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Demographic and social-cultural dynamics on access to safe sanitation in pastoral communities: A case of Saku sub-County, Marsabit, Kenya

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ABSTRACT

The Sustainable Development Goals (SDGs) agenda 6.2 aim for universal access to safely managed sanitation by 2030 and also emphasizes eradication of open defecation as a way to promote pathogen-free environment. Despite efforts to improve sanitation standards, significant challenges still persist, particularly in developing regions inhabited by pastoral communities and could be linked to unique components in the society. This study investigated the influence of demographic and social-cultural factors on access to safely managed sanitation in pastoral communities of Saku Sub-County, Kenya, where sanitation access is notably low. A cross-sectional descriptive design was employed. Semi-structured questionnaires were used to collect data from a sample of 100 household heads, calculated using Yamane's adjusted formular. The data was analysed using Statistical Package for Social Sciences (SPSS) version 26 in descriptive and inferential statistics. Findings showed that gender roles were significant predictors of toilet adoption at the households (β=0.138, p=0.01). The nature of work for women such as having to look for water and for men like herding in lonely places where there were no toilets attracted open defecation cases. Latrine utilization was minimal at night due to safety concerns among females as indicated by 72% of the respondents. The cultural beliefs held in the region had a negative influence on toilet adoption (β=-0.130, p=0.040) while level of awareness on sanitation-related matters among the residents positively influenced adoption of safe toilets, thus increased access to safe sanitation (β=0.127, p=0.011). Construction of toilets near some households was undermined by the fear that the toilet pits would kill or injure livestock, which seemed to be given the highest priority. Traditions that revolved around restriction of latrine sharing between grown-ups and children attracted cases of open defecation even with access to toilets which suggested a need for toilets separation. The study recommended exploration of different context-appropriate mechanisms for triggering behaviour change to enhance sanitation standards among pastoral communities. An assessment of demographic characteristics, social and cultural practices prior to implementation of sanitation solutions, along with stakeholder involvement, could help in spotting any drawbacks towards ownership, uptake and sustainability of sanitation solutions.

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Introduction

The Sustainable Development Goals (SDGs) agenda 6.2 envisions universal access to safely managed sanitation with zero cases of open defecation by 2030 (UN, 2015) as a strategy towards improved public health, social wellbeing and economy. Although states and Non-Governmental Organizations have shown efforts towards improvement of sanitation standards, the reality for millions of people is one of polluted environments and use of toilets which fail to separate human contact from excreta with a noticeable gap between developing and developed countries. A report by WHO/UNICEF (2023) showed that 3.5 billion people globally accessed unsafely managed sanitation by 2020 with 419 million people still practicing open defecation. In Europe, 72% of the population had safely managed sanitation facilities compared to 25 % in less developed countries where countries in Sub-Saharan Africa, Kenya included, had only 20% coverage in safely managed sanitation (WHO/UNICEF, 2023). The use of unsafe sanitation facilities and the practice of open defecation could expose the population to diarrhoeal diseases responsible for 30% of annual morbidities among children under 5 years in low and middle-income countries (WHO, 2022). According to Mulenga et al. (2017), societal social, demographic and economic factors could explain the disparities in access to safely managed sanitation which differ with communities.

Community awareness and education level on sanitation matters could improve sanitation standards and eliminate open defecation. A study by Paul et al. (2022) in America that assessed factors associated with open defecation established that 25% of the population practiced open defecation. The study found out that high household head's level of education and access to information sources about sanitation matters significantly minimized open defecation practices. A similar study in Ethiopia, by Temesgen et al. (2021) found out that household heads having formal education had 3.10 odds of avoiding open defecation (CI 95%: 1.34-7.13) compared to those who lacked. However, although increased knowledge and awareness regarding sanitation could be essential, the outcomes for approaches of awareness creation such as public and community health campaigns and Community-led total sanitation have exhibited mixed outcomes in ensuring adoption of toilets and eradication of open defecation (McMichael, 2018). In Ghana, a study by Alhassan and Anyarayor (2018) established that while effective communication on the essence of safe sanitation resulted in widespread sanitation awareness, community beliefs accounted for households' inability to sustain latrine utilization where people avoided even the available toilets. Avoidance of the available toilets could encourage people to defecate openly exposing them to infectious pathogens.

