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COMMUNITY ASSISTANCE IN CONSTRUCTING A CLEAN WATER INSTALLATION AT THE BONGGO HEALTH CENTER, ARMOPA VILLAGE, BONGGO DISTRICT, SARMI REGENCY

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Abstract

Access to clean water is a fundamental necessity that underpins effective public health services and the operational efficiency of health facilities, including the Bonggo Health Center in Sarmi Regency. Recognizing the importance of reliable clean water access, a community assistance initiative was launched to establish a sustainable water installation system at the Bonggo Health Center. This initiative is crucial to enhancing the health center's ability to deliver quality healthcare services, as safe, clean water is essential for various healthcare functions, from sanitation to patient care. The primary aim of the assistance program is to equip the Bonggo Health Center with a dependable source of clean water, ensuring it meets health and safety standards for use in medical services. To achieve this goal, the implementation method was carefully structured, involving several sequential steps. First, the service team conducted a comprehensive location survey to assess the water requirements and potential challenges. Following this, the team engaged in in-depth problem discussions, planning sessions, and preparatory work to lay the groundwork for the installation. The actual construction of the water installation was then carried out, followed by rigorous testing and evaluation to ensure functionality and quality. Through close collaboration with the Armopa Village community, the service team successfully completed a fully operational clean water installation. This unit now provides a reliable supply of high-quality water for the Bonggo Health Center, significantly improving the center's capacity to serve the healthcare needs of the surrounding community. This installation not only meets immediate needs but also sets a foundation for sustained health service enhancements and community well-being in the region.

Keywords: Bonggo Health Center, Community Collaboration, Health Facility Support, Public Health Services

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INTRODUCTION

Water is a vital resource that sustains life on Earth, and access to clean water is essential for health, hygiene, and environmental sustainability. As populations grow and living standards improve, the demand for clean water provision and service increases. However, this demand often outpaces the capability of service systems, leading to gaps that require strategic initiatives, especially in remote areas with limited access. Clean water is a basic need fundamental to public health, particularly in regions where health facilities, such as Bonggo Health Center in Sarmi Regency, serve large communities. Without reliable access to clean water, health centers struggle to deliver optimal care, and the surrounding community's health may suffer.

In response to this pressing need, a community assistance program was developed to establish a clean water installation at Bonggo Health Center, addressing a critical gap in service and aiming to improve the quality of public health services in the region. This program represents a significant effort to secure consistent, safe, and potable water for both the health facility's operations and the broader community's use. Not only does this initiative address immediate water needs, but it also sets a foundation for ongoing health improvements, potentially reducing the prevalence of waterborne diseases and ensuring that the health center can perform its functions without disruption.

The primary objective of this assistance program was to provide Bonggo Health Center with a sustainable water source, designed to meet the center's needs for safe and clean water and, in doing so, support its role in community health. The project's success was contingent on a comprehensive process that involved multiple phases and community engagement. The service team executed several key steps: initial site surveys, problem identification through discussions with health center staff, program planning and preparation, physical construction, and a post-construction evaluation. Each step was meticulously planned to ensure the project addressed Bonggo Health Center's needs effectively.

A site survey was the first step in this process, conducted by the service team to evaluate the existing water sources and distribution systems. The survey revealed that while Bonggo Health Center had access to well water, the water was contaminated with fine sand particles that made it unsuitable for immediate use in health services. This contamination posed a significant health risk and required a solution that would filter out impurities, making the water safe for all intended uses. Discussions with the health center staff provided further insight into the daily operational challenges caused by the water quality issues, reinforcing the urgency of the project.

Based on the survey findings and consultations, the service team identified a solution involving the construction of a clean water installation. This system included several key components: a robust piping system to transport water, a high-capacity pump to maintain steady water flow, a storage tower to regulate water pressure, and a temporary holding tank where water could be filtered before use. The setup aimed to remove sand and other particulate contaminants, providing a cleaner water supply directly to the health center.

