



Influence of social cultural factors on adoption of sanitation systems in rural communities: case of Tharaka-North sub-county, Tharaka-Nithi County, Kenya.

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ABSTRACT

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The Sustainable Development Goal agenda 6.2 targets to achieve universal basic sanitation and hygiene by 2030 (United Nations, 2018). This paper assessed the influence of social cultural factors on adoption of sanitation systems in rural communities. The article was based on field research that employed convergent research design where both qualitative and quantitative data was gathered simultaneously. Quantitative data was gathered using mixed questionnaires from 388 household heads selected using stratified proportionate simple random sampling techniques. The study objectives were to assess the influence of religion, traditions and gender on adoption of sanitation systems in rural communities and to assess the influence of toilets on adoption of sanitation systems in rural communities. Qualitative data was collected using an interview guide from a purposively selected focus group consisting of 13 participants. The findings were organized into themes and presented in narratives. Quantitative data was analyzed using the statistical package for social sciences (SPSS) version 25.0 which generated descriptive and inferential statistics to unveil the relationship between variables. The findings, established that the adoption of unimproved toilets was the main form of sanitation system, covering a mean of 2. 9807. A unit increase in traditions led to a 0.029 decrease in adoption of sanitation systems ($p.value=0.009$) in the rural communities. A unit increase in gender roles led to a 0.142 increase in adoption of sanitation practices ($p.value=0.001$). Residents believed that faeces left in the open could be used for witchcraft purposes, a tradition that had a positive impact in eradication open defecation. Some religious denominations like the Kavonikia and Agendi associated diarrhea with demons other than the poor sanitation which was seen to facilitate poor sanitation practices and systems. The study recommended that the Community Led Total Sanitation (CLTS) strategy should target both open defecation and enlighten residents on the dangers of adopting unimproved latrines. The study also recommended that inclusion of women in household sanitation matters to ensure adoption of women and children friendly household sanitation facilities and incorporation of religious leaders as advocates of sanitation systems alongside demographic, psychosocial and environmental factors.

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Introduction

The global Sustainability Development Goal 6 (SDG6) aims to ensure sustainability and sanitation for all by 2030 (United Nations 2018). It includes eight targets that address drinking water in sanitation and hygiene (WASH) services, waste water, water quality, water use, water management, Trans Boundary Corporation and participation of local communities. Multi stakeholder engagement is critical for making progress towards Sustainable Development Goal (SDG6) to ensure access to water and sanitation for all which is currently off track to be achieved by 2030. Provision of adequate sanitation has been pointed out as one of the common strategies preventing sanitation related diseases such as Cholera and diarrhea (*Busienei et al 2019*).

In Lowdar, a study by *Busienei et al* (2019) established that 27% of the available latrines were full to capacity and 12% had floors with excreta scattered on the slabs. Rural sanitation is at times ignored and a lot emphasis put on urban informal settlements. The increasing number of children death in developing countries as a result of easily preventable diseases like diarrhea warrants urgent attention in rural sanitation where the children mostly live. Existing studies for instance by *Busienei et al* (2019), *Ssemugabo et al* (2021) and *Mwirigi et al* (2020) confirm issues and the status of latrine facilities could influence the adoption of sanitation systems.

Maximizing success and use of safely managed sanitation facilities reduces the risk of human contact with excreta (*Wasonga et al*, 2016). Contact with excreta from unsafesanitation facilities could result in diarrhea incidences responsible for 88% of children deaths in Sub-Saharan Africa (*Demissie et al*,2021). The role of gender in sanitation programming has been reported to constrain access to suitable sanitation facilities specifically for females (*Caruso et al*,2017, *O'Reilly*,2016, *Khanna & Dar*,2016).

Although the influence of religion on sanitation practices is conceptualized as less obvious, some values could interfere with toilet adoption and use for people who deeply embrace them. Study by *Rowray et al* (2017) in India found out that in 80% of households, power dynamics were limited to one gender. Although the importance of safe sanitation facilities is acknowledged, reports by WHO/UNICEF (2021) show that 3.6 billion people globally access unsafe sanitation facilities where 14% from develop-

ing countries defecate in the open, with the majority from developing countries. In developing countries like Kenya, only 33% of the population use sanitation facilities which separate them from contact with excreta and 9% still practice open defecation (WHO/UNICEF,2021). Inadequate adoption and use of sanitation facilities could be associated with social cultural factors. The need for the universal access to safe sanitation has been underscored in the Kenya vision 2030 agenda on sanitation as a fundamental face towards eradication , of diarrhea morbidities, poverty and possible mortalities (WHO/UNICEF)

Adoption and use of sanitation facilities is thus likely to be more successful when the communities' social cultural perspectives are considered which was the facts of the study.

