

Households' Latrine Preference and Financing Mechanisms in Peri-urban Ghana

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Abstract

Using household-level survey data, this study investigates households' latrine preference and financing mechanisms for improved latrines in the Ningo-Prampram district in the Greater Accra region of Ghana. Descriptive and inferential analyses are employed for data analysis and reporting. The results of the study show that a majority of the sampled households practice open defecation due to lack of funds and space for an improved latrine. Most of the households prefer the flush/pour-flush to the piped sewer system latrine or the ventilated improved pit (VIP) latrine. About half of the households prefer to use own funds via savings or 'susu' to build their latrines, and very few prefer funds from the financial institutions (FIs), albeit the FIs are interested in providing loans for household latrines. Empirical results from a binary logistic model show that there is some relationship between households' latrine financing decisions and their socioeconomic and community characteristics, such as gender, education, household composition, income, tenancy, type of defecating practiced and type of community. The study recommends the need to educate households to consider 'cheaper' and more feasible latrine technologies, and also adopt joint-resource mobilization strategies for their latrines. There is also the need to educate the households on the possibility and conditions for alternative sources of funds for improved latrines. Policy efforts by the government and other stakeholders toward a sustainable uptake of improved sanitation should also consider the household and community factors that may influence a household's latrine preference and financing decision.

Keywords: Household latrine, financing mechanism, peri-urban Ghana, SUSA

1. Introduction

Ghana's coverage of improved sanitation is far below expectation; it is currently at 14% of the country's MDG target of 53% (WHO/UNICEF, 2014). This creates a number of problems to individuals and communities. A number of studies have reported on the impact of poor sanitation; one of the prominent problems being health-related such as the episodes of diarrhoeal cases and risks of other infectious diseases which normally lead to deaths of millions, particularly the vulnerable groups such as children under five and the elderly in developing countries. Moreover, poor sanitation creates a number of direct and indirect costs on communities, such as increased households' direct medical costs associated with treating sanitation-related diseases, lost income through reduced or lost productivity, time and effort losses due to distant or inadequate sanitation facilities, and lost school days which tend to influence the quality of life. In addition, there are also increased social costs of providing health services and clean up costs, and reduced income from tourism.

The definition of improved sanitation set by international agencies calls for increased investments in household sanitation facilities (latrines)¹. There have been several debates on the operational implications as well as the economic impact of this call on the poor, as the demand and investments in improved sanitation at household level may compete with other household needs. In Ghana, household latrines are inadequate, and the available few public latrines are over-utilised and poorly managed. In view of this, most households in poor peri-urban communities practise open defecate (ODF). The resulting health problems and social costs of this situation can be huge and devastating.

The poor sanitation situation in Ghana now calls for public-private partnership in the management of sanitation in Ghana (Thrift, 2007; MLGRD, 2010). In fact, Ghana's current sanitation policy supports the private-led approach in the promotion of household toilets and the management of public latrines. Hence, the central government and other stakeholders, such as local governments and NGOs are not interested in the provision and promotion of public latrines.

The new sanitation policy seems to create some discomfort to households, particularly those in poor peri-urban communities. Some households have opposing interests in the new sanitation policy due to the

¹ The WHO/UNICEF joint monitoring project (JMP) defines an improved toilet facility as one that hygienically separates human excreta from human contact and includes: flush/pour-flush to piped sewer system, septic tank and pit latrine; ventilated improved pit latrine (VIP); and composting toilet (WSMP, 2009).

expected change (rise) in the price to the household. A change in the provision of sanitation (latrine) may lead to a 'full price effect', as the change in price may not commensurate to the fixed household income. This may result in a situation where some households may have to resort to their current unimproved defecating practice, ODF. The readiness and ability to pay for improved latrines therefore becomes an issue of concern to households and other stakeholders. For example, a household's interest in the improved sewer excreta systems, such as flush toilets, is rare in peri-urban communities like in this study due to the high costs and scarce water resources (Cofie et al, 2004). Moreover, the demand for improved sanitation for most households may not be high until other needs or priorities such as housing (shelter), water, farming, and schooling - are met (Card and Sparkman, 2010).

Nonetheless, a change in the household's defecating practice with the use of an improved latrine is expected to bring optimum satisfaction, hence welfare maximisation. With the change towards the use of an improved latrine, the household's utility can be maximised subject to their fixed budget. The acquisition of an improved latrine technology would therefore necessitate a decision on an appropriate financing mechanism which should be determined by the household. The aim of this study is to investigate households' latrine preference and financing strategies for their latrines in the Ningo-Prampram district of Greater Accra region of Ghana. It is hypothesised that a latrine financing decision is influenced by the household's socioeconomic characteristics such as gender, age, education, occupation, household size and composition, income and tenancy, and other community factors such as access to public latrines (Weinberger and Jütting, 2000).

2. Methodology

2.1 Study Area

The study was conducted in four peri-urban communities (Upper-Prampram: Kley and Olowey; Lower-Prampram: Lower East and Lower West) in Ningo-Prampram district (formerly Dangme West district) in the Greater Accra region of Ghana (Fig. 1). Ningo-Prampram district was chosen as a convenience sample because it is peri-urban and forms part of the study area of the Dodowa Health Research Centre (DHRC), a partner institution of the SUSA-Ghana Project which provided funding for the study. The district is situated in the south-eastern part of Ghana, lying between latitude 5° 45' south and 6° 05' North and Longitude 0° 05' East and 0° 20' West. The total population of Dangme West is 122,836 persons (47.9% males and 52.1% females), representing about 0.50% of Ghana's total population and 3.06% of the Greater Accra region population (GSS, 2012).

The average household size in the District is estimated at 5.2 persons. Agriculture, the dominant occupation, employs about 59% of the people, followed by trade (22.1%) and fishery (6.4%). Financial reports indicate that the highest contribution to internally generated revenue in the District comes from fees and fines, followed closely by business operating permits (<http://www.ghanadistricts.com/districts>). It is estimated that about 36% and 40% of households defecate in the beach and bush, respectively (SUSA Baseline Report, 2011).

