Pre-feasibility Study

PRODUCTION UNIT FOR CANDY AND OTHER CONFECTIONERY PRODUCTS

September 2021

"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, andrevenues 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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2. EXECUTIVE SUMMARY

Candy also called sweets, is a confection[1] that features sugar as a principal ingredient. Vegetables, fruit or nuts which have been glazed and coated with sugar are said to be candied. Confectionery is the art of making confections, which includes food items that are rich in sugar and carbohydrates. These have two broader categories i.e. bakery and sugar confections.

Bakers' confectionery, also called flour confections, includes primarily sweet pastries, cakes, and similar baked goods. Sugar confectionery includes candies/sweets, candied nuts, chocolates, chewing/bubble gum and other confections that are made mainly from sugar.

With population growing at a fast pace and changing trends in the local consumer market, the demand for confectionery items has gone up. Pakistan's food product market size was recorded at PKR 155 billion in the year 2020 (PKR 130 billion in 2019), up by 19% at a CAGR (Cumulative Aggregate Growth Rate) of 6% during 2016 to 2020.[2]

This "Pre-feasibility Document" provides details for setting up a "Production Unit for Candy and Other Confectionery Products". The products selected for this study include candies, chocolates, cupcakes, cookies/biscuits and chewing gums. The increasing consumption trends of candies and confectionery products make the proposed project an attractive investment opportunity.

This unit may be established in industrial areas of major cities like Karachi, Lahore, Islamabad, Peshawar, Quetta or in other large cities like Faisalabad, Multan, Rawalpindi, Bahawalpur, Sargodha, Sialkot, Sukkur, Gujranwala, Mardan, Lasbela, etc. These cities have been proposed due to presence of strong supply chain. Availability of large consumer base and skilled, low-cost labor and presence of good quality industrial infrastructure are important factors to make these cities favorable locations for setting up such a unit.

The proposed unit has an annual capacity of producing 300,000 boxes of candies, 131,250 boxes of chocolates, 291,667 boxes of cupcakes, 250,000 boxes of cookies/biscuits and 770,000 boxes of chewing gums at a maximum capacity of 100%. However, the operating capacity during the first year of operation has been assumed to be 60% which translates into 180,000 boxes of candies, 78,750 boxes of chocolates, 175,000 boxes of cupcakes, 150,000 boxes of cookies/biscuits and 462,000 boxes of chewing gums. A 5% annual increase of capacity utilization has been assumed to achieve a maximum operational capacity of 90% in year 7.

The production unit will be set up in a rented building with an area of 4,500 square feet. The project requires a total investment of PKR 53.42 million. This includes

[1] A confection is a food loaded with sugar. Candies, Chocolates, cakes, lollipops, bonbons and all manner of food that's full of sugary deliciousness are all confections.

[2] https://www.pacra.com/sector_research/Food%20Products%20-%20PACRA%20Research%20-%20Dec'20_1608986137.pdf

capital investment of PKR 46.44 million and working capital of PKR 6.98 million. It is proposed that the project shall be financed through 100% equity. The Net Present Value (NPV) of project is PKR 47.69 million with an Internal Rate of Return (IRR) of 27% and a Payback period of 4.29 years. Further, this project is expected to generate Gross Annual Revenues of PK 171.92 million during 1st year, Gross Profit (GP) ratio ranging from 17% to 20% and Net Profit (NP) ratio ranging from 2% to 10% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 47% (826,330 boxes) with annual breakeven revenue of PKR 135.85 million.

The proposed project may also be established using leveraged financing. At 50% financing at a cost of KIBOR+3%, the proposed business provides Net Present Value (NPV) of PKR 71.22 million, Internal Rate of Return (IRR) of 26% and Payback period of 4.42 years. Further, this project is expected to generate Net Profit (NP) ratio ranging from 2% to 10% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 48% with breakeven revenue of PKR 137.97 million.

The proposed project will provide employment opportunities to 57 people, working in single shift of 8 hours during 300 days in a year. 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. The legal business status of this project is proposed as “Company”. Further, the proposed project may also be established as a “Partnership Concern”.

3. INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with the 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 'sectorial 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 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 facilitate potential investors in production of candies and other confectionary items by providing a general understanding of the business with the intention of supporting them in 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 & SERVICES

This document provides details for the manufacturing of candies and other confectionary items. Sweets, candies and chocolates collectively are called confectionery products; which possess high sugar content and carbohydrates. Confectionery items are divided into two broad categories; the bakers' confectionery and the sugar confectionery.

In Pakistan, bakers' confectionery products include the most popular traditional sweets of different varieties, as well as cakes, pastries; whereas sugar confectioneries include chocolates, jellies, candies, lollypops and chewing gums. This report focuses on the production of candies, chocolates, chewing gums, cupcakes, cookies/biscuits.

5.1. Machinery Used

A brief description of production lines and other machinery used for the products is given as under.

Production Line – Candies

Production line is an arrangement in which products being manufactured are passed through a sequence of operations at different sets of machines (melting sugar pot, raw material mixer, raw material storage tank, pouring and cooling system, etc.). The proposed production line for candies consists of storage tanks, cookers, cooling tunnel, molds and packing machine. Production lines with different capacities exist. The maximum production capacity of the production line proposed in this study is 50 kg per hour. Candies with weight of 3.5 grams each can be made at the proposed production line. Electrical power of the candies production line is 18 KW. Figure 1 shows the production line for candies.

Figure 1: Production Line - Candies

Wrapping Machine – Candies

An automatic machine is used for piece-by-piece wrapping of mass-produced articles (such as candies, chewing gum, etc.). A wrapping machine usually consists of a wrapping mechanism; a transporting device that receives, moves, and unloads the articles, rolls of wrapping material or a magazine with previously prepared labels (rolls) and a gluing device and sometimes a counting mechanism. Wrapping materials used include paper, cellophane (a thin and transparent sheet made from cellulose), and foil. A wrapping machine can be used as an independent unit or as a part of an automatic prepacking and packaging machine. The proposed machine has a capacity of wrapping 250 candies per minute. Power consumption of the machine is 2.4 KW. Figure 2 shows wrapping machine.

Figure 2: Wrapping Machine - Candies

Automatic Production Line - Chocolate

The proposed production line of chocolates comprises of different set of machines (raw material mixer, raw material storage tank, pouring and cooling system, etc.). The production capacity of the production line proposed for this study is 100 kg per hour. Chocolates with weight of 30 grams each can be made through proposed production line. The line has an electrical power of 20 KW. Figure 3 shows automatic production line to make chocolates.

Figure 3: Automatic Production Line - Chocolate

Wrapping Machine - Chocolate

First the bar is loaded into position with the foil and paper beneath it. The worker then spins the bar into the machine where the foil is wrapped. After the foil wrapping is completed, a new bar is placed onto the loading point. Capacity of the proposed machine is 60 chocolates per minute. Electrical power of the proposed machine is 3.8 KW. Figure 4 shows automatic wrapping machine for chocolates.

Figure 4: Wrapping Machine - Chocolate

Figure 5: Printed Wrapping Film

Production Line – Cupcake

Cupcake making production line includes mixer and cake forming machine. The cake forming machine consists of injection molding machine and baking tunnel. These machines are fully automated, using touch screen and computer programming for operation. Touch screen is used for insertion of commands and instructions for machines and computer programing control the operations of machines. The cake injection molding machine automatically injects cake ingredients into the cake pan and delivers them into the cake baking oven for baking. The amount of ingredients injected can be flexibly adjusted according to product requirements. It is suitable for the production of cake products such as cupcakes, egg yolk pie, milk cake etc. It has

a compact structure, allows flexible movement and is convenient to operate. Figure 6 shows automatic cupcake making machine.

Figure 6: Automatic Cupcake Making Machine

Production Line - Cookies

The proposed automatic production line for making bakery cookies has a capacity of 100kg/hour. The fully automatic production line uses advanced technology and is suitable for manufacturing small, medium and large biscuit/cookies. The proposed production machine is fully automatic which makes it easy to operate. It saves energy, does not cause noise or pollution and works with minimum wastage of material. Figure 7 shows automatic production line for cookies.

Figure 7: Automatic Production line - Cookies

Wrapping Machine - Cookies

A wrapping machine takes a group of items and wraps them together for shipping. There are several types of packing machines that are available. Capacity of the proposed machine is 50 units per minute. Figure 8 shows automatic wrapping machine for cookies.

Figure 8: Automatic Wrapping Machine - Cookies

Chewing Gum - Production Line

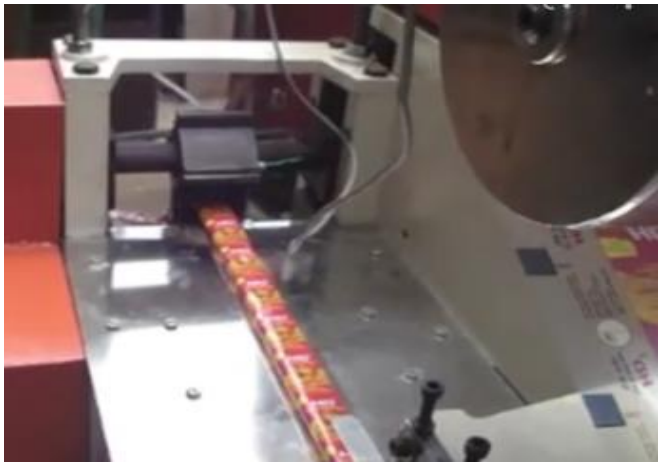
Electric power of the proposed automatic production line of chewing gum is 50 KW. Figure 9 shows automatic chewing gum making production line.

Figure 9: Automatic Production Line – Chewing Gum

Wrapping Machine

Automatic wrapping machine is used to wrap bubble gum pellets/pieces individually in wrappers. It works in the same manner as a chocolate wrapping machine. Electric power of the proposed machine is 2.4 KW with a capacity of wrapping 60 units per minute. Figure 10 shows chewing gum wrapping machine.

