

**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MINING ENGINEERING

PROJECT PROPOSAL REPORT

**INVESTIGATING THE EFFECTIVENESS OF BAMBOO BASED CYANIDE IN
GOLD LEACHING**

CASE STUDY: TIIRA GOLD FIELD

BY

TAMALE RONALD

BU/UP/2020/2538

SUPERVISORS

MR. EDSON NUWAREEBA

MR. BAGOOLE CHRISTOPHER

*A proposal research project report submitted to the Department of Mining Engineering in
partial fulfillment of the requirements for the award of a Bachelor of Science in mining
Engineering at Busitema University*

ABSTRACT

There are many different gold extraction techniques that have been employed worldwide but however they are effective to some degrees because of their operational difficulties, diverse effects on the environment and people, complicated industrial setup which calls for alternatives.

Bamboo's ability to produce cyanogenic glycosides can be used because gold cyanidation is straightforward and has a high gold dissolving efficiency.

Gold ore samples of low concentration obtained from Tiira gold field were used. The

Bamboo cyanide co

ncentration of 3091.88ppm, from the Bamboo type was also used in the study.

The laboratory tests showed that cyanide obtained from crushing 2kg of cassava, was able to leached 61.6% of gold at pH of 10-12, contact time of 24hours and at room temperature.

DECLARATION

I TAMALE RONALD hereby declare to the best of my knowledge that this is my true and original piece of work and has never been submitted to any university or institution of higher learning for any academic award.

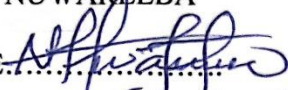
Signature:

Date: 21/09/2024

APPROVAL.

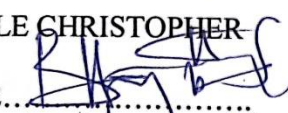
This report has been submitted to the faculty of Engineering and Technology with the approval of

MR. EDSON NUWAREEBA

SIGNATURE.....

DATE 24/9/24 .

MR.BAGOOLE CHRISTOPHER

SIGNATURE.....

DATE 24/9/24

DEDICATION

I dedicate this report to my Parents for the support which has indeed made me what I am today. Am very humbled and equally grateful for the Almighty God may he reward them abundantly

ACKNOWLEDGMENT

First and foremost, I thank the Almighty God for the gift of life, wisdom, knowledge, understanding, and good health.

I appreciate my Parents for the support given to me especially financially. May the Almighty God bless the work of their hands, I also thank my friends in the mining class for the prayers and encouragement, they are true friends to me. am grateful for Mr. Edson Nuwareeba, Mr. Bagoole Christopher and the department at large for the incredible help, knowledge, and encouragement they gave me throughout the accomplishment of this final project proposal report.

I congratulate and appreciate all my classmates for the mutual support I received from them during the final year project report compilation.

TABLE OF CONTENT

Contents

ABSTRACT ii

DECLARATION..... iii

APPROVAL. v

DEDICATION vi

ACKNOWLEDGMENT vii

LIST OF ABBREVIATIONS USED. xi

1 CHAPTER ONE:..... 1

1.1 INTRODUCTION 1

1.2 BACKGROUND OF THE STUDY 1

1.3	PROBLEM STATEMENT	4
1.4	OBJECTIVE OF THE STUDY	4
1.4.1	Main objective.....	4
1.4.2	Specific objective.....	5
1.5	THE SCOPE OF THE STUDY.....	5
1.5.1	Geographical scope;	5
1.5.2	Time scope;	5
1.5.3	Conceptual scope;	5
1.6	JUSTIFICATION OF THE STUDY.....	5
2	CHAPTER TWO: LITERATURE REVIEW	7
2.1	INTRODUCTION	7
2.2	THE STUDY AREA	7
2.3	CYANIDE	8
2.3.1	PRECAUTIONS TAKEN WHEN HANDLING CYANIDE.....	8
2.3.2	Chemical and physical properties.	9
2.3.3	Uses of Cyanide	11
2.4	TECHNIQUES OF GOLD RECOVERY FOR CYANIDE.	12
	Heap Leaching	12
2.5	Cyanogenic plants	12
2.5.1	Cyanogen in bamboo.....	13
2.6	THEORY OF LEACHING GOLD WITH BAMBOO EXTRACT	14
2.7	FACTORS AFFECTING CYANIDE CONTENT OF BAMBOO.....	14
2.8	MODE OF OPERATION OF THE AAS MACHINE	15
3	CHAPTER THREE: METHODOLOGY	17
3.1	Introduction.....	17
4	JUSTIFICATION.....	17
5	SCOPE OF THE STUDY	17
6	COST BENEFIT ANALYSIS.....	18
6.1	SPECIFIC OBJECTIVE ONE: TO CHARACTERIZE THE BAMBOO.2	20
	Characterizing bamboo shoots involves assessing various physical, chemical, and structural properties that may influence their suitability for use in gold leaching processes. Here are some methods and parameters you can consider for characterizing bamboo shoots:	20
1.	Physical Properties:	21
	Size and Morphology: Measure the length, diameter, and shape of the bamboo shoots using calipers or rulers. Note any variations in size among different shoots.....	21
2.	Chemical Composition:.....	21

• Moisture Content: Determine the moisture content of the bamboo shoots using a moisture analyzer or oven drying method. This is important for assessing their stability and potential for microbial degradation.	21
6.1.1 CYANIDE CONTENT IN THE BAMBOO SHOOT	21
Process Flow diagram	21
Measure the cyanide content of the bamboo shoots to enable continue to the next objective. This can be done through titration method.....	22
The chemical composition of the cyanide in the bamboo shoots was analysed	22
6.1.2 Cyanide Determination in the Bamboo shoots	22
3. Structural Properties:	25
4. Environmental Factors:	25
6.1.3 SPECIFIC OBJECTIVE TWO: TO EXTRACT CYANIDE FROM BAMBOO	25
6.1.4 Sample collection	27
6.1.5 Ore drying.....	27
6.1.6 Crushing and pulverizing	28
6.1.7 SAMPLE DIGESTION	28
6.1.8 Bottle roll leaching method.....	29
7 CHAPTER FOUR: RESULTS AND DISCUSSION.....	32
7.1 Specific objective ONE: TO CHARACTERIZE THE BAMBOO.....RESULTS	32
7.2 SPECIFIC OBJECTIVE TWO: EXTRACTION OF BAMBOO CYANIDE.	33
METHODOLOGY.....	33
7.3 CONCLUSION AND RECOMMENDATION.....	36
7.3.1 CONCLUSION	36
7.3.2 RECOMMENDATION.....	36
REFERENCES.....	38

LIST OF ABBREVIATIONS USED.

UNEP United Nations Environment

ent Program

ASGM Artisanal and small-scale gold miners

Hg mercury

EPA Environmental protection Agency

g/t grams per tone

ppm parts per million

CNcyanide

REFERENCES

www.reference.com/world-view/bamboo-poisonous-humans-8f5e65ec199f96b6

www.reference.com/science-technology/animals-eat-bamboo-762dbaea5c1badc7

https://www.cnlitereagent.com/gold_leaching/cyanide

(Seccatore et al. 2014),

(Achparaki et al., 2012).

(Omara, . (2019).)

(Pattarathitiwat, (2021).)

(Ding, (2018).)

(Sarangthem, (2010).)

(Achparaki et al., 2002)

(Atulegwu Patrick & Egwuonwn, 2011).

(Dufour, 1988)

(Torkaman et al., 2021)

(Yard et al., 2012)

(Sang-A-Gad, 2018)