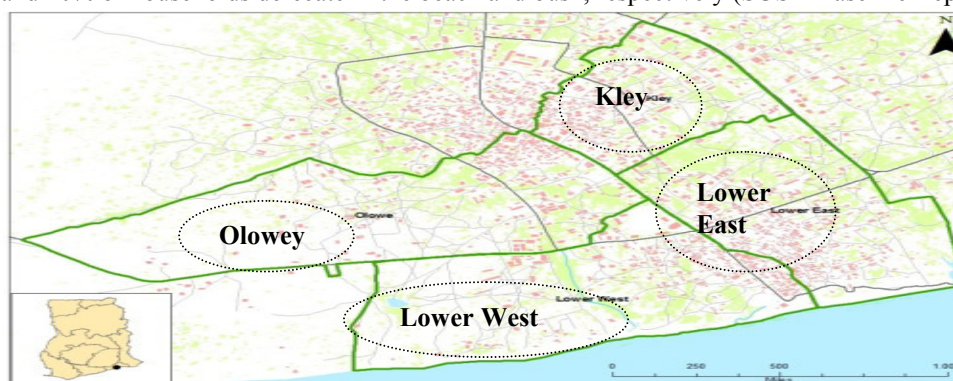


Fig. 1: Study Area

2.2 Population, Sampling and Data Collection

Households in selected communities and other stakeholders such as financial institutions in the Ningo-Prampram district of the Greater Accra region of Ghana constituted the population for this study. The study used a household survey data collected from 633 randomly selected households (Upper-Prampram: Kley and Olowey, 280; Lower-Prampram-Lower East and Lower West, 353) without latrines. The determination of the sample size was guided by the use of the sample size chart (<https://www.surveymonkey.com/mp/sample-size/>) and the formula: $N = (z/e)^2 \cdot p(1-p)$, where N is the required sample size, z is the confidence level at 95% (value of 1.96), p is the estimated number of households without latrines, and e is the margin of error at 5%. To improve the validity of the results, the sample size used for this study was more than that estimated by the sample size chart and the formula. A study by Spencer (2012) in the study area had investigated households with and without

latrines and this study therefore focused on the latrine preferences and financing mechanisms for households without latrines.

In each selected household, the head or any other adult member who consented was interviewed with a survey questionnaire. The household questionnaire comprised four main sections: section one elicited data on personal and household characteristics such as age, sex, educational level, income, expenditure, religious affiliation, tenancy and household defecating practice; section two captured data on households' latrine preferences and cost estimates of those latrines; section three captured data on households' proposed financing mechanisms and factors that influence their latrine financing decisions; and section four elicited data on households' banking profile. In additions, the study used a lenders' questionnaire which elicited data on the interests of lenders to finance household latrines. Consent was sought from the study participants before any discussions or interviews were conducted. With the help of trained field assistants/interpreters, all the instruments were administered by the researcher in the local language of the participants, 'Dangme'. Clearance was obtained from the ethical review board (IRB) of the DHRC before the study started.

2.3 Analysis of Data

Both descriptive and inferential statistics were employed for data analysis and reporting. Descriptive statistics such as frequency tables, percentages and graphs were used to summarise the households' socioeconomic characteristics and their latrine preferences and proposed financing strategies. The factors that lenders consider in their assessment of (latrine) loan applications were examined using the Kendall's Coefficient of Concordance (W) (Mattson, 1986). Using STATA software, a logistic regression, a probabilistic statistical classification and binary response model (http://en.wikipedia.org/wiki/Logistic_model), was used to estimate the socioeconomic and community factors that influence households' latrine financing decisions. The logistic model which is based on the cumulative logistic probability function (Pindyck and Rubinfeld, 1991) is specified as:

$$P_i = F(Z_i) = F(\alpha + \beta X_i) = \frac{1}{1 + e^{-Z_i}} = \frac{1}{1 + e^{-(\alpha + \beta X_i)}} = \log \frac{P_i}{1 - P_i} = Z_i = \alpha + \beta X_i$$

where, P_i is the probability that a household will make a certain financing decision, given X_i predictor variables, and e is the base of natural logarithm.

The dependent variable, a household's financing decision (Z_i), is the logarithm of the odds that a rational choice would be made weighing the costs and consequences of a financing decision. Since P_i is the probability of a household's financing decision of use of equity (own) funds for building a latrine, $(1 - P_i)$ is the probability of use of non-equity funds. $P_i/(1 - P_i)$ is the odds ratio in favour of use of own funds. If P_i happens to equal either 0 or 1, then the odds $P_i/(1 - P_i)$ equal zero or infinity and the logarithm of the odds undefined, hence the application of the ordinary least-squares estimation, inappropriate.

It is assumed that Z_i depends on the characteristics of the household head (H) who makes a financing decision based on the household's current income (y), the characteristics of the household (W), other community characteristics (C), and the error term u (Weinberger and Jütting, 2000). The general model of the household's latrine financing decision is specified as:

$$Z_i = f(y_i, H_i, W_i, C_i)$$

In this study, the empirical logistic model for estimating the probability of a household's latrine financing decision was specified as follows:

$$Y_i = \beta_0 + \beta_1 Age_1 + \beta_2 Sex_2 + \beta_3 Educ_3 + \beta_4 hhCmpCHILD_4 + \beta_5 INCOMpCAP_5 + \beta_6 Tenancy_6 + \beta_7 DfPRACTICE_7 + \beta_8 Cmnty_8 + u_i$$

where, $Y_i = 1$, if $Y_i > 0$, meaning a household is interested in using its own funds to construct the household latrine, and $Y_i = 0$ otherwise. β_0 is the intercept, β_i is the coefficients of the predictor variables. The descriptive statistics and definition of variables employed in the empirical logistic model are presented in Table 2 (in Section 3.4 below).

