The lack of adequate sanitation facilities in rural areas can lead to serious hygiene problems, as most residents still rely on environmentally unfriendly sanitation methods, such as open latrines or direct disposal of liquid waste into water sources. As a result, domestic waste, such as household wastewater and faeces, often pollutes the surrounding environment, including water sources used by the community for daily needs. These unhygienic sanitation practices pose a serious risk to health, as they can transmit various environment-based diseases, such as diarrhoea, cholera, and other gastrointestinal infections.

Sanitation-based diseases, such as diarrhoea, are one of the leading causes of morbidity and mortality in many rural areas in Indonesia, including in Pangkep Regency. For example, data from the Pangkep Regency Health Office shows that the incidence of diarrhoea and other gastrointestinal diseases tends to be higher in areas where community access to sanitation is limited. These diseases not only cause health problems, but also have an impact on community productivity, add to the economic burden on families, and worsen the quality of life of the community.

Furthermore, the lack of adequate sanitation infrastructure also impacts the poor quality of groundwater and surface water used by the community. Water contaminated by sanitary waste can cause gastrointestinal infections, which affect children more vulnerably. Research by (WHO, 2024) It also mentions that poor sanitation can worsen quality of life and contribute to an increase in infectious diseases, which in turn leads to high healthcare costs and a decline in community welfare. In this case, the existence of proper sanitation infrastructure is essential to prevent the spread of disease and improve overall community health.

From these findings, it is evident that improving access to adequate sanitation is an urgent matter in Pangkep Regency, especially in rural areas. Improving sanitation infrastructure will not only reduce negative impacts on health, but will also contribute to improving the overall quality of life of the community, including physical, social and economic health.

Community Participation

In addition to challenges related to sanitation infrastructure, another significant finding in this study was the low level of community participation in existing sanitation programmes in Pangkep Regency. Although various sanitation and education programmes have been implemented by local governments and non-governmental organisations (NGOs), active community participation in maintaining and improving the sanitation conditions of their environment remains very low. One of the main factors found is the lack of public awareness of the importance of proper sanitation and its impact on health and quality of life.

Many people in rural areas of Pangkep Regency still rely on traditional sanitation systems that are not environmentally friendly, such as open toilets or direct disposal of liquid waste into open channels. Such sanitation practices pose a high risk of environmental and water pollution, which can ultimately lead to various health problems, such as diarrhoea and other gastrointestinal infections. This situation highlights a gap in the community's understanding and awareness of healthy and sustainable sanitation. Although the government and NGOs have implemented several educational programmes to raise awareness about the importance of sanitation, the results have been limited. These programmes often fail to reach all segments of society, especially those living in remote and hard-to-reach areas. In addition, most of the approaches used in sanitation education programmes focus on general outreach, without directly involving the community in the planning and implementation of the programmes. This has led to many residents feeling that they are not actively involved in efforts to improve their environmental sanitation, which ultimately hinders the success of these programmes.

Only about 40% of the community actively participates in community-based sanitation activities, such as working together to clean up the environment and build toilet facilities. This figure shows that most

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people still lack sufficient awareness or motivation to participate in maintaining the cleanliness of their environment. Several factors that influence this low level of participation include a lack of understanding of the long-term benefits of good sanitation, a lack of incentives for the community to get involved, and limited facilities and resources to support community-based sanitation activities.

According to the theory of community participation (Cohen & Uphoff, 1977), The success of sanitation development programmes is highly dependent on active community participation. Communities that are directly involved in the planning and implementation of sanitation programmes are more likely to feel a sense of ownership and will be more committed to ensuring their sustainability. In the context of Pangkep Regency, low community participation indicates the need for a more inclusive approach based on direct community involvement. One solution that can be implemented is to build partnerships between the government, NGOs, and the community to design sanitation programmes that are more suited to local needs and conditions. This approach can include community involvement in policy-making, sanitation facility management, and supervision of existing sanitation programmes.

In addition, behavioural economics theory can be used to explain the low level of community participation in sanitation programmes. According to this theory, the community tends to prefer to continue using familiar methods (such as open latrines) because they do not see the immediate benefits or advantages of changing their sanitation behaviour. Therefore, to increase participation, a more creative approach is needed, such as providing incentives or direct assistance to communities participating in sanitation programmes, as well as ensuring that the results of these programmes can be directly felt by them in the form of improved quality of life and health.

