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**DEPARTMENT OF MINING AND WATER RESOURCES
ENGINEERING**

**REDESIGNING A SLUICE BOX TO IMPROVE ON GOLD
RECOVERY AT KAYONZA MINING AREA.**

By

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**A research project report presented in partial fulfillment of the requirements for the
award of the degree of Bachelors of Science in Mining Engineering of Busitema
University, MAY, 2017.**

DECLARATION

I TUGUME GODWIN hereby declare that this report is an outcome of my own participation and has not been presented for any award in any university, college or institution of learning .I undertake to be held responsible for any complaint from any reader of this report.

Signature.....

Date.....30th - 05 - 2017



APPROVAL

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DEDICATION

This report book is dedicated to all to those that have ever contributed to who, what, where I am today and those that helped me out produce this report book. I dedicate this final year project report to my parents; Mr. Byaruhanga Stanley and Mrs. Byaruhanga Jane Irene and, to all my brother and sisters for support and love.

ABSTRACT

Approximately 30 million people worldwide are employed directly and indirectly in small-scale mining operations. Artisanal mining extraction activity has existed in Uganda since the country's independence in 1962. Uganda is home to an estimated 93,000 artisanal miners (with a third of these engaged in gold mining). Gold is one of the expensive minerals mined in Uganda and is a major source of income for most of the people who live near the gold mines. In areas which contain gold deposits, most of the people in those areas are partly or fully involved in the mining of the gold on small scale basis. Now artisanal gold mining is spread across four of the sub counties of Mubende. The Rubaali artisanal mine is the largest location with huge mining camps and a high concentration of artisanal mining operations. Hard rock ore is found on the mountain and is collected in mining pits, which are on average 30 meter deep. The mountain hosts around 200 mining pits.

Mainly sluice boxes are used in the concentration of the gold before it is panned. The sluice boxes used recover around 60% instead of 90% recover. The sluice boxes used are constructed in three different ways, i.e. the zed (Z) sluice, the slash (V) and the viz (< or >) type (Basics in Minerals Processing, 2nd Edition, Metso Minerals publ, 2002).

However, due to the poor sluicing methods, gold recovery is always low and sometimes the costs incurred are always high thus need for the improvement of the gold recovery at Rubaali. This is due to the high velocity of flow of the water, the nature of the sisal mats used and the high inclination of the of the sluice boxes. The sluice boxes used at Rubaali recover around 50% instead of 90% recovery.

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1.0 INTRODUCTION

1.1 BACKGROUND.

Approximately 30 million people worldwide are employed directly and indirectly in small-scale mining operations. Artisanal mining extraction activity has existed in Uganda since the country's independence in 1962. Uganda is located in the Centre of Africa's Great Lakes Region, a region that has seen a gold rush during the last six years. The scale of the Uganda mining sector is minor compared to that of its neighbors. Uganda is home to an estimated 93,000 artisanal miners (with a third of these engaged in gold mining). Uganda's fiscal revenues from its mining sector are relatively limited compared to its total fiscal revenues.

(Dormer et al. 2012, Lahiri-Dutt 2003).

Artisanal and small-scale mining (A&SM) has become one of the developing world's most important activities, contributing significantly to local employment, foreign exchange earnings and national gross domestic product (GDP). A&SM refers to mining by individuals, groups, families or small cooperatives with minimal or no mechanization, often in the informal (illegal) sector of the market using only rudimentary mining and processing methods.

(Sousa et al. 2010, Hilson 2002b).

A&SM is therefore very labor-intensive and is conducted by manual operations based on picks, shovels and basins or by employing machinery in a small capacity. Artisanal and small-scale mining activities have dramatically increased in the recent years. As gold deposits are often located in the developing nations, gold mining serves as a major source of income for over 15 million people in impoverished regions throughout the world.

(Veiga et al., 2004)

Gold is one of the expensive minerals mined in Uganda and is a major source of income for most of the people who live near the gold mines. In areas which contain gold deposits, most of the people in those areas are partly or fully involved in the mining of the gold on small scale basis.

(Sousa et al. 2010; Buxton 2013)

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