Figure 10: Chewing Gum Wrapping Machine

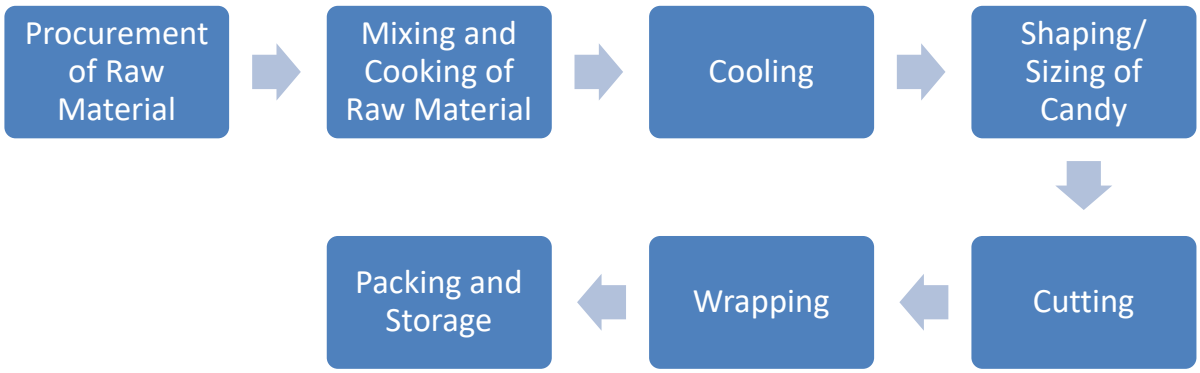


5.2. The Production Processes

The production of confectionery items is usually done in batches. The production process of each item is briefly discussed hereunder. Figure 11 shows production process flow of candies.

Candies

Figure 11: Production Process – Candies



Procurement of Raw Materials

The key raw materials used to make candies include sugar, light corn syrup, citric acid and flavors. These are purchased from the local market in bulk quantities according to the requirement of production. Wrapping and packing materials including wrapping film/roll and boxes are also purchased in bulk quantities. Procurement of raw materials is done by procurement department.

Mixing and Cooking of Raw Material

Production of candies starts with mixing of sugar, light corn syrup, citric acid, flavors (apple, strawberry, guava, mango, etc.) and water in the mixer. After mixing of raw materials, the material is transferred to pan for cooking. Pan is a part of the

automatic candies production line. Mixture (mixed material) is cooked in the pan at 140 C for 25 minutes. Figure 12 shows mixing and cooking of raw material.

Figure 12: Mixing and Cooking of Raw Materials

Cooling

After cooking, material is poured on a cooling table (which is also called cooling line in automatic candies making production line), which helps reduce the temperature. Cooling line consists of cooling conveyor belt which transports the material in cooling line in presence of cooled air. The cooled air reduces the temperature of raw material from 140 C to 72 C.

When a mixture is hot, its particles moving very fast, as the mixture cools, the molecules slow down and it is easier for them to stick together. Cooling plays an important role in determining the number and size of crystals that ultimately forms and affects the texture of the final candy. Figure 13 shows cooling table and process of pouring and cooling of cooked material/mixture.

Figure 13: Cooling Table

Shaping/ Sizing

After cooling the mixture to 72 C, the material is put into Enrober which is a machine through which the required size and shape of the candy is made through molds/dies. Enrober is also a part of candies production line. Candies can be made in multiple types of shapes, i.e. ball-shaped candies, heart-shaped candies, round candies, triangle-shaped candies, star-shaped candies, etc. Figure 14 and Figure 15 shows different shapes of candies and shaping/sizing process of candies through Enrober.

Figure 14: Shapes of Candies

Figure 15: Shaping/Sizing Process of Candies

Cutting

After shaping and sizing, candies are cut through automatic cutters which are adjusted in cutting line/machine (part of candies making production line). After cutting into pieces, candies are carried to the wrapping machine to be wrapped. Figure 16 shows cutting process of candies.

Figure 16: Cutting Process of Candies

Wrapping

Ready candies are wrapped in printed wrappers. For this purpose, wrapping machine is used on which wrapping films/rolls are adjusted. Figure 17 shows wrapping of candies on wrapping machine.

Figure 17: Wrapping of Candies on Wrapping Machine

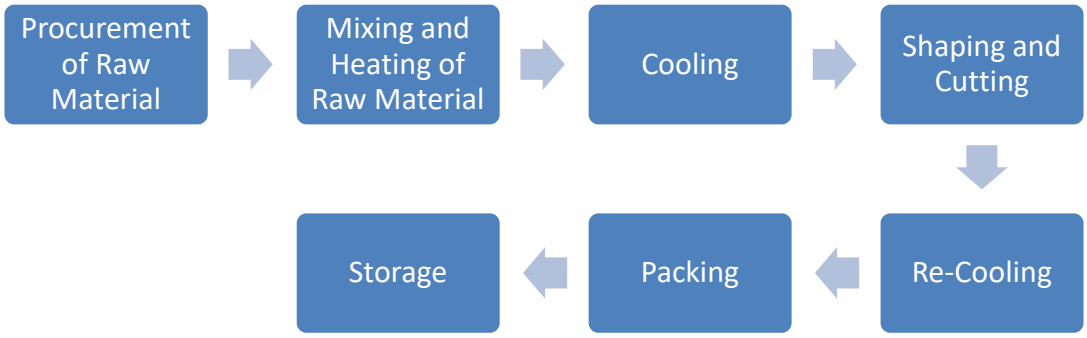
Packing and Storage

After wrapping candies are packed in corrugated boxes. 100 units (350 grams) of candies are packed manually in a corrugated box. The packed corrugated boxes are then shifted to finished goods store for storage until they are sold out. Figure 18 shows packing of candies in corrugated boxes.

Figure 18: Packing in Boxes

Chocolates

Figure 19: Production Process – Chocolate



Procurement of Raw Material

Key raw materials used to make chocolate are sugar, cocoa powder, powder milk and coconut oil. These are purchased from the local market in bulk quantities according to the requirement of production. Wrapping and packing materials are also purchased in bulk quantities. Wrapping and packing materials, used to wrap and pack chocolate bars, are wrapping film/roll and boxes. Procurement of raw materials is done by procurement department.

Mixing and Heating of Raw Material

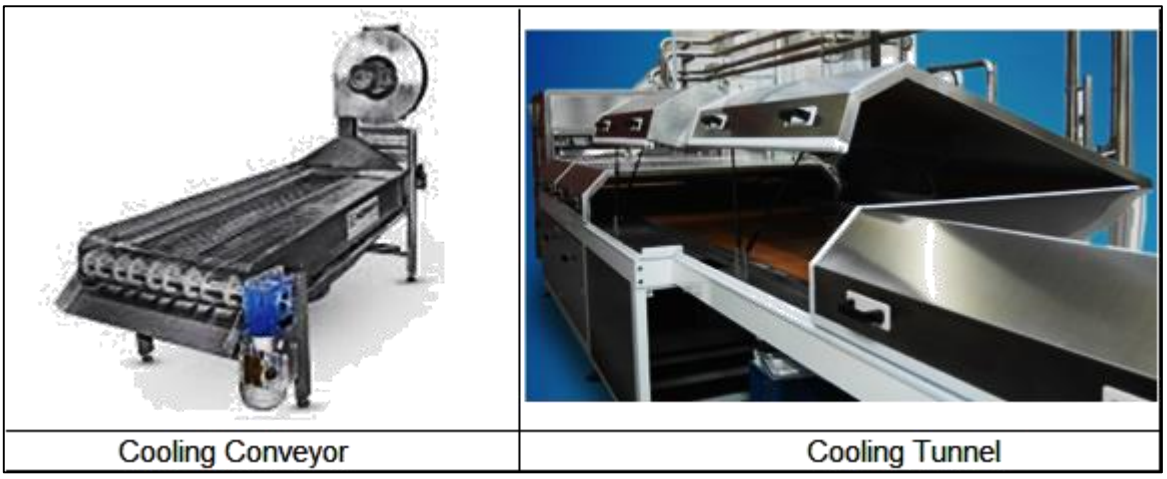
To make chocolates, first of all, the raw materials are mixed well in the mixer at temperature of 65 C. An electric heater is placed beneath the mixer to heat the material for mixing. Purpose of the heating is to disrupt the chocolate's ordered crystalline structure, causing it to melt into a liquid to ensure complete mixing. This process takes from 20 to 25 minutes. Figure 20 shows process of mixing of raw materials.

Figure 20: Mixing of Chocolates Raw Material

Cooling

After mixing of raw materials, the mixture is poured on cooling conveyor, by inclining the container towards cooling conveyor, to reduce its temperature. Cooling conveyor goes through the cooling tunnel where temperature of the mixture is reduced to 30-32 C. Cooling conveyor and cooling tunnel is a part of chocolate making production line. Figure 21 shows cooling conveyor chocolate cooling tunnel.

