ORIGINAL ARTICLE

Factors Influencing Community-Led Total Sanitation Implementation in Chiefdoms of Chipangali District, Zambia

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ABSTRACT

Introduction: Community-Led Total Sanitation (CLTS) is a participatory approach aimed at improving sanitation and hygiene practices by empowering communities to achieve open defecation-free (ODF) status. Despite being implemented in eight Chiefdoms of Chipangali district, Zambia, none have achieved ODF status five years after the project's initiation. This study assessed the factors influencing CLTS implementation in four chiefdoms: Mshawa, Mkanda, Chanje, and Mnukwa, all of which share similar cultural, demographic, and resource backgrounds.

Materials and methods: Using a mixed-methods, cross-sectional analytical study design, data were collected from 267 households through systematic random sampling, as well as from CLTS facilitators and stakeholders using purposive sampling. Semi-structured questionnaires and interview guides were used for data collection. Qualitative data were analyzed using Nvivo, and quantitative data using descriptive and inferential statistics in *Statistical Package for the Social Sciences* version 29, with significant associations established at $p < 0.05$.

Results: The study found that Chanje Chiefdom had the highest sanitation coverage (65%), though the majority (68.2%) of respondents still used pit latrines without a smooth, cleanable floor. Key factors affecting CLTS implementation included community engagement, leadership support, geographical location, community awareness, and external support. These factors significantly (*p=0.001*) contributed to the varying sanitation coverage across the four chiefdoms. The study found moderate community engagement and participation in the chiefdoms, with an average rating of 2.0899 and a median rating of 2.0000, with a low standard deviation. The study found an

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average rating of 2.4794 for leadership and governance in chiefdoms. Variability and positive skewness suggested a right-skewed distribution.

Conclusion: The study concludes that CLTS implementation is influenced by a combination of geographical, leadership, policy, and external support factors. To improve CLTS implementation, the study recommends proactive community engagement, the use of traditional sanctions by leaders to promote latrine construction, and periodic sensitization by local authorities for CLTS implementers.

INTRODUCTION

Community-Led Total Sanitation (CLTS), is an approach to improve sanitation and hygiene practices in communities. It is a participatory, demand-driven approach that aims to create an open defecation-free (ODF) environment by mobilizing and empowering communities to take collective action. It emphasizes the importance of building and using toilets to protect personal and community health, leading to behaviour change at the individual and community levels[1]. The lack of access to improved sanitation remains a significant challenge in low- and middle-income countries, affecting both urban and rural areas[2]. Sub-Saharan Africa faces significant sanitation disparities, with only 31% of urban and rural populations having access to basic facilities, resulting in over 500 million people without adequate sanitation, and 892 million resorting to open defecation[3]. A study in Ghana identified social norms, behavioural patterns, and self-efficacy action planning as critical factors influencing the implementation of CLTS initiatives across Africa[4]. Additionally, related studies from rural settings in Tanzania, Kenya, Uganda, and Zambia highlight that community engagement, strong local leadership, soil conditions, social stigma, latrine placement, political commitment, and household size also significantly impact CLTS efforts in the community[5,6].

Inadequate sanitation facilities can negatively impact education, gender equality, and economic productivity. Improving access to sanitation is therefore a critical component of efforts to achieve the Sustainable Development Goals (SDGs), particularly SDG 6, which aims to ensure the availability and sustainable management of water and sanitation for all[7]. Addressing the sanitation challenge requires a range of approaches, including behaviour change communication, infrastructure development, and policies and regulations that support sustainable sanitation solutions[8]. CLTS first developed and implemented in Bangladesh, encourages open defecation through disgust and shame, promoting the use of low-cost, locally appropriate sanitation facilities[1]. Since then, the approach has been adopted by several other countries in Asia, Africa, and Latin America, and has been recognized as an effective approach to achieving sustainable sanitation behaviour change[9].

