

Households' Ability and Willingness to Pay for the Provision of Sanitary Facilities in the Kassena-Nankana District of the Upper East Region of Ghana

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Abstract

Developing nations are confronted with issues of poor sanitation and its implications on human welfare cannot be under-estimated. This challenge cannot be dealt with only by central governments and therefore the need to share this burden with the citizenry by way of cost sharing. However, little is known about the people ability and willingness to pay (WTP) for the provision of sanitary facilities to deal with this poor sanitation problem. The current study contributes to this discussion by offering an empirical assessment of the determinants of households' WTP and their ability to pay using a recently collected data from the Kassena-Nankana district of the Upper East Region of Ghana. Data was collected by designing and administering questionnaires to 150 households in three communities in the study area using a multi-stage sampling technique. Using probit regression, it is observed that gender, educational status and household size are the major determinants of households' WTP. Additionally, more than 50% of the households in the study area were able and more willing to pay for the provision of these toilet facilities. It is concluded that households were more prepared to partner with the local government authorities to deal with the poor sanitation issue in the area. The study recommends that government and other developmental partners in the sanitation fraternity should consider partnering with the communities to deal with the sanitation problems.

Keywords: Sanitation, Willingness to pay, Determinants, Ability to Pay, Kassena-Nankana

Introduction

Issues of sanitation are a major concern for most developing nations and to the extent that they all aspired to achieve goals 7 of the Millennium Development Goals (MDGs) and more recently goal 3 of the Sustainable Development Goals (SDGs). Sanitation generally

refers to the provision of facilities and services for the safe disposal of human urine and faeces (www.who.int). The World Health Organization (WHO) (2015) defined sanitation as methods used to collect human excreta and urine as well as community wastewater in a hygienic way, where human and community health is not altered.

Lack of sanitation is widely acknowledged to be a major cause of diseases worldwide and improvement in sanitation is known to have significant beneficial impact on health status of both households and communities (WHO, 2015 and WaterAid, 2011).

Research and statistical facts from the World Health Organization (2015) indicates that, in 2015, 68% of the world's population had access to improved sanitation facilities including flush toilets and covered latrines, compared with 54% in 1990. Nearly one third of the current global population has gained access to an improved sanitation facility since 1990 with about 2.4 billion people still not having basic sanitation facilities such as toilets or latrines. Of these 2.4 billion people stated, 946 million still defecate in the open, for example in street gutters, behind bushes or into open bodies of water.

Ghana has been ranked second after Sudan in Africa in open defecation, with 5 million Ghanaians not having access to any toilet facility. The country has also been performing poorly with sanitation coverage of only 15 percent, making the practice of open defecation a key sanitation challenge because people do not have access to key basic facilities (UNICEF, 2015). The statistics further revealed that the Upper East Region records the highest rate of open defecation with 89 percent, followed by Northern region with 72 percent and Upper West region with 71 percent. This sanitation challenge is no doubt a life threatening situation and must therefore be given the necessary attention it deserves. This notwithstanding, government is doing its bit to address these insanitary conditions¹¹. District and Municipal Assemblies are not able to tackle this canker head on because of inadequate financial resources compared to the over growing population in recent times. In line with this, it is very important and timely to consider the possibility of cost sharing by households, and for this we need to analyse the demand side for the provision of sanitary facilities.

There is an extensive literature on the Willingness to Pay (WTP) for solid waste management (see Dagnew et al., 2012; Aggrey and Douglasan, 2010 and Fantu, 2007), but very little empirical studies on the WTP for the provision of sanitary (toilet) facility more especially in Ghana. The current study seeks to bridge this gap by examining the following specific objectives:

- i. The socio-demographic characteristics of respondents in the study area.

11 In 2014 the President of Ghana declared the National Sanitation Day and which falls on the first Saturday of every month.

- ii. The determinants of WTP for the provision of toilet facilities in the study area.
- iii. The ability to pay for the provision of toilet facilities in the area.

Methodology of the Study

The study made use of only primary data that was sourced by designing and administering questionnaires to respondents in the Kassena-Nankana District. The questionnaire was structured into two sections. Section one was designed to collect information on the socio-demographic characteristics of respondents and that of section two was on willingness and ability to pay for the provision of toilet facilities in the study area. A multi-stage sampling technique was used to select 150 respondents from the study communities for interview.

The first stage was a purposive¹² selection of three communities in the district. These communities are Tankuna, Janania and Gonia. The second stage involves a random selection of 50 households from each community. The final stage was a random selection of an adult household member, irrespective of gender and who has more knowledge about the household for interview. Data was analysed using STATA version 13.

