



FACULTY OF NATURAL RESOURCE AND ENVIRONMENTAL SCIENCES

NAMASAGALI CAMPUS

**DEPARTMENT OF GEO-INFORMATION, EARTH OBSERVATIONS AND
PHYSICAL LANDS RESOURCES**

**ASSESSING THE EFFECT OF LAMPARA NET SIZE ON THE
RASTRINEOBOLA ARGENTAE (MUKENE) FISHERY: A CASE STUDY OF
LOLWE ISLAND, ON LAKE VICTORIA NAMAYINGO DISTRICT**

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DECLARATION

I, Mangeni Nelson, declare that this dissertation is my original work and has not been submitted for a degree in any other university.

Signature.....

Date.....

APPROVAL

I hereby certify that this report has been submitted with my approval.

Name:

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DEDICATION

I dedicate this work to my wife and children.

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ACRONYMS

CPUE	Catch per Unit of Effort
LVFO	Lake Victoria Fisheries Organization
SOPs	Standard Operating Procedures
LVFRP	Lake Victoria Fisheries Research project
Lampara net	The Net used to harvest Mukene fish samples

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ABSTRACT

This study was undertaken in Lolwe waters at Kadenge landing sites on the off shore area of Lake Victoria Uganda in Namayingo district, in the month of December 2021 and January 2022 for three weeks days of sampling. The main aim was to determine the effect of Lampara net on the catch rate and size of the *Rastrineobola argentea* (Mukene) harvested on Lake Victoria using various mesh sizes. The study focused on the 5mm and 10 mm mesh sizes of the Lampara net.

A total of 212 boats were sampled; from the 5 mm mesh sizes indicated catch rates of 353 kg/boat/day and yet for 10 mm mesh size was at 147 kg/boat day with only 5 boats in the whole samplings. The study showed that there more catches of Mukene harvested as compared to 2004 and 2014 an indication that we still have a lot of Mukene fishery that need to exploited in the lake on proper management measures.

CHAPTER ONE

INTRODUCTION

Back ground of the study

The distribution of the Mukene fishing effort is influenced by the population structure and the demand of the fishery by the fisher community surrounding the lake. The type of boat used and the size of the net may affect the size of the Mukene harvested by the fishermen in the Lake Victoria Lolwe Island. Some of these factors have affected the exploitation rate of this fishery on Lake Victoria, a lake that is shared by many countries in East Africa. Lake Victoria is the largest freshwater system in the tropics with minimum depth of 40 meters and maximum depth of 80 meters. The lake is located at the latitudes ranging from 0° 20' N to 3° 0' S and longitudes of 31° -34°, 53' E with an altitude of 1136 m. The whole lake has total surface area of 68,680 km² and maximum length is 400 km and minimum 320 km. It has water retention time of 140 years and catchment area of 193,000 km², which extends into Rwanda and Burundi (Okaranon, *et al.*, 1999, Ntiba, *et al.*, 2001 and Balirwa, 2007). Lake Victoria fisheries have experienced recognizable changes over the last seventy years or more. It is certain that in the early years of the Lake Victoria, adequate fisheries catches were obtained with little effort, from inshore areas alone, and with simple fishing gears and the fishing intensity was almost negligible (Kudhongania and Cordone, 1974 (a)&(b), Okaranon, *et al.*, 1999). Major changes in the species composition occurred in early 1980's following these introductions which led to an explosive population increase in the Nile perch (*Lates niloticus*) and *Caridina nilotica*, a small benthic shrimp. The population of Nile tilapia and indigenous small pelagic cyprinid *Rastrineobola argentea* expanded substantially at about the same time. The present fishery is made up of mainly three commercial fish species, Nile perch, Nile tilapia and *Rastrineobola argentea*. Nile perch dominates the fishery followed by *Rastrineobola argentea* and Nile tilapia (Ligtvoet *et al.*, 1995). The Lake Victoria basin currently supports 40 million people and 10% of this population depend on the lake especially fish either directly or indirectly. The gross economic product is in the order of US\$4-6 billion annually (Kamanyi *et al.*, 2006(a)&(b), Balirwa 2007, Muyodi *et al.*, 2010, Report on Uganda Fisheries Frame survey 2008). But as the Nile perch fishery has been dropping the Mukene fishery has been gaining and the biomass in the lake indicates that the lake has a lot that needs to be harvested. The shift in the cyprinid expansion while the cichlids declining emanates from the fishing effort that has been put on such fishes by the people of Uganda besides the predator prey relationship by the Nile perch. The growth rate of the cyprinids is very fast thus maturing in a short period of time as compared to others fishes thus leading to high biomass rate of this fish (NAFIRRI CAS Technical reports

REFERENCES

Balirwa, S.J. 2007. Ecological, environmental and socio-economic aspects of the Lake Victoria's introduced Nile perch fishery in relation to the native fisheries and the species culture potential: lessons to learn. *The African Journal of ecology* 45, 120-129. Blackwell publishing Ltd.

