

Evaluation of the Triggering Activity of Community-Led Total Sanitation to Eradicate Open Defecation in Nagari Tiku Utara, Agam Regency

Dewi Yusnisa Putri

Environmental Engineering Department, Universitas Andalas, Padang, Indonesia

*Koresponden email: dewiyusnisa@eng.unand.ac.id

Received: May 21, 2025

Approved: July 2, 2025

Abstract

Open defecation (OD) is a form of poor sanitation. OD can affect environmental health and public health. Community-led Total Sanitation (CLTS) is an approach that can be used to change community behavior by fostering a sense of disgust and shame towards OD practices so that the community can stop OD practices. This study is a form of CLTS triggering activity to eradicate OD in Nagari Tiku Utara. Evaluation of CLTS triggering activities was carried out to obtain community feedback after receiving triggering activities. This study was divided into several stages in the form of literature studies, procurement of triggering activity related to the eradication of OD practices, implementation of evaluation of triggering activity for the eradication of OD practices that have been carried out, and data analysis. Evaluation of the triggering activity was carried out using interviews and filling out questionnaires. The number of respondent samples taken was as many as the number of residents who attended the triggering activity related to the practice of eradicating OD in Nagari Tiku Utara, namely a sample of 30 respondents. The results of this study showed that the four components assessed after the triggering activities, namely community knowledge, community behavior, safe latrines components, and latrines observations, actually achieved achievements ranging from very good to sufficient.

Keywords: *CLTS, community, open defecation, sanitation, triggering*

Abstrak

Buang Air Besar Sembarangan (BABS) merupakan salah satu bentuk sanitasi yang buruk. BABS dapat mempengaruhi kesehatan lingkungan dan kesehatan masyarakat. Community-led Total Sanitation (CLTS) merupakan suatu pendekatan yang dapat digunakan untuk mengubah perilaku masyarakat dengan menumbuhkan rasa jijik dan malu terhadap praktik BABS sehingga masyarakat dapat menghentikan praktik BABS. Penelitian ini berupa kegiatan pemicuan CLTS untuk memberantas BABS di Nagari Tiku Utara. Evaluasi kegiatan pemicuan CLTS dilakukan untuk memperoleh umpan balik masyarakat setelah menerima kegiatan pemicuan. Penelitian ini dibagi menjadi beberapa tahap berupa studi pustaka, pengadaan kegiatan pemicuan terkait pemberantasan praktik BABS, pelaksanaan evaluasi kegiatan pemicuan pemberantasan praktik BABS yang telah dilakukan, dan analisis data. Evaluasi kegiatan pemicuan dilakukan dengan menggunakan wawancara dan pengisian kuesioner. Jumlah sampel responden yang diambil sebanyak jumlah warga yang hadir pada kegiatan pemicuan terkait praktik pemberantasan BABS di Nagari Tiku Utara yaitu sampel sebanyak 30 responden. Hasil penelitian ini menunjukkan bahwa keempat komponen yang dinilai setelah kegiatan pemicuan, yaitu pengetahuan masyarakat, perilaku masyarakat, komponen jamban aman, dan pengamatan jamban, memperoleh capaian yang berkisar antara sangat baik sampai dengan cukup.

Kata Kunci: *CLTS, masyarakat, BABS, sanitasi, pemicuan*

1. Introduction

Sanitation is fundamental in efforts to fulfill human life in order to achieve optimum health levels [1]. Handling and management of sanitation are becoming increasingly complex with the increasing population but are not followed by the development of community behavior to participate in managing sanitation [2]. Poor sanitation can cause various diseases. One of the diseases that can be caused by poor sanitation is diarrhea which is closely related to the practice of open defecation (OD) [3].

Prevalent OD is known to have adverse impacts on human health. It contributes to both acute health conditions due to infectious excreta-related diseases and chronic health effects such as anaemia or child stunting [4]. Open defecation also has socio-ecological impacts, as it endangers public resources such as

soil, groundwater, and, waterways [5]. To eradicate OD, several approaches have been developed [6]. The government has carried out many activities to improve the provision of sanitation access, especially in encouraging public awareness to change the behavior of OD to defecating in hygienic and proper latrines. The latrine procurement program has been widely implemented in several regions but has not been fully implemented [3]. This is basically also influenced by the willingness of the community to change their behavior and perspectives on the implementation of OD. Therefore, Community Led Total Sanitation (CLTS) is present as a participatory method that can help improve community access to sanitation. CLTS is an integrated sanitation promotion approach to achieve and maintain Open Defecation Free (ODF) [7] [8].

