FEASIBILITY STUDY

FOR

MS. UHUSIANO MINING GROUP LIMITED

MINERAL PROCESSING PROJECT

PREPARED BY

MS. UHUSIANO MINING GROUP LIMITED

MWANZA

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1.0 INTRODUCTION

1.1 Foreword

The Tanzania Government is emphasing p on its long – term industrial plan of strengthening the metal and engineering sub- sector in the country.

The private sector has also been paying a vital role in the development of this basic industry, mainly by establishing service- oriented engineering workshops which provide maintenance and repair services.

The National demand was established to be more than 400,000 tons per annum .Indications that the demand is increasing fast and is now closed to 700,000 tons per annum

One of the basic necessities for the establishment of this basic industry is the availability of an adequate local market for its output. It is rational for local Governments, therefore , to encourage and promote the growth of the local engineering sub- sector which will ultimately consume the local based copper & iron and steel industry's output. A recently established local firm, **MS. UHUSIANO MINING GROUP LIMITED** has realized the potential this country has in terms of steel scrap, Copper and steel products markets. It is now contemplating putting up a complex that will refine steel and copper to produce various types of goods.

1.2 Objective of Study

The purpose of this feasibility study is to work out the technical and commercial details and financial viability for the establishment of Melting / refinery facilities for Gold, Copper and metal products for various and users such as civil work construction and engineering works.

1.3 Project Promoters

The proposed copper and steel mill is being promoted by a locally registered company namely **MS. UHUSIANO MINING GROUP LIMITED** of P.O Box 34674, Dar es Salaam

Name of Director	Percentage Share	Nationality
CATHEDRAL ROCK PARTERNS P.O. BOX 34674 DAR ES SALAAM	65	SOUTH AFRICA
UHUSIANO INTERNATIONAL ICT LIMITED P.O. BOX 34674 DAR ES SALAAM	35	TANZANIA

2.0 EXECUTIVE SUMMARY

2.1 Introduction

This study examines the possibility for the establishing a Mineral processing facilities, such as Gold, Copper and metal to produce copper bars and Various metal products by using induction furnace and hot rolling technologies and locally available metal products and imported copper from Zambia . A techno- economic evaluation has been carried out to determine the viability of the project idea.

2.2 Market and Marketing Aspect

The market survey carried out revels that he demand for steel and copper products raising rapidly.

The survey concludes that the proposed production of about 4,800 tons of Metal copper products per annum will not face any market problems.

2.3 Process and Technology

There are various methods for Smelting/ Refining Gold, Copper and metal. The most widely used method is the basic process. The method for iron smelting is of two type's .This includes the converted and the heath methods. The electric methods fall under the heath method and employ electricity as the energy for melting the inputs.

Two methods are used, namely the arc furnace and induction furnace. The former uses electrodes for current circulation while the latter used frequency. The proposed project will employ the induction method, a method which is more economical for high quality steel.

The process involved sorting out the crucible of the furnace, heating and melting it and finally pouring the liquid steel into moulds where they solidify. Thereafter the ingots are reheated to even internal temperatures and then hot- rolled .The requisite machinery for the production include a 4 tone charge induction furnace, a reheating furnace and steel re-rolling induction accessories such as pouring and moulding equipment.

2.4 Production Inputs

The most critical inputs in to the plant are metal and copper, electric power in the magnitude of 2000 KVA will be required and this amount will be required and this amount will be supplied by Tanzania Electric Supply Company Limited

A considerable amount of water will be required for cooling .However, it will be recycles. Other production inputs include fuel oil, alloying elements, graphite powder and limestone.

2.5 Location

The plant will be located at Melela Mlandizi, Mvomero District - Morogoro

2.6 Manpower Requirements

The plant Management will comprise 3 people out of a total workforce of 142 people. There will be 81 operators, 4 expatriates and the rest in direct workforce. The plant will operate on a3- shift per day basis. The plant will be organized into three departments, namely production, , finance and Administration and technical services(repair , maintenance and quality control).

