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Influence of Social and Cultural Factors on Adoption of Community-Led Total Sanitation in Laisamis Sub-County, Marsabit County, Kenya

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ABSTRACT: Community-Led Total Sanitation (CLTS) is a behavior change approach that aims at promoting access to safe sanitation and hygiene. The approach empower communities to take collective action to eliminate open defecation practices, thus promoting a healthy population. Despite CLTS implementation in Kenya, open defecation is still rampant, in low-income communities particularly in pastoral areas. This study's study was to examine the influence of social and cultural factors on adoption of Community-Led Total Sanitation in pastoral areas. The study was conducted in Laisamis Sub-County, Marsabit County, Kenya using a descriptive design with a mixed methods approach. The sample size was 393 household heads who were randomly selected from the five Wards in the Sub-County, which were treated as clusters. The data was collected using structured questionnaires and analyzed in descriptive and inferential statistics. Qualitative data was collected from a focus group and analyzed in themes. Findings showed that despite CLTS activities to impart communities with knowledge on toilet use, 63.3% of participants opined that open defecation practice was still rampant. The most cases of open defecation were reported among herdsmen whose livelihood was based in herding in grazelands where there were no toilets. Results also revealed that taboos and beliefs that surrounded toilet sharing between children and adults affected toilet utilization (OR 0.67 95% CI: 0.345-4.567, P=0.002). The impact of CLTS was thought to be minimal for a community that often interacted with animal faeces, which made over 90% of the participants believe that human faecal matter was not dangerous just like animal faecal matter. The role of women in household sanitation matters was appreciated as they were left in households to construct toilets while men went to look after cattle. However, herdsmen's concerns regarding the essence of investing in improved latrines were minimal as most of their time was spent in the fields, and convincing them on the need for better toilets could have been impossible for the women. The study concluded that CLTS was an effective strategy in triggering behaviour change among communities if its execution was to be context-specific. Involvement of both women and men in CLTS triggering exercises is essential in reinforcing the importance of ending open defecation whether in bushes or at home.

KEYWORDS: Community-Led total sanitation, cultural factors, latrine construction, latrine use, open defecation, pastoral communities, social factors

INTRODUCTION

Sustainable Development Goals (SDGs) agenda 6.2 targets achievement of access to adequate and equitable sanitation and hygiene for all and complete eradication of open defecation by the year 2030 (UN 2015). One way of realizing the development agenda is through the implementation of sanitation-based interventions such as community-led total sanitation (CLTS). The approach is used to trigger sanitation standards of communities practicing open defecation (OD). It is based on this principle of shame, fear, and disgust were used to encourage the community to take action to improve sanitation standards and to eradicate OD (Kouassi et al 2023). Although it is thought to be a good intervention to promote improved sanitation and to reduce OD. Its results are at times not encouraging or it yields unexpected outcomes. Globally a report by WHO/UNICEF 2021 showed that 3.6 Billion people do not have improved sanitation and 494 Million still defecate in the open. Whereby 92% of the population lives in rural areas, particularly in south and central Asia and sub-Saharan Africa where sociocultural factors play a great role in delayed adoption of CLTS. The same report indicated that in Kenya 9% of the population practice OD and only 33% have toilets capable of preventing human contact with excreta. It was greatly noted that household factors such as being able to afford materials to construct toilets greatly delayed the adoption of CLTS among 27% of Kenyans. OD and unimproved toilets could facilitate the spread of sanitation-related diseases such as cholera, dysentery, typhoid, and other diarrheal diseases which are responsible for 760,000 deaths per year globally

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(Kouassi et al 2023). Slippage of CLTS has also been noted where communities retract back to practice OD even after going through all the steps of CLTS up to the tail end of the celebration (Jerneck et al, 2016).

Community-led total sanitation focuses on raising awareness of the dangers of OD and the need to adopt the use of toilets. The community is subjected to triggering activities that entail a walk of shame and disgusting encounters with their faeces with the aim of making them understand the dangers of OD. However, In Ghana, a study by Harter et al. (2019) that examined the success of CLTS established that despite triggering exercises to make the community understand or improve knowledge on the dangers of OD, the practice persisted, the study showed that the creation of knowledge alone was not sufficient to trigger behavior change, and that there was need for latrine constructors have the required masonry skills and for eradication of cultural practices that supported OD through behavior change. A different study in Ghana by Crocker et al. (2016) found that training natural leaders on latrine construction led to increased adoption of latrines as well as a 19.9%-point reduction in OD suggesting that supportive community structures were essential in promotion of positive sanitation outcomes after CLTS. Hygiene standards of the community are likely to improve when the community adopts toilets and refrains from the practice of OD.

Adoption of CLTS could depend on cultural norms and practices among communities which differ from community to community. For instance, according to the old culture of the Mijikenda, Kenya, it is taboo or sinful to share toilets with respected relatives (Omar, 2021) which makes open defecation rampant in the community. Similar findings were established in Haiti by Paul et al. (2022) who associated cultural beliefs against toilet sharing with 1.5 odds of contributing to open defecation. The practice of open defecation could lead the communities deeper into poverty by using the already scarce resources in the treatment of easily preventable diseases. Given that different communities hold different cultures in relation to sanitation, it was necessary to the existence of sanitation-related cultures which could hinder adoption of CLTS in the study area. Despite implementation of CLTS, uptake of CLTS in Marsabit County has for long exhibited wavering outcomes due to the increasing rates of open defecation (MOH, 2017; Marsabit, 2020). Marsabit County's population is predominantly pastoralists, which could have made the maintenance of proper sanitation difficult. Social cultural factors and taboos among the pastoralists could be an impediment to the implementation of CLTS.

