# ECONOMIC VALUATION OF HOUSEHOLD PREFERENCES FOR SOLID WASTE MANAGEMENT IMPROVEMENTS

## A CASE STUDY OF MUKONO MUNICIPALITY

BY

NEED TO SEE STATE OF THE PARTY OF THE PARTY

**OWEMBABAZI STEPHANIE** 

BU/UG/2013/67

DEPARTMENT OF NATURAL RESOURCE ECONOMICS

A RESEARCH REPORT SUBMITTED TO THE FACULTY OF NATURAL RESOURCE
AND ENVIRONMENTAL SCIENCES IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF A BACHELOR OF SCIENCE
IN NATURAL RESOURCE ECONOMICS OF
BUSITEMA UNIVERSITY

**JUNE 2016** 

## **DECLARATION**

I OWEMBABAZI STEPHANIE, hereby declare that this report is my own original work accomplished as a result of my knowledge and under the guidance of my research supervisor. It has never been submitted for any academic award in any other university or higher institute of learning. I, therefore, take full responsibility for any errors that may arise from this work arising from omission or otherwise.

Signature Date 26th June 2016

**OWEMBABAZI STEPHANIE** 

## APPROVAL

This work has been thoroughly supervised and approved to have fulfilled the requirements leading to the award of a Bachelor of Science in Natural Resource Economics of Busitema University. Therefore, this report has been submitted for examination with my approval as University supervisor of Busitema University.

Signature.

Date.

KITUMBA DAVID NSAJJU

# **DEDICATION**

I dedicate this report to my parents, The Late Donald E. Akugizibwe Karasanyi and Ms Nakuya Jane Harriet who began the work in me. Not forgetting my siblings Rukundo Arnold Jothams and Ayesiga Mercy Tess who have stood with at all times.

God bless you all abundantly.

## ACKNOWLEGEMENT

The successful completion of this work came as a result of a substantial contribution made by several people of whom i would want to extend my heartfelt thanks;

To Busitema University under supervision of Mr. Kifumba David Nsajju. I express my appreciation for your sacrifice, commitment and contribution to my academic performance and towards the assessment of this research report.

To my Uncle Mr. Mugisha Joseph and Brother Rukundo Arnold, I say thank you for the spiritual, moral support, and financial assistance you have always provided.

I would also like to extend my great acknowledgement to the 2013/2016 Class of B.Sc. in Natural Resource Economics, Busitema University Namasagali campus. Special thanks to my course mates, Obukui Pius Imeri and Kahwa Charles for your sustained prayers mindful of your concerns towards my academic struggle.

Lastly to the Environmental Officer of Mukono Municipality Mr. Masengere George, providing me with information that was vital in the preparation of my report. Thank you so much.

# TABLE OF CONTENT

DECLARATION	i
APPROVAL	ii
DEDICATION	. iii
ACKNOWLEGEMENT	.iv
TABLE OF CONTENT	μŲ
LIST OF ACRONYMS AND ABBREVIATIONS	ix
LIST OF FIGURES	, ix
LIST OF ACRONYMS	.х
DEFINITION OF KEY TERMS	χí
ABSTRACT	xli
CHAPTER ONE	1
INTRODUCTION	1
1.1. Background of the study	1
1.1.1. Drivers of increasing Solid waste generation	1
1.1.2 Access to Solid waste management services	1
1.1.3. Financial constraints in Solid waste management	2
1.1.4. Privatization as a reform in SWM	2
1.1.4 Demand- side aspects related to SWM	3
1.2 PROBLEM STATEMENT	3
1.3. General and specific objectives of the study	3
1.3.1. General objective	3
1.3.2. Specific objective	.4
1.4 Research Questions	4
1.5 Justification	4
1.6. Scope of the study	5
1.6.1. Subject scope	5
1.6.2. Geographical scope	5
1.6.3. Time scope	5
1.7. Conceptual framework	5
CHAPTER TWO	6
2.0LITERATURE REVIEW	6
2.1 Global standards and perspectives	6
2.2 Concept of Waste	6

