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Empowering Sustainable Tourism: A Health-Centric and Self-Sustaining Village Program (A Case Study in Sawahan Village, Watulimo Subdistrict, Trenggalek Regency)

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ABSTRACT Desa Sawahan, Watulimo District, Trenggalek Regency, is well-known as a durian forest tourism area. Residents living near the river basin often complain about the odor due to waste, and the microbiological water quality does not meet the requirements for total *Coliform*. The source exceeds 65 CFU/100 ml, and for the *Escherichia coli* parameter at the source, it is 3 CFU/100 ml. The aim of this community service is to enhance the knowledge and behavior of the community for a clean and healthy lifestyle. The methods employed include introducing the chlorine diffuser tool, assisting in the development of tourist villages and self-reliance, providing education on waste management using the Takakura method and the establishment of a Waste Bank, healthy settlements and, clean and healthy living behavior through handwashing with soap activities within the family setting. In the community service of 2023, a technology called the chlorine diffuser is introduced. Assistance is provided for the operation and maintenance of Clean Water Facilities (CFW) by teaching the use of chlorine diffusers for chlorination. The conclusion of this community service is that there is a significant increase in knowledge after education on waste management through a waste bank, with 10 people (20%) understanding waste sorting, which then increased to 48 people (96%). The highest improvement in community behavior regarding clean and healthy living behavior is observed in handwashing with soap is seen in 18 people (36%) practicing handwashing with clean water and away from pollutants, which increased to 50 people (100%).

INDEX TERMS Community service, clean water facility, water management, healthy settlements

I. INTRODUCTION

Indonesia has more than 74 thousand villages spread throughout the region with tourism potential that is worth developing, through a tourism village program that can be a driving factor in the realization of sustainable tourism [1]. Sustainable tourism emphasizes the importance of efforts to preserve the environment and optimize benefits for the community in an area. [2], [3]. Sustainable tourism can run well if community involvement is actively implemented with

the collaboration of government, private and community. Sustainable tourism cannot be separated from humans as human resources who manage potential and maintain the environment [4], [5], [6].

Watulimo Sub-district is one of the 14 sub-districts in Trenggalek Regency. Watulimo sub-district has 12 villages where the number of family heads in 2022 reached 2,311 families, with a population of 74,768 people and an area of

9,086 hectares. Sawahan Village is one of the existing villages and is included in the administrative area of Watulimo District. Sawahan Village is a village developed as a "Tourism Village". The initiation and pioneering of the "Tourism Village" was initially assisted by Bappeda (Regional Development Planning Agency) of East Java Province and Poltekkes Kemenkes Surabaya starting in early 2015, and was officially launched or established by the Trenggalek Regency Government at the end of 2015.

Community empowerment will not succeed without encouragement from the community itself [7]. Community participation is influenced by various factors such as awareness of development, resources, utility, effective management, and leadership [8]. The involvement of village heads or committees is also necessary [9]. The potential of the village and local community in the development of this tourist village has a big role. The role of the community is to manage, and operate and control the running and development of tourist villages, starting from design plans and types of tourist villages, determining products to the benefits they receive. The benefits received by the local community are encouraging healthier community life, increasing and more prosperous community economic conditions, and the community plays an active role in preserving cultural values and the natural environment. The presence of this tourist village is also able to absorb local community labor, create entrepreneurs, and create positive activities in village communities such as activities in agriculture, plantations, livestock, fisheries, and others [10].

In empowering a village to become a tourist destination, there needs to be an understanding of tourism [11], [12], [13]. Moreover, there should be a plan regarding how supporting resources impact internationally [14]. The development of international tourism has positive effects on the local economy [15], [16]. Therefore, a sustainable approach is needed to develop tourist villages (Richards & Hall, 2000; Azam et al, 2018). Policies for sustainable tourism typically require support from various sectors, including transportation, accommodation, taxes, environmental conservation, and others [17]. Even though tourism concepts penetrate the international market, it is essential to respect local culture and heritage [18], [19].

