



Pre-feasibility Study

CROCKERY MANUFACTURING UNIT

January 2023

“The figures and financial projections are approximate due to fluctuations in exchange rates, energy costs, and fuel prices etc. Users are advised to focus on understanding essential elements such as production processes and capacities, space, machinery, human resources, and raw material etc. requirements. Project investment, operating costs, and revenues can change daily. For accurate financial calculations, utilize financial calculators on SMEDA’s website and consult financial experts to stay current with market conditions.”

Small and Medium Enterprises Development Authority
Ministry of Industries and Production
Government of Pakistan

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1 DISCLAIMER

This information memorandum is to introduce the subject matter and provide a general idea and information on the said matter. Although, the material included in this document is based on data/information gathered from various reliable sources; however, it is based upon certain assumptions, which may differ from case to case. The information has been provided on as is where is basis without any warranties or assertions as to the correctness or soundness thereof. Although, due care and diligence has been taken to compile this document, the contained information may vary due to any change in any of the concerned factors, and the actual results may differ substantially from the presented information. SMEDA, its employees or agents do not assume any liability for any financial or other loss resulting from this memorandum in consequence of undertaking this activity. The contained information does not preclude any further professional advice to be obtained by user. The prospective user of this memorandum is encouraged to carry out additional diligence and gather any information which is necessary for making an informed decision, including taking professional advice from a qualified consultant/technical expert before taking any decision to act upon the information.

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2 EXECUTIVE SUMMARY

Crockery is a broad term that refers to various types of ceramic tableware used for serving and eating food. Ceramics are classified as inorganic and nonmetallic materials that are generally made by taking mixtures of clay, earthen elements, powders, and water and shaping them into desired forms. Ceramics is one of the most ancient industries, dating back to thousands of years. Once humans discovered that clay is found in abundance and can be formed into objects by first mixing it with water and giving it a shape and then firing, a key industry originated.

Crockery includes all types of dishware and dinnerware that are used at the table during meals. It includes all forms of cups, cup saucers, dishes such as plates, bowls, as well as serving dishes that are used to hold other tableware, such as curry bowls, plates and cups, etc. Crockery is made of ceramic materials such as Porcelain or China Clay. These materials are known for their durability and ability to withstand high temperatures, making them suitable for use in the microwave, oven, and dishwasher. In the proposed project, the ceramic material used is China Clay since it the most commonly used and easily available material in the market.

Crockery is of use in daily life and use of sophisticated crockery enhances the elegance of food served at the table. Crockery can be used to create a cohesive and polished look on a table setting, and can also be used as a decorative element in a home. Crockery is available in a wide range of styles, colors, and designs, and can be used for both casual and formal occasions.

Large variety of crockery items is available in the markets, varying from different range of prices and designs to different qualities. There are two main types of crockery items available in the market, one is dinner set and other is tea set. Dinner set usually includes 6 Small plates, 6 Medium plates, 6 Large plates, 6 small bowls, 1 medium curry bowl and 1 large curry bowl, 5 soup bowls, 1 large rice tray and salt pot. Tea set usually comprises of 6 cups along with their saucers, a tea pot, a sugar pot and a milk pot, This tea set is also available separately in the markets.

This "Pre-feasibility Document" provides details for Setting-up a Crockery Manufacturing Unit. The unit is proposed to be located in major cities like Karachi, Lahore, Islamabad, Peshawar, Rawalpindi, Quetta, Faisalabad, Sialkot, Hyderabad, Gujranwala, Multan or any other city of Pakistan. These cities are preferred because of easy availability of industrial infrastructure and skilled labor.

The proposed manufacturing unit has a maximum annual capacity of manufacturing 4,200 Dinner Sets and 4,200 Tea Sets. Initially, the project is assumed to operate at 60% of the total production capacity, which is equal to 2,520 Dinner Sets and 2,520 Tea Sets. The production capacity utilization is assumed to increase at a rate of 5% per annum to reach the maximum capacity of 95% in Year 8.

The proposed project will be set up in a rented building having an area of 4,480 sq. ft. for the crockery manufacturing unit. The project requires a total investment of PKR 22.62 million. This includes capital investment of PKR 20.97 million and working

capital of PKR 1.65 million. The project will be established using 100% equity financing. The Net Present Value (NPV) of project is PKR 50.03 million with an Internal Rate of Return (IRR) of 55% and a Payback period of 2.75 years. Further, the proposed project is expected to generate Gross Annual Revenues of PKR 80.90 million in 1st year of operations, Gross Profit (GP) ratio ranging from 27% to 41% and Net Profit (NP) ratio ranging from 2% to 20% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 49% (4,145 units) with gross breakeven revenue of PKR 69.42 million in a year.

The proposed project may also be established using leveraged financing. At 50% financing at a cost of KIBOR+3%, the proposed manufacturing unit of Crocery provides Net Present Value (NPV) of PKR 61.19 million, Internal Rate of Return (IRR) of 54% and Payback period of 2.83 years. Further, this project is expected to generate Net Profit (NP) ratio ranging from 2% to 20% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 50% (4,202 units) with breakeven revenue of PKR 70.38 million.

The proposed project will provide employment opportunities to 36 people. It is evident from the above financial figures that the project for manufacturing of crockery offers reasonable profitability and is economically and financially viable. The legal business status of this project is proposed as "Sole Proprietorship".

3 INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs", SMEDA has carried out 'sectoral research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need-based capacity building programs of different types in addition to business guidance through help desk services.

National Business Development Program for SMEs (NBDP) is a project of SMEDA, funded through Public Sector Development Program of Government of Pakistan.

The NBDP envisages provision of handholding support / business development services to SMEs to promote business startup, improvement of efficiencies in existing SME value chains to make them globally competitive and provide conducive business

environment through evidence-based policy-assistance to the Government of Pakistan. The Project is objectively designed to support SMEDA's capacity of providing an effective handholding to SMEs. The proposed program aimed at facilitating around 314,000 SME beneficiaries over a period of five years.

4 PURPOSE OF THE DOCUMENT

The objective of the pre-feasibility study is primarily to facilitate the potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document/study covers various aspects of project concept development, start-up, and production, marketing, finance and business management.

The purpose of this document is to provide information to the potential investors about establishing a business of "Crockery Manufacturing Unit". The document provides a general understanding of the business to facilitate potential investors in crucial and effective investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business setup and its successful management.

Apart from carefully studying the whole document one must consider critical aspects provided later on, which form the basis of any investment decision.

5 BRIEF DESCRIPTION OF PROJECT & PRODUCTS

Crockery is a broad term that refers to various types of ceramic tableware used for serving and eating food. Ceramics are classified as inorganic and nonmetallic materials that are generally made by taking mixtures of clay, earthen elements, powders, and water and shaping them into desired forms. It includes all types of dishware and dinnerware that are used at the table during meals.

Crockery plays an essential role in creating the best dining experience. Crockery creates an appealing look if it is presented in right way with mix or match plates, bowls and serving items. Crockery is an essential element in table setting for meals, which can be more fun and elegant when beautiful crockery is placed upon the table, whether it be a casual or formal sitting.

Crockery is manufactured using ceramic materials such as China clay, Earthenware or Stoneware. Ceramic is a non-metallic, solid material that is used in making crockery, tiles, bricks plates and glasses. Ceramics is one of the most ancient industries going back thousands of years. In the ancient world, clay was abundant, and it could be mixed with water and then fired to form objects. This led to the development of a major industry. Ceramics made from clay were used in Asia, the Middle East and Europe as,

art objects, tiles, crockery, and bricks. Ceramic products are brittle, non-compressible and hard in nature. Crockery made from ceramic material is non-toxic and therefore can be used on stove, or in a microwave or an oven.

