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DETERMINANTS OF THE WILLINGNESS TO PAY FOR SOLID WASTE RECYCLING AMONG HOUSEHOLDS IN ILEMELA, TANZANIA

Stanslaus Rupia
Department of Economics Student, St. Augustine University of Tanzania Master of Arts in Economics
*e-mail: standodoma@gmail.com
*Correspondence: standodoma@gmail.com

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Abstract: This study aimed to investigate the determinants of willingness to pay for solid wastes recycling among households in Ilemela District, Mwanza-Tanzania. The study design was a cross-sectional survey design which was conducted among households residing in Ilemela District. A multistage sampling technique was useful for selecting representative samples from every ward. Structured questionnaires were used to obtain data from study participants. Data was analyzed using descriptive statistics, logistic regression was used in analyzing the factors influencing household's willingness to pay for solid waste recycling and ordinary least square regression was used to estimate the effect of socio-economic factors on the amount households were willing to pay for solid wastes in Ilemela District. The findings of the study show that majority of households were not willing to pay for solid waste recycling in Ilemela District, Mwanza region.The willingness to pay for solid waste recycling was associated with age of the household head, marital status, and education. Information dissemination and logarithm of household's income while the effect of socio-economic factors on amount households were willing to pay for solid waste recycling was associated with the marital status (married households), households' years of education, information dissemination on solid waste recycling and logarithm of income was statistically significant in influencing the amount households are willing to pay for solid waste recycling. The study recommends that the government and other interested stakeholders on solid waste management should invest more on education and awareness about importance of waste management to the mass using different mechanisms.

Keywords: Solid Waste Recycling, Contingent Valuation, Willingness to Pay, Households' Perceptions

INTRODUCTION

Globally, the amount of municipal solid waste is growing faster than the rate of urbanization. In 2012, the world's cities generated 1.3 billion tons of solid waste per year, amounting to a rate of 1.2 kg per person per day. With rapid population growth and urbanization, municipal waste generation is expected to rise to 2.2 billion tons by 2025 (Akhtar et al., 2017; AOIKE, 2019). At present, 62 million tons per year of municipal waste is generated in sub-Saharan Africa, with an average of 0.65 kg per person/day (Wilson et al., 2012). By 2050, the urban population in sub-Saharan Africa is projected to generate three times the amount of waste it currently produces (Kaza et al., 2018).

Cities in developing countries are facing increasing generation of waste (Begum et al., 2007) and accompanying problems associated with waste collection and disposal (Begum et al., 2007) resulting from urbanization process that brings a lot of problems in most third world countires (Kwabena and Danso-Abbeam 2014). In Africa, it is estimated that currently the rate at which solid waste is growing in urban areas is muchaster than the urbanization itself (Hoornweg and BhadaTata, 2012). Likewise, according to UNESC (2009), urbanization with poor waste management practice, especially widespread disposal of waste water bodies dumping inside the road and uncontrolled dump site magnifies the problem of low sanitation level across the African countries. The problems are aggravated by high amount of waste generation, shortage of waste disposal sites, lack of waste collection by municipality offices, and less attention and poor disposal habits by dwellers (Banga et al., 2011). As evidences have shown that the global populations of urban residence continue to grow significantly within the last decades, it was reported that with about 30% of world population living in urban areas in 1950s, the figure is projected to reach 66% by year 2050 (United Nations, 2015).

Almost 2 billion people worldwide still lack access to solid waste collection services, with the lowest collection rates being observed in low-income countries (Rodić & Wilson, 2017). Scholarly literatures indicated that improper municipal solid waste disposal and management causes all types of pollution: air, soil, and water (Alam & Ahmade, 2013; Srigirisetty et al., 2017). This indicated that improper solid waste management contributes to a worsening environmental degradation (Marshall & Farahbakhsh, 2013). Problems of waste generation and management in developing countries have become one of the intractable environmental problems facing urban centers (Thi et al., 2015).

Solid waste management is practiced in Mwanza city. However, the approaches of landfills and burning which were usually common and practiced are no longer recommended by the municipal regulations, bylaws and are not effective especially in environmental protection and natural resource conservation. Solid waste recycling could be the best option in dealing with solid waste in the growing

urban areas of Mwanza especially in Ilemela municipal. That is why the current study analyzed household's willingness to pay for solid waste recycling.