Low adoption of CLTS has facilitated poor sanitation practices such as open defecation which expose communities to disease-causing pathogens due to poor faecal disposal methods such as in the open. Sanitation-related diseases have been reported among the leading causes of child mortalities and illnesses especially in less developed countries (WHO/UNICEF, 2022) as the infections further compromise their already compromised immunities. While CLTS has been promoted as an effective approach to improving sanitation practices in various parts of the world, its successful implementation and adoption have been varying in certain contexts, particularly in pastoral communities (Abebe & Tucho, 2020). To successfully implement CLTS programs, it is crucial to understand the local social dynamics and cultural beliefs that could influence the adoption of improved sanitation practices. However, there is currently limited empirical evidence or studies that specifically focus on Laisamis Sub County and examine the interplay of these factors to CLTS adoption. By addressing this knowledge gap, the study aims to provide valuable insights into the practice of CLTS implementation. The findings of the research can contribute to the development of more effective strategies and interventions for promoting CLTS and improving sanitation practices in similar rural communities in Kenya and potentially other regions facing similar challenges.

Objective

To examine the influence of social and cultural factors on adoption of community-led total sanitation (CLTS) in Laisamis sub-county, Marsabit County, Kenya.

METHODOLOGY

A convergent design which involved mixed a methods approach (qualitative and quantitative data) was employed. The study targeted household heads in Laisamis Sub-County. According to the 2019 census, Laisamis Sub-County has a total of 23912 and the average number of household members is 4 (KNBS, 2019). The study also targeted focus group discussion participants who included chiefs, Public Health Officers, Community Health Volunteers, natural leaders, religious leaders and CLTS implementers from Non-Governmental Organizations (NGOs). A sample size of 393 household heads calculated using Yamane's (1967) formula as illustrated in the equation below was targeted.

$n = N/1 + N(e)2$= n=23912 / (1+ 23912 (0.05)) ²

= 393 household heads

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Where: n = the desired sample size; N = Population (23912 household heads) and e = Margin of error (taken as 5%). The area was divided into five strata namely, Kargi (3009 households), Korr/Ngurunit (8985 households), Laisamis (4142 households), Loglogo (1984 households) and Loiyangalani (5792 households) and household heads drawn from each ward (stratum) using simple random sampling technique which was proportionate to size because the participants were from an unevenly distributed population. Quantitative data was collected from household heads within the households in the strata using structured questionnaires. Qualitative data was collected using focus group discussion guides. The focus group discussion aimed to obtain comprehensive information regarding the adoption of CLTS and related factors to complement findings from the quantitative data. The quantitative data was analysed in descriptive statistics and inferential analyses using the Statistical Package for Social Sciences (SPSS) version 29. Descriptive statistics included percentages, frequencies and means while inferential analysis was done in logistic regression. The simple logistic regression analysis was run on each independent variable to ascertain whether it had a significant relationship with the dependent variable. Then a joint model was run to test the joint relationship between the adoption of CLTS and the covariates of the independent variables (social and cultural factors). Adjusted and unadjusted Odd Ratios (ORs) at 95% Confidence Intervals (CI) were obtained and discussed. A logistic model was chosen since the dependent variable was binary; adoption of CLTS or non-adoption of CLTS. A license for data collection was obtained from the National Commission for Science, Technology and Innovation (NACOSTI) (Reference number: ….). The researcher also sought approval to carry out the study from the relevant authorities in Marsabit County. Participation was on a voluntary basis and without coercion or enticement. Participants' names were concealed for confidentiality of the information they shared.

RESULTS AND DISCUSSION

The results obtained from the study were as discussed:

Response rate and general characteristics of respondents

The response rate was 72% (283/393 questionnaires were returned). Majority of participants were females at 92.6% attributable to their usual household chores which made it necessary for them to stay within the households. More than 10% had never gone to school which was attributed to the ancient low preference of education especially for females and by pastoralists who were busy in the fields looking after cattle. The age range of participants from the highest to the lowest was as follows: 29-39 years at 56.5%, 18-28 at 21.6%, 50-50 years at 16.6% and above 50 years at 5.3%. Household sizes were between 1-5 members (54.5%), 6-10 members (44.2%) and more than 10 members at 1.4% which informed the number of toilets required in the households and the frequency of toilets reconstruction or exhaustion.

Adoption of community-led total sanitation

The study aimed at assessing the adoption of CLTS in Laisamis Sub-County. Adoption of CLTS was assessed in terms of latrine adoption (construction and type), utilization and/or open defecation. It was considered low when a high percentage of the community adopted unimproved toilets, failed to use the available toilets or defecated in the open. Adoption of CLTS was considered high with the adoption and use of improved toilets and few or no cases of open defecation in the community.

Regarding type of toilets adopted, results from Table 1 show that most (65.7%) of the respondents had adopted traditional pit latrines. Bush or open defecation was reported by 29% of the respondents while only 5.3% used ventilated Improved Pit latrines which were considered improved due to their odour and fly control capabilities. Ordinary or traditional pit latrines are mostly unimproved sanitation options that do not cut human contact with excreta. Such toilets were characterized by odour and flies, which could contribute to the spread of sanitation-related diseases. Defecation in the open also exposes people to the risk of interacting with pathogens from stool. Although findings showed a majority of the population (91.2%) appreciating the role of CLTS in promotion of latrine construction, the sanitation status in the community was unimproved due to the adoption of unimproved toilets and the practice of open defecation. The question on whether CLTS triggered the adoption of toilets which kept people free from interacting with excreta persisted.