Crockery can be made from number of materials. These materials can be ceramic such as China clay, earthenware, stoneware or alumina, or non-ceramic materials such as porcelain or melamine. In the proposed project, two main products i.e., dinner set and tea set will be manufactured using ceramic material (China clay). The proposed unit will manufacture 33-piece ceramic dinner sets and 15-piece tea sets. The composition of 33-piece ceramic dinner is composed of 6 small plates, 6 medium plates, 6 large plates, 6 small bowls, 1 medium curry bowl, 1 large curry bowl, 1 soup bowl, 1 large rice tray and 1 salt pot. The composition of 15-piece tea set is composed of 6 tea sets, 6 tea saucers, 1 tea pot, 1 milk pot and 1 sugar pot.

Dinner Set

Dinner set is used for serving of food and includes three different sizes of plates, large, medium, and small. Each size has 6 plates, 6 small bowls, medium bowls, large bowls, soup bowls, custard bowls, and two trays. Descriptions of all above items are as follows:

Large Plate

Large plate is also known as dinner plate, full plate, or meal plate usually used to serve the main course of meal. Dinner plates vary in size and are measured according to their diameters. A dinner plate is about 11.5 inches (29 centimeters) in diameter.

Medium Plate

The medium dinner plate is slightly larger than the appetizing plates, but not large enough to be considered a full dinner plate. Size of medium plate is about 10 inches (25 centimeters) in diameter.

Small Plate

The smallest size plate is used to serve small appetizers at the beginning of a meal. Sizes of small plate is about 8 inches (20 centimeters) in diameter. Figure 1 shows large, medium and small plates.

Figure 1: Large, Medium & Small Plates



Large Bowl

Large bowl is also known as serving bowl in dinner set. Such bowls are used for serving. The inside of the large bowl is 12 inches wide and 6 inches deep.

Figure 2: Large Bowl



Medium Bowl

Medium bowls are smaller than the large bowl in size. The inside of the medium bowl is 10 inches wide and 4.5 inches deep.

Figure 3: Medium Bowl



Small Bowls

Small bowls are commonly used for serving individual portions of a different dishes. The inside of the small bowl is 6 inches wide and 3 inches deep.

Figure 4: Small Bowls



Soup Bowl

This is one of the most common bowl types simply because a soup cannot be eaten in a plate. These bowls are increasingly used today to consume soup meals by the likes of Chipotle. But it can be used for all purposes. The inside of the soup bowl is 7 inches wide and 3 inches deep.

Figure 5: Soup Bowl



Tray

Serving tray plays an important role in a dining setup. It is used to serve foods and drinks to guests. Tray is known as dish or platter.

Figure 6: Tray



Figure 7 shows complete dinner set.

Figure 7: Complete Dinner Set



Tea Set

A tea set is a collection of matching tea ware and related utensils used in the preparation and serving of tea. A tea set consists of a teapot, teacups, cup saucers, a milk pot and a sugar pot. The tea set manufactured by the proposed unit contains 6 teacups along with an equivalent number of saucers where the cups can be placed after sipping the tea. It also includes 1 tea pot and 1 sugar pot.

Tea Cups with Saucers

Tea cup is a small cup with handle and a saucer used to serve tea or hot beverages. A saucer is a small shallow dish in which a cup is set at the table. Figure 8 shows tea cup with saucer.

Figure 8: Tea Cup with Saucer

**Tea Pot**

The tea pot contains tea for serving. It should be able to hold at least five full cups of tea or six quarter cups of tea. Figure 9 shows tea pot.

Figure 9: Tea Pot



Milk Pot

The milk pot contains milk in case of serving milk tea. Figure 10 shows a milk pot.

Figure 10: Milk Pot

**Sugar Pot**

This essential accessory serves for both kinds of people, those who want sugar in their tea and those who don't. Figure 11 shows sugar pot.

Figure 11: Sugar Pot



Figure 12 shows a complete tea set.

Figure 12: Complete Tea Set



5.1 Machinery and Equipment

The machinery and equipment required for setting up a crockery manufacturing unit is provided below:

Ball Mill

A ball mill is a type of grinding machine made of steel that uses balls, inside a drum, to grind and crush material. It consists of a hollow compartment that rotates along a horizontal or vertical axis. It is called a ball mill because it is filled with ceramic or stainless-steel balls, or flint pebbles, used for grinding the materials. The materials are added to the ball mill along with balls. The machine rotates horizontally at which point the balls knock around inside the mill and grind the material to the required particle size. For grinding, the ball mill is partially filled with material to allow the balls to move freely and knock the material easily. In the proposed unit, ball mill is used to grind and mix raw materials such as clay, quartz and feldspar with water during raw material preparation process. Figure 13 shows a ball mill.

Figure 13: Ball Mill**Filter Press**

A filter press is a type of solid-liquid separation equipment that uses a mechanical pressure drive to separate the liquid and solid phases of a suspension. It consists of a series of filter plates and frames that are arranged in a vertical stack, with a slurry feed pump at the top. The slurry is pumped into the filter press and distributed evenly across the filter plates. Each filter plate has a filter cloth on one side and a grooved surface on the other side. The grooves create channels for the filtrate to flow through, while the filter cloth acts as a barrier to retain the solids. As the filter press operates, the solids build up on the filter cloth, forming a filter cake. The filter cake is then removed from the filter press and the remaining liquid, called filtrate, is discharged. In the proposed unit, the filter press machine is used to remove water from clay slurry formed in ball mill. Figure 14 shows a Filter Press.

Figure 14: Filter Press**Pug Mill**

A pug mill, also known as a pug mixer or a paddle mixer, is machine used for mixing materials such as clay, crockery glazes, and other powders. It typically consists of a

cylindrical or conical mixing chamber with one or more horizontal, rotating paddles or augers inside. The paddles or augers are powered by an electric motor and are used to mix, knead, and blend the materials. Pug mills are used extensively in the crockery industry and are an important piece of equipment for crockery manufacturers, as they allow for the production of high-quality crockery products with consistent properties. Pug mills can be used in different types of crockery production such as casting, pressing, and extrusion. Figure 15 shows pug mill.

Figure 15: Pug Mills



Roller Press Machine

A roller press machine in crockery industry is a machine used to press clay or crockery powders into a desired shape or form. A press machine can come in various types and sizes, such as mechanical presses, hydraulic presses, and pneumatic presses. Roller press machines are usually used in the mass production of crockery items such as tiles, crockery and sanitary ware. These machines can also be used for creating complex shapes like sculptures or figurines. The machine applies pressure to the material with the use of a mold, and the pressure is used to shape the material into the desired form. The proposed unit will use single head roller press machine for manufacturing of crockery. Figure 16 shows single head roller press machine.

Figure 16: Single Head Roller Press Machine**Electric Pottery Wheel**

An electric wheel is powered by a high-torque or rotational-force electric motor. It comes with a foot pedal which, when pressed, accelerates the rotation of the wheel. The wheel is set on a frame and is around waist height. Worker sits in front of the wheel and leans forth to work with the clay. The wooden arm is connected to a series of shafts, which rotate the wheel. Figure 17 shows an Electric Pottery Wheel.

Figure 17: Electric Pottery Wheel

Kiln Furnace

A kiln furnace is a thermally insulated chamber, a type of oven that produces temperatures sufficient to complete processes like hardening, drying, or chemical changes. Various industries and trades use kilns to harden objects made from clay into pottery, bricks, etc. Crockery kilns furnaces are the most commonly used kilns in crockery industry. The temperatures in crockery kilns can range from 100 to 1,400 degree centigrade. The temperature of kiln can be adjusted based on the type of crockery being fired. Kiln furnace can be gas powered, electric powered or that can be operated by burning wood. The kiln furnace in the proposed unit is used in the firing process to harden the clay and fuse the glaze on to the work piece. Figure 18 shows kiln furnace.

Figure 18: Kiln Furnace



Kiln trolleys or carriages, which run on rails, are used to move items for firing into a kiln. The kiln car and its wheel bearings are specifically designed to be able to withstand high temperatures of kiln furnaces. Figure 19 shows kiln trolleys.

Figure 19: Kiln Trolleys

5.2 Production Process Flow

The production process flow of manufacturing crockery is shown in Figure 20.

