

Assessment of motivating factors for sustained use of sanitation practices and technologies in Kyarumba Sub-County, Kasese District.

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Page | 1 **Abstract**

Background:

At the structural and community levels, seasonal changes and infrastructure shape when and how sanitation technologies are adopted. The aim of the study is to assess the motivating factors for sustained use of sanitation practices and technologies in Kyarumba Sub County, Kasese District.

Methodology:

The study was a descriptive survey in which quantitative data were collected. Data were coded, entered, and analyzed using Statistical Package for Social Scientists (SPSS) and Stata computer software.

Results:

The majority of the respondents (77.5%) were married, with only 15.8% and 6.7% single and divorced, respectively. Continued use of sanitation facilities was mainly influenced by perceived susceptibility to diseases (62.5%). Other major motivators for sustained use of sanitation facilities and practices were distance to water source (55.8%) and nurturing (53.3%). Other factors influencing sustained adoption of sanitation practices and technologies included: cost of technology (46.7%) and perceived severity of diseases (42.5%); durability of technology (40.8%), age (39.5%), gender (35.5%), social norms (27.5%) and socio-economic status of respondents (25.8%).

Conclusion:

Sustainable use of sanitation facilities in households was mainly influenced by perceived susceptibility to diseases, distance to water source, nurturing cost of technology, perceived severity of diseases, durability of technology, age, gender, social norms, and socio-economic status of respondents.

Recommendations:

There is a need for development stakeholders in Kasese and Kyarumba Sub County to sensitize the community about the need to break culturally defined gender roles that negatively impact household adoption of good sanitation technologies and practices.

Keywords: Technologies, Sustained use, Practices, Sanitation.

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Background

Global diarrhea-related mortality in children under five years of age remains a major justification for investment in sanitation interventions, despite recent declines to an estimated 700,000 deaths in 2011 (WHO, 2015). According to WHO (2006), many communicable diseases like polio, cholera, trachoma, dysentery, bilharzia and others were directly linked to poor sanitation. An analysis carried out in 2011 showed that Uganda loses UGX 386 billion (US\$177 million) annually due to poor sanitation (US\$5.5 per person in Uganda or 1.1% of GDP) (World Bank, 2011). Kyarumba Sub County is recognized as one of those with poor sanitation practices and technologies in the district, especially households in mountainous areas where open

defecation and poor personal hygiene are rampant in spite of massive sanitation campaigns in the area. The district latrine coverage stands at 58%, with Kyarumba Sub County lagging behind at 48% coverage. In a study assessing the post-implementation latrine use in Zimbabwe, participants discussed perceived advantages such as privacy, proximity, and environmental hygiene as well as disadvantages like odor (Waterkeyn and Cairncross, 2005). However, recognition of the benefits of sanitation does not necessarily influence sustained use. Changing normative behavior was a key factor reported by Hanchett et al (2011) in encouraging latrine use for both rich and poor. Knowledge of the mode of transmission of diarrhoea and awareness of other water-related diseases was commonly cited (Malebo, 2012). At the habitual level, having consistent, easy access to latrines

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helps facilitate long-term behavior change. However, existing habits like continued preference for open defecation may inhibit uptake of sanitation facilities (Roma, 2010). Age and gender are important factors influencing sustained adoption because these factors often determine who in the household has the ability to use and interact with the technology (Waterkeyn and Cairncross, 2005). Choudhury and Hossain (2006) argue that cost, durability, feasibility of use, and maintenance required that are important factors for sustained latrine adoption. Community-wide mobilization and ownership can aid in effecting long-term changes; successful programs such as Community-led (Roma et al, 2010). The aim of the study is to assess the motivating factors for sustained use of sanitation practices and technologies in Kyarumba Sub County, Kasese District

Methodology

Study setting

The study was carried out in Kyarumba Sub County, Kasese District. The Sub County was selected because it had the least coverage of sanitation facilities in the district. Kasese District is located in the Western region of Uganda and is bordered by the districts of Bushenyi to the South, Kamwenge to the East, Kabarole to the North East, Bundibugyo to the North and the Democratic Republic of Congo to the Western border. The total land area is 2,724sq. km, of which 1,647sq. km is available for human settlement activities. The population is estimated at 702,029 people, giving an average density of 426 persons per square kilometer of settled areas. About 85 % of the people live in rural areas. Kasese district comprises 25 sub-counties, 3 Town Councils, and a municipality.

Research design

The study was a descriptive survey in which quantitative data were collected. Data were collected from respondents who had adopted sanitation practices and technologies and those who had not.

