

**EVALUATION OF SOLID WASTE MANGEMENT PRACTICES FROM
GENERATION TO DISPOSAL, CASE OF TORORO MUNICIPALITY**

BY

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BU/UP/2011/1314



**A DESERTATION SUBMITTED TO THE FACULTY OF NATURAL RESOURCES
AND ENVIRONMENTAL SCIENCES IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF BACHELOR OF
SCIENCE IN NATURAL RESOURCE ECONOMICS OF BUSITEMA UNIVERSITY**

JUNE 2014

DECLARATION

I **Mwima Kuzaifa** declare that this report is my original work and to the best of knowledge, it has never been submitted for any purpose in any university or higher institution of learning.

Signature



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APPROVAL

This is to certify that this research has been under my supervision

Signature.....Date.....

.....

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DEDICATION

This report is dedicated to my mother Rehema Namwirya.

ACKNOWLEDGEMENTS

I acknowledge with gratitude the financial, spiritual and technical support provided to me by the various individuals during the time of data collection, consultations and report writing. Special thanks go to Mr. Kifumba David for supervising this research project and providing all the necessary invaluable comments and guidance during the preparation of this report. I thank Dr. Alice Nakiyemba Were and Professor Isabirye Moses (Dean, faculty of Natural Resources and Environmental Sciences), Dr. Theodore Munyuli, Ms. Ariango Esther and all my lecturers at Busitema University for baking me into what I am today. Without your effort my candle would not have burnt to this end. May God reward you abundantly.

This report is an output of invaluable effort of the author with the assistance of friends, groups and individuals from Tororo municipal council authorities who contributed in various ways including meetings, face-face interactions, discussions and the participants in Tororo municipality for accepting to provide responses to my questions without which it could not be possible to prepare this report. The contribution of these individuals is greatly acknowledged and appreciated.

Without forgetting the sacrifice provided to me by my in-law, Mr. Yovan Manghara for sponsoring my university education and providing all the necessary financial and parental and support during the hard times when in the field, if it was not for that I could have not reached this far. May the almighty keep you alive to enjoy the fruits of your sacrifice.

I also thank my grandparents, Mzee Issa Wandera and Laziya Wandera for bringing up into what I am today. The work you did to bring up after my father passed away in 1993 and educate me even when there seemed to be no hope. You did not end on that, you have always been there for me. May you live to enjoy the fruits of your sacrifice.

All my friends in the same faculty especially, Anyango Robina, Akullo Gloria, Kijali Julius, Mugisha Ronald, Nalubega Doreen, Muliro Francis, Okello Simon, Okori Sam, Naigaga Esther, Nyangoma Imelda, Dawaru Mary and everyone who has provided academic and friendly support during the hard times. May the lord bless you for your kind hearts.

The almighty God who has provided me with enough breath to live up to now, thanks for making a living testimony.

LIST OF ACRONYMS

KCC	Kampala Capital City
KM	Kilo Meter
MFPED	Ministry of Finance Planning and Economic Development
MSW	Municipal Solid Waste
NEMA	National Environmental Management Authority
NES	National Environment Statute
SPSS	Social Package For Social Scientists
SW	Solid Waste
SWM	Solid Waste Management
UBOS	Uganda Bureau Of Statistics
LD	Indiscriminate Dumping

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ABSTRACT

The collection, transportation and disposal of solid waste (garbage, trash, litter, and rubbish among others) are the responsibilities of Tororo municipal council. The solid waste generated in Tororo municipality is stored, collected and disposed in both gazetted and un-gazetted areas but most of it is dumped indiscriminately along the streets and open spaces. Much of these wastes take long to be removed wherever it is dumped. This implies that the waste management system in Tororo municipality is not efficient which results into filth and smell in the town.

The main objective of the study was to investigate the reasons for the delayed removal of solid wastes that is left to decompose at collection sites and why there is scattered solid waste material in Tororo municipality and make recommendations for improvement. The specific objectives of the study were 1. To establish the sources of the different solid wastes generated in Tororo municipality. 2 To establish reasons for delayed removal of solid waste from the different existing storage sites, and 3. To establish reasons for indiscriminate dumping of solid waste in Tororo municipality.

The data collection method used was basically a questionnaire with structured and semi structured questions. This was used alongside physical observations of the practices, reviews of various relevant literature and discussions with the concerned authorities.

The findings attributed the current state of the waste management system to inadequate funds, limited tracks for transporting wastes, *I do not care attitude*, limited public solid waste storage/collection containers/skips, and some of the respondents assumed that the concerned authorities seem not to be bothered more so about their state in the outskirts of the town.

In conclusion, solid waste generated in Tororo municipality takes relatively long periods of time at the different collection sites due to the inadequate funds to enable the municipal authorities remove the garbage at these sites in time. Therefore, to improve on the current situation there is need to increase on the funding for this sector as a solution for the delayed removal of wastes from the collection and dumpsites.

CHAPTER ONE

I.O. INTRODUCTION

1.1. Background of the study

1.1.1. Solid waste management in developing countries.

In developing countries without significant recycling, solid waste predominantly includes food wastes, yard wastes, containers and product packaging, and other wastes from residential, commercial, institutional, (http://en.wikipedia.org/wiki/Municipal_solid_waste 20 May 2014). Such wastes are dumped indiscriminately in un gazetted areas which results into harm to the environment and human health. This is in agreement with that, garbage attracts rodents and other animals. Insects, such as mosquitoes that carry diseases, may hatch in water that pools on the waste (<http://www.azdeq.gov/environ/waste/dumping/faqs.html> 20 May 2014).