Figure 20: Manufacturing Process of Crockery

Raw Material Procurement

The main raw material used in crockery manufacturing is China clay. Although China clay deposits can be found in districts of Punjab province however due to its inferior quality, it is mostly not preferred by manufacturers. Therefore, the proposed unit not uses imported China clay for manufacturing of crockery. Imported China clay can easily be sourced from the local market as its importers can be found in all major cities of Pakistan. Other materials required for manufacturing of crockery are Quartz, Feldspar, Barium Oxide and Zinc Oxide. These materials can easily be sourced from local market as they are available in all major cities of Pakistan. The proposed unit

maintains a raw material inventory for 30 days. The raw materials used in the proposed manufacturing unit are briefly described below:

- **China Clay**

China clay, also known as Kaolin, is a type of clay that is widely used in the crockery industry. It is a white, fine-grained mineral that is composed mainly of the mineral kaolinite. China clay is highly valued for its extreme whiteness and fine particle size, which makes it an ideal ingredient for crockery products. It is also used in the production of porcelain¹ and sanitary ware. In the proposed unit, China Clay is the main raw material used for manufacturing of crockery. Figure 21 shows lumps of China Clay.

Figure 21: China Clay



- **Quartz**

Quartz is used as a source of Silicon Dioxide (SiO_2), which is an important component of crockery products. Quartz can be ground into a fine powder and added to the crockery mixture to provide the necessary SiO_2 content. In glazing process, quartz is used as a flux to lower the melting point of the glaze and make it more fluid. It also acts as a source of silica in the glaze, which helps to improve the hardness and durability of the final product. Figure 22 shows quartz used in the proposed project.

¹ **Porcelain** refers to a wide range of ceramic products that have been baked at high temperatures to achieve vitreous, or glassy, qualities

Figure 22: Quartz

- **Feldspar**

Feldspar is a group of minerals that are commonly used in the crockery manufacturing industry. Feldspar is used in crockery glazes as a source of alumina (Al_2O_3) and silica (SiO_2). Similar to Quartz, Feldspar acts as a flux to lower the melting point of the glaze and make it more fluid. Feldspar also plays a role in determining the thermal expansion of crockery and glazes, which is important for matching the expansion of the glaze to the crockery body to avoid cracking. This is why feldspar is considered as an important ingredient in crockery glaze and body recipes. Figure 23 shows feldspar for crockery. In the proposed project, Feldspar is procured in powdered form, as shown in Figure 24.

Figure 23: Feldspar for Crockery

Figure 24: Feldspar Powdered Form

- **Barium Oxide**

Barium oxide (BaO) is a chemical compound that is used in small amounts as a glaze ingredient in crockery. It is a white powder that is used as an opacifier in crockery glazes, which means that it helps to make the glaze opaque and hide the color of the crockery body underneath. Barium oxide is used in the production of crockery, as well as in the production of other ceramic products such as sanitary ware and tiles, etc. The use of Barium oxide in crockery can improve whiteness, brightness, and gloss of the final product. Figure 25 shows barium oxide in powdered form.

Figure 25: Barium Oxide

- **Zinc Oxide**

Zinc oxide (ZnO) is a chemical compound that is used in crockery as an ingredient in glazes and bodies. It is a white powder that can be added to crockery glazes as a source of zinc, which can help to improve the strength and durability of the final product. In glazing process zinc oxide can be used to produce a range of colors, from

pale yellow to deep red, depending on the other glaze ingredients and the firing conditions. It is commonly used as a colorant in glazes. Figure 26 shows zinc oxide.

Figure 26: Zinc Oxide



Raw Material Preparation

The first step in the manufacturing process of crockery is preparation of clay. For this purpose, the raw clay is first crushed and ground to reduce its size and improve its consistency. This step is usually performed by adding raw clay in a ball mill along with other ingredients such as quartz and feldspar. The ball mill rotates around horizontal axis and uses materials such as ceramic balls, flint pebbles or stainless-steel balls to finely crush the clay in powder form and mix it together with quartz, feldspar. The materials after being finely grinded are mixed together with water to form slurry soil. Figure 27 shows slurry soil after grinding in a ball mill.

Figure 27: Grinded Soil in a Ball Mill



The soil formed in ball mill is then transferred to a separate tank where it is pumped through pipes and is passed through the filter press machine to separate water from soil. The slurry pressures through filters, leaving behind solid particles. The slurry continues to pass until filters are full of solid, forming clay cakes. Figure 28 shows clay cakes.

Figure 28: Clay Cakes



After that, the clay cakes are extracted from the filter press machine and are transferred to pug mill machine where it is kneaded/pugged until a uniform dough is achieved. The pugged clay is then extracted from the pug mill and is ready to be formed. Figure 29 shows pugged clay.

Figure 29: Pugged Clay



Press Forming

Press Forming refers to the process of shaping crockery material into a desired form or shape. It is a technique by which the desired shape is formed using press molds and a press machine. For this process, a worker takes a piece of pugged clay and places it inside the mold, the press machine using a vertically rotating disc and presses the clay into the mold. As a result, the pressed clay takes form of the mold and is extracted by the worker by hand. The mold is then ready to be used again for the next piece. After formation the product is then transferred for sanding process. Figure 30 shows formed work pieces.

Figure 30: Formed Work pieces



Sanding

After the work piece is formed, a worker uses a sand paper machine to smoothen out the inside of the work piece. A quick quality check on smoothness of edges and base of the work piece is also performed during this process. Figure 31 shows the sanding process.

Figure 31: Sanding Process



Drying

The purpose of the drying process is to remove excess moisture from the crockery pieces, making them ready for the firing process. There are several methods for drying crockery, including air drying, natural drying, and mechanical drying. Air drying is the simplest method which involves allowing the crockery pieces to dry in a room with good ventilation. Natural drying is a similar process, but it is done outside in the sun and wind. Mechanical drying method makes use of special equipment such as kilns for drying and is much expensive as compared to air and natural drying.

The proposed unit uses air drying process due to being more efficient and quicker method than natural drying and much cost effective as compared to mechanical drying. Air drying also produces more consistent results and there is less chance of cracking and warping as compared to natural drying. Figure 32 shows air drying of crockery in a room.

Figure 32: Air Drying Process



Glazing

Glazing is a process used in crockery manufacturing to add a smooth, glossy surface to crockery products. The glaze is made-up with mixture of number of materials; however, the most common materials used for glaze preparation are clay, feldspar, barium oxide, zinc oxide and zirconium. The ingredients can be mixed together to create a specific color and surface finish. Different types of glazes can be used to create different effects, such as a glossy or matte finish, a transparent or opaque surface, or a specific color.

For glazing of the desired product, a worker carefully handles and dips the product into the liquid glaze. The dipped product is then carefully set aside by the worker to avoid any smudge marks that can be formed by accidentally scuffing the wet glazed surface of the product. The glazed product is left to dry at room temperature for half an hour. After the glaze has dried, the product is then ready for heat treatment (firing process). Figure 33 shows dip glazing.

Figure 33: Dip Glazing

Firing

For heat treatment, a worker places the glazed products on crockery trolleys and transfers them to kiln furnace where the products are heated at 1000-1200 degree centigrade for several hours. The high temperature causes the glaze to melt and fuse to the surface of the crockery, creating a smooth, glossy finish.

During the firing process, the crockery pieces go through several chemical and physical changes, such as the formation of new minerals, the strengthening of the crockery pieces, and changes in color and surface finish. The firing process is crucial for the quality and durability of the final crockery product, as well as for its chemical and thermal resistance properties. Figure 34 shows firing process.

Figure 34: Firing

Quality Control

Quality control checks are performed at the beginning of every process. Due to delicate nature of product, each worker carefully inspects the product before performing their respective operations. A final quality check is performed after firing and before the packing process. Any defected pieces are discarded and approved pieces are sent for packing.

Packaging

All the approved final work pieces, when ready, are sent to packing department where workers make combinations of work pieces to form individual dinner sets and tea sets. Each dinner set is packed in an individual carton by the workers. A strip of corrugated card box is also placed between every work piece in the dinner set to avoid the risk of work pieces being broken from colliding with each other. Figure 35 shows a packed box with crockery products.