3. Results and Discussion

3.1 Socioeconomic Characteristics of Respondents

Table 1 presents the results of the socioeconomic characteristics of the respondents. Of the 633 respondents, 62% were men and 38% were women. A majority (96%) of the respondents were above 30 years, and the average age was 48 years. More than half of the respondents (51%) had basic education (i.e. JHS/MSLC or below), a proportion below the national proportion of 54% for only JHS/MSLC (GSS, 2012). About 56% had a household size of five persons or less which is relatively higher than the national figure of 4.4 persons per household (GSS, 2012). Almost all the respondents were Christians (98%).

A majority (92%) was self-employed (basically fishing and farming). The average household monthly income was GH¢560 (US\$280) and the modal monthly income was GH¢600 (US\$300). The per capita income was GH¢134 (US\$67.39) which is below and about half the per capita gross national average monthly income of

GH¢224.7 (US\$124) (GSS, 2012). On average, the households' monthly expenditure was around GH¢390 (US\$195), and the modal monthly expenditure was GH¢300 (US\$150). This indicates a lower household expenditure relative to the household's income, implying that a household may have surplus income for savings or to cater for other needs of the household.

A majority (86%) of the households were living in their own house or family house. About two-third of the households could access the public latrines (69%), but only one-third (34%) use the public facilities, and a majority practice open defecation (67%: 32% bush; 35% beach). This result is consistent with a study by Spencer (2012) who reported that open defecation is the most common practice in the study area.

Table 1: Socioeconomic characteristics of respondents

Variables		Freq. (%)	Min.(Max)	Mean (SD)
Gender	Male	392 (61.9)		
	Female	241 (38.1)		
Age (years)	20-29	18 (2.8)		
	30-39	142 (22.4)		
	40-49	212 (33.5)	22 (98)	47.9 (12.4)
	50-59	144 (22.7)		
	60 and above	117 (18.5)		
Education	Tertiary (Univ./Poly/College)	15 (2.4)		
	Secondary (SHS/O'Level/A'Level)	51 (8.1)		
	Junior High/MSCL	143 (22.6)		
	Primary school	183 (28.9)		
	None/no formal education	241 (38.1)		
Household size	5 and below	388 (61.3)		
	6-10	222 (35.1)	1 (15)	5.18 (2.4)
	Above 10	23 (3.6)		
Occupation	Salaried ²	40 (6.3)		
	Self-employed ³	580 (91.6)		
	Unemployed	13 (2.1)		
Household income (month) (GH¢)	Below 500	272 (43.0)	100	560.0
	500-1000	322 (50.9)	(1700)	(272.9)
	Above 1000	39 (6.2)		Mode (600)
Household expenditure (month) (GH¢)	Below 500	496 (78.4)	90	389.9
	500-1000	131 (20.7)	(1200)	(175.1)
	Above 1000	6 (0.9)		Mode (300)
Tenancy	Landlord	171 (27.0)		
	Family house	374(59.1)		
	Tenant	88 (13.9)		
Household defecating practice	Beach	218 (34.4)		
	Bush	203(32.1)		
	Public latrine	212 (33.5)		
Access to public toilet	Yes	436 (68.9)		
	No	197 (31.1)		

N = 633. US\$1.00 = GH¢1.99 (May/June, 2013). *Source*: Computation from field data, 2013

3.2 Households' Defecating Practice and Latrine Preference

3.2.1 Households' Defecating Practice

It can be observed from Fig. 2 that a majority of the sampled households practice open defecation. Lack of money (51%) was identified as the most important reason for the households defecating practice. The order of importance of the households' reasons for not owning a latrine was not different across the study communities, except in Lower East-Prampram, where the second most important reason was that as members dwell in family houses, the decision on owning a latrine would require a general consensus by all family members, a decision which the respondents considered 'difficult'.

² *Salaried workers*: teachers, bankers, ECG, GWCL, nurses, security officers and sanitation workers

³ *Self-employed*: fishermen, farmers, drivers, businessmen/traders, cooks, *artisans*- seamstresses/tailors, masons, carpenters

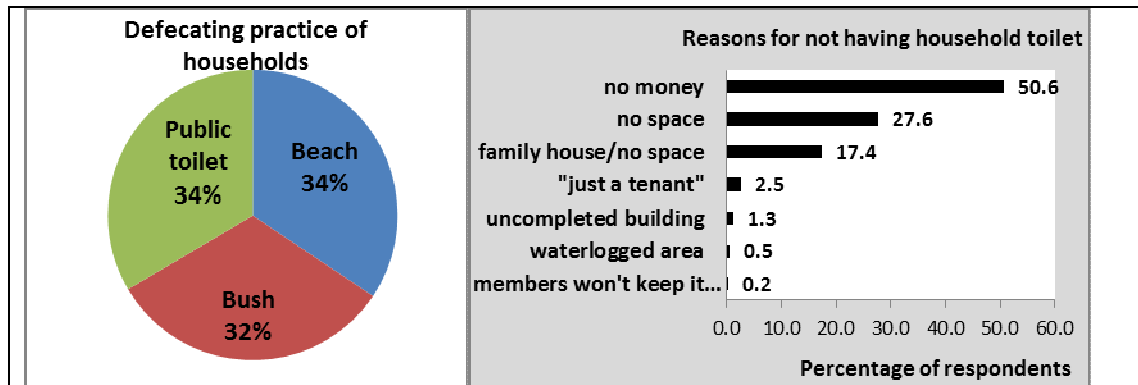


Fig. 2: Households' defecating practice and reasons for not having own latrine

3.2.2 Households' Latrine Preference

The study found that more than half (54%) of the households prefer the flush or pour-flush toilet linked to a piped sewer system latrine (Fig. 3). However, the flush latrine seems not feasible in the short term due to the lack of water and a sewer system in the study area. Spencer (2012) argues that it is unlikely that (poor) populations that have to purchase water will turn around and flush that water down a toilet. The second most preferred latrine was the ventilated improved pit (VIP) latrine. Relative to the flush latrine, the VIP does not require water for its use and could be the next best alternative for the households.