A set of beliefs relating to sanitation uptake have been associated with adoption of sanitation practices which however could differ from region to region. In Indonesia, a study by Dwipayanti et al. (2019) that assessed the cultural determinants of sanitation sustainability and uptake found out that establishment of latrines in households was considered polluting and was believed to cause illnesses and attracted curses from gods. Lack of latrines in the households could attract the practice of open defecation hence diseases related to poor excreta disposal. Similar sanitation-related beliefs were also noted by Bhatt et al. (2019) in Nepal where residents preferred open defecation to latrine utilization because having a latrine at home was deemed to attract diseases and smell. In Kenya, a study by Wasonga et al. (2016) that examined the determinants of sanitation practices established that toilet sharing among males and females or in-laws was prohibited and that the use of latrines at night exposed members to evil spirits.Establishment of many toilets per household because of toilet non-sharing beliefs could be expensive especially for the poor households. Beliefs could however differ with communities. It was therefore be necessary to find out the existence of sanitation-related beliefs in the study area.

While the topic of gender and sanitation has received attention in research, sanitation insecurity among women and children has yet to be defined (*Caruso et al*., 2017). Males, females and children have different sanitation needs related to safety, privacy and convenience and therefore require sanitation facilities which address their needs. The role of gender in household sanitation provision where households adopt toilets that are non-friendly to some members like women and children has attracted indisputable debates in the literature. In India, a study by Caruso et al. (2017) that analysed gendered sanitation experiences established that women preferred def-

ecating and throwing children faeces in the open to save time for household chores such as house maintenance and washing because the toilets were situated far from households. Location of toilets far from households could attract insecurity concerns and make women fear using the toilets. Another similar study by Khanna and Das (2016) in India that explored gender and sanitation safety found out that although women had higher demand for safe latrines, they continued to defecate in bushes and water bodies because the available toilets were unsafe for use due to lack of privacy and location far from households. The study established that gender-based power dynamics where men had the overall mandate on sanitation-decision making influenced establishment of women-unfriendly toilets. Unless women are also involved as decision-makers in household sanitation matters, toilets adopted at the households could fail to address their sanitation needs.

Another issue that could arise in access to safely managed sanitation facilities is inability of children to use some of these facilities such as pit latrines. For instance, Ellis et al. (2020) observed that barriers to safe disposal of child faeces were lack of latrines, time associated with safe disposal practices, beliefs that infant faeces were not harmful, and not knowing where children had defecated. Children may be discouraged from using the latrine if the slab is not designed with them in mind and is too big for them. Access to safely managed sanitation facilities is key to healthy and safe environment. Although the United Nations (2015) has set a target of achieving safe sanitation and end open defecation for all by 2030, developing countries seem off track the goals and achievement of the target may require consideration of new strategies for progress (WHO/UNICEF, 2023).

Pastoral communities mostly interact with animal faeces and could treat human excreta with equal management measures just like animal faeces (Maliti, 2021), thus could fail to embrace safe sanitation measures for human excreta. Unless sanitation-related behavioural factors are well comprehended and addressed, provision of unsafe, underutilized toilets as well as open defecation practices could continue being rampant making attainment of the SDGs agenda 6.2 and illusion in such communities. There is a limited empirical data on the influence of demographic and social-cultural factors on access to safely managed sanitation particularly in pastoral communities which was the focus of this study. With the increasing rates of open defecation cases and access to unsafe sanitation facilities in pastoral communities (Njuguna & Muruka, 2017; *Busienei et al*., 2019), there is need to examine the influence of demographic and social-cultural factors on access to safely managed sanitation to inform strategies for progression in sanitation ladder in such areas.