The development of a tourist village in Sawahan Village is able to provide new alternatives to tourists to carry out tourism activities, which not only invites tourists to enjoy the beauty of nature, but tourists are invited to learn and get to know life and interact directly with the village community. Another positive outcome is that tourists visiting this tourist village can prosper life through providing services and selling products created from various potentials owned in the village. Sawahan Village as a Tourism Village still has a lot to improve regarding the management or management of tourism villages, the fulfillment of village environmental sanitation facilities, basic sanitation of settlements or housing, supporting facilities for tourist destinations and social problems related to clean

and healthy living behavior of the Sawahan village community. Based on the results of community service that has been carried out by Khambali, et al in 2022 and its follow-up, that the existing and main problems in the development of tourist villages in Sawahan village still revolve around: lack of competence in management or management of tourist villages, problems with village environmental sanitation facilities, and basic sanitation of residential houses (settlements), and still lacking supporting facilities for village tourism destinations and community clean and healthy living behavior which still need to be improved.

The potential of Sawahan Village is very large and has the opportunity to be maximized both from the aspect of fertile natural resources and beautiful natural panoramas which certainly become and have their own attraction for tourists. Likewise, the condition and social character of the people who are friendly, willing to move forward and the life of the villagers who get along well together are potential basic capital to be developed. The support of the village government, the village officials are very good starting from the village head and other officials as well as the support of sub-district leaders and the regional government of Trenggalek Regency. The existence of a tourism village manager that has been formally established and determined by the Village Head, adaptive tourism actors and obedient to the laws and regulations as well as the willingness to learn and the spirit to progress into the spirit of the development of "Tourism Village" Sawahan Village is a leading and mainstay destination in the Trenggalek Regency area. Community participation in tourism villages can be realized in the form of tourism activities designed and provided by local communities [20], [21].

On the basis of the situation analysis and mapping of problems and potential of the village, it is necessary to carry out community service activities through the Partner Village Development Program in Sawahan Village, Watulimo District, Trenggalek Regency. The expected output is that through this partner village development program it can improve the welfare of the community and realize that Sawahan village as a Healthy Tourism Village as well as a village or area under the continuous guidance of Poltekkes Kemenkes Surabaya in realizing "Healthy Tourism Village". So referring to the background and mapping of problems and potential, it is necessary to carry out community service activities with the title "Empowering Sustainable Tourism: A Health-Centric and Self-Sustaining Village Program (A Case Study in Sawahan Village, Watulimo Subdistrict, Trenggalek Regency, 2023)".

The objectives of this community service activity include:

- Improving clean water facilities in the Healthy Tourism Village of Sawahan Village, Watulimo District, Trenggalek Regency through Appropriate Technology chlorine diffuser.
- Increasing the competence of managers in the management and development of Tourism Villages in the operation and maintenance of clean water treatment facilities in the Tourism

Village of Sawahan Village, Watulimo District, Trenggalek Regency. c. Increasing community knowledge and skills about domestic waste management through Takakura and the formation of a Waste Bank. d. Increasing community knowledge about hygiene sanitation of dwellings in preventing disease transmission. e. Increasing clean and healthy living behavior, especially compliance with hand washing using soap and running water. e. Increasing clean and healthy living behavior, especially compliance with hand washing using soap and running water. Increase community knowledge about hygiene sanitation of the residence in preventing disease transmission. e. Improve clean and healthy living behavior, especially compliance with hand washing using soap and running water [22][23].

The problems raised in community service activities entitled "Strengthening the Healthy, Independent and Sustainable Tourism Village Program in Sawahan Village, Watulimo District, Trenggalek Regency 2023" are focused on improving the quality of clean water with microbiological parameters through appropriate technology chlorine diffuser, mentoring and strengthening the competence of tourism village managers, counseling related to takakura domestic waste treatment and the formation of waste banks, healthy settlements and the application of clean and healthy behavior through hand washing with soap in Sawahan Village, Watulimo District, Trenggalek Regency in 2023.

