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The Socio-Economic determinants of latrine use in Imenti North Sub County, Meru County, Kenya

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ABSTRACT

Aim: To determine the Socio-Economic Determinants of Latrine Use in Imenti North Sub County, Meru County, Kenya. ***Objective:*** To examine the social economic factors influencing latrine use among the residents of Imenti North Sub-County, Meru County, Kenya. ***Introduction:*** Sanitary Latrine access is crucial for public health and sustainable development, for significant reduction of morbidity and mortality from diseases like diarrhea. Despite global efforts, 3.6 billion people lacked access to safely managed sanitation services in 2020, with sub-Saharan Africa and rural areas disproportionately affected. In Kenya, only 33% of the population has improved sanitation, with significant disparities across regions. *Study Area and Population:* The study was conducted in Imenti North Sub County, Meru County, Kenya, with a population of 548,161 and 57,668 households. The target sample was 396 households, calculated using the Yamane formula, and data was collected through questionnaires, observation checklists, and interviews. ***Methodology:*** Cross-sectional descriptive study design incorporating both quantitative and qualitative methods was employed. Purposive and cluster sampling techniques were used to obtain appropriate sample size. From each cluster, simple random sampling technique was utilized to select respondents. Data analysis was conducted using SPSS Version 26 to generate descriptive and inferential statistics. Ethical approvals were obtained and permits sought to ensure participant confidentiality. ***Results:*** The response rate was 97%, with 387 fully completed questionnaires. Key findings included: Household Characteristics, 72% of household heads were males. Most respondents had primary education (41%), and over half were not formally employed, indicating economic instability. Sanitation Practices: 68% of households had 4 - 8 occupants, affecting latrine hygiene and use. 77.8% financed latrine construction from personal resources, and health education was a significant motivator (42.9%).Challenges: Major barriers to latrine use included unhygienic conditions (51.7%) and distance (29.2%). The main obstacles to latrine ownership were lack of land (29.5%) and financial constraints (22.2%). Inferential Statistics: Significant factors influencing latrine use included household density, cleanliness, hand wash station availability, and privacy, all showing p-values = 0.000< 0.05.

Introduction

Access to excreta disposal facilities (sanitary toilets) is an essential human right for everyone and a key indicator of primary health prevention and sustainable development WHO/UNICEF (2020). Empirical research demonstrates that sanitary excreta disposal facilities and hygiene (hand washing) are the optimal interventions for mini-

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mizing disease mortality/ morbidity rates, especially diarrhea diseases. It acts as a primary barrier in breaking the transmission cycle of these diseases. For example, providing toilets alone can lessen the incidence of diarrhea and deaths of children under five years by more than 30%. (Chola et al., 2015). In reference to the World Health Organization (WHO), sanitation generally refers to the establishment of facilities and amenities for the secure and proper dumping of human urine and feces , (Oloruntoba et al., 2019).

Affordability has affected the construction of latrines in several rural areas. People who do not have financial capacity cannot construct latrines. For this reason, simple, cheap, and easy-to-construct latrines were introduced by CRS in Ethiopia in the name of Arborloo, which costs the least and is easy to construct (Fry et al.,2015).According to (Lawrence et al., 2016), emotional, social, and physical drivers also play a key role in initiating, constructing and using latrines. In Cambodia, latrines were more comfortable than open defecation since they were customized environments, while bushes had thorns and dirt from the environment. Privacy was a big motivating factor in constructing and owning a latrine. Women and girls need to use latrines to maximize privacy while answering the call of nature, hence avoiding exposing their private parts. She further noted that not only is it important for women and girls to use latrines but also for men who want to protect their families. Improved privacy is why several people construct latrines in rural areas. In Bihar, Kenya, and Cambodia, 45 per cent of people constructed latrines mainly because of privacy, while the rate in Rajasthan was 56 % (Chanie et al., 2016). In reference to the study conducted by (Gokcekus et al., 2020) discovered that the rate of latrine usage in a rural community had a strong association with the presence of a clean latrine facility, the presence of a bad toilet facility, the presence of children at home, the presence of a traditional hat latrine facility, and the age of families. In rural settlements, the proportion of latrine usage was 57.3%. Factors such as the husband's educational attainment of primary level or higher, the number of school-age children in the household, the family's monthly income, ownership of a pit latrine, the building material of the latrine, and the duration of owning the latrine were found to be connected with the utilization of latrines (Debesay., 2015). Kanda et al. (2022) found that social economic factors lend to householders, unaffordability of household toilets, and several other factors as the main cause of the lack of household latrines.