The specificity of CLTS is that it is managed by the community itself, as its name implies, and that no subsidies or financial contributions from outside the community are used in the construction of the facilities [6]. CLTS requires facilitating community observation, assessment, and analysis of their sanitation profile, defecation practices, and their consequences, leading to collective action to become ODF [7]. The approach taken in CLTS is by creating a sense of disgust and shame in the community towards the practice of OD. This approach aims to raise awareness of the very unclean and uncomfortable conditions caused by the practice of OD. This approach also raises awareness that the habit of defecating in any place is a common problem because it can affect all communities, so the solution must also be carried out and solved together [3].

Nagari Tiku Utara is one of the villages in Tanjung Mutiara District, Agam Regency, West Sumatra, Indonesia. This village has an area of 39.52 km² with a low population density that is developing. The practice of OD is still carried out by several community members. Safe latrines also have not reached 100%. A triggering activity was carried out with the CLTS concept related to the eradication of OD in the Nagari Tiku Utara. Triggering activities are a step from CLTS in order to create a sense of disgust and shame for the community so as to prevent them from carrying out OD in the future [7] [8]. Post-triggering will then be observed by carrying out an evaluation after the triggering activity. This was carried out to determine the level of community understanding and the changes that have been made after participating in the triggering activity.

2. Material and Methods

This study was divided into several stages in the form of literature studies, procurement of triggering activity related to the eradication of OD practices, and implementation of evaluation of triggering activity for the eradication of OD practices that have been carried out. Furthermore, data analysis and discussion of the evaluation results were carried out to determine the effect of the CLTS triggering activities on the community.

Literatur Study

The purpose of the literature study is to obtain information and theories related to the activities carried out so that the activities carried out have objectives related to the results of research from other people and the data obtained later can be more accurate. The literature study in this report examines the definition, objectives, working principles, and implementation of CLTS, as well as the definition, impact, and prevention of OD practices.

Triggering Activities with the CLTS

The triggering activities carried out were in the form of socialization and present of materials related to OD practices. The presentation delivered were the definition of OD, the impacts and reasons why OD should not be carried out, and the steps that must be taken if OD practices are still exist. This activity aims to foster a sense of hatred and shame towards the community for OD practices. Socialization was carried out by explaining directly to the community verbally and providing an overview of OD and ODF through visual materials (in the form of displayed images). This activity was carried out with the target being mothers of the residents of Nagari Tiku Utara. This was chosen as the most effective step because women are considered to have a fairly large role in improving good sanitation in the household.

Evaluation of Triggering Activities with the CLTS

The evaluation activity is carried out after the socialization of procurement related to the eradication of the practice of OD in Nagari Tiku Utara. The evaluation is carried out using an instrument in the form of a questionnaire. The selected respondents were citizens who had participated in the triggering activities

regarding the eradication of the practice of OD in Nagari Tiku Utara. The evaluation activities were carried out through interviews using questionnaires and observations to obtain information about the condition or behavior of the community towards the practice of OD after the triggering was carried out.

The number of respondent samples taken was as many as the number of people who attended the triggering activity regarding the practice of eradicating OD in Nagari Tiku Utara. The number of samples was 30 respondents. Questionnaire sampling was carried out directly by direct interviews to residents' houses and filling out questionnaires.

Data Analysis

The questionnaire analysis was carried out after evaluation of triggering activities. The results of the answers given by respondents will be totaled and grouped into categories of very good, good, and less. Data analysis was undertaken by scoring the respondents' answers and comparing the total score with the total number of questions. Furthermore, the data was interpreted in the form of a percentage [9]. The percentage of achievement conclusions can be seen in **Table 1**.

Table 1. Percentage of Achievement

Percentage (%)	Description
81 – 100	Very Good
61 – 80	Good
41 - 60	Sufficient
21 – 40	Less
0 – 20	Very Less

Source: Arikunto, 2006

3. Results and Discussion

General Description of Nagari Tiku Utara

Nagari Tiku Utara is one of the villages located in Tanjung Mutiara District, Agam Regency, Padang, Indonesia, with an area of 39.52 km². It has a population of 6,219 people consisting of 3,146 men and 3,073 women. This village has a low population density with a developing economy. The main sources of economic growth in Nagari Tiku Utara are the service, agriculture, and trade sectors [10]. Nagari Tiku Utara consists of 3 jorongs (hamlets), namely Jorong Bukit Malintang, Jorong Cacang Tinggi, and Jorong Cacang Randah. The communities that participated in the CLTS triggering activities were diverse and covered the three jorongs.