2.3	Solid waste management (SWM)	
2.3.1	Integrated Solid Waste Management (ISWM)	
2.4	The status quo of Municipal waste in Uganda	
2.5	Determinants of households' willingness to pay for SWM	9
СНАРТ	FER THREE	11
3.0	METHODS OF STUDY,	11
3.1.	Study Area	11
	2	
Ma	p of mukono showing the study area	
Figure	3.1. Map of Mukono District showing the study area	12
3.2.	Study site	
3.2.1.		
3	.2.2. Target population	
3.3.		
3.3.	1. The sampling technique	12
3.3.	2 Determination of sample size	12
3.4.	Study design	13
3.5.	Collection of data	13
3.5.	1. Qualitative approach	13
Doc	tumentary review	13
Qbs	servation	13
Que	estionnaires	13
3.5	2. Quantitative approach	14
3.6	Data processing and analysis	14
3.7	Limitations	14
3.8.	Ethical consideration	14
CHA	APTER FOUR	15
4.0	PRESENTATION OF RESULTS	15
4.1.	. Bio data	15
4.1	1. Sample size distribution by division	15
Figu	ure 4.1. Comparison of sample size distribution	15
4.1	.2 Comparison of sample size distribution in villages by divisions	15
4.1	3.Gender of residents.	
Figu	ure 4.3 Gender of residents	16
4.1		
4.1	.6.Type of House ownership by residents	17

4.1.7. Household size of residents	18
4.1.8.Occupation levels of residents.	18
4.1.9. Monthly Income levels of residents.	19
4.2 Solid waste management service options availed to residents in Mukono municipality	19
4.2.2. Service options available to residents of different villages	20
4.2.3. Service options available to residents of different types of house ownership	21
4.2.4.5ervice options available to residents of different marital status.	21
4.2.5. Solid waste management service options available to residents of different levels of form education	
4.2.6.Solid waste management service options available to residents of different monthly inco	
4.3 Consumer's willingness to pay for Improved Solid waste management service options	25
4.3.1 Residents' Willingness to pay for Communal bins by different monthly income levels	25
4.3.2. Residents' willingness to pay for storage bins by different monthly income levels	25
4.3.3. Residents' willingness to pay for waste composting by different monthly income levels.	26
4.3.4.Residents' willingness to pay for provision of waste separation facilities at source by different monthly income levels.	27
4.3.3. Willingness to pay for provision of waste separation facilities at source by residents of different levels of Education.	28
4.3.4.Comparisonof Gender with Willingness to pay for provision of waste separation facilities	
source.	29
4.3.5 Computation of households' willingness to pay for the different service options	
4.4.Reasons for the preferred SWM service options	31
4.4.1. SWM service options preferred by residents in Mukono Municipality	31
4.4.2. Reasons for the SWM service options preferred by residents	
CHAPTER FIVE	33
5.0. DISCUSSION, CONCLUSION AND RECOMMENDATIONS.	33
5.1. Discussion	33
5.1.1. General information	33
Gender of residents.	33
5.2. Solid waste management service options availed to residents in Mukono municipality	34
5.2.2.The different residential villages	34
5.2.3. Types of house ownership.	34
5,2.4. Marital status.	35
5.2.5. Education levels	35
5.2.6. Level of satisfaction with the available service options by the residents	35

5.3. Determinants of Consumer's willingness to pay for Improved Solid waste management service options.	36
5.3.2. Education level.	37
5.3.3, Gender,	37
5.4 Computation of households' willingness to pay for the different service options	37
5.4.1. Waste composting	38
5.4.2 Waste separation facilities at source	38
5.4.3. Communal bins and storage bins	38
5.5 Conclusions	39
5.6 Recommendations	39
REFERENCES	41
APPENDIX	44
QUESTIONNAIRE	44
Average/Mean WTP for the different SWM service options	48