Figure 35: Packed Box

**Finished Goods Store**

Subsequently after the packing process, the dinner sets are stored in the finished goods store where they are managed by storekeeper until delivery.

Delivery and Payment

The products are sold to the distributors on cash basis. Transportation charges are borne by the customer.

5.3 Installed and Operational Capacities

The proposed manufacturing unit has a maximum annual capacity of manufacturing total of 8,400 crockery sets, which includes 4,200 Dinner Sets and 4,200 Tea Sets. Initially, the project is assumed to manufacture products at 60% of the total production capacity, which is equal to 5,040 crockery sets, including 2,520 Dinner sets and 2,520 Tea Sets. The project is operational for 280 working days annually and 8 working hours per day.

The production capacity utilization is assumed to increase at a rate of 5% per annum to reach the maximum capacity of 95% in Year 8. High return on investment and steady growth of business is expected with the entrepreneur having some prior experience or education in the related field of business. Table 1 show installed and operational production. Table 2 shows details of capacity assumptions of number of units per batch.

Table 1: Installed and Operational Production Capacity

Particulars	Time Required in Kiln per Batch (Hours)	Number of Batches per Day	Number of Complete Dinner Sets/Tea Sets Produced per Day	Annual Number of Dinner Sets/Tea Sets @ 100% Production Capacity	Annual Number of Dinner Sets/Tea Sets @ 60% Production Capacity
Dinner Set	8.00	1.00	15	4,200	2,520
Tea Set	8.00	1.00	15	4,200	2,520
Total				8,400	5,040

Table 2: Production Capacity Assumptions– Number of Units per Batch

Particulars	Number of Units per Batch in the Kiln
Dinner Set	15
Small Plate	90
Medium Plate	90
Large Plate	90
Small Bowl	90
Medium Curry Bowl	15
Large Curry Bowl	15
Soup Bowl	75
Large Rice Tray	15
Salt Pot	15
Total	495
Tea Set	15
Tea Cup	90
Cup Saucer	90
Tea Pot	15
Milk Pot	15
Sugar Pot	15
Total	225

6 CRITICAL FACTORS

Before making the decision to invest in the business of Crockery manufacturing, the investor must know about the key types of crockery products and their demand in the market. The associated risk factors of this business should also be taken into account. Some critical factors to be considered before starting this business are given below:

- Good understanding of the ceramics industry
- Good knowledge of market demand
- Procurement of China Clay and Glazing materials from importers
- Evaluating prospective customer base

- Availability of skilled workforce
- Knowing major competitors
- Knowledge about the modern machinery and equipment

7 GEOGRAPHICAL POTENTIAL FOR INVESTMENT

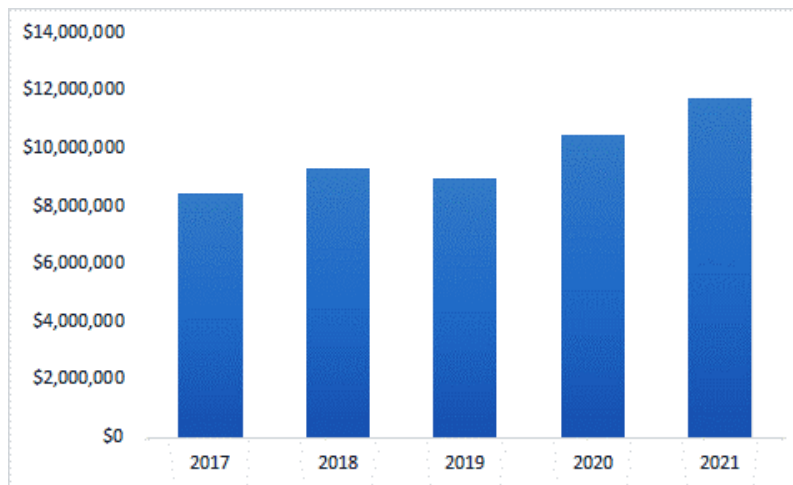
The manufacturing unit of crockery is proposed to be established in larger cities like Karachi, Lahore, Peshawar, Gujranwala, Quetta, Faisalabad, Multan, Sialkot or any other major city of Pakistan. As in these major cities the ceramic industry exists, hence an easy availability of skilled labor and raw materials make these areas more suitable for the proposed business. Furthermore, due to large population of middle and upper-class in these cities the demand of crockery is high. Among these cities Gujranwala is the city where most of the ceramic and crockery manufacturers exist.

8 POTENTIAL TARGET CUSTOMERS / MARKETS

The products provided by the proposed unit will be mainly used by households, hotels and restaurants. Uniquely designed high end crockery dinner and tea sets are in high demand in common households. An increase in the number of home renovation projects, a rise in the number of family units, and an increase in the installation of modular kitchens are some of the primary drivers driving the growth of the crockery industry.

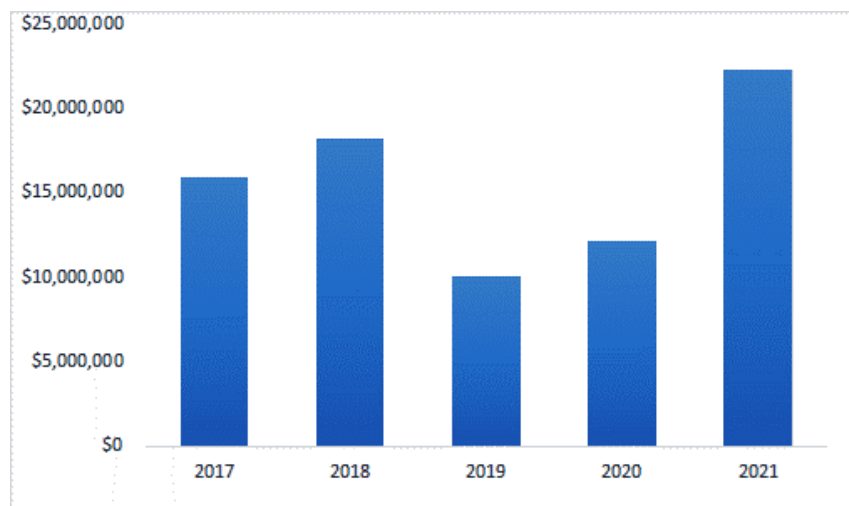
Increase in the number of new hotels and restaurants has increased the demand for tabletop products for the crockery industry. Catering businesses also require crockery in large numbers. Therefore, the proposed business will target common households, hotels, restaurants, catering and any other businesses which require crockery in its day-to-day operations. These markets will be targeted through sales to distributors.

The proposed unit uses China clay for the manufacturing of crockery. According to data obtained from UN Comtrade under HS Code 250700, Pakistan's imports of China clay (Kaolin) increased from US \$ 8.43 million in 2017 to US \$ 11.70 million in 2021. This increase in imports indicates the increase in demand for ceramic crockery in the local market. Figure 36 shows this increasing trend in imports.

Figure 36: China Clay Import Data

The crockery or table ware industry is a global industry. According to a report published by future market insights in year 2020, the global market for tableware was valued at US \$ 39.2 billion in year 2020 and is projected to reach US \$ 54.1 billion in year 2027 with a compound annual growth rate (CAGR) of 4.7%.²

The valuation and projected increase of global tableware industry indicates a great opportunity for local manufacturers to tap in the export segment of crockery/tableware market. According to data obtained from UN Comtrade under HS Code 3924, the exports for tableware, kitchenware stood at US \$15 million in year 2017 which increased to US\$ 22.27 million in year 2021. This export value can be further increased with investment in this business.³ Figure 37 shows tableware export trend.

Figure 37: Tableware Export Trend

²https://www.researchandmarkets.com/reports/338785/tableware_global_market_trajectory_and_analytics

³<https://comtrade.un.org/data>

The local market for crockery is a very versatile market. Crockery made from either porcelain or melamine or ceramic, all have continuous demand in local market. However, crockery made from ceramic material such as China clay is preferred in local market because its deemed good due to its material (Clay) being found in natural environment as compared to crockery made from materials such as melamine (which is considered to be toxic). The local demand for crockery has continuous demand and with increase in population, and this demand is expected to remain steady in future as well. The local manufacturers for China crockery can be found in all major cities of Pakistan however due to undocumented nature of local economy, an exact figure for number of manufacturers in local market cannot be estimated.