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Table 1: Adoption of CLTS-Type of toilet used at the household

Response	Frequency	Percentage
Traditional Pit Latrine (simple/normal latrine)	186	65.7 5.3
Ventilated pit latrine (Latrine with Vent pipes)	15	29.0
Bush/Open	82	
CLTS has promoted toilet construction		
Response	Frequency	Percentage
True	258	91.2
False	25	8.8
Type of toilets after CLTS are good for use		
True	173	61.1
False	110	38.9
Ever participated in a CLTS-triggering exercise		
Yes	261	92.2
No	22	7.8

It was established that the majority (92.2%) of the participants had participated in CLTS triggering exercises and that only 7.8% had never been to the triggering sessions as shown in Table 1. Attendance to CLTS triggering sessions could ensure that the community was enlightened and their emotions triggered to stop the practice of open defecation. The results suggested that a high number of community members had been taught about the essence of toilet construction and avoidance of open defecation as it was always done in CLTS triggering sessions thus they understood the impacts of poorly managed faecal matter in relation to human health. A community that understands the essence of toilet adoption and use is likely to be open defecation-free. When asked to indicate the gender that mostly participated in CLTS triggering activities, 86.9% of the participants indicated females while a few (5.3%) reported males as shown in Figure 1.

Fewer males than females participated in the CLTS triggering exercises as men were most of the time busy in the fields looking after their livestock. Women, who were mostly left in their households were available for the triggering session hence the high number. The findings were supported in the focus group discussion where a participant said:

"We women are always around the households. When the community doctors come, they always find us around. The men go to look after cows and they are nowhere to be found. I think it is good for them to understand what we are taught."

Researchers like Tough et al. (2023) have reported that participation of both men and women in CLTS activities could promote a platform for improved household sanitation status as the triggering process enables both to understand and initiate household-level behaviour change. Although women could understand the essence of toilet construction as a result of attending the triggering sessions, a study by Ashraf et al. (2022) established that, convincing men, who are mostly the primary decision makers in households, that spending money to construct improved sanitation facilities is a worthwhile investment might be difficult. Although women might have attended the sessions, there was a need for support from men, in order to construct good household toilets.

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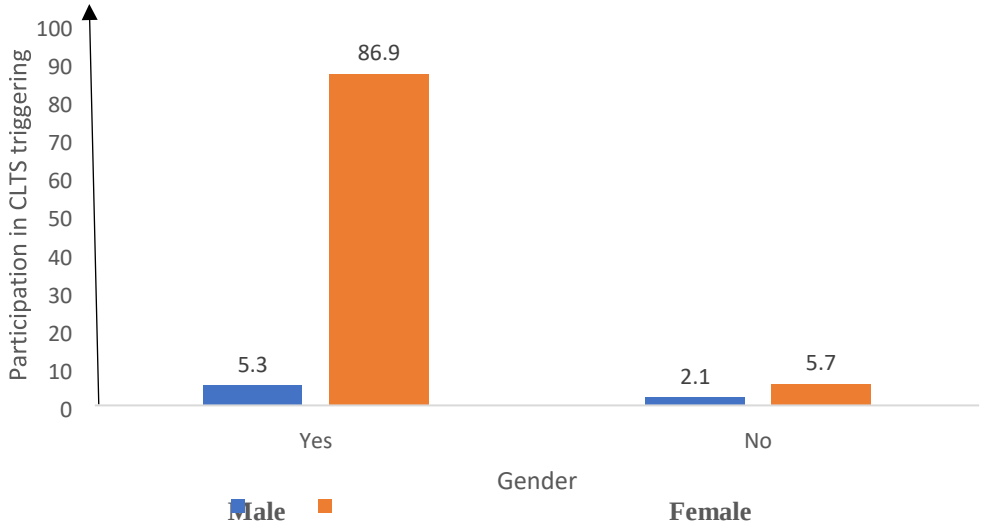

Figure 1: Gender that mostly participated in the CLTS triggering sessions

The participants were further requested to indicate whether CLTS had promoted the construction of toilets and whether the type of toilets constructed after CLTS were good for use as shown in Table 4.10.

Open defecation and toilet avoidance

The researchers intended to find out whether participants used the toilets constructed after CLTS and whether there were still open defecation cases that occurred within the community even after CLTS implementation. Findings in Table 2 showed that 74.9% of participants acknowledged the role of CLTS in promoting avoidance of open defecation. However, slightly more than a quarter (25.1%) of the respondents reported the inability of CLTS to trigger avoidance of open defecation. The findings suggested that open defecation still happened even after residents were made aware of its dangers, during the CLTS sessions. Studies have found out that knowing the dangers of open defecation is not enough in promoting behaviour change as open defecation could be driven by physical aspects where toilets are unfriendly for use, cultural barriers related to toilet utilization as well as the inability to construct toilets at the households (Wasonga et al., 2023; Appiah-Effah et al., 2024).

Regarding the use of toilets constructed after CLTS, results as shown in Table 2 showed that 41.3% and 34.6% of participants agreed and strongly agreed that some people in the area did not make use of the toilets constructed after CLTS (Mean=3.98, Standard deviation=0.234) implying a general agreement. Researchers like Mumin et al. (2023) in Tamale have reported toilet avoidance due to their status, which could have been a reason behind latrine non-utilization in the study area.

Table 2: CLTS has promoted avoidance of open defecation

Response	Frequency	Percentage
True	212	74.9
False	71	25.1

Some people do not make use of the constructed toilets after CLTS

Response	Frequency	Percentage
Strongly disagree	20	7.1
Disagree	48	17.0
Not sure	0	0.0
Agree	117	41.3

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Strongly agree	98	34.6
Total	**283**	**100.0**

Mean=3.98, SD=0.234

Findings from observation (Figure 2 on status of toilets) showed that although there were footpaths for 71.4% of the toilets, 28.6% lacked clear footpaths which demonstrated that they were rarely used. Pathways to toilets that were used were always clear, with no bushes or grasses growing, indicating that people frequently visited them. Evidence of faeces left in the open was observed in 55.5% of the households which showed that although people had adopted toilets, cases of open defecation still happened, thus the presence of toilets alone was not an absolute motivator for their utilization. Nuisances like flies and odour were evident in 55.5% of the toilets, an implication that their maintenance status and ability to control nuisances was poor. Studies for instance by Kouassi et al. (2023) and Mosler et al. (2018) have found a relationship between toilet maintenance and utilization where low maintenance in toilets attracts toilets underutilization. Although 58.7% of toilets had no gaps in the walls, 41.3% of toilets' superstructures were gapped. Gapped superstructures did not maintain the privacy of users.