## LIST OF ACRONYMS AND ABBREVIATIONS

#### LIST OF FIGURES

- Figure 1.1 Conceptual frameworks on solid waste management
- Figure 3.1 Map of Mukono District showing the study area
- Figure 4.1 Comparison of sample size distribution
- Figure 4.2. Comparison of sample size distribution in villages by divisions
- Figure 4.3 Gender of residents
- Figure 4.5Education level of Residents
- Figure 4.6Marital statuses of residents.
- Figure 4.7 Type of House ownership of residents
- Figure 4.8 Size of Household
- Figure 4.9 Occupation levels of residents.
- Figure 4.10 Monthly Income levels of residents
- Figure 4.11 Comparison of SWM service options on offer by service providers to residents.
- Figure 4.12 Comparison of types of service options available to different villages provided.
- Figure 4.13 Comparison of types of service options available to different types of house ownership
- Figure 4.13 Comparison of type of SWM service options available by marital status.
- Figure 4.14 Comparison of types SWM service options available to residents by highest level of formal education.
- Figure 4.15 Comparison of types of SWM service options available to residents by different monthly income levels
- Figure 4.16 Comparison of level of satisfaction with the available service options by the residents
- Figure 4.17 Comparison of residents' Willingness to pay for Communal bins by different monthly income levels.
- Figure 4.18 Comparison between residents' willingness to pay for storage bins by different monthly income levels.
- Figure 4.19 Comparison of residents' willingness to pay for waste composting by different monthly income levels.
- Figure 4.20 Comparison of residents' willingness to pay for provision of waste separation facilities by different monthly income levels.
- Figure 4.18 Comparison of residents' Willingness to pay for provision of waste separation facilities at source by different Education levels
- Figure 4.19 Comparison of residents' with Willingness to pay for provision of waste separation facilities at source by gender
- Figure 4.20 Comparison of SWM service options preferred by residents
- Figure 4.21 Comparison of reasons for the SWM service options preferred by residents

## LIST OF ACRONYMS

CCB Central communal bins

HHC House to House collection

SW Solid Waste

SWM Solid Waste Management

ISWM Integrated Solid Waste Management

KCCA Kampala Capital City Authority

NEMA National Environment Management Authority

USEPA United States Environmental Protection Agency

WTP Willingness To Pay

## DEFINITION OF KEY TERMS

Wastes: Substances or objects which are disposed off or are intended to be disposed off or are required to be disposed off by the provisions of national law. In most cases, the definition of waste depends on the type or category of waste under consideration. Some of the dominant types of waste include; municipal waste, solid waste, hazardous waste and electronic waste.

Solid waste: Organic and inorganic waste materials produced by households, commercial, institutional and industrial activities that have lost value in the sight of the initial user.

Municipal waste: Refers to wastes from domestic, commercial, institutional, municipal and industrial sources but excluding excreta, except when it is mixed with solid waste.

Solid Waste Management: The collection, transportation, processing, recycling or disposal of waste materials, including the supervision of such operations and after-care of disposal sites.

Resource recovery: Refers to the extraction and utilization of materials and energy from solid waste.

**Composting:** A biological process that submits biodegradable waste to anaerobic or aerobic decomposition, and results in a product that is recovered.

Willingness to pay: In economics, the willingness to pay is the maximum amount a person would pay, sacrifice or exchange in order to receive a good or to avoid something undesirable such as pollution.

#### ABSTRACT

In most developing countries policies and frameworks that govern solid waste management strategies have often been directed at the waste management service providers and less attention is often given to the demand side of the problem. This study reports regarding households' willingness to pay for improved residential solid waste management. The data for the study originated from a contingent valuation survey that was conducted in 50 households in Mukono Municipality, Uganda. Using SPSS version 16 and Stata version 11 was used to account for some factors influencing the respondents' willingness to pay for different SWM service options. The results show that more than 78 % of the respondents were in support of the residential waste management. The respondents were willing to pay an average of Waste composting for 6222.22, Provision of waste separation facilities at source for 3793.10, Communal bins for 3485.93 and storage bins for 3137.93 (Ugshs)each month. Income, education, Marital status, gender positively influenced the respondents' willingness to pay. The type of household ownership, household size and occupation had negative influence. The findings from this study could contribute to the knowledge regarding the design of a more sustainable residential waste management strategy in Mukono municipality.

### **CHAPTER ONE**

#### 1.0 INTRODUCTION

## 1.1. Background of the study

## 1.1.1. Drivers of increasing Solid waste generation

Management of solid waste resulting from rapid urbanization has generated a lot of concern in most developing countries. Especially during the last decade the volume and complexity of solid waste generated particularly in large cities, have been increasing at an unprecedented rate. This increase has been attributed to two main drivers: intensification of urbanization and rising living standards (Rathi, 2007). The solid waste management (SWM) system comprises four activities: waste generation, collection, transportation and disposal (Mahmood & Trevedi, 2007). The current practice of collecting, processing and disposing municipal solid wastes is also considered to be least efficient in the developing countries. The typical problems are; low collection coverage and irregular collection services, crude open dumping and burning without air and water pollution control, the breading of flies and vermin, and the handling and control of informal waste picking or scavenging activities (Bartone, 1995). Although some cities do spend significant portions of their municipal revenues on waste management (Coitreau, 1984, 1994; Thomas-Hope, 1998; Schübeler, 1996 and Bartone, 2000), they are often unable to keep pace with the scope of the problem.