Objective

To investigate the influence of demographic and social-cultural factors on access to safely managed sanitation in pastoral communities of Saku Sub-County, Kenya

Methodology

The study used a cross-sectional descriptive study design and a quantitative approach of data collection. The data was collected in Saku Sub-County, Marsabit County, Kenya, where sanitation access is low. The area is mostly inhabited by the pastoral communities who depend on livestock keeping as the main economic activity. The study targeted the household heads in Saku Sub-County as they were believed to possess accurate information regarding their households. A sample of 100 household heads, calculated using Yamane's (1967) formula was used. Cluster sampling technique was used to classify the area into three clusters of the respective Wards, namely: Central, Karare and Sagante (KNBS, 2019). Proportionate-to size simple random sampling technique was then used in selection of participants at the household level. The product of the ratio of number of households per cluster and total number of households in the Sub-County was used to determine the participants to be engaged in the study per cluster as shown in **Table 1**.

Ward	No. of Households	Sample Size
Central	11294	83
Karare	899	7
Sagante	1366	10
Total	13559	100

Table 1: *Sample size distribution*

Data was collected from household heads using semi-structured questionnaires and was analysed in descriptive and inferential statistics (multiple regression) to test the relationship between independent and dependent variables. A research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI). Permission was sort from county health managers and individual respondents. The respondents were assured of confidentiality of the information gathered. Ensuring confidentiality and data security was crucial to protecting the privacy of participants and maintaining ethical standards in research. The data collected was stored in coded form without individual identifiers, and access to the data was limited to the principal investigator. Participant's informed consent was sort and codes were used instead of respondents' real names.

Results and Discussions

The results obtained from the study were as discussed.

Demographic factors

Results in table 2 indicate that most respondents under the study were over 50 years 37 (37%) followed by 32 (32%) between 21-35 years, 24 (24%) between 36-50 years, 7 (7.0%) less than 20 years. This implied that most of the respondents were aged 50 years and above represented by 37 (37%) and the least representation was of ages less than 20 years. This finding aligns with the study by Akter et al. (2022), which highlighted that older household heads had better access to higher levels of adequate sanitation in Bangladesh. This suggests that older individuals might have more experience, resources, or priority for sanitation improvements. However, the specific cultural context of older individuals in Saku Sub-County might also contribute to this trend.

Regarding number of people in households, majority of households were occupied by 2-5 people represented by 55 (55.0%), followed by 6-10 people 31 (31%) and above 10 people in the household represented by 8 (8%) and finally less than 2 were 6 (6%). The study by Donacho et al. (2022) also highlighted that larger family sizes negatively impacted sanitation access in Jimma, Ethiopia. Larger families may strain available resources, making it harder to allocate sufficient funds for sanitation improvements.

Forty two percent (42%) of people engaged in the study had no form of formal education. Education increases awareness of health benefits associated with improved sanitation and the knowledge needed to navigate and access resources or programs that provide such facilities, an lack of it thereof could promote poor sanitation behaviours. Studies for instance by Akter et al. (2022) found that highly educated household heads had better access to sanitation facilities in Bangladesh.

	Frequency	Percent
Less than 20	7	7.0
21 – 35 years	32	32.00
36 – 50 years	24	24.00
Over 50	37	37.00
Household size		
Less than 2	6	6.00
2 – 5	55	55.00
6 – 10	31	31.00
Over 10	8	8.00
Level of education		
No formal education	42	42.00
Primary	36	36.00
Secondary	10	10.00
Post-secondary	12	12.00
Total	**100**	**100.00**

Table 2: *Demographic characteristics*

Regression analysis on the influence of demographic factors on access to safely managed sanitation

Table 3 below shows the regression findings from analysis of demographic factors and indicators of access to safe managed sanitation (dependent variable) For engagement in open defecation despite having toilets, the model, based on 100 observations, has an R-squared of 0.0398 and an F-statistic of 0.6421 ($p = 0.6963$), indicating that none of the predictors were significant. The model for inadequate toilet facilities (R-squared = 0.1692, F-statistic = 3.1574, $p = 0.0073$) shows age ($\beta = -0.1648$, $p = 0.044$) and area of residence ($\beta = -0.5021$, $p = 0.014$) as significant predictors, with younger individuals more likely to have access to inadequate sanitation facilities suggesting age-related disparities in access. For improved toilets, the model (R-squared = 0.0961, F-statistic = 1.6480, $p = 0.1427$) indicates gender ($\beta = 0.2479$, $p = 0.019$) as a significant predictor, with men more likely to report improved conditions. The findings highlight that both age and