II. METHOD

The community service method is to use three methods simultaneously, namely through Communication, Information and Education (IEC) related to Clean and Healthy Living Behavior in the family setting through Hand Washing with Soap, domestic waste management and clean water treatment. Demonstration or practice of takakura (domestic or household waste management) and initiation of the formation of waste banks, as well as Hand Washing with Soap in accordance with the World Health Organization (WHO). Followed by mentoring activities for tourism village governance, sanitation management and community clean water with clean water disinfection using chlorine diffusers for clean water treatment for the community. The three methods are used to increase community knowledge, understanding, and skills.

III. RESULTS

A. DOMESTIC WASTE MANAGEMENT THROUGH TAKAKURA AND WASTE BANK ESTABLISHMENT

Based on the counseling activities, filling out the questionnaires for the pre-test and post-test regarding waste management through Takakura and the formation of a Waste Bank, the following results were obtained:

In **FIGURE 1**, there is an increase in the indicators assessed in the level of community knowledge in waste management through the Waste Bank. Initially only 5 people (10%) understood how to sort waste, after counseling it increased to 42 people (84%). 10 people (20%) understood how to sort waste, then increased to 48 people (96%). Then, only 9

The Level of Community Knowledge in Waste Management through the Takakura Method and the Establishment of a Waste Bank

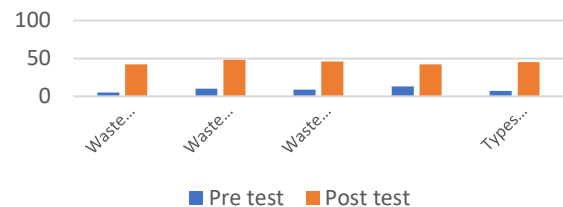


FIGURE 1. The Level of Community Knowledge in Waste Management through the Takakura Method and the Establishment of a Waste Bank

people (18%) understood waste processing with the Waste Bank, increasing after counseling to 46 people (92%). 13 people (26%) who understand takakura waste management, after counseling and post-test assessment 42 (84%) who understand Takakura waste management. 7 people (14%) understood the types of waste that must be processed through

The Level of Community Behavior in Waste Management through the Takakura Method and the Establishment of a Waste Bank

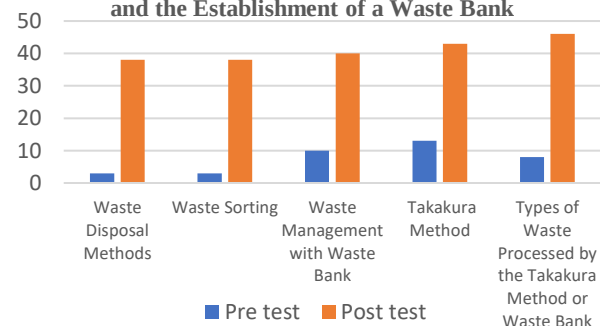


FIGURE 2. The Level of Community Behavior in Waste Management through the Takakura Method and the Establishment of a Waste Bank

Takakura and Waste Bank then in the post test it increased to 45 people (90%).

Meanwhile, for the behavior level in **FIGURE 2**, only 3 individuals (6%) had containers and practiced separate waste sorting for organic and inorganic waste. After behavioral counseling, there was a significant increase, with 38 individuals (76%) having separate waste containers for organic and inorganic waste, actively engaging in waste separation. Before the counseling, 10 individuals (20%) sold inorganic waste to the waste bank, and after the counseling, 40 individuals (80%) sold their waste to the waste bank. Before the counseling, 13 individuals (26%) claimed to engage in waste management using the Takakura method. After the counseling, 43 individuals (86%) joined in domestic waste management using the Takakura method. Additionally, 42 individuals (92%) independently used products resulting from the Takakura method after the counseling products.