Literature Review

Maskey and Singh (2017) looked into Nepalese households' willingness to pay for improved garbage collection services. Using a stratified sampling approach, the study assesses 401 families' willingness to pay (WTP) for improved waste collection service in all 15 wards of Nepal's Gorkha municipality, as well as the factors that influence it. We utilized a unexpected valuation strategy to decide households' WTP, a logit relapse demonstrate to decide components affecting WTP, and a tobit relapse show to decide the most extreme sum families are willing to pay for moved forward trash collection benefit. The larger part of families (61%) are willing to pay an average of NRs. 73.38 (0.72 US$) per month. Monthly household income, the household head's education, environmental awareness, and garbage collection service are all important factors in determining a household's WTP. Except for the degree of the household head, all of these factors have an impact on the maximum amount of money that households are willing to pay.

Balasubramania (2019) used the contingent valuation method for improved solid waste management to investigate the willingness of 150 families in Madurai, India, to pay for enhanced solid waste management services. According to the survey, semi-urban household respondents are willing to pay Rs 24 (US$ 0.34) for a clean environment. According to the survey, more than 95 percent of Madurai household respondents are willing to pay for solid waste management. The majority of household respondents believe that improper solid waste management is one of the leading causes of health problems in the study area, especially among children and the elderly. The study's main policy recommendation is that India's semi-urban areas develop a solid waste management plan for collection, transportation, disposal, and segregation of solid waste.

Tassie and Endalew (2020) discovered that the model result showed that the household's educational level, monthly aggregate income, quantity of waste generated per week, access to solid waste management services, and respondents' responsibility for solid waste management all had a significant positive effect on households' willingness to pay. When designing and implementing improved solid waste management services, the municipality of Bahir Dar should keep these important factors in mind.

Using a contingent valuation technique, Sizya (2015) investigated the relationship between selected socio-economic variables of households and their willingness to pay for improved solid waste management. The study used the logit regression technique to estimate the determinants of selected dependent variables on willingness to pay in 300 randomly selected households in Mwanza City, Tanzania. Seven variables had a significant impact on the families' willingness to pay, according to the logit model's findings. The respondents' post

vocational, primary education, and income variables were positive and statistically significant, with the exception of the dummy variables of age, environmental knowledge, and secondary education, but household type and environmental legal regulations were negative and significant. The study's findings also indicate that individual households are willing to pay for solid waste management.

Ezibilo (2013) investigated householders' willingness to pay for improved residential solid waste management using data from a contingent valuation survey of 236 houses in Ilorin, Kwara State, Nigeria. When using a binary logit model, the survey found that more than 80 percent of respondents supported household trash management. The respondents were willing to pay an average of 3,660 Naira ($24) per year. Income, education, living style, and whether or not they were satisfied with the private sector's participation in waste management service provision all influenced respondents' willingness to pay. The effects of price, gender, home size, and sanitary inspector actions were all negative. The findings of this study could help Nigeria and other countries in similar situations develop a more sustainable home waste management strategy.

Mulat et al.,(2019) looked at Ethiopian households' willingness to pay for better solid waste management and the factors that influence it. The study looked at the factors that influence people's willingness to pay for better garbage management using a Tobit regression model. The household heads' sex (being male), the household's wealth, the household's educational status, the household's age, the amount of solid waste generated, the distance from solid waste dumping, and the household's perceived satisfaction all had a statistically significant relationship with WTP, according to the study.

MATERIALS AND METHODS

Theoretical Model

The relationship between the dependent variable and independent variables can be generally expressed as follows:

$$y_i = f(x_i)$$

.....(1)

Economic Model

The willingness to pay model that follows logit model has the economic expression of the form:

$$\Pr(y_i \neq 0 \mid x_i) = \frac{\exp(x_i\beta)}{1+\exp(x_i\beta)}$$

..... (2)

Econometric Model

The econometric model is the economic model plus the error term. Thus, by adding the error term in equation (2), the economic model turns out to be an econometric model. The econometric model can therefore be expressed as follows:

$$\Pr(y_i \neq 0 \mid x_i) = \frac{\exp(x_i\beta + u_i)}{1+\exp(x_i\beta + u_i)}$$

..... (3)

Where, $\Pr(y_i \neq 0 \mid x_i)$ is the probability of an individual willing to pay for solid waste recycling given the explanatory variables x_i

, x_i is a vector of independent variables that affect one's willingness to pay, u_i is the error term, and β is the slope coefficient or the marginal effects in the logistic regression language.