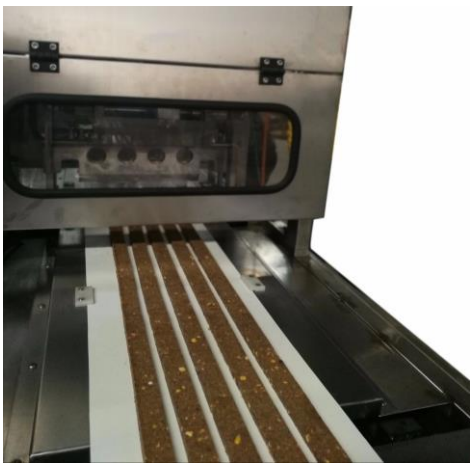
Figure 21: Cooling Conveyor and Cooling Tunnel



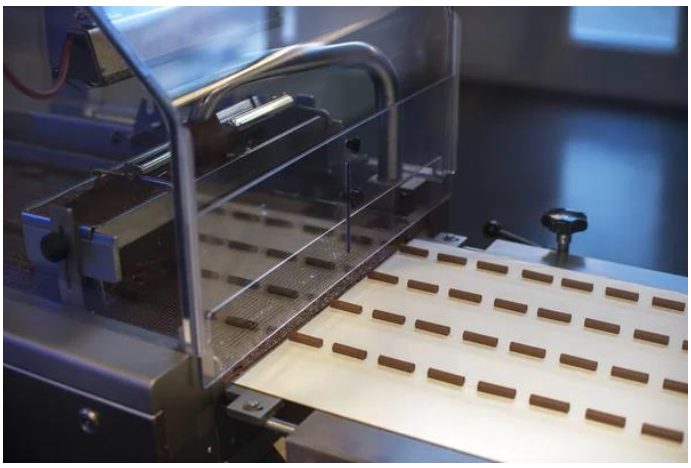
Cooling Conveyor	Cooling Tunnel

Shaping and Cutting: After reducing temperature to 30-32 C, a required shape in layers is given to the mixture. Layers are made on extruder machine which is a part of chocolate making production line. Different dies according to required shapes are used on extruder machine. After shaping on extruder machine, the chocolate layers are transferred to the cutting line of chocolate making production line. On cutting line/machine, chocolate layers are cut into chocolate bars according to their required weight (in the proposed project, the weight of one chocolate bar is 20 grams). On cutting machine, cutters are adjusted to work according to instructions given through panels based on computerized system. Figure 22 chocolate bar layers on Extruder Machine and Cutting of Chocolate Bars.

Figure 22: Chocolate Bar Layers on Extruder Machine and Cutting of Chocolate Bars



Bar layers on Extruder Machine



Cutting of Chocolate Bars

There are several shapes in which chocolates may be made. Some common ones are block-shaped, bar-shaped, chips-shaped and pistoles-shaped chocolates. Figure 23 shows different shapes of chocolates.

Figure 23: Different Shapes of Chocolate

Blocks

Bars

Chips

Pistoles

Re-Cooling

After cutting in required size and shape (20 grams), the temperature of the ready chocolate bars is reduced to 20-22^{o}C by passing them through the cooling tunnel again so that these could be wrapped easily. Figure 24 shows process of re-cooling of ready chocolates.

Figure 24: Chocolate bars after Re-Cooling

Wrapping and Packing

Ready chocolate bars are carried to wrapping machine to wrap these in printed wrappers after which these are packed in boxes. In the proposed project, 24 chocolate bars are packed in a box. Packing of chocolate bars in boxes is done manually. Figure 25 shows process of wrapping of chocolates.

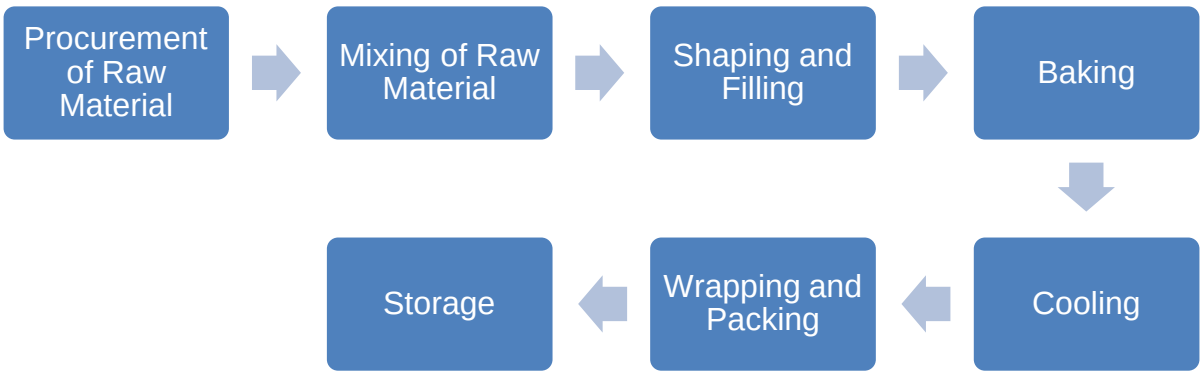
Figure 25: Wrapping of chocolates

Storage

The boxes of wrapped chocolate bars are transferred to finished goods store. The temperature of finished goods store of chocolates is comparatively lower than other stores because chocolates may melt in high temperature. The required temperature of finished goods store for storage of chocolate should be 20-22 C. The melting point of chocolate is 30-32 C. In the proposed project, chiller air conditioners are used to maintain temperature of finished goods store room.

Cupcakes

Figure 26: Production Process – Cupcakes



Procurement of Raw Material

Raw Materials used to make cupcake include eggs, sugar, cooking oil, wheat flour, baking powder, milk, vanilla flavor and tutti frutti (chopped fruit pieces). These are purchased from the local market in bulk quantities according to the requirement of production. Wrapping and packing materials, wrapping film/roll and boxes, are also purchased in bulk quantities. Procurement of raw material is done by procurement department.

Mixing of raw material

After issuance of raw materials from raw material store, all raw materials are mixed in mixer except vanilla flavor and tutti frutti. After mixing, vanilla flavor and tutti frutti are also added into the mixture. Figure 27 shows mixing of raw materials.

Figure 27: Mixing of Raw Material

Shaping and Filling

After mixing of raw materials, the mixture (cake material) is filled in cupcake liners. There are different shapes of cupcake liners available in the market. Some common shapes of cupcake liners are round, tulip, lotus, etc. The mixed cake material is filled into cupcake liners through filling nozzles after adjustment of cupcake liner on baking trays. Figure 28 shows different shapes of cupcake liners.

Figure 28: Different Shapes of Cupcake Liners

Round Cupcake Liner

Tulip Cupcake Liner

Lotus Cupcake Liner

Figure 29 shows cupcake liners on adjusting table in which mixture (cake material) is filled and filling of cake material into cupcake liners through nozzles.

Figure 29: Cupcake liner and its Filling

Baking

After filling of cupcake material in baking trays, the next process is baking. The baking trays are carried to the baking oven where cupcake material is baked at 95-98 C for 15-20 minutes. Baking oven is part of the cupcake making production line. Figure 30 shows baking trays in baking oven for baking of cupcakes.

Figure 30: Baking

Cooling

After baking in the required size and weight, the cupcakes are passed through cooling tunnel of cupcake making production line to lower the temperature where the wrapper does not get stuck with the cake while wrapping. Figure 31 shows cupcakes ready to be wrapped.

Figure 31: Cooling of Cupcake

Wrapping and Packing

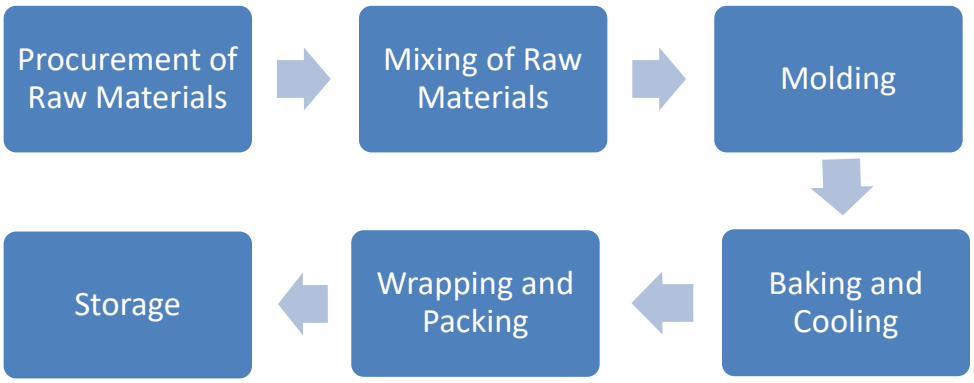
After cooling, the ready cupcakes are carried to the wrapping machine to be wrapped individually. The last process before transferring to finished goods store is packing. Wrapped cupcakes are packed in boxes (24 pieces per box or 12 pieces per box) to store and ship easily. Packing in boxes is done manually.

Storage

After packing in boxes, cupcakes boxes are carried to finished goods store for storage.

Cookies

Figure 32: Production Process – Cookies



Procurement of Raw Material

Raw materials used to make biscuits/cookies are eggs, sugar, butter, corn starch, wheat flour, sodium bicarbonate, salt, cream and vanilla flavor. These are purchased from the market in bulk quantities according to the requirement of production. Wrapping foils and boxes used to wrap and pack biscuits/cookies are also procured from local market by the procurement department.

Mixing of Raw Materials

After issuance of the required raw materials from raw material store, all of those, except vanilla flavor, are mixed in a mixer for 3 minutes. Afterwards, vanilla flavor is also added in the mixture and it is mixed further for 2 minutes. Figure 33 shows mixing of raw materials in mixer.

Figure 33: Mixing of Raw Material

Molding

Molding in biscuits manufacturing process is the process during which dough pieces are molded into cookies' shapes. During molding process, the dough is placed inside the hopper[3] and the rotary molder machine is started which transforms the dough into shapes of biscuits/cookies. Figure 34 shows rotary molder (this is a part of cookies making production line).

Figure 34: Rotary Molder

[3] A container for a bulk material such as grain, rock, or any other material (mixed material for cookies etc.), typically one that tapers downward and is able to discharge its contents at the bottom.

Baking and Cooling

Baking

After giving shapes, the cookies are baked in the baking oven at 150-180 C for 13-15 minutes, or until cookies bottom takes golden brown color. After baking, cookies are transferred onto a cooling shelf.

Figure 35: Baking Oven

Wrapping and Packing

After cooling, cookies are wrapped in printed wrappers. Wrapping film is used for wrapping of biscuits/cookies. After wrapping, cookies are packed in boxes. Figure 36 shows biscuits/cookies ready for sale.