In designing the installation, the service team drew on successful implementations of similar projects. For example, Kusuma et al. (2022) developed a piped distribution system for residential areas, highlighting the importance of tailoring water infrastructure to the specific

needs of the population it serves. Mulyad et al. (2021) explored the selection of storage capacities, pumps, and piping systems to optimize clean water distribution, a methodology that informed the selection of components for Bonggo Health Center. Fontes (2021) tackled water distribution challenges in a rural setting, providing a model for structuring systems in resource-limited environments. Lastly, Hamsi and Taufik (2022) expanded water delivery at PDAM Tirtanadi by increasing pump and pipe capacity, a principle applied to ensure consistent water flow at the health center. These references informed the installation's design, helping the team build a resilient system that could withstand the demands of daily use.

Once the installation was complete, it served as a transformative resource for Bonggo Health Center and the local community. The presence of a clean water supply had an immediate and positive impact on the health center's operations, allowing staff to focus on delivering quality care without the constant concern of water scarcity or contamination. For the surrounding community, the installation marked a significant improvement in public health infrastructure. The availability of clean water at the health center reduced the risk of waterborne diseases such as diarrhea and skin infections, which are common in areas with compromised water quality. With these health risks minimized, Bonggo Health Center was better positioned to provide essential health services, contributing to overall community well-being.

Moreover, the program's success was not only in delivering a clean water installation but also in fostering community awareness about water sanitation and its importance for health. Throughout the project, the service team engaged local residents in discussions about water safety, helping to build a broader understanding of waterborne illnesses and preventive measures. This knowledge was crucial for encouraging long-term community support for the clean water installation, as residents became more invested in maintaining the facility and understanding its health benefits.

A formal evaluation at the end of the program indicated high satisfaction among the community and health center staff. The clean water installation met operational needs, and the feedback was overwhelmingly positive. Community members expressed appreciation for the project, recognizing the clean water facility's value to public health and safety. Additionally, the local health center staff reported that the water installation had reduced daily logistical challenges, allowing them to focus on patient care.

This program's success underscores the broader importance of strategic, community-focused initiatives in addressing fundamental public health needs. By combining infrastructure development with community engagement, the project achieved sustainable outcomes that extend beyond the immediate provision of clean water. The installation now serves as a model for similar programs in other rural and underserved regions, demonstrating how clean water access can directly enhance health service quality and community health outcomes.

Moving forward, this community assistance program highlights the need for continuous collaboration between communities, local governments, and service providers to ensure sustainable access to clean water. The Bonggo Health Center installation has the potential to serve future generations if maintained and supported by ongoing community and governmental efforts. With these partnerships, clean water access can become a lasting reality,

transforming health services and promoting well-being in communities across the region.

The clean water installation at Bonggo Health Center represents a pivotal step in improving public health infrastructure in Sarmi Regency. This program demonstrates that even small-scale projects can have a significant impact when they address core needs and engage the community. The project is a reminder of the power of community-oriented solutions to deliver lasting health benefits, contributing to a healthier, more resilient future for Bonggo Health Center and the surrounding community.

IMPLEMENTATION METHOD

The implementation of this clean water installation project at Bonggo Health Center was meticulously structured to address each phase of development with precision and community involvement (Fig. 1). The first step, Initial Observation, involved a site visit by the project team to the Bonggo Health Center, which allowed for a direct assessment of the specific water supply issues facing the facility and surrounding community. This observation was essential for identifying the root cause of the water quality problem, as the team observed and analyzed the current condition of water sources and distribution at the health center. Through these findings, the team pinpointed the primary issues, including particulate contamination, which was compromising the water's safety and usability. With a comprehensive analysis, the team then outlined a clear solution tailored to meet the health center's needs, focusing on filtration, accessibility, and sustainable water distribution.