The study population

The study population included households of Kyarumba Sub County, both with good and poor sanitation practices and technologies. The respondents interviewed were household heads or their spouses who were willing to consent before participating in the study, or any other adult member of the household aged 18 and above.

Inclusion Criteria:

Household heads or their representatives, Adults above 18 years, mentally sound participants

Exclusion Criteria

Children below 18 years, mentally deranged, Visitors/ Household members who have been away from home for a long time

Sampling

A simple random sampling technique was adopted to select two (2) out of the five (5) parishes found in Kyarumba Sub County, from which one village was randomly selected per parish. Lists of households were made by the researcher with the assistance of the chairpersons of Local Council One (LC1s) and village health teams to obtain the study population. The study sample was obtained using Israel and Glenn's (1992) formula for sample size determination, stated as;

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the population size, and e is the level of precision

The study sample was determined from a total of 169 households for Kaghema and Kitabona villages

$$n = \frac{169}{1 + 169(0.05)^2} = 120 \text{ households}$$

From each household, the head or his or her representative who was at least 18 years of age was selected for the interview. This translated into 120 respondents.

Data collection instrument

A structured questionnaire containing closed-ended questions was used for data collection. This was developed by the researcher with the assistance of the supervisor in line with the objectives of the study. The questionnaire was preferred to other types of instruments because a higher completion rate was expected given that the researcher looked for respondents and interviewed them face to face. The questions in the questionnaire were written in English, but the interviewer would translate them into Lhukonzo (the local language of the area) while interviewing and record the response in English.

The questionnaire was pre-tested on 20 respondents in Karusandara sub-county, Kasese district. This sub-county was selected for pretesting the research instrument because it was among the sub-counties with poor sanitation in the district. Pretesting the interview schedule in a different area enabled the researcher to fine-tune the instrument before applying the tool to the target population. It also prevented monotony of interviewing the same respondents if they happened to be in the study sample. The researcher and supervisor reviewed the questionnaire for content validity. Their views were sought on the clarity of the questions, the general layout of the instrument, and whether the questions adequately covered the objectives of the study. The supervisors gave their opinions, and subsequent revisions were made by deleting the irrelevant questions and adding some on relevant areas of study.

The questionnaire was tested for its reliability during the pre-testing exercise. Twenty respondents selected from Karusandara Sub County were interviewed twice by the researcher using the same questionnaire. The interval between the interviews was two weeks. Two weeks were appropriate because the respondent would have forgotten the previous response. This was done to check for the

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consistency of the responses given by the same respondents during the two interviews. The results were correlated to generate reliability coefficients ranging from 0.58 to 0.63; hence, the questionnaire was considered reliable for data collection since reliability coefficients were reasonably high (Amin, 2005).

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Data collection methods

Data were collected in the months of April and May 2016 by the researcher. Both primary and secondary data were collected. Primary data were collected through face-to-face interviews in addition to observations made on adoption and use of sanitation practices and technologies. The popular language in the area (Lhukonzo) was used during interviews, while the responses were recorded in English. This was done because the researcher was well-versed in both languages and hence it would save time during interviews. Respondents interviewed were either the household heads/their spouses or their representatives because they were considered to have a bigger stake in the adoption of sanitation practices and technologies than anybody else in their households. Respondents were interviewed to generate information about the socio-demographic characteristics of the respondents, the existing sanitation conditions and associated health, environmental and socio-economic problems in the area. In addition, respondents were asked to provide information on factors influencing adoption of sanitation practices and technologies as well as motivating factors for sustained use of sanitation practices and technologies.

Data analysis

After collection, data were coded, entered, and analyzed using Statistical Package for Social Scientists (SPSS) and Stata computer software. Statistical Package for Social Scientists and Stata were used because of their ability to handle diverse numbers of variables and test them simultaneously. Statistical Package for Social Scientists was used to generate frequencies and percentages of the socio-demographic characteristics of the respondents, the existing sanitation conditions, associated health, environmental and socio-economic problems in the area, and motivating factors for sustained use of sanitation practices and technologies. Stata was used to compute the factors affecting uptake of sanitation practices and technologies using a logit regression model that is described below.