The CLTS approach, a UNICEF-led initiative, was first implemented in Zambia's Choma District in 2007, involving trained CLTS facilitators, leading to a significant increase in sanitation coverage and open defecation from 38% to 93%, with 78% of the 517 villages verified as Open Defecation Free[10,11]. Since then, CLTS has been implemented in other provinces, including Luapula, Western, Central, and Eastern, where it has demonstrated an increase in Open Defecation Free status. The program is currently active in all the 106 districts in Zambia[11].

The Ministry of Water Development, Sanitation, and Environmental Protection (MWDSEP) launched a strategy in 2018 to improve water and sanitation services and promote good hygiene practices across all population segments. The goal was to provide basic sanitation to 70% of the urban population and 55% of the rural population by December 2021[12]. In 2019, the Eastern Province of Zambia had 35% sanitation coverage, with only a third of the population having access to improved facilities[13]. This is lower than the national average of 47%. In Chipangali district, CLTS has been

implemented in all 8 chiefdoms, but none have been declared Open Defecation Free[14]. This hence necessitated the need for this study. CLTS implementation in Chipangali aimed to improve sanitation coverage by the second year of project implementation[15]. However, none of the Chiefdoms in Chipangali have achieved ODF status after five years since the project commenced despite them sharing similar cultural, demographic, and resource backgrounds, with other Chiefdoms in other districts where CLTs have been implemented and ODF status attained. The eight Chiefdoms have fallen behind in terms of sanitation coverage and compliance compared to the other three Chiefdoms (Madzimawe, Pembamoyo and Phikamalaza) in the province. It has been unclear why these Chiefdoms failed to attain ODF status despite using the same CLTS approach as the other Chiefdoms in the province. The study aimed to identify and evaluate the key demographic and sociocultural factors that hinder the successful implementation of CLTS in four chiefdoms of Chipangali district.

MATERIALS AND METHODS

Study design

This study utilized a mixed-method study approach which entailed the utilization of both quantitative and qualitative research methods. The study design utilized was a cross-sectional analytical study design.

Study setting and population

Chipangali district is one of 15 districts in Zambia, that covers 245,347 hectares and has a projected population of 169,357[16]. It is divided into eight chiefdoms, including the Chewa and Ngoni tribes. The study population includes CLTS facilitators, local leaders, government officials, NGOs, and stakeholders involved in CLTS activities in the district. The study took place in four chiefdoms namely Mshawa, Mkanda, Chanje, and Mnukwa Chiefdoms.

Sampling technique

A systematic random sampling technique was used to select households within the sampled Chiefdoms to ensure a fair and representative selection process. Households were stratified based on location, socio-economic status, and existing CLTS status, reflecting the diverse regional demographics of Chipangali district. Stratification was crucial in capturing variations across different geographic areas, income levels, and stages of CLTS implementation, ensuring that all subgroups were adequately represented in the study. Within each stratum, households were randomly selected to accurately assess overall CLTS coverage and behaviour change outcomes. For the qualitative component, purposive sampling was used to select CLTS facilitators, local leaders, Environmental Health Technicians (EHTs), community champions, government officials, NGOs, and other key stakeholders involved in CLTS activities.

Sample size

For the qualitative phase, the 20 participants purposively selected constituted the sample size. Key Informant Interviews (KIIs) were then conducted, with a planned distribution of 5 KIIs for each of the four selected chiefdoms, resulting in a total of 20 key informants. This method allowed for a targeted and diverse range of perspectives, ensuring a comprehensive understanding of CLTS implementation across different community contexts.

For the quantitative phase, the Slovin's formula $\left[n = \frac{N}{1 + N(e)2} \right]$ was used to estimate 267 as the sample size for the household survey. Where was n - sample size, N - population size (800) and e = margin of error, 5% (0.05). Households within the sampled Chiefdoms were selected using a stratified sampling technique. Stratas included location, socio-economic status, and existing CLTS status. From each stratum, a simple random sampling for household selection was utilized.