2.7 Implementation

The Major activities include registration and approval by the Tanzania Investment Centre and mobilization of funds from sponsors and banking instutions. Civil works design, tendering and construction will be carried out immediately after project is approved and would take about six months.

Machinery will be ordered after funds are committed. These will be fabricated shipped for activities related to machinery up to their receipt at site .

Training machinery installation and commissioning will be undertaken within another two months.

Activities related to civil works and machinery will take place simultaneously.

2.8 Project Economics

2.8.1 Capital Investment Requirements

DESCRIPTION	TOTAL
Land and Building	800,000
Plant & Machinery	1,100,000
Furniture & Fitting	90,000
Vehicle	600,000
Pre- Operational Expenses	40,000
Working Capital	400,000
TOTAL INVESTMENT	**3,030,000**

2.8.2 Financing Scheme

i) Fixed Assets and Pre- Operational Costs

	US$
Equity	3,030,000
Total	3,030,000

2.9 Recommendations

The study shows that steel & copper production is both technically and financially feasible. Furthermore, it will cut down on imports of this important product. In view of the findings the project is recommended for implementation

3.0 MARKET AND MARKETING

3.1 Product

The product which this steel and copper plant is going to produce for sale is various Gold, Copper and metal products.

3.2 Demand

Demand for the proposed product has been derived on the basis of the end use method. The products are used in various ways from buildings and other civil work constructions, in manufacturing of security grills and fences and as raw materials for manufacture of industrial products and machinery parts to industries.

Copper also is one of the basic chemical elements. In its nearly pure state, copper is a reddish- orange metal known for its high thermal and electrical conductivity. It is commonly used to produce a wide variety of products, including electrical wire, cooking pots and pans, pipes and tubes, automobile radiators and many others .Copper is also as a pigment and preservative for paper, paints, textiles and wood. It is combined with zinc to produce brass and with tin to produce bronze.

There is high demand for steel & copper products as Raw materials for manufacture of Industrial products and machinery parts. The demand for these products as raw material for the manufacture of industrial products and machinery parts, analysis has revealed there is an increase which is caused by shortage of raw materials, old machineries and import of manufactured goods.

Given the current improvements in the national economy, it is expected that the average capacity utilization of the past 5 years to at least 70%. It is also expected that the average growth rate of usage of steel bars as raw materials will equal to the growth rate of GDP for the industrial sector, currently at 3.4 %.

3.3 Supply

There exist numerous factors which supply metal and copper products. The quantity has been declining over the years. The declining trend is as a result of increasing number of steel companies being opened in the country.

Distribution Channels

Steel & Copper products are heavy and bulky products. Hence they can be easily distributed to find consumers either directly (one level channel) to final consumers or by using only one intermediary who will resale to final consumers (two level channel)

3.4 Promotion

Experience of selling this product prescribes that they can be easily sold through personal selling (personal solicitations of orders) to potential big customers and advertisement with emphasis on product availability quality and persuasion.

4.0 PRODUCTION PROCESS AND TECHNOLOGY

4.1 Production Processes for Steel

On the basis of steel refining steel making processes fall into two chemical divisions namely:

- Acidic process
- Basic process

The terms acid and basic refer to the furnace linings and the nature of the slag formed. The bulk of steel production today is in basic processes. This is because of the quality of iron ore mostly used.

Modern steel making processes are divided into two groups as follows:-

a) Converter Method

In this method air or oxygen is blown from the top or bottom of a converter through molten iron oxidizing the impurities. Air blown processes include the Bessemer's method (acidic) in which the melting vessel is fined with silica and basic Bessemer (Thomas method) where a converter acts as a basic lining

Oxygen blown process is divided into top blown which is good for phosphorus poor and which oxygen is injected through nozzles set in the converter bottom. There are a methods differing in the way oxygen is fed. The converter method is best used for refining and alloying of steel.

b) Hearth Process

In the health process iron is melted and refined into steel in the same vessel .The process included open heart, electric air furnace, and plasma and induction methods .In the heath process the source of melting energy can be electricity.(e.g in electric are furnace induction furnace ad plasma method) gas or oil (e.g in open hearth furnace) and the input raw material ranges from liquid metal to solid metal e.g scrap.