Conceptual Framework and Econometric Procedure

A considerable part of empirical environmental economics concerns the economic benefit of changes in the level of environmental quality. Services such as improved sanitation and sanitary facility supply are generally not traded in markets and information on market demand or competitive market prices are often not available to value benefits (FAO, 2000). The Contingent Valuation Method (CVM) creates a hypothetical market for such products or services and seeks to elicit the value that people attach to them by asking them how much they would be prepared or willing to pay to obtain the benefits of such products or services. The method is said to capture both the use and non-use value attached to the product or service (Carson et al, 2001). The study adopted the CVM approach to measure the WTP for the provision of toilet facilities. The reason being that, the CVM method is more superior to other valuation methods such as the Travel cost and the Hedonic pricing methods as they capture only used values of products.

Binomial probit regression would be used to examine the determinant of the WTP for the provision of toilet facilities. Willingness to pay is considered binary given that a household can either be willing to pay or not. This is expressed in functional form as:

12 These communities were selected because of the high incidence of open-defecation being practiced by its members.

$$WTP_i = f(X_i) + e \dots\dots\dots 1$$

where X_i is a vector of determinants and e is the error term.

Following equation 1 above, the determinants of WTP model is specified as:

$$WTP = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon \dots\dots\dots 2$$

Where $X_1 - X_3$ is the individual, households and location characteristics respectively.

Results and Discussions

Socio-demographic Characteristics of Respondents

The desire for an individual or household to pay for the provision of sanitary facility is derived by certain socio-demographic characteristics of that individual or the household. Examination of these characteristics is important to the extent that it provides policy makers and implementers a guide when introducing cost sharing projects in dealing with sanitation problems. The current study therefore examines the socio-demographic characteristics of respondents as indicated in objective one.

The socio-demographic characteristics of the 150 households' respondents were examined with respect to gender, age, marital status and highest educational qualification attained. The average household size of the study area was 7.25, almost twice the national average of 4.0 and an Upper East regional average of 4.5 (GLSS 6, p.4). A small percentage of these households have household size of at most 4 members. By age and gender of respondents, the study revealed that a greater proportion (69.33 percent) of the respondents was in the youthful age category of 10 – 40 years with females dominating in that regard (see Table 1). Only a small percentage (5.33 percent) of the respondents were aged (above 60 years) with males recording the highest percentage.

Table 1: Distribution of Respondents by age and gender

Age of Respondents	Male (%)	Female (%)	Total (%)
10 – 20	5.88	6.10	6.00
21 – 30	27.94	35.37	32.00
31 – 40	33.82	29.27	31.33
41 – 50	20.59	19.51	20.00
51 – 60	2.94	7.32	5.33
61 – 70	8.82	2.44	5.33
Total (%)	100.00	100.00	100.00
N	68.00	82.00	150.00

Source: Field Survey, 2016

In terms of educational status and gender, the study noted that a little over one-fourth of the respondents have no education (Table 2). This figure is higher for females than males though not statistically significant. Aside no education, close to half (47 percent) of the respondents had education beyond the basic level with females recording the highest percentage. This has implication for households' desirability to share cost of keeping their environment clean as it has been hypothesised that more educated households know the risk of staying in unhygienic environment.

Table 2: Distribution of respondents by education and gender

Education of Respondents	Male (%)	Female (%)	Total (%)
No education	25.00	29.27	27.33
Junior High School	30.88	21.95	26.00
Senior High School	20.59	29.27	25.33
Tertiary	23.53	19.51	21.33
Total (%)	100.00	100.00	100.00
N	68.00	82.00	150.00

Source: Field Survey, 2016

Marital status of respondents is expected to influence the value the individual attaches to a proposed change. Married people are likely to be more responsible to keep the environment clean than single ones. This could be explained by the fact that married people are more likely to suffer the risk of hygiene associated diseases because of their larger family size. Results of the study revealed that 54 percent of the respondents were married (Table 3). This figure reduces for the single, widowed and divorced with females recording the highest percentage in all categories.

Table 3: Distribution of respondents by marital status and gender

Age of Respondents	Male (%)	Female (%)	Total (%)
Single	26.47	31.71	29.33
Married	58.82	50.00	54.00
Divorced	5.88	7.32	6.67
Widowed	8.82	10.98	10.00
Total	100.00	100.00	100.00
N	68.00	82.00	150.00

Source: Field Survey, 2016

Having discussed the socio-demographic characteristics of respondents, it would be insightful for one to examine the determinants of willingness to pay for the provision

of toilet facilities to the study area as required by objective 2. The estimated results are presented in Table 4. The results showed that Age, marital status, monthly income and practice of open defecation do not significantly influence WTP for the provision of toilet facilities.