Data collection

Qualitative data was collected using a checklist and interview guides from households and the key informants, respectively. Quantitative data was obtained using semi-structured questionnaires consisting of closed-ended and a few open-ended questions. To minimize bias such as recall and self-reported errors, questions were structured clearly and concisely. Furthermore, all data collectors were trained to probe for accurate and consistent responses.

Data analysis

The qualitative data was analysed using thematic analysis using Nvivo. This involved analysing all the collected data, interpreting the findings, and synthesizing the information before proceeding with the report writing. Quantitative data was analysed using descriptive and inferential statistical analyses in Statistical Package for the Social Sciences (SPSS) version 29. All statistical tests adhered to a significance level of $\alpha = 0.05$, which is standard practice for establishing statistical significance.

Ethical Considerations

Ethical clearance for the study was sought from the Lusaka Apex Medical University Biomedical Research Ethics Committee. Permission was obtained from the Chipangali Town Council chiefdom representatives such as headmen. Additionally, informed consents were obtained from all study participants. Participants' autonomy, right to withdraw and privacy were respected. All collected data was securely stored and accessible only by the principal investigators. Confidentiality was maintained throughout the process.

RESULTS

A total of 267 respondents were successfully recruited and interviewed across Chanje, Mkanda, Mnukwa, and Mshawa chiefdoms representing a response rate of 100%.

Sociodemographic characteristics

The demographic statistics for the respondents are shown in the table below.

Table 1: Demographic Profile of Respondents

Variable	Frequency (n)	Minimum	Maximum	Mean	Std. Deviation
Age	267	1.00	5.00	2.8876	1.42564
Gender	267	1.00	2.00	1.5880	.49312
Education	267	1.00	3.00	1.9213	.75431
Income	267	1.00	4.00	1.5431	.73642
Chiefdom	267	1.00	4.00	2.5056	1.11844
Total	267				

The study recorded mean scores for respondent demographic characteristics that showed moderate age variability (2.8876) with Std. dev 1.42, balanced gender composition (1.5880), moderate education levels (1.9213), moderate income levels (1.5431), and distinct geographical disparities in chiefdom (1.11844) respectively.

Sanitation coverage of selected Chiefdoms in Chipangali district

CLTS levels, the type of sanitation facilities, and community satisfaction with sanitation facilities were evaluated to ascertain the chiefdoms' coverage of sanitation.

Table 2: Levels of Community-Led Total Sanitation Implementation

Chiefdoms	**Percent (%)**
Chanje	65%
Mshawa	55%
Mnukwa	50%
Mkanda	55%
Total	**100**

From Table 2, Chanje stood out with a higher percentage distribution of sanitation levels, with 65% coverage, indicating a substantial portion of the community had access to improved facilities.

Table 3: Types of Sanitation Facilities Available

Types of sanitation facilities available	Frequency (n)	Percent (%)
Pit latrine with a smooth cleanable floor	77	28.8
Pit latrine without a smooth cleanable floor	182	68.2
Household without latrine	4	1.5
Others	4	1.5
Total	**267**	**100.0**

The majority of respondents (68.2%) reported they had pit latrines as their primary sanitation option but lacked essential hygiene features such as a smooth, cleanable floor (*See Table 3*).

Factors influencing CLTS implementation in selected chiefdoms of Chipangali district, Zambia

Geographical Location (Soil type of the Chiefdoms)

The study discovered an average rating of 1.6105, with respondents identifying their chiefdom's environmental setting as between 'Firm ground' and 'Swamp Area'. The median was 1.0000, with 'Firm ground' being the central response.

Participants in CLTS chiefdom areas faced challenges in toilet construction due to rocky soil conditions and erosion during rainy seasons. This limited toilet quantity and durability, even after construction.