With increased community participation in sanitation programmes, it is hoped that a cleaner and healthier environment will be created, and that the achievement of sustainable sanitation targets in Pangkep Regency will be accelerated. Successful sanitation programmes must involve the community as agents of change, not merely as beneficiaries.

Local Government Policy

Local government policy in Pangkep Regency has included various efforts to improve sanitation, including a programme to provide bathing, washing and toilet facilities (MCK), the development of clean water infrastructure, and public education on the importance of proper sanitation. The local government has formulated a number of action plans and policies aimed at improving sanitation access throughout the Regency, especially in rural areas with limited access to sanitation facilities. Despite the government's good intentions to improve sanitation conditions, the implementation of these policies is often hampered by several significant problems.

One of the main obstacles is the limited budget available to support sanitation programmes. Limited budgets make it difficult for governments to implement comprehensive sanitation projects, especially in more remote areas. Sanitation programmes are often hampered because the costs of building adequate infrastructure are much higher than what is available in the regional budget. In many cases, the budget allocated for sanitation is insufficient to cover all of the region's needs, so only a small portion of the region receives more attention. In fact, to achieve equitable access to sanitation, especially in rural areas, substantial funds that are well distributed are needed. This exacerbates the gap in access to sanitation between more developed and underdeveloped regions.

In addition, the lack of coordination between government agencies is also one of the factors that hinders the effectiveness of sanitation policies in Pangkep Regency. Many sanitation programmes should involve various agencies, such as the Health Office, the Public Works Office, and non-governmental organisations, but often there is no good coordination between these agencies. This leads to duplication of work or even inconsistencies between the policies implemented and the actual conditions in the field. For example, the toilet construction programme carried out by the Public Works Agency is often not accompanied by a sanitation education programme from the Health Agency, which aims to raise public awareness. As a result, even though sanitation facilities are built, the community does not always understand how to use them optimally, thereby limiting the effectiveness of the programme.

In addition to budgetary and coordination issues, sanitation policies in Pangkep Regency are often not supported by comprehensive and integrated development policies. Sanitation development is often considered a separate programme from other infrastructure development, such as road repairs, clean water provision, and housing development. In fact, to create sustainable sanitation, sanitation policies

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must be integrated with broader and more integrated development policies. For example, sanitation programmes need to be planned within the framework of overall regional development, involving other interrelated sectors, such as health, education, and the economy. This integrated approach is essential to ensure that sanitation development can be sustainable and have a broad impact on the quality of life of the community.

Social systems theory (Bertalanffy, 1968), supports the view that in order to achieve success in sanitation programmes, coordination is needed between various elements of society, including the government, the community and the private sector. An integrated system will create a more efficient flow of information and optimise existing resources, enabling each element to function to its full potential. In this regard, sanitation policy must be viewed as part of a larger development system, which includes comprehensive and coordinated planning and management.

In addition, public policy theory also shows that sanitation policies must be accompanied by effective monitoring and evaluation mechanisms to ensure that these policies are implemented properly in the field. Without an adequate monitoring system, it is difficult to determine whether the sanitation policies implemented are having a positive impact or creating new problems. A good monitoring system can help the government assess the effectiveness of programmes, identify existing obstacles, and make the necessary policy adjustments so that sanitation programmes can be achieved more effectively.

Overall, sanitation policy in Pangkep Regency requires a more coordinated and integrated approach, with adequate budgetary support and a robust monitoring and evaluation system. Without improvements in these areas, efforts to improve sanitation access in Pangkep Regency will continue to encounter obstacles and difficulties that could hinder the achievement of sustainable sanitation goals. Therefore, strategic and planned measures are needed to improve the sanitation management system in this region, in order to ensure better welfare and health for the community in the future.

5. Discussion

The results of this study indicate that several key factors influencing the improvement of sustainable sanitation access in Pangkep Regency are inadequate infrastructure, low community participation, and local government policies that are still constrained in their implementation. Based on these findings, several solutions can be proposed to address these issues.