When special technological properties and / or clean steel are required, other methods or secondary metallurgy are employed i.e treatment of steel ousted the melting vessel- ladle metallurgy.

c) Induction Furnace and Hot Rolling

The induction furnace steel making and hot rolling processes are the technologies desired by the project promoters. The details or the said processes are as under.

The induction furnace steel- making process is most suitable and economical for production of steel castings and high quality steel grades.

This is because in this furnace the durability of based refractories is quite low and meets more frequent relatively small furnaces and the largest is about 10 tons of liquid steel per heat. Other steel production technologies are advisable when producing large steel quantities and low quality steel.

In the frequency induction furnace the heat for melting and superheating the scrap in the furnace crucible is generated in the charge itself by eddy currents induced by the magnetic field set up by an alternating current, i.e the charge acts as the secondary circuit and copper coils at the primary winding circuit. Due to its oscillating nature nature the current changes polarity many times per second thus melting the change very rapidly.

Induction furnaces use mainly steel scrap as raw material and electricity as a source of melting energy. Availability of adequate quantities when planning for this technology. Noteworthy is that scrap prices change in accordance with supply and demand therefore the economics of this type of steel- making depends primarily on scrap availability.

d) Scrap Processing

Scrap can be from machining works e.g chips, trimmings,. Forging and stamping wastes, worn out machines, rolling stock, vehicle, rails, domestic appliances etc.

In view of the different sources, scrap can be of varying composition and does not have uniform composition.

Scrap is contaminated with sulpture – containing lubricating oils, chips etc, and non- ferrous metals (lead aluminum, tin, copper, zinc, etc) These metals are harmful to the working personnel, steel making equipment and steel quality.

Scrap processing is normally associated with the following activities and facilities:-

- Sorting the scrap for unwanted materials
- Large size scrap are broken into pieces with hammers or hydraulic press or cut into smaller pieces using oxygen/ acetylene flame.
- Steel chips or light scrap are crushed and presses into bales
- Special furnaces are employed for scrap burning (to burn off wood, plastics, oils etc)

i. Scrap Melting and steel Refining and Alloying

The sorted steel scrap will be put into baskets and fed into the crucible of the furnace where it is melted by induction method as described above.

Some additives which regulate the composition of the steel are also added into the crucible.

e) Ingot Casting

After the steel copper scrap in the furnace has melted down the furnace will be titled and the melted surface charges will pour through the launder into a teeming ladle placed below it.

The liquid metal in the ladle is then poured (cast) into a number of specially prepared smaller containers (ingor moulds) Thereafter the melt is allowed to solidify.

It is advisable to retain 10% of liquid steel in the furnace to facilitate the melting of fresh scrap.

f) Re- Heating the Ingots

After the ingots have solidifies, it may be worked immediately. However the ingots tend to be somewhat cooler on their outside than their centres. Therefore before they are rolled they will be put into a reheating furnace in which the sectional temperatures of the ingots are equalized

.Uniform temperature is important before rolling, otherwise it results into rolled products with cracks and fissures.

Recommended rolling temperatures for mild steel is around 1100C.

The recommended technology offers a considerable saving in energy because ingots from the steel mill will be sent for re- rolling almost immediately. Only slight reheating will therefore be required.

g) Steel Hot- Rolling Process

The hot steel ingots are then fed into the rolling mills.

Rolling is the process of passing a heated ingot between the rolls revolving at the same peripheral speed and in opposite directions.

As the roll grip the work piece, they apply forging and kneading pressure the effect being that of increasing the work piece length appreciably and the width slightly.

Thereafter the rolled bars are left to cool and sold as final product.

4.2 PRODUCTION PROCESS FOR COPPER

Copper is one of the basic chemical elements. In its nearly pure state, copper, is a reddish orange metal known for its high thermal and electrical conductivity. It is commonly used to produce a wide variety of products, including electrical wire, cooking pots and pans, pipes and tubes, automobile radiators and many others. Copper is also used as a pigment and preservative for paper, paint, textiles and wood. It is combined with zinc to produce brass and with tin to produce bronze.