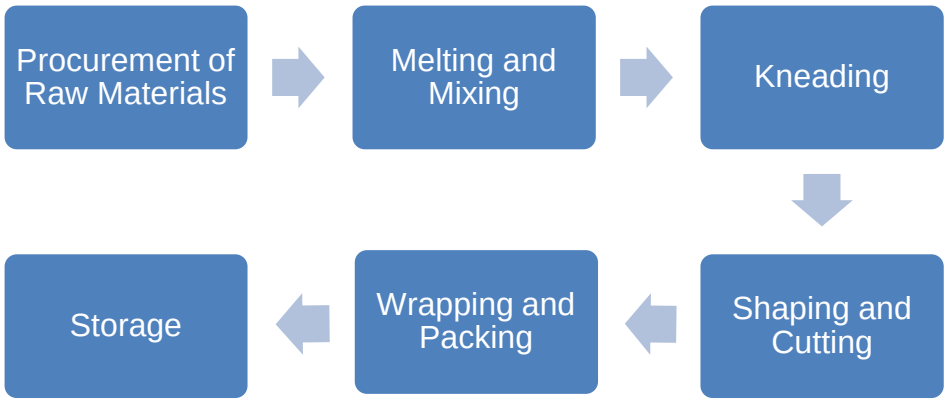
Figure 36: Cookies

Storage

After packing, cookies are transferred to finished goods store.

Chewing Gum

Figure 37: Production Process – Chewing Gum



Procurement of Raw Materials

Raw materials required to make chewing gum are gum base, citric acid, glycerin, light corn syrup and powdered sugar. These are purchased from the market in bulk quantities according to the requirement of production. Wrapping and packing materials are also purchased in bulk quantities.

Melting and Mixing

Gum base is the non-nutritive, non-digestible, water-insoluble masticatory delivery system used to carry sweeteners, flavors, and any other substances in chewing gum and bubble gum. It provides all the basic textural and masticatory properties of gum. After weighing the required quantities of raw material for the batch, the solid gum base is melted in a container. Softeners (glycerin), sweeteners (powdered sugar) and other additives (citric acid and light corn syrup) are mixed with melted gum base. After mixing, the material is made as a dough, which is transferred to the next process. Figure 38 shows melting and mixing of gum base and other raw materials.

Figure 38: Melting and Mixing of Gum base

Kneading

The next step is kneading process. Kneading is the process of working a dough mixture to form a smooth and cohesive mass. Proper kneading is essential to make the dough elastic. For kneading process, kneading machine is used that is a part of chewing gum making production line. Figure 39 shows kneading machine.

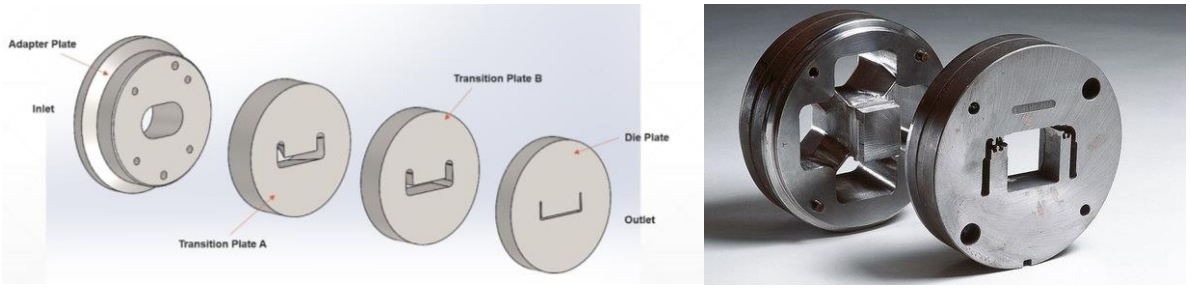
Figure 39: Kneading Machine

Shaping and Cutting

Extruder machine is used to blend, smooth and form the chewing gum into layers to be cut into pieces/pellets. Extrusion dies are used in extruder machine to give specific shapes. Extruder machine is a part of the chewing gum making production line. After shaping through extruder machine, cutting machine cuts the chewing gum layers into sticks or small pellets. Sharp cutters are used on cutting machine. Cutting machine is also a part of chewing gum making production line. Figure 40 shows the process of shaping and Figure 41 extrusion dies.

Figure 40: Shaping Layers

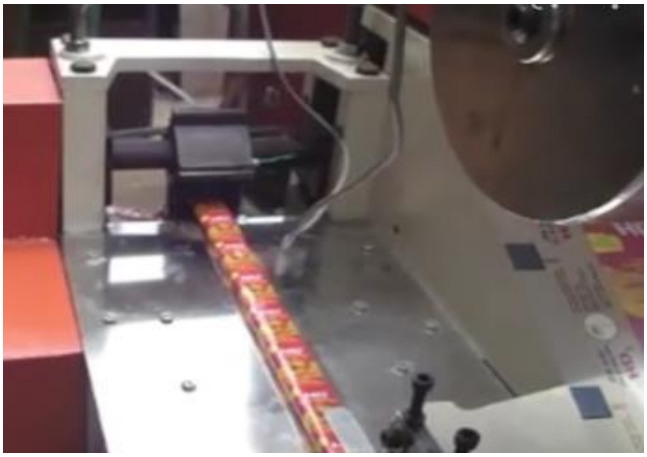
Figure 41: Extrusion Dies



Wrapping and Packing

Wrapping machine carefully wraps chewing gum pellets/pieces individually in wrappers and after that chewing gums are packed in boxes manually. In the proposed project, 100 pieces of chewing gum are packed in one box. Figure 42 shows wrapping of chewing gum pellets.

Figure 42: Wrapping of Chewing Gum Pellets/Pieces



Storage

At the end, gum boxes are stored in finished goods store to be sold.

5.3. Installed and Operational Capacities

The proposed production unit will run 8 hours a day in a single shift of 8 hours for 300 days in a year. The assumed weight of finished products are 3.5 grams, 20 grams, 30 grams, 7 grams and 3 grams for candies, chocolate, cupcake, cookies and chewing gum respectively. It has been further assumed that the operational capacity of the unit will increase at the rate of 5% per annum; from the operational capacity utilization of 60% during first year. The unit will achieve 90% of its total capacity during the projected period of 10 years. Table 1 shows details of maximum annual capacity and operational capacity utilized during first year of operations.

Table 1: Installed and Operational Capacity

Particulars	Name of Machines	No of Machines	Time / Batch (Hours)	Available Hours /Day	Setup Time/Day (Hours)	Production Hours / Day	Batch Processed /Day
		A	*B*	*C*	*D*	*E=(C-D)*	*F=(E/B*A)*
Candy - 3.5 grams	Candy Making Production Line - (18KW)	1	1	8	1	7	7
Chocolate – 20 grams	Chocolate Making Production Line (20kw)	1	1	8	1	7	7
Cupcake-30 grams	Cupcake Making Production Line (20KW)	1	1	8	1	7	7
Cookies- 7grams	Cookies Making Production Line (2.5KW)	1	1	8	1	7	7
Chewing Gum - 3 grams	Chewing Gum Making Production Line (25 KW)	1	1	8	1	7	7

Table 2: Installed and Operational Capacity

Particulars	Machine Capacity / Batch (kgs)	Annual Capacity (kgs)	Weight / Unit (grams)	Annual Capacity (Units)	Units/ Box	Boxes @ 100%	Boxes @ 60%
	G	*H=(F*G*300)*	*I*	*J=(H*1000)/I*	*K*	*L=(J/I)*	*M=(L*60%)*
Candy-3.5gram	50	105,000	3.5	30,000,000	100	300,000	180,000
Chocolate-20gram	30	63,000	20	3,150,000	24	131,250	78,750
Cupcake-30gram	50	105,000	30	3,500,000	12	291,667	175,000
Cookies-7gram	50	105,000	7	15,000,000	60	250,000	150,000
Chewing Gum -3gram	110	231,000	3	77,000,000	100	770,000	462,000

6. CRITICAL FACTORS

Before making the decision to invest in manufacturing of candies and other confectionary items, one should carefully analyze the associated risk factors. The important considerations in this regard include:

- Hiring of trained labor
- Use of good quality raw materials
- Proper cleaning of equipment for ensuring hygiene conditions
- Use of modern technology and machines for maintaining quality and boosting appearances
- Strict compliance with standards of hygiene and safety
- Proper maintenance of the manufacturing machinery
- Eye catching packaging
- Diversity in colors and flavors
- Strong distribution channels

6.1. The Concept of Quality Control

Food & Agriculture Organization (FAO) defines Quality Control as "a planned system of activities whose purpose is to provide a quality product."

Quality Control is carried out in three major areas of operations:

1. Raw ingredients
2. Process of manufacture
3. Inspection of finished product

Raw Material Control

The following points are to be considered while ensuring the quality concerns:

- All packages, drums or containers should be marked appropriately to avoid confusion.
- If the source of supply and manufacture is known and reliable, a superficial examination is sufficient.
- Sugars when used in the form of syrups, should be checked for parameters like pH, total solids and invert sugar[4] contents, color, temperature.

[4]Invert sugar a mixture of glucose (dextrose) and fructose produced from sugar (sucrose) by application of heat and an acid "sugar doctor," such as cream of tartar or citric acid, affects the sweetness, solubility, and amount of crystallization in candy making.

Process Control

The process of manufacture can be either a batch type production processes or continuous type production lines. In this proposed manufacturing unit, it is batch type production where the quality greatly depends on the efficiency and reliability of the workers.

Finished Product Inspection

- Adoption of in- line control eliminates the need for frequent inspection.
- Generally, the finished product is analyzed for three significant parameters: *appearance, taste and weight.*

Finished Packs:

Package testing is an important aspect of quality control since the quality of finished product depends greatly on the quality of the packaging material. These must be inspected for any open area/leakage, missing labels, expiry dates etc.