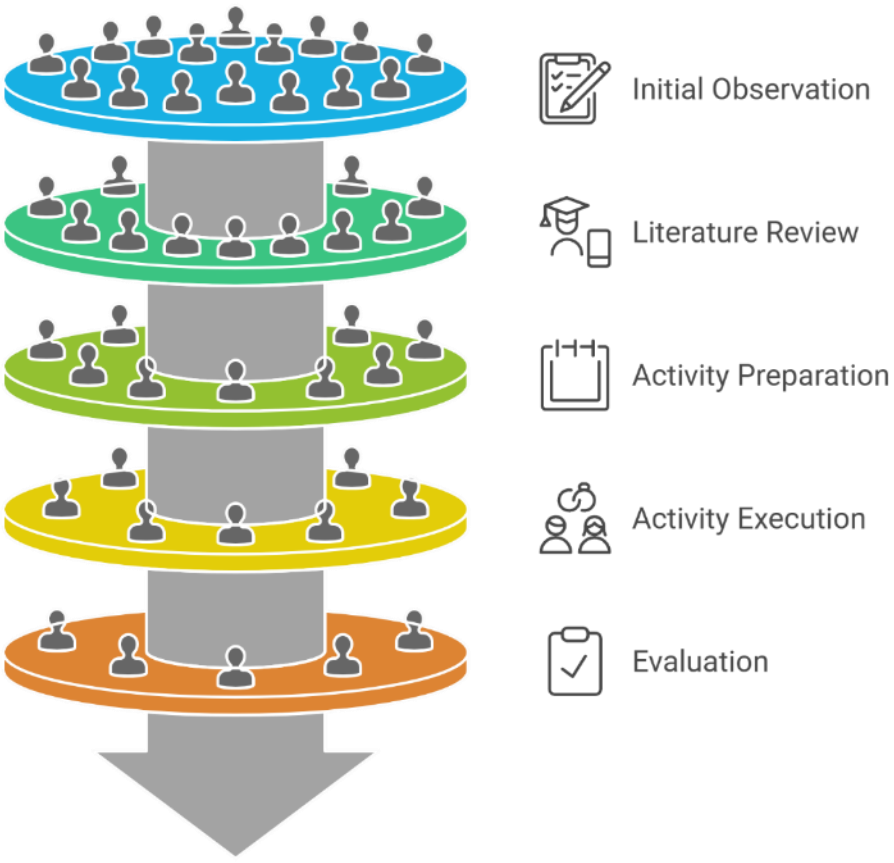

Figure 1. Clean Water Project Implementation

Following the initial assessment, the team engaged in a Literature Review. This phase involved gathering relevant research, including case studies, previous projects, and scientific journals that provided insight into similar water installation systems. These resources offered guidance on best practices in water filtration, piped distribution, and community engagement. By studying documented techniques and methodologies, the team could adopt proven approaches while also customizing them to align with the local context at Bonggo. This literature review stage was invaluable for informing decisions around materials, construction techniques, and community engagement strategies, as the team sought a solution that was both effective and sustainable within the region's specific environmental and logistical constraints.

With a solid foundation from the observation and research phases, the team moved to Activity Preparation, during which they organized and finalized project logistics. This included developing a detailed activity plan, scheduling timelines, and securing essential materials and tools needed for construction. By establishing a clear roadmap, the team ensured that all resources were in place, reducing the potential for delays or resource shortages during implementation. Additionally, this phase included logistical preparations to engage community members and schedule their involvement, recognizing that their participation would be crucial for the project's success and long-term maintenance.

The fourth and most intensive phase, Activity Execution, encompassed the hands-on construction of the water installation (Fig. 2). This phase was conducted in collaboration with the Armopa Village community, with the team actively engaging local residents at each step. The construction process began with foundation digging for the water tower, providing a stable base to ensure the durability and resilience of the installation. After the foundation was laid, the team constructed the tower frame and assembled the piping system, which would deliver clean water to the health center. This collaborative approach allowed community members to gain hands-on experience with each aspect of the installation, from building and securing the structural components to understanding the operational requirements of the piping and filtration systems. Community participation served not only as a means of labor but also as an educational opportunity, equipping local residents with skills and knowledge that would aid in the installation's long-term care and maintenance. The phase culminated in a final testing session, during which the water flow and filtration effectiveness were checked to ensure the system's reliability and safety for health center use.

Finally, a thorough Evaluation phase took place once the installation was completed. This evaluation served as both a quality assurance measure and an opportunity for feedback from the community and health center staff. The team conducted testing by running water through the entire system, checking for any leaks or inconsistencies in the water flow. The system was deemed successful when clean water flowed smoothly, without particulate contamination, and met the needs of the health center. This phase also provided an occasion for the community to voice any questions or concerns, which the team addressed to improve the community's confidence in managing the system. By conducting an evaluation, the team could confirm that the project met its objectives and was capable of providing safe, clean water to the health center.