Empirical Model

Willingness to pay depends on different factors such as household's income, age of household head, business as alternative source of income, proximity to the collection points, households' size, level of education and gender (Abel, 2009; Ajanu, 2007; Sridhar, et al., 1985). Therefore, empirically, the logistic model for willingness to pay in this study is expressed as follows.

$L_i = \beta_0 + \beta_1 \ln(Inc_i) + \beta_2 \ln(Age_i) + \beta_3 Educ_i +$ (4)

Estimation Technique

This study was estimated by using logistic regression since the dependent variable was binary that is 1 if the household is willing to pay for solid w if the house. The model that will be used to estimate the willingness to pay for solid waste management and recycling is that of logit model

Logit $(WTP_i) = (WTP_i + \varepsilon_i)$ ..... (5)

This can be explain as follows

$\text{Logit}(WTP_I) = \beta_0 + \beta_1 \text{Age}_i + \beta_2 \text{Gender}_i + \beta_3 \text{Income}_i + \beta_4 \text{Education}_i + \beta_5 \text{business} + \varepsilon_i$ (6)

After the parameters of our model are estimated through maximum likelihood procedure, estimation of the mean WTP is straightforward. The mean WTP will therefore be calculated as:-

$E(Y) = \hat{\bar{x}}\hat{\beta}$ .....(7)

Model Specification for the effect of socio-economic factors on the amount households' willingness to pay for solid waste recycling

On the Amount households is willing to pay (WTPA), the nature of the dependent variable wasmeasured as in continuous scale. The analysis of this variable employed multiple linear regression models under ordinary least square technique (OLS). To estimate the model the nature of dependent variable wasconverted to natural logarithm to reduce the problem of collinearity of the variable and for that case is taken as "LnY" and was explained by all demographic and socio-economic factors. The general OLS model can be shown as follows:

$y_i = \beta_0 + \sum_{i=1}^{n} \beta_I x_i + \varepsilon_i$ .....(8)

Where:

y_i=dependent variable

x_i=independent variables

β_0=intercept

β_1=coefficient

N=number of observations

i=households

ε_i=disturbance term

Specification of the econometric model

$LnY_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$

μ_i =Stochastic error term

LnY=natural logarithm of Amount households willing to pay

β_0=intercept term

β_1=coefficient of the age of the households and X1 is the age of households

β_2=coefficient of the sex of households and X2 sex of households

β_3=coefficient of the marital status of the households and X3 marital status

β_4=coefficient of years of education of the households and X4 years of education

β_5=coefficient of occupation of households and X5 is an occupation

β_5=coefficient of information dissemination and X6 is information dissemination

β_6=coefficient of household's awareness and X7 is household's awareness

β_7=coefficient of income of households and X8 is income of households

β_8=coefficient of household's size and X9 is household's size

The variables measurement and expected signs

The table below summarizes the variables and how they are measured. Nevertheless, their expected signs are given in the right column of the table. The expected signs for some variables such as gender, age, and family size are not certain. As a result, their signs are either positive or negative.

Table 1. Variables, measurements and Expected Signs

Variables	Descriptions	Measurement scale	Expected signs
WTP for types of sanitation facilities (dependent variable)	1 if a household is willing to pay for solid waste recycling 0 otherwise	Nominal scale	
Amount Willing to Pay(WTA) (dependent variable)	The amount of money that households is willing to pay	Continuous scale (Tshs)	
Independent variables			
Age	The actual number of years of respondents age	Continuous scale(years)	+
Gender	1 if the respondent is male 0 otherwise	Nominal scale	+
Marital status	1 whether the respondents are married 0 otherwise	Nominal scale	+
Household's Head education years	Number of years of respondents spent in school	Continuous scale(years)	+
Households size	Number of all members in the households	Continuous scale (numbers)	+
Households income	The average household's income earned by the household's head	Continuous scale (Tshs)	+
Household's Head occupation	Nominal which tells if households involved in a certain activity or not	Nominal scale	+

	(0=unemployed, 1=employed)		
Awareness of households on solid waste recycling	1 if the respondents have sufficient knowledge 0 otherwise	Nominal scale	+
Information dissemination	1 if household is disseminated with information on solid waste recycling through radio or television 0 otherwise	Nominal scale	+

Source: Author's formulation, 2021

From Table 1, for the gender, if the sign is positive then male household heads are more willing to pay for solid waste recycling than female household heads.