7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

The proposed manufacturing unit has the potential to provide good entrepreneurship opportunity if the business is established in metropolitan cities of Pakistan, including Karachi, Lahore, Islamabad, Peshawar and Quetta. Other large to medium cities like Gujranwala, Hyderabad, Faisalabad, Sukkur, Rawalpindi, Multan, Bahawalpur, Sargodha, Sukkur, Lasbela, Mardan, Sialkot, etc. are also suitable locations to establish the proposed manufacturing unit due to easy access to raw material and low-cost labor. Other reasons of proposing metropolitan cities for setting up of this business are the large population, strong distribution channels and presence of industrial infrastructure.

8. POTENTIAL TARGET MARKETS

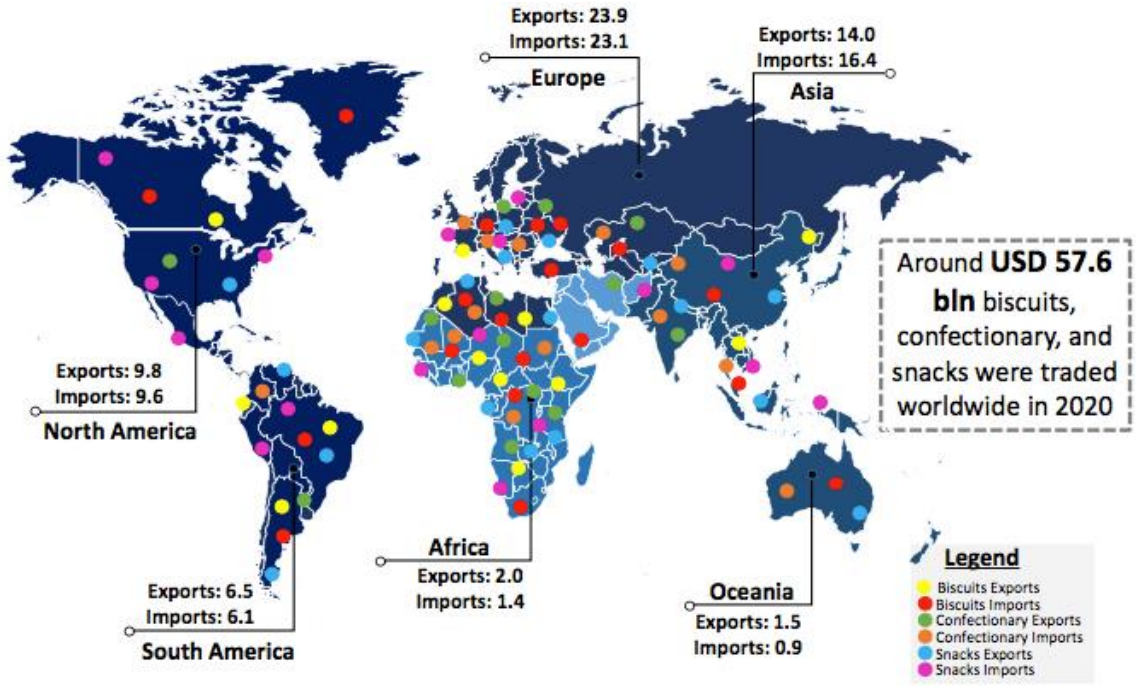
The potential target customers for candies and other confectionary items are children and adults who like sweets. The consumers of every age satisfy their cravings with candies and other confectionaries. For this, general retailer shops and large stores are the right places for selling these items.

The candies and other confectionary items can be utilized in making multiple sweet dishes thus serving the bakeries and other cafes as well. These cafes and shops can be potentially targeted.

According to a research study conducted by Pakistan Credit Rating Agency (PACRA)[5], during 2020, around USD 57.6 billion worth of biscuits, confectionery products and snacks were traded in the world as shown in Figure 43.

[5]https://www.pacra.com/sector_research/Food%20Products%20-%20PACRA%20Research%20-%20Dec'20_1608986137.pdf

Figure 43: Global Market (Billion Dollars)



Pakistan's food product market was recorded at PKR 155 billion in 2020 and 130 billion in 2019 showing an increase of 19% on year basis. Food products grew at a compound annual growth rate (CAGR) of 6% during 2016 to 2020. The confectionery market grew at 9.4% and biscuit market showed growth of 9.1% during this period. This implies that there are good returns for the investors.

In Pakistan, approximately 37% of income is spent on food and beverages of every household but growing concerns about obesity and other lifestyle-related diseases have urged the consumers to pay close attention to nutritional labeling, introduction of products with value-added nutrients and fewer preservatives, less fat, etc. This trend is expected to discourage the unorganized sector and increase growth of the organized sector.

In Pakistan, a number of large formal units and small cottage level units are working to produce different types of confectionery products. These units are operating in all the major cities of Pakistan

Some key player in this sector include Ismail Industries, Hilal Foods, Pearl Confectionery (Pvt) Ltd, Mitchelle's, B.P industries and Hobnob. Famous brand include CandyLand, Fanty, Cola, Chili Mili, Fruity, Toss and Eclairs of Ismail Industries; DING DONG, Fresh Up, Kidco Centro Aamrus, Hajmola, Khopra, and Coolyaar of Hilal foods; and Cow candy, Butter Up, Dr Milk, Kidco's and 4Ever of BP industries.

Most of the brands in this sector are short-lived and the companies behind them also did not focus on them. This attitude can be due to either presence of only local companies who does not have the professional and strategic thinking behind their operations. Another reason of short-term brand life is that major portion of target customer of this sector is below age of 16, which are not so much brand loyal.

9. PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of manufacturing candies and other confectionary items. Various assumptions relevant to revenue and costs along with the results of the analysis are outlined in this section.

The projected Income Statement, Cash Flow Statement and Balance Sheet are attached as annexures of this document.

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

9.1. Initial Project Cost

Table 3 provides fixed and working capital requirements for establishment and operations of the production unit.

Table 3: Initial Project Cost estimates

Particulars	Cost (PKR)	Reference
Land	-	9.1.1
Building / Infrastructure	2,753,195	9.1.2
Machinery & equipment	37,570,000	9.1.3
Furniture & fixtures	1,265,000	9.1.4
Office vehicles	1,141,300	9.1.5
Office equipment	2,034,000	9.1.6
Pre-operating costs	962,081	9.1.7
Security Against Building	675,000	9.1.8
License	35,000	9.1.9
Total Capital Cost – (A)	**46,435,576**	
Working Capital		
Consumables inventory	51,200	
Raw material inventory	5,116,668	
Upfront building rent	225,000	
Upfront insurance payment	592,083	

Cash	1,000,000	
Working Capital Requirement - (B)	**6,984,951**	9.1.10
Total Project Cost - (A+B)	**53,420,527**	

9.1.1. Land

The production unit will be established in a rented building to avoid the high cost of land. Suitable location for setting up a production unit like this can be easily found on rent. Therefore, no land cost has been added to the project cost. Total space requirement for the proposed production unit has been estimated as 4,500 square feet. The breakup of the space requirement is provided in Table 4.

Table 4: Breakup of Space Requirement

Particulars	Area %	Area (sq ft)
Production Area		
Raw Material Store Room	8%	360
Production Area	39%	1,750
Finished Goods Store room	8%	360
Workers' rest area and Mess	7%	300
Washrooms	6%	256
Office Block		
Executive Office	3%	120
Accounts Department	3%	120
HR and Admin Department	3%	120
Procurement Department	3%	120
Quality Assurance Department	5%	225
Sales and Marketing Department	4%	180
Kitchen	1%	36
Washrooms	3%	128
Parking and Gate area	9%	425
Total	**100%**	**4,500**

9.1.2. Building Renovation Cost

The “Manufacturing of Candies and other Confectionary products” will be set up in a rented building of 4,500 sq. ft. Industrial electricity connection having load of around 120 KW is required for the proposed project. There will be no cost of building

construction, however, building renovation and interior decoration cost is included in the capital investment. Building rent is included in the operating cost. Table 5 Provide details of renovation cost.

Table 5: Building Renovation Cost

Particulars	Unit of Measurement	Area (sq ft)	Cost / sq. ft (PKR).	Cost (PKR)
Paint Cost	Ltr	133	500	66,365
Labour Cost	Sq. Feet	13,273	10	132,730
Wall Racks	Units	40	15,000	600,000
Curtains	Units	15	3,000	45,000
Blinds	Units	10	5,000	50,000
Glass Door and Partition	Sq. Feet	1,305	800	1,044,000
Tiles	Sq. Feet	2,470	300	741,000
Labour Cost – Tiles	Sq. Feet	2,470	30	74,100
Total				**2,753,195**

9.1.3. Machinery and Equipment

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

Table 6: Machinery Cost Details

Cost Item	No. of Items	Unit Cost (PKR)	Total Cost (PKR)
Candy Making Production Line - (18KW)	1	8,000,000	8,000,000
Candies Wrapping Machine (2.4KW)	1	800,000	800,000
Chocolate Making Production Line (20kw)	1	10,000,000	10,000,000
Chocolate Wrapping Machine (2.4KW)	1	700,000	1,000,000
Cupcake Making Production Line (20KW)	1	2,300,000	2,300,000
Cupcake Wrapping Machine (2.4 KW)	1	700,000	700,000
Cookies Making Production Line (2.5KW)	1	2,800,000	2,800,000
Cookies Wrapping Machine (2.4 KW)	1	700,000	700,000
Chewing Gum Making Production Line (25 KW)	1	7,000,000	7,000,000
Chewing Gum Wrapping Machine (2.4 KW)	1	700,000	700,000
Support Machinery and Lab Equipment (**Table 7**)			3,570,000
Total			**37,570,000**

Table 7: Support Machinery and Lab Equipment

Cost Item	Number of Items	Unit Cost (PKR)	Total Cost (PKR)
Diesel Generator (120 KW)	1	1,500,000	1,500,000
Chiller AC 4 ton (For chocolate production and finished goods store area)	4	180,000	720,000
Deep Freezer-Large Size (Capacity 12 cubic-feet, 180W)	5	55,000	275,000
Fridge-Large Size (Capacity 11 cubic-feet, 200W)	6	65,000	390,000
Weigh Scales (50Kg)	8	5,000	40,000
Working Tables	15	25,000	375,000
Trays	50	700	35,000
Baskets	50	500	25,000
Grinders	5	10,000	50,000
Trolleys	15	7,000	105,000
Spatulas	15	1,500	22,500
Total (A)			**3,537,500**
Lab Equipment			
Brix Refractometer (Rang 20 to 62 % Brix)	3	1,500	4,500
Chewing Gum test apparatus	1	5,000	5,000
Viscometer	2	3,500	7,000
Colorimeter (Wavelength range 400 to 710nm)	3	4,000	12,000
Digital Automatic pH Meter	2	2,000	4,000
Total (B)			**32,500**
Total Cost (PKR) (A+B)			**3,570,000**

9.1.4. Office Equipment

Table 8 shows details of office equipment required for the production unit.