Globally, 3.6 billion individuals lacked access to safely managed sanitation services by 2020. Of that population, 52, 8% had elementary services, 16.1% had inadequate sanitation services, 17.1% lacked access to improved facilities, and 14% still practiced open defecation (WHO/UNICEF., 2021). The same report indicated that 66% of those lacking basic sanitation services were from rural settings, and more than half lived in developing countries. Besides, 92% of the proportion practicing open defecation resided in rural setups. According to WHO/UNICEF (2021), the proportion in Sub-Saharan Africa with access to at least basic sanitation was only 33%. Current global data indicate that the world was not progressing towards achieving the sanitation objective set by the Sustainable Development Goals (SDGs). In Kenya, only 33% of the population has achieved improved sanitation, and 9% still defecate in the open (WHO/UNICEF., 2021). Kenya Vision 2030 stresses the need for universally improved latrine adoption to eradicate diarrheal infection, poverty, and mortalities (United Nations., 2015). According to MOH's (2017) benchmarking sanitation report, Meru County was ranked 43 out of 47 in various indicators such as latrine coverage rate, number of persons use per latrine, and rate of open defecation, among others. Pit latrine coverage in Meru County was 60%, thus encouraging open defecation (OD) (Njuguna, 2019). The lack of improved latrine use in Meru County continues to be a widespread health and environmental hazard. Poor sanitation-related diseases such as diarrhea accounted for 16% of diseases recorded among chil-

dren below five years and second to pneumonia in Meru County (MoH, 2019). Based on the MoH report (2022), there was a diarrhea disease outbreak in 2022 in Meru County, specifically Imenti North Sub County, with two fatalities and five admitted to Meru Teaching and Referral hospitals due to poor hygiene. Latrine coverage levels, both nationally and globally, were well studied and documented in the National census, Kenya Demographic and Health Surveys, WHO, UNICEF, and Joint Monitoring Programme reports. While these investigations have concentrated on ascertaining the latrine coverage levels, there was limited information on latrine use and associated factors that were attributed to the low latrine coverage levels among residents such as Meru County; therefore, the study seeks to investigate socio-economic factors associated with latrine use in residential areas within Imenti North Sub County, Meru County.

Methodology

The study was conducted in Kenya's Imenti North Sub County, Meru County. Imenti North Sub County has a total population of 548161 and 57668 households (KNBS, 2019). A cross-sectional descriptive study was used, utilizing qualitative and quantitative investigation methods. The quantitative aspect was used to capture the quantifiable patterns, while the qualitative aspect was used in depth to explore the issues at hand. The questionnaire, observation checklists, and in-depth interviews were used for data collection. The study population consisted of residents' household heads or representatives and key informants from the Imenti North Sub County study area. The total number of households in the sub-county is 36200 (KNBS, 2019). A sample size of 396 was drawn using the Yamane formula (1967), as shown in the table 1.