Logit Model specification

Uptake of sanitation practice/ technology was the dependent variable and represented in the model by a binary variable taking the value of one (1) if the respondent had adopted the practice/technology and zero (0) otherwise. The cumulative logistic probability function is specified as:

$$P_i = \frac{e^{(Z_i)}}{1 + e^{(Z_i)}} = F \quad [a + \sum_{i=1}^n \beta_i x_i] = \frac{1}{1 + e^{-(a + \sum_{i=1}^n \beta_i x_i)}} \quad (1)$$

Where, P_i represents the i^{th} respondent adopting a sanitation practice/technology given x_i , and x_i represents the i^{th} explanatory variable $i=1, 2, 3, \dots, n$; Z_i a linear function of n explanatory variables (x_i), e represents the base of natural logarithms; a and β are regression parameters to be estimated in the model, where a is the intercept, $\beta_1 \beta_2 \dots \beta_n$ are slope coefficients of the equation. The model can be written in terms of the log of the odds ratio (the probability that the respondent has adopted a sanitation practice/technology or has not adopted ($1 - P_i$) defined by:

$$(1 - P_i) = \frac{1}{1 + e^{Z_i}} \quad (2)$$

Using equations 1 and 2, the odds ratio becomes;

$$\left(\frac{P_i}{1 - P_i} \right) = \left(\frac{1 + e^{Z_i}}{1 + e^{-Z_i}} \right) = e^{Z_i} \quad (3)$$

Alternatively

$$\left(\frac{P_i}{1 - P_i} \right) = \left(\frac{1 + e^{Z_i}}{1 + e^{-Z_i}} \right) = e^{(a + \sum_{i=1}^n \beta_i x_i)} \quad (4)$$

Taking the natural logarithms of the odds ratio in equation (4), it results as,

$$Z_i = \ln \left(\frac{P_i}{1 - P_i} \right) = \ln e^{(a + \sum_{i=1}^n \beta_i x_i)} = a + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n + u \quad (5)$$

If the disturbance term (U_i) is introduced to the model, the model becomes

$$Z_i = a + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n + u \quad (6)$$

The logit model is specified as:

$$\text{Log} = \left(\frac{P}{R - P} \right) =$$

Linearizing

$$Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + \dots + b_7 x_7 + u \quad (7)$$

Where;

$$Y = \begin{matrix} 1 = \text{Uptake of sanitation technologies and practices} \\ 0 = \text{Non uptake of sanitation technologies and practices} \end{matrix}$$

X_1 =Sex

X_2 =Age

X_3 =Marital status

X_4 =Level of education

X_5 =Family size

X_7 =Occupation

Ethical considerations

The proposal was reviewed by the ethical committee and approved by the ethical board of Mountains of the Moon University before the research was conducted. Approval and introductory letters were obtained from the Directorate of Post-Graduate Studies and Research, which the researcher presented to the DHO of Kasese to be granted permission to undertake the research and introduced to Kyarumba Sub County. The researcher would explain the purpose of the study to respondents and obtain their informed consent before conducting the interviews.

Results

Characteristics of respondents

Table1: Characteristics of respondents in Kyarumba Sub County, Kasese District

Characteristic	Freq. (N=120)	(%)
Sex		
Males	58	48.3
Females	62	51.7
Age (years)		
18-30	40	33.3
31-48	50	41.7
49-58	23	19.2
59+	07	05.8
Marital status		
Married	93	77.5
Single	19	15.8
Divorced	08	06.7
Level of education		
No formal education	38	31.7
Primary education	62	51.6
Secondary education	15	12.5
Post-secondary education	05	04.2
Family size		
2-4	32	26.7
5-7	58	48.3
8-10	19	15.8
>10	11	09.2
Source of sanitation information		
Radio	98	81.7
Governmental official	47	39.2
NGO official	39	32.5
Neighbors	52	43.3
Public posters	08	06.7
Occupation		
Farmer	98	81.7
Trader	31	25.8
Laborer	43	35.8
Civil servant	04	03.3

Source: Field survey, 2016. Some percentages add up to more than 100 due to multiple responses

Table 1 indicates that both females and males participated in the interviews, with a bigger proportion of females (51.7%) than males (48.3%). The majority of respondents (41.7%) were aged 31-48, followed by 33.3% aged 18-30, 19.2% aged 49-58, and 5.8% aged 59 and above were 5.8%. Most respondents (77.5%) were married, with only 15.8% and 6.7% single and divorced, respectively. The level of

education attained by most respondents was primary education (51.2%), followed by those with no formal education (31.7%). Respondents who had acquired secondary education and post-secondary education were few at 12.5% and 4.2%, respectively. Most households (48.3%) had 5- 7 persons. The main source of sanitation information in the area was the radio, which provided information to 81.7% of the respondents.