Table 8: Office Equipment Cost Details

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Laptops	7	80,000	560,000
Desktop Computers	7	40,000	280,000

Printer	3	40,000	120,000
CCTV Cameras (2MP)	16	2,000	32,000
DVR	2	12,000	24,000
LED TV	3	15,000	45,000
Air Conditioners	8	80,000	640,000
Exhaust Fan	13	4,000	52,000
Bracket Fan	17	7,000	119,000
Ceiling Fan	14	4,500	63,000
Microwave Oven	1	5,000	5,000
Water Dispenser	3	20,000	60,000
Wi-Fi / Internet Router	2	17,000	34,000
Total			**2,034,000**

9.1.5. Furniture and Fixture

Table 9 provides details of furniture and fixtures.

Table 9: Furniture & Fixtures Cost Details

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Office Table	10	25,000	250,000
Executive Tables	9	35,000	315,000
Executive Chairs	9	20,000	180,000
Office Chairs	10	10,000	100,000
Visitors Chairs	16	10,000	160,000
Chairs - Production dept.	10	10,000	100,000
Cabinets	9	10,000	90,000
Sofa Set	2	35,000	70,000
Total			**1,265,000**

9.1.6. Vehicles

Table 10 provides details of the vehicles required along with their cost for the proposed project.

Table 10: Office Vehicle Cost Details

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Motocycle	1	80,000	80,000
Pickup	1	1,050,000	1,050,000
Registration Charges		1%	11,300
Total			**1,141,300**

9.1.7. Pre-Operating Costs

Table 11 provides details of estimated pre-operating costs.

Table 11: Pre-Operating Cost Details

Description	Per Month (PKR)	Months Before operating	Total (PKR)
Administration expense	372,000	1	372,000
Utilities expense	590,081	1	590,081
Total			**962,081**

9.1.8. Security against Building

Table 12 provides details of security provided against rented premises.

Table 12: Security against Building

Particulars	Rent per Month	No. of Months	Cost (PKR)
Security against building	225,000	3	675,000

9.1.9. Licenses and Permits

For establishing a food items production in Punjab, a license is required from the Punjab Food Authority (PFA). It has categorized the manufacturers of food items into five categories from very small units to very large units.[6] The proposed production unit is medium size production unit. Charges for the production unit according to the size are provided in Table 13.

Table 13: Licenses, Permits Cost Details

License / Permit	Cost (PKR)
Very Small Production Unit	8,000
Small Production Unit	16,000
Medium Production Unit	35,000
Large Production Unit	50,000
Very Large Production Unit	100,000

The license fee in KPK is PKR 50,000 for manufacturing concerns, in Sindh its PKR 22,600 for a small unit covering an area up to 1000 square feet, PKR 33,900 for medium units having covered area from 1001 to 2000 square feet and PKR 56,500 for large units having covered area of more than 2000 square feet. These of charges may differ in other provinces or in federal capital area.

9.1.10. Initial Working Capital

Table 14 provides details of working capital requirements for the project.

Table 14: Initial Working Capital Details

Particulars	Total Cost (PKR)
Consumables inventory	51,200
Raw material inventory	5,116,668
Upfront building rent	225,000
Upfront insurance payment[7]	592,083
Cash	1,000,000
Total Working Capital (PKR)	**6,984,951**

[6] https://www.pfa.gop.pk/food-licensing-categories/

[7] Insurance cost has been calculated using 2.5% of cost of machinery and equipment.

9.2. Breakeven Analysis

Table 15 shows calculation of break-even analysis.

Table 15: Breakeven Analysis

Description	First Year Values (PKR)	Ratios
Sales (PKR) – A	171,918,279	100%
Variable Cost (PKR) – B	142,804,261	83%
Contribution (PKR) (A-B) = C	29,114,018	17%
Fixed Cost (PKR) – D	23,005,303	10%
Contribution Margin	17%	
Breakeven		
Breakeven Revenue (PKR)		135,846,314
Breakeven (Boxes)		826,330
Breakeven Capacity		47%

9.3. Revenue Generation

Table 16 provides details for revenue generation of the production during the first year of operations.

Table 16: Revenue Details

Products	Boxes Sold during the Year (Units) (A)	Price Per Box (PKR) (B)	Total Revenue (PKR) (A*B)
Candies	176,250	113.39	19,984,988
Chocolate	77,109	517.10	39,873,064
Cupcake	171,354	71.90	12,320,353
Cookies	146,875	220.16	32,336,000
Chewing Gum	452,375	149.00	67,403,875
Total			**171,918,280**

9.4. Variable Cost Estimate

Variable costs of the project have been provided in Table 17.

Table 17: Variable Cost Estimate

Description of Costs	Amount (PKR)
Material Cost	122,800,043
Consumables - uniform etc	614,400

Direct Electricity	6,446,802
Direct Labour	10,200,000
Vehicle maintenance and running cost	636,000
Communications expense (phone, internet etc.)	397,320
Office vehicles running and maintenance expense	249,971
Electicity	514,175
Promotional expense	515,755
Bad debt expense	429,796
Total Cost (PKR)	**142,804,262**

Table 18: Raw Material Cost

Products	Boxes Sold during the Year (Units) (A)	Cost Per Box (PKR) (B)	Total Cost (PKR) (A*B)	Reference
Candies	176,250	80.99	14,274,488	Table 19
Chocolates	77,109	369.36	28,480,980	Table 20
Cupcakes	171,354	51.36	8,800,741	Table 21
Cookies	146,875	157.26	23,097,563	Table 22
Chewing Gums	452,375	106.43	48,146,271	Table 23
Total			**122,800,043**	

Table 19: Raw Material Cost - Candy

Raw material / Input name	Production Batch / Hour (Kgs)	Recipe Ratio	Raw Material Required / Batch (kgs)	Raw Material Cost / Kg or Ltr (PKR)	Raw Material Cost/ Batch	Process Loss (5%) (Kgs)	Output of Finished Good - Candies / Batch (Kgs)	Candies made / Batch	Raw Material Cost / Unit (PKR)
	A	B	C=A*B	D	E=C*D	F=A*5%	G=A-F	H=(G*1000)/3.5	I=E/H
Sugar	50	57.76%	28.88	85	2,454.80	2.50	47.50	13,571	0.18
Light corn syrup		19.16%	9.58	600	5,748.00				0.42
Citric acid		0.89%	0.45	350	155.75				0.01
Flavor		1.32%	0.66	400	264.00				0.02
Water		20.87%	10.44	-					-
Wrapping and Packing cost									0.17
Total		**100%**	**50.00**	**1,435**	**8,623**				**0.81**
Units/ Box									**100**
Cost per Box (PKR) *(Rounding off difference(81-80.99=0.01))*									**81**

Table 20: Raw Material Cost - Chocolate

Raw material / Input name	Production Batch / Hour (Kgs)	Recipe Ratio	Raw Material Required / Batch (kgs)	Raw Material Cost / Kg or Ltr (PKR)	Raw Material Cost/ Batch	Process Loss (5%) (Kgs)	Output of Finished Good - Chocolate / Batch (Kgs)	Chocolates made / Batch	Raw Material Cost / Unit (PKR)
	A	**B**	**C=A*B**	**D**	**E=C*D**	**F=A*5%**	**G=A-F**	**H=(G*1000) /20**	**I=E/H**
Sugar	30	33.25%	9.98	85	848	1.50	28.50	1,425	0.60
Cocoa powder		26.75%	8.03	1,200	9,630				6.76
Powder milk		13.25%	3.98	700	2,783				1.95
Coconut oil		26.75%	8.03	1,000	8,025				5.63
Wrapping and Packing Cost									0.44
Total		**100%**	**30.00**	**2,985**	**21,285**				**15.39**
Units/ Box									**24**
Cost per Box (PKR) *(Rounding off difference(369-369.36=0.36))*									**369**

Table 21: Raw Material Cost – Cup Cake

Raw material / Input name	Production Batch / Hour (Kgs)	Recipe Ratio	Raw Material Required / Batch (kgs)	Raw Material Cost / Kg or Ltr (PKR)	Raw Material Cost/ Batch	Process Loss (5%) (Kgs)	Output of Finished Good - Chocolate / Batch (Kgs)	Cup-Cakes made / Batch	Raw Material Cost / Unit (PKR)
	A	B	C=A*B	D	E=C*D	F=A*5%	G=A-F	H=(G*1000) /30	I=E/H
Eggs	50	28.75%	14.38	300[8]	4,313	2.50	47.50	1,583	0.19
Sugar		28.75%	14.38	85	1,222				0.05
Cooking Oil		28.75%	14.38	380	5,463				0.24
Wheat Flour		1.31%	0.66	55	36				0.03
Baking Powder		1.31%	0.66	600	393				0.38
Milk		7.85%	3.93	90	353				0.06
Vanilla Flavor		1.32%	0.66	1,600	1,056				1.01
Tutti Frutti		1.96%	0.98	600	588				0.38

[8] The proposed recipe needs 14.38 liter egg material (egg white and egg yolk) excluding egg shell. So, this cost is for egg material excluding egg shell. Excluding egg shell, egg material weight is round about 50 grams and 20 eggs are required for 1 liter egg material (egg white and yolk).