Multiple sampling technique was used in this study since the targeted respondents had different characteristics. These included purposive, cluster, and simple random. Data from questionnaires and observation checklists were first coded

Ward	Households (n_1)	Sample per ward ($n_1/N \times n$)
Municipality	18179	198
Ntima West	7747	85
Nyaki East	10294	113
Total	N=36220	n=396

Table 1: *Sample Size*

and analyzed using the Statistical Package for Social Sciences (SPSS, Version 26) to generate descriptive and inferential statistics that showed the relationship between variables. The qualitative data collected was thematically analyzed and presented as narratives. Household data were collected using questionnaires self-administered to household heads at the household level. Further, an observation checklist was used to collect data on the status of toilets in terms of hygiene, privacy, toilet distance from households, presence of nuisances, and open defecation cases. A focus group discussion guide was used to gather data from Public Health Officers, Community Health Assistants, Community Health Promoters, Administrators, and Household Heads. The descriptive findings of the study were presented in the form of numerical summaries, tables, and charts. In contrast, inferential findings used frequencies to measure the association between the dependent and independent variables, with p-values of less than or equal to 0.05 considered statistically significant. Qualitative and Quantitative data and information were presented using tables, figures, and charts in thematic areas.

Before the data collection, the researcher obtained a research permit from the Meru University Institutional Research and Ethics Review Committee (MIRERC). Permission to collect data was sought from the National Council of Science, Technology, and Innovation (NACOSTI). Permission was further granted by the chief manning the various wards. Participation in the study was voluntary; respondents first signed consent forms to indicate willingness to participate. The partici-

pants were notified of the right to withdraw participation even when the study was halfway with no consequences. Respondents were assured of the safety of the information shared and reassured that the information would be treated with strict confidentiality and would not land in the hands of a third party.

Results

Response Rate

This study attained 97% rate of responses since only 387 respondents were available and willing to participate in the study with their questionnaires fully filled out of 396 household heads were desired for this study.

Household Characteristics

Most household heads were male with 72.4% against 27.6% female heads as shown in table 3.1 below. A factor that could be linked with the Ameru culture where men are usually considered as the household heads.

Table 2 shows the distribution of occupations of the household heads where over 50% of the respondents are not formally employed but engaged in alternative means of income generation. The results therefore indicates that majority of the participants 53.7% were not employed where only 46% were employed. The financial status of people who lack a defined form of occupation is mostly low. These findings therefore implied that more than half of the population were not financially stable.

All respondents in this study as shown in table 3 had a level of formal education with a majority 41% having attended primary level compared to secondary school 27.1% and tertiary level at 31.8%. The study exhibited that education levels could directly influence one's knowledge on latrine use.

The income of households mainly ranged between10 000 to 30,000, with only 30% of the respondents making more than 50,000/=, as illustrated by Table 3.4 below. This implied that more than 50% of the respondents were not financially stable since they were not formally employed.

Most of the households 68% were composed of between 4 to 8 occupants and 32% composed of between 1-3 occupants in a household as shown in the table 3.5 below. A factor which could be attributed to the fact that the bigger the

Employment status	Frequency	Percent
Salaried	179	46.3
Casual	86	22.2
Business	74	19.1
Livestock	23	5.9
Crop agriculture	25	6.5
Total	387	100.0

Table 2: *Occupations of the Household Heads*

Level	Frequency	Percent
Primary	159	41.1
Secondary	105	27.1
Tertiary	123	31.8
Total	387	100.0

Table 3: *Education Level of Household Head*

Income bracket (KES)	Frequency	Per cent
10001-30000	167	43.2
30001-50000	102	26.4
50001-100001	78	20.2
> 100000	40	10.3
Total	387	100.0

Table 4: *Average Household Income*

Household Density	Frequency	Percent
1-3	124	32.0
4-8	263	68.0
Total	387	100.0

Table 5: *Household density*

Finance	Frequency	Percent
Own resources	301	77.8
Loan	86	22.2
Total	387	100.0

Table 6: *Construction financing for toilet*

Motive	Frequency	Percent
Normalcy	114	29.5
Health education	166	42.9
Disease prevention	107	27.6
Total	387	100.0

Table 7: *Motivation for constructing latrine*

Gender	Frequency	Percent
Men	0	0
Women	387	100.0
Total	387	100.0

Table 8: *Responsibility for Cleaning*

Promoters	Frequency	Percent
None	131	33.9
Community volunteers	173	44.7
Own resources	83	21.4
Total	387	100.0

