BUSITEMA UNIVERSITY

FACULTY OF NATURAL RESOURCES AND ENVIRONMENTAL SCIENCES

# ECONOMIC VALUATION OF WETLANDS: THE CASE STUDY OF KAGANGO WETLAND IN KABWOHE-ITENDERO TOWN COUNCIL SHEEMA DISTRICT

BY

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BU/UG/2012/1979

A RESEARCH REPORT SUBMITTED TO THE FACULTY OF NATURAL RESOURCES AND ENVIRONMENTAL SCIENCES IN PARTIAL FULFILLMENT FOR THE AWARD OF THE BACHELOR'S DEGREE OF SCIENCE IN NATURAL RESOURCE ECONOMICS OF BUSITEMA UNIVERSITY.

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# DECLARATION

I, **RUBAGUMYA OSHEA,** do declare that this research report is my original work. The information given in this report has been prepared by me and references were made purposely for external informational cross reference only. It is my original report and it has never been submitted to any institution of higher learning. I, therefore, take full responsibility for any errors that may arise in this work as a result of omission or otherwise.

Signature,

.....

RUBAGUMYA OSHEA

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Date.....30/06/2015.....

# APPROVAL

This is to certify that the work titled "Economic valuation of wetland resources, a case of Kagango Wetland in Kabwohe-Itendero Town Council, Sheema district" has been done under my supervision and is now ready for submission to the Faculty of Natural Resource Economics and Environmental Science of Busitema University.

Signature,

.....

**MR. KIFUMBA DAVID NSAJJU.**

Supervisor

Date.....30/6/15.....

# DEDICATION

I would like to dedicate this report to my beloved parents Mr. Biryabarema T.A Oshea and Mrs. Enid Biryabarema for taking care of me and for their financial and moral support.

I also dedicate this report to Naigaga Esther, my brother Kabandize Oinemukama and my sisters Oddity Nayebare, Nyakato Owamukama and Oshenid Kekijo.

Above all, this work is dedicated to the almighty God who gave me the gift of life and has seen me through all the hardships.

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| | |
|---|---|
| ABM | Averting Behaviour Method |
| CA | Conjoint Analysis |
| CVM | Contingent Valuation Method |
| FAO | Food and Agricultural Organization |
| GDP | Gross Domestic Product |
| GoU | Government of Uganda |
| KITC | Kabwohe-Itendero Town Council |
| MA | Millennium Ecosystem Assessment |
| MTTI | Ministry Of Trade Tourism and Industry |
| MWE | Ministry of Water and Environment |
| MWLE | Ministry of Water, Lands and Environment |
| NEMA | National Environmental Management Authority |
| NWP | National Wetland Policy |
| SDLG | Sheema District Local Government |
| TCM | Travel Cost Method |
| TEV | Total Economic Value |

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# DEFINITION OF KEY TERMS.

**Altruism value:** The preference of the individual for others of the current generation to enjoy and benefit from a resource, even if the individual professing the value does not use the resource.

**Bequest value:** The preference of the individual for others of future generations to enjoy and benefit from a resource, even if the individual professing the value does not use the resource.

**Direct Use Values (DUV):** benefits derived from fish, agriculture, fuel wood, recreation, transport, wildlife harvesting, peat/energy, vegetable oils, dyes, fruits among others.

**Economic value:** can be defined as the most that a person is willing to give up in other goodsand services in order to obtain a good, service, or state of the world.

**Existence value:** is the value of simply knowing that the resources or biodiversity within the wetland are protected.

**Indirect Use Value (IUV):** indirect benefits derived from the wetlands functions like nutrient retention, flood control, storm protection, groundwater recharge, micro-climatic stabilization.

**Non-Use Value (NUV):** derived from the knowledge that a resource (biodiversity, cultural heritage, religious site, and bequest) is maintained.

**Option value:** is the estimated future value of resources and services offered by the wetland such as possible medicinal, leisure, agricultural or industrial uses.

**Replacement cost: is** a method used to calculate the cost of replacing a service with a human-created product, such as fertilizers to replace the nutrients that worms create for the soils. This uses the costs of restoring ecosystem goods or services (e.g. through habitat restoration), or of replacing them with artificial substitutes.

**Total Economic Value (TEV)** is theoretically the sum of all the above values, although depending on how they are measured they may not always be additive (**TEV = DUV + IUV + NUV**).