The data

For the analysis of the WTP for solid waste recycling, this study will basically use primary data which will be collected from the population sampled wards in Ilemela municipal the case study of Kawekamo ward

Target Population

The study used households in Ilemela District for the selected wards of Kawekamo, pasiansi and Nyamanoro representing the population of Ilemela and the environmental stakeholders.

Sample and Sampling Design

The study focuses on Ilemela Municipality which is too big given researcher's limited time. Therefore, one division was randomly selected from the Ilemela. Three-stage sampling technique in the multi-stage sampling design was used to arrive to a reasonable sample, where by three wards out of 19 were selected randomly and from each ward, one street from each ward was selected making a total of three streets.

Therefore, Sample for this study was selected from three wards namely Kawekamo, Pasiansi and Nyamanoro. Given that households' population is known as per Population entire the entire Ilemela Municipality population. Regarding the study topic willingness to pay for solid waste recycling among households where the population is too large and unknown to be studied at once. The sample size was selected using the Cochran formula for sample selection because the population is too large for the study to deal with its sample size.

$n_0=\frac{z^2pq}{e^2}$

Where; *e*: desired level of precision (margin error).

p: the proportion of the population which has the attribute in question.

q= 1-p

In this case

e = 1.96

p = 0.5

q = 1-p

$n_0=\frac{z^2pq}{e^2} = \frac{(1.96)^2\times 0.5\times 0.5}{0.8^2} = 150.0625$

The sample size was taken to be 150 households.

Table 2. Represent number of households for every selected ward in IlemelaMunicipality

No	Name of the Ward	Target population	Sample size
1	Kawekamo	265911	40.0
2	Pasiansi	35,723	50.0
3	Nyamanoro	51,456	60.0
	TOTAL	353090	150.0

Source: Researcher, 2021

Data Collection Method

The data were collected by using systematic interviews moderated by questionnaires. The questionnaires were administered by the researcher to ensure high rate of response. Nevertheless, respondents did not have enough time to fill in the questionnaires. In this study, the main instrument for the collection of household data was questionnaire survey. The study used primary data obtained directly from a sampling frame of 853 households but represented by 150 households. The survey collected household demographic factors and socio-economic characteristics, household's participation and their attitudes towards participating in solid waste recycling services.

The study employed contingent valuation method (CVM) to come up with precise analysis on a household decision whether or not to pay for solid waste recycling service. The underlying idea behind this method is that people have preferences for other environmental amenities and services but these preferences are hidden, then we have to translate these in monetary units.

During the interview, respondents were freely to answer the open-ended questions while indicating the maximum amount they are ready to pay (Song et al., 2012). The CVM technique have been criticized for having biases including strategic bias, hypothetical, design bias, and operational bias (Padi et al., 2015; Nkansah et al., 2015). Despite its drawbacks, CVM was used in this study because of its ability to capture use and non-use values, unlike other environmental methods such as hedonic pricing and travel cost methods which have a tendency to underestimates a satisfaction by considering use values only. The method of CV was preferred because of its simplicity in data collection, relatively easy to understand, interpret, and to use for policy intervention purposes.

Data Type

For the analysis of the WTP in Ilemela the study used cross sectional primary data which were collected from the respective wards. Within the survey which was conducted in Kawekamo, Pasiansi and Nyamanoro wards.

Data Analysis

The data collected were analyzed by using SPSS and STATA 12. The analysis was quantitative descriptive and inferential statistics. The sample and individual household's characteristics were analyzed by using Analysis of Variance (ANOVA). The data obtained were tested by pre-estimation test, were estimated and were post estimated.

