## ECONOMIC VALUE OF WETLAND RESOURCES IN KIBAALE DISTRICT CASE STUDY OF MUTUNGURU WETLAND

AKUGIZIBWE EMMANUEL BU/UG/2013/60

# A RESEARCH REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF BACHELOR OF SCIENCEIN NATURAL RESOURCE ECONOMICS OF BUSITEMA UNIVERSITY

**JUNE 2016** 

### DECLARATION

I AKUGIZIBWE EMMANUEL, hereby declare that this research report is my original work and to the best of my knowledge it has never been submitted by any person to any University or any other institution of higher learning for any academic award.

## APPROVAL

This is to certify that this research report has been successfully completed under my guidance and supervision

Signature

Date: 20/06/2016

MR. SSUUNA JAMES

### DEDICATION

۰.

¢

.

ı

I dedicate this work to my great parents; Mr. Ndyanabo Luke and Mrs. Lusia Ndyanabo who have been considerate to my education throughout my secondary and University education, my sister; Atuhairwe Evas and all my brothers and whoever contributed towards my study, all deserve special thanks for their back-up, tolerance and perseverance.

#### ACKNOWLEDGEMENTS

I wish to acknowledge the contributions of the following people without whose tireless efforts I would not have completed this research report timely. My sincere gratitude goes to my supervisor Mr.Ssuuna James for his devotion, guidance and encouragement which proved to be worthy for excellent research apprenticeship. Thanks go to my sponsor, Government of Uganda through the ministry of education and sports for providing the necessary funding for my studies. In particular, thanks go to Associate Professor; Isabirye Moses, the Dean of Faculty of Natural Resources and Environmental Sciences and Mr.kifumba David, Head of department of Natural Resource Economics for their coordination

Many thanks also go to all the non-academic staff, including AA students' Welfare, AA Academic registrar and security for providing us with accommodation without which I would not have accomplished my work timely.

Special thanks go to my parents; Mr. Ndyanabo Luke my father and Mrs. Lusia Ndyanabo my num, Brothers, Sisters, Niece, Cousins, Aunts and Uncles for their words of encouragement, spiritual and financial support.

Finally my profound gratitude goes to my friends Alinaitwe Mugenzi Moses, Kato Paul, Kahwa Charles, Tumusiime immaculate, Rusengwe Thadus, Kembabazi Hollen, BUSDDA Members; Anena Sharon, Otoo Ronan Aliro, Nalunga veronica, Happy Edward Atwooki, Nabukenya Dorah and all my classmates for the good and extraordinary cooperation exhibited.

### TABLE OF CONTENT

| DECLARATIONi   |
|--|
| APPROVALii   |
| DEDICATION   |
| ACKNOWLEDGEMENTSiv   |
| LIST OF TABLESix   |
| ABSTRACT   |
| CHAPTER ONE: INTRODUCTION  |
| 1.1. Background  |
| 1.2. Problem statement   |
| 1.3. Objectives of the study   |
| 1.4. Research guestions  |
| 1.5. Significance of the study   |
| 1.6. Conceptual framework  |
| 1.7. Organization of the study   |
| CHAPTER TWO: LITERATURE REVIEW   |
| 2.1. Introduction  |
| 2.2. State of wetlands in Uganda   |
| 2.3. Benefits derived from wetlands  |
| 2.4. Economic Activities in Wetlands Ecosystems  |
| 2.5. Total Economic Value for Wetland Resources  |
| 2.6. Valuation Techniques  |
| CHAPTER THREE: METHODOLOGY   |
| 3.1. Introduction  |
| <ul> <li>3.2. Research design and data collection methods/ instruments.</li> <li>2.1</li> <li>3.2.1. Research design</li></ul> |