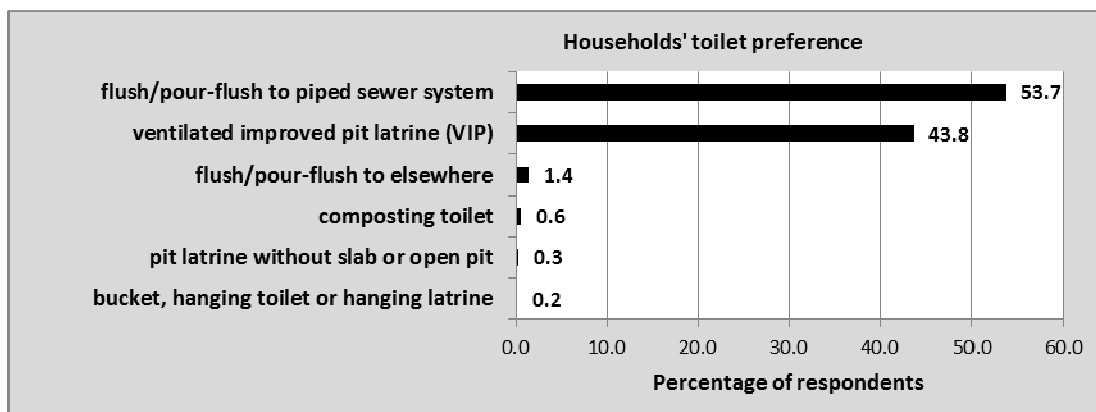


Fig.3: Households' latrine preference

The study found that personal factors and type of latrine technology were key factors in a household's choice of latrine (Fig. 4). Convenience and aesthetic value (*nice latrine*) were identified as the most important factors that the households consider for a flush latrine. Affordability, which represents a household's financial asset, hence the ability to pay, was also identified as the most important factor for the choice of other facilities such as the ventilated pit latrine (VIP), pit latrine and composting latrine. This result is consistent with the findings by Wittington et al. (1993) who reported that most households prefer improved ventilated pit latrines to conventional sewerage latrines (flush latrines) because the former is cheaper. Card and Sparkman (2010) also assert that a majority of households would not upgrade their latrine facilities (or defecating practice) without an affordable facility within their 'means' and current preferences. Personal factors such as safety of use of facility and concerns about user health, that is, odourless and flies-free facilities, were also identified by the households as important in their choice of latrine. This also clearly shows that the preference for a household latrine entails more than its core benefits, but also a consideration of a facility that provides value to users.

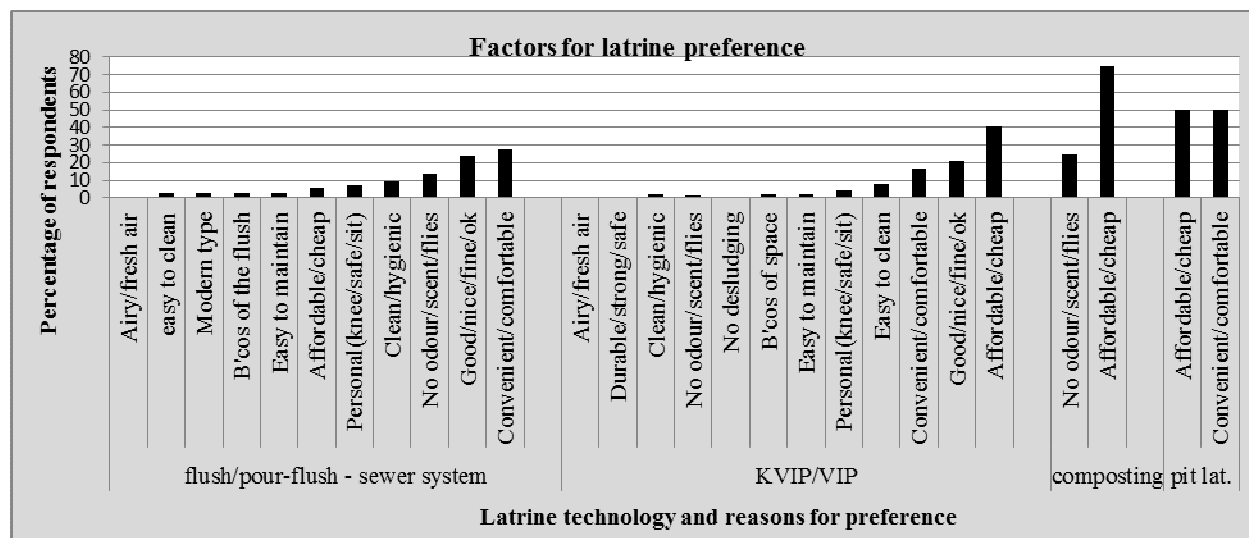


Fig. 4: Reasons for households' latrine preference

3.3 Resource Mobilization Strategies for Household Latrine

3.3.1 Estimated Costs of Improved Latrines

Knowledge of the cost of an improved household latrine technology is important to help guide the household in making decisions regarding a latrine preference and financing. Few of the respondents (about 15%) knew about the costs of improved latrines at the time of the survey (Fig. 5). Information on the estimated costs⁴ of improved latrines was provided to the respondents, after which financing decision was inquired. The costs of improved latrines were obtained using a budgetary estimate via data from latrine builders (masons) and hardware suppliers in the study area.