Problem Statement

Poor sanitation is responsible for 10% of the global disease burden. Inadequate access to appropriate sanitation and hygiene practices largely impacts the health of the communities leading to sanitation related illnesses such as diarrhea, intestinal worm infectors and upper respiratory tract infections. Universal access to sanitation can only be attained through adoption and active use of improved sanitation facilities to ensure complete separation of human contact from excreta (WHO/UNICEF).

Approaches instituted by the government to promote improved sanitation and creation of awareness have not shown complete effectiveness in triggering a sustainable sanitation behavior change.

Objectives

The objective of the study was to assess the influence of religion, traditions and gender on adoption of sanitation systems in rural communities and to assess the influence of toilets on adoption of sanitation systems in rural communities.

Methodology

Study design

The study adopted a convergent mixed methods research design which enabled simultaneous gatherings of both qualitative and quantitative data.

Study area

The survey/study was conducted in Tharaka-North Sub-County of the Tharaka-Nithi which borders Embu

County to the East, Kitui county to the West and Meru County to the North. The main activity for the people of Tharaka-North Sub- County is agriculture. They mainly grow green grams, Sorghum and millet since the area is semi-arid which frequently experiences drought. The area of the study was chosen because it is rural . It's mainly predominantly inhabited by the Tharaka tribe who live together in homesteads headed by male household husbands, their wives, children and sometimes their children's families. The Sub- County has a total population of 58,345 and 13,413 households (KNBS,2019).

Target population

According to Onjala(2017),population is the aggregate assumption of components about which we wish to make decisions. Tharaka-North Sub- County has a population of 58,345 people. The study consisted of household heads, public health officers, community health volunteers and masons.

Location	Number of Households'	Population
Gatunga	1815	7723
Kathangachini	2191	9934
Maragwa	1822	8216
Kanjoro	2258	9712
Gikingo	3091	13131
Ntoroni	1101	4676
Thiiti	1137	4976
TOTAL	13415	58345

Distribution of population and households in Tharaka-NorthSub-county.

Sample size

Yamane's (1967) formula was used in calculating the number of participants for the study. The formula was used to calculate an appropriate sample size , 388 given a known population size and a preferred value for a margin of error. The formula is important as it allows inferences and conclusions drawn from the survey to be applied to the complete population which the sample is drawn. The sample was therefore determined as follows; $n=N/(+N(e^2))$, whereby, n represented the desired sample,N was the total tar-

get population size, and e was the sample error(considered to be +/- 5%) $=13415/ (1+13,415(0.052))$. The sample size is 388 households.

Sampling technique

Cluster sampling technique was employed in categorizing Tharaka-North Sub-county into clusters of seven locations namely Gatunga (1815households), Kathagachini(2191households), Maragwa (1822 households), Kanjoro (1822 households), Gikingo (3091 households), Ntoroni (1101 households) and Thiiti (1137 households),(KNBS,2019).To fairly select responsibilities from each location, the researcher will employ the proportionate random sampling technique where participants are chosen from unequally distributed clusters (Mukadi,2016).

Location	Number of household per cluster	Sample per location (n2)=(Ne/N)*n
Gatunga	1215	53
Kathagachini	2191	63
Maragwa	1822	53
Kanjoro	2258	65
Gikingo	3091	89
Ntoroni	1101	32
Thiiti	1137	33
Total locations =7	Total households (N)=13415	Desired sample size(n)=388

Table1: Distribution of samples for Tharaka-North Sub-County

Additionally, the study considered purposive sampling technique to select 4 Public Health Officers,2community Health volunteers,2household heads,1chief and 4masons as interviewees for focus group discussions.

Data collection

Data collection involved the use of self-administered questionnaires during the interview schedule to guide selected respondents. Interviews were conducted in an unstructured manner so that the research could be able to collect variable data by building rapport with the respondents. Qualitative data was organized into themes guided by objectives and prevented in narratives.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Presence of sanitation technology encourages use of toilet	53%	39%	3%	5%	0%
Open defecation resulting from lack of toilets.	39%	40%	12%	5%	4%
Insufficient shared toilets discourage use of toilets	23%	61%	8%	3%	5%

Table 2: Influence of presence of toilets on adoption of sanitation systems

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Open defecation risks children to diseases	0%	2%	6%	42%	50%
Effect open disposal of human fecal and lack of a care giver on adoption of sanitation system	5%	11%	8%	51%	25%
Children faeces are not harmful	31%	45%	21%	2%	1%
Sharing of information influences sanitation system use	38%	30%	17%	11%	7%
The effects of usage of unimproved toilets and disease transmission	43%	48%	7%	1%	1%