B. HEALTHY HOUSING IN THE PREVENTION OF DISEASE TRANSMISSION

Based on the counseling activities, a questionnaire was filled out for the pre-test and post-test regarding healthy settlements in the context of disease control, with the following results:

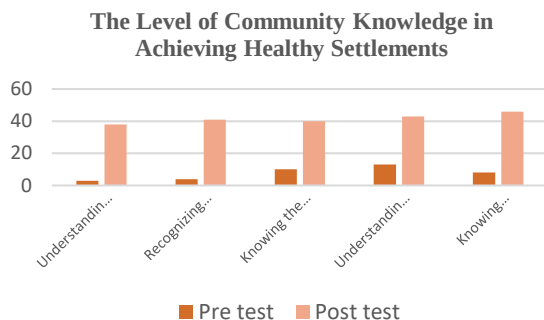


FIGURE 3. The Level of Community Knowledge in Achieving Healthy Settlements

It can be seen in [FIGURE 3](#), that there is an increase in community knowledge about healthy housing. Among them 3 people (6%) understand basic sanitation increased to 38 people (76%), people (8%) know the importance of clean water, garbage facilities, latrines, ventilation, and sewage increased to 41 people (82%). 10 people (20%) know the

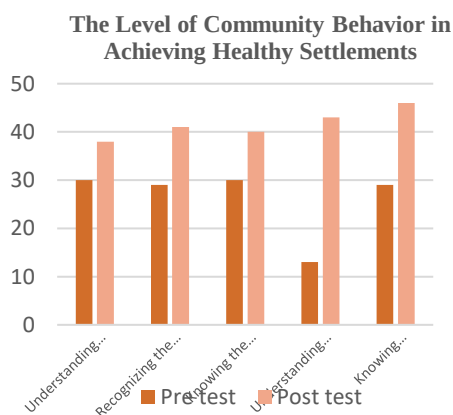


FIGURE 4. The Level of Community Behavior in Achieving Healthy Settlements

procedures for cleaning the house increased to 40 people (80%). 13 people (26%) know the house as a major factor in disease transmission increased to 43 people (86%), 8 people (16%) know the types of infectious diseases due to the living environment increased to 46 people (92%).

Meanwhile, for the behavior level in [FIGURE 4](#), it can be observed that there has been an improvement in community behavior regarding healthy settlements. Initially, 30 individuals (60%) had basic sanitation facilities at home, including handwashing facilities, clean water, waste facilities, toilets, ventilation, and wastewater drainage, which increased to 38 individuals (76%) after the counseling.

The number of individuals maintaining basic sanitation facilities increased from 29 (58%) to 41 (82%) after the counseling. Those engaging in regular cleaning of the home environment at least once a day increased from 30 individuals (60%) to 40 individuals (80%) after the counseling. The number of individuals claiming to practice the 3M+ approach in family settings increased from 13 (26%) to 43 (86%) after the counseling. Furthermore, the active participation of 29 individuals (58%) in the prevention of communicable diseases, such as the national sanitation month, increased to 46 individuals (92%) after the counseling.

C. CLEAN AND HEALTHY LIVING BEHAVIOR THROUGH HANDWASHING WITH SOAP

In [FIGURE 5](#) The following is the pre-test and post-test data that has been carried out during counseling with an assessment of several indicators, namely:

There was an increase in community knowledge in clean and healthy living behavior through hand washing with soap in [Figure 5](#), namely 10 people (20%) Understand the five steps of hand washing with soap increased to 35 (75%). 9 people (18%) understand that handwashing with soap must

