

TANZANIA CARBONATE LIMITED

FEASIBILITY STUDY

FOR THE ESTABLISHMENT

OF

MANUFACTURING FACILITIES

FOR

**SUPERFINE CALCIUM CARBONATE, DOLOMITE POWDER
AND RELATED PRODUCTS**

**Prepared by
Tanzania Carbonate Limited
P.O.BOX 100049
Dar-ES-salaam**

1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION

This business plan represents management’s best decision to establish a manufacturing facility for the production of superfine calcium carbonate and dolomite powder and related products by making the chemical and physical treatments to be used as raw materials in various industries such as paints, plastic, and soaps. The rate of consumption of superfine calcium carbonate and dolomite powder Products in manufacturing depends on the number of factories that manufacture soaps, plastics paints, etc. Calcium Carbonate and Dolomite are white marble stones that are available in Tanga, Chalinze, Tanzania.

1.2 THE COMPANY

The sponsor of the project is M/S Tanzania Carbonate Limited of P.O. Box 100049 having the certificate of incorporation no 178665073 dated 9th /10/2024. M/S Tanzania Carbonate Limited is owned by Sudanese and Jordanians. It is primarily a family business with the following shareholders.

DIRECTOR/SHAREHOLDER	NO OF SHARES	%
MAZEN MOHAMED ABDELQADER ABUHIJLEH	150	15
HATEM BASSAM MOHAMMAD ABUHEJLEH	250	25
AMER BASSAM MOHAMMED ABU HIJLEH	250	25
MOHAMMAD B M ABU HAJLEH	250	25
MEDHAT TAGI GAIED SABBA	50	5
MEINA TAGI GAIED SABA	50	5

The shareholders have extensive and long-term exposure to the manufacturing sector through their involvement in various manufacturing activities.

1.3 Company Vision

The project promoters wish to see Tanzania Carbonate Limited as the leading producer of super fine Calcium Carbonate and Dolomite and related products to be used as raw materials in various industries such as paints, plastic, and soaps, cement& papers. The customers should associate the company's name with high-quality products manufactured to international standards in a modern environment. This includes positioning Tanzania Carbonate Limited clearly with the competitors and placing the company as a leading manufacturer of Calcium carbonate and Dolomite Powder in areas of production technology, quality control, safety, and working environment.

1.4 The Project

Tanzania Carbonate Limited intends to invest **USD 10 Million** to install facilities for the manufacturing of calcium carbonate and dolomite powder to be used as raw materials in various industries such as paints, plastic, steel, and soaps. The capacity will be **300,000 tons** of Superfine Calcium Carbonate and Dolomite powders per annum. The project will use the latest technology manufacturing process for producing products in large volumes.

1.5 THE MARKET

Superfine Calcium Carbonate and Dolomite powders are very important in the manufacturing of various industrial products such as follows.

i)Plastics, Paints, and Coatings

Calcium carbonate is an extremely common material found in the production of plastics, paints, and other special coatings. Calcium

carbonate is used in the paint industry both as a filler and as a coating which allows for different paints.

ii) Paper Industry

Calcium carbonate is a very vital material for the paper industry.

precipitated calcium carbonate is used in the paper industry both as a filler and as a coating. As pure white paper is more difficult to achieve, the value that is added with the help of calcium carbonate is truly significant.

ii) Medical Industry

Calcium carbonate is used in the medical industry in many different ways.

Common uses for calcium carbonate in the medical industry include effective dietary calcium supplements, antacids, phosphate binders, or base material for medicinal tablets. Typically, in the medical field, precipitated (synthetic) calcium carbonate is used.

iii) Food Industry

Calcium carbonate can be found on many grocery store shelves in a variety of products. Calcium carbonate can be found in products such as baking powder, toothpaste, dry-mix dessert mixes, dough, and even wine. Another important use for calcium carbonate in the food industry is agricultural lime. It is the active ingredient in agricultural lime and is many times used in animal and livestock food.

iv) Building Products Industry

One of the most critical uses for calcium carbonate is in the construction industry. Calcium carbonate can be used as a building material on its own,

like a marble countertop for example. But calcium carbonate is also an important ingredient that can be found in cement. Calcium carbonate is a versatile industrial mineral commodity and is used in the manufacturing of mortar which is used when bonding bricks, concrete blocks, stones, roofing shingles, rubber compounds, and tiles to other surfaces.