Triggering Activity for the Eradication of Open Defecation Practices

The triggering activity with the CLTS related to the eradication of the practice of OD was carried out in one day in the form of presenting material related to the practice of OD. This activity was held in order to realize or give rise to a sense of disgust, shame, and fear in the community towards the practice of OD. The community who attended this activity were housewives from Nagari Tiku Utara. This activity was welcomed enthusiastically by the mothers. They were able to understand the explanation regarding the practice of OD, the impacts, and the reasons why OD should not be done properly. Figure 1 shows the triggering activity related to the eradication of the practice of OD.

Evaluation of Triggering Activities for the Eradication of Open Defecation Practices

The evaluation was conducted after the triggering activity regarding the practice of OD was conducted. The evaluation aims to obtain a picture of the condition of the community after receiving the triggering activity in terms of behavior in eradicating OD. The results of this evaluation can also be the latest information on the current sanitation conditions in Nagari Tiku Utara. The evaluation was conducted using interview and observation methods using a questionnaire. The respondents of this evaluation activity were the community (housewives) who participated in the previous triggering activity.

Community Characteristics

The characteristics of the community, which in this case of triggering activities are represented by housewives, are seen through three main points, namely education level, occupation, and income. The percentage of community education who were respondents in the evaluation of triggering activities in Nagari Tiku Utara can be seen in **Figure 1**.

Based on the figure, it can be seen that community latest education varies with the highest education being junior high school or equivalent at 47.83%. Then the second highest percentage is elementary school with a percentage of 34.78%. Furthermore, followed by associate degree (D3) graduates at 26.09%, and did not graduate from elementary school at 21.74%. It is known that none of the community respondents have a bachelor's degree (S1) and master's degree (S2).

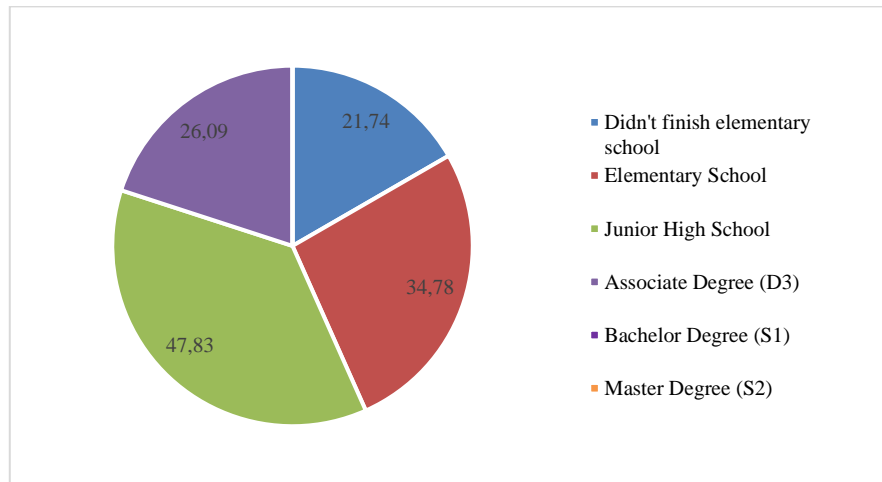


Figure 1. The Education Level of Respondents

The percentage of occupations of the community who were respondents in the evaluation of triggering activities in Nagari Tiku Utara can be seen in **Figure 2**. Based on the figure, it can be seen that there are three most common occupations of the community, namely 60% housewives, 20% entrepreneurs, and 20% farmers.