9 PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of Crockery Manufacturing Unit. Various costs and revenue related assumptions, along with results of the analysis are outlined in this section.

The projected Income Statement, Cash Flow Statement and Balance Sheet are attached as Annexure.

9.1 Project Economics

All the figures in this financial model have been calculated after carefully taking into account the relevant assumptions and target market.

9.2 Initial Project Cost Estimates

Total cost of the project has been calculated to be PKR 22.62 million. The project will be financed through 100% Equity. Table 3 provides fixed and working capital requirements for establishment and operations.

Table 3: Initial Project Cost

Cost Item	Cost (PKR)	Reference
Land	-	9.2.1
Building / Infrastructure	1,695,833	9.2.2
Machinery & equipment	11,890,000	9.2.3
Allied Equipment	88,000	9.2.4
Office equipment	2,066,000	9.2.5
Furniture & fixtures	627,000	9.2.6
Office vehicles	489,000	9.2.7
Pre-operating costs	3,379,861	9.2.8

Advance Against Building Rent	739,200	9.2.9
Total Capital Costs	20,974,894	
Working Capital Cost		
Equipment spare part inventory	12,385	
Raw material inventory	389,016	
Upfront Building Rent	246,400	
Cash	1,000,000	
Total Working Capital	1,647,801	
Total Project Cost	22,622,695	

9.2.1 Land

The proposed unit of manufacturing of crockery unit will be established in a rented building to avoid the high cost of land. Suitable locations for setting up a unit can be easily found on rent. Therefore, no land cost has been added to the project cost. Total space requirement for the proposed manufacturing unit has been estimated as 4,480 sq. ft. The breakup of space requirement is provided in Table 4.

Table 4: Breakup of Land of Manufacturing unit

Description	% Break-Up	Number	Area (Sq. Ft.)
Executive Office	3%	1	150
Admin & Accounts Department	3%	1	150
Sales & Marketing Department	3%	1	150
Procurement Office	3%	1	120
Raw Material Store	7%	1	320
Production Area	50%	1	2,250
Assembly & Quality Control Area	4%	1	180
Painting & Designing Area	4%	1	180
Finished Goods Store	8%	1	360
Parking Area	7%	1	300
Washroom	7%	4	320
Total	100%		4,480

9.2.2 Building

There will be no cost of building since the proposed manufacturing unit of crockery will be started in the rented premises. However, there will be a renovation cost, required to make the building usable for the business. The proposed manufacturing unit requires estimated electricity load of around 1032 KW for which an electricity connection under the industrial supply tariff, three phase will be required. Manufacturing Unit Building rent of PKR 246,400 per month respectively has been included in the operating cost. Table 5 provides details of building renovation cost.

Table 5: Renovation Cost

Cost Item	Unit of Measurement	Total Units	Cost/Unit/Sq.foot	Total Cost (PKR)
Paint Cost	Liter	103	800	82,568
Labour Cost - Paint	Feet	10,321	15	154,815
Blinds	Units	8	7,000	56,000
Glass Partition	Sq. Feet	873	550	480,150
Tiles	Sq. Feet	570	350	199,500
Labour Cost - Tiles	Sq. Feet	570	40	22,800
Wall Racks - Production and Store Rooms	No.	40	15,000	600,000
Wall Racks - Office	No.	10	10,000	100,000
Total				1,695,833

9.2.3 Machinery and Equipment

Table 6 provides details of machinery and equipment required for the project.

Table 6: Machinery and Equipment

Cost Item	Unit(s)	Unit Cost (PKR)	Total Cost (PKR)
Ball Mill Machine	1	1,600,000	1,600,000
Pug Mill Machine	1	360,000	360,000
Filter Press Machine	1	1,300,000	1,300,000
Single Head Roller Press Machine	1	1,275,000	1,275,000
Industrial Ceramic Shuttle Kiln	1	6,000,000	6,000,000

Electric Pottery Wheel	4	75,000	300,000
Industrial Transportation Trolley (3 shelves)	15	12,000	180,000
Water Pump (2 HP)	1	25,000	25,000
Diesel Power Generator (50 Kw)	1	850,000	850,000
Total			11,890,000

9.2.4 Allied Equipment

Table 7 shows allied equipment required for manufacturing unit

Table 7: Allied Equipment

Cost Item	No. of Equipment	Cost per Equipment (PKR)	Total Cost (PKR)
Mechanical Tool Kit	4	12,000	48,000
Electrical Tool Kit	4	10,000	40,000
Total			88,000

9.2.5 Office Equipment Requirement

Table 8 present the office equipment requirement for manufacturing unit.

Table 8: Office Equipment Requirement

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Air Conditioner (1 Ton)	6	90,000	540,000
Laptop	3	150,000	450,000
Desktop Computer	4	75,000	300,000
Inkjet Printer	2	40,000	80,000
LED/LCD 32	2	40,000	80,000
Water Dispenser	2	25,000	50,000
Ceiling Fan	26	8,000	208,000
Exhaust Fan	18	4,500	81,000
Pedestal Fan	20	10,000	200,000
Wi-Fi Router and Connection	2	3,500	7,000

Security System (16 Cams , 1 MP)	16	2,500	40,000
DVR	2	15,000	30,000
Total			2,066,000

9.2.6 Furniture and Fixture Requirement

Table 9 gives details of the furniture and fixture required for the project.

Table 9: Furniture and Fixtures Requirement

Cost Item	Units	Unit Cost(PKR)	Total Cost(PKR)
Executive Table	1	60,000	60,000
Office Table	5	30,000	150,000
Executive Chairs	1	30,000	30,000
Office Chair	10	14,000	140,000
Staff Plastic Chair(s)	16	2,000	32,000
Staff Table	5	6,000	30,000
Visitor Chairs	10	5,000	50,000
Sofa Sets	3	45,000	135,000
Total			627,000

9.2.7 Vehicle Requirement

Details of vehicles required for the project is given in Table 10.

Table 10: Vehicle Requirement

Cost Item	Unit(s)	Unit Cost (PKR)	Total Cost (PKR)
Loader Rickshaw	1	350,000	350,000
Motorcycle	1	120,000	120,000
Registration- Loader Rickshaw		13,000	13,000
Registration- Motorcycle		6,000	6,000
Total			489,000

9.2.8 Pre-Operating Cost Requirement

Details of pre operating cost required for the project is given in Table 11.

Table 11: Pre-Operating Cost Requirement

Cost Item	Total (PKR)
Administration Expense	446,000
Utilities Expense	2,933,861
Total (PKR)	3,379,861

9.2.9 Advance against Building Rent

Details of advance against building rent for the project is given in Table 12.

Table 12: Advance against Building Rent

Cost Item	Months	Unit Cost (PKR)	Total Cost (PKR)
Advance Against Building Rent	3	246,400	739,200
Total Cost (PKR)			739,200

9.3 Breakeven Analysis

Table 13 shows calculation of break-even analysis.

Table 13: Break-Even Analysis

Description	Amount First Year (PKR)	Ratios
Sales (PKR) – A	80,902,500	100%
Variable Cost (PKR) – B	61,016,698	75%
Contribution (PKR) (A-B) = C	19,885,802	25%
Fixed Cost (PKR) – D	17,063,638	21%
Breakeven Revenue	69,420,937	
Breakeven Units	4,145	
Breakeven Capacity	49%	

9.4 Revenue Generation

Based on 60% capacity utilization, sales revenue during the first year of operations is shown in Table 14.

Table 14: Revenue Generation

Product	Unit Sold	Price (PKR)	Total Revenue (PKR)
Dinner Set	2,415	24,500	59,167,500
Tea Set	2,415	9,000	21,735,000
Total	4,830		80,902,500

9.5 Variable Cost Estimate

Variable costs of the project have been provided in Table 15.