Results of the focus group discussion showed that the toilets that had been constructed could be avoided by some people since some were constructed using weak materials that did not maintain user privacy. A respondent from the focus group discussion said that: *"They tell us to construct toilets. I construct one with what is available. But you cannot use the toilets when children can see you when inside. You see the walls cannot be completed because they are made of tree branches. You cannot miss a hole."*

Reduced privacy and the condition of toilets stood out among the non-motivators of toilet use. Avoidance of toilets due to their status even in their presence after CLTS was noted in Tamale (Mumin et al., 2023), Uganda (Cagnet, 2022) and Cambodia (Hendrix, 2020).

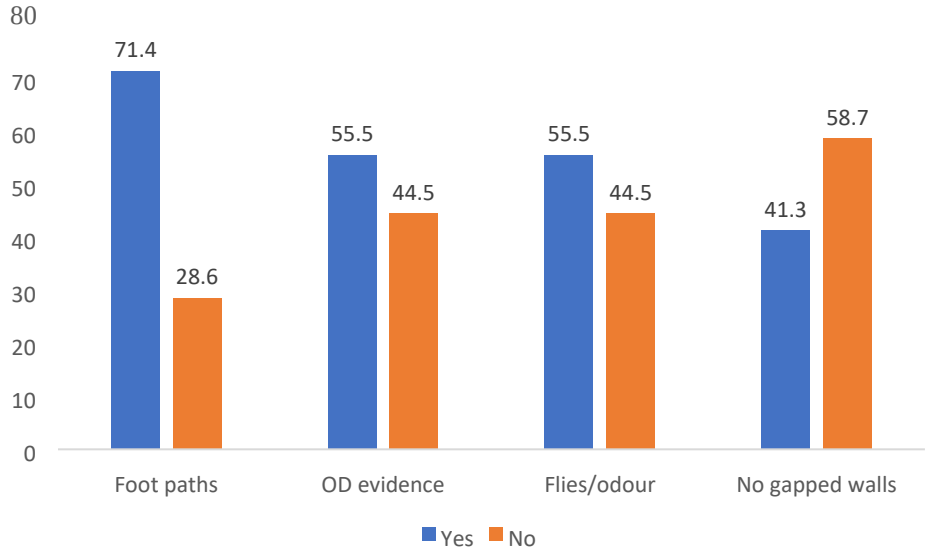

Figure 2: Status of toilets

Influence of social factors on adoption of Community-Led Total Sanitation

The influence of social factors like social support, knowledge, gender and decision-making roles and societal mobilization/pressure on adoption of CLTS was examined.

Social support, knowledge and adoption of Community-Le Total Sanitation

Respondents were requested to indicate their degree of agreement with the statement on whether the opinion of influential community members affected adoption of CLTS. Findings as shown in Table 3 showed that at a mean of 4.103 (SD=0.949), participants demonstrated a general agreement with the statement implying that most of the responses lied in the agree and strongly agree categories. The findings implied that influential leaders and members of the community acted as respected figures who could

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dictate behaviour change. Such people contributed to the adoption of Community-Led Total Sanitation in the Sub-County as they could give orders that the community had to follow to the latter. Similar findings were reported in a study by Kouassi et al. (2023) in Burkina Faso where CLTS implementation was successful as a result of strategizing on influential people who were listened to and were more respected in the community.

Participants also reported that support was offered by the community neighbors to ensure that they implemented what was required of them after CLTS (toilet construction) (Mean=3.74, SD=1.023). Some community members might not have been in a position to construct toilets on their own. Given that latrine construction is always demanded for after CLTS (Kar, 2010), community members assisted those who could not construct toilets on their own probably due to cost constraints to construct toilets so that the community would become open defecation free. Respondents from the focus group discussion indicated that the primary goal of CLTS was to promote open defecation-free status in communities and a community could be declared as open defecation-free when one household was still practicing open defecation as follows:

"We teach the community that if one person has not stopped defecating in the open, then the whole community is not safe. They even monitor each other to ensure that everybody has constructed toilets." "We also want our community to be celebrated as having attained open defecation-free status. That cannot happen when one of us does not have a toilet. We have been ensuring as much as we can that we construct toilets and even help those who are unable to dig pits."

When people who find toilet construction a burden to them are helped out, communities could attain an ODF status due to wide adoption of toilets. In Ghana and Cambodia, a study by Tribbe et al. (2021) established that rural households sustained sanitation gains by having neighbors help fellow neighbors to construct toilets.

When asked to indicate their degree of agreement with the statement on knowledge of facilitators on the CLTS process, results as shown in Table 3 indicated that most of the participants agreed at 48.4% and strongly agreed at 32.9%. The absolute value for the responses (mean) was 4.003 SD=0.977 implying a general agreement. The facilitators of CLTS were therefore knowledgeable of the process of CLTS and were capable of convincing the community to adopt the desired behaviour change and practices. Researchers like Nanyim et al. (2022) have confirmed that success in the implementation of CLTS could be high when the facilitators understand the CLTS concepts and have a convincing ability to the target population which can motivate behavior change.

The statement on whether the community had adequate knowledge on the dangers of open defecation scored a mean of 3.908 (SD=0.902) implying general support for the statement. The results suggested that CLTS had facilitated the increased understanding of the community on the essence of avoiding open defecation which could have contributed in encouraging avoidance of open defection. The findings were supported in the focus group discussion where a participant argued that:

"The sessions are good for the community where open defecation is practiced. The act of making them interact with the faeces makes them practically understand what it means by the movement of flies from what they leave in the open, to their food and then their mouths. Understanding that makes them decide to stop open defecation."