It was found that less than half of the respondents (44%) were interested to finance their latrines from own funds. With an average household size of five persons per household (Table 1), and using the average prices for use of the different public latrines (flush, pour-flush and KVIP/VIP) in the study area, it was found that a household spends (or would spend, for those practicing open defecation) about GH¢365 to GH¢730 per annum on defecating in the public latrines. This implies a high opportunity cost for not having a household latrine, in the long-run. A study by Adank (2011) concurs this finding that the use of public latrines by households is more expensive overall than an improved (private) latrine option.

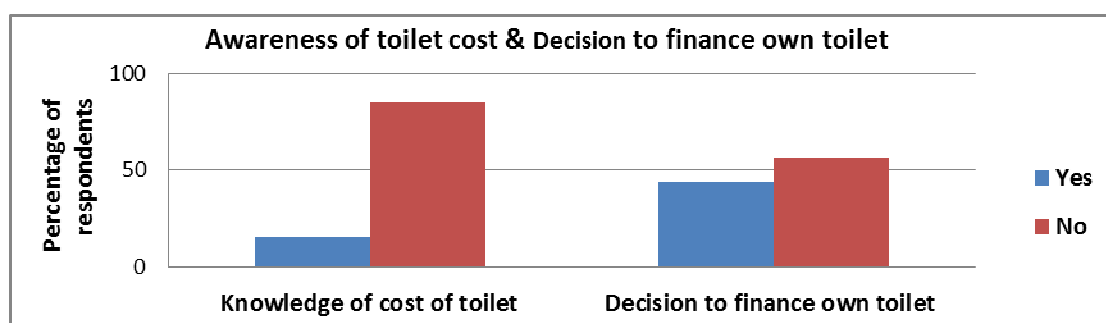


Fig. 5: Households' awareness of cost of latrine facilities and decision to finance own latrine

3.3.2 Source of Capital for Household Latrine

⁴ Flush toilet: Total cost (yrs): GHS5,208 (5-year period) = [4,000, Initial Cost; 750 (150*5), maintenance & usage (150/year); 458 (FV) for pit-emptying at 150(PV), 25%DF]

Pour Flush latrine: Total cost (yrs): GHS3,540 (5-year period) = [2,332, Initial Cost; 750 (150*5), maintenance & usage (150/year); 458 (FV) for pit-emptying at 150(PV), 25%DF]

KVIP/VIP latrine: Total cost (yrs): GHS1,503 (3-year period) = [1,000, Initial Cost; 210 (70*3), maintenance & usage (70/year); 293 (FV) for pit-emptying at 150(PV), 25%DF]

Pit latrine: Total cost (yrs): GHS450 (3-year period) = [300, Initial Cost; 150, maintenance & usage (50/year); 0 for pit-emptying]

Composting latrine: Seasonally in cottages and cabins = \$700 - \$1500 (GHS3,000). At home \$1200 - \$6000

Fig. 6 presents the results on the households' proposed source(s) of capital for their latrines, and specifically on how they would raise funds for their latrines. Strangely, about one-third (33%) of the sampled households indicated that they had 'nothing' (*no resources*) for the construction of their latrines. This confirms a report by Card and Sparkman (2010) in their study on 'sanitation market analysis' that households in poor peri-urban communities are normally not extremely dissatisfied with their current defecating practice, and their priorities are normally for housing (shelter), water, farming and schooling. However, about 37% and 26% of the households indicated they would provide 'money' and 'labour' which represent financial capital and human capital, respectively to build their latrines, implying an interest in a household latrine. As a common practice in Ghana, about 4% of the households also indicated that they would provide 'food' for the local labour (e.g. masons) they would hire for the construction of their latrines.

Concerning the source(s) of funds for a household latrine, half of the respondents indicated that they prefer to use their own funds via savings or 'susu' to build their latrines. Less than 10% of the households expressed interest in borrowing funds from the Banks or micro-financial institutions (MFIs) or using rent advance for their latrines. The high lending rate and other formal requirements, among others, were mentioned by the respondents as reasons for their low preference of funds from the Banks/MFIs.

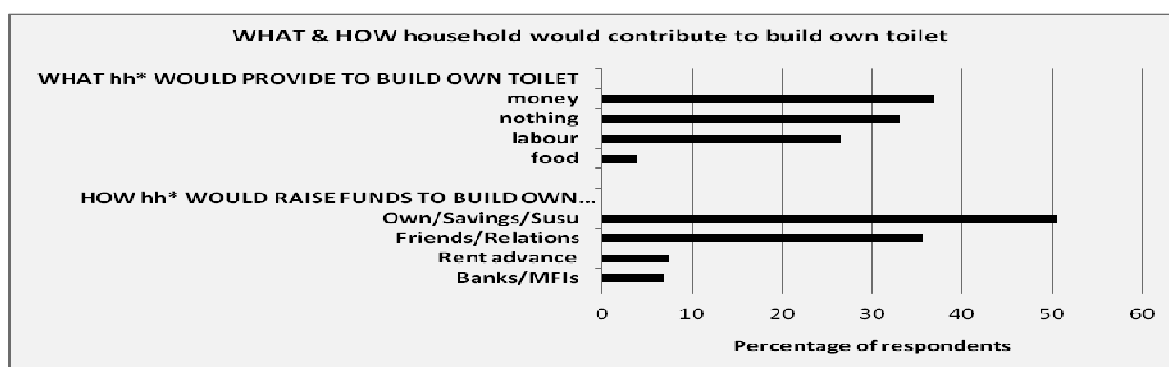


Fig. 6: Households' proposed source(s) of funds for their latrines. (Note: *hh, household)

The use of own funds or funds from friends/relatives was considered a 'more reliable' option of a household's access to funds for a project, including a household latrine. Moreover, the respondents considered the use of 'own funds' as a better, more flexible, more convenient and problem-free option (*no debtor-creditor issue*). In addition, the respondents indicated that as dwellers of an (extended) family house it was necessary for every household member to contribute for the construction of a household latrine. However, the households that indicated that they prefer to use funds from the Banks/MFIs gave reasons that the Banks are always available and reliable to provide loans to interested creditworthy persons.