Households Amount willing to pay for solid waste recycling

Household's amount willing to pay was used as a proxy measure of willingness to pay for solid waste recycling. The household's amount was captured as a continuous variable and findings pointed out that, the average amount of households willing to pay was 1733.333with maximum and minimum of 10000 and 0 respectively (See Table 4.2).

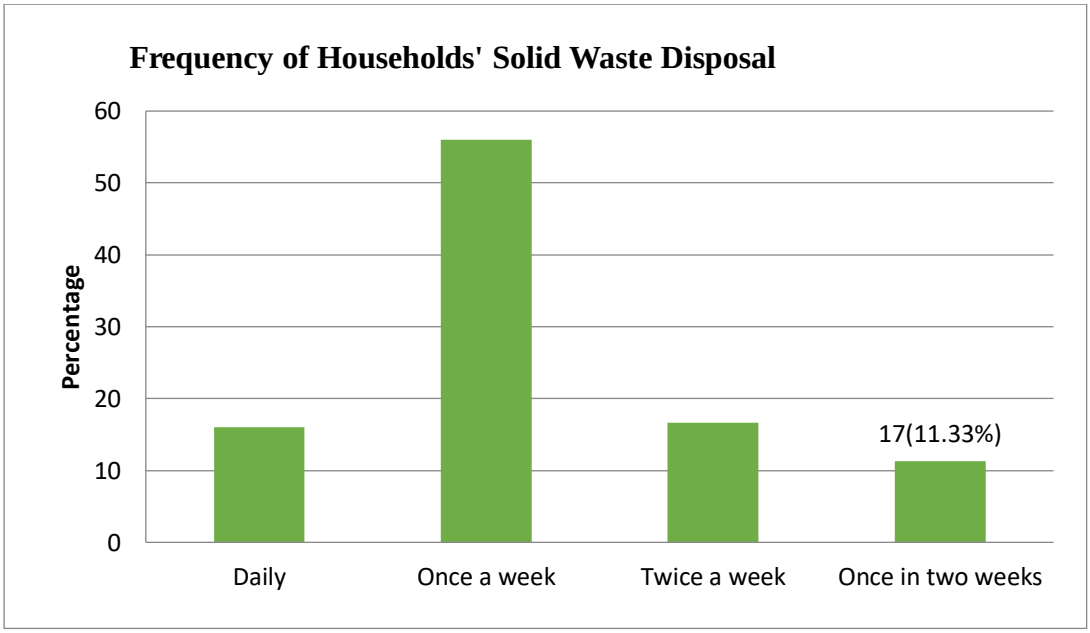
Education years of households

Educational status of the households determines willingness to pay for solid waste recycling and the amount households willing to pay for solid waste recycling. Those who can read and write stand a better chance of understanding things faster. Moreover, better-educated households tend to be more innovative and are therefore more likely to pay for solid waste recycling (Astewel, 2010). Therefore, it is hypothesized to influence positively willingness to pay and the amount households willing to pay. Findings pointed out that, an average mean of education was 6.64 years of schooling with a standard deviation of 3.306. The minimum and maximum years of education households reached were 0 and 19 years of education respectively.

RESULTS AND DISCUSSION

Households frequency of waste disposal in Ilemela district

Figure 1. Frequency of Households' Solid Waste Disposal



Source: Field survey, 2021

The findings from figure 1. are associated with the question on frequency of household's solid waste disposal. The respondents were asked how often they dispose solid wastes. The answers were indicated as; waste is disposed daily is indicated by 24 (16 percent) of households, 84 (40percent) of households dispose

wastes once a week, with 25 (16.67 percent) of households disposed their wastes twice a week. Further the findings indicate that once in two weeks households accounted 17 (11.33 percent) disposed solid wastes once in two weeks. The finding implies that majority of the households dispose solid waste once a week which implies high rate of household's consumption of various products within a week.

The findings were similar to the study conducted by (Otai, 2020) indicated that majority of households waste disposal was once a week in Uganda.

Factors influencing household's willingness to pay for solid waste recycling

Table 3 indicates the logistic regression statistical significance results for the factors influencing household's willingness to pay for solid waste recycling. Based on the data analyzed the identified factors are age of households, households' gender, households' marital status, households' years of education, households' occupation, households size, information dissemination and households awareness on the solid waste recycling.