Equation	Obs	Parms	RMSE	"R-sq"	F	P
engaging_i~s	100	7	1.381736	0.0398	.6420675	0.6963
inadequate~s	100	7	.7259807	0.1692	3.157378	0.0073
absenceof_~s	100	7	.6367469	0.0971	1.666255	0.1380
improved_t~s	100	7	.4893707	0.0961	1.648001	0.1427
type_of_to~t	100	7	1.109427	0.1396	2.514982	0.0267

	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Engaging_in_od_despite_toilets						
gender	-.1869434	.294143	-0.64	0.527	-.771053	.3971662
age	.1720245	.1535524	1.12	0.265	-.1329003	.4769492
education_level	-.0471834	.1468284	-0.32	0.749	-.3387554	.2443887
househol_size	.180547	.2173261	0.83	0.408	-.2510196	.6121136
number_children	.0854015	.2701087	0.32	0.753	-.450981	.6217839
area_residence	-.1500002	.3795171	-0.40	0.694	-.903646	.6036456
_cons	2.933653	1.068628	2.75	0.007	.8115698	5.055736
Inadequate_toilet_facilities						
gender	.0271279	.1545463	0.18	0.861	-.2797704	.3340261
age	-.1647546	.0806783	-2.04	0.044	-.3249658	-.0045435
education_level	-.0961016	.0771454	-1.25	0.216	-.2492971	.0570939
househol_size	-.0575796	.1141858	-0.50	0.615	-.28433	.1691707
number_children	-.0398592	.1419184	-0.28	0.779	-.321681	.2419626
area_residence	-.5021315	.1994029	-2.52	0.014	-.8981061	-.1061569
_cons	5.530241	.56147	9.85	0.000	4.415273	6.645209
Absenceof_toilets						
gender	.109284	.1355502	0.81	0.422	-.1598919	.3784599
age	.0371103	.0707618	0.52	0.601	-.1034085	.1776291
education_level	-.0440184	.0676631	-0.65	0.517	-.1783839	.0903471
househol_size	-.0853332	.1001507	-0.85	0.396	-.2842125	.1135462
number_children	.026985	.1244745	0.22	0.829	-.2201967	.2741667
area_residence	-.3976544	.1748933	-2.27	0.025	-.7449578	-.0503509
_cons	4.762334	.492457	9.67	0.000	3.784412	5.740256
Improved_toilets						
gender	.2478809	.1041769	2.38	0.019	.0410063	.4547556
age	.0331815	.0543838	0.61	0.543	-.074814	.141177
education_level	-.0707221	.0520024	-1.36	0.177	-.1739884	.0325443
househol_size	-.0747456	.0769706	-0.97	0.334	-.2275939	.0781028
number_children	.0405214	.0956647	0.42	0.673	-.1494496	.2304925
area_residence	.0202732	.1344139	0.15	0.880	-.2466463	.2871927
_cons	4.308811	.3784769	11.38	0.000	3.557231	5.060392
Type_of_toilet						
gender	-.4691187	.236174	-1.99	0.050	-.9381134	-.000124
age	.1707412	.1232907	1.38	0.169	-.0740897	.4155721
education_level	-.1327544	.1178918	-1.13	0.263	-.3668641	.1013554
househol_size	-.0953536	.174496	-0.55	0.586	-.4418681	.2511609
number_children	.1522804	.2168764	0.70	0.484	-.2783931	.5829539
area_residence	-.8065783	.3047228	-2.65	0.010	-1.411697	-.2014592
_cons	3.024972	.8580252	3.53	0.001	1.321104	4.72884

Table 3. *Multivariate Regression on Demographic Factors and Access to Safely Managed Sanitation Facilities*

gender play important roles in determining access to improved sanitation, pointing to the need for targeted interventions to address these inequalities.

The findings indicate that younger individuals are more likely to experience inadequate sanitation facilities, suggesting age-related disparities in access. Additionally, gender significantly influenced the adoption of improved toilets, with men more likely to report better sanitation conditions. This highlights that both age and gender play important roles in determining access to improved sanitation, pointing to the need for targeted interventions to address these inequalities.