Surprisingly, about half of the households had an account with the financial institution in the study area. A majority was affiliated with the Dangme Rural Bank (DRB), the indigenous rural bank in the study area. Only 13% of the sampled households had ever applied for a loan from the financial institution, and a majority of this proportion was to do business/trading with the loan (Fig. 7). This is not surprising as trading/self-employment, is one of the major occupations of most of the households in the study area (Table 1). The purpose of the loan was also for building, schooling and farming. This result again corroborates the report by Card and Sparkman (2010) that the priorities of households in poor peri-urban communities are normally for housing, water, farming, and schooling, instead of for proper sanitation. Of the proportion of households that had applied for a loan, a majority of the applications were successful.

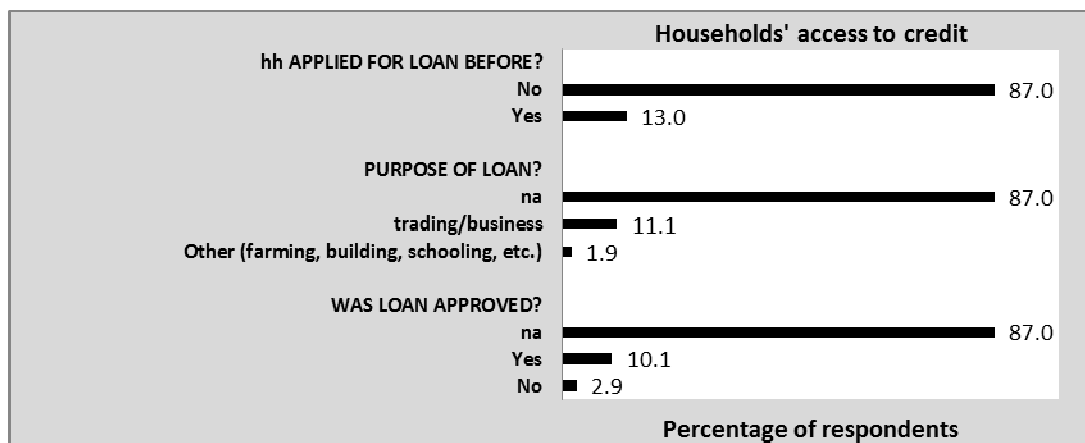


Fig. 7: Households' banking affiliation and access to credit

Interestingly, none of the financial institutions (FIs) in the study area had ever granted a loan for the construction of a household latrine, because no client had ever requested for such a loan. However, it was found that the FIs were interested in financing household latrines; they indicated that a 'latrine loan' could be considered as a personal loan to interested and creditworthy households. This indicates an opportunity for households that are interested in using non-equity funds to build their latrines, provided they can pay without default.

Based on the *five Cs* for credit scoring (Ross *et al.* 1998), the study found that 'collateral' was the most important indicator that the FIs would consider in their assessment of a household's creditworthiness for a 'latrine loan' (Fig. 8). To qualify for a 'latrine loan' the FIs explained that a household or would-be-borrower would need 50% of his/her savings or immovable item(s) as collateral. This result concurs with findings by Olagunju and Ajiboye (2010) who reported that the provision of collateral by borrowers is an important determinant of lenders' decision in their approval or otherwise of a loan application. The other most important lending indicators that were found were capital and character. A test of significance of W (0.76) among the lenders was statistically significant at 1%, implying a unanimous agreement by the FIs on the importance and order of ranking of the indicators (*five Cs*) for a household 'latrine loan'.

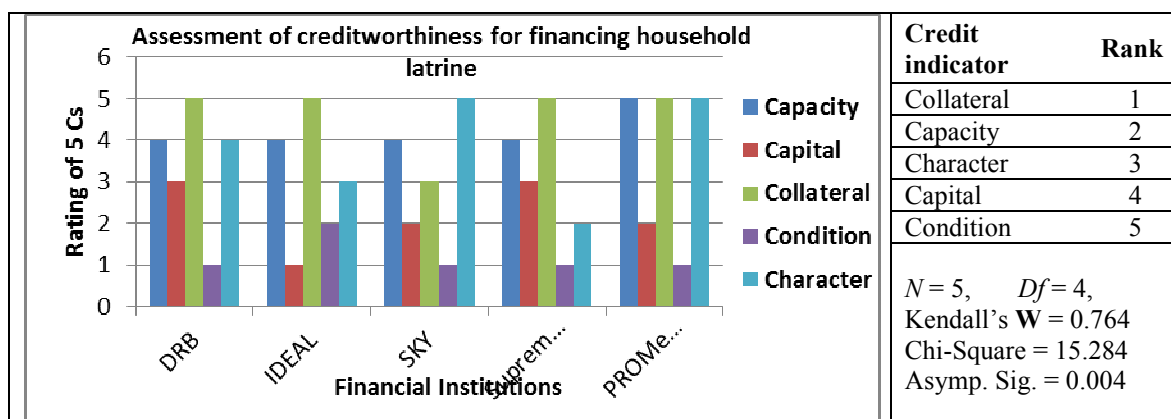


Fig. 8: Assessment of creditworthiness for household 'latrine loan'. Source: Field data, 2013

3.3 Empirical Estimates of Households' Latrine Financing Decision

The variable definitions and results of the descriptive statistics of variables that were used in the logistic regression model for households' latrine financing decision are presented in Table 2. Decision to finance own latrine, which is a dichotomous variable, was used as the dependent variable in an associative model of explanatory factors relating to the personal and household characteristics as well as community characteristics that could influence a household's latrine financing decision.