Sanitation Infrastructure and Technology Utilisation

The theory of sustainable development proposed by Brundtland (1987), emphasising the importance of a development concept that can meet the needs of the current generation without compromising the ability of future generations to meet their needs. In the context of Pangkep Regency, this theory is highly relevant because the regency faces major challenges in providing adequate sanitation access for its citizens, especially in rural areas that are not yet fully covered by adequate sanitation infrastructure. Therefore, a sustainable development approach in the sanitation sector is essential, which includes not only the construction of bathing, washing and toilet (BWT) facilities but also environmentally friendly wastewater management systems that can adapt to local needs and resources. Sanitation infrastructure development in Pangkep Regency must be designed to provide direct benefits to the community without damaging the environment or depleting existing natural resources. One of the main principles of sustainable development is sustainability in natural resource management. In the context of sanitation, this means that in addition to building proper facilities such as public toilets, it is also important to pay attention to how liquid and solid waste is managed properly so that it does not pollute the environment, especially water sources used by the community.

One solution that can be implemented to support the principle of sustainable development is to utilise biofiltration-based wastewater treatment technology. This technology offers a more environmentally friendly and cost-effective approach compared to conventional wastewater treatment systems, which often require large investments and complex maintenance. Biofiltration systems use natural processes involving microorganisms and plants to break down contaminants in wastewater. Biofiltration can be applied on a small to medium scale, making it an ideal solution for rural areas such as Pangkep Regency, where large and expensive sanitation infrastructure is difficult to access. One of the main advantages of biofiltration technology is its lower cost compared to traditional wastewater treatment systems, such as wastewater treatment plants (WWTPs), which require large investments and complex maintenance. In

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addition, this technology is also more environmentally friendly, as the wastewater treatment process involves the use of natural materials and does not produce hazardous waste that is difficult to treat. Thus, this technology supports the principles of sustainable development by reducing negative impacts on the environment and being more efficient in the use of resources.

In addition, the application of biofiltration technology can also help overcome budget constraints, which are often an obstacle to the development of sanitation infrastructure in Pangkep Regency. With more affordable costs, more villages or sub-Regencys can be empowered to build environmentally friendly sanitation systems, without having to wait for large budget allocations from local or central government. This technology also allows for community participation in the development and maintenance of sanitation systems. The community can be involved in the construction and maintenance of biofiltration units, which in turn can increase a sense of ownership and sustainability of sanitation programmes at the community level. In the long term, the application of biofiltration-based wastewater treatment technology will also reduce water and soil pollution, which is a critical issue in sanitation management in many regions in Indonesia. By reducing this pollution, the quality of groundwater and surface water will be maintained, which is very important for public health. Furthermore, this solution will contribute to the achievement of sustainable development goals (SDGs), particularly those related to the provision of clean water and proper sanitation (SDG 6), as well as the protection of marine and terrestrial ecosystems (SDG 14 and 15).

Overall, the application of biofiltration-based wastewater treatment technology in Pangkep Regency is a solution that is highly compatible with the principles of sustainable development. This technology is not only effective in addressing existing sanitation issues, but also takes into account environmental sustainability and the efficient use of natural resources. The implementation of this technology can be an important step towards achieving better and more sustainable sanitation in Pangkep Regency, while also supporting efforts to improve the overall quality of life and health of the community.

Increased Community Participation

The theory of community participation proposed by Cohen & Uphoff (1977) It should be emphasised that the success of a development programme, including in the area of sanitation, is highly dependent on the level of active participation of the community involved. According to this theory, programmes that are designed without involving the community in planning, implementation and monitoring are often less successful or unsustainable. In the context of sanitation programmes in Pangkep Regency, low levels of community participation are one of the biggest obstacles to achieving sustainable sanitation goals. Although the government and non-governmental organisations (NGOs) have implemented several sanitation education programmes, many people are still not fully aware of the importance of proper sanitation and its impact on health.

One of the main findings of this study is that most people, especially in rural areas, still consider sanitation to be less urgent than other issues such as basic food needs, employment and education. Many residents rely on traditional sanitation methods that are not environmentally friendly, such as open latrines, because they do not yet understand the direct link between poor sanitation and their health. This lack of understanding shows that existing sanitation education programmes have not been effective enough in building public awareness of the importance of sanitation for health and quality of life.