> *"In our district, certain regions have soil that is of poor quality, primarily rocky. It's noteworthy that you could construct a toilet that is well-designed and sturdy, but during the rainy season, the water from the rain would erode the toilet due to the soil's limited ability to provide adequate support for the toilet structure."* [KII 1 F 18.18.23]

Another respondent said;

> *"In other chiefdoms, like Mnukwa and Mshawa, where the forest is still intact, people prefer to use the forest instead of constructing toilets. However, in Mkanda and Chanje, where the forest has been depleted, people find it easier to construct toilets as their chiefdoms lack forests that could serve as public convenience areas."* [KII, 2 M 18.10.23]

Community Awareness of the CLTS

Programme/Activities

The study found that respondents had an average awareness level of 1.2921, with a median of 1.0000, indicating a majority of respondents were aware of the CLTS program.

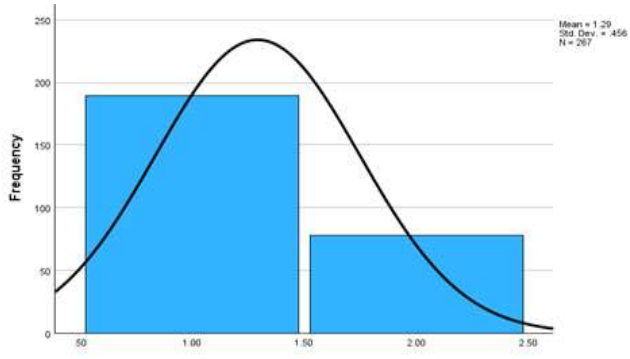

Figure 1: Community Awareness on the CLTS Programme

Community Engagement and Participation in CLTS Activities

The study findings discovered an average rating of 2.0899, indicating moderate community engagement and participation in their chiefdom. The median was 2.0000, with a low standard deviation (0.44991) and positive skewness (0.386).

Participants mentioned that the government, Environmental Health Technologists (EHTs), and Non-Governmental Organizations like

Development Aid from People to People (DAPP) conducted community engagement to raise awareness about CLTS, encouraging members of the community to continue building latrines and achieving Open Defecation Free (ODF) status.

> *"Due to extensive community engagement efforts and campaigns conducted by the Local authority, UNICEF and Splash, a significant number of villagers have become more aware of the importance of using a latrine for defecation instead of resorting to open defecation in the bush. As a result, many households have increased their pit latrine construction compared to the past."* [KII, 3 F 18.10.23]

Community Access to Resources (Socio-Economic Status)

The study found an average rating of 1.9925 for access to resources in chiefdom, with a median of 2.0000 and a mode of 'Moderate', with minimal variability and a near symmetrical distribution. The slight negative skewness of -0.072 suggested a near-symmetrical distribution.

The CLTS program's implementation faced dissatisfaction among participants due to the limited involvement of individuals with lower socioeconomic status. Financial constraints limited their ability to construct high-quality latrines, impacting their productivity and limiting their ability to oversee toilet construction activities effectively.

> *"Yes, the socioeconomic status of an individual was also one of the major hindrances to CLTS implementation, especially for households headed by the elderly. They could not afford the right materials for toilet construction, such as cement and blocks. Consequently, they often resorted to using sacks and poles. This compromised the structural integrity of the latrines, making them vulnerable to harsh weather conditions. Their toilets were inadequate and did not meet the necessary parameters."* [KII, 9 M 18.10.23].

Community Leadership and Governance

The study showed an average rating of 2.4794 for leadership and governance in chiefdoms, with a median of 2.0000 and a mode of 'Good'. However, variability in responses and a positive skewness (0.950) suggest a right-skewed distribution, with the majority clustering around 'Good'

Some participants believed that their traditional leaders' lack of support for the CLTS program, resulted in a lack of toilets, leading residents in certain chiefdoms not to recognize the need for toilets and sanitation.

> *"Attaining the Open Defecation Free (ODF) status is quite challenging, mainly because the traditional leadership is not effectively enforcing certain policies, like imposing a K300 fine on households without toilets. I believe there's a need for them to reconsider how they implement these policies."* [KII, 4 M 18.10.23]

External Support and Collaboration

The majority of the participants indicated that certain Non-Governmental Organizations, such as DAPP, were providing households with complimentary building materials for the construction of pit latrines. This contribution played a significant role in expanding the reach of the CLTS program to the chiefdoms where it is currently being carried out.