,

| 3.3. Study population  |
|--|
| 3.4. Simple size and sampling techniques   |
| 3.5. Data processing and analysis  |
| 3.6. Ethical considerations  |
| 3.7. Limitations of the study  |
| CHAPTER FOUR: PRESENTATION AND DISCUSSION OF RESULTS   |
| 4.1. Introduction  |
| 4.2. Characteristics of the respondent   |
| 4.2.2. Age group   |
| 4.2,3. Marital status  |
| 4.2.4. Education level   |
| 4.2.5. Occupation  |
| 4.3. Human activities at Mutunguru wetland   |
| 4.3.1. Economic activities   |
| 4.3.3. Threatening activities  |
| 4.4. Ecosystem services obtained from Mutunguru wetland       31         4.4.1. Provisioning services       31         4.4.2. Cultural services       32         4.4.3. Regulating services       33   |
| 4.4.4. Basic needs of people for their livelihood in terms of the ecosystem services obtained from Mutunguru wetland   |
| 4.4.5. Other ecosystem services provided by Mutunguru wetland  |
| 4.4.6. The extent to which the wetland ecosystem services affect economic wellbeing  |
| <ul> <li>4.5. Valuation of ecosystem services obtained from Mutunguru wetland</li></ul>  |
| The second second the second products of the second s |

۴,

| 4.5.5. Estimated value of non marketed wetland services obtained from Mutunguru wetland44 |
|---|
| 4.5.6. Annual Total Economic Value of Mutunguru wetland                                   |
| CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION                                      |
| 5.1. Introduction   |
| 5.2. Summary of the findings  |
| 5.3. Conclusion   |
| 5.4. Recommendations  |
| 5.5. Areas of further study   |
| REFERENCES  |
| APPENDIX 1: OUESTIONNAIRE   |

ı.

## LIST OF FIGURES

| Figure 1.1: Conceptual framework                               | 5 |
|--|---|
| Figure 4.2: Distribution of respondents by Size of land2       | 9 |
| Figure 4.3: Effects of Mutunguru wetland on economic wellbeing | 7 |

•

.

.

## LIST OF TABLES

| Table 4.1: Distribution of respondents by Gender   |
|--|
| Table 4.2: Distribution of respondents by Age group       26                                   |
| Table 4.3: Distribution of the respondents by Marital status                                   |
| Table 4.4: Distribution of the respondents by Education level       27                         |
| Table 4.5: Distribution of the respondents by Occupation                                       |
| Table 4.6: Distribution of respondents by Economic activities                                  |
| Table 4.7: Distribution of respondents by threatening activities         30                    |
| Table 4.8: Distribution of respondents by Ecosystem services obtained from Mutunguru wetland   |
| Table 4.9: Distribution of respondents by Basic needs obtained from Mutunguru wetland          |
| Table 4.10; Distribution of respondents by other ecosystem services from Mutunguru wetland .36 |
| Table 4.11: Distribution of Gender by food type       38                                       |
| Table 4.12: Distribution of economic activities by educational level         39                |
| Table 4.13: Distribution of Energy services by Gender  |
| Table 4.14: Distribution of energy services by educational level                               |
| Table 4.15: Monetary value of Mutunguru wetland in terms output of crops grown per annum .41   |
| Table 4.16: Monetary value of fresh water obtained from Mutunguru wetland                      |
| Table 4.17: Monetary value of fuel wood obtained from Mutunguru wetland                        |
| Table 4.18: Monetary value of other welland products from Mutunguru wetland                    |
| Table 4.19: Monetary value of non-marketed wetland services from Mutunguru wetland             |
| Table 4.20: Total Economic Value of Mutunguru wetland       45                                 |

## LIST OF ABBREVIATIONS

| TEV  | Total Economic Value                      |
|------|---|
| WTA  | Willingness To Accept                     |
| WTP  | Willingness To Pay                        |
| NEMA | National Environment Management Authority |
| CVM  | Contingent Valuation Method               |
| GDP  | Gross Domestic Product                    |
| MEA  | Millennium Ecosystem Assessment           |
| NFA  | National Forestry Authority               |
| ŴRĹ  | World Resources Institute                 |

۲

#### ABSTRACT

This study was under taken to estimate the total economic value of mutunguru wetland resources in Kibaale district. The study employed market price method and contingent valuation method as valuing techniques to obtain the values of both marketed and non marketed goods and services provided by Mutunguru wetland.

The findings indicate that Mutunguru wetland generated a stream of benefit ranging from direct market goods such as fish, crops, fresh water, thatch and fuel wood and indirect /non marketed goods and services such as climate regulation, water purification and soil retention. They also show that climate change regulation generated the highest monetary value (\$225,134,08) and thatching grass generated the lowest value (\$94.55). The results show that an estimated annual total economic value of Mutunguru wetland is \$375,601.83:

In conclusion, Wetland resources contribute significantly to the household economy of people living near the Mutunguru wetland. Approximately 57% of households depend on the wetland for either their own consumption or the sale of such resources for money to buy food as a basic need. Thus this study recommends for incentive based regulation to be adopted by the developing countries Uganda inclusive owing to their cost effectiveness than the traditional forms of command and control approach which only rely on enforcement of regulations. Such approaches should include the use of direct economic incentives that include property rights that enable the formation of conditions under which communities will benefit from the wetlands and therefore have a stake in their conservation, performance bonds or subsidies upon environmentally friendly activities.