# ABSTRACT

Wetlands perform a number of ecosystem services and are well recognized internationally recognized as one of the most important ecosystems for the conservation of biodiversity. Kagango wetland directly and indirectly supports thousands of people, and provides goods and services namely fertile agricultural soils, wetland fish; wetland trees for timber and fuel wood and reeds to make mats and to thatch roofs. However, the wetland is being rapidly degraded through brick making, and art and craft which appear to yield much higher and more immediate profits.

The wetland is located in KITC Sheema District where a sample of 60 respondents was taken. The general objective was to determine the total economic value of Kagango wetland in its current state through finding out the reasons for encroachment, determining the current environmental and ecological benefits from the wetland accrued to different community activities conducted in Kagango sub-county and suggesting the best possible ways of conserving Kagango wetland. Questionnaires and interviews were used to gather data from wetland encroachers, local leaders, and 5 key informants from SDLG. The estimated monetary value for the different wetland benefits that accrue to the people who use this wetland was arrived at by using the replacement cost method.

Findings revealed that most individuals use the wetland either for papyrus harvesting, agriculture or brick making which are highly paying activities. Also the replacement cost value of Kagango wetland in its current state was estimated to be US $ 3,827.3per month. The replacement costs per month steadily increase as more people engage in Kagango wetland utilisation which jeopardises the future existence of the wetland. Therefore, this calls for promoting papyrus harvesting for mulching of crops grown outside the wetland to enhance output and incomes.

# CHAPTER ONE:

## 1.0. INTRODUCTION

## 1.1. Background

### 1.1.1. What are wetlands?

Wetlands certainly occupy the transitional zones between permanently wet and generally dry environments. They share characteristics of both environments yet cannot be classified unambiguously as either aquatic or terrestrial. Wetlands differ widely in character due to regional and local differences in climate, soils, topography, hydrology, water chemistry, vegetation, and other factors (Gosselink et al, 1993). While all wetlands are characterized by impeded drainage, the length of their flooding period, depth of water, soil fertility and other environmental factors vary with different wetland types. They are home to distinctive plant and animal communities that are well adapted to the presence of water and flooding regimes.

According to the Ramsar Convention (1971) "wetlands are areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static, or flowing, fresh, brackish or salty, including areas of marine water that do not exceed 6 meters at low tide". Uganda's National Policy for the Conservation and Management of Wetland Resources (1994) define wetlands as areas "where plants and animals have become adapted to temporary or permanent flooding." It includes permanently flooded areas with papyrus or grass swamps, swamp forests or high-altitude mountain bogs, as well as seasonal flood plains and grasslands. The National Environment Act, Cap 153 under Section 2 defines wetlands as areas permanently or seasonally flooded by water where plants and animals have become adopted.

### 1.1.2. Global Wetland distribution

Wetlands are valuable ecosystems that occupy about 6% of the world's land surface. They comprise both land ecosystems that are strongly influenced by water, and aquatic ecosystems

# REFERENCES


Albert, D.A 1994. Michigan's Landscape. Evers ed. Endangered and Threatened wildlife species

Birol, E. Karousakis, K. and Koundouri, P. (2006) Using economic valuation techniques to East of South Australia, Report no.7: "Private and Social Values of wetlands" project,

Evers, D.C. (1994). Endangered and Threatened Wildlife of Michigan. Univ. of MI Press. Inform waterresources management: A survey and critical appraisal of available Techniques and an application. Science ofthe Total Environment 365: 105–122. University of New South Wales,Canberra.

Malabika B.R, K. R. Pankaj, R. S. Nihar, and M. Asis (2012), "Socio-economic calculations of Wetland based occupations of lower genetic basin through participatory approach," Environment and Natural Resources Research, vol. 2, no. 4, pp. 30–44.

Barbier, E.B. 2007. "Valuing Ecosystem Services as Productive Inputs" Economic Policy

Brouwer, R. and F. Spaninks (1997) The validity of transferring environmental benefits: further Empirical testing, Centre for Social and Economic Research on the Global Environment, Norwich.

Costanza, R. and Folke, C. (1997). Valuing ecosystem services with efficiency, fairness, and Sustainability as goals. In G.C. Daily (ed.) Nature's Services, 49–68. Washington, D.C. Island Press.