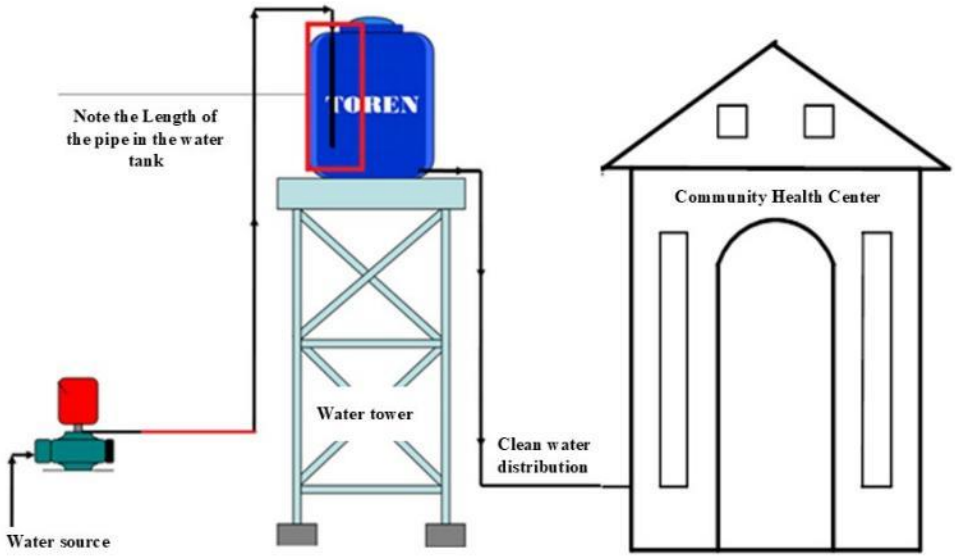

Figure 2. Clean Water Installation

The implementation method was a well-orchestrated process that integrated technical assessments, research-based planning, logistical preparation, community-led construction, and thorough testing. This structured approach not only facilitated the successful completion of the clean water installation but also fostered community ownership and capacity-building, which are essential for the project's sustainability and long-term impact on public health in the Bonggo area.

RESULTS AND DISCUSSION

The clean water installation project at the Bonggo Health Center in Armopa Village was designed to address the pressing need for safe, accessible water within the facility and the surrounding community. In the initial stages, the project involved detailed preparation and planning to ensure both the effectiveness of the installation and the successful engagement of community members. The main activities were divided into two phases: preparation and implementation, each with distinct stages and specific goals aimed at achieving sustainable clean water access for the health center.

Preparation Phase

The preparation phase was pivotal to establishing a foundation for the installation process (Fig. 3). It started with site surveys and problem analysis. During this stage, the service team visited the Bonggo Health Center to assess the condition of existing water sources and the primary water issues impacting the health facility. Observations revealed that the water was contaminated with fine sand particles due to inadequate filtration at the source. This insight allowed the team to develop a solution involving a filtration-based clean water system with a storage tank and piped distribution to ensure safety and accessibility.

In addition to on-site assessments, the team conducted a literature review to understand the methods and challenges associated with similar water installation projects. The review

provided the team with insights into design elements, materials, and systems that could be adapted to fit the Bonggo Health Center's specific needs. Studies on water distribution systems and filtration were instrumental in selecting appropriate materials, such as sand filters and piped networks, and determining the capacity required for the storage tank to meet the health center's demand. This research allowed the team to adopt and modify a methodology based on best practices from similar successful projects, ensuring a system that would be reliable and sustainable in the long term.

(a) (b)

(b) (d)

Figure 3. Initial activity stages: (a) Installation of foundation stakes, (b) Excavation of foundations, (c) Installation of foundations, and (d) Casting of foundation corners.

With research findings in hand, the team shifted to logistical preparation. This included the procurement of materials such as pipes, cement, filters, a water tank, and tools necessary for the installation. These resources were selected to ensure durability, affordability, and ease of maintenance, given the limited local access to advanced materials. Additionally, a schedule was established to coordinate the stages of the project, from excavation and construction to the final testing and evaluation. This plan accounted for potential challenges, including the weather and the availability of community members for hands-on assistance.