Kamanyi, J.R. Nabbongo, H. and Kibirige, H.L 2006 (a). The Hook fishery on Lake Victoria Uganda. Technical report to Implementation of the Fisheries Management Project, Lake Victoria Fisheries Organization.

Kudhongania, A.W. and Cordone, J. A. 1974 (a). Batho-spatial distribution pattern and Biomass estimate of the major demersal fishes in Lake Victoria. *The African Journal of Tropical hydrobiology and Fisheries* page 15. East African Literature Bureau Nairobi, Dar es Salaam and Kampala.

Kudhongania, A.W. and Cordone, A. J. 1974 (b). Past trends, present stocks and possible future state of the fisheries of the Tanzania part of the Lake Victoria. *The African Journal of tropical hydrobiology and Fisheries* page 167. East African Literature Bureau Nairobi, Dar es Salaam and Kampala.

Ligvoet, W., Mous, P.J., Mkumbo, O.C., Budeba, Y.L., Goudswaard, P.C., Katunzi, E.F.B., Temu, M.M., Wanink, J.H., Witte, F. 1995. The Lake Victoria Fish stocks and fisheries Fish stock and Fisheries of Lake Victoria. Page 32. A hand book for field observation. Samara publishing Ltd. Cardigan, U.K.

Manyala J.O., and J. E. Ojuok 2008. Survival of the Lake Victoria *Rastrineobola argentea* in a rapidly changing environment: Biotic and abiotic Interactions. *Aquatic Ecosystem Health & Management*, 10:4, 407 – 415.

Muhoozi, L.I. 1998. Factors affecting fishing effort and their effects on fish catches at selected landings on Lake Victoria. Msc Dissertation submitted for the degree of Masters of Science at Makerere University.

Muyodi, J.F., Bugenyi, F.W.B, Hecky, R.E 2010. Experiences and lessons learned from Interventions in the Lake Victoria Basin: The Lake Victoria Environmental Management

Project. Lakes and Reservoirs: Research and Management 2010 15: 77-88. Blackwell Publishing Asia Pty Ltd.

Mhithu, H. and Chande, A.L. 2004. Diurnal feeding patterns and food habits of *Lates niloticus* in the Speke gulf, Lake Victoria. Tanzania. Journal of Science pages 91-99 ISSN 0856-1761. Published by faculty of Science University of Dar es Salaam.

NaFIRRI Report 2015. Catch assessment report of May 2014 Lake Victoria, Uganda. National Fisheries Resources Research Institute, NARO, Jinja, Uganda.

NaFIRRI report 2011. Catch Assessment Technical Report on Lake Victoria, Uganda. National Agricultural Research organization.

NaFIRRI report 2011. Catch Assessment Technical Report on Lake Victoria, Uganda. National Agricultural Research organization.

Ntiba, M.J., Kudoja, W.M. and Mukasa, C.T 2001. Management issues in the Lake Victoria watershed. Case report. Lakes and Reservoirs: Research and management 6:211-216.

Okaranon, J.O., Muhoozi, L.I & Bassa, S. 1999. Current status of the fish stocks of Lake Victoria (Uganda) page 1-8. Lake Victoria Fisheries research Project Phase II Technical document number 7. LVFRP/TECH/99/07.

Report on Uganda Fisheries Frame survey, 2008. Fisheries Management component. Lake Victoria Fisheries Organisation.

Taabu, A.M., Njiru, M., Nsinda, P., Getabu, A., Nkalubo, W.N., and Mlaponi, E 2008. Trends in abundance, distribution, and life history parameters of commercial fish stocks in Lake Victoria. Lake Victoria organisation stakeholders' conference held at Hotel Royale – Kampala Uganda on 27th -29th 2008.

Tumwebaze H., Cowx I., Ridgway, Getabu A. MacLennan D.N. (2008). Spatial and temporal changes in the distribution of *Rastrineobola argentea* in Lake Victoria. Aquatic Ecosystem Health & Management. 10:4, 398 - 406

Witte, F. and Wim van Densen, L.T., eds. 1995. Family: Centropomidae, *Lates niloticus*. The Lake Victoria fish stock and Fisheries. Fish stock and Fisheries of Lake Victoria, page 296-297. A hand book for field observation. Samara publishing Ltd. Cardigan, U.K.

Wanink J. H. 1998. The pelagic cyprinid *Rastrineobola argentea* as a crucial link in the disrupted ecosystem of Lake Victoria. In Wanink H.J., Frans Witte; Niche shift in zooplanktivorous cyprinid from Lake Victoria after the reduction of its cichlid guild members by the Nile perch (page158-193).