#### **CHAPTER ONE: INTRODUCTION**

### 1.1. Background

Wetlands are natural lands perceived as waste lands and needed to be converted to put into use which may range from agriculture to developmental purposes. This use of the term "Wetland" can be traced to the beginning of 20<sup>th</sup> century. The term wetland has been defined by different people and researchers (Nwankwoala, 2012), especially based on their profession and the needs of this important ecosystem and up to today there is no single definition accepted by all users of wetlands.

McCartney et al. (2010) defined wetlands as sinks into which surface water or groundwater flows from a surrounding catchment. Within landscapes they are natural harvesters of rain water and, by definition, sites where water occurs at or close to the ground surface.

According to US EPA (2009), wetlands are land areas covered with water or where water is present at or near the soil surface all year or varying periods of the year. These areas support the prevalence of hydrophytes or aquatic plants that are typically adapted to life in water saturated (hydric) conditions.

Wetlands are particularly important providers of all water-related ecosystem services as they are essential sources of water. They regulate water quantity (including availability of surface water), groundwater recharge, and can contribute to regulating floods and the impacts of storms. Lesser known; but no less important, wetlands particularly help in erosion control and sediment transport, thereby contributing to land formation and increasing resilience to storms.

#### REFERENCES

Adekola, O., Morardet, S., Groot, R. De, Grelot, F., (2008). The economic and livelihood value of provisioning services of the Ga-Mampa wetland, South Africa. *13th IWRA World Water Congress*, Sep 2008, Montpellier, France. 24 p.HAL Id: hal-00468552

https://hal.archives-ouvertes.fr/hal-00468552

Amaniga, IR., Lucy, L., Mafumbo, J., Nabulumbi, J., Mwesigye, J., Madanda, S. (2010). A Socio-Economic Baseline Survey of Communities Adjacent to lake Bisina / Opeta and lake Mburo / Nakivali wetland systems: Providing Baseline Information for the Implementation of The Cobweb Project in Western and Eastern/North-Eastern Uganda.

Avenue, T., Tacoma, S., & St, H. (2012). Rapid Assessment of the Economic Value of Wisconsin's Wetlands, 53703(608), 1–16.*EARTH'S ECONOMICS*, on February 9, 2012., Retrieved from www.wisconsinwetlands.org

Beaumais, O., Briand, A., Millock, K., and Nauges, C. (2010). What are Households Willing to Pay for Better Tap Water Quality? A Cross-Country Valuation Study, *Documents de Travail du Centre d'Economie de la Sorbonne*, 2010.51.

Birol, E., Karousakis, K., and Koundouri, P. (2006) Using economic valuation techniques to inform water resources management: A survey and critical appraisal of available techniques and an application. *Science of the Total Environment* 365: 105–122

Barbier, E.B., (2007). "Valuing ecosystem services as productive inputs," Economic Policy, CEPR & CES & MSH, vol. 22, pages 177-229, 01.

De Groot, R.S., Stuip, M.A.M., Finlayson, C.M., and Davidson, N., (2006). Valuing Wetlands: Guidance for valuing the benefits for derived from wetland ecosystem services, Ramsar Technical Report No. 3/CBD Technical Series No. 27. Ramsar Convention Secretariat, Gland, Switzerland Depletion of Uganda's wetlands; Retrieved from

http://internaionalschoolhouse.org/ugdepletion.htm 16/04/2016

Dixon, J. A. (2008). Environmental Valuation: Challenges and Practices. A Paper Presented at the Conference on Economic and Conservation in the Tropics: A Strategic Dialogue. January 31– February 1, 2008.

IUCN, (2006). Can Lao PDR afford not to invest in conserving its biodiversity? Exploring the need for innovative financial mechanisms, Vientiane, Laos: The World Conservation Union (IUCN).

Junk, W.J., Brown, M., Campbell, I.C., Finlayson, M., Gopal, B., Ramberg, L., Warner, B.G. (2006). The comparative biodiversity of seven globally important wetlands. *Aquat.* Sci. 68: 400-414. K.