Motivating factors for sustained use of sanitation practices and technologies

Table 2: Motivating factors for sustained use of sanitation practices and technologies

Sanitation facility	Frequency (N=120)	Percentage
Perceived susceptibility to diseases	75	62.5
Perceived severity of diseases	51	42.5
Nurturing	64	53.3
Social norms	33	27.5
Cost of technology	56	46.7
Durability of technology	49	40.8
Distance to water source	67	55.8
Socio-economic status	31	25.8
Gender	42	35.0
Age	47	39.2

Source: Field survey, 2016. Some percentages add up to more than 100 due to multiple responses

Table 2, continued use of sanitation facilities was mainly influenced by perceived susceptibility to diseases (62.5%). Other major motivators for sustained use of sanitation facilities and practices were distance to water source (55.8%) and nurturing (53.3%). Other factors influencing sustained adoption of sanitation practices and technologies included: cost of technology (46.7%) and perceived severity of diseases (42.5%); durability of technology (40.8%), age (39.5%), gender (35.5%), social norms (27.5%) and socio-economic status of respondents (25.8%).

Discussion

Continued use of sanitation facilities was mainly influenced by perceived susceptibility to diseases (62.5%). It was expected that households that have experienced waterborne or excreta-related infection will be willing to patronize improved sanitation services (WHO, 2008). This shows that respondents were aware, either through personal experience or through external information sources, that poor sanitation predisposes an individual to diseases. Other major motivators for sustained use of sanitation facilities and practices were distance to water source (55.8%) and nurturing (53.3%). Kyarumba Sub County, being a mountainous area, makes it difficult for residents to gain access to water sources with ease. People staying near water sources are likely to adopt sanitation practices on a sustainable basis, like bathing, regular washing of clothes and domestic utensils, compared to those staying far from water sources. Nurturing plays a significant role in sustained adoption of sanitation practices and technologies. Household members in Kyarumba Sub County who have been well nurtured in the use of sanitation practices were more likely to adopt good sanitation practices on a sustainable basis than those from households with poor sanitation. Changing social norms leveraged individual behaviors to facilitate positive support for hand washing. In Guatemala, the Global Scaling up Hand washing Project

employed a mass media campaign focused on reinforcing self-efficacy, injunctive norms, and nurturing behavior. To illustrate, a well-dressed mother would say, "I commit myself to get my family to wash their hands with soap. This method increased sustained hand washing with soap in the area. Other factors influencing sustained adoption of sanitation practices and technologies included; cost of technology (46.7%) and perceived severity of diseases (42.5%); the burden of caring for family members who are ill with waterborne diseases and going for water often falls disproportionately on female members of the household (KNBS, 2010) hence limiting their time on other activities such as education, income generating and food-related activities. The cost of technologies like digging pit latrines and construction of kitchens was mentioned as a factor inhibiting some households from sustainable adoption of these facilities. The study findings on age, gender and socio-economic status were in consonance with study findings of Devine and Koita (2010) in Senegal that linked Socio-economic status, age and gender as strongly tied to sustained adoption of sanitation facilities and practices in the area. While Kullmann and Ahmed (2011) attribute a shift in social norms as a factor responsible for sustained use of latrines and abandonment of open defecation in Bangladesh.

Conclusion

Sustainable use of sanitation facilities in households was mainly influenced by perceived susceptibility to diseases, distance to water source, nurturing, cost of technology, perceived severity of diseases, durability of technology, age, gender, social norms, and socio-economic status of respondents.

Recommendations

There is a need for development stakeholders in Kasese and Kyarumba Sub-County to sensitize the community about the need to break culturally defined gender roles that negatively

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impact household adoption of good sanitation technologies and practices.

The study should be replicated in other districts of Uganda. Information gathered in other districts could provide an appropriate yardstick for making appropriate recommendations for the uptake of sanitation technologies and practices.

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Acronyms

ADB: African Development Bank

ANPPCAN: African Network for the Prevention and Protection against Child Abuse and Neglect

IRC: International Water and Sanitation Centre

MWLE: Ministry of Water, Lands and Environment

MFPED: Ministry of Finance, Planning and Economic Development

WHO: World Health Organization

WSP: Water and Sanitation Programme

UBOS: Uganda Bureau of Statistics

NEMA: National Environmental Management Authority

MoH: Ministry of Health

UN: United Nations

DHO: District Health Office

UNICEF: United Nations International Children's Education Fund

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Conflict of interest

The Author did not declare any conflict of interest.

Author biography

Harriet Masika is a student of a Master of Science degree in public health at Mountains of the Moon University.

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