Table 4: Probit regression results on determinants of WTP

Variable	Coeff	Std Err	Z-Value	P> z
Age	0.4067	0.0090	1.100	0.270
Gender	0.4067*	0.2280	1.780	0.074
Household size	-0.0756***	0.0305	-2.470	0.013
Education	0.2316**	0.1097	2.110	0.035
Marital status	0.0152	0.2351	0.060	0.949
Monthly income	0.0002	0.0003	0.720	0.474
Open defecation	0.3681	0.2716	1.360	0.175
N			150	
Wald chi ² (7)			35.100	
Prob > chi ²			0.000	
Log likelihood			-83.146	

Note: ***, ** and * implies the level of significance at 1%, 5% and 10% respectively.

Source: Authors' Construct, 2016

However, gender, household size and educational qualification significantly influence households' WTP. As expected, educational attainment is positive and significant. This finding suggests that people with higher educational qualification are more likely to be WTP for the provision of toilet facilities in the communities than those with no education. Highly educated people are anticipated to know the risk of living in unhygienic environment and therefore will be willing to pay to avoid diseases such as cholera and dysentery. Similarly, the coefficient of gender is positive and significant, an indication that females are more likely to pay for the provision of toilet facilities than their male counterparts. Thus, females are about 41 percent more likely to pay than males. This finding is consistent with that of Fujita et al. (2005) and Dzienyo (2014) which reports that females are more willing to pay for the provision of sanitary facility or improvement of existing ones. This result could be explain perhaps by the highly uncomfortable feeling females experienced when defecating in the open and also they being prone to unhygienic related diseases than males. What is surprising though is the negative effect of household size on WTP. Larger households are less willing to pay

for the provision of sanitary facilities than smaller ones¹³. This finding is at variant with that of Kazi (2008) which reports that larger households are more willing to pay for improved sanitation services. The practice of open defecation has the expected sign though not statistically significant.

Of the 150 respondents interviewed, majority (70 percent) were willing to pay for the provision of these sanitary facilities. Whilst this figure might be more impressive, the study sought to find out how many households will be able to pay money for these services. The study noted that 57.3 percent (far less than those who expresses their WTP) of those households will be able to pay (see Table 5).

Table 5: Distribution of respondents by ability and WTP

Will you be able to pay?	Will you be willing to pay?			
		No (%)	Yes (%)	Total (%)
	No	100.00	19.63	42.67
	Yes	0.00	80.37	57.33
	Total	100.00	100.00	100.00
	N	43.00	107.00	150.00

Source: Field Survey, 2016

Averagely households were WTP GH¢42.52 each and a maximum amount of GH¢500 towards the project. For those who could not afford to pay also indicated their readiness to offer other forms of support such as materials and labour. In fact, majority (61.3 percent) of those who reported their inability to pay were ready to supply labour toward achieving the project and with just 4.8 percent saying they could offer nothing (see Table 6).

Table 6: Respondents' ability to pay and other forms of support

If not money, what can you offer?	Will you be able to pay?			
		No (%)	Yes (%)	Total (%)
	Nothing	4.84	3.70	4.31
	Labour	61.29	74.07	67.24
	Materials	33.87	22.22	28.45
	Total	100.00	100.00	100.00
	N	62.00	54.00	116.00

Source: Field Survey, 2016

13 This could be explained perhaps by the 'free rider game' where everyone looks up to the other to pay for them to enjoy.

Conclusion and Recommendations

Majority of the respondents from the study area were in their youthful ages with females constituting the greater percentage. This has policy implication more especially in mobilizing physical and human resources towards achieving a disease free environment. Similarly, close to half of the respondents have education beyond the basic level. The main determinants of households' WTP for the provision of toilet facilities were gender, household size and educational attainment of heads of households. Furthermore, the study revealed that majority of the households were able and willing to pay for the provision of these sanitary facilities.

In terms of policies, government and other developmental partners considering achieving goal 7 of the MDGs should consider involving the communities to share the cost of providing toilet facilities in the face of financial difficulties faced by local government authorities and the desirability of most households WTP. This high incidence of people WTP is explained by the educational attainment and therefore government in ensuring a healthy and polluted free environment should extend education to cover all, more especially the rural communities. This could be done through proper implementation of the government free SHS policy.

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