V) Environmental Industry

Calcium carbonate has antacid properties, and because of this, calcium carbonate is also used in different industrial settings to neutralize acidic conditions that are commonly found in both soil and water.

1.6 LOCATIONS AND SITE

The manufacturing plant will be located in **Plot No. 18-19 Misugusugu Kibaha– Coast Region.**

1.7 MANPOWER

Estimated manpower according to the proposed level set up has been estimated at **83 people**. This again has been derived taking into account the types of activities that are intended to be undertaken. The manpower will be working in 2 shifts

1.8 IMPLEMENTATION SCHEDULE

It is estimated that the project will take about 36 months to complete once the decision for implementation has been reached.

1.9 INVESTMENT STRUCTURE

The total initial investment in fixed assets and working capital is estimated at **USD 10,000,000**. The breakdown of this is as follows:

Land & Building	1,300,000
Machinery & equipment	6,200,000
Vehicles	1,200,000
Furniture & Fixtures and office equipment's	100,000
Others	600,000
Pre-operational expenses	100,000
Add: initial Working Capital	500,000
GRAND TOTAL	10,000,000

1.10 FINANCING PATTERN

The total initial investment of **US \$ 10,000,000** shall be financed as follows;

Investment Financing

US\$

	Foreign	Total
Equity	10,000,000	10,000,000
Total	10,000,000	10,000,000

1.11 OPERATION COSTS

The structure of operating costs at full capacity is estimated to be 85 % of the Total revenue as given below

1.12 ECONOMIC ADVANTAGES

Based on the above account the analysis has overwhelmingly proved that the project is financially sound and techno-economically viable.

2.0 THE PROJECT

Facing an increasing demand on manufacturing of various manufacturing industries, the shareholders of ***Tanzania Carbonate Limited*** see the need for establishing facilities for the production of Superfine Calcium Carbonate and Dolomite Powder by making the chemical and physical treatments to be used as raw materials in various industries such as paints, plastic, soaps, pharmaceutical, agriculture, and construction industries to meet demand in the market. The shareholders have perceived that the establishment of the industry is an opportunity to position ***Tanzania Carbonate Limited*** as a leading manufacturer of Products Superfine Calcium Carbonate and Dolomite Powder in the manufacturing sector of the country.

2.1 Based on this opportunity seen by **Tanzania Carbonate Limited**, it has decided to invest **USD 10 Million** to install facilities for the manufacturing of Calcium Carbonate and Dolomite Powder to be used in the manufacturing industries. The products to be produced will have a capacity of **300,000 tons per year**.

2.2 THE PRODUCTS

In the manufacturing industries, the choice of raw materials plays a pivotal role in determining the performance and characteristics of the final product. Out of many raw materials used in the manufacturing industry, Calcium Carbonate and Dolomite are commonly used ingredients in many manufacturing industries such as paints, plastic, soaps, pharmaceuticals,

agriculture, steel, and construction industries. Each brings unique properties to the product and makes it easy to use.

Dolomite powder and limestone powder have different compositions. Limestone primarily consists of calcium carbonate (CaCO_3) and often contains small amounts of magnesium carbonate (MgCO_3) and other impurities. Dolomite powder, on the other hand, is primarily composed of calcium magnesium carbonate ($\text{CaMg}(\text{CO}_3)_2$), with varying amounts of calcium carbonate and magnesium carbonate.