### 1.1.2 Access to Solid waste management services

Senkoro (2003) indicated that for many African countries, only less than 30% of the urban population has access to proper and regular garbage removal. SWM therefore requires adequate infrastructure provision and maintenance for all four activities. When not managed adequately, solid waste generates several public health and environmental hazards. According to Cointreau (1984), in most cities in developing countries, municipal SWM costs consume 20-50% of municipal revenues yet collection service levels remain low with only 50-70% of residents receiving service and most disposals being unsafe. This deplorable situation is not different in the urban areas of Uganda such as Kampala, Mukono, Jinja, Masaka, Entebbe and others to mention but a few.

#### REFERENCES

Adepoju, A. A., and Salimonu, K. K. (undated). "Household Willingness to pay for Improved Solid Waste Management in Osun State, Nigeria", http://www.appropriatetech.net/files..

Aggrey N. and Douglason O. G. (2010), "Determinants of Willingness to Pay for Solid Waste Management in Kampala City." Maxwell Scientific Organization, Current Research Journal of Economic Theory 2(3): No. 2042-485X pp. 119-122.

EIA report for Katikolo waste composting plant ,2008

Mukono municipal Environment Plan 2012/2016

Afroz, R., Hanaki, K. & Hasegawa-Kurisu, K. (2009). Willingness to pay for waste Management improvement in Daka city, Bangladesh. Journal of Environment Management 90 (2009) 492-502

Altaf, A. A. & Deshazo, J. R. (1996). Household demand for improved solid waste Management: A case study in Gujranwala, Pakistan. World Development, 24(5), 857-868.

Buenrostro, O. &Bocco, G. (2003) Solid Waste management in municipalities in Mexico: Goals and perspectives. Resources, Conservation and Recycling, 39 (3), 251-263.

Carson, R.T. & Haneman, W.M. (2006). Contingent valuation, In: Maler, K.G. Vincent, J.R. (Eds.), Handbook of Environmental Economics, 2, 821-936.

Households' Willingness to Pay for Improved Urban Waste Management in Mekelle City, Ethiopia.By Dagnew Hagos, AlemuMekonnen, and Zenebe Gebreegziabher, April 2012

Bartone, C.L., and J.D. Bernstein. 1993. Improving Municipal Solid Waste Management in Third World Countries. Resources, Conservation and Recycling 8:43-5.

Alhassan, M., and Mohammed, J. 2013. Households' Demand for Better Solid Waste Disposal Services: Case Study of Four Communities in the New Juaben Municipality, Ghana. Journal of Sustainable Development. 6(11): 16-19. doi: 10.5539/jsd.v6n11p16

Zerbock, O. 2003. Urban Solid Waste Management: Waste Reduction inDevelopingNations.

Retrieved from http://www.cee.mtu.edu

Joshua Zake, Waste Management in Uganda; Issues forPolicy and Practice change, Environmental Alert, 2008

Environmental Resource Limited (ERL), Solid Waste Disposal-Kampala \_nal report, 2009

WaterAid Uganda, Solid Waste Management Study in Bwaise II Parish, Kawempe Division, 2011

Kampala Solid Waste Management Strategy, December, 2002, as revised in 2006

J B Nyakaana, Geography Department Makerere University: Population, Urban Development and the Environment in Uganda: The Case of Kampala City and its Environs, 2009

United Nations Human Settlements Programme (UNhabitat), Situation analysis of informal settlements in Kampala: Kivulu (Kagugube) and Kinawataka (Mbuya 1) Parishes, 2010

Matagi, S. V. (2001). Some issues of environmental concern in Kampala, the capitalcity of Uganda. Environmental Monitoring & Assessment, 77, 121e138.

Mugagga, F. (2006). The public private sector approach to municipal solid waste management: How does it work in Makindye division, Kampala district Uganda?

Master of Philosophy in Development Studies thesis, Trondheim, Norway.

Tukahirwa, T. J., Mol, A. P. J., & Oosterveer, P. (2010). Civil society participation in Urban sanitation and solid waste management in Uganda. Local Environment, 15(1), 1e14.

Doan, L. P. (1998). Institutionalizing household waste collection: the urban environmental Management project in Cote d'Ivoire. Habitat International, 22(1),27e39

Golooba-Mutebi, F. (2003). Devolution and outsourcing of municipal services in Kampala city, Uganda: an early assessment. Public Administration and Development, 23, 405e418