Costanza, R., D'Arge, R., DeGroot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., O'Neill, R.V., Paruelo, J., Raskin, R.G., Sutton, P., and van den Belt, M. (1997). The Value of the world's ecosystem services and natural capital. Nature,London **387**,

Daily, G.C. 1997. Nature's Services: Societal Dependence on Natural Ecosystems. Washington, D.C. Island Press.

DeGroot, R., Wilson, M.A., and Boumans, R.M.J. (2002). A typology for the classification, Description, and valuation of ecosystem functions, goods and services. Ecological Economics.

E. B. Barbier, M. Acreman, and D. Knowler(1997), Economic Valuation of Wetlands: A Guide ForPolicy makers and planners, Ramsar Convention Bureau, Gland, Switzerland.

F. Karanja, L. Emerton, J. Mafumbo, and W. Kakuru, Assessment of the Economic Value of Pallisa District Wetlands, Biodiversity Economics Programme for Eastern Africa, IUCN

FAO (Food and Agricultural Organization) (2001). The State of Food Insecurity in the World,

Food and Agriculture Organization of the United Nations, Rome, Italy.

Freeman, A.M. (1986). On assessing the state of the art of the contingent valuation method for Valuing environmental changes.

Government of Uganda (2010), The National Development Plan For Uganda, Kampala, Uganda.

Hoevenagel, R. (1994). The contingent valuation method: scope and validity, Vrije Universiteit, Amsterdam.

Holmlund, C.M. & Hammer, M. 1999. Ecosystem services generated by fish populations. *Ecological Economics*

Hanson, A. *et al.* (2008). Wetland ecological functions assessment: An overview of approaches. Canadian Wildlife Servicetechnical report Series No. 497.

Mitchel, R.C. and R.T. Carson (1989). Using surveys to value public goods: the contingent Valuation method, John Hopkins University Press for Resources for the Future, Washington D.C.

N. Turyahabwe, W. Kakuru, M. Tweheyo, and D. Tumusiime(2013) "Contribution of wetland Resources to household food security in Uganda," Agriculture and Food Security Journal,

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

Pearce, D., E. Barbier and A. Markandya (1990). Sustainable development; Economics and Environment in the third world, Edward Elgar, Aldershot.

Pearce, D.W. and A. Markandya (1989). Environmental policy benefits: monetary valuation, Organisation for Economic Co-operation and Development, Paris.

Roggeri, H. (1995) Tropical Freshwater Wetlands – A Guide to Current Knowledge and Sustainable Management, KluwerAcademic Publishers

S. M. Mwakubo and G. A. Obare (2009), "Vulnerability, livelihood assets and institutional dynamics in the management of wetlands in Lake Victoria watershed basin," Wetlands Ecology and Management, vol. 17

Stynes, D.J. (1990). A note on population distributions and the travel cost method, Chapter 9. In: Johnson, R.L. and G.V. Johnson (eds.), Economic valuation of natural resources, Westview Press, Boulder, pp. 139-149.

The World Conservation Union and Uganda National Wetlands Programme (2001), Kampala,

Uganda,

T. V. Ramachandra, B. Alakananda, A. Rani, and M. A. Khan (2011), "Ecological and socio economic assessment of Varthur wetland, Bengaluru (India)," Journal of Environmental Science &Engineering, vol. 53

Turner, R.K., D. Pearce and I. Bateman (1994). Environmental economics; An elementary introduction, Harvester Wheatsheaf, New York.

Vatn, A. and D.W. Bromley (1994). Choices without prices without apologies, Journal of Environmental Economics and Management, Vol. 26, No. 2, pp. 129-148.

Wetlands Management Department, Ministry of Water and Environment, Uganda Bureau of Statistics, International Livestock Research Institute, and World Resources Institute (2009), Mapping a Better Future: How Spatial Analysis can benefit wetlands and ReducePoverty in Uganda, World Resources Institute, Washington, DC.

Wierstra, E., A. van der Veen, en P. Geurts (1996). Monetaire waardering van Milieuveranderingen: de contingent valuation method, Universiteit Twente, Enschede

Whitten, S.M. and Bennett, J.W., (2001). A travel cost study of duck hunting in the Upper South Wildlife of Michigan. University of Michigan Press. Ann Arbor M