The results suggested that information delivered during Community-Led Total Sanitation execution had the capability of attracting a positive behaviour change when the community had the right or the desired knowledge on the dangers of poor sanitation practices. Participants were further requested to indicate whether human faeces was dangerous. Results showed that 53%, which was more than half of the participants agreed. However, the mean score for the responses was 2.890 (SD=1.282) implying that the absolute score was neutral which showed that the scores were fairly distributed between the agree and the disagree categories. Some participants disagreed because they understood that human faeces was more pathogenic compared to animal faeces as reported by a focus group discussion participant who said:

"Human faeces is very dangerous. You cannot compare it with animal faeces. You cannot touch human faeces the way you can carry animal faeces. Leave alone its ability to cause diseases, it will even make you smelly."

Another respondent from the focus group discussion indicated that most of the community members had interacted with animal faeces for long and did not feel that human faeces could have any different from animal faeces as reported:

"You know the community has pastoralists who interact with animal faeces. I think this long-term interaction makes them less concerned about leaving faeces in the open. They treat all faecal matter with the same measure."

The implication was that less concern about the dangers of leaving human faeces in the open could encourage people to continue practicing open defecation and to give less priority to toilet adoption. The goals of CLTS could therefore fail when the community

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does not embrace toilet adoption and use. A similar study by Barasa and Walden (2022) in Tanzania has also documented that faecal matter is recognized as less dangerous by pastoralists due to continuous interaction with livestock faeces.

Table 3: Social support, knowledge and adoption of CLTS

Statement	Strongly disagree	Disagree	Not sure	Agree	Strongly agree	Mean(SD)
Opinions of influential community members and adoption of CLTS	0%	12%	4.3%	45.2%	38.5%	4.103(0.949)
Support from community members in implementing CLTS targets	1.8%	18.7%	2.1%	59%	18.4%	3.74(1.023)
Facilitators have adequate knowledge on CLTS	1.1%	11.6%	6.0%	48.4%	32.9%	4.003(0.977)
Community has adequate knowledge on the dangers of open defecation	1.4%	11.3%	3.2%	63.3%	20.8%	3.908(0.902)
Human faeces are not dangerous just like animal faeces	21.9%	21.6%	2.8%	53%	0.7%	2.890(1.282)

Decision making roles, social mobilization and adoption of Community-Led Total Sanitation

Respondents were requested to indicate the gender who were the primary decision-maker at the household on matters regarding toilet construction as shown in Table 4. Findings showed that females mostly made decisions on toilet construction in their households as reported by 89% of the participants. The findings showed that men were not mostly involved in matters of toilet construction in the households. When participants were requested to indicate whether gender roles hindered adoption of CLTS, the scores of their responses averaged at 3.97 (SD=0.862) an indication that adoption of CLTS could be influenced by gender roles. Participants in the focus group discussion indicated that women, who were left at the households to perform usual household duties also constructed toilets when men had gone away to look after livestock. Females were left at the households to manage their homes and could thatch toilets, or construct them using locally available materials such as sticks, sacks and tree branches. A focus group discussion participants indicated that:

"Toilets are constructed by mothers and females because they are left in the village to look after or manage their households. They construct them using materials just within their households. The use of locally available materials like sacks, grass, sticks and branches result in the construction of low standard toilets." However, the kind of toilets constructed were observed to be poor and as reported in the focus group discussion, women wished to have improved toilets which was impossible as they lacked money for the purchase of better materials. Focus group discussion participants reported that since men did not mostly live in their households, they did not give priority to household sanitation and convincing them that good sanitation infrastructure was a worthwhile strategy was difficult for their women:

"The fact that we have used the locally available materials such as sticks and constructed shallow pits makes it difficult to have others when they fill up. Other toilets easily sink and digging others over and over again is impractical. We stay with the old one until we get means of having another one"

"Involving both males and females in the triggering exercise can improve the situation. They will both understand why they need good toilets for their households. Most toilets are constructed by women and the men are not there. To convince them to give out money for the construction of goods toilets might not make sense to them because they are mostly in the field."

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Table 4. Primary decision makers in household toilet construction

Gender	Frequency	Percentage
Males	31	11.0
Female	252	89.0

Gender roles and social mobilization

Statement	Strongly disagree	Disagree	Not sure	Agree	Strongly agree	Mean(SD)
Gender roles hinder adoption ofCLTS	0.4%	11.3%	2.5%	62.5%	23.3%	3.97(0.862)
There is societal pressure to adopt toilets after CLTS in my community	10.3%	14.8%	4.9%	53%	17%	3.52(1.227)
Human faeces are not dangerous just like animal faeces	21.9%	21.6%	2.8%	53%	0.7%	2.890(1.282)
Natural leaders have played a key role in encouraging toilet construction	4.9%	14.1%	2.5%	60.8%	17.7%	3.721(1.067)

Results from Table 4 on the role of social mobilization/societal pressure show that to some extent societal pressure made people adopt toilets after CLTS (Mean=3.516, SD=1.227). Pressure from peers or fellow community members could encourage people to conform to the expected practices of sanitation improvement. Studies by Nanyim et al. (2022) and Tribbe et al. (2021) have acknowledged the role of social push and validation in motivating behaviour change, which promotes effective CLTS outcomes of proper hygiene and sanitation practices among community members. The need to conform and to 'fit in' has also been recognized as a significant motivator of behaviour change as people would want to do what is acceptable to the community. When requested to rate their degree of agreement on the role played by natural leaders, most of the participants' responses as indicated in Table 4 lied in the agree category (60.8%). The mean obtained from the statement was 3.721, SD= 1.067 indicating that participants appreciated the positive contribution of natural leaders in encouraging toilet construction among the communities. Findings from the focus group discussion showed that natural leaders were essential in following up with community members who needed to construct toilets to ensure that they had indeed constructed them and pushing for the declaration of open defecation-free status in their communities.