Influence of social-cultural practices on access to safe sanitation

Traditional cultural practices reflect values and beliefs held by members of a community for periods often spanning generations. Every social grouping in the world has specific traditional cultural practices and beliefs, some of which are beneficial to all members, while others are harmful to a specific group, such as women (UNICEF/WHO, 2023).

The study sought to investigate whether latrines situated in secluded areas were used at night and its influence on safely managed sanitation facilities

	Frequency	Percent
Strongly Agree	5	5.00
Agree	15	15.00
Neutral	8	8.00
Disagree	36	36.00
Strongly disagree	36	36.00
Total	**100**	**100**

Table 4: *Latrines situated in secluded areas are mostly unused at night.*

in Saku sub-county, and the results were presented in the **table 4.**The results from **Table 4** illustrate the distribution of responses regarding the usage of latrines situated in secluded areas at night. The data shows that a substantial portion of the respondents, 72% (with 36% strongly disagreeing and 36% disagreeing), did not believe that latrines in secluded areas were mostly unused at night. In contrast, 5% of the respondents strongly agreed and 15% agreed with the statement, while 8% remain neutral. This distribution suggests that despite the seclusion, many people still used these latrines at night, possibly indicating a level of necessity or limited alternatives. However, the 20% agreement also pointed out some concern or avoidance, highlighting a potential area for improving the safety and accessibility of these facilities during nighttime. Results indicated that females would fear visiting toilets alone especially at night when located far away from dwelling places due to safety concerns.

Gender roles and prevalence of open defecation

The role of gender in determining access to safe sanitation was investigated and findings were as shown in **Table 5**. The data reveals varying opinions on whether female roles impacted the prevalence of open defecation. Approximately 34% of respondents either agreed or strongly agreed that female roles played a role in this practice. Findings showed that female roles such as having to look for water in deserted places attracted open defecation as there were no toilets available for use. However, a significant portion (50%) either disagreed or remained neutral. When asked whether males roles influenced the prevalence of open defecation, approximately 39% of respondents either agreed or strongly agreed that male roles play a role in this practice. The results indicated that men, who were mostly tasked with taking livestock for grazing practiced open defecation as they grazed in lonely places without toilets. A significant portion (41%) however either disagreed or remained neutral. This suggests a complex social dynamic which call for targeted interventions to address sanitation practices effectively and highlight the need for context-specific interventions to address sanitation practices within the community. To promote better hygiene and sanitation, it is crucial to understand the cultural factors influencing access to safe sanitation.

	Frequency	Percent
Strongly Agree	10	10.00
Agree	24	24.00
Neutral	16	16.00
Disagree	31	31.00
Strongly disagree	19	19.00
Total	**100**	**100**

Table 5: *Female roles influence the prevalence of open defecation*

	Frequency	Percent
Strongly Agree	11	11.00
Agree	28	28.00
Neutral	20	20.00
Disagree	28	28.00
Strongly disagree	13	13.00
Total	**100**	**100**

Table 6: *Male roles influence the prevalence of open defecation*

Toilet separation by gender

The study sought to investigate how segregation of toilets by gender influenced their utilization on safely managed sanitation facilities in Saku sub-county, and the results were presented in the **Table 7**.

	Frequency	Percent
Strongly Agree	20	20.00
Agree	24	24.00
Neutral	8	8.00
Disagree	26	26.00
Strongly disagree	22	22.00
Total	**100**	**100**

Table 7: *Segregation of toilets by gender influences their utilization*

The data from **Table 7** indicates varying opinions on whether the segregation of toilets by gender influenced their utilization. Notably, among the respondents, 20% strongly agreed and 24% agreed that gender-segregated toilets impacted utilization positively. The results were associated with residents', particularly women's desire of privacy while using toilets. Results obtained from the open-ended questions further showed that women would fear being 'peeped at' while using toilets shared with men.

Maintenance of toilets

The researchers wanted to establish whether maintenance status in toilets influenced safely managed sanitation and the results were presented in the **Table 8**.