Table 15: Variable Cost Estimate

Description of Costs	Amount (PKR)
Material Cost- Dinner Set	7,003,500
Material Cost- Tea Set	2,332,890
Packing Cost	796,950
Material Transportation Cost	466,820
Direct Electricity	34,557,926
Direct Labor	9,264,000
Consumables	800,500
Fuel Cost-Generator	3,455,793
Machinery Maintenance – Cost	594,500
Communications expense (phone, fax, mail, internet, etc.)	780,000
Office vehicles running expense	183,820
Office expenses (stationery, entertainment, janitorial services, etc.)	780,000
Total Variable Cost	61,016,699

Table 16: Material Cost

Particulars	Price Per Ton (PKR)	Price per KG (PKR)
China Clay	150,000	150
Feldspar	130,000	130
Quartz	100,000	100

Table 17: Formulation of Clay

Particulars	Proportion (%)	1 KG of Clay Mixture Cost (PKR)
China Clay	50%	75
Feldspar	22%	28.6
Quartz	18%	18
Water	10%	
Total	100%	121.6

Table 18: Clay's Weight

Item	Clay's weight (Grams) ***
Small Plate	650
Medium Plate	750
Large Plate	900
Small Bowl	630
Medium Curry Bowl	1,800
Large Curry Bowl	2,200
Soup Bowl	800
Large Rice Tray	2,000
Salt Pot	140
Total Clay Weight Of Dinner Set (Grams)	9,870
Total Clay Weight Of Dinner Set (Kilograms)	9.87
Tea Set	

Tea Cup	450
Cup Saucer	370
Tea Pot	1,300
Milk Pot	1,000
Sugar Pot	175
Total Clay Weight of Tea Set (Grams)	3,295
Total Clay Weight of Tea Set (Kilograms)	3.30

Table 19: Wastage During Formation

Particulars	Clay Required (KG)	Wastage (%)	Weight of Before Firing Process (KG)
Dinner Set	16.02	30%	12.32
Tea Set	3.60	30%	2.77

Table 20: Cost

Particulars	Total Weight of Clay (KG)	Raw Material Price per KG (PKR)	Clay Cost (PKR)
Dinner Set	12.83	30%	9.87
Tea Set	4.28	30%	3.295

Table 21: Glaze Consumption

Particulars	Counsumption (KG)	Cost (PKR)
Dinner Set	2.69	1,340
Tea Set	0.90	446

* 1 Gram of clay consumes 0.2727 grams of Glaze

Table 22: Glaze

Particulars	Proportion (%)	Price Per Ton (PKR)	Price Per KG (PKR)
Wallastonite	10%	43,500	43.5
FRIT 3134	25%	73,000	73
Kaolin	22%	150,000	150
Quartz	15%	100,000	100
Feldspar	18%	130,000	130
Water	10%		
Total	100%	496,500	496.5

Table 23: Production Cost

Particulars	Cost (PKR)
Dinner Set	2,900
Tea Set	966

Table 24: Packing Cost

Particulars	Printed Packing Box Price per Unit (PKR)	Packing Paper Price per Unit (PKR)	Total Packing Cost (PKR)
Dinner Set	150	50	200
Tea Set	100	30	130

Table 25: Consumables

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Sand Paper	8	5,000	40,000
Water Buckets	12	700	8,400
Sponges	45	100	4,500
Overglazing Brushes	15	400	6,000
Wooden Potter Ribs (Set of 3)	7	5,000	35,000
Wire Clay Cutter	10	300	3,000
Potters Needle	8	450	3,600

Plaster of Paris Moulds	1,000	700	700,000
Total			800,500

Table 26: Direct Labor

Post	No. of personnel	Monthly Salary (PKR)	Annual Salary (PKR)
Production Manager	1	120,000	1,440,000
Production Supervisor	1	80,000	960,000
Skilled Labor	8	35,000	3,360,000
Unskilled Labor	9	28,000	3,024,000
Furnance Operator	1	40,000	480,000
Total			9,264,000

Table 27: Machinery Maintenance Cost

Cost Item	Cost of Machinery (PKR)	Machinery Maintenance Rate	Total Cost (PKR)
Machinery Maintenance Cost	11,890,000	5%	594,500
Total Cost (PKR)			594,500

9.6 Fixed Cost Estimate

Table 28 shows the estimated fixed cost of the project.

Table 28: Fixed Cost Estimate

Description of Costs	Amount (PKR)
Management Staff	7,800,000
Administration benefits expense	511,920
Building rental expense	2,956,800
Indirect Electricity	648,401
Promotional expense	1,618,050
Depreciation expense	2,447,983
Amortization of pre-operating costs	675,972
Total Fixed Cost	16,659,126

Table 29: Management Staff Salary

Post	No of personnel	Monthly Salary (PKR)	Annual Salary (PKR)
Marketing Manager	1	80,000	960,000
Marketing Officers	2	50,000	1,200,000
Raw Material Store Incharge	1	50,000	600,000
Finished Goods Store Incharge	1	50,000	600,000
Accountant	1	70,000	840,000
Quality Control Staff	2	40,000	960,000
Mechanical Technician	1	40,000	480,000
Driver	1	30,000	360,000
Office Boy	2	25,000	600,000
Security Guards	4	25,000	1,200,000
Total (PKR)	16		7,800,000

9.7 Financial Feasibility Analysis

The financial feasibility analysis provides the information regarding projected Internal Rate of Return (IRR), Net Present Value (NPV) and Payback period of the proposed business, which is shown in Table 30.

Table 30: Financial Feasibility Analysis

Description	Project
IRR	55%
NPV (PKR)	50,030,783
Payback Period (years)	2.75
Projection Years	10
Discount rate used for NPV	25%

9.8 Financial Feasibility Analysis with 50% Debt

The financial feasibility analysis provides the information regarding projected IRR, NPV and payback period of the proposed business on the basis of Debt: Equity Model (50:50), which is shown in Table 31.

Table 31: Financial Feasibility Analysis with 50% Debt

Description	Project
IRR	54%
NPV (PKR)	61,190,415
Payback Period (years)	2.83
Projection Years	10
Discount rate used for NPV	22%

9.9 Human Resource Requirement

For the 1st year of operations, the manufacturing of crockery shall require the workforce at a salary cost shown in Table 32.

Table 32: Human Resource Requirement

Post	No of Personnel	Monthly Salary (PKR)	Annual Salary (PKR)
Production Manager	1	120,000	1,440,000
Production Supervisor	1	80,000	960,000
Skilled Labor	8	35,000	3,360,000
Unskilled Labor	9	28,000	3,024,000
Marketing Manager	1	80,000	960,000
Marketing Officers	2	50,000	1,200,000
Raw Material Store Incharge	1	50,000	600,000
Finished Goods Store Incharge	1	50,000	600,000
Accountant	1	70,000	840,000
Furnance Operator	1	40,000	480,000
Quality Control Staff	2	40,000	960,000
Mechanical Technician	1	40,000	480,000

Driver	1	30,000	360,000
Office Boy	2	25,000	600,000
Security Guards	4	25,000	1,200,000
Total (PKR)	36		17,064,000

10 CONTACT DETAILS

Contact details of some suppliers of the relevant machinery and equipment are provided in Table 33.