Dolomite powder finds versatile applications across various industries. In the construction sector, it is used as a building material and aggregate, enhancing the durability and strength of concrete and asphalt mixtures. It is also utilized in the steel industry as a fluxing agent, aiding in the removal of impurities during steel production. In agriculture, it serves as a soil conditioner, adjusting pH levels and providing essential nutrients to crops. Additionally, it is employed in glass manufacturing as a source of magnesium oxide, improving the durability and chemical resistance of glass products. These diverse applications highlight the importance of dolomite powder as a valuable resource in multiple industries.

Further Dolomite is a naturally occurring mineral composed of calcium magnesium carbonate. In the realm of paint chemistry, dolomite serves as a versatile extender and filler. Its unique composition imparts excellent hardness and weather resistance in products especially paints making them more durable. Dolomite also enhances the overall coverage and provides a smooth finish, contributing to the aesthetic appeal of painted surfaces.

On the other hand, Calcium carbonate, widely known as chalk or limestone, is a popular choice in most industries. This mineral filler is renowned for its cost-effectiveness and ability to improve the product capacity and brightness. Its fine particle size contributes to easy dispersion within products like paints, leading to a smoother consistency. Moreover, calcium carbonate acts as a rheology modifier, influencing the flow and viscosity of the paint.

2.3 PRODUCTION PROCESS

2.3.1 CALCIUM CARBONATE EXTRACTION

Calcium carbonate is not native to any specific area and can be located throughout the world. Calcium carbonate's most common natural forms are sedimentary rocks such as chalk and limestone, as well as metamorphic rocks like marble. These sedimentary rock forms are produced by the carbonate sediments of the shells of small, fossilized snails, shellfish, and coral over millions of years., Calcium carbonate, or CaCO_3 , combines calcium oxide and carbon dioxide, making up more than 4% of the earth's crust. Three types of calcium carbonate-containing rock are excavated and used by industry. They are limestone, chalk, and dolomite. Limestone and chalk are both forms of calcium carbonate and dolomite is a mixture of calcium and magnesium carbonates. All have impurities such as clay but some rocks are over 97% pure. There are different ways in which calcium carbonate can be extracted from the crust of the earth. The two main ways that we extract calcium carbonate are mining and quarrying. The mining process typically begins with identifying suitable deposits, followed by drilling and blasting to break the rock into manageable pieces. Once extracted, the

raw material is transported to processing facilities where it is crushed and refined to produce ground calcium carbonate. Ground calcium carbonate, as the name implies, is made by taking calcium carbonate and crushing the material. The crushed material creates a substance that takes on a powdery form. Ground calcium carbonate is graded and categorized by size and other properties. Ground calcium carbonate is utilized in a wide variety of industrial, agricultural, and pharmaceutical applications.

2.3.2 CALCIUM CARBONATE & DOLOMITE PROCESSING PLANT

. A calcium carbonate plant, also known as a calcium carbonate processing or grinding plant, is a production line where ground calcium carbonate powder is made mechanically in factories. To make commercially usable calcium carbonate. Manufacturing processes are used to improve specific properties and reduce the size of particles within the material after being mined from open pits or underground, then drilled, blasted, and crushed. After this, the crushed stone is sized and washed, removing much of the colored impurities within the material.

From there, calcium carbonate goes through either dry or wet processing. The wet process involves a chemical synthesis that uses carbon dioxide, with wet processing often following dry processing to increase purity.

Usually, a complete set of machinery is needed for the calcium carbonate production line. Some calcium carbonate manufacturing plants are also equipped with a calcium carbonate coating machine to obtain both naturally coated and uncoated calcium carbonate powder. There is no one-for-all solution for building a calcium carbonate production plant. Customers need

to consider various requirements in powder fineness, production capacity, and so on.

3.0 THE MARKET

3.1 World Market

Dolomite and Calcium Carbonate are critical raw materials for many products. Calcium carbonate is mostly used in paper, plastics, paints, and construction, due to its versatility and wide-ranging applications. Calcium carbonate is extensively used as a filler, pigment, and additive in manufacturing processes, contributing to product enhancement. On the other hand, A majority portion of dolomite produced worldwide goes to manufacturing iron and steel. Moreover, calcium and magnesium are two of the basic components of dolomite which help in the manufacturing of steel.