" I am currently overseeing the construction of toilets by our community members. Those who do not have toilets have to do so before 7 days. I was disturbed to learn that we can continue consuming faecal matter from people who do not want to construct toilets. At least some have constructed and we will push the others to construct. We want to be declared open defecation free."

"There are those committees selected during triggering. They are helping so much in influencing CLTS outcomes. The community feels comfortable with them because they can understand them."

The results suggested that concern from natural leaders encouraged people to construct toilets. The role of natural leaders in championing and spearheading toilet construction for their communities was also appreciated in Ghana by Nanyim et al. (2022) and in Nigeria by Victor et al. (2020).

Logistic regression analysis for social factors

Findings from the univariable model for the odds of open defecation shown in Table 5 showed that involvement of women in decision-making on toilet construction at the households was associated with 55.4% lower chances of open defecation (Unadjusted OR 0.446, 95%CI: 0.325-0.611, p<0.001). Support from community members on toilet construction seemed to be associated with 1.049 higher chances of contributing to open defecation but the relationship was non-significant (p>0.05). Participants who perceived human faeces as less dangerous just like animal faeces had 4.375 chances of defecating in the open compared to those who were knowledgeable of the difference between the dangers of the two kinds of faecal matter (Unadjusted OR 4.375, 95% CI: 3.287-6.492, p<0.001). Increased societal pressure to adopt toilets, encouragement by natural leaders, and participation in CLTS activities lowered the likelihood of open defecation by 49.8%, 42.8% and 30% respectively (Unadjusted OR 0.502, 95% CI: 1.168-1.932, p= 0.002; OR 0.572, 95% CI: 0.444-0.737, p<0.001; 0.700 95% CI: 1.570-4.645, p<0.001). The variables that turned out

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significant in the univariable model were also significant in the multivariable model except the involvement of women in decision-making and societal pressure to adopt toilets (p>0.05).

In the simple model for the odds of the status of toilets adopted after CLTS, the likelihood of adopting improved toilets after CLTS was 17.9% times lower when women participated in decision-making and toilet construction processes (p=0.031<0.05). Communities who were supported by natural leaders had 1.572 more chances of adopting improved toilets compared to those who were not supported by natural leaders (p<0.001). The probability that people who had participated in the CLTS triggering exercise would adopt improved toilets was 2.700 higher than their counterparts (p<0.001). The relationship between societal pressure to adopt toilets, support from community members and low knowledge on the difference between the dangers of human faecal matter and animal faecal matter and the status of toilets adopted after CLTS was not significant (p>0.05).

Findings from the multivariable model shown in Table 5 for the odds of the status of toilets showed that encouragement by natural leaders and participation in CLTS triggering exercises had 1.576 and 2.218 higher chances of facilitating adoption of improved toilets respectively (Adjusted OR 1.576, 95% CI: 1.2453.476, p=0.042; Adjusted OR 2.218, 95% CI: 1.733-4.654, p=0.001). The findings implied that communities who actively participated in CLTS triggering meetings and who had active natural leaders constructed toilets which were capable of separating human contact from excreta. As such, lack of participation or absence of natural leaders within the community, who would spearhead construction of better toilets, promoted construction of unimproved toilets in the area.

Table 5: Odds of adoption of CLTS in Laisamis Sub-County (n=283)

Variable	A. Open defecation			
	Unadjusted ORs (95% CI)	**Pvalue**	**Adjusted ORs (95% CI)**	**P-value**
Women as decision makers in sanitation	0.446(0.325-0.611)	<.001	0.558(0.675-1.237)	0.558
Support from community members	1.049(0.829-1.328)	0.691	1.833(1.196-2.810)	0.055
Societal pressure to adopt toilets	0.502(1.168-1.932)	0.002	0.794(0.553-1.141)	0.212
Human feaces not dangerous just like livestock dung	4.375(3.287-6.492)	<.001	4.543(3.199-6.453)	0.005
Natural leaders encouraging toilet construction	0.572(0.444-0.737)	<.001	0.616(0.386-0.982)	0.042
Ever participated in a CLTS-triggering exercise	0.700(1.570-4.645)	<.001	0.718(1.733-4.654)	0.001
	B. Status of toilets adopted after CLTS			
Women as decision makers in sanitation	0.821(0.654-1.163)	0.031	0.914(0.675-1.237)	0.558
Support from community members	1.555(0.883-1.410)	0.460	1.833(1.196-2.810)	0.115

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Societal pressure to adopt toilets	0.884(0.696-1.123)	0.918	0.794(0.553-1.141)	0.212
Human feaces not dangerous just like livestock dung	0.756(0.449-0.632)	0.714	0.656(0.488-0.882)	0.155
Natural leaders encouraging toilet construction	1.572(0.444-0.737)	<.001	1.576(1.245-3.476)	0.042
Ever participated in a CLTS-triggering exercise	2.700(1.570-4.645)	<.001	2.218(1.733-4.654)	0.001

Influence of cultural factors on adoption of Community-Led Total Sanitation

This results on the influence of cultural factors such as taboos, beliefs, norms and lifestyle were as discussed. Respondents were given statements on a Likert scale to rate their level of agreement with the statements as shown in Table 5. When asked whether defecation in toilets was considered a taboo, most responses (45%) were in the agree category which were closely followed by strongly agree (26.5) and disagree (23.7%) responses. When requested to respond to the claim that community culture promoted open defecation, most responses (41.3%) were in the category of agree, followed by 24% and 23% in the strongly disagree and disagree categories respectively. The means of the responses were 2.696 (1.296) and 2.809 (SD=1.336) respectively which suggested that on average, respondents leaned on the 'disagree' category but not strongly so. Findings from the focus group discussion indicated that taboos that existed in the area mostly discouraged the practice of open defecation as leaving faecal matter in the open especially for children attracted anal diseases when their faeces got to be seen by people with a 'bad eye' as reported by a focus group discussion participant that:

"*We have to be keen in finding out where our children defecate. It is believed that children defecate in the compound or another person's field and a person with a bad eye sees the faeces, the children can acquire boils in their buttocks."*

Such a belief attracted positive sanitation outcomes of avoidance of open defecation by children. However, although taboos that encouraged open defecation were not mostly reported, the near average mean showed that some people held taboos that encouraged defecation in the open. Such taboos surrounded the shame of mentioning human faecal matter and of expressing the urge to relieve oneself as reported in the focus group discussion where a member said:

"Sometimes it is an embarrassment to keep asking household owners permission to use their toilets when moving with cows. At times we are on the road. I see it a taboo to mention the urge. No one wishes to be associated with human waste."

The results suggested that open defecation was common among the people who moved around with livestock due to absence of toilets along the ways. The fear of expressing their sanitation needs discouraged them from using toilets from neighbourhoods. A study report in Ethiopia similarly showed that taboos had a significant contribution to the practice of open defecation (Abebe & Tucho, 2020). The findings suggested the need for strategies to enhance safe faecal disposal options for people on transit in such a community.

When requested to indicate whether herdsmen used latrines while moving with their livestock, participants indicated a general disagreement at a mean of 2.845 (SD=1.460). People who moved with their livestock did not mostly use toilets when they needed to relieve themselves as there could have been no toilets along their grazing or movement ways. In addition, although neighboring households along the road could have had toilets, it could have been difficult for the herdsmen to express their desire to use the toilets. The other statement on latrine use by herdsmen in settler camps yielded a mean of 2.799 (SD=1.463) which implied that herdsmen did not use toilets when in settler camps. Failure to use toilets in both cases was attributed to lack of toilets and reluctance to build temporary structures for temporary solutions as reported in the focus group discussion where a respondent said:

"You see they are mostly moving, they cannot construct toilets in settler camps because they know after sometimes they will move."

Lack of toilets in setter camps and movement with livestock in deserted places attracted open defecation which made adoption of the desired outcomes of CLTS of open-defecation free communities less achieved. A study conducted by Barasa and Waldman

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(2022) also reported similar findings where herdsmen contributed to increased bush open defecation cases in Tanzania. People who implement CLTS required to address occupation-related sanitation issues for the communities to be open-defecation free.

The findings from Table 5 show that at a mean of 3.184 (SD=1.261), respondents indicated that CLTS practices aligned with the cultural values and beliefs of the community. The findings suggested that the community had no issue with the implementation mechanism for CLTS where faecal matter is mentioned and brought in their presence. Studies have reported a likelihood of communities embracing behaviour change approaches that align with their values (Lomas & Hammersley, 2016). The community in the study area therefore had no values that could discourage the implementation of CLTS. Implementation of CLTS requires a receptive community that can feel shocked when faecal matter is brought near them. However, members from the focus group discussion indicated that the community had interacted with faeces from livestock too much to feel ashamed of human faeces as reported:

"We live with faeces from animals. Don't you think that some people might be less shocked when interacting with faeces from human beings? The CLTS process may not always cause disgust to some of these people. They are used to it."

Community-Led Total Sanitation might be less effective when the disgust and fear of faeces are not felt as intended. Context-specific approaches to CLTS could be necessary to improve the receptiveness of CLTS messages to pastoral communities for effective behaviour change.

Results showed that at a mean of 3.898 (SD=0.895), there existed cultural norms that affected sanitation in the community (Table 5). Some communities could have norms and hold practices that affect the willingness to construct or use toilets. Findings from the focus group discussion also indicated that other people who spent their lives in deserted places like warriors contributed to high cases of open defecation in the study area. The participants reported avoidance of toilets at night for the warriors as they were engaged in their missions as follows:

"People have constructed toilets but not all avoid open defecation. Warriors are the only individuals who are not free to use toilets during the day but they can use them at night. They have to stay alert and focused on missions instead of taking breaks. They are on the move during the day or engaged in activities."

Postponement of missions by warriors to attend to personal needs was considered a waste of time and would mean losing the mission. Community-led total sanitation awareness creation interventions are required to address such issues to eradicate open defecation cases in bushes.

Regarding results on beliefs shown in Table 5, most of the respondents (67.8%) reported that there were beliefs in the community that discouraged toilet sharing suggesting that most of the communities in the area did not like sharing toilets either across gender or age. Findings from the focus group discussion indicated beliefs that restricted toilet sharing among in-laws and between adults and children as follows:

"Married women do not use the same toilet with their husband's father. Children are not also supposed to use the same toilets as adults. They have a tendency of wanting to know what an adult is doing inside there."

Having beliefs that discouraged toilet sharing among members of one family implied that households needed to construct toilets several toilets for children, adults and in-laws which could be expensive and impractical especially for low-income families. Failure to provide separate toilets for the groups could have facilitated avoidance of the available toilets for open defecation which promoted failure in CLTS adoption. Other beliefs that affected latrine adoption in households revolved around the perception that toilets would harm livestock as they could collapse inside toilet pits. A participant in the focus group discussion indicated that:

"They believe that cows can get inside the toilets through the pits and deem toilets as animal traps. Toilets are either be constructed away from households or not constructed at all."

People who feared that their livestock would die or get injured in toilets were less likely to construct toilets ar situate the toilets far from households which could discourage some members like women from using them especially at night due to fear of harassment. Similar findings on the influence of beliefs on sanitation behaviours were noted by Barasa and Waldman (2022) in Tanzania and Wasonga et al. (2023) in Kenya.

