

Socialization and Production of Natural Hand Sanitizer from Lemongrass Stems (*Cymbopogon citratus*) to Promote Hand Hygiene Awareness in Konda Satu Village

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ABSTRACT

Hand hygiene is an essential aspect of preventing the spread of infectious diseases, particularly in rural areas where access to sanitation facilities remains limited. This community service activity aimed to enhance the awareness and practical skills of residents of Konda Satu Village in maintaining hand hygiene through educational outreach and training on the production of natural hand sanitizer using lemongrass (*Cymbopogon citratus*) stalks. Lemongrass was selected because it contains essential oils with active compounds such as citronellal, citronellol, and geraniol, which possess antibacterial properties. The activity employed several methods, including educational sessions, hands-on demonstrations of natural hand sanitizer production, and an assessment of community knowledge using pre- and post-activity questionnaires. The results demonstrated a significant improvement in participants' knowledge, attitudes, and interest in using natural hand sanitizers, with the level of understanding increasing from 52% to 88%. The activity not only successfully increased community awareness of the importance of hand hygiene but also empowered residents to utilize locally available resources in a sustainable manner.

Keyword : Lemongrass; *Cymbopogon citratus*; Hand Sanitizer; Hand Hygiene; Konda Satu.

INTRODUCTION

Health is a fundamental aspect of human well-being and plays a crucial role in maintaining quality of life. One of the key measures for maintaining health is the adoption of clean and healthy living behaviors, including proper hand hygiene (Manus et al., 2016). Hands serve as a primary medium for the transmission of various pathogenic microorganisms, such as bacteria and viruses, which can cause infectious diseases, including diarrhea and respiratory tract infections (Risnawaty, 2016). Proper handwashing with soap and running water has been shown to reduce the risk of disease transmission by up to 31% (Kristy et al., 2021). However, in several areas, particularly rural communities such as Konda Satu Village, public awareness of the importance of hand hygiene remains relatively low, while access to alcohol-based hand hygiene products is also limited.

Hand sanitizer is a practical alternative for hand hygiene when soap and running water are unavailable (Dewi et al., 2023). These products typically contain antiseptic active ingredients, such as alcohol, which can inhibit the growth of pathogenic microorganisms. Although effective, the use of high concentrations of alcohol may cause dry and irritated skin, particularly with repeated use (Walidah et al., 2014). Therefore, there is a need to develop innovative hand sanitizer formulations derived from natural ingredients that retain antibacterial efficacy while being gentler and safer for the skin.

One plant with considerable potential as a source of natural active compounds is lemongrass (*Cymbopogon citratus*). This plant contains essential oils whose major components, including citronellal, citronellol, and geraniol, have been demonstrated to possess antibacterial activity (Sefriyanti et al., 2020). The antibacterial properties of lemongrass have been reported to inhibit the growth of several pathogenic bacteria, including *Pseudomonas*, *Salmonella typhium*, and *Escherichia coli* (Wulandari et al., 2024). The antibacterial mechanism of lemongrass essential oil involves disruption of the bacterial cell wall and cytoplasmic membrane, thereby interfering with cellular metabolism and ultimately leading to bacterial cell death (Rumlus et al., 2022).

Furthermore, Konda Satu Village has considerable natural potential in the form of lemongrass (*Cymbopogon citratus*), which grows abundantly around residents' home gardens but remains largely underutilized. This condition presents an opportunity to develop locally sourced products that not only support health and hygiene but also generate economic value for the community. Through socialization activities and hands-on training in the production of natural hand sanitizer derived from lemongrass stems (*Cymbopogon citratus*), community members can acquire practical knowledge and skills to produce simple, safe, and effective hygiene products using locally available resources.

In response to these challenges, educational interventions are needed to raise public awareness of the importance of hand hygiene while providing practical solutions through the utilization of locally available natural resources. Community-based education and the production of natural hand sanitizer from lemongrass stalks represent a potential alternative, as they integrate health education with community empowerment. This approach not only promotes greater awareness of proper hand hygiene practices but also encourages the utilization of local natural resources as accessible and potentially sustainable materials for maintaining personal hygiene.