4.2.1 Raw Materials

Pure copper is rarely found in nature, but is usually combined with other chemicals in the form of copper ores. There are about

15 copper ores mined commercially in 40 countries around the world. The most common are known as sulfide ores in which the copper is chemically bonded with sulfur. Others are known as oxide ores, carbonate areas or mixed ores depending on the chemicals present .Many copper ores also contain significant quantities of commercially useless material ..The most common sulfide ore chalcopyrite , Cu, S, is another sulfide ore, Cuprite or red copper ore, Cu, O,is an oxide are Malachite or green copper ore , Cu(OH)2 CUCO 3 , is an important carbonate ore , as is azurite or blue copper carbonate, Cu (OH), 2CUCO 3.Other ores include tennantite boronite , chrysocolla, and atacamite .In addition to the ores themselves, several other chemicals are often used to process and refine copper. These include sulfuric acid, oxygen , iron, silica and carious organic compounds , depending on the process used.

4.3.2 THE MANUFACTURING PROCESS

Process

The process of extracting copper from copper ore varies according to the type of ore and the desired purity of the final product .Each process consists of several steps in which unwanted materials are physically or chemically removed, and the concentration of copper is progressively increased. Some of these steps are conducted at the mine site itself, while others may be conducted at separate facilities

Here are the steps used to process the sulfide ores commonly found in the western United States.

(a) Mining

Most sulphide ores are taken from huge open pit mines by drilling and blasting with explosives. In this type of mining , the material located above the ore, called the overburden, is first removed to expose the buried ore deposit . This produces an open pit that may grow to be a mile or more across. A road to allow access for equipment spirals down the interior slopes of the pit.

1) The exposed ore is scooped up by large power shovels capable of loaf\ding 500- 900 cubic feet (15-25 cubic meters) in a single bite . The ore is loaded into giant dump trucks, called haul trucks, and is transported up and out of the pit.

(b) Concentrating

The copper ore usually contains a large amount of dirt, clay, and a variety of no- copper bearing minerals. The first step is to remove some of this waste material. This process is called concentrating and is usually done by the flotation method.

1) The ore is crushed in a series of cone crushers. A cone crusher consists of an interior grinding con that rotates on an recent vertical axis, inside a fixed outer cone. As the ore is fed into the top of the crusher, it is squeezed between the two cones and broken into smaller pieces.

2) The crushed ore is then ground even smaller by a series of mills. First it is mixed with water and placed in a rod mill, which consist of a large cylindrical container filled with humorous short lengths of steel rod. As the cylinder rotates on its horizontal axis, the steel rods tumble and break up the ore into pieces about 0.13 in (3 mm) in diameter .The mixture of ore and water is further broken up in two ball mills, which are like a rod mill except steel balls are used instead of rods. The slurry of finely ground ore that emerges from the final ball mill contains particulars about 0.01 in(0.25 mm) in diameter.

3) The slurry is mixed with various chemical reagents, which coat the copper particles. A liquids, called a frothier, is also added. Pine oil or long- chain alcohol are often used as frothers.This mixture is pumped into rectangular tanks, called floatation

cells, where air is injected into the slurry through the bottom of the tanks.The chemical reagents make the copper particles cling to the bubbles as they rise to the surface. The frothier forms a thick layer of bubbles are allowed to condense and the water is drained off. The resulting mixture, called a copper concentrate, contains about25 - 35% copper along with various sulphides of copper and iron, plus smaller concentrations of gold, silver and other material ..The remaining materials in the tank are called the gangue or tailings. They are pumped into setting ponds and allowed to dry.

4) The process of extracting copper from copper ore varies according to the type of ore and the desired purity of the final product. Each process consists of severally removed, and the concentration of copper is progressively increased.

c) Smelting

Once the waste material have been physically removed from the ore, the remaining copper concentrate must undergo several chemical reactions to remove the iron and sulfur.This process is called smelting and traditionally involves two furnaces as described below .Some modern plants utilize a single furnace, which combined both operations.