The findings from regression indicate that age of the households, marital status, and education in years, information dissemination and logarithm of household' income was statistically significant in influencing household's willingness to pay for solid waste recycling.

The results in Table 4.3below, indicates logistic regression to analyze the factors influencing household's willingness to pay for solid waste recycling. The fitness of the data was statistically significant given that the P-value 0.0002 is at (P< 1%). And the Pseudo $R^2$was 0.116which indeed tells us how well the maximum likelihood estimates were obtained through iteration fitting the model.

Table 3. Logistic regression indicating households' willingness to pay for solid waste recycling

WILLINGNESS TO PAY	Odds Ratios	dy/dx	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AGE	1.042	.010101	.026	1.68	0.093	.993	1.094	*
Gender	1.229	.050065	.508	0.50	0.618	.546	2.765	
Marital Status	5.55	.324388	4.738	2.01	0.045	1.041	29.582	**
Education in years	1.142	.032431	.063	2.41	0.016	1.025	1.271	**
Household Occupation	.639	-.105973	.375	-0.76	0.445	.202	2.019	
Households size	.92	-.020464	.097	-0.79	0.427	.748	1.13	
Information dissemination	3.069	.271966	1.953	1.76	0.078	.881	10.685	*
LOG_INCO	2.65	.238427	.665	3.88	0.00	1.62	4.335	***
AWARENES	.741	-.073451	.278	-0.80	0.42	.355	1.547	
Constant	0.00		0.00	-4.12	0.00	0.00	0.00	***

Mean dependent var	0.433	SD dependent var	0.497
Pseudo r-squared	0.116	Number of obs	150
Chi-square	21.082	Prob> chi2	0.0002
Akaike crit. (AIC)	201.408	Bayesian crit. (BIC)	231.514

*** p<.01, ** p<.05, * p<.1

Table 4. Marginal effect computations

variable	dy/dx	Std.Err.	z	P>z	[	95%	C.I. X]
AGE	0.010	0.006	1.680	0.093	-0.002	0.022	31.927
gender1*	0.050	0.100	0.500	0.615	-0.145	0.245	0.713
marit~01*	0.324	0.106	3.060	0.002	0.117	0.532	0.933
EDUCATIO	0.032	0.013	2.410	0.016	0.006	0.059	6.640
Househ~l*	-0.106	0.133	-0.800	0.424	-0.366	0.154	0.133
HOUSEHOL	-0.020	0.026	-0.790	0.427	-0.071	0.030	5.613
Inform~s*	0.272	0.142	1.910	0.056	-0.007	0.551	0.113
LOG_INCO	0.238	0.061	3.930	0.000	0.120	0.357	13.318
AWARENES*	-0.073	0.092	-0.800	0.425	-0.254	0.107	0.587

Marginal effects after logistic
y=Pr (WILLINGT) (predict) = .42710889
(*) dy/dx is for discrete change of dummy variable from 0 to 1

It is normally assumed that older households have more knowledge and understanding on solid waste recycling than younger households. The results from table 4.3 indicate that age of the households was positively and statistically significant influencing willingness to pay for solid waste recycling at 10 percent significant level (p=0.093).

This cross-sectional study aimed to analyse household's willingness to pay for solid waste recycling in Ilemela District. The survey data was collected from 150 households as respondents from Ilemela Districts in Mwanza Region, Tanzania. Descriptive statistical analysis, logistic model regression analysis and ordinary least square regression analysis were used to answer the questions arising from three objectives. The objectives were: to determine the frequency of waste disposal among households in Ilemela District; and to analyze the factors influencing households' willingness to pay for solid waste recycling in Ilemela District, Tanzania. Findings representing demographic characteristics of households were presented using the descriptive statistics, the average number of households willing to pay and those not willing to pay were 65(43.33 percent) and 85(56.67 percent) respectively making a total of 150 households.

The first objective on the frequency of household's disposal of solid waste collection indicate that; waste is disposed

daily is showed by 24 (16 percent) of households, 84(40 percent) of households dispose wastes once a week, with 25(16.67 percent) of households disposed their wastes twice a week. Further the findings indicate that once in two weeks households accounted 17 (11.33 percent) disposed solid wastes once in two weeks. The finding implies that majority of the households dispose solid waste once a week which implies high rate of household's consumption of various products within a week.