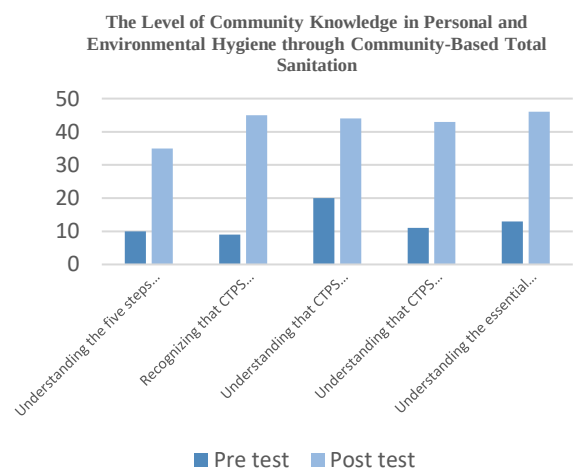


FIGURE 5. The Level of Community Knowledge in Personal and Environmental Hygiene through Community-Based Total Sanitation

use clean water increased to 45 people (90%). 20 people (40%) understand handwashing with soap using running water increased to 44 people (88%). 11 people (22%) understand that handwashing with soap must use soap increased to 43 people (86%). 13 people (26%) understood the times that handwashing with soap must be done, after handling objects, before preparing food and drinks, after cleaning baby's stool, after defecating and washing water and so on increased to 46 people (92%).

Meanwhile, for the behavior level on [FIGURE 6](#), it is noted that there has been an improvement in community behavior in Personal and Environmental Hygiene (PHBS) through Community-Based Total Sanitation (CTPS). Initially, 13 individuals (26%) had handwashing facilities at

home, which increased to 36 individuals (72%). The availability of soap at handwashing facilities increased from 21 individuals (42%) to 40 individuals (80%). Adequate flowing water for handwashing, initially available for 11 individuals (22%), increased to 39 individuals (78%). The number of individuals with water quality suitable for handwashing, initially 15 (30%), increased to 41 individuals (82%). The availability of handwashing facilities that are free from pollutants and at a distance from contaminants increased from 18 individuals (36%) to 50 individuals (100%).

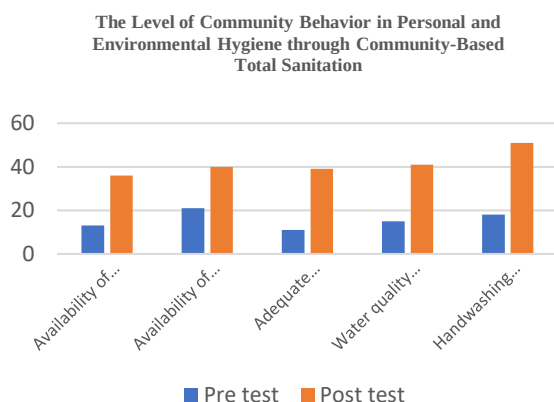


FIGURE 6. The Level of Community Knowledge in Personal and Environmental Hygiene through Community-Based Total Sanitation

IV. DISCUSSION

A. IMPROVING CLEAN WATER FACILITIES IN SAWAHAN VILLAGE, WATULIMO DISTRICT, TRENGGALEK REGENCY WITH APPROPRIATE TECHNOLOGY CHLORINE DIFFUSER

Community service in 2022 using the Broncaptering tool. Broncaptering is one of the Simple Water Treatment Plant Systems used in drinking water supply systems in production units. Broncaptering functions to protect and capture water from springs to be accommodated and channeled using transmission pipes to reservoirs. The selection of the planned broncaptering type is based on the Technical Guidelines for the Implementation of Simple Drinking Water Infrastructure. It is known in the results of laboratory examinations that the microbiological parameters, namely total *coliform*, are still not eligible to exceed 65 CFU/100 ml and the *E. coli* parameter at the source is still high around 3 CFU/100 ml. So that in this community service in 2023, an appropriate technology is introduced, namely a chlorine diffuser. Chlorine diffuser is one of the appropriate clean water treatment technologies that is chlorination in preventing or overcoming bacterial pollution with the total *coliform* indicator. The impact of water quality standards contamination caused by total *coliform* bacteria is in the form of digestive tract disorders, especially diarrhea so that the chlorine diffuser method is able to reduce bacterial contamination with a high enough amount and is able to improve the water quality standards process from contamination [24].