1) The copper concentrate is fed into a furnace along with a silica material called a flux. Most copper smelters utilize oxygen Enriched air is forced into the furnace to combust with fuel oil.The copper concentrate and flux melt, and collect in the bottom of the furnace .Much of the iron in the concentrate chemically combines with the flux to form a slag , which sculpture in the concentrate combines with the oxygen to form sulphur dioxide which is exhausted from the furnace as a gas and is further treated in an acid plant to produce sulphuric acid.The remaining molten mixture in the bottom of the furnace is called the matte. It is a mixture of copper sulphidea and iron sulphides and contains about 60% copper by weight.

2) The molten matter is drawn from the furnace and poured into a second furnace called a converter .Additional silica flux is added and oxygen is blown through the molten material .The chemical reactions in the converter are similar to those in the flash furnace. The silica flux reacts with the remaining sulphur to form sulphur dioxide. The slag may be fed back into the flash furnace to act as a flux , and the sulphur dioxide is processed through the acid plant .After the slag is removed , a final injection of oxygen removes all but a trace of sulphur .The resulting molten material is called the blister and contains about 99% copper by weight.

d) Refining

Even though copper blisher is 99% pure copper, it still contains High enough levels of sulfur, oxygen and other impurities to hamper further refining. To remove or adjust the levels of these materials, the blister copper is first fire refined before .It is sent to the final electro refining process.

1) The blister copper is heated in a refining furnace, which is similar to a converted described above. Air is blown into the molten blister to oxidize some impurities. A sodium carbonate flux may be added to remove traces of arsenic and antimony. A sample of the molten material is drawn and an experienced operator determines when the impurities have reached an acceptable level. The molten copper, which is about 99.5% pure. Is then poured into moulds to form large electrical anodes, which act as the positive terminals for the electro refining process.
2) Each copper anode is placed in an individual tank, or cell, made of polymer- concrete. There may be as many as 1,250 tanks in operation at one time. A sheet of copper is placed on the opposite end of the tank to act as the cathode, or negative terminal. The tanks are filled with an acidic copper

sulphate solution, which acts as an electrical conductor between the anode and cathode.

When an electrical current is passed through each tank, the copper is stripped off the anode and is deposited on the cathode. Most of the remaining impurities fall out of the copper sulphate solution and form a slime at the bottom of the tank. After about 9-15 days, the current is turned off and the cathodes are removed. The cathodes now weigh about 300 ib(136 kg) and are 99.95-95 % pure copper

3) The slime that collects at the bottom of the tank contains gold, silver, selenium and tellurium. It is collected and processed to recover these precious metals.

e) Casting

1) After refining, the copper cathodes are melted and cast into ingots, cakes, billet or rods depending on the final application. Ingots are rectangular or trapezoidal bricks, which are re-melted along with other metals to make brass and bronze products. Cakes are rectangular slabs about 8 in (20 cm)thick and up to 28 ft(8.5m) long.They are rolled to make copper plate, strip, sheet and foil products. Billets are cylindrical logs about 8 in (20cm) in diameter and several feet (meters) long. They are extructedor drawn to make copper tubing and pipe. Rods have around cross –section about 0.5 in (1.3 cm) in diameter. They are usually cast into very long lengths, which are coiled.This coiled material is then drawn down further to make copper wire.

e) Quality Control

Because electrical applications require a very low level of impurities, copper is one of the few common metals that are refined to almost 100% purity. The ensure this purity, samples are analyzed at various steps to determine whether any adjustment to the process is required.

4.3.2 PRODUCTS/ WASTE

The recovery of sulfuric acid from the copper smelting process Only provides a profitable byproduct, but also significantly reduces the air pollution caused by the furnace exhaust, Gold, silver and other precious metals are also important byproducts. Waste products include the overburden from the mining operation, the tailing from the concentrating operation, and the slag from the smelting operation. This waste may contain significant concentrations of arsenic, lead, and other chemicals, which pose a potential health hazard to the surrounding are

The Future

Demand for copper is expected to remain high, especially in the electrical and electronics industries. The current trends in copper processing are towards methods and equipment that use less energy and produce less air pollution and solid waste.