Also bacteria can grow in discarded food, and human waste. Most dangerously, hazardous chemicals in household and commercial solid waste may contaminate water and soil.

1.1.2. Legal frame work for solid waste management in Uganda

In Uganda, under the Local Government Act Cap 245, solid waste collection, transportation and disposal are one of the responsibilities of local governments. But as noted in the Uganda Policy Note (2014), in most urban areas the standards of refuse disposal is generally low. In urban areas the methods of waste disposal include pit, skip/bins, bush, garden, and others and this poses problems in urban local governments due to lack of treatment and disposal facilities. The unscientific manner of disposal of solid waste such as dumping in open sites and low lying areas constitutes a serious health issue.

1.1.3 Statement of the problem

Tororo municipality with an average population of 44,000 (UBOS 2013) compared to 43,700 people (UBOS 2011) indicates that the rate of population growth is high, by the year 1998, Tororo municipality had a population density of 202 persons per KM² (NEMA 1998) compared to the current 500 persons per km² (MFPED 2012) is currently facing challenges of managing the garbage generated. The National Environment Management Authority (NEMA 1998) noted that

REFERENCES

- Ekere, W. 2009. Assessment of waste situation and potential for reuse in urban and peri-urban areas of Lake Victoria crescent. PhD. Thesis, Makerere University, Uganda.
- European Union. 2008 Directive 2008/98/EC of the European parliament and of the council of November 2009 on waste and repealing certain Directives. Official journal of the European union. L312/3-30
- Hickman: Lanier H. (1999): Principles of Integrated Solid waste Management. ISN 1 883767-26-1
- http://en.wikipedia.org/wiki/Municipal_solid_waste 20 May 2014 20. May 2014
- <http://www.azdeq.gov/environ/waste/dumping/faqs.html> 20 May 2014 20. May 2014
- http://www.urbanknowledge.org/ur/docs/Uganda_Policy%20Note.pdf 20. May 2014
- Jagannath., Er. V. 2000. validation of micro treatment plants for community solid waste using Environmental sound technology criterion. Internet conference on material flow analysis of integrated Bio-systems (March-October 2000).
- KCC. 2003. City Development strategy, Kampala Development plan. 2003/2004. Kampala city council
- Local Government Act Of 1997. Constitution of Uganda 1995
- MFPED (2012). Millennium Development Goals Report For Uganda 2012. Ministry Of Finance, Planning and Economic Development, Kampala, Uganda
- NEMA & UNEP., 2010. Guidelines for E-waste management in Kenya. Ministry of Environment and Mineral Resources, Kenya
- NEMA (1998) State Of Environment Report For Uganda 2008. National Environment Management Authority (NEMA), Kampala
- NEMA (2000) State Of Environment Report For Uganda 2008. National Environment Management Authority (NEMA), Kampala
- NEMA (2008) State Of Environment Report For Uganda 2008. National Environment Management Authority (NEMA), Kampala
- NEMA (2010) State Of Environment Report For Uganda 2010. National Environment Management Authority (NEMA), Kampala
- NEMA National Environment Management Authority (2007) Clean Development Mechanism (CDM)-Uganda solid waste compositing project analysis Report

- Oberlin, A.S., 2011. The role of Households in Solid waste management in East African cities, PhD Thesis. Environmental policy series. Wageningen University. The Netherlands
- Okot-Okumu, J., & Nyenje R., 2011. Municipal solid waste management under the decentralization in Uganda. Habitant international
- Okot-Okumu, J., (2008) Solid waste management in Uganda: issues, challenges and opportunities. PROVIDE program workshop. The Netherlands.
- Popov V., A. Kungolos, C.A Brebbia, and H. Itoh (2006): waste management and the Environment 111 (V.3) WIT Press (UK)
- Public Health Act of 1964. Constitution of Uganda 1995
- Richardson, G.M., and Whitney, J.B.R 1995. Goats and garbage in Khartoum, Sudan: a Sabiiti, E.N., Bareeba, F., Spondondly, E., Tenywa, J.S., Ledin, S., Ottabong, E., Kyamanywa, S. Ekborn, B., Mugisha, J., and Drake, L., 2004. Urban market garbage: a hidden resource for sustainable urban/peri-urban agriculture and the environment in Uganda. The Uganda journal. 50:102-109
- Simon, A.M., 2008. Analysis of activities of community Based Organizations involved in solid waste management, investment Modernized Mixtures Approach. The case of Kinondoni Municipality, Dar es Salaam. MSc. Thesis. Wageningen University.
- The national environment (waste management) Regulations, 1999
- The National Environment Statute (NES) OF 1995
- Tororo municipal council office 2014 (Unpublished)
- UBOS (2011) statistical abstract 2011. Uganda Bureau of Statistics, Kampala Uganda
- UBOS (2013) statistical abstract 2011. Uganda Bureau of Statistics, Kampala Uganda.
- Water Aid Uganda, (2011) Solid waste management. Study in Bwaise 11 Kawempe division. Final Report
- Water Aid, WSUP & CIDI, October 2011. Issues for policy change. Challenges of urban solid waste management in Kampala city
- World Bank (1993): Alternative Approaches to pollution control and waste management.
- Zurbrugg, C.2002. Urban solid waste management in low income countries of Asia: How to cope with the garbage crisis: Presented for: scientific committee on problems of the environment (SCOPE) Urban solid waste management Review session, Durban, South Africa, November 2002)