Wrapping and Packing Cost									1.93
Total		**100%**	**50**	**3,710**	**13,423**				**4.27**
Units/ Box									**12**
Cost per Box (PKR) *(Rounding off difference (51-51.36=0.36))*									**51**

Table 22: Raw Material Cost - Cookies

Raw material / Input name	Production Batch / Hour (Kgs)	Recipe Ratio	Raw Material Required / Batch (kgs)	Raw Material Cost / Kg or Ltr (PKR)	Raw Material Cost/ Batch	Process Loss (5%) (Kgs)	Output of Finished Good - Chocolate / Batch (Kgs)	Cookies made / Batch	Raw Material Cost / Unit (PKR)
	A	**B**	**C=A*B**	**D**	**E=C*D**	**F=A*5%**	**G=A-F**	**H=(G*1000) /7**	**I=E/H**
Egg	50	36%	17.86	300[9]	5,357	2.50	47.50	6,786	0.79
Sugar		7%	3.57	85	304				0.04
Butter		7%	3.57	1,200	4,286				0.63
Corn Starch		9%	4.29	200	857				0.13

[9] The proposed recipe needs 17.86-liter egg material (egg white and egg yolk) excluding egg shell. So, this cost is for egg material excluding egg shell. Excluding egg shell, egg material weight is round about 50 grams and 20 eggs are required for 1 liter egg material (egg white and yolk).

Wheat Flour		22%	11.07	55	609				0.09
Sodium Bicarbonate		11%	5.36	150	804				0.12
Salt		1%	0.71	40	29				0.00
Cream		4%	1.79	500	893				0.13
Vanilla Flavor		4%	1.79	1,600	2,857				0.42
Wrapping and Packing Cost									0.26
Total		**100%**	**50**	**4,130**	**15,995**				**2.62**
Units/ Box									**60**
Cost per Box (PKR) *(Rounding off difference (157-157.26=0.0.26))*									**157**

Table 23: Raw Material Cost – Chewing Gum

Raw material / Input name	Production Batch / Hour (Kgs)	Recipe Ratio	Raw Material Required / Batch (kgs)	Raw Material Cost / Kg or Ltr (PKR)	Raw Material Cost/ Batch	Process Loss (5%) (Kgs)	Output of Finished Good - Chocolate / Batch (Kgs)	Chewing Gum made / Batch	Raw Material Cost / Unit (PKR)
	A	**B**	**C=A*B**	**D**	**E=C*D**	**F=A*5%**	**G=A-F**	**H=(G*1000)/3**	**I=E/H**
Gum base	110	36.82%	40.50	500	20,251	5.50	104.50	34,833	0.58
Citric acid		0.68%	0.75	350	262				0.01
Glycerin		2.50%	2.75	500	1,375				0.04
Light Corn syrup		5.00%	5.50	600	3,300				0.09
Powdered sugar		55.00%	60.50	100	6,050				0.17
Wrapping and Packing Cost									0.17
Total		**100%**	**110**	**2,050**	**31,238**				**1.06**
Units/ Box									**100**
Cost per Box (PKR) *(Rounding off difference (106-106.43=0.43))*									**106**

9.5. Fixed Cost Estimate

Table 24 shows the estimated fixed cost of the project.

Table 24: Fixed Cost Estimate

Description of Costs	Amount (PKR)
Administration expense	11,352,000
Administration benefits expense	1,077,600
Building rental expense	2,700,000
Office expenses (stationery, entertainment etc.)	227,040
Insurance expense	592,083
Professional fees (legal, audit, consultants, etc.)	283,800
Depreciation expense	6,576,865
Amortization of pre-operating costs	192,416
Amortization of legal, licensing, and training costs	3,500
Total	**23,005,304**

9.6. 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 study, which is shown in Table 25.

Table 25: Financial Feasibility Analysis

Description	Project
IRR	27%
NPV (PKR)	47,698,822
Payback Period (years)	4.29
Projection Years	10
Discount rate used for NPV	15%

9.7. Financial Feasibility Analysis with 50% Debt

The financial feasibility analysis provides the information regarding projected IRR, NPV and payback period of the study on the basis of Debt: Equity Model (50:50), which is shown in Table 26.

Table 26: Financial Feasibility Analysis with 50% Debt

Description	Project
IRR	26%
NPV (PKR)	71,216,856
Payback Period (years)	4.42
Discount rate used for NPV	11%

9.8. Human Resource Requirement

The proposed production unit shall require the workforce as provided in Table 27.

Table 27: Human Resource

Personnel	Number of Personnel	Salary per Head (PKR)	Salary Per Month (PKR)	Annual Salaries (PKR)
Owner/CEO	1	100,000	100,000	1,200,000
Production Manager	1	80,000	80,000	960,000
Supervisors	2	50,000	100,000	1,200,000
Production Department - Candies				
Operators	2	35,000	70,000	840,000
Labor	2	22,000	44,000	528,000
Helper	1	20,000	20,000	240,000
Production Department - Chocolate				
Operators	2	35,000	70,000	840,000
Labor	2	22,000	44,000	528,000
Helper	1	20,000	20,000	240,000
Production Department - Cupcake				
Operators	2	35,000	70,000	840,000
Labor	2	22,000	44,000	528,000
Helper	1	20,000	20,000	240,000
Production Department - Cookies				
Operators	2	35,000	70,000	840,000

Labor	2	22,000	44,000	528,000
Helper	1	20,000	20,000	240,000
Production Department - Chewing Gum				
Operators	2	35,000	70,000	840,000
Labor	2	22,000	44,000	528,000
Helper	1	20,000	20,000	240,000
Other Staff				
Quality Controller	1	50,000	50,000	600,000
Assitant Quality Controller	1	40,000	40,000	480,000
Store Incharge	2	40,000	80,000	960,000
Store Helper	2	22,000	44,000	528,000
Procurement Manager	1	50,000	50,000	600,000
Assistant Procurement	1	25,000	25,000	300,000
Accounts Manager	1	50,000	50,000	600,000
Accounts Assistant	1	25,000	25,000	300,000
Sales and Marketing Manager	1	60,000	60,000	720,000
Assistant Sales and Marketing	2	30,000	60,000	720,000
Admin and HR Manager	1	50,000	50,000	600,000
Assistant Admin and HR	1	25,000	25,000	300,000
Security Guard	6	22,000	132,000	1,584,000
Sweeper	2	20,000	40,000	480,000
Driver	1	30,000	30,000	360,000
Cook	1	25,000	25,000	300,000
Office Boy	3	20,000	60,000	720,000
Total	**57**		**1,791,000**	**21,552,000**

10. CONTACT DETAILS

The contact details of all the major suppliers of machinery and equipment and raw material are given in Table 28.

Table 28: Contact Details

Name of Supplier	Particulars	Contact	Website
Interglob Enterprises – Karachi	Food Ingredients	021 34388585	https://www.interglobe.com.pk
Lautier Flavours & Ingredients – Karachi	Food Flavours	021 34920567	http://www.lautier.com.pk
Quality Flavors & Fragrances – Lahore	Food Flavours	0317 1703093	https://www.quality-flavors.com
Bake House, Lahore	Baking Tools	0300-0202779	https://bakehouse.pk/
Hg Industry Group Ltd.	Cookies Machinery	+8616988589	https://hgfoodmachine.en.made-in-china.com
Kashif Engineering Company Faisalabad	Packing/ Wrapping Machines	03006610120	-
M.Nadeem Engineering Co, Faisalabad	Machinery	0300 8661903	https://www.mnadeemengineering.com/
Wuxi Ai Yi Yi Machinery Equipment Co., Ltd	Chocolate, Candy Machinery	86-15995259329	https://aizhanyi.en.made-in-china.com/
Buhler Pakistan - Lahore	Chocolate, Candy Machinery	04235298701-7	https://www.buhlergroup.com/
Shanghai Target Industry Co., Ltd	Confectionery Equipment	86-21-67186935	https://shinwei.en.made-in-china.com/

11. USEFUL LINKS

Table 29: Useful Links

Name of Organization	E-mail Address
Small and Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
National Business Development Program (NBDP)	www.nbdp.org.pk
Government of Pakistan	www.pakistan.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	sindh.gov.pk/
Government of Balochistan	balochistan.gov.pk/
Government of KPK	kp.gov.pk/
Government of Gilgit Baltistan	gilgitbaltistan.gov.pk/
Government of Azad Jammu & Kashmir	ajk.gov.pk/
Trade Development Authority of Pakistan	www.tdap.gov.pk
Punjab Food Authority	www.pfa.gop.pk
Sindh Food Authority	www.sfa.gos.pk
Food Department Government of Balochistan	www.balochistan.gov.pk/departments/food-department/
Khyber Pakhtunkhwa Food Safety & Halal Food Authority	www.kpfsa.gov.pk
Securities and Exchange Commission of Pakistan	www.secp.gov.pk
State Bank of Pakistan	www.sbp.gov.pk
Federal Board of Revenue	www.fbr.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpcci.com.pk
Pakistan Stock Exchange (PSX)	www.psx.com.pk
Pakistan Food Association	www.facebook.com/pfa.com.pk
Small Industries Development Board, Khyber Pakhtunkhwa	www.sidbkp.com
Sindh Small Industries Corporation	www.ssic.gos.pk
Punjab Small Industries Corporation	www.psic.gop.pk
Pakistan Standards and Quality Control Authority (PSQCA)	http://www.psqca.com.pk