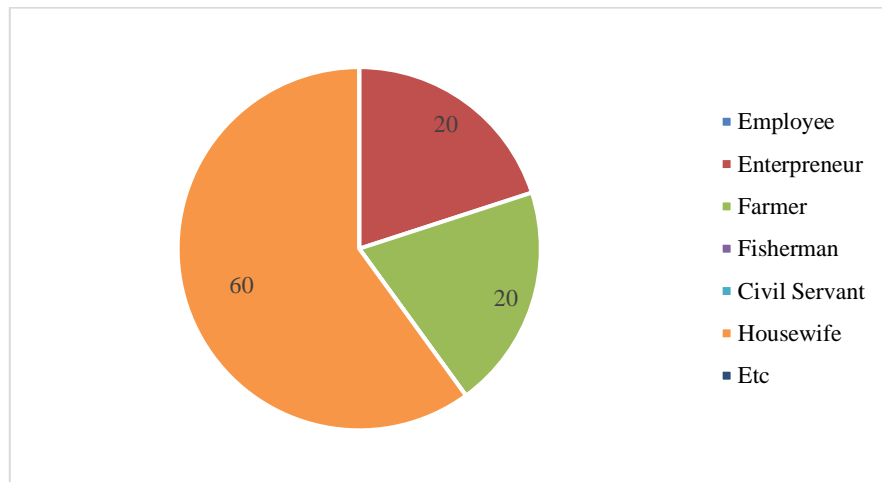


Figure 2. The Occupation of Respondents

The percentage of monthly income of the community who were respondents in the evaluation of triggering activities in Nagari Tiku Utara can be seen in **Figure 3**. Based on the figure, it can be seen that the community's income is mostly in the range of 1,000,000-3,000,000 per month, as much as 66.67%. Furthermore, there are 26.67% of people who have an income of <1,000,000 per month and 6.67% of people who have an income of >3,000,000 per month.

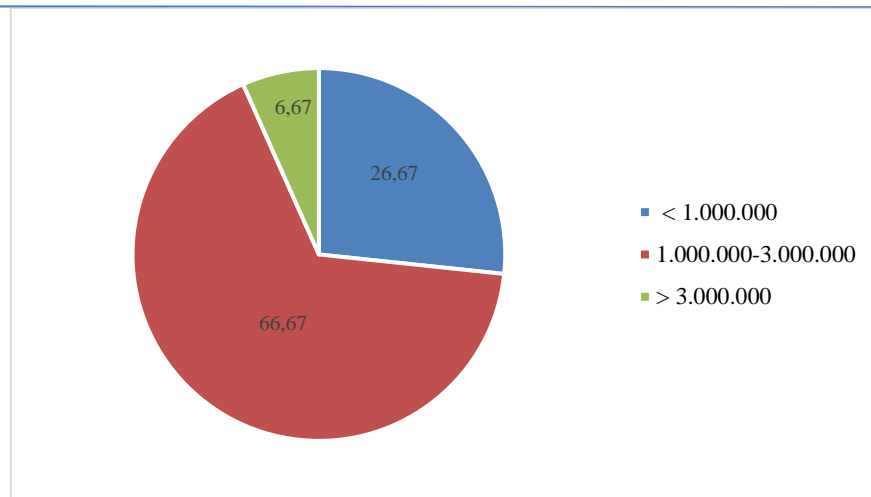


Figure 3. The Income of Respondents

Community Knowledge

Based on the interview results, the respondents gave different answers. As many as 66.67% respondents showed very good achievement results in terms of having knowledge related to the practice of OD and 33.33% respondents were categorized as having good knowledge of the practice of OD. The results of the respondents' knowledge answers after the triggering activity regarding the eradication of the practice of OD in Nagari Tiku Utara can be seen in **Table 2**.

Table 2. The Questionnaire Results of Community Knowledge

Respondents (%)	Results (%)	Range (%)	Achievement
66.67	100.00	81 – 100	Very Good
33.33	80.00	61 – 80	Good

Community Behavior

Based on the interview results, the answers from the respondents varied. There are 3 achievement results obtained. Very good achievement is shown by 40% of respondents at a percentage of 100%, 36.67% at a percentage of 91.67%, and 3.33% at a percentage of 83.33%. Then, as many as 6.67% of respondents gave good achievement results at a percentage of 75% and 3.33% of respondents gave good achievement results at a percentage of 66.67%. Furthermore, 10% of respondents gave sufficient achievement results with a percentage of 58.33%. The results of the respondents' behavioral answers after the triggering activity regarding the eradication of the practice of OD in Nagari Tiku Utara can be seen in **Table 3**.