Kaggwa, R., Hogan, R., and Hall. B. (2009). Enhancing Wetlands ' Contribution to growth; Employment and Prosperity. *Environment and Natural resources Report Series* UNDP/NEMA/UNEP Poverty Environment Initiative, Uganda-Kampala.

Kotze, D. C., Marneweck G. G., Batchelor, A. L., Lindley, D. S and Collins, N.B. (2008). WETEcoServices: A technique for rapidly assessing ecosystem services supplied by wetlands.WRC Report no. TT 339/08, *Water Research Commission*, Pretoria, South Africa. 69pp.

McCartney, M., Rebelo, L. M., Senaratna Sellamuttu, S., de Silva, S. (2010). Wetlands, agriculture and poverty reduction; Colombo, Sri Lanka: *International Water Management Institute*. 39p. (IWMI Research Report 137). Doi: 10.5337/2010.230

NEMA, (2011). WORLD WETLANDS DAY 2,(n.d.) February 2011 Wetlands for Forests.20 years of Wetlands Conservation in Uganda - Have Uganda 's Wetlands become Wastelands Again.

NEMA, (2008). State of the Environmental Report for Uganda. Kampala:

NFA, 2008. National Biomass Study Report. Kampala, Uganda.

Nwankwoala HO. (2012) Case studies on coastal wetlands and water resources in Nigeria. European journal of sustainable development 2012; 1(2) 113-126

Rebelo, L.M., McCartney, M.P., Finlayson, C.M. (2009). Wetlands of sub-Saharan Africa: Distribution and contribution of agriculture to livelihoods. *Wetlands Ecology and Management* 18(5): 557-572.

Russi, D., ten Brink, P., Farmer, A., Badura, T., Coates, D., Förster, J., Kumar, R., Davidson, N. (2013). The Economics of Ecosystems and Biodiversity (TEEB) for water and wetlands. London and Brussels: Institute for European Environmental Policy (IEEP); Gland, Switzerland: Ramsar Secretariat.

Setlhogile, T., Arntzen, J., Mabiza, C., & Mano, R. (2011). Economic valuation of selected direct and indirect use values of the Makgadikgadi wetland system, Botswana. *Physics and Chemistry of the Earth*, Parts A/B/C, 36(14-15), 1071–1077. http://doi.org/10.1016/j.pce.

Turpie, J., Lannas, K., Scovronick, N., Louw, A. (2010). Wetland ecosystem services and their valuation: A review of current understanding and practice. *Water Research Commission*, Gezina. UN (2012). Sustainable land use for the 21st century. Division of Sustainable Development of the UN, Department of Economic and Social Afffairs, Washington, D.C.

Turyahabwe et al. (2013): Contribution of wetland resources to household food security in Uganda. Agriculture & Food Security 2013; Doi: 10.1186/2048-7010-2-5

US.EPA, what are wetlands? Wetlands, 2009.

http://www.epa.gov./owow/wetlands/vital/what.html. Retrieved on 23/05/2016

Wasswa, H., Mugagga, F., and Kakembo, V. (2013). Economic Implications of Wetland Conversion to Local People's Livelihoods: The Case of Kampala- Mukono Corridor (KMC) Wetlands in Uganda. *Acad. J. Environ. Sci.* 1(4): 066-077. Whiteoak, K., and Binney, J. (2012). Literature Review of the Economic Value of Ecosystem Services that Wetlands Provide. *Final Report prepared for the Department of Sustainability, Environment, Water, Population and Communities*-FINAL REPORT 3 SEPTEMBER 2012

Wood, A. (2009). Valuing wetlands for livelihoods as the basis for sustainable management: The SAB approach. Striking a balance. Policy Briefing Note 1. UK: Wetland Action & the Centre for Wetlands, Environment & Livelihoods at the University of Huddersfield.

Wood, A., van Halsema, G.E., (2008). Scoping agriculture-wetland interactions: Towards a sustainable multiple response strategy. FAO Water Report 33. Rome, Italy: Food and Agriculture Organization of the United Nations.

WRI.(2009). *Mapping a Better Future* – How Spatial Analysis Can Benefit Wetlands and Reduce Poverty in Uganda. Wetlands Management Department, Ministry of Water and Environment. Kampala, Uganda.