IMPLEMENTATION METHOD

The community service activity was conducted on Sunday, September 28, 2025, at the Konda Satu Village Hall, Konda District, South Konawe Regency, Indonesia. The activity focused on the theme "Socialization and Production of

Natural Hand Sanitizer from Lemongrass Stems (*Cymbopogon citratus*) as an Effort to Increase Hand Hygiene Awareness and Community Empowerment.” The activity began with a presentation on the importance of maintaining hand hygiene, the potential risks associated with excessive use of chemical-based hand sanitizers, and the potential of lemongrass stems as a natural antiseptic ingredient.

The activity continued with a hands-on demonstration of how to prepare natural hand sanitizer, actively engaging community members throughout the process, from preparing the ingredients and mixing them to packaging the final product. Participants were also provided with instructional leaflets to enable them to replicate the preparation process independently at home. The activity concluded with the distribution of the hand sanitizer produced during the training to the residents of Konda Satu Village as a practical application of the knowledge and skills acquired during the program. Through this activity, community members gained not only knowledge but also practical skills in maintaining hand hygiene and utilizing locally available natural resources to produce simple, accessible, and health-related products.

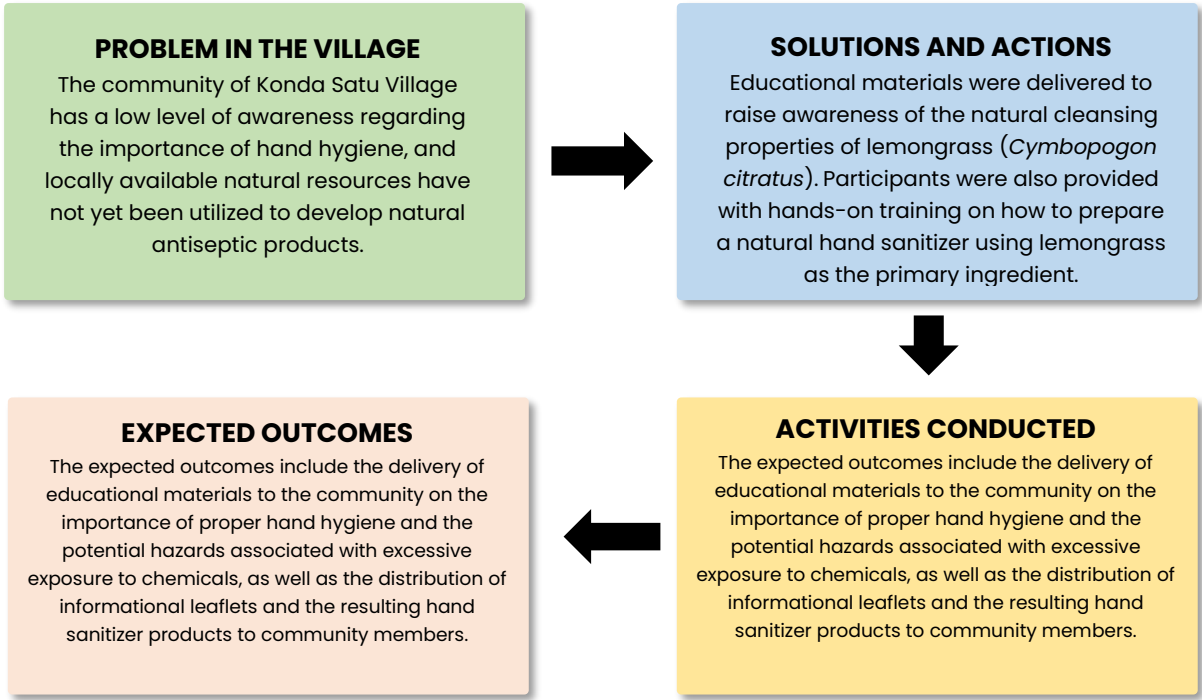


Figure 1. Flowchart of Community Service Activities in Konda Satu Village

RESULTS AND DISCUSSION

The community service activity entitled “Socialization and Production of Natural Hand Sanitizer from Lemongrass Stems (*Cymbopogon citratus*)” was conducted on Sunday, September 28, 2025, at the Konda Satu Village Hall, Konda District, South Konawe Regency, Indonesia. The activity aimed to provide information, raise community awareness of the importance of hand hygiene, and provide hands-on training in producing natural hand sanitizer using locally available and easily accessible materials.

