

BUSITEMA UNIVERSITY

FACULTY OF NATURAL RESOURCE AND ENVIRONMENTAL SCIENCES

**ASSESSING THE POTENTIAL OF AQUACULTURE SYSTEMS TO IMPROVE
LIVELIHOODS**

A Case study of Jinja District and Nyenga parish- Njeru sub-county

BY

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UNIVERSITY**

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DECLARATION

I hereby declare that this work is a result of my own commitment and has never been submitted either in the same or different kind to this or any other institution for any academic qualification.



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Date 23 / 06 / 2015

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APPROVAL

This is to certify that this dissertation by NAHAYO WYCLIFF has been prepared under my supervision, and recommend it for submission to the Faculty of Natural Resources and Environmental Sciences for Assessment.

Signed.......... Date.....23rd / June / 2015.....

MS. GIMBO REBECCA

DEDICATION

I dedicate this work to the Almighty God for his divine guidance. Also dedicate this dissertation to my mother Ms.Nanyanzi Mada who financed me during data collection; and my uncle Mr. Nfittumukiza Muhammad plus the government of the republic of Uganda for the financial assistance it rendered to me. I also dedicate it to Mr. Behwera Wilson (District Environmental Officer of Masaka District Local Government) who gave me guidance and financial help during my research, may the lord bless you.

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LIST OF ACRONYMS

FAO	Food and Agricultural Organization of the United Nations
NaFIRRI	National Fisheries Resources Research Institute
MAAIF	Ministry of Agriculture, Animal industry and Fisheries
NEMA	National environmental management authority
CBO's	Community Based Organizations
MAFAP	Monitoring Africa's Food and Agricultural Program
NGO's	Non- Governmental Organization
SON	Source Of the Nile
NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organization
GoU	Government of Uganda

ABSTRACT

Fish farming is one of the most important economic activities in Uganda particularly on and around Lake Victoria where biological and environmental conditions are said to be favorable for fish. The demand for fish in Uganda and worldwide is increasing due to increasing human population and health concerns growth. According to (FAO,2000), the per capita fish consumption should be 15 kg, Uganda capture fisheries production has been declining to the extent that per capita fish consumption currently is 8 kg which is much below that recommended, and this source is not expected to produce more fish. Furthermore, population pressure from agriculture and industry are having an impact on water resources thus need to have an alternative source of fish if Uganda has to avoid the importation of fish, and then the only available option for increasing fish production is through aquaculture. The gap existing is that the capable investors are un aware of the potential of different aquaculture systems in terms of productivity, profitability and its capacity to improve people's welfare, thus low adoption and investment in aquaculture systems especially cage culture and pond technology. The local community lack sufficient capital and technical knowledge required to operate fish farming. Therefore the study focuses on the potential of fish farming to improve livelihoods and efficiency of fish farming with concerns of environmental conservation, ensuring of food security in addition to identifying the factors that determine efficiency of fish production. Primary data was collected from Jinja district and Nyenga parish in Njeru sub-county Buikwe district. Direct observations, group discussions and interviews using questionnaires were used to collect primary data from government officials, non-government officials, community members, fish sellers, fish farm workers and fish farm owners complemented with Secondary data collected from internet and research centers such as NaFIRRI. The profit margin model was used to assess the profitability of aquaculture, and also a logistic regression to find the factors determining the technical efficiency of fish farming and the Cobb-Douglas productivity frontier model (stochastic productivity frontier model) were used to determine the level of technical efficiency of fish farmers in the area and it was revealed that all of the 4 factors assessed were found crucial as regards technical efficiency of fish production and these included; fingerlings, labour, feeds for both cage and pond systems; and fertilizers for pond systems were significant at 5% level of significance. However, the constant coefficients for both aquaculture systems were found insignificant at 5% level of significance to explain the variation in output though they were positive. This implied that when the above factors included in the model are zero, there would be no output/ or change in output would also

be zero. From the profitability analysis, it was found out that profit margin for both pond and cage systems decrease with increase in costs. The adoption of cage and pond fish farming technologies was found out to be low due to lack of knowledge and skills and capital required to carry out fish farming, and therefore this called for government intervention to control the situation if we are to use fish farming as a tool to improve the livelihoods of the poor Ugandans, and if we are to achieve Ugandas goal of becoming a medium developed country by 2050.

CHAPTER ONE: GENERAL INTRODUCTION

1.1 Background

Aquaculture is the science, art and business of farming or cultivating fish under controlled conditions. Halwart et al (2000), defines aquaculture as the farming of aquatic organisms, including fish, crustaceans, molluscs and aquatic plants. Globally, aquaculture has contributed enormously to the growth in fish production. It represents currently 30% of global fish production and this figure is projected to increase to 41% by 2020 (Delgado et al., 2003). With most of the capture fisheries being over exploited, there are hopes that aquaculture may help reduce the pressure on natural fish resources. Aquaculture has been suggested as a viable option through which Uganda can increase fish production for the attractive export market as well as satisfy domestic and regional demand. The government of Uganda has set a goal of having 10% of fish exports come from aquaculture by 2020. In line with this, it supported the stocking of 20 dams with 3 million Tilapia fry between September 2001 and March 2003 (MFPED, 2003). The commercialization of fish farming is a key objective of Uganda Commercial Fish Farmers Association, an umbrella organization that brings together all fish farmers and encourages investments in fish farming. Uganda has a favorable bio-physical environment for warm water fish aquaculture and it is estimated that over 70% of districts have potential for aquaculture development (FAO, 2002; Jagger and Pender, 2001). However, key production and marketing factors like-availability of labor/cost of labor, access to inputs e.g. fish fry, availability of extension services, proximity to markets, proper roads and quality of the produce are likely to affect investments and profitability (Jagger and Pender, 2001). Fish farming is a labor intensive activity, involving pond construction and maintenance, feed collection, collection of manure, fertilization and protection of the ponds. It is therefore mainly suited to areas with high population densities and low wage rates. The availability of extension staff to deliver technical knowledge hampers productivity. The new, farmer demand-driven, National Agricultural Advisory Services (NAADS) under the Plan for Modernization of Agriculture offers a new opportunity for fish farmers to access to information on relevant technologies and marketing practices, but the service is still too new to gauge how much emphasis farmers place on aquaculture in their demand for services under NAADS, which covers a broad range of farm enterprises. Ecological theory suggests that Uganda has already reached a maximum sustainable yield for many aquatic wild populations. The survival of wild fish populations is today threatened by over

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