Table 3. The Questionnaire Results of Community Behavior

Respondents (%)	Results (%)	Range (%)	Achievement
40.00	100	81 – 100	Very Good
36.67	91.67	81 – 100	Very Good
3.33	83.33	81 – 100	Very Good
6.67	75	61 – 80	Good
3.33	66.67	61 – 80	Good
10.00	58.33	41 - 60	Sufficient

Safe Latrines Components

Based on the interview results, respondents gave varying answers. As many as 26.67% respondents gave very good achievement results at 100% and 33.33% respondents gave very good achievement results at 83.33%. Then 30% respondents showed good achievement results at 66.67% and as many as 10% respondents showed sufficient achievement results at 50%. The results of the answers to the toilet components owned by the community after the triggering activity regarding the eradication of the OD practice in Nagari Tiku Utara can be seen in **Table 4**.

Table 4. The Questionnaire Results of Safe Latrines

Respondents (%)	Results (%)	Range (%)	Achievement
26.67	100	81 – 100	Very Good
33.33	83.33	81 – 100	Very Good
30.00	66.67	61 – 80	Good
10.00	50	41 - 60	Sufficient

Latrines Observation

Based on the interview results, respondents gave different answers. The result showed that as many as of 10% respondents had very good achievement results with a percentage of 100% and 40% respondents gave very good achievement results with a percentage of 85.71%. Then 50% respondents showed good achievement results with a percentage of 71.43%. The results of observations of community latrines after the triggering activity regarding the eradication of the OD practice in Nagari Tiku Utara can be seen in **Table 5**.

Table 5. The Questionnaire Results of Latrines Observation

Respondents (%)	Results (%)	Range (%)	Achievement
10.00	100	81 – 100	Very Good
40.00	85.71	81 – 100	Very Good
50.00	71.43	61 – 80	Good

Recapitulation of Triggering Activity Evaluation Results for the Eradication of Open Defecation Practices in Nagari Tiku Utara

Based on the triggering activities regarding the eradication of OD practice and the evaluation that has been carried out, the recapitulation results are obtained as in **Table 6**. It can be seen that the achievement of sanitation conditions in Nagari Tiku Utara is in the very good to sufficient range with the most achievements in the very good category. It shows that the triggering activities related to the eradication of OD practices can run well and produce good sanitation conditions. Achievement in the very good category is in the range of 50-80%. The assessment components of community knowledge and latrines observation provide very good and good achievement results while the assessment components of community behavior and safe latrines provide very good, good, and sufficient achievement assessment results.

Table 6. The Recapitulation Results of The Questionnaire

Criteria	Achievements (%)				
	Very Good	Good	Sufficient	Less	Very Less
Community Knowledge	66,67	33,33	-	-	-
Community Behavior	80	10	10	-	-
Safe Latrines	60	30	10	-	-
Latrines Observations	50	50	-	-	-

Sanitation is a public health effort that focuses on monitoring various environmental factors that affect human health [1]. Sanitation prioritizes prevention efforts so that disease occurrence can be avoided. Public health efforts can include interventions on environmental factors, behavioral factors, and health service factors. Interventions on behavioral factors mean efforts to make people aware of and know how to maintain health, avoid or prevent causes of declining health, and seek treatment [11] [12].

Behavior change efforts through CLTS are something that needs to be considered. This study shows that there is public enthusiasm for eradicating OD which is often misunderstood. The community to be triggered to create a feeling of hatred towards OD in order to stop OD practices. The CLTS triggering study in Nagari Sialang, Kabupaten 50 Kota showed that after the triggering activity, the community already had the desire to have healthy family toilet facilities and realized the importance of sanitation for the health of their families and their living environment [13]. In addition, empirical studies show that exposure to other people who share the same sensitivity to environmental issues has a positive impact in sharpening individuals' environmental identity [14]. It indicates that aligning the perceptions of each individual in society through CLTS trigger activities can stop OD practices.

CLTS is one of the most widely implemented behavioral interventions, representing a paradigm shift from previous top-down, subsidy-based approaches. CLTS relies on changing community behavior and community self-enforcement to end open defecation and encourage the construction of latrines rather than

directly providing hardware or prescribing a particular design that may not make sense locally in a community [15] [16]. A study in Ethiopia showed that households targeted by CLTS were 1.78 times more likely to have a toilet than households not part of the CLTS program [17]. In addition, toilet coverage and utilization were higher among households implementing CLTS [18].