The community service activity was attended by 50 community members, comprising village officials, housewives, adolescents, and health cadres. The activity was officially opened with remarks from representatives of the village government and the community service team leader. This was followed by a pre-test questionnaire to assess the participants' level of knowledge prior to the socialization session. Subsequently, the main facilitator delivered a presentation on the importance of hand hygiene in preventing infectious diseases, as well as the potential risks associated with excessive use of chemical-based hand sanitizers. The facilitator also explained the potential of lemongrass (*Cymbopogon citratus*), which contains essential oils with active compounds such as citronellal, citronellol, and geraniol that possess natural antibacterial properties.

Throughout the activity, the community members were provided with leaflets containing a summary of the socialization materials and step-by-step instructions for preparing natural hand sanitizer, enabling them to review and practice the procedure independently at home. Following the presentation of the materials, the activity continued with a hands-on demonstration of natural hand sanitizer preparation. Community members were actively involved in each stage of the process, including the preparation of ingredients, mixing, and packaging of the final product, under the guidance of the community service team. The participants demonstrated a high level of enthusiasm and engagement, actively asking questions and carefully following each step of the preparation process. This active participation indicated a strong interest among the community in acquiring practical knowledge and skills related to the production and use of natural hand sanitizer.

At the final stage of the activity, community members were given the opportunity to try the natural hand sanitizer product that they had collectively produced. Each participant also received a package containing a bottle of hand sanitizer prepared during the training session. The activity concluded with a group photograph involving community members, village officials, students, field supervisors, and the community service team. The entire activity was conducted in an enthusiastic and collaborative atmosphere, reflecting a strong sense of community engagement and togetherness.



Figure 2. Implementation of Community Service Activities

To assess the effectiveness of the activity, an evaluation was conducted by administering questionnaires before and after the socialization session. The questionnaire consisted of questions assessing the community’s knowledge, attitudes, and interest in hand hygiene and the preparation of natural hand sanitizer. The results are presented in Tables 1 and 2 below.

Table 1. Respondents’ Responses Before the Socialization of Natural Hand Sanitizer Production

No	Question	Frequency (Participants)	Percentage (%)	Category
1	Have you ever heard of natural hand sanitizer?	15	30 %	Low
2	Are you aware of the importance of maintaining hand hygiene to prevent disease?	22	44 %	Moderate
3	Are you aware of natural ingredients that can be used as antiseptics?	12	24 %	Low
4	Are you aware that lemongrass stalks contain antibacterial compounds?	8	16 %	Very Low
5	Have you ever made or used natural hand sanitizer before?	6	12 %	Very Low

Table 2. Respondents’ Responses After Training on Natural Hand Sanitizer Production

No	Question	Frequency (Participants)	Percentage (%)	Category
1	Have you ever heard of natural hand sanitizer?	50	100 %	Very Good
2	Are you aware of the importance of maintaining hand hygiene to prevent disease?	48	96 %	Good
3	Are you aware of natural ingredients that can be used as antiseptics?	46	92 %	Good
4	Are you aware that lemongrass stalks contain antibacterial compounds?	45	90 %	Good
5	Have you ever made or used natural hand sanitizer before?	43	86 %	Good

Based on the activities conducted and the data presented, the socialization program and production of natural hand sanitizer using lemongrass (*Cymbopogon citratus*) stems in Konda Satu Village successfully improved the community’s knowledge, attitudes, and practical skills. These changes indicate that the program effectively achieved its primary objectives, namely, increasing community awareness of the importance of hand hygiene and promoting the utilization of natural materials as an alternative source of antiseptic agents. The findings further demonstrate that community-based education combined with hands-on training can contribute to strengthening health awareness and practical capacity in adopting simple, locally available, and environmentally friendly hygiene practices.