One encouraging trend is the increased use of recycled copper, Currently over half the copper being produced in the world comes from copper machining operations, such as screw forming and 45% comes from the recovery of used copper products, such as electrical wire.

4.4 Power Utilization

In the operation of electrical facilities, the most favorable installation for power costs is attained at preferably high utilization with preferably low power peak. This is achieved in modern medium- frequency melting by provision of constant power supply in the converters and through selective switching of power feed units.

4.5 Environment Protection

During the process of melting steel scrap there will the emission of dust and gaseous furnes.Furnes especially are toxic and of complex composition. The most common are sulphur and nitrogen oxides (S0x, NOX) In the developed world where there are many steel works this is of concern, Therefore, it is recommended to arrest this problem right from the beginning in countries entering the steel industry. In the recommended technology i.e induction furnace, the amount of hazardous gases emitted will be very small especially because only cleaned raw materials will be used. There is therefore no environment hazardous waste expected from this project

5.0 Plant Location and Civil Works

The plant will be located in Tanzania. Production Building Required which is an open shed roofed with GCI sheets, and constructed from reinforces concrete slab in site is ideal for both the furnace and rolling mill facilities.The scrap and finished products would both be stored in the open

6.0 Utility Services

a) Water

The site has already been supplied with water. A 3 inch diameter pipeline connects the plot to the main pipeline.The plant water requirement is basically for cooling purposes and water will be recycled. About 10,000 litres of water will be required per day. Therefore a water reservoir of capacity 30,000 litres is recommended to be constructed.

b) Electricity

The site will tap its power from substation nearby. A number of machines will be premedical operated .There will therefore be a need to have a central compressor station which will generate the compressed air requirements .A central compressor station will be provided to provide compressed air for some of the production units.

As said elsewhere in this report, the source of energy for meeting the scrap will be electric power. Power is consumed in very large quantities and it is among the biggest cost element in this type of steel production. The demand for this plan is estimated at around 2000Kva

c) Material Handling Equipment

The plant will require the services of an overhead crane which will be employed for lifting the scrap containers for feeding the furnace as well as move the ladles with liquid steel into the casting area.

d) Weighing Scales

A road vehicle weigh bridge and a portable dial platform scale will be required at the plant site for weighing incoming trucks with scrap and weighing the production inputs during production

e) Oxygen and Acetylene Gas Cutting Equipment

Several gases cutting equipment of the type mentioned above and their corresponding cutting torches will also be required for the steel mill.

f) Workshop Facility

In order to enable the company to handle small repairs to its aassets we recommend the acquisition of a minimum number of metal working machines such as one lathe, a milling/drilling machine power hacksaw and tool kits.

7.0 MANPOWER AND ORGANISATION

The proposed Gold, Copper and metal plant complex will have three Independent departments, namely administration and finance production and technical staff.

Organisation

The top people in the day- to day running of the company will be General Manager .Under the General Manager's office will e three department, namely finance/ administration production and technical services. Each department will be under a Manager and will comprise a number of sections each headed by section head such as Finance/ Personnel Department Production Department.

Each section will be manned by a number of personnel with varying education levels and work experiences. The management team will comprise the General Manager, Chief Accountant and the four expatriates who will head the different production and service department.

He will also be responsible for repair and maintenance for company assets and research and development activities.

The technical department will comprise three sections, namely:

a) The repair and maintenance section which would be responsible for all repair works. An expatriate will be employed to train the local technician in the machinery repair works.
b) Laboratory section which will be responsible for quality control of both the raw materials and finished goods.
c) Research and development section.

7.1Production Department

The production department will comprise two sections, namely steel mill and rolling mill.

Finance and Administration Department

An Administration and Finance Manager will head the department. He will be responsible for the administration of the company as well as overseeing the financial aspect of the company

7.2 Manpower Requirement

The manpower requirement for running the proposed steel and rolling mill is 142 people .The administration staff will work on one shift per Day. The production and technical departments will work on 3 shifts per Day basis.