Table 33: Contact Details

Supplier Name	Type	Address	Contact Number	Email/Web Address
Shaheen Grinding Mill (Lahore)	China Clay	9 km Bhoptian Chowk, Off Raiwind Road Lahore	042-35322531 042-35322532	https://shaheengrinding.com/
Eastern Commodities (Karachi)	China Clay	29 / 3 D Block -6, Raja Manzil, Nursery Commercial Area, Karachi	021-4520330	https://ecmine.com/
Miz Builders (Kasur)	Quartz	Plaza#12, Saif City Housing Scheme, Kasur Bypass, Kasur	0322-4138328	w https://www.mizbuilders.com/
Faryal International (Karachi)	Feldspar	Room No 33, 3Rd Floor, Al Rehman Trade Centre Karachi	042- 37934233	https://www.paktherm.com.pk/?page_id=73
Paktherm	Kiln furnace	11Km. Sharakpur Road Sagian, Moti Fouji Road, Near Almugni Trust Nain Sukh. Lahore	021-32761005	https://www.paktherm.com.pk/
Accurate Engineering (Faisalabad)	Machine ry	1315-B, Peoples Colony #1, Faisalabad	0300-7678403	http://www.accurateengineering.com.pk/product/ball-mill.html
King Engineering (Karachi)	Machine ry	Plot # R-948, Sector 33-E, Korangi No. 2½, Industrial Area, Karachi	0313- 2737285	https://kingengineering.pk/filter-press-manual/

11 USEFUL WEB LINKS

Table 34: Useful Web Links

Name of the Organization	Email/Website
Small and Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
National Business Development Program	www.nbdp.org.pk
Government of Pakistan	www.pakistan.gov.pk
Federal Ministry of Industries & Production	www.moip.gov.pk/
State Bank of Pakistan	www.sbp.org.pk
Trade Development Authority of Pakistan	www.tdap.gov.pk
Punjab Small Industries Corporation (PSIC)	www.psic.org.pk
Sindh Small Industries Corporation (SSIC)	www.ssic.gos.pk
Small Industries Development Board KPK	www.small_industries_de.kp.gov.pk
Industries and Commerce Department Balochistan	www.dgicd.gob.pk/
Federal Board of Revenue	www.fbr.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	www.sindh.gov.pk
Government of Khyber Pakhtunkhwa	www.kp.gov.pk
Government of Balochistan	www.balochistan.gov.pk
Government of Azad Jammu and Kashmir	www.ajk.gov.pk
Government of Gilgit Baltistan	www.gilgitbaltistan.gov.pk
Punjab Board of Investment and Trade	www.pbit.gop.pk/
Small Industries Development Board Khyber Pakhtunkhwa	www.small_industries_de.kp.gov.pk

12 ANNEXURES

12.1 Income Statement

Calculations	SMDA									
Income Statement										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue - Dinner Set	59,167,500	74,130,924	88,795,606	105,848,968	125,533,507	148,341,270	174,683,281	205,116,620	228,547,923	254,145,290
Revenue- Tea Set	21,735,000	27,231,768	32,618,794	38,883,294	46,114,349	54,492,712	64,169,368	75,348,962	83,956,380	93,359,494
Total Revenue	80,902,500	101,362,692	121,414,401	144,732,262	171,647,856	202,833,982	238,852,649	280,465,582	312,504,302	347,504,784
Cost of sales										
Material Cost- Dinner Set	7,003,500	8,703,663	10,341,055	12,227,304	14,383,828	16,859,610	19,692,806	22,936,537	25,349,827	27,960,859
Material Cost- Tea Set	2,332,890	2,899,220	3,444,641	4,072,957	4,791,303	5,615,994	6,559,742	7,640,239	8,444,115	9,313,858
Packing Cost	796,950	990,417	1,176,741	1,391,383	1,636,780	1,918,507	2,240,906	2,610,020	2,884,635	3,181,753
Material Transportation Cost	466,820	639,899	838,590	1,093,682	1,419,091	1,834,674	2,363,712	3,036,619	3,701,800	4,503,643
Direct Electricity	34,557,926	40,395,335	46,939,380	54,265,276	62,455,715	71,601,574	81,802,692	93,168,721	100,529,050	108,470,845
Direct Labor	9,264,000	10,162,608	11,148,381	12,229,774	13,416,062	14,717,420	16,145,010	17,711,076	19,429,050	21,313,668
Consumables	800,500	882,952	973,896	1,074,207	1,184,850	1,306,890	1,441,499	1,589,974	1,753,741	1,934,376
Fuel Cost-Generator	3,455,793	4,455,606	5,710,687	7,281,964	9,244,304	11,689,613	14,730,608	18,505,410	22,023,974	26,211,546
Machinery Maintenance - Cost	594,500	655,734	723,274	797,771	879,942	970,576	1,070,545	1,180,811	1,302,435	1,436,585
Total Cost of Sales	59,272,878	69,785,432	81,296,644	94,434,319	109,411,875	126,514,858	146,047,519	168,379,407	185,418,626	204,327,134
Gross Profit	21,629,622	31,577,260	40,117,756	50,297,943	62,235,981	76,319,124	92,805,131	112,086,175	127,085,676	143,177,650
General administration & selling expenses										
Management Staff	7,800,000	8,556,600	9,386,590	10,297,089	11,295,907	12,391,610	13,593,596	14,912,175	16,358,656	17,945,446
Administration benefits expense	511,920	561,576	616,049	675,806	741,359	813,271	892,158	978,698	1,073,631	1,177,773
Building rental expense	2,956,800	3,252,480	3,577,728	3,935,501	4,329,051	4,761,956	5,238,152	5,761,967	6,338,163	6,971,980
Indirect Electricity	648,401	699,624	754,895	814,531	878,879	948,311	1,023,227	1,104,062	1,191,283	1,285,394
Communications expense (phone, fax, mail, internet, etc.)	780,000	855,660	938,659	1,029,709	1,129,591	1,239,161	1,359,360	1,491,218	1,635,866	1,794,545
Office vehicles running expense	183,820	202,753	223,637	246,672	272,079	300,103	331,014	365,108	402,714	444,194
Office expenses (stationery, entertainment, janitorial services, etc.)	780,000	855,660	938,659	1,029,709	1,129,591	1,239,161	1,359,360	1,491,218	1,635,866	1,794,545
Promotional expense	1,618,050	2,027,254	2,428,288	2,894,645	3,432,957	4,056,680	4,777,053	5,609,312	6,250,086	6,950,096
Depreciation expense	2,447,983	2,447,983	2,447,983	2,471,154	2,471,154	2,453,554	1,730,460	4,530,938	4,507,767	4,547,928
Amortization of pre-operating costs	675,972	675,972	675,972	675,972	675,972	-	-	-	-	-
Bad debt expense	404,513	506,813	607,072	723,661	858,239	1,014,170	1,194,263	1,402,328	1,562,522	1,737,524
Miscellaneous expense 1	-	-	-	-	-	-	-	-	-	-
Subtotal	18,807,458	20,642,377	22,595,532	24,794,450	27,214,779	29,217,976	31,498,642	37,647,022	40,956,554	44,649,424
Operating Income	2,822,164	10,934,883	17,522,224	25,503,493	35,021,202	47,101,148	61,306,489	74,439,153	86,129,122	98,528,226
Gain / (loss) on sale of machinery & equipment	-	-	-	-	-	-	2,972,500	-	-	-
Gain / (loss) on sale of office equipment	-	-	-	-	-	-	516,500	-	-	-
Gain / (loss) on sale of office vehicles	-	-	-	-	-	-	122,250	-	-	-
Earnings Before Interest & Taxes	2,822,164	10,934,883	17,522,224	25,503,493	35,021,202	47,101,148	64,917,739	74,439,153	86,129,122	98,528,226
Subtotal	-	-	-	-	-	-	-	-	-	-
Earnings Before Tax	2,822,164	10,934,883	17,522,224	25,503,493	35,021,202	47,101,148	64,917,739	74,439,153	86,129,122	98,528,226
Tax	1,011,281	2,078,721	3,863,612	6,058,461	8,801,361	12,425,344	18,143,265	21,237,725	25,315,193	29,654,879
NET PROFIT/(LOSS) AFTER TAX	1,810,882	8,856,162	13,658,612	19,445,033	26,219,841	34,675,803	46,774,474	53,201,428	60,813,929	68,873,347