The level of community knowledge also underlies the achievement of ODF. Knowledge, and supportive supervision were found to be significant predictors of household access to better sanitation conditions [19]. Households that have good knowledge about improved latrines tend to have improved latrines. Households that have positive attitudes towards improved toilets tend to have access to improved toilets [19] [20].

Prioritizing community-led approaches and strengthening community communication efforts can increase the impact of sanitation programs, ensuring that they are well received and actively supported by the community [21]. This can drive the success of sanitation programs. Another study showed that CLTS was most effective in communities with stronger social identification, because individuals are expected to follow social norms [22]. Therefore, CLTS can be a good approach in changing community behavior and can further be considered as a tool to achieve healthy community sanitation conditions.

To ensure that the gains achieved through CLTS implementation can be sustained for longer, community leaders and figures are expected to be involved in the CLTS program to ensure that there is inspection and enforcement. Establishment of local regulations and more educational activities will sustain the program. In addition, subsidies in the form of sanitation loans for latrine construction materials by the government and supporting non-governmental organizations (NGOs) will be the most important thing in maintaining ODF [23] [24].

4. Conclusion

Triggering activities are a step from CLTS in order to create a sense of disgust and shame for the community so as to prevent them from practicing OD. This study showed that after the triggering activities, the achievement of sanitation conditions in Nagari Tiku Utara is in the very good to sufficient range with the most achievements in the very good category. The categories assessed were community knowledge, community behavior, safe latrines, and latrines observation. It also indicated that the triggering activities related to the eradicating OD practices can run well and improve better sanitation conditions. Furthermore, the participation of other stakeholders including leaders and community figures is needed to maintain the effectiveness of CLTS in eradicating OD.

5. Acknowledgment

The authors would like to thank the community and the research respondents in Nagari Tiku Utara who have been willing to participate without any coercion from any party

6. Abbreviations

<i>CLTS</i>	Community-Led Total Sanitation
<i>OD</i>	Open Defecation
<i>ODF</i>	Open Defecation Free

7. References

- [1] A. Sumantri, *Kesehatan Lingkungan.*, Keempat. Depok: Kencana, 2023.
- [2] D. Ermayendri, "Pengaruh CLTS (pemicuan) untuk meningkatkan akses jamban (pilar pertama STBM di Kabupaten Bengkulu Selatan," *J. Nurs. Public Heal.*, vol. 5, no. 2, pp. 14–18, 2017.
- [3] N. N. S. N. Sudhiastiningsih, T. Agustina, and C. R. Priadi, "Analysis of water, sanitation, and hygiene (WASH) implementation based on GEDSI and climate resilience in Kupang City," *E3S Web Conf.*, vol. 485, 2024, doi: 10.1051/e3sconf/202448504001.
- [4] J. Novotný, J. Hasman, M. Lepič, and V. Bořil, "PROTOCOL: Community-led total sanitation in rural areas of low- and middle-income countries: a systematic review of evidence on effects and influencing factors," *Campbell Syst. Rev.*, vol. 14, no. 1, pp. 1–27, 2018, doi: 10.1002/cl2.188.
- [5] N. E. Soboksa, S. R. Gari, A. B. Hailu, and B. M. Alemu, "Child defecation, feces disposal practices and associated factors in community-led total sanitation adopted districts in Jimma Zone, Ethiopia," *Environ. Challenges*, vol. 3, no. January, p. 100059, 2021, doi: 10.1016/j.envc.2021.100059.
- [6] H. A. A. Kouassi *et al.*, "Review of the slippage factors from open defecation-free (ODF) status towards open defecation (OD) after the Community-Led Total Sanitation (CLTS) approach