> *"We received free cement from UNICEF through the local authority and other stakeholders like Splash, when the CLTS program began around 2015. This support motivated several villagers to build pit latrines until it was discontinued."* [KII, 5 F 17.10.23]

Government policies and support

The CLTS program initially provided roofing sheets and cement to ODF status, but most respondents believed this support stopped, causing a plateau in coverage rates. However, some community members found cost-effectiveness in constructing latrines using local materials.

> *"We require continued support from NGOs and the government. In the past, they used to provide us with cement, which I believe facilitated the construction of pit latrines. However, since they ceased their support, many villagers have become hesitant to build toilets, feeling neglected. I believe this has contributed to our chiefdoms' inability to achieve ODF status."* [KII, 6 M 18.10.23]

On the contrary, another participant held a slightly different perspective:

> *"The government and certain organizations used to supply us with cement, but they discontinued it because some villagers were selling the cement for financial gain. This led to NGOs discontinuing their sponsorship of cement. Nevertheless, even in the absence of this support, we can still use locally available materials like thatch for roofing our toilets and make mud bricks, which are free to acquire."* [KII, 7 M 19.10.23]

Traditional Beliefs and Customs

In Chipangali, the implementation of CLTS programs is influenced by local cultural norms and customs, shaping the community's response to sanitation initiatives.

> *"Cultural practices, such as those of the Nyau dancers of the Chewa people, often involved them considering themselves akin to bush animals. During their practices and ceremonies, they traditionally camped in the bush. This cultural belief sometimes led to the perception that defecating in a toilet was taboo. Consequently, they practised open defecation, particularly during their camping for dances and ceremonies."* [KII, 8 M 19.10.23].

The Relationships between Sanitation Coverage and the Factors Affecting the Implementation of CLTS in the Selected Chiefdoms in Chipangali District, Zambia

Table: 4: Chi-square distribution percentiles on factors associated with CLT implementation

Factor	χ^2 Value	df	95% CI Lower Bound	95% CI Upper Bound	*P-values*
Geographical Location	286.5	12	12.28	65.06	<0.001
Community Engagement & Participation	300.2	12	12.86	68.17	<0.001
Government Policies & Support	396.7	9	20.85	146.90	<0.001
Local Leadership & Governance	187.7	6	12.99	151.70	<0.001
External Collaboration & Support	300.3	12	12.87	68.19	<0.001
Traditional Beliefs & Customs	289.8	12	12.42	65.81	<0.001
Socioeconomic Status	300.3	12	12.87	68.19	<0.001

The study found a significant correlation between sanitation coverage and factors affecting CLTS implementation, including geographical location, community engagement, government policies, local leadership, external collaboration, traditional customs, and socioeconomic status.

Table: 5: Multiple regression results on factors associated with CLT implementation

Predictor Variable	B (Coeff.)	Std. Error	95% CI (Lower, Upper)	*P-values*
(Constant)	4.878	0.090	N/A	<0.001
Geographical location	-0.075	0.037	(-0.148, -0.002)	0.041
Community engagement & participation	-0.078	0.036	(-0.149, -0.007)	0.030
Government policies & support	-0.089	0.025	(-0.138, -0.040)	<0.001
Local leadership & governance	0.156	0.069	(0.021, 0.291)	0.026
External support & collaboration	-0.085	0.104	(-0.289, 0.119)	0.414
Traditional beliefs & customs	-0.266	0.019	(-0.303, -0.229)	<0.001
Socioeconomic status	-0.264	0.107	(-0.474, -0.054)	0.014

Table 5 depicts regression test results that indicate that the factors have a significant role to play in shaping CLTS implementation in Chipangali chiefdoms.