8.0 INVESTMENT AND FINANCING

8.1 Assumptions

The financial projections to determine the viability of the Copper and metal Project is based on the following key assumptions:

- The project will operate at 50% capacity in year 1 , 60% in year 2, 70% in year 4 and thereafter
- Plant will operate on three shifts per day for 250 days per year.
- The whole project output will be sold locally

8.2 Summary of Capital Costs

The total initial investment required for undertaking the project is estimated at US$ 3.03 million. Spread over a year as shown. The breakdown of the capital investments is presented in table below:

DESCRIPTION	**Total**
Land and Building	800,000
Plant & Machinery	1,200,000
Furniture & Fitting	90,000
Vehicle	600,000
Pre- Operational Expenses	40,000
Working Capital	400,000
TOTAL INVESTMENT	**3,030,000**

8.3 Building and Civil Works Costs

The premises will be renovated e for constructions for plant installation only. These are Estimated and given under cost of machinery

8.4 Plant Machinery and Equipment Costs

The main machinery for the envisaged project will be electric furnace, steaming ladles and moulds reheating various tools, accessories etc.

8.5 Furniture and Fittings

The items to be purchased will comprise office furniture and computers for office and factory.

8.6 Vehicles

A 15 toner truck and a 5 toner truck that will be used for transportation of raw Materials and finished products and other office activities are recommended. A Bus of 45 seats will be provided for workers' transport and two saloon cars for the top management

8.7 Pre- Production Capital Expenditures

These include project development cost for feasibility study and start-expenses

Including interest on loan taken for capital investment in the pre-production Period

8.8 Initial Working Capital

Initial Working capital requirements for the proposed steel mill project works Out at about US$0,20 Million

8.9 COST OF OPERATION

The anticipated costs for operating the project are detailed in the following Sections the capacity utilization has been assumed to grow at a rate of 50% in year 1, 60% in year 2, 70% in year 3 while stabilized production is envisaged From the fourth year at 80% of rated capacity. 80% will be the sustainable Production level.

8.10 Repair and Maintenance

Annual repairs and maintenance of the machinery and equipment have been Worked out to cover all costs including spare parts.

8.11 Vehicle Running Expenses

Vehicle running expenses include fuel, lubricants, tear and wear, road licence Insurance etc, This cost item has been estimated at 35% of the original cost of the vehicle annually

8.12 Salaries and Wages

The total wage package is estimated at US$ 0,070 million for the first two years

8.13 Administrative Overheads.

The main item in the administrative cost is insurance of fixed assets. The administrative costs are estimated at US$0,010 million/ annum

Dividends for the first 5 years during which are company will have to meet other

Commitments like loan repayment, costs for technology training etc.

9.0 FINANCIAL ANALYSIS

9.1 Income and Expenditure

9.1.1 Income

The proposed steel and copper mill project expects to earn its income through the sale of reinforcement copper and steel products mainly at sustainable level of production, the total sales are expected to stand at US$ 1,632 million from the Fourth year of production onwards by selling a total of 4800t of final products.

9.1.2 Cash Flow Statement

The project's cash flow is impressive as the need for external assistance arises Only in the initial stages of the project investment.

10.0 Economic Benefits

The successful operation of this processing plant will contribute significant Economic benefit to Kilimanjaro region people and Tanzania as whole . In summary the benefits which will be realized are as follows:

- The execution of this project will bring about employment opportunities
- Provision of income to other services providers, thus contributing to the reduction of poverty. The income to be earned will help in improving standard of living of the workers and other people residing in the region

- The direct income for the workers combined with help in overall efforts of alleviation of poverty in the Region
- This project will facilitate opportunities to increase foreign exchange earnings through export of some of its value products
- Project will create Government Revenue through Taxation

11.0 Conclusion

The investment and development of these products processing undertaking is in Line with the Government objective of encouraging proper development of Industries in the country. It will have a positive impact on the development of the region as, it would Generate a number of benefits and more positive impact on the economy of the region

This document has provided a full analysis on the financial , Techno-economic viability and have established that the proposed project is technically sound financially viable , and economically/ socially beneficial.