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Table 5: Culture and CLTS adoption

Statement	Strongly disagree	Disagree	Not sure	Agree	Strongly agree	Mean/SD
Defecation in toilets is considered a taboo	26.5%	23.7%	3.9%	45.6%	0.4%	2.69((1.296)
Our culture promotes open defecation	24.0%	23.0%	6.4%	41.3%	5.3%	2.809(1.336)
Herdsmen use latrines when moving with their livestock	21.6%	31.8%	6.0%	21.9%	18.7%	2.845(1.460)
Herdsmen use latrines while in settler camps	30.7%	17.3%	2.5%	40.3%	9.2%	2.799(1.463)
CLTS practices align with the cultural values and beliefs of my community	17.0%	16.3%	2.8%	59.4%	4.6%	3.184(1.261)
There are cultural norms that affect sanitation in this community	1.8%	11.0%	2.1%	66.1%	19.1%	3.898(0.895)

Beliefs discouraging toilet sharing		
Response	Frequency	Percentage
True	192	67.8
False	91	32.2
Total	**283**	**100.0**

Logistic regression analysis for cultural factors

Findings from the univariable model shown in Table 6 showed that the odds of open defecation were 5.203 times higher for people who perceived defecation in toilets as a taboo ($p<0.001$). Open defecation chances were 3.733 times higher for families whose lifestyle was centered on herding compared to the people who did not practice herding ($p=0.012<0.05$). People who held beliefs against toilet sharing had 0.640 lower chances of defecating in the open compared to when beliefs were not held ($p<0.001$).

All variables that turned out to be significant in the univariable model were also significant in the multivariable model. Consideration of defecation in toilets as a taboo (adjusted OR 4.481 95% CI 29536.800, $p<0.001$), herding (OR 4.094, 95% CI: 0.145-2.856, $p=0.000$) and beliefs surrounding sharing of toilets (OR 0.670, 95% CI: 0.345-4.567, $p=0.002$) influenced open defecation.

In the univariable and multivariable models for the odds of the status of toilets after CLTS in Table 6, the only variable that tested significant was taboos restricting defecation in toilets. Both models showed a reduced likelihood of adopting improved toilets for residents who held such taboos ($p<0.05$). The results implied that open defecation was more common for communities who held sanitation-related taboos and presence of such taboos was an hinderance to toilet utilization and thus adoption of CLTS.

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Table 6: Odds of adoption of CLTS in Laisamis Sub-County (n=283)

Variable	A. Open defecation			
	Unadjusted ORs (95% CI)	P-value	Adjusted ORs (95% CI)	P-value
Defecation in the toilets as a taboo	5.203(3.677-7.360)	<.001	4.481(2.953-6.800)	<.001
Cultural norms affecting sanitation	0.810(0.639-1.027)	.082	0.717(0.459-1.122)	0.146
Lifestyle (herding) hindering CLTS	3.733(0.575-2.933)	0.012	4.094(0.145-2.856)	0.000
Beliefs discouragingtoilet sharing	0.64(0.269-4.497)	<.001	0.670(0.345-4.567)	0.002
B. Status of toilets adopted after CLTS				
Defecation in the toilets as a taboo	0.621(0.451-1.568)	<.001	0.655(0.481-1.891)	0.007
Cultural norms affecting sanitation	1.093(0.857-1.395)	0.473	0.921(0.648-1.310)	0.648
Lifestyle (herding)	0.724-0.570-0.921	0.058	0.718(0.815-1.703)	0.384
Beliefs discouragingtoilet sharing	1.122(0.884-1.423	0.344	0.886(0.657-1.195)	0.429

CONCLUSION

Although CLTS had been implemented, the desired outcomes of adopting improved toilets, use of toilets and open-defecation free status in the communities were minimally achieved. The study concluded that CLTS could be an effective approach in promoting behaviour change only if the factors that influenced its adoption were addressed. The practice of open defecation and adoption of unimproved toilets were as a result of the interaction of residents with animal faeces which made them treat human faeces with the same measure as animal faeces, low participation in CLTS triggering exercises, limited strategizing on natural leaders for social mobilization, taboos discouraging toilet use, beliefs which prohibited toilet sharing among family members and the lifestyle of herding cattle in lonely and deserted places without toilets. Although culture should be respected, context-specific solutions are needed to ensure that the desired outcomes after CLTS are attained to minimize slippage down the sanitation ladder.

RECOMMENDATION

The study recommends regular follow-ups to communities where CLTS has been implemented to ensure complete eradication of open defecation and to oversee the construction of improved toilets. The follow-up activities should incorporate household-based training on latrine construction. Sanitation marketing is essential at the community level, to sell ideas on the best toilets to be constructed using locally available materials which could favour the poor, who cannot afford the costs associated with the construction of toilets. In addition, community sanctions are necessary to restrict open defecation practices whether in bushes or within the household compounds. This should be preceded by awareness creation campaigns to make people understand that faeces left in the open could facilitate sanitation-related infections.

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Given the cultural orientation of the communities in the study area, the study recommends context-specific CLTS strategies that address sanitation needs in the most practical and effective way, to make communities better appreciate the essence of adopting toilets. The strategies could make them better and practically appreciate safe sanitation practices. Besides, efforts by governments and policymakers are needed to advocate for the construction of public toilets along the roads and in strategic places of deserted areas to ensure that herdsmen can have options to manage their faecal matter. The study identified a need for the CLTS implementors including the Ministry of Health to advocate for local champions who are respected figures in the community and who can command behaviour change. Participatory approaches during the CLTS implementation processes are needed to ensure representation of gender in the triggering meetings. This would make both men and women more informed on the essence of toilet construction and use, thus successful adoption of CLTS.

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