Implementation Phase

The implementation phase involved construction and installation of the clean water system in collaboration with the Armopa Village community. To foster community ownership and understanding, the team held an initial meeting to brief the villagers on the project objectives, construction process, and their roles in assisting with various tasks. This approach promoted active participation and shared responsibility, which are crucial for the long-term

sustainability of the water installation system.

Excavation and Foundation Building

The construction began with excavating and laying the foundation for the water tower (Fig. 5). The team and community members worked together to dig a foundation pit at a designated site near the health center. Given the structural demands of a water tower, it was essential to build a strong foundation to prevent future instability. Cement was poured and left to set, forming a solid base for the tower. The foundation-building process required precise measurements and leveling to ensure the tower's stability, given that it would support the water tank and serve as the installation's primary distribution point.

Figure 4. Construction of tower frame

Assembling the Water Tower and Piping System

Once the foundation was ready, the team moved on to the assembly of the water tower framework. Using locally available materials, the framework was constructed to hold the water tank at a height sufficient for gravity-fed water distribution. This design was chosen because gravity-fed systems are effective for remote areas, where consistent electricity for pumping may be limited. The frame was secured to ensure it could withstand the weight of the water tank when filled to capacity.

Figure 5. Assembly of the frame, pipes and tower supports

Simultaneously, the team worked on installing the piping system, which was connected to the water source and the health center. Pipes were carefully chosen for their durability and resistance to clogging, given the previous issues with sediment and fine sand particles contaminating the water. The piping system included multiple filtration points to further

ensure that contaminants would be removed before the water reached the health center.
The community members were actively involved in laying pipes and sealing connections (Fig. 6). This involvement was critical not only for project efficiency but also for empowering the community with skills they could use for maintenance and potential future expansions of the system. The hands-on experience with pipe fittings and filtration setup gave the villagers insight into the water distribution process and the importance of each component in maintaining clean water access.

Installing the Storage Tank and Final Testing

The water storage tank was installed at the top of the tower, serving as a reservoir for treated water. This tank was chosen based on calculations of daily water usage at the health center, which included estimations for patient needs, sanitation, and medical procedures. The tank installation was completed with additional secure fittings and leak-proof seals to ensure the reliability of the storage unit (Fig. 7).

Following the tank installation, the team conducted a series of tests to ensure that the system worked as intended. Initial tests focused on verifying the filtration effectiveness, with team members checking for any visible particulates in the water and testing water clarity at various points along the piping network. Additional tests involved running water from the tank through the pipes to assess flow rate and pressure consistency at the health center's endpoints.

The final test results showed a significant improvement in water clarity and flow, confirming that the filtration system effectively removed fine sand particles and other contaminants. This outcome indicated that the clean water installation could meet the health center's needs, providing a dependable water source that enhanced the quality and safety of its services.

Figure 6. Installation successful

Discussion of Community Impact and Sustainability

The successful completion of the clean water installation had a profound impact on both the Bonggo Health Center and the Armopa Village community. The improved water quality directly benefited health services, as access to clean water is critical for patient care, sanitation, and infection control within the health center. Furthermore, the project addressed a long-standing issue that had compromised health service delivery, thus enhancing overall public

health standards in the area.

Additionally, community members gained practical skills in water system installation and maintenance. This hands-on experience empowered them to take an active role in the project and instilled a sense of ownership over the installation. With an understanding of the system's components and functionality, they are better equipped to address minor issues and perform routine maintenance, ensuring the installation's long-term sustainability.

CONCLUSION

The service team, in collaboration with the community of Armopa Village, has successfully established a 1,000-liter capacity clean water installation unit specifically to meet the water needs of the Bonggo Health Center in Sarmi Regency. This installation, designed to improve health service delivery by ensuring reliable access to clean water, is a valuable resource that has the potential to make a lasting impact on the community's healthcare standards.

The service team recommends that the Bonggo Health Center staff and community members prioritize regular maintenance of the clean water installation. Regular upkeep is crucial for ensuring that the system continues to function effectively and can serve the health center's needs over the long term. Through periodic inspections and necessary repairs, the water installation can remain in optimal condition, providing sustainable access to clean water essential for health and hygiene.

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