JURNAL DEDIKASI PUBLIK
https://ejournal.iiknutuban.ac.id/index.php/judepub
Vol. 1 N0.1, 2025

Empowering Coastal Families in Tuban to Prevent Environment-Based Diseases through Sanitation Education and Clean Water Management

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Article Info:
Submitted: 10 June 2025
Accepted: 1 Sept 2025
Published: 12 Nov 2025

Handling Editor:

Keywords:
coastal communities; environmental health; sanitation education; clean water management

ABSTRACT

Coastal communities in Palang, Jenu, Bulu, and Tambakboyo Subdistricts of Tuban Regency continue to face environmental health challenges, especially limited access to clean water during the dry season, which increases the risk of environmentally-related diseases. This community engagement program aimed to strengthen household capacity in environmental health through targeted education on sanitation practices and simple clean-water management techniques. Using participatory methods—including workshops, demonstrations, and household mentoring—the program reached approximately 42 households and facilitated improvements in hygiene behavior, understanding of water treatment, and adoption of low-cost sanitation solutions. The results indicate that structured education combined with community empowerment can significantly enhance health awareness and preventive practices in resource-limited coastal settings. This program highlights the importance of sustained collaboration between academic institutions, local stakeholders, and communities to achieve long-term improvements in environmental health and overall well-being.

1. INTRODUCTION

The coastal areas of Tuban Regency play a crucial role in the local economy, particularly through fisheries and maritime activities, with a significant portion of the population relying directly on marine resources for their livelihoods.[1] Despite this economic potential, these communities face persistent public health challenges, particularly those linked to environmental conditions. Access to clean water remains limited, with many households relying on shallow wells that are often vulnerable to contamination.[2] Additionally, household sanitation practices are frequently inadequate, increasing the risk of waterborne and environment-related diseases such as diarrhea, skin infections, and helminthiasis.[3]

Environmental pressures in the region exacerbate these health risks. Seawater intrusion, the expansion of industrial activities along the coast, and insufficient management of domestic and industrial waste contribute to the deterioration of water quality and environmental hygiene.[4] While previous interventions have addressed general health promotion and disease prevention, they often lack specificity for coastal contexts, fail to integrate local knowledge and practices, and rarely focus on empowering families as the primary agents of change.[5]

This gap highlights a critical need for targeted, context-sensitive interventions that not only raise awareness but also strengthen the capacity of coastal families to manage sanitation and water quality at the household level.[6] Currently, there is limited evidence of programs

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that effectively combine education on environmental health with practical, community-based strategies for behavior change in Tuban's coastal villages.[7] Without such interventions, the community remains vulnerable to preventable diseases, and efforts to improve public health outcomes are unlikely to be sustainable.[8]

Addressing this gap requires a participatory approach that empowers families to identify environmental risks, implement proper sanitation practices, and manage clean water resources effectively.[9] By focusing on both education and empowerment, the proposed program seeks to create sustainable improvements in health behavior and environmental management, ultimately reducing the prevalence of environment-based diseases in coastal Tuban.[10]

2. METHODE

The implementation of this program adopts a community-based participatory approach, involving coastal families, health cadres, community leaders, and local government officials. The program will be carried out in several coastal sub-districts of Tuban Regency, namely Palang, Jenu, Bulu, and Tambakboyo, where some areas experience limited access to clean water, particularly during the dry season, as well as suboptimal household sanitation conditions. The initial stage of the program involves a needs assessment and survey, including family data collection, evaluation of sanitation conditions, water sources, and health practices through observations and interviews with health cadres and community leaders. The survey results will serve as the basis for developing educational materials, covering healthy sanitation practices, clean water management and storage, and prevention of environment-based diseases. These materials will be delivered through interactive training sessions, posters, and educational videos to ensure easy understanding and practical application by the community.[11]

The next stage is training and family empowerment, conducted through workshops, hands-on practice simulations, group discussions, and the formation of sanitation-conscious family groups, tasked with monitoring and guiding the implementation of healthy practices in their respective communities. The program continues with routine mentoring and monitoring over 3–6 months to ensure consistent application of sanitation and clean water management practices. Monitoring is conducted using observation checklists, interviews, and visual documentation, followed by evaluations at the beginning, mid-point, and end of the program to assess behavioral changes, capacity improvement, and impacts on household environmental quality. Program success will be measured by increased knowledge and awareness of sanitation practices among families, behavioral improvements in waste and water management, the establishment of active and sustainable sanitation-conscious family groups, and a reduction in the risk of environment-based diseases in the coastal areas of Tuban.[12]

3. RESULTS AND DISCUSSION

Result

The coastal family empowerment program in Tuban was implemented across four sub-districts: Palang, Jenu, Bulu, and Tambakboyo. A total of 42 heads of households participated in the full range of activities, including educational workshops, hands-on training on sanitation and clean water management, and field mentoring. Participants came from diverse age groups and occupational backgrounds, with the majority being fishermen or family members of fishermen, making their role crucial in household sanitation and water management.