Table 3: Influence on knowledge of adoption of sanitation systems

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Presence skilled masons	18%	38%	8%	32%	4%
Do skilled masons construct improved toilets	1%	2%	14%	62%	21%
The effects of using untrained masons to construct toilets	3%	17%	17%	38%	25%
Are masons trained on the design of disposal of waste resources	6%	7%	20%	32%	35%
Do Household heads dictate the design of toilets	2%	9%	7%	46%	36%

Table 4: Influence of skills on adoption of sanitation systems

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Are males as decision makers	3%	5%	13%	43%	36%
Does male roles influence open defecation	21%	36%	18%	19%	6%
Does female roles influence open defecation	5%	31%	30%	26%	8%
Does gender use influence toilet separation	11%	37%	40%	11%	1%

Table 5: Gender roles and adoption of sanitation systems Influence of cultural factors on adoption of sanitation systems

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Association of diarrhea with demons	49%	36%	2%	6%	7%
Pit latrines and evil spirits	55%	37%	4%	5%	3%
Children faeces not harmful	39%	37%	19%	3%	2%
Church leaders talking about sanitation matters	58%	29%	2%	5%	6%

Table 6: Religion and beliefs and adoption of sanitation systems

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Traditions discouraging toilets construction	23%	70%	3%	2%	2%
Traditions encouraging OD	29%	65%	4%	1%	1%
Traditions encouraging toilet construction	6%	13%	8%	52%	21%

Table 7: Traditions and adoption of sanitation systems.

Data analysis

Data obtained from the filled questionnaires and interviews will be analyzed by both descriptive statistics and inferential statistics using statistical package for social sciences (SPSS) version 25.0

Ethical consideration

Before embarking on the research, ethical approval was sought from the Meru University Institutional Research Ethics Review Committee (MIRERC). Participants gave informed consent before participating in the study and were assured of safety of their information. To ensure safety of the information gathered, data in hard copies was locked in a private box,

in the data collection coordination office under my custody and soft copy data was password protected and stored in a zipped file at the data collection coordination office by me to avoid access by a third party.

Results and Discussion

Demographics

The results showed that more males (63%) than females (37%) participated in the study and that only 6% had not attained formal education. Christianity was the predominant religion taking 98% of the sampled population.

The findings suggested that men mostly took overall charge of household matters and women took lesser roles in decision making. The fact that Christianity was the common religion implied that there mostly existed no sanitation barriers tied to religion in the area.

Adoption of sanitation systems

Research results showed that 86% of the residents used traditional pit-latrines, 29% used ventilated improved pit-latrines, 3% used flush toilets, while 2% had no latrine facility. Adoption of unimproved toilets was the main form of sanitation systems and took a mean of 3.3074. Latrine use and open defecation had the means of 2.6757 and 2.5770 respectively.

Influence of cultural factors on adoption of sanitation systems

Presence of toilets on adoption of sanitation systems

The findings showed that some residents failed to use sanitation facilities even when toilets were available. The result of the study in Tharaka-North sub county rhymed with the findings obtained in Nepal by Bhattut et al (2019) who reported residents ignored using the available sanitation facilities. The implication of the high negative opinion was that open defecation was hardly tied to toilet presence. The result also revealed that sharing of toilets among households did not influence toilet use, an indication that all groups in the households could comfortably share toilets and there existed no barriers to toilet sharing in the community. Participants in the study area would strive to use the available toilets, an implication that defecating in the open was the least option for the residents even with strained access to sanitation facilities.

Knowledge on adoption of sanitation systems

The study revealed that 50% of the respondents strongly agreed that open defecation put children at risk of diseases, while 42% agreed and 2% disagreed. Of the sampled population, 25% strongly agreed that lack of caregiver awareness had an influence on open disposal of childrenfaeces, 51% agreed, 8% disagreed and 5% of the sampled population strongly disagreed with the argument. About exposure of people to diseases by unimproved sanitation facilities, 43% of the participants strongly disagreed that unimproved toilets were capable of enabling disease

transmission, 42% agreed, 1% agreed and 1% strongly agreed with the argument. The result showed a mean of 4.95, $SD=0.498$ indicating that the participants supported that knowledge influenced adoption of sanitation practices.