Table 9: *Main promoters of sanitation*

Factor	Frequency	Percent
Unhygienic latrines	200	51.7
Distance to Latrine	113	29.2
None exist	74	19.1
Total	387	100.0

Table 10: *Factors affecting toilet use negatively in community*

Obstacle	Frequency	Percent
Lack of responsibility	86	22.2
Lack of finances	86	22.2
Lack of land and space	114	29.5
Unsuitable sharing	101	26.1
Total	387	100.0

Table 11: *Obstacles to latrine ownership and utilization*

number of household members the lower the chances of a clean latrine and the fewer the members the lower the burden on the infrastructure.

Social Economic Attributes Affecting Latrine Utility

This section looks at the data on social and economic factors prevalent in Imenti North Sub County that determine the utility of latrine facilities.

An overwhelming majority of the respondents indicated that the households of Imenti North Sub County spent their own resources in procuring toilet facilities and 22% of the respondents had to service loans after the same goal as shown in table 6.

Table 7 shows the distribution of motivating factors towards construction of latrine facilities in Imenti North Sub County where 69% of the respondents indicated health consciousness and disease prevention as their chief drivers towards latrine uptake while the rest 29% signaled a continuation of practices they had become accustomed to.

The study found that regardless of headship within the households, responsibility for cleaning and hygienic maintenance of latrines fell to the women100% without exception as shown on table 8 and lends credibility to the role of socio-cultural and economic dynamics within households. This would imply that men were considered as the breadwinners of a household hence making it difficult to find time for cleaning the latrine.

As shown in table 9, the study found that households that had not interacted with promoters of sanitation or engaged with sanitation on their own motivation made up 33.9% of the respondents ,21.4% of those who interacted with sanitation on their own and the rest 44.7% had preexisting interactions with community health promoters who championed sanitation.

Table 10 shows distribution of factors affecting latrine utilization in the assessed households. A marginal 19% reported no hindrances to utility of latrine facilities while the rest maintained the unhygienic facilities at 51.7% and distances to latrines at 29.2% as the main hindrances. The findings are similar to those of Schmittet et al. (2018) who found that due to distances to latrine girls and women experience direct harassment from boys and men including sexual assault hence leading to use of plastic bags which are later thrown in open environ-

Indicators		Sum of Squares	Df	Mean Square	F	Sig.
Household Members	Between Groups	52.536	3	17.512	211.364	.000
Facility users	Between Groups	53.861	3	17.954	60.940	.000
Hygienic Separation of Excreta	Between Groups	14.292	3	4.764	34.691	.000
Hand wash Station Present	Between Groups	131.906	3	43.969	345.322	.000
Toilet Cleanliness	Between Groups	9.774	3	3.258	5.567	.001
Status of Privacy	Between Groups	24.007	3	8.002	12.996	.000
Motivation for constructing latrine	Between Groups	112.296	3	37.432	132.039	.000
Benefit of toilet use	Between Groups	298.833	3	99.611	117.209	.000
Promoters of toilet use and construction	Between Groups	168.510	3	56.170	60.482	.000
Factors affecting toilet use negatively	Between Groups	168.200	3	56.067	331.497	.000
Major obstacles to latrine	Between Groups	229.947	3	76.649	123.680	.000
Ownership and utilization Problems attributed to lack of latrine facilities	Between Groups	304.927	3	101.642	210.767	.000
Diseases in Household over the past 2 weeks	Between Groups	175.868	3	58.623	155.028	.000

Table 13: *ANOVA of study statistics*

ment especially at night.

Table 11 shows the near even distribution of challenges hampering the ownership and effective utilization of latrines in the communities of Imenti North Sub County.