MS. UHUSIANO MINING GROUP LIMITED

INVESTMENT COST

DESCRIPTION	TOTAL
Land and Building	800,000
Plant & Machinery	1,100,000
Furniture & Fitting	90,000
Vehicle	600,000
Pre- Operational Expenses	40,000
Working Capital	400,000
TOTAL INVESTMENT	**3,030,000**

MS. UHUSIANO MINING GROUP LIMITED

PROJECT FINANCING

US$

DESCRIPTION	FOREIGN	TOTAL
Equity	3,030,000	3,030,000
TOTAL INVESTMENT	**3,030,000**	**3,030,000**

MS. UHUSIANO MINING GROUP LIMITED

DEPRECIATION SCHEDULE

			Rate		1	2	3	4	5	6	7	8	10-Sep
Land & Building			4%	900,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000
Plant & Machinery			12.50%	1,200,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Furniture & Fitting			12.50%	90,000	11,250	11,250	11,250	11,250	11,250	11,250	11,250	11,250	11,250
Vehicles			25%	800,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Pre Operational Expenses			20%	40,000	8,000	8,000	8,000	8,000	8,000	8,000	-		
TOTAL					**405,250**	**405,250**	**405,250**	**405,250**	**405,250**	**405,250**	**397,250**	**397,250**	**397,250**

MS. UHUSIANO MINING GROUP LIMITED

PROFIT & LOSS FORCAST

		1	2	3	4	5	6	7	8	9	
		60%	80%	90%							
PNOVER		979000	1,305,600	1632000	1632000	1632000	1632000	1632000	1632000	1632000	1632000
Sale of Steel &											
Copper Products											
		979000	1,305,600	1632000	1632000	1632000	1632000	1632000	1632000	1632000	1632000
RECT COSTS		242000	322000	403000	403000	403000	403000	403000	403000	403000	403000
Total Direct Cost		242000	322000	363000	403000	403000	403000	403000	403000	403000	403000
LOSS PROFIT		737000	939600	1229000	1229000	1229000	1229000	1229000	1229000	1229000	1229000
OTHER COSTS		200750	200750	200750	200750	200750	200750	196750	196750	196750	200750
Depreciation											
Profit before tax		536250	738850	1,028,250	1,028,250	1,028,250	1,028,250	1,032,250	1,032,250	1,032,250	1,032,250
ERATING PROFIT		536250	738850	1,028,250	1,028,250	1,028,250	1,028,250	1,032,250	1,032,250	1,032,250	1,032,250
Taxation 30%		160875	221655	308475	308475	308475	308475	309675	309675	309675	309675
GROSS PROFIT		375375	517195	719775	719775	719775	719775	722575	722575	722575	722575
MULATIVE		375375	892570	1,612,345	2,332,120	3,051,895	3,771,670	4,494,245	5,939,395	5,939,395	6,661,970

MS. UHUSIANO MINING GROUP LIMITED

PROJECTED CASH FLOW

		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
Source											
Profit before			737000	939600	1229000	1229000	1229000	1229000	1229000	1229000	1229000
interest and											
Depreciation											
Equity		**3,030,000**									
Total Sources		**3,030,000**	737000	939600	1229000	1229000	1229000	1229000	1229000	1229000	1229000
Dulpications		**3,030,000**									
Capital Expenditure		**3,030,000**									
Tax		**3,030,000**	536250	738850	1,028,250	1,028,250	1,028,250	1,028,250	1,032,250	1,032,250	1,032,250
Sub Total		**3,030,000**	536250	738850	1,028,250	1,028,250	1,028,250	1,028,250	1,032,250	1,032,250	1,032,250
Capita Duplications		**3,030,000**	536250	738850	1,028,250	1,028,250	1,028,250	1,028,250	1,032,250	1,032,250	1,032,250
Net working capital			200750	200750	200,750	200,750	200,750	200,750	196,750	196,750	196,750
Acumulated Cash			200758	401500	602,250	803,000	1,003,750	1,204,500	1,401,250	1,598,000	1,794,750