To increase active community participation in sanitation programmes, a more holistic and community-based approach is needed. One step that can be taken is to develop an outreach programme that involves community leaders and local leaders. Local leaders or community leaders have a significant influence in shaping public opinion and behaviour in the area. They are often the main source of information for local residents and are respected within the community. By involving them in sanitation education programmes, it is hoped that information about healthy sanitation will be more easily accepted and implemented by the community. These community leaders can act as facilitators in education, helping to explain the benefits of good sanitation and providing examples of how more environmentally friendly sanitation practices can be applied in everyday life.

In addition, a community-based approach that involves the construction of sanitation facilities managed by the community is also an effective solution to increase participation and sustainability of sanitation programmes. The construction of community-based sanitation facilities, such as public toilets or shared wastewater management systems, which are managed and maintained by the local community, can

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increase a sense of ownership of these facilities. When communities are directly involved in the construction, maintenance, and management of sanitation facilities, they are more likely to take good care of and maintain these facilities. This sense of ownership not only creates program sustainability, but also increases collective awareness of the importance of good sanitation for health and environmental hygiene.

The implementation of this community-based sanitation model can also improve the efficient use of resources. For example, in several existing sanitation programmes, communities can be empowered to manage and maintain toilet facilities, thereby reducing the burden on the government in terms of maintenance costs. In addition, this programme can also create jobs for local residents involved in the management of sanitation facilities, while boosting the local economy.

The theory of community participation also suggests that the success of sanitation programmes depends not only on community education and awareness, but also on active involvement in decision-making. Communities that are involved in every stage of the sanitation process, from planning to evaluation, have a greater sense of responsibility for the programme. By providing space for communities to be involved in decision-making, whether in determining the location of toilet construction, choosing appropriate sanitation technology, or designing relevant sanitation education programmes, sanitation programmes can be more accepted and sustainable.

The application of this theory in the context of Pangkep Regency shows that a bottom-up approach, in which the community is part of the decision-making process, is very important for the success of sanitation programmes. The government needs to support these efforts by providing training and guidance to the community on the importance of sanitation and how they can play a role in maintaining environmental hygiene. Active community involvement in sanitation management will also strengthen social sustainability, as the community feels responsible for the common good.

Overall, in order to increase community participation in sanitation programmes in Pangkep Regency, more integrated and community-empowerment-based efforts are needed. Using an approach that involves community leaders, builds community-managed sanitation facilities, and gives the community an active role in decision-making will increase the success and sustainability of these sanitation programmes. This is in line with the theory of community participation, which emphasises the importance of the active involvement of all parties, from the government to the community, in achieving sustainable sanitation goals.

Improvement of Government Policy and Coordination

One of the important findings in this study is the low effectiveness of existing sanitation policies in Pangkep Regency, which is mainly related to budget management and coordination between government agencies. Although sanitation policies have been implemented, their implementation still faces many obstacles. One of the main problems found is budget constraints, which are often insufficient to implement all sanitation programmes comprehensively, especially in rural areas that need more attention. As a result, only a small portion of the region receives more attention, while other areas still lag behind in terms of access to proper sanitation. Coordination between government agencies is also an obstacle, as there is often overlap or a lack of synchronisation between policies implemented by various sectors, such as the Health Office, the Public Works Office, and non-governmental organisations working in the field of sanitation.

According to the social system theory proposed by Bertalanffy (1968), To achieve success in sanitation policy, an integrated system involving various elements of society and government is required. In the context of Pangkep Regency, this means that sanitation policy cannot be viewed as an isolated programme, but must be seen as part of a larger development system. This system must involve relevant government agencies, the private sector, and the community. Good coordination between various parties will optimise the use of limited resources, accelerate policy implementation, and increase the effectiveness of sanitation programmes.

Better coordination between government agencies is essential to ensure that sanitation policies can be implemented effectively. Local governments need to strengthen coordination mechanisms between relevant agencies, such as the Public Works Agency for sanitation infrastructure development, the Health Agency for sanitation education programmes, and non-governmental organisations that can play a role in outreach and programme implementation. Without good coordination, sanitation programmes

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can be hampered by unsynchronised policies or duplication of tasks between agencies. Therefore, a clear and structured coordination mechanism is needed, for example through the formation of a coordination team involving representatives from various relevant agencies.