Skills on adoption of sanitation systems

The study showed that 18% of the respondents strongly disagreed that masons with toilet construction skills were available when needed, 38% disagreed, 32% agreed while only 4% strongly disagreed. Concerning capability of skilled masons to construct improved toilets, 62% of the respondents agreed, that masons with toilet construction skills constructed improved toilets, 21% strongly agreed, while 2% agreed and 1% strongly disagreed. From the study, 32% of the respondents agreed that the training of masons was a waste of resources while, 35% strongly agreed and 6% agreed. The result showed that the ability to construct latrines could only be based on mason training but also on the work experience. The findings showed that the household heads had the mandate of dictating the design of the toilets to be constructed in their households. The findings implied that there was need to sensitize communities on the public health approved toilet designs for adoption by masons in order to improve toilet conditions in Tharaka-North sub county.

Gender roles and adoption of sanitation practices

The findings showed that 36% of the respondents strongly agreed that males were the decision makers on toilet construction, 43% agreed with the statement, 3% strongly agreed and 5% disagreed.

Regarding male roles, 21% of the participants strongly disagreed that male roles influenced open defecation, 36% disagreed while 19% agreed and only 6% strongly agreed that roles taken by men influenced defecation in the open.

Concerning toilet separation by gender, 11% strongly disagreed that it influenced toilet use, 37% disagreed, 11% agreed and only 1% strongly agreed.

The findings also showed that having separate toilets for males and females did not guarantee their use although support to the importance of toilet separation by gender could be attributed to the fact that males and females desired privacy and each gender would feel comfortable while using separate toilets.

Religion beliefs on adoption of sanitation practices.

Majority of the respondents, 49%, strongly disagreed that diarrhea was associated with demons, 36% disagreed, 6% agreed and 7% strongly agreed. In addition, 39% of the sampled population strongly disagreed that toilet pits harbored evil spirits.

Children faeces were not harmful was disagreed by 37% of the sampled population while 3% agreed and 2% strongly agreed with the statement.

About church leaders discussing sanitation matters in churches, 58% strongly disagreed, 29% disagreed and 6% strongly disagreed.

The findings implied that majority of the residents were aware that childrens' faeces could cause diseases. The widespread awareness could be attributed to the high literacy levels in the region as people had attended school and learnt about the negative implications of poor sanitation. The study further showed that sanitation matters were not prioritized in gatherings such as churches.

Traditions on adoption of sanitation process.

The findings established that 23% of the respondents strongly disagreed that there existed traditions which discouraged toilet construction in Tharaka-North subcounty, 70% disagreed while 2% strongly agreed. 29% strongly disagreed on the existence of traditions which encouraged open defecation, 65% disagreed and 1% strongly agreed. Furthermore, 21% strongly agreed on the existence of traditions that encouraged toilet construction in the region, 52% agreed, 13% disagreed, 6% strongly disagreed. These findings were supported by the results obtained from discussions in the focus group which revealed the existence of witchcraft on faeces left in the open as uttered by a respondent that; people feared leaving their faeces in the open as they would be taken for witchcraft purposes.

Correlation between cultural factors and adoption of sanitation systems

Indicators of cultural factors such as gender roles, religion and beliefs and traditions were correlated with sanitation practices to reveal the direction and extent of relationship between the variables. The findings showed that the correlation between gender roles and open defecation was positive and significant ($r=0.474$, $p\text{-value}=0.000<0.04$). The re-

lationship between religion and beliefs and open defecation and with improved toilets was non-significant, $p\text{-value}>0.04$.

Traditions and open defecation recorded a negative relationship (-0.256) which was significant ($p\text{-value}=0.07<0.05$). The findings suggested that gender roles facilitated latrine use issues and increased chances of open defecation practices.

Conclusion

It can be concluded that access to improved sanitation is still a challenge due to social cultural factors such as presence of toilets, knowledge, gender, religion, beliefs and traditions.

Recommendation future reference

The Ministry of Health through Public Health Officers should popularize approved toilet designs for use in the rural communities through training of masons on construction of proper toilets using locally available materials.

There should be inclusion of women in household sanitation matters to ensure adoption of women and children friendly household sanitation facilities.

The Community Led Total Sanitation (CLTS) strategy in the public and community health practices should both target open defecation and enlighten residents on the dangers of adopting unimproved latrines. This will encourage the residents to adopt properly constructed toilets in acceptable designs.

The Government of Kenya, through the Ministry of Health should review sanitation policies to address excrete disposal and management of children faeces in rural communities.

There is the need for sanitation policies to embrace gender empowerment in order to reduce gender-based sanitation inequalities in rural areas.

The future studies should also seek to establish whether environmental and climatic factors have an influence on adoption of sanitation systems especially in other dry or water scarce rural communities.

Competing Interests

The authors declare that there are no competing interests.

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