- implementation,” *Int. J. Hyg. Environ. Health*, vol. 250, no. March, 2023, doi: 10.1016/j.ijheh.2023.114160.
- [7] Ministry of Health Uganda, *Community Led Total Sanitation in Uganda. A handbook on Facts and Processes*, no. October 2012. 2012. [Online]. Available: <https://www.communityledtotalsanitation.org/country/afghanistan>
- [8] K. Kar and R. Chambers, *Handbook on Community-Led Total Sanitation*, vol. 44, no. 0. London: Institute of Development Studies, 2008.
- [9] S. Arikunto, *Prosedur penelitian suatu pendekatan praktik*. Jakarta: Rineka Cipta, 2006.
- [10] BPS Kabupaten Agam, *Kecamatan Tanjung Mutiara Dalam Angka 2024*. Lubuk Basung: BPS Kabupaten Agam, 2024.
- [11] Mundiatur, Daryanto, and A. Suprihatin, “Pengelolaan Kesehatan Lingkungan,” 2015, *Gava Media, Yogyakarta*.
- [12] S. Rejeki, *Sanitasi, Hygiene, dan Kesehatan & Keselamatan Kerja (K3)*. Bandung: Rekayasa Sains, 2015.
- [13] Zulkarnaini and B. V. Wemas, “Pemicuan Community Led Total Sanitation di Jorong Lubukk Koto, Nagari Sialang, Kecamatan Kapur IX, Kabupaten 50 Kota,” *War. Pengabd. Andalas*, vol. 30, no. 3, pp. 480–491, 2023, [Online]. Available: <http://wartaandalas.lppm.unand.ac.id/index.php/jwa/article/view/943>
- [14] C. Leong, “Narratives of sanitation: Motivating toilet use in India,” *Geoforum*, vol. 111, no. October 2019, pp. 24–38, 2020, doi: 10.1016/j.geoforum.2019.10.001.
- [15] V. Zuin, C. Delaire, R. Peletz, A. Cock-Esteb, R. Khush, and J. Albert, “Policy Diffusion in the Rural Sanitation Sector: Lessons from Community-Led Total Sanitation (CLTS),” *World Dev.*, vol. 124, 2019, doi: 10.1016/j.worlddev.2019.104643.
- [16] M. Harter, J. Inauen, and H. J. Mosler, “How does Community-Led Total Sanitation (CLTS) promote latrine construction, and can it be improved? A cluster-randomized controlled trial in Ghana,” *Soc. Sci. Med.*, vol. 245, no. December 2019, 2020, doi: 10.1016/j.socscimed.2019.112705.
- [17] D. A. Zeleke, K. A. Gelaye, and F. A. Mekonnen, “Community-Led Total Sanitation and the rate of latrine ownership,” *BMC Res. Notes*, vol. 12, no. 1, pp. 10–14, 2019, doi: 10.1186/s13104-019-4066-x.
- [18] N. Eshete, A. Beyene, and T. Gudina, “Implementation of Community-led Total Sanitation and Hygiene Approach on the Prevention of Diarrheal Disease in Kersa District, Jimma Zone Ethiopia,” *Sci. J. Public Heal.*, vol. 3, no. 5, p. 669, 2015, doi: 10.11648/j.sjph.20150305.22.
- [19] W. Asrate, A. Admasie, and T. Shibabaw, “Households’ access to an improved latrine and its associated factors among households of sanitation marketing products users and non-users, Northeast Amhara, Ethiopia,” *Heliyon*, vol. 8, no. 11, 2022, doi: 10.1016/j.heliyon.2022.e11325.
- [20] T. K. Soe and K. K. Nyein, “Social Disparities And Accessibility Of Sanitation Marketing Factors Among Rural Community Of Myinmu Township: A Cross Sectional Analytical Study,” no. June 2020, p., 2023.
- [21] E. Siti, I. Masni, J. Sianipar, A. Rahman, and I. W. Koko, “Advancing the 2030 agenda with community importance-performance perspective and public relations strategies for community-based sanitation,” vol. 9, no. April, 2025.
- [22] M. Harter, N. Contzen, and J. Inauen, “The role of social identification for achieving an open-defecation free environment: A cluster-randomized, controlled trial of Community-Led Total Sanitation in Ghana,” *J. Environ. Psychol.*, vol. 66, no. December 2018, 2019, doi: 10.1016/j.jenvp.2019.101360.
- [23] E. Adam and E. Badu, “Community-led total sanitation (CLTS) implementation in West Mamprusi Municipal Assembly in Ghana. What do communities think eleven years on?,” *Glob. Heal. J.*, vol. 8, no. 2, pp. 67–73, 2024, doi: 10.1016/j.glohj.2024.05.003.
- [24] J. Tribbe, V. Zuin, C. Delaire, R. Khush, and R. Peletz, “How do rural communities sustain sanitation gains? Qualitative comparative analyses of community-led approaches in cambodia and ghana,” *Sustain.*, vol. 13, no. 10, 2021, doi: 10.3390/su13105440.