BUSITEMA UNIVERSITY

Faculty of Natural Resource and Environmental Sciences

COMPARISON OF THE PERCEIVED AND "UNSEEN" VALUE OF TREES:
FOCUSING ON BGBD AND CROP PERFORMANCE UNDER THEIR CANOPIES

CASE STUDY NAMASAGALI PARISH, KAMULI DISTRICT

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BU/UG/2012/117

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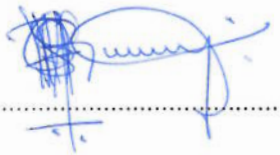
A Dissertation submitted in partial fulfillment for the award of Bachelor of Science degree in natural resource economics of Busitema University

Faculty of natural resource and environmental sciences

JUNE 2015

DECLARATION

I, **ATUGUMYA ARMSTRONG B** do hereby declare that this research work has been through my own efforts and never has it been submitted to Busitema University or any other Institution of higher learning for the award of a degree or any other qualification.



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APPROVAL

This is to confirm that this research report titled ***Comparison of the perceived and "unseen" value of trees: focusing on BGBD and crop performance under their canopies. Case study Namasagali parish, Kamuli district*** is original and has only been through the efforts of **ATUGUMYA ARMSTRONG B** after pursuing a three year Bachelor of Science degree in natural resource economics of Busitema University. He has therefore fulfilled part of his requirements for the award of the degree in Natural Resource Economics of Busitema University.

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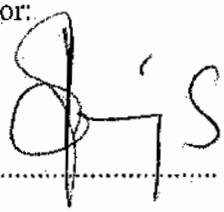

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DEDICATION

To the almighty God for His never-ending love, enrichment, and a feeling of peace throughout the study period; Glory be to Him.

ACKNOWLEDGEMENTS

I would like to thank God for His spiritual potency that He poured unto me. It kept me buoyant and overflowing with wisdom right throughout the whole study period.

My supervisor Professor Moses Isabirye (Busitema University) for his guidance towards completion of my research: not forgetting the tireless efforts of the entire Namasagali campus academic staff throughout the course, with their undeniable professional support which has provided a step towards my professional career.

To my family members; My Dad Mr. Bihangire M Didan Akiiki for his inexorable financial support and back-up towards my victorious completion of this course, my two mums Namiiro scovia and Namayanja Specioza; my brothers Aganyira Arthur, Ategeka Allan and Anil Aveans; my sisters Allelluiah Angella and Abigail Aria for the moral support facilitating me in the great effort to obtain knowledge.

My treasured Friends; Wamala B, Naturinda Z, Katabarwa C, Mugalu S, Kusiimwa A; for their support, advice, assistance rendered to me throughout the research and the entire course. My appreciation further goes to the research team; Kitimbo I, Kimalyo I, Nsubuga P, Amanya D and Oshea R. Technical assistance; Namazzi B (for field equipment) , Sekajugo J and Mabirizi J (for their advice) which all made the survey activities simpler.

And all my course mates for the sustenance especially during the trial times of my study, the modesty, concern, the feel of togetherness and team work exhibited. You are forever esteemed May the Almighty provide for all your desires.

Finally, Busitema University for giving me a practicum opportunity to exchange and gain knowledge in the related fields of Natural Resources Conservation and Management plus all other areas of life.

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ACRONYMS

AE	Avoidance Expenditure
AGB	Above Ground Biomass
BG	Below Ground
BGB	Below Ground Biomass
BGBD	Below Ground Bio Diversity
C	Carbon
CA	Conservation Agriculture
CH4	Methane
CM	Centimeter
CO_2	Carbondioxide
CV	Contingent Valuation
D	Diameter
DBH	Diameter at Breast Height
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
IPCC	Intergovernmental Panel for Climate Change
MA	Millennium Ecosystem Assessment
MLHUD	Ministry of Lands, Housing and Urban Development
NFA	National Forestry Authority
SOM	Soil Organic Matter
SPSS	Statistical Package for Social Scientists
SSA	Sub Saharan Africa
Stdev	Standard Deviation
TEV	Total Economic Value
UGX	Uganda Shillings
WTA	Willingness To Accept

ABSTRACT

It is essential to be aware of farmers' knowledge in order to comprehend the possible barriers and opportunities to carrying out sustainable practices in tree-crop management Kiptot et al., 2006. Garbeva et al. 2006 explains that trees can influence the composition of underlying soil microbial communities. However Faye et al., 2010 explains that this biodiversity is vulnerable to the socio-economic and climatic determinants.