As per export data of the world, In the period from Mar 2023 to Feb 2024, there were a total of 274 Calcium Carbonate Suppliers in the World, exporting to 221 buyers in Tanzania. (*Volza's from internet*).

3.2 Demand

There is an increasing demand for dolomite & calcium carbonate-reinforced polypropylene from the automotive industry and the ability of calcium carbonate to enhance the properties of plastics and help in improved heat dissipation. Also, the increasing use of plastics in various end-use industries such as packaging, building & construction, and electrical & electronics has increased the demand for plastics. These factors contribute to the growth of the calcium carbonate market in the plastic industry.

3.3 Driving Factors of the Demand Dolomite and Calcium Carbonate Market

Several factors propel the growth of the Calcium Carbonate Market:

1. Increasing Demand in Paper Industry: Calcium carbonate improves paper quality, brightness, and opacity, driving its usage in paper production amid the expanding packaging and printing sectors

2. Growth in Construction Activities: The booming construction industry, particularly in emerging economies, fuels the demand for calcium carbonate in paints, coatings, and concrete applications for its properties of durability and weather resistance.

3. Surge in Plastic Production: Calcium carbonate acts as a reinforcing agent and filler in plastic manufacturing, aiding in cost reduction, improved mechanical properties, and sustainability, amid the rising demand for lightweight and eco-friendly materials.

4. Shift towards Eco-friendly Products: Calcium carbonate's natural composition and recyclability align with the growing consumer preference for sustainable and environmentally friendly products, fostering its adoption across various industries.

5. Technological Advancements: Ongoing research and development efforts focus on enhancing calcium carbonate's properties and production processes, driving innovation and expanding its application scope in niche markets.

3. Quality Variability: Variations in calcium carbonate quality and purity levels can affect product performance and consistency, necessitating

stringent quality control measures and supplier reliability to maintain customer satisfaction and market competitiveness.

3.4 Supply

The estimate for worldwide mining of calcium carbonate is 15 billion tonnes a year. The annual production of calcium carbonate is not readily available. Approximately 1 billion tonnes of its two principal ores, limestone, and dolomite, are mined annually in the US.

In Tanzania about 150k tons are produced per year. Tanzania imports Calcium carbonate primarily from: China (\$1.91M), Jordan (\$1.09M), Egypt (\$887k), United Arab Emirates (\$471k), and Kenya (\$317k). The fastest-growing import markets in Calcium carbonate for Tanzania between 2021 and 2022 were the United Arab Emirates (\$250k), Kenya (\$241k), and Vietnam (\$214k).

.The fastest growing export markets for Calcium carbonate in Tanzania and appeared to be the largest markets between 2021 and 2022 were the Democratic Republic of the Congo (\$10k), Zambia (\$2.49k), and Burundi (\$1.72k).

In value terms, Vietnam, China, and Jordan constituted the largest calcium carbonate suppliers to Tanzania, with a combined 65% share of total imports. In value terms, Rwanda, Burundi, and the Democratic Republic of the Congo appeared to be the largest markets for calcium carbonate exported from Tanzania worldwide, with a combined 78% share of total exports. (Https: www.indexboxhttps://)

Dolomite from Tanzania is exported to: China (\$7) and Turkey (\$2). The fastest-growing export markets for Dolomite of Tanzania between 2021 and 2022 were China (\$7) and Turkey (\$2). Imports In 2022, Tanzania imported \$41k in Dolomite, becoming the 107th largest importer of Dolomite in the world.

3.5 Distribution activities

. The company will have to do the following;

- Increasing advertising to end-users to induce them
- Building strong ties with dealers by offering them special services, promotional discounts, and technical information about Tanzania Carbonate Limited's product range. In the long run, as the dealer network gets stabilized, special emphasis will be put on reducing the credits.