DISCUSSION

The study revealed a moderate age distribution among respondents, a balanced gender composition, and varying levels of education and income. This aligned with a study conducted in Zambia and Mozambique which suggested that community perceptions, education and income significantly play a crucial role in sanitation program success[6,17]. This implies that level of education and income are significant factors in the success of CLTS implementations.

The present study reported sanitation coverage in the four selected chiefdoms of Chapangali district as follows: Chanje (65%), Mshawa (55%), Mnukwa (50%), and Mkanda (55%). Additionally, the study found that a significant majority (68.2%) of household pit latrines lacked smooth and cleanable floors, highlighting a critical sanitation challenge. This observation aligns with findings from a study conducted in Cameroon, where 33.2% of those with sanitation facilities used pit latrines without a slab or secure hole[18]. The lack of smooth, cleanable floors in pit latrines emphasizes the need for improved sanitation infrastructure, as it hinders the maintenance of proper hygiene standards. Such deficiencies can lead to waste accumulation, unpleasant odours, and the spread of disease vectors, ultimately creating an unhygienic environment and underscoring the importance of accessible and sanitary facilities.

This study found that several factors influence CLTS implementation in Chipangali district such as soil type, community participation, government support and policy, local leadership and governance, traditional beliefs and customs and economic status. Our study identified a significant association between CLTS implementation and geographical location, emphasizing the role of environmental factors in sanitation efforts. This aligns with the findings by Stuart *et al*[19], which highlight the importance of considering environmental conditions for successful interventions. This signifies that soil and geographical features are key to developing targeted strategies that address regional challenges in CLTS programs. Furthermore, the study revealed a significant relationship between CLTS implementation and community engagement and participation. This finding aligns with a study by Stuart *et al*[19], which indicated the importance of community engagement in CLTS implementation and the crucial role of community involvement in ensuring the sustainability of sanitation programs. This implied that increased community engagement empowers communities to take ownership of practices, fosters responsibility, and ensures long-term infrastructure maintenance. The study also reported the significant influence of government policies and support on the implementation of the CLTS program. The association between CLTS implementation and a conducive policy environment underscores the

critical role of effective governance in driving sanitation initiatives. In comparison, Okolimong, *et al*[20]. confirm that robust governance is fundamental to the success of such programs. Policies that encourage and incentivize sanitation practices are essential in promoting sustained behavioural change and fostering community development. This study also found significant links between local leadership, governance, and external support in implementing the CLTS program. This is consistent with a study conducted by Abramovsky, *et al*[21]. in which effective local governance was identified as key to sanitation success. Local leaders drive change by influencing community behaviour and aiding sanitation interventions, highlighting the need for capacity-building and investment in leadership initiatives. Conversely, the study revealed a less significant role for external support, aligning with another study by Tough *et al*[22]. in emphasizing context-specific interventions. While external collaborations offer resources and expertise, a standardized approach is less effective. Tailoring support to community needs boosts outcomes. Our study underscores the importance of sustainable partnerships with NGOs and external entities to provide ongoing resources and assistance, ensuring the long-term success of sanitation programs. The significance of taking cultural aspects into account when designing sanitation treatments is highlighted by our study's considerable correlation between the application of CLTS and traditional beliefs. In line with a study by Mbewe *et al*.[6] that emphasised the importance of using culturally sensitive methods. Additionally, the present study findings are comparative to similar studies conducted in Burkina Faso and Ghana, that showed that culture norms significantly impede utilization and implementation of sanitation programs such as CLTS[23,24,25]. The resonance of these findings with the present study could be attributed to the study setting-rural settings. Understanding the cultural norms held by a specific community is vital for effective CLT implementations. Our work, therefore, suggests that incorporating and recognising regional traditions into sanitation initiatives not only guarantees cultural suitability but also fosters community acceptance and involvement. Culturally sensitive interventions are necessary to address the negative links with conventional beliefs. Initiating conversations and providing knowledge to communities can aid in removing cultural barriers and promote the adoption of better sanitation methods. Finally, our study highlights the importance of inclusive approaches that take economic disparities into account, as there is a substantial correlation between these factors and the application of CLTS. This is seen in a study by Harter, *et al*.[17] where it was discovered that socioeconomic characteristics had an impact on how easily accessible sanitation facilities are. This result implies that the impact of social and economic status must be acknowledged, and it highlights the necessity of focused interventions in communities with lower socioeconomic levels. Plans to guarantee that everyone has equal access to hygienic facilities should include funding, incentives, and capacity-building.