In addition, one aspect that needs to be improved is the regular monitoring and evaluation of sanitation policies. Without a good monitoring mechanism, it is difficult to know whether the sanitation policies implemented are actually having the desired impact. Regular evaluations will help the government to determine the effectiveness of policies, identify problems that arise, and make the necessary improvements. This monitoring and evaluation will also assist in more targeted budget allocation, ensuring that limited resources can be used optimally to achieve maximum results.

Furthermore, current sanitation policies often do not fully consider local needs. Pangkep Regency, which has diverse social and geographical characteristics, requires a more specific approach tailored to local conditions. Each region has different challenges and needs in terms of sanitation. Therefore, a local needs-based approach is essential to ensure that the programmes implemented are in line with the challenges on the ground. For example, in areas with limited access to water resources, the development of sanitation systems must take into account efficient and environmentally friendly wastewater management, such as biofiltration technology or water-efficient wastewater treatment systems. In isolated areas, a community-based approach that prioritises active community participation in sanitation planning and management will be more effective than a top-down approach.

The importance of a local needs-based approach is also related to the cultural diversity and customs of the local community. Sanitation programmes implemented in Pangkep Regency need to take into account local values and community customs so that the community can better accept and participate in these programmes. Therefore, in addition to technical aspects, sanitation policies also need to involve social and cultural approaches that can support changes in community behaviour in terms of sanitation. By overcoming existing challenges, Pangkep Regency has the opportunity to improve sanitation access for its citizens, which in turn will improve the quality of health and welfare of the community. Integration between infrastructure development, community participation, and supportive policies will create a sustainable sanitation system and provide long-term benefits. Integrated policies based on local needs, together with effective coordination and evaluation mechanisms, will ensure that sanitation programmes are not only effective in the short term but also sustainable in the long term. In this way, Pangkep Regency can serve as an example for other regions in managing and improving access to adequate sanitation for all its residents.

6. Conclusion

This study aims to identify challenges and solutions in improving sustainable sanitation access in Pangkep Regency. Based on the findings, it can be concluded that sanitation issues in Pangkep Regency are greatly influenced by three main factors: limited sanitation infrastructure, low community participation, and constraints in local government policies. Limited sanitation infrastructure, especially in rural areas, means that around 35% of households do not have access to proper sanitation facilities, which has the potential to increase sanitation-related diseases. In addition, low community participation in sanitation programmes indicates the need for a more inclusive and community-based approach, involving local leaders in outreach programmes and building community-based sanitation facilities managed by the community itself. Furthermore, existing sanitation policies in Pangkep Regency need to be supported by an integrated system between government agencies, with regular monitoring and evaluation of policies to ensure they are implemented effectively and in line with local needs.

Overall, to achieve sustainable sanitation access in Pangkep Regency, a more coordinated solution is needed, based on an understanding of local community needs and supported by more integrated policies. The active role of the community, both in planning and managing sanitation facilities, is crucial to creating program sustainability. Local governments must also pay attention to budgetary aspects and inter-agency coordination to ensure that sanitation programs can be implemented evenly and effectively throughout the region.

Recommendations

Based on the findings and analysis conducted, several steps are recommended to improve sanitation access in Pangkep Regency, as follows: Improve Coordination Between Government Agencies: There

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is a need to improve coordination and synchronisation of policies between various government agencies involved in sanitation programmes, such as the Health Office, Public Works Office, and non-governmental organisations. Increasing Community Participation: The development of outreach programmes involving community leaders and local leaders in sanitation outreach should be expanded. In addition, building sanitation facilities managed by the community can increase ownership and sustainability of the programme. Application of Environmentally Friendly Technology: To overcome budget constraints, biofiltration-based wastewater treatment technology needs to be applied as a more affordable and environmentally friendly alternative. Improving Sanitation Policy Monitoring and Evaluation: Local governments need to establish effective monitoring and evaluation systems to ensure that sanitation policies are implemented in accordance with their intended objectives and can be evaluated periodically for continuous improvement.

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