Inferential Statistics

The indicators used to substantiate and quantify the data required in responding to the research questions and meeting the objectives were tabled with corresponding significance values at $p<0.05$. Table 13 shows that all critical elements of the study returned favorable p values and that validates the efficacy of the indicators. Household density was significant at .000 which means that there was statistical value in whether a household had fewer or more members and the impact on latrine utility. Facility users was equally significant at .000 which suggest that there was valuable differences in whether the number of people using a facility was higher or lower.

Statistical significance for toilet cleanliness, hand wash station availability, hygienic separation of excreta and status of privacy was found at .000 which meant that for every one of these indicators there was importance in whether they were cleaned, available, separated or offered privacy as indicated by the study. Motivation for constructing latrines, benefit of toilet use, and promoters of sanitation also returned significance at .000 which implies that the varied motives, benefits and promoters of sanitation development each bore statistical significance and informs the study objectives effectively.

Discussion

The study found that those with higher incomes had a greater propensity to use latrines compared to those with lower incomes. The findings were consistent with those of UNDP (2006), which identified poverty as a significant factor contributing to disparities in latrine access. They also align with the results of the Water Sanitation Programme (2004), which highlighted limited financial resources as major obstacles to increasing toilets usage. Additionally, the findings are in line with the studies conducted by Kanda et al. (2022), which demonstrated that higher monthly household income positively influenced the utilization of latrine facilities.

A significant majority of the participants said they used their personal funds to acquire sanitation facilities, while 20% had to repay loans for the same purpose. There was a noticeable disparity between the understanding of latrines and the actual implementation of latrine usage in the research region. The study found that while there was a high level of knowledge about latrine use, causes of diarrhea, and prevention methods, most household members, particularly women, did not participate in sanitation projects like building and maintaining latrines due to their shortage of expertise and skills. Poverty has also led to the spread of diseases due to a lack of money to access treatment as well as to purchase medicine. Busienei et al. (2019), argue that the lack of employment opportunities has led to poverty, which is the main reason why there is a lot of informal trading manifested in the form of randomly distributed kiosks, some of which are licensed by the government but the majority of which operate without a valid license and with no sanitation facilities as required by law.

The study showed that residents failed to use the sanitation facilities even when available since they were not user friendly. According to Routray et al., 2017, majority of rural residents did not use their toilets due to the structures that were not properly built, some lacked doors, walls, roof, and poor slabs and or sometimes pit latrines that were not clean and very shallow and filled up quickly. From the findings, campaigning for better hygiene and sanitation practices and active involvement of both women and men in community activities such as cleaning the toilets are very beneficial in promoting proper hygiene and better sanitation practices.

According to Gudda et al. (2019) sensitization of communities to sanitation issues is essential, and the lack of proper awareness has a long-term impact on sanitation practices in the household. This also conforms to the survey conducted in Nakuru County in Kenya by Gudda et al. (2019), which showed that less than half 45% of the respondents had not received any sanitation maintenance awareness. Awareness creation varied, and the government was cited as the most common awareness provider (21%), especially when inspecting facilities and during disease outbreaks. Most stakeholders who intermittently provided sanitation-related information included community-based organizations and Non-Governmental organizations, according to the study by Dagaga et al. (2022), who reported that open defecation in open fields (26.9%), bushes (28%), or in-house compound (38.5%) were as a result of a shortage of land or space. There is a need to sensitize the residents to modern sanitation facilities, which can be emptied to curb the issue of land space. Most of the households 68% were composed of between 4 to 8 occupants and 32% composed of between 1-3 occupants in a household a factor which could be attributed to the fact that the bigger the number of household members the lower the chances of a clean latrine.

Conclusion and Recommendation

The study concludes that challenges such as toilet construction materials' unavailability, financial constraints, and the number of users influenced the type of sanitation facilities to be adopted in the area and hindered the utilization of the latrine.

The Government should provide matching resources to tackle the sanitation disparities in the Sub-County. Communities should also be encouraged to initiate the construction of their latrines as opposed to waiting for external help in the form of subsidies, as this may not be sustainable in the long term. Community Sensitization on constructing improved toilets using locally available materials (due to financial challenges).

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