12.2 Balance Sheet

Calculations											SMEDA
Balance Sheet											
Assets	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Current assets</i>											
Cash & Bank	1,000,000	1,513,676	7,048,713	12,596,924	18,760,408	25,352,919	31,803,945	47,843,956	101,065,073	161,539,764	234,623,969
Accounts receivable		2,216,507	2,496,783	3,051,741	3,645,845	4,333,974	5,129,888	6,050,502	7,113,948	8,122,875	9,041,220
Raw material inventory	389,016	533,249	698,825	911,402	1,182,576	1,528,895	1,969,760	2,530,516	3,084,833	3,753,036	-
Equipment spare part inventory	12,385	14,973	18,100	21,881	26,452	31,977	38,657	46,732	56,494	68,294	-
Finished Goods inventory	-	2,724,083	3,537,566	4,545,565	5,823,991	7,442,705	9,492,560	12,086,805	15,370,282	18,669,029	22,691,851
Pre-paid building rent	246,400	271,040	298,144	327,958	360,754	396,830	436,513	480,164	528,180	580,998	-
Total Current Assets	1,647,802	7,273,527	14,098,132	21,455,472	29,800,025	39,087,300	48,871,323	69,038,675	127,218,810	192,733,997	266,357,040
<i>Fixed assets</i>											
Land	-	-	-	-	-	-	-	-	-	-	-
Building/Infrastructure	1,695,833	1,526,250	1,356,666	1,187,083	1,017,500	847,917	678,333	508,750	339,167	169,583	(0)
Machinery & equipment	11,890,000	10,106,500	8,323,000	6,539,500	4,756,000	2,972,500	1,189,000	22,586,853	19,198,825	15,810,797	12,422,769
Furniture & fixtures	627,000	532,950	438,900	344,850	250,800	156,750	62,700	1,191,081	1,012,419	833,757	655,095
Office vehicles	489,000	415,650	342,300	268,950	195,600	122,250	48,900	1,015,242	862,956	710,670	558,383
Office equipment	2,066,000	1,756,100	1,446,200	1,136,300	826,400	516,500	206,600	3,924,679	3,335,978	2,747,276	2,158,574
Advance Against Building Rent	739,200	739,200	739,200	739,200	739,200	739,200	739,200	739,200	739,200	739,200	739,200
Total Fixed Assets	17,595,033	15,147,050	12,699,066	10,366,938	7,895,784	5,424,629	3,123,602	30,110,999	25,580,061	21,273,100	16,725,172
<i>Intangible assets</i>											
Pre-operation costs	3,379,861	2,703,888	2,027,916	1,351,944	675,972	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	3,379,861	2,703,888	2,027,916	1,351,944	675,972	-	-	-	-	-	-
TOTAL ASSETS	22,622,695	25,124,465	28,825,115	33,174,354	38,371,781	44,511,930	51,994,925	99,149,674	152,798,871	214,007,097	283,082,212
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable		690,887	868,897	1,055,591	1,278,536	1,544,039	1,861,731	2,242,006	2,689,775	3,084,071	3,285,839
Total Current Liabilities	-	690,887	868,897	1,055,591	1,278,536	1,544,039	1,861,731	2,242,006	2,689,775	3,084,071	3,285,839
<i>Other liabilities</i>											
<i>Shareholders' equity</i>											
Paid-up capital	22,622,695	22,622,695	22,622,695	22,622,695	22,622,695	22,622,695	22,622,695	22,622,695	22,622,695	22,622,695	22,622,695
Retained earnings		1,810,882	5,333,522	9,496,067	14,470,550	20,345,196	27,510,499	74,284,973	127,486,401	188,300,330	257,173,677
Total Equity	22,622,695	24,433,578	27,956,217	32,118,763	37,093,245	42,967,891	50,133,195	96,907,668	150,109,096	210,923,026	279,796,372
TOTAL CAPITAL AND LIABILITIES	22,622,695	25,124,465	28,825,115	33,174,354	38,371,781	44,511,930	51,994,925	99,149,674	152,798,871	214,007,097	283,082,212

12.3 Cash Flow Statement

Calculations	SMEDA										
Cash Flow Statement											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Operating activities</i>											
Net profit		1,810,882	8,856,162	13,658,612	19,445,033	26,219,841	34,675,803	46,774,474	53,201,428	60,813,929	68,873,347
Add: depreciation expense		2,447,983	2,447,983	2,447,983	2,471,154	2,471,154	2,453,554	1,730,460	4,530,938	4,507,767	4,547,928
amortization of pre-operating costs		675,972	675,972	675,972	675,972	675,972	-	-	-	-	-
Finished goods inventory		(2,724,083)	(813,483)	(1,007,999)	(1,278,425)	(1,618,714)	(2,049,856)	(2,594,245)	(3,283,477)	(3,298,747)	(4,022,822)
Equipment inventory	(12,385)	(2,587)	(3,128)	(3,781)	(4,571)	(5,525)	(6,680)	(8,075)	(9,762)	(11,801)	68,294
Raw Material Inventory	(389,016)	(144,233)	(165,576)	(212,577)	(271,174)	(346,319)	(440,865)	(560,756)	(554,318)	(668,203)	3,753,036
Pre-paid building rent	(246,400)	(24,640)	(27,104)	(29,814)	(32,796)	(36,075)	(39,683)	(43,651)	(48,016)	(52,818)	580,998
Accounts payable		690,887	178,010	186,694	222,944	265,503	317,692	380,275	447,769	394,297	201,768
Cash provided by operations	(647,802)	513,676	10,868,560	15,160,133	20,634,034	26,937,707	34,114,052	44,757,867	53,221,116	60,675,498	73,084,204
<i>Financing activities</i>											
Issuance of shares	22,622,695	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares											
Cash provided by / (used for) financing activities	22,622,695	-	-	-	-	-	-	-	-	-	-
<i>Investing activities</i>											
Capital expenditure	(20,974,894)	-	-	(115,855)	-	-	(152,527)	(28,717,857)	-	(200,806)	-
Acquisitions											
Cash (used for) / provided by investing activities	(20,974,894)	-	-	(115,855)	-	-	(152,527)	(28,717,857)	-	(200,806)	-
NET CASH	1,000,000	513,676	10,868,560	15,044,278	20,634,034	26,937,707	33,961,526	16,040,011	53,221,116	60,474,691	73,084,204

13 KEY ASSUMPTIONS

13.1 Operating Cost Assumptions

Table 35: Operating Cost Assumptions

Descriptions	Details
Building rent growth rate	10%
Furniture and fixture depreciation	15%
Vehicle depreciation	15%
Office equipment depreciation	15%
Inflation growth rate	10.3%
Wage growth rate	9.7%
Electricity price growth rate	7.9%
Office equipment price growth rate	9.6%
Office vehicle price growth rate	11%

13.2 Revenue Assumptions

Table 36: Revenue Assumptions

Description	Details
Sale price growth rate	11.2%
Initial year capacity utilization	60%
Capacity growth rate	5%
Maximum capacity utilization	95%

13.3 Financial Assumptions

Table 37: Financial Assumptions

Description	Details
Project life (Years)	10
Debt: Equity	0:100
Discount Rate	25%
Discount Rate (50% Debt: 50% Equity)	22%

13.4 Debt-Related Assumption

Figure 38: Debt-Related Assumption

Description of Cost	Details
Project Life (Years)	10
Debt: Equity	50:50
Discount Rate	22%
Debt Tenure	5 years
Grace Period	1 Year
Interest Rate (KIBOR+3%)	19%

13.5 Cash Flow Assumptions

Table 38: Cash Flow Assumptions

Description	Day(s)
Accounts receivable cycle	10
Accounts payable cycle	20

Small and Medium Enterprises Development Authority

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REGIONAL OFFICE PUNJAB	REGIONAL OFFICE SINDH	REGIONAL OFFICE KPK	REGIONAL OFFICE BALOCHISTAN
3 rd Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road Lahore, Tel: (042) 111-111-456 Fax: (042) 36304926-7 helpdesk.punjab@smeda.org.pk	5 TH Floor, Bahria Complex II, M.T. Khan Road, Karachi. Tel: (021) 111-111-456 Fax: (021) 5610572 helpdesk-khi@smeda.org.pk	Ground Floor State Life Building The Mall, Peshawar. Tel: (091) 9213046-47 Fax: (091) 286908 helpdesk-pew@smeda.org.pk	Bungalow No. 15-A Chaman Housing Scheme Airport Road, Quetta. Tel: (081) 831623, 831702 Fax: (081) 831922 helpdesk-qta@smeda.org.pk