The highlights opinions regarding the avoidance of toilets with stagnant urine or faeces on the floor. Approximately 22% of respondents strongly agreed and 23% agreed that such toilets should be avoided. Conversely, 26% strongly disagreed and 18% disagreed with the statement. The findings indicated a mixed perspective on the importance of maintaining clean and hygienic toilet facilities. It suggested a need for increased awareness and education on proper maintenance of sanitation practices to ensure access to user-friendly sanitation facilities.

	Frequency	Percent
Strongly Agree	22	22.00
Agree	23	23.00
Neutral	11	11.00
Disagree	26	26.00
Strongly disagree	18	18.00
Total	**100**	**100**

Table 8: *Toilets with stagnant urine or faces on the floor are avoided*

Influence of culture and traditions on access to safe sanitation

Table 9 summarizes findings on how traditions and culture influenced access to safe sanitation in the study area.

	Frequency	Percent
Strongly Agree	27	27.00
Agree	23	23.00
Neutral	17	17.00
Disagree	20	20.00
Strongly disagree	13	13.00
Total	**100**	**100**

Table 9: *Distribution of responses on Certain traditions in this area discourage individuals from constructing toilets.*

The data from **Table 9** reveals varying opinions regarding whether certain traditions discouraged individuals from constructing toilets. Approximately 50% of respondents either agreed or strongly agreed with this notion. This indicates that half of the population perceived traditional beliefs as a significant barrier to constructing toilets. It was reported that pastoralists perceived toilets located near households as dangerous structures as they could trap their livestock, which were highly treasured, to injuries or death. Such beliefs discouraged adoption of toilets near the households which affected access to safe sanitation. Other traditions reported revolved around reluctance of toilet sharing between adults and children. The findings underscored the need for

EquationA	Obs	Parms	RMSE	"R-sq."	F	P
engaging_i~s	100	6	1.284529	0.1612	3.613149	0.0049
inadequate~s	100	6	.7146955	0.1862	.301489	0.0014
absenceof_~s	100	6	.6113413	0.1587	.547197	0.0055
improved_t~s	100	6	.470695	0.1548	3.442909	0.0067
type_of_to~t	100	6	1.090831	0.1593	3.561295	0.0054

	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Engaging_in_od_despite_toilets						
gender_roles	.3593646	.0942325	3.81	0.000	.1722637	.5464655
awareness	-.0502576	.0878646	-0.57	0.569	.2247147	.1241996
cultural_beliefs	-.0083413	.1125597	-0.07	0.941	-.2318312	.2151485
traditions	.05694	.0943573	0.60	0.548	-.1304088	.2442887
safety_latrines	.0093096	.1111394	0.08	0.933	-.2113602	.2299795
_cons	2.380655	.5509968	4.32	0.000	1.286638	3.474672
Inadequate_toilet_facilities						
gender_roles	.1384722	.0524298	2.64	0.010	.0343717	.2425728
awareness	.127312	.0488867	2.60	0.011	.0302462	.2243778
cultural_beliefs	-.1303558	.0626268	-2.08	0.040	-.2547027	-.0060088
traditions	.0924418	.0524992	1.76	0.082	-.0117967	.1966802
safety_latrines	-.0559028	.0618365	-0.90	0.368	-.1786807	.0668751
_cons	.50681	.3065676	11.44	0.000	2.898113	4.115507
Absenceof_toilets						
gender_roles	.1385703	.0448478	3.09	0.003	.0495241	.2276166
awareness	.0453638	.0418171	1.08	0.281	-.037665	.1283926
cultural_beliefs	-.0511981	.0535701	-0.96	0.342	-.1575629	.0551666
traditions	-.0153966	.0449072	-0.34	0.732	-.1045608	.0737677
safety_latrines	.0872568	.0528942	1.65	0.102	-.0177658	.1922794
_cons	3.668414	.262234	13.99	0.000	3.147742	4.189086
Improved_toilets						
gender_roles	.0802309	.03453	2.32	0.022	.0116707	.148791
awareness	.0767222	.0321966	2.38	0.019	.0127951	.1406492
cultural_beliefs	-.0412724	.0412457	-1.00	0.320	-.1231667	.0406219
traditions	.0835972	.0345757	2.42	0.018	.0149462	.1522481
safety_latrines	.0059995	.0407253	0.15	0.883	-.0748614	.0868605
_cons	3.924218	.201904	19.44	0.000	3.523333	4.325104
Type_of_toilet						
gender_roles	.0702743	.080023	0.88	0.382	-.0886132	.2291618
awareness	-.2028304	.0746153	-2.72	0.008	-.3509808	-.05468
cultural_beliefs	-.0731057	.0955865	-0.76	0.446	-.262895	.1166836
traditions	.0177533	.080129	0.22	0.825	-.1413447	.1768512
safety_latrines	.2324507	.0943804	2.46	0.016	.0450562	.4198452
_cons	1.577903	.4679107	3.37	0.001	.648855	2.50695