On the second objective regarding the factors influencing willingness to pay for solid waste recycling, the results indicated that willingness to pay for solid waste recycling was associated with the number of factors. Among all factors, willingness to pay was found to be associated with the age of the households, marital status, and education in years. Information dissemination and logarithm of household' income was statistically significant in influencing household's willingness to pay for solid waste recycling.

As far as the third objective is concerned, the results indicated that the amount households are willing to pay for solid waste recycling was associated with the number of factors. Among all factors, willingness to pay was found to be associated with the marital status (married households), households' years of education, information dissemination on solid waste recycling and logarithm of income. They were all statistically significant in influencing the amount of household willingness to pay for solid waste recycling.

CONCLUSIONS

The findings of the study show that households were unwilling to pay for solid waste recycling in Ilemela district, Mwanza region. Their main argument were on the issue of charging households based on the amount/quantity of solid waste generated by the household to address the issue of free riding. Involve households in determining the charges that will be levied to help minimize the free riding problem.

Willingness to pay for solid waste recycling was associated with the number of factors. Among all factors, willingness to pay was found to be associated with the age of the households, marital status, and education in years, information dissemination and logarithm of household's income was statistically significant in influencing household's willingness to pay for solid waste recycling, while the amount households are willing to pay for solid waste recycling was associated with the number of factors. Among all factors, willingness to pay was found to be associated with the marital status (married households), households' years of education, information dissemination on solid waste recycling and logarithm of income was statistically significant in influencing the amount household's willing to pay for solid waste recycling.

On the issue of the frequency of waste

disposal, it was found out that majority of the households dispose solid waste once a week which implies high rate of household's consumption of various products within a week.

Due to the data's heteroscedasticity, it is possible that not all significant variables influencing households' WTP for solid waste management services in Ilemela district, Tanzania, were captured.

Policy implications and Recommendations

Sustainable waste management provides ideal opportunities to collaborative and work in partnership. To meet the Sustainable Development Goals of ensuring sustainable waste services and reduce pollution as well as health impacts through environmentally sound management of all wastes throughout the product life cycle, this study provided with various recommendations and policy implications to improve the situation in the study area.

In line with Sustainable Development Goals of achieving sound management of all wastes, the study then recommends that the government and other interested stakeholders on waste management should investment more on education and awareness about importance of waste management to the mass using different mechanism including social medias, along with this, there should be a special mechanism that will charge waste prices according to weight so to avoid the free riding problem.

The economic status of households (household's income) was linked with the willingness to pay for solid waste recycling and amount that households are willing to pay and found to be statistically significant. Thus households with no reliable sources of income are more likely not to pay for solid waste recycling. Especially it has been seen that household's income was a fundamental factor influencing household's willingness to pay and the amount that households are willing to pay for solid waste recycling. Therefore, authorities should grant special attention to the poor groups when implementing strategies for ensuring safe and clean environment through solid waste recycling in Ilemela.

The study recommends the national policy on waste collection, recycling and disposal with a broad scope entailing management of solid waste disposal to be encouraged and translated into actions. The policy should entail asking the government for the proper management of waste each year in each region.

The study recommends the development of various projects concerning waste management with strategies which should focus on that inability to pay for waste recycling. Some strategies could be accessed by vulnerable households in addition to providing them with necessary education on waste recycling. Also, it should be possible to create a mechanism that would guarantee female-headed households and other vulnerable groups with proper access to credit for them to be willing to pay for solid waste recycling in the study area.

Information access is a key determinant in the waste management. There is a positive relationship between information access through media such as radio and television to household's willingness to pay for solid waste recycling.

This provides great emphasize on government and other NGO's to provide basic information on solid waste recycling through television, radio all over Tanzania to increase awareness of the concerned matter.

The results for the WTP indicated that majority of the respondents were not willing to pay for improved sanitation facilities. This implies that households were not eager to improve the availability and efficiency of sanitation services. Therefore, the government in collaboration with various NGO's should make it easier for households to seek waste management through waste recyclin

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