FACULTY OF ENGINEERING

DEPARTMENT OF MINING AND WATER RESOURCES ENGINEERING

ASSESSING THE RELIABILITY OF WATER DISTRIBUTION SYSTEM OF NWSC- NAGONGERA BRANCH TORORO AREA

BY

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***A final year project report submitted to the department of mining and water resources engineering in partial fulfillment of the requirements for the award of the Bachelor* of Science in water resources engineering degree of Busitema University**

DECLARATION

I **OLOGE HECTOR DANIEL** declare that the work presented in this project report is out of my effort and has not been published or submitted before to any university or higher institution of learning.

Sign…….

Date…….

DEDICATION

This research is dedicated to my lovely parents mr and mrs Obbo Gideon Ologe and my wife Aiko Sarah who have stood by me and always believed in me. You are the best.

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First of all, I thank the almighty God for his protection and wisdom he granted to me throughout my education life.

I forward my appreciation to my parents towards their financial support, guidance and encouragement towards my studies and for making this research possible. I would love to express my gratitude to my supervisor Mr. Oketcho Yoronimo and other lecturers of Busitema University in persons of Mr. Maseruka S. Bendicto, Mrs. Engole Mario among others for their advice and encouragement throughout the research period. Sincere thanks are extended to Nwsc Tororo for support during field works.

ABSTRACT

The provision of adequate and reliable water supply in developing countries is becoming a challenge for most water utilities especially national water and sewerage corporation. The existence of an information gap regarding the assessment of utility performance and a lack of focus on consumer's perceptions regarding the efficiency of service provision formed the basis of this research. The aim was to investigate performance indicators that would best reflect the efficiency of the Nagongera town Council and to assess the perceptions from the end customers.

The methodology employed included literature and documentary review and participatory methods such as customer survey questionnaire and key informant/customer interviews. The relative performance of the utility was analyzed based on the Overall Efficiency Indicator (OEI) which is a function of unaccounted for water and collection ratio. The data obtained from the customer survey questionnaires were analyzed using the Statistical Package for Social Sciences (SPSS). The research analysis revealed that Nagongera Town council water distribution network best performance was achieved only at early stages when the population of customers was still low. The study revealed that, the system had a number of factors affecting its performance which include seasonal water shortages, customer affordability, aged pipes, poorly installed network components such as booster pumps, tapings. It was concluded that the system performance is below expectations of best practice targets. The most cited problems arising from the perceived lack of response to burst water pipes, the lack of forewarning and explanation for water cuts and the perceived high current cost of water.

APPROVAL

I certify that this study has conducted under my guidance and supervision and it is ready to be submitted to department for examination.

Signature …… Date …….

Mr. OKETCHO YORONIMO

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CHAPTER ONE: INTRODUCTION

This chapter outlines the relevant information about the project, problem statement, and justification, objectives of the study, purpose of the study and the scope of the study.

1.1 Background

Essential to human life is water. Drinking water, in particular is of utmost significance for all living creatures including man. In 2013, the UN estimated that about 85% of the global population (6.74 billion people) had access to piped water supply through house connections[1]

Water supply networks are part of the master planning of communities, counties, and municipalities. Their planning and design require the expertise of city planners and engineers, who must consider many factors, such as location, current demand, future growth, leakage, pressure, pipe size, press

ure loss, firefighting flows, among others.

NWSC Tororo abstracts water from surface water source that is river Malaba. The water is then purified, disinfected through chlorination and sometimes fluoridated. Treated water is then pumped to a reservoir, which is elevated above ground. The water is then fed into the distribution systems by gravity.

Until 2015, NWSC Tororo area served only the towns of Malaba and Tororo Municipality. It then underwent an expansion to cover the areas of Nabuyoga, Pajwenda, Kisoko towns and other rural households in Tororo district and Buwesa and surrounding areas in Butaleja District. The expansion has also seen Busitema University and some other rural areas in Busia district being connected to the Tororo water supply system.

Amidst all this effort to improve on safe water coverage in these areas, some of the areas for example Nabuyoga, Pajwenda, Kisoko have faced persistent shortage of water supply even during seasons when there is sufficient water to supply all the customers.

Some of the key Strategic focus areas for the NWSC five-year direction (2016-2021) include water service reliability, increased water coverage, comprehensive asset management, non-revenue water reduction, sewerage services enhancement, ICT-

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