Before the activity was conducted, most community members had limited understanding of the functions and benefits of natural hand sanitizers. The results of the pre-socialization questionnaire indicated that only 30% of respondents had previously heard of natural hand sanitizers, while 16% were aware that lemongrass stems contain antibacterial compounds. Moreover, only 12% of respondents had ever prepared or used such natural products. These findings indicate a gap in knowledge and hygiene practices among rural communities, particularly regarding the utilization of locally available natural resources for health purposes.

Following the socialization and educational session, a substantial improvement in participants’ knowledge was observed. All participants (100%) demonstrated an understanding of the definition and function of natural hand sanitizers, while 90% were aware that lemongrass stems contain active compounds, such as citronellal, citronellol, and geraniol, which can inhibit the growth of bacteria that cause infectious diseases. Furthermore, 86% of the participants expressed an interest in producing similar products independently at home.

The socialization activities, accompanied by a live demonstration on the preparation of natural hand sanitizer from lemongrass (*Cymbopogon citratus*)

stalks and hands-on opportunities for community members to use the resulting product, proved effective in changing perceptions, increasing interest, and enhancing community understanding of the importance of hand hygiene and the use of natural ingredients. These changes were clearly reflected in several key aspects, as follows:

- a) Interest in Use: Before the socialization activity, most community members showed limited interest in using hand sanitizer, particularly those made from natural ingredients, as they were perceived as less effective and difficult to prepare. Following the activity, community interest increased significantly, with nearly all participants (100%) expressing their willingness to use and prepare natural hand sanitizer independently at home.
- b) Perceived Safety: Prior to the activity, many community members believed that only commercially available alcohol-based hand sanitizers were effective in killing germs. However, after receiving information about the active compounds in lemongrass essential oil and their natural antibacterial properties, participants' perceptions of the safety and effectiveness of natural ingredients improved considerably. Participants perceived lemongrass-based hand sanitizer as safer for the skin because it did not cause excessive dryness or irritation.
- c) Product Acceptance: During the activity, participants were given the opportunity to directly test the hand sanitizer produced through the activity. The results showed that 100% of participants responded positively to the product, particularly appreciating the fresh natural aroma of lemongrass and the lightweight, non-sticky texture of the formulation.

This change demonstrates that hands-on experience and practical demonstrations are key to successfully transforming community perceptions. The activity not only enhanced participants' knowledge and awareness but also fostered their confidence and self-reliance in developing innovations using locally available materials.

CONCLUSION

The socialization and training program on the production of natural hand sanitizer from lemongrass (*Cymbopogon citratus*) in Konda Satu Village, Konda District, South Konawe Regency, successfully improved the knowledge and skills of 50 community members regarding hand hygiene as an effort to prevent infectious diseases. Based on the questionnaire results, participants' knowledge increased from 52% before the socialization to 88% after the training, demonstrating the effectiveness of the program in raising awareness of clean and healthy living behaviors. Through the distribution of leaflets, interactive discussions, and hands-on demonstrations, community members gained a better understanding of how to produce natural hand sanitizer that is safe, affordable, and easy to prepare at

home. Furthermore, the program contributed to community empowerment by utilizing locally available resources, particularly lemongrass as a natural antibacterial ingredient. This initiative has the potential to strengthen community self-reliance in maintaining personal hygiene and support sustainable community health resilience through the optimal utilization of local resources.

The socialization and production of natural hand sanitizer from lemongrass stalks are expected to be carried out sustainably by involving a broader segment of the community. Continued assistance is also necessary to ensure that the knowledge and skills acquired by the community can be consistently applied in their daily lives. Furthermore, further development of the natural hand sanitizer product derived from lemongrass stalks can be pursued through testing its antibacterial efficacy, safety, and stability to produce a more effective and optimal formulation that can be utilized more widely.

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