Table 2: Variable definition and sample statistics

Variable	Variable definition	Mean/ Mode	SD
<i>Dependent variable</i>			
DTF_OwnLat	Decision of household to finance own latrine	0.44	0.50
<i>Independent variables</i>			
Gender	1 if male, 0 otherwise	0.62	0.49
Age	Age of respondent (years)	47.9	12.3
Educ_PostBasic	1 if highest education level is secondary/tertiary, 0 otherwise	0.10	0.31
Educ_BASIC	1 if highest education level is basic, 0 otherwise	0.51	0.50
hhCmpCHILD	1 if household has a child below 6 years, 0 otherwise	0.48	0.50
INCOMpCAP	Average household monthly per capita income (in GH¢)	134.77	118.61
T_Landlord	1 if respondent is a landlord, 0 otherwise	0.27	0.44
T_FamilyHouse	1 if respondent resides in family house, 0 otherwise	0.59	0.49
Def_PubLAT	1 if household uses public latrine, 0 otherwise (ODF)	0.33	0.47
Cmnty-Upper-P	1 if household resides in Upper Prampram, 0 otherwise	0.44	0.50

US\$1.00 = GH¢1.99 (May/June, 2013). *Source:* Computation from field data, 2013

The empirical logistic estimates of households' decision to finance their latrines with own funds are presented in Table 3. Other statistics presented based on the estimates include the z -values, McFadden R^2 and the log-likelihood statistics. The coefficients of the predictor variables representing gender, education, household composition, income, tenancy, household's defecating practice and type of community were found to be significant at the conventional levels. The results show that male household heads (aOR = 0.507, CI: 0.353, 0.726) had a reduced odds decision to finance their latrines compared with female household heads. Men were about 51% reluctant to finance their latrines compared with women household heads. This may be due to the difficulty women have with ODF, as it is culturally unacceptable for women to be 'naked' in public. Moreover, women are responsible for household sanitation such as disposal of faeces of children; hence they may have interest in owning a household latrine than men. In addition, men in the study area usually spend less time at home, due to the nature of their job as fishermen, drivers or farmers, than women; hence the men may not consider it necessary to own a private/household latrine. This result supports the finding that households with children (aOR = 1.758, CI: 1.233, 2.507) had an increased odds decision to finance their latrines compared with those without children. Households with children were about two times more likely to finance their latrines than those with no children. The findings concur with the report by WSP (2004) that sanitation is more important to women and children, but men who make the investment decisions in many communities may have other priorities than sanitation.

Household heads with higher education (thus post basic education - secondary and tertiary) and landlords, as well as those with higher incomes and those who use public latrines and reside in the upper Prampram communities were also keen to finance their latrines. Household heads with higher education (aOR = 1.897, CI: 1.022, 3.519) had an increased odds decision to finance their latrines compared with those with no formal education. They were about two times more likely to finance their latrines than those with no formal education. Moreover, higher income households (aOR = 1.001, CI: 1.000, 1.003) had increased odds decision to finance their latrines compared with lower income households, implying that the former may have some disposable income to finance their latrines. Furthermore, landlords (aOR = 3.108, CI: 1.759, 5.491) had increased odds decision to finance their latrines compared with tenant households. They were three times more likely to finance their latrines than tenants. The result confirms the anecdotal evidence that tenants in poor peri-urban communities normally prefer 'low cost' rooms, due to the high rent price associated with dwellings with latrine facilities.

In addition, households using the public latrines (aOR = 1.808, CI: 1.243, 2.629) had an increased odds decision to finance their latrines compared with those who practice open defecation, and they were about two times more likely to finance their own latrines than those who practice ODF. Households residing in Upper Prampram, Kley and Olowey (aOR = 1.638, CI: 1.162, 2.309) had increased odds decision to finance their latrines compared with those in Lower Prampram (Lower East and Lower West), and they were about two times more likely to finance their latrines than those in Lower Prampram.

Table 3: Logistic estimates of households' decision to finance own latrine

Variables	Odds Ratio (CI)	Std. Err	z-Value	p-Value	Ref. Group
Gender_male	0.507 (0.353, 0.726)***	0.0930	-3.70	0.000	Gender-female
Age	1.003 (0.988, 1.018)	0.0076	0.46	0.733	All other variables
Educ_PostBasic	1.897 (1.022, 3.519)***	0.5981	2.03	0.042	Educ_NONE
Educ_BASIC	1.335 (0.919, 1.940)	0.2546	1.52	0.130	Educ_NONE
hhCmpCHILD	1.758 (1.233, 2.507)***	0.3182	3.12	0.002	hh > 6 yrs members
INCOMpCAP	1.001 (1.000, 1.003)*	0.0008	1.67	0.094	All other variables
T_Landlord	3.108 (1.759, 5.491)***	0.9026	3.90	0.000	T_Tenant
T_FamilyHouse	1.107 (0.654, 1.873)	0.2971	0.38	0.704	T_Tenant
Def_PubLAT	1.808 (1.243, 2.629)***	0.3452	3.10	0.002	Cmnty-Ningo
Cmnty-Upper-P	1.638 (1.163, 2.309)***	0.2868	2.82	0.005	Cmnty-Lower-P
Pseudo-R ² = 0.0948		Log-likelihood = -392.474		LR chi2(10) = 82.18	
Prob > chi2 = 0.0000		Observations = 633			

*** Significant at 1%; * Significant at 10%. *Source:* Computation from field data, 2013

4. Conclusion and Recommendations

This study investigated households' latrine preferences and resource mobilization strategies for improved latrines in the Ningo-Prampram district in the Greater Accra region of Ghana. Household survey data were collected in 2012 from 633 randomly selected households without improved latrines. Both descriptive and inferential analyses were employed for data analysis and reporting. Households' socioeconomic characteristics and community factors that influence a household's latrine financing decision were estimated using the binary logistic model. The study found that a majority of the sampled households practice open defecation, and lack of funds and space for an improved latrine were identified as key reasons for the households' defecating practice. This is consistent with the finding that the households' average monthly per capita income was lower than the per capita gross national average monthly income. A majority of the households prefer the flush/pour-flush to piped sewer system latrine, albeit the most expensive among the improved latrine technologies. The ventilated improved pit (VIP) was identified as the second most preferred latrine, which is relatively cheaper and also does not require water for its use.