Throughout the program, participants demonstrated a significant improvement in knowledge regarding healthy sanitation practices, clean water management, and prevention of environment-based diseases. Initial and mid-term evaluations indicated that most families began implementing better household waste management, including separating organic and non-organic waste, creating simple waste bins, and managing kitchen waste more effectively. Additionally, participants started practicing safe water storage, such as using

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covered containers and routinely cleaning storage facilities.

Routine monitoring revealed consistent behavioral changes, with approximately 85% of participants reporting the adoption of sanitation practices taught during the program, and over 70% of families conducting regular checks on household water quality. The formation of sanitation-conscious family groups proved effective, as members actively reminded and guided each other in maintaining environmental cleanliness and practicing healthy behaviors.

These results indicate that the program successfully enhanced awareness and capacity among coastal families in Tuban to manage sanitation and clean water effectively, thereby reducing the risk of environment-based diseases. With this initial success, the program has the potential to be replicated and scaled to other coastal areas in Tuban with similar conditions.

Discussion

The implementation of the coastal family empowerment program in the sub-districts of Palang, Jenu, Bulu, and Tambakboyo in Tuban Regency demonstrated that community-based educational interventions can effectively drive significant behavioral changes related to sanitation and clean water management. With 42 heads of households participating, the program successfully created opportunities for learning and practicing hygiene behaviors, helping families understand the direct link between household environmental conditions and the risk of environment-based diseases.[13] Monitoring results indicated that most participants began implementing improved sanitation practices, including waste separation, household waste management, and the use of proper sanitation facilities, as well as safe water storage practices, which had previously been inconsistently applied.[14] These findings confirm that family empowerment through participatory approaches not only increases knowledge but also encourages consistent adoption of healthy practices at the household level.[15]

Beyond individual behavior change, the program emphasized the importance of forming sanitation-conscious family groups as collective mechanisms to monitor, support, and reinforce healthy practices within the community. Activities conducted by these groups demonstrated that community-based interventions could create supportive social systems that facilitate information exchange, sharing of experiences, and dissemination of good practices among families.[16] This collective approach ensures that the impact of the program extends beyond individuals, fostering sustainable and community-wide health improvements. These results are consistent with previous studies showing that community involvement and participatory methods significantly enhance the effectiveness of environmental health programs in coastal areas (Name, Year).[17]

The observed behavioral changes also highlight the critical role of practical knowledge and hands-on experience in accelerating the adoption of healthy practices. Interactive workshops, hands-on simulations, and routine mentoring proved effective in helping participants identify environmental risks and take preventive actions.[18] This approach is particularly relevant given that several areas in coastal Tuban experience limited access to clean water, especially during the dry season, making households' ability to independently manage water and sanitation practices essential.[19]

Evaluation also revealed variations in behavioral adoption among participating families, influenced by factors such as educational background, household workload, and local cultural practices related to domestic management.[20] This finding underscores the need for tailored empowerment strategies that consider the social and cultural characteristics of each community to achieve optimal outcomes. Consequently, the program not only provided technical knowledge and skills but also fostered critical awareness and adaptive capacity among coastal communities in managing environmental health challenges.[21]

Overall, the program demonstrated that education-based, hands-on, and community-participatory interventions can significantly enhance environmental health and reduce the

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risk of environment-based diseases among coastal families.[22] The initial success of this program suggests strong potential for replication and scaling to other coastal areas with similar conditions. Furthermore, integrating educational approaches with the formation of community groups can serve as a sustainable model for improving public health, particularly in the context of limited clean water access and ongoing environmental changes.[23]

4. CONCLUSION

The coastal family empowerment program implemented in Palang, Jenu, Bulu, and Tambakboyo sub-districts of Tuban Regency successfully enhanced the knowledge, skills, and practices of 42 participating households regarding sanitation and clean water management. The program demonstrated that a community-based participatory approach, combining education, hands-on training, and ongoing mentoring, can effectively encourage families to adopt healthy environmental practices, including proper waste management and safe water storage.

The formation of sanitation-conscious family groups further strengthened the sustainability of behavioral changes by creating a supportive social system that fosters knowledge sharing, mutual guidance, and reinforcement of good practices. As a result, the program contributed to a reduction in environmental health risks and increased the capacity of coastal families to manage their household environment independently, particularly in areas facing limited access to clean water during the dry season.

Overall, the success of this program indicates its potential for replication and scaling to other coastal communities in Tuban and similar regions. By integrating education, practical training, and community participation, the program provides a sustainable model for improving public health outcomes in coastal areas, enhancing family resilience, and preventing environment-based diseases.

5. ACKNOWLEDGMENTS

We sincerely express our gratitude to the coastal families of Palang, Jenu, Bulu, and Tambakboyo for their active participation and commitment throughout the program. Our thanks also go to the health cadres, community leaders, and local government officials for their guidance and support in planning, implementing, and monitoring the activities. We deeply appreciate the efforts of the research and academic team in preparing educational materials, conducting trainings, and documenting results. Without the collaboration and dedication of all parties, this program would not have achieved its objectives, and we hope that its outcomes will contribute to sustainable improvements in public health for coastal communities.

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