5.0 THE ENVIRONMENT CONSIDERATION

Within the mining industry, there is an increasing consciousness about environmental issues.

It is worth mentioning that Tanzania Carbonate Limited will have a clear environment policy which includes preventing pollution of the surrounding environment and employing environmentally friendly processes in the manufacture of calcium bicarbonate and dolomite

The company intends to obtain a certified management system following the requirements of the ISO standards for quality assurance and environmental management systems. The Implementation of environmental awareness at

Tanzania Carbonate Limited will have the following impact on the external environment:

- It will substitute environmentally harmful material with environmentally friendly or less health-hazardous raw materials
- It will reduce environmental impact on the external environment by reducing waste in the surroundings.
- It will conduct training for the employees on environmental awareness and use of protective equipment.

6.0 PROJECT IMPLEMENTATION SCHEDULE

The critical activities are securing finance to purchase capital equipment. The Company will start purchasing other capital items from the middle of year 2025 and will be bought as and when the financing is secured

7.0 MANAGEMENT AND ORGANISATION STRUCTURE

7.1 Management

The company policy is to have adequate manpower to manage its operations efficiently. *Tanzania Carbonate Limited* believes in keeping on board only the essential manpower strength, to develop them into a highly motivated and sincere company team for the best and efficient operations of the company. The company will have a team of qualified and experienced functional managers in operation/marketing, workshop operations, and finance & administration. The personnel will be qualified, well-seasoned, and possess considerable experience per their job description.

8.0 FINANCIAL ANALYSIS

8.1 Revenue Assumptions

The basic revenue underlying the projected revenue is detailed below:

Basic Revenue Assumptions

- 1) The project will operate with Plant Production at the Capacity of **300,000 tons per annum**
- 2) The project construction time is assumed to be three years
- 3) The economic life of the project is 10 years
- 4) The currency exchange rate of Tshs 2500= to one US \$ has been adopted.
- 5) An investment of USD 10,0 million has been assumed as suitable for the venture.

7) The capacity utilization of the machinery starts from 70% in the 1st Year to 80% in the 2nd year and 90%, in the 3rd year, and 100% in the subsequent years.

6) The operation costs have been assumed at 85% of the total revenue

8) The revenue and operating cost assumptions have been projected at constant prices; it is being assumed that any increase in costs will be offset by a corresponding increase in revenue

9) Economic depreciation rates based on useful lifetimes of the various capital items have been adopted. The following facts apply to the depreciation rates in this project:

- Building and Civil works are depreciated at 4% straight line.
- Workshop equipment, plant, machinery, and operating equipment 12.5%
- Office equipment is depreciated at 12.5% and therefore replacement
- Furniture and fittings are depreciated at 12.5%
- Pre-operational expenses are amortized and written off after 5 years the write-off therefore is 20%.

8.3 Projected Profit and Loss Accounts

The accounts demonstrate that the project will be very profitable after the operation starts with pre-tax profits of about US\$ 672,500 from year 4 of operation onwards.

8.4 Projected Cash Flow

The strong liquidity position confirms the project's ability to meet all financial obligations.

8.5 Profitability

The project's long-term retained earnings are considerably high due to the gains from the current establishment. The financial plan is for the shareholders to finance the project from their sources by plowing back profits.

9.0 Development Aspects

The following are the major economic and social benefits, which will be generated by the proposed project.

- i) Revenue to the Government in the form of taxes, fees, and levies.
- ii) Increase in employment opportunities.
- iii) Savings/earnings of foreign exchange because of the
The project's active engagement in the manufacturing
Industry.
- iv) With the liberalization of the economy in full swing
resultant industrial growth is expected to push up the
demand for the dolomite , calcium carbonate and related products

10.0 CONCLUSION AND RECOMMENDATION

The brief financial analysis indicates that the project will be financially viable. Therefore, it is strongly recommended that the sponsors of Tanzania Carbonate Limited are availed of the required assistance to enable them to establish the proposed project.