It was found that about 44% of the households prefer to use their own funds via savings or 'susu' to build their latrines; less than 10% of the households prefer to use borrowed funds from the Banks or micro-financial institutions (MFIs). However, the financial institutions (FIs) in the study area had never been requested for a loan for a household latrine, although the FIs are interested in providing loans for household latrines. The empirical estimates from the logistic model also show that gender, education, tenancy, defecating practice and type of community may influence a household's latrine financing decision. Notably, higher education (post-basic), households with children below six years, per capita income, ownership of land/house, access to public latrine, and residents in Upper Prampram tend to positively influence a household's interest and financing decision for an improved latrine.

Since the study found that lack of funds and space are key constraints to acquiring a household latrine, and a majority of households prefer to use their own funds to build their latrines, there is the need to educate households to consider 'cheaper' and more feasible (*space*) latrine technologies such as the VIP, and also adopt joint-resource mobilization strategies such as 'ROSCAs' to acquire their latrines. There is also the need to educate the households on the possibility and conditions for alternative sources of funding for improved latrines. Policy efforts by the government and other stakeholders toward a sustainable uptake of improved sanitation should also consider the household and community factors that may influence a household's latrine preference and financing decision.

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References

- Adank, M., Darteh, B., Moriarty, P., Osei-Tutu, H., Assan, D., Rooijen, D. van (2011). "Towards Integrated Urban Water Management in the Greater Accra Metropolitan Area, Current Status and Strategic Directions for the Future", SWITCH/RCN Ghana, Accra, Ghana.
- Card, N. and Sparkman, D. (2010). "Sanitation market analysis: Kyarusozzi Sub-country, Kyenjojo District, Uganda". Draft Report Prepared for Water for People, October 21, 2010. <https://app.box.com/shared/amn9g82u2f>.
- Cofie, O. O., Kranjac-Berisavljevic, G. and Pay Drechsel (2004). "The Use of Human Waste for Peri-urban Agriculture in Northern Ghana", *Renewable Agriculture and Food Systems*: 20(2); 73–80. DOI:

10.1079/RAF200491.

- District Profile of Dangme West and Ningo-Prampram. <http://www.ghanadistricts.com/districts>.
- GSS (2012). "Population and Housing Census – 2010, Summary Report of Final Results", Ghana Statistical Service, Accra, Ghana. www.statsghana.gov.gh.
- Mattson, D. E. (1986). "Statistics - Difficult Concepts, Understandable Explanations", Bolchazy - Carducci Publishers, Inc. Pp. 281-283, 361, 423.
- MLGRD (2010). Ghana's Revised Environmental Sanitation Policy", Draft Final, April 2010. www.gh.gov.com
- Olagunju, F. I. and Ajiboye, A. (2010). "Agricultural Lending Decision: A Tobit Regression Analysis", African Journal of Food, Agriculture, Nutrition and Development. Vol. 10(5), pp. 2522. [url:http://www.ajfand.net/Volume10/No5/Olagunju9260.pdf](http://www.ajfand.net/Volume10/No5/Olagunju9260.pdf). Accessed: Feb 2012.
- Pindyck, R. S. and Rubinfeld, D. C. (1991). "Econometric Models and Economic Forecasts", Third Edition. McGraw - Hill Inc. Pp. 248.
- Ross, S. A., Westerfield, R. W. and Jordan, B. D. (1998). "Fundamentals of Corporate Finance", Fourth Edition, McGraw-Hill Companies, Inc., USA.
- Spencer, M. C. (2012). "Sanitation Practices and Preferences in Peri-Urban Accra, Ghana", Master's Thesis submitted to the Faculty of the Rollins School of Public Health of Emory University in partial fulfillment of the requirements for the degree of Master of Public Health in Hubert Department of Global Health, 2012. <http://susaghana.com>.
- Survey Sample Size: *How many people do I really need to send my survey to?* <https://www.surveymonkey.com/mp/sample-size/>
- SUSA Baseline (2011). "Sanitation Practices and Preferences in Peri-urban Ghana: The Case of Dangme West district", SUSA-Ghana Project.
- Thrift, C. (2007). "Sanitation in Ghana: Key Factors and the Potential for Ecological Sanitation Solution", EconSanRes Programme and the Stockholm Environmental Institute pp v, 1.
- Weinberger, K., and Jütting, J. (2000). "The Role of Local Organizations in Risk Management: Some Evidence from Rural Chad", Quarterly Journal of International Agriculture 39(3): 281–99.
- Whittington, D., Lauria, D. T., Wright, A. M., Choe, K., Hughes, J. F. and Swarna, V. (1993). "Household Demand for Improved Sanitation Services in Kumasi, Ghana: A Contingent Valuation Study" Water Resources Research, Vol. 29, No. 6, pp. 1539-1560.
- WHO and UNICEF (2014). "Progress on Drinking Water and Sanitation", JMP's (WHO/UNICEF) 2014 Update. http://www.wssinfo.org/fileadmin/user_upload/resources/JMP_report_2014_webEng.pdf
- Wikipedia. "Logistic Regression", url: http://en.wikipedia.org/wiki/Logistic_regression.
- WSMP (2009). "Status of Ghana's Drinking Water and Sanitation Sector", A WSMP Ghana Summary Sheet, 2009, Ministry of Water Resources, Works and Housing, Accra, Ghana.
- WSP (2004). "The Case for Marketing Sanitation", Water and Sanitation Program, Field Note, August 2004. http://www.wsp.org/sites/wsp.org/files/publications/af_marketing.pdf.

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