B. ASSISTANCE FOR OPERATION AND MAINTENANCE OF CLEAN WATER FACILITIES

Community Service Activities of Lecturers of the Environmental Health Department who strive to carry out assistance activities for the operation and maintenance of clean water facilities through the application of water management appropriate technology are expected to be able to adjust to the conditions of raw water sources, social, cultural, economic conditions and local human resources. One method that is widely used in the river water treatment process is the removal of total *coliform* bacteria using a chlorination system. This is with the consideration that total *coliform* bacteria are easily disinfected by chlorine, the contact time required is very short, making it suitable for treating surface water in large quantities and sustainable and chlorine is easily available on the market at a low price. The method of affixing chlorine can be done in stages using a chlorine diffuser. The addition of chlorine by using a chlorine diffuser has the advantage that the chlorine content mixed in the water will decompose slowly, does not cause odor and can be easily applied by the general public [24]

C. DOMESTIC WASTE MANAGEMENT THROUGH TAKAKURA AND WASTE BANK ESTABLISHMENT

One of the objectives of this service program is to increase knowledge and empower the community about processing household organic waste with the Takakura method. Processing organic waste with the Takakura method and demonstration methods to show the work process so that training participants can easily understand. Demonstrations are carried out by community service team lecturers as resource persons. It is hoped that the training participants can simulate the processing of organic waste with the Takakura method in accordance with the instructions that have been given.

The results of this service program show the enthusiasm of the partner community in organic waste management. The community can produce organic fertilizer independently. Through this socialization and training, the community realized the importance of household organic waste management for the creation of a healthy and clean environment. The community can produce organic fertilizer independently. Improved understanding and increased awareness of the partner community about the importance of organic waste processing is indicated by a significant reduction in organic waste and the availability of two types of dry waste bins (inorganic) and wet waste (organic). The community can produce organic fertilizer independently. With this service program, the understanding and awareness of partner communities about the importance of organic waste processing has increased [25].

D. ESTABLISHMENT OF WASTE BANK

Community Service Activities Lecturers of the Environmental Health Department who strive to carry out counseling activities related to waste management material in the form of 3R (Recycling, Reduce, Reuse) in the community in Sawahan Village, Watulimo District,

Trenggalek Regency. The target in the counseling activity is community members in Sawahan Village, Watulimo District, Trenggalek Regency as many as 50 people. Counseling activities on 3R waste processing in the community as many as 50 counseling participants. During the counseling activities the community was very enthusiastic as evidenced by being active in discussions related to the material presented in the form of 3R (Recycling Reduce, Reuse). The community is enthusiastic about the delivery of material related to recycling waste into more economical and aesthetic items. This is evidenced by the example of recycling bottles into lanterns that we showed during community service activities and made them more appreciate about it. The community is also motivated to create a Waste Bank group to reduce the volume of inorganic waste that can be recycled again and the benefits of waste banks can be used as an empowerment institution for mothers to empower family welfare in Sawahan Village, Watulimo District, Trenggalek Regency.

The waste bank teaches the community to sort waste, fostering public awareness of processing waste wisely in order to reduce waste transported to landfills. In addition, residents who hand over waste will get additional income for their economic independence, which can be used for savings and loan businesses such as cooperatives, with low interest so that waste bank finances can be rotated and developed, as well as the realization of environmental health. The coaching of women residents has demonstrated the ability of women residents to mobilize their communities to play an active role in managing waste in their neighborhoods as well as to exercise social control in their communities. The establishment of a waste bank integrated with education on the 4R principles (Recycling, Reduce, Reuse, Replant) provides basic knowledge for residents to manage waste from its source, namely household waste [26].