CONCLUSION

The study reveals that CLTS implementation coverage varies across four chiefdoms of Chipangali district, with Chanje Chiefdom having the highest coverage at 65%. Factors such as geographical location, community engagement, government policies, local leadership, external support, traditional beliefs, and socioeconomic status significantly impact CLTS implementation. Challenges like unfavourable soil conditions and local leadership commitment impact sanitation prioritization. External support from NGOs is crucial for latrine construction. Despite initial support, sustained implementation challenges impact the momentum of CLTS initiatives. The study recommends enhanced community sensitization activities for local leaders and their subjects emphasizing cultural factors and their role in CLTS implementations. Continued support from NGOs especially in training and supply of logistics

essential for an effective implementation of CLTS in Chipangali district.

What is already known on this topic:

1. Effectiveness of CLTS: Community-Led Total Sanitation (CLTS) is recognized for its effectiveness in eliminating open defecation and improving sanitation through community mobilization and behavioural change.
2. Challenges in CLTS Implementation: Common challenges in CLTS implementation include resistance to behavioural change, inadequate infrastructure, and limited access to essential resources like water and sanitation facilities.
3. Importance of Community Engagement: The success of CLTS programs heavily relies on active community participation, with community ownership and leadership being crucial for achieving and maintaining open defecation-free (ODF) status.

What this study adds:

1. Localized Insights for Zambian Districts: This study offers specific insights into how local cultural, environmental, and socio-economic factors influence CLTS implementation in Zambian districts, particularly in Chipangali.
2. Identification of Unique Barriers: It identifies unique barriers in the selected chiefdoms of Chipangali, such as local sanitation attitudes, resource constraints, and the role of traditional leadership, enhancing the understanding of CLTS challenges in rural Zambia.
3. Recommendations for Tailored Interventions: The study provides targeted recommendations for improving CLTS implementation in these communities by suggesting interventions tailored to the specific challenges and opportunities in Chipangali, aiding in more effective sanitation programs in similar rural areas.

Study limitations

Certain individuals chose not to participate in the study, which could have introduced potential bias in the sample and affected the overall representativeness of the results.

Recommendations

The study provides the following recommendations:

1. Traditional leaders and their subjects should proactively address cultural norms that impede the efficacy of CLTS in Chipangala district with continuous support from NGOs regarding training and logistics.
2. Local authorities should periodically conduct sensitization campaigns led by Community Champions and Sanitation Action Groups, highlighting the significance of having sanitation facilities in households and instituting continuous monitoring mechanisms to assess the effectiveness of sanitation programs.
3. Community members to prioritize the construction of sanitation facilities (toilets) in households and include essential components/parameters such as doors, roofs, toilet covers, smooth cleanable floors and hand washing facilities with soap and water.

DECLARATIONS

Ethics approval

Approval for ethics was obtained from the Lusaka Apex Medical University Bio-medical Research Ethics Committee (*FWA 00029892, IRB 00001131*, ***Ref 00545-23***). Permission from community leaders and local authorities was sought. Furthermore, signed consents were obtained from all participants and confidentiality and privacy of the information was observed.

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Conflicts of interest

The authors declare no conflicts of interest regarding the publication of this paper.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

IP participated in the preliminary formation of the study and cleaned and analysed the dataset. AC and CM supervised the work and scrutinized the methodology and result interpretation. The manuscript was developed, reviewed and approved by CM.

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