TANZANIA CARBONATE LIMITED

CAPITAL INVESTMENT

Land & Building	1,300,000
Machinery & equipment	6,200,000
Vehicles	1,200,000
Furniture & Fixtures and office equipment's	100,000
Others	600,000
Pre-operational expenses	100,000
Add: initial Working Capital	500,000
GRAND TOTAL	10,000,000

TANZANIA CARBONATE LIMITED FINANCING PLAN

	Foreign	Total
Equity	10,000,000	10,000,000
Total	10,000,000	10,000,000

TANZANIA CARBONATE LIMITED

DEPRECIATION SCHEDULE

US \$

YEAR	Value	Rate %	1	2	3	4	5	6	7	8	9
Land & Buildings	1,300,000	4	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
-											
Machinery and equipment	6,200,000	12.5	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	-
Motor Vehicles	1,200,000	25	300,000	300,000	300,000	300,000	-	-	-	-	-
Furniture & Fixtures	100,000	12.5	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	-
TOTAL	920,000		1,127,500	1,127,500	1,127,500	1,127,500	827,500	827,500	827,500	827,500	40,000

TANZANIA CARBONATE LIMITED

PROJECTED PROFIT AND LOSS ACCOUNTS

USD

YEAR	1	2	3	4	5	6	7	8	9
Sales Revenue	3,000,000	3,428,571	3,857,143	4,285,714	4,285,714	4,285,714	4,285,714	4,285,714	4,285,714
Less: Cost of Sales	1,950,000	2,228,571	2,507,143	2,785,714	2,785,714	2,785,714	2,785,714	2,785,714	2,785,714
Contribution	1,050,000	1,200,000	1,350,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Operating Surplus	1,050,000	1,200,000	1,350,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
<u>Capital Costs</u>									
Depreciation	1,127,500	1,127,500	1,127,500	1,127,500	827,500	827,500	827,500	827,500	40,000
Total capital cost	1,127,500	1,127,500	1,127,500	1,127,500	827,500	827,500	827,500	827,500	40,000
Profit before Tax	(77,500)	73,000	222,000	372,500	672,500	672,500	672,500	672,500	1,460,000
Taxable 30%	-	21,900	66,600	1,117,500	201,750	201,750	201,750	201,750	438,000
Net Profit	(77,500)	51,100	155,400	260,750	470,750	470,750	470,750	470,750	1,022,000
Revenue Reserves	(77,500)	995,600	1,151,000	1,411,750	1,882,500	2,353,250	2,824,000	3,294,750	3,396,950

TANZANIA CARBONATE LIMITED

PROJECTED CASHFLOW

USD

	0	1	2	3	4	5	6	8	9	10
Cash Inflow										
Equity	10,000,000	-	-	-	-	-	-	-	-	-
Total Inflow	10,000,000	-	-	-	-	-	-	-	-	-
Operational Inflow										
Profit before Tax		(77,500)	73,000	222,000	372,500	672,500	672,500	672,500	672,500	1,460,000
Depreciation		1,127,500	1,127,500	1,127,500	1,127,500	827,500	827,500	827,500	827,500	40,000
Total Operations Inflow		1,050,000	1,200,500	1,349,500	1,500,000	2,872,500	2,872,500	2,872,500	2,872,500	1,500,000
Total Cash inflow	10,000,000	1,050,000	1,200,500	1,349,500	1,500,000	2,872,500	2,872,500	2,872,500	2,872,500	1,500,000
Cash Outflow										
Investment	10,000,000	-	-	-	-	-	-	-	-	-
Operational Outflow		-	-	-	-	-	-	-	-	-
Taxation		21,900	66,600	1 11,750	201,750	201,750	201,750	201,750	438,000	21,900
Total Cash Outflow		21,900	66,600	1 11,750	201,750	201,750	201,750	201,750	438,000	21,900
Net Cash flows	-	1,028,100	1,134,000	1,237,750	1,298,250	2,670,750	2,670,750	2,670,750	2,434,500	1,478,100