Table 10: *Multivariate Regression Analysis on Socio-Cultural Factors and Access to Safely Managed Sanitation Facilities*

context-specific interventions to address sanitation practices within the community. The results aligned with the findings from Girmay et al. (2022), who noted that cultural and social norms significantly influenced sanitation practices in Ethiopia. Addressing these socio-cultural barriers through community education and engagement is essential for improving sanitation access in Saku Sub-County.

The report in **Table 10** presents an analysis of socio-cultural factors influencing safely managed sanitation facilities based on regression models. The data comprises 100 observations, focusing on key predictors: gender roles, awareness, cultural beliefs, traditions, and the safety of latrines. Five dependent variables were examined: engaging in open defecation despite toilets, inadequate toilet facilities, absence of toilets, improved toilets, and type of toilet. For engagement in open defecation despite having toilets, gender roles had a positive and significant effect (coefficient = 0.359, $p < 0.001$), indicating that stronger adherence to gender roles was associated with higher engagement in open defecation. The model was significant ($p = 0.0049$).

In the context of inadequate toilet facilities, gender roles (coefficient = 0.138, $p = 0.010$), awareness (coefficient = 0.127, $p = 0.011$), and cultural beliefs (coefficient = -0.130, $p = 0.040$) were significant predictors, with the model overall being significant ($p = 0.0014$). For the absence of toilets, gender roles was also a significant predictor (coefficient = 0.139, $p = 0.003$), with the model significant ($p = 0.0055$). Improved toilets were significantly influenced by gender roles (coefficient = 0.080, $p = 0.022$), awareness (coefficient = 0.077, $p = 0.019$), and traditions (coefficient = 0.084, $p = 0.018$), with the model being significant ($p = 0.0067$). For the type of toilet, awareness (coefficient = -0.203, $p = 0.008$) and the safety of latrines (coefficient = 0.232, $p = 0.016$) were significant predictors, and the model was significant ($p = 0.0054$).

The analysis showed that gender roles consistently played a significant role in influencing toilet-related issues, indicating that societal expectations tied to gender strongly shape sanitation access and behaviors. Awareness also emerged as a critical factor, appearing as significant in several models, though its impact varied depending on context. This suggests that how informed individuals are about sanitation issues can either positively or negatively influence outcomes. Cultural beliefs had a notably negative impact on the perception of toilet adequacy, with some traditional views possibly discouraging the use or acceptance of existing facilities. In contrast, traditions were found to positively affect the likelihood of having improved toilets, implying that some long-standing practices may support better sanitation infrastructure. Finally, the safety of latrines was a key factor, positively associated with the type of toilet used, highlighting that people are more likely to use improved sanitation facilities when they perceive them as safe. Overall, social and cultural dynamics play central roles in shaping sanitation outcomes.

Conclusion and Recommendation

The study concluded that access to safe sanitation was low due to the influence of, among other factors, demographic and social-cultural factors among pastoral communities. The study recommended exploration of different context-appropriate mechanisms for triggering behaviour change by sanitation implementers to enhance sanitation standards among pastoral communities. An assessment of demographic characteristics, social and cultural practices prior to implementation of sanitation solutions, along with stakeholder involvement, could help in spotting any drawbacks towards ownership, uptake and sustainability of sanitation solutions.

Conclusion of Interest

The authors declare no conflict of interest.

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