D. HEALTHY HOUSING IN THE PREVENTION OF DISEASE TRANSMISSION

Community Service Activities Lecturers of the Environmental Health Department who strive to carry out counseling activities related to Healthy Settlement material in the community in Sawahan Village, Watulimo District, Trenggalek Regency. Counseling activities are carried out to convey material about healthy settlements. The target in counseling activities is community members in Sawahan Village, Watulimo District, Trenggalek Regency as many as 50 people. Healthy settlement counseling activities in the community to 50 participants. Community counseling activities are very enthusiastic as evidenced by being active in discussions related to the material presented in the form of healthy settlements in Sawahan Village, Watulimo District, Trenggalek Regency.

Discussion activities take place participants who ask questions get souvenirs in the form of towels to motivate participants to be active in the discussion, the community service team provides souvenirs in the form of towels as many as 6 pieces. Regarding the understanding of counseling participants on healthy settlement material, it can be seen in

the pre-post results, because in Sawahan Village, Watulimo Subdistrict, Trenggalek Regency, there are cages that are very close to the house so that when the cleanliness of the cage is not maintained by cleaning it every day, livestock manure smells up to 300 meters.

D. CLEAN AND HEALTHY LIVING BEHAVIOR THROUGH HANDWASHING WITH SOAP

Community Service Activities Lecturers of the Environmental Health Department who strive to carry out counseling activities related to clean and healthy living behavior material through hand washing with soap in the community in Sawahan Village, Watulimo District, Trenggalek Regency. Counseling activities are carried out to convey material about hand washing with soap. The target in the counseling activity is community members in Sawahan Village, Watulimo District, Trenggalek Regency as many as 50 people.

Hand washing with soap counseling activities in the community were given souvenirs in the form of dish soap, hand washing soap, and 50 pieces of hand sanitizer for 50 counseling participants. During counseling activities, the community was very enthusiastic as evidenced by being active in discussions related to the material presented in the form of washing hands before and after doing activities outside the home. There was a significant increase in community knowledge regarding Clean and Healthy Behavior in handwashing with soap activities, with 9 individuals (18%) initially understanding that handwashing with soap activities should use clean water, which increased to 45 individuals (90%). The highest improvement in community behavior related to Clean and Healthy Behavior in handwashing with soap activities was observed in 18 individuals (36%) having handwashing facilities that are free from pollutants, increasing to 50 individuals (100%).his is evidenced by when asking questions and answering pre-post questionnaires there was an increase in knowledge and behavior in the post test results. Knowledge, both attitudes and behavior of the community in conducting household waste management is important for waste management [27]. Sorting household waste related to organic waste can be processed as compost and inorganic waste is deposited in the waste bank for recycling [28].

V. CONCLUSION

The aim of this community service is to enhance the knowledge and behavior of the community for a clean and healthy lifestyle. The conclusion based on the results of this Community Service activity is as follows: In the 2022 community service, only the microbiological parameters did not meet the requirements, specifically the total coliform parameter at the source, which exceeded 65 CFU/100 ml, and the E. coli parameter at the source, which was 3 CFU/100 ml. Therefore, in the 2023 community service, the introduction and guidance in operating an Appropriate Technology (AT), specifically the chlorine diffuser, by teaching the application of calcium hypochlorite using a chlorine diffuser were implemented.

There was an increase in knowledge regarding waste separation (79.16%) and behavior in waste separation using containers (92.10%) related to waste management through the waste bank. Community knowledge about infectious diseases due to unhealthy settlements also increased (82.6%). Furthermore, there was a substantial improvement (69.76%) in community behavior regarding waste management for a healthy settlement. Additionally, there was an increase in community knowledge about Clean and Healthy Behavior (PHBS), specifically the use of clean water in Community-Based Total Sanitation (CTPS) by 80%, and an increase in community behavior by building handwashing facilities by 64%. Through this guidance, it is expected that there will be an increase in knowledge and behavior. Additionally, the guidance for this tourist village is hoped to transform Sawahan village into a sustainable and healthy tourist destination.

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