The study brings to note the farmer's perception of agrarian trees in Namasagali parish basing on their influence on BGBD and crop performance under their canopies. Purposive sampling was considered in determining the sampling population where only farmers with trees incorporated in their gardens were investigated; interviews and questionnaires were used to capture their perception using the WTA valuation method. Crop performance was studied in terms of estimated yield to which the market price was attached. The crops that were dominating the individual cropping systems included coffee, banana and others (combining yams, cassava, kulekula). For studying the BGBD, sample plots of (20cm*20cm) stretch, 15cm deep were established and organisms within them counted. Focus was on macro fauna and the organisms which were dominant unto which emphasis was put were Earthworms, Black ants, Crickets, Termites, Beetles, Centipedes, Millipedes, Ants, Beetle larvae, Earwig and Red ants. Studied trees with their dominance percentage were *Ficus natalensis* (72%), *Ficus sycomorus* (6%), *Persea americana* (4%), *Ficus ovata* (6%), *Markhamia lutea* (2%), *Mangifera indica* (2%), *Artocarpus heterophyllus* (2%), *Albizia coriaria* (4%) and *Milicia excelsa* (2%).

Questions whether there is any influence; of trees towards the presence of BGBD, soil organisms towards crop performance, trees to crop performance were answered. It was observed that the composition of soil organisms was greater under the trees than outside the tree canopy. The farmer's perceived value was averagely lesser than the calculated and "un seen" value. Using regression analysis, soil organisms had p-value less than 0.05 ($P < 0.05$; $0.000 < 0.05$) and were found significant explaining 99% of the variations in the crop amount. I therefore recommend an involvement of several stakeholders at local and national level as suggested by (Isaac, 2012) to boost up the farmer's willingness to adopt scientific based options for sustainable management of their cropping systems.

Key words: Agrarian trees, Perceived value, BGBD, Tree canopy

CHAPTER ONE

INTRODUCTION

1.1 Introduction

The biggest numbers of people are unaware of the ecosystem services that trees provide especially to enhance crop performance and improvement of people's livelihood. The depletion of the tree resources has important implications for the livelihoods of a sizeable majority of the population, undermining the sustainability of the region's economy and posing a real threat to poverty reduction. Uganda lost 27 percent (1,329,570 hectares in total or 88,638 hectares per year) of its original forest cover between 1990 and 2005 according to National Forestry Authority report (2009). The increased demand of fuel, fodder for animals, charcoal burning among others has caused a great threat to trees leading to their depletion. At this rate of demand, forest resources are likely to be exhausted by 2050 according to Moyini, Y., Muramira, E. T. and Alumai, G. (2007). This has left the environment degraded with less resilience to provide the social needs of the community such as; fodder, fuel and various ecosystem services like climate regulation, biological regulation, soil formation and regeneration (MA. 2005) that trees offer to foster the performance of the cropping systems. The integration of trees and agricultural crops in gardens also has the potential to enhance soil fertility, reduce erosion, improve water quality, enhance biodiversity, increase aesthetics and sequester carbon (Garrett and McGraw. 2000, Garrity, 2004, Williams-Guillén et al., 2008 and Nair et al., 2009).

Biological resource management and people's livelihoods are complex and interconnected. While everyone is affected by ecosystem degradation, the poor rural who have no access to land which is the most essential pillar of human livelihood and national development in Uganda are disproportionately affected (MLHUD) (2009). With the low adaptability of the rural farmers to agro forestry systems the researcher considers the farmers to be less knowledgeable about the different ecosystem services these trees provide.

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