12. ANNEXURES

12.1. Income Statement

Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue from Candies	19,984,988	23,837,031	28,263,459	33,340,712	39,155,421	45,804,409	53,397,270	58,790,394	64,728,224	71,265,775
Revenue from Chocolate	39,873,064	47,559,107	56,390,137	66,520,560	78,121,349	91,387,740	106,536,124	117,296,273	129,143,196	142,186,659
Revenue from Cupcake	12,320,353	14,695,167	17,423,913	20,553,961	24,138,641	28,237,641	32,918,401	36,243,160	39,903,719	43,933,994
Revenue from Cookies	32,336,000	38,568,764	45,730,687	53,945,878	63,354,039	74,112,347	86,397,558	95,123,712	104,731,207	115,309,058
Revenue from Chewing Gum	67,403,875	80,395,972	95,324,885	112,449,320	132,060,482	154,486,002	180,094,329	198,283,856	218,310,526	240,359,889
Total Revenue	171,918,280	205,056,041	243,133,081	286,810,431	336,829,931	394,028,139	459,343,683	505,737,395	556,816,872	613,055,376
Cost of sales										
Raw material cost-Candies	14,274,488	17,388,148	20,616,993	24,320,689	28,562,217	33,412,439	38,951,042	42,885,097	47,216,492	51,985,357
Raw material cost-Chocolate	28,480,980	34,693,842	41,135,980	48,526,012	56,988,659	66,666,344	77,716,923	85,566,332	94,208,532	103,723,593
Raw material cost-Cupcake	8,800,741	10,720,475	12,711,160	14,994,605	17,609,715	20,600,033	24,014,759	26,440,250	29,110,715	32,050,897
Raw material cost-Cookies/Biscuit	23,097,563	28,135,780	33,360,378	39,353,331	46,216,552	54,064,700	63,026,720	69,392,418	76,401,052	84,117,559
Raw material cost- Chewing Gum	48,146,271	58,648,305	69,538,844	82,031,000	96,337,207	112,696,469	131,377,566	144,646,700	159,256,017	175,340,874
Consumables - uniform etc	614,400	676,454	744,776	819,999	902,819	994,003	1,094,398	1,204,932	1,326,630	1,460,619
Direct Electricity	6,446,802	7,027,014	7,659,445	8,348,795	9,100,187	9,919,204	10,811,932	11,785,006	12,845,656	14,001,766
Direct Labour	10,200,000	11,189,400	12,274,772	13,465,425	14,771,571	16,204,413	17,776,241	19,500,537	21,392,089	23,467,121
Vehicle maintenance and running cost	636,000	691,968	752,861	819,113	891,195	969,620	1,054,947	1,147,782	1,248,787	1,358,680
Total cost of sales	140,697,245	169,171,385	198,795,210	232,678,969	271,380,121	315,527,225	365,824,527	402,569,053	443,005,969	487,506,467
Gross Profit	31,221,035	35,884,655	44,337,871	54,131,462	65,449,810	78,500,914	93,519,156	103,168,341	113,810,902	125,548,908
	18%	17%	18%	19%	19%	20%	20%	20%	20%	20%
General administration & selling expenses										
Administration expense	11,352,000	12,453,144	13,661,099	14,986,226	16,439,889	18,034,559	19,783,911	21,702,950	23,808,136	26,117,526
Administration benefits expense	1,077,600	1,182,127	1,296,794	1,422,583	1,560,573	1,711,949	1,878,008	2,060,174	2,260,011	2,479,232
Building rental expense	2,700,000	2,970,000	3,267,000	3,593,700	3,953,070	4,348,377	4,783,215	5,261,536	5,787,690	6,366,459
Electricity	514,175	560,450	610,891	665,871	725,799	791,121	862,322	939,931	1,024,525	1,116,732
Communications expense (phone, internet etc.)	397,320	435,860	478,138	524,518	575,396	631,210	692,437	759,603	833,285	914,113
Office vehicles running and maintenance expense	249,971	274,218	300,817	329,997	362,006	397,121	435,642	477,899	524,255	575,108
Office expenses (stationery, entertainment etc.)	227,040	249,063	273,222	299,725	328,798	360,691	395,678	434,059	476,163	522,351
Promotional expense	515,755	615,168	729,399	860,431	1,010,490	1,182,084	1,378,031	1,517,212	1,670,451	1,839,166
Insurance expense	592,083	503,270	414,458	325,645	236,833	148,021	59,208	1,114,021	946,918	779,814
Professional fees (legal, audit, consultants, etc.)	283,800	311,329	341,527	374,656	410,997	450,864	494,598	542,574	595,203	652,938
Depreciation expense	6,576,865	6,576,865	6,576,865	6,576,865	6,576,865	6,576,865	4,476,350	12,181,680	12,181,680	12,181,680
Amortization of pre-operating costs	192,416	192,416	192,416	192,416	192,416	-	-	-	-	-
Amortization of legal, licensing, and training costs	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Bad debt expense	429,796	512,640	607,833	717,026	842,075	985,070	1,148,359	1,264,343	1,392,042	1,532,638
Subtotal	25,112,320	26,840,050	28,753,959	30,873,157	33,218,708	35,621,431	36,391,258	48,259,483	51,503,859	55,081,258
Operating Income	6,108,716	9,044,605	15,583,912	23,258,304	32,231,103	42,879,482	57,127,898	54,908,858	62,307,043	70,467,650
Gain / (loss) on sale of machinery & equipment	-	-	-	-	-	-	9,392,500	-	-	
Gain / (loss) on sale of office equipment	-	-	-	-	-	-	508,500	-	-	
Gain / (loss) on sale of office vehicles	-	-	-	-	-	-	285,325	-	-	
Earnings Before Interest & Taxes	6,108,716	9,044,605	15,583,912	23,258,304	32,231,103	42,879,482	67,314,223	54,908,858	62,307,043	70,467,650
Subtotal	-	-	-	-	-	-	-	-	-	-
Earnings Before Tax	6,108,716	9,044,605	15,583,912	23,258,304	32,231,103	42,879,482	67,314,223	54,908,858	62,307,043	70,467,650
Tax	2,148,979	2,622,935	4,519,334	6,744,908	9,347,020	12,435,050	19,521,125	15,923,569	18,069,043	20,435,619
NET PROFIT/(LOSS) AFTER TAX	**3,959,737**	**6,421,670**	**11,064,577**	**16,513,396**	**22,884,083**	**30,444,432**	**47,793,098**	**38,985,289**	**44,238,001**	**50,032,032**

12.2. Balance Sheet

Balance Sheet

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
Current assets											
Cash & Bank	1,000,000	2,552,413	8,645,851	15,072,400	21,625,378	28,058,604	34,041,639	43,942,048	87,681,949	135,250,332	237,694,909
Accounts receivable		14,130,270	16,853,921	19,983,541	23,573,460	27,684,652	32,385,874	37,754,275	41,567,457	45,765,770	50,388,113
Finished goods inventory	-	2,931,193	3,524,404	4,141,567	4,847,479	5,653,753	6,573,484	7,621,344	8,386,855	9,229,291	10,156,385
Consumables Inventory	51,200	61,783	74,553	89,963	108,558	130,996	158,073	190,746	230,172	277,748	-
Raw material inventory	5,116,668	6,862,283	8,958,335	11,634,979	15,044,181	19,376,375	24,869,684	30,147,056	36,544,291	44,299,026	-
Pre-paid building rent	225,000	247,500	272,250	299,475	329,423	362,365	398,601	438,461	482,307	530,538	-
Pre-paid insurance	592,083	503,270	414,458	325,645	236,833	148,021	59,208	1,114,021	946,918	779,814	-
Total Current Assets	6,984,951	27,288,711	38,743,771	51,547,570	65,765,311	81,414,765	98,486,564	121,207,951	175,839,950	236,132,520	298,239,407
Fixed assets											
Machinery & equipment	37,570,000	31,934,500	26,299,000	20,663,500	15,028,000	9,392,500	3,757,000	71,369,898	60,664,413	49,958,928	39,253,444
Furniture & fixtures	1,265,000	1,075,250	885,500	695,750	506,000	316,250	126,500	2,403,059	2,042,600	1,682,141	1,321,682
Office vehicles	1,141,300	970,105	798,910	627,715	456,520	285,325	114,130	1,738,887	1,478,054	1,217,221	956,388
Office equipment	2,034,000	1,728,900	1,423,800	1,118,700	813,600	508,500	203,400	3,863,891	3,284,307	2,704,723	2,125,140
Security Against Building	675,000	675,000	675,000	675,000	675,000	675,000	675,000	675,000	675,000	675,000	675,000
Total Fixed Assets	45,438,495	38,861,631	32,284,766	25,707,902	19,131,037	12,554,173	5,977,308	80,876,693	68,695,013	56,513,334	44,331,654
Intangible assets											
Pre-operation costs	962,081	769,665	577,249	384,833	192,416	-	-	-	-	-	-
Legal, licensing, & training costs	35,000	31,500	28,000	24,500	21,000	17,500	14,000	10,500	7,000	3,500	-
Total Intangible Assets	997,081	801,165	605,249	409,333	213,416	17,500	14,000	10,500	7,000	3,500	-
TOTAL ASSETS	**53,420,527**	**66,951,506**	**71,633,786**	**77,664,804**	**85,109,765**	**93,986,438**	**104,477,872**	**202,095,144**	**244,541,963**	**292,649,353**	**342,571,061**
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable		11,551,110	14,012,490	16,611,604	19,616,203	23,087,352	27,095,849	31,585,927	35,047,457	38,916,847	38,806,522
Total Current Liabilities	-	11,551,110	14,012,490	16,611,604	19,616,203	23,087,352	27,095,849	31,585,927	35,047,457	38,916,847	38,806,522
Shareholders' equity											
Paid-up capital	53,420,527	53,420,527	53,420,527	53,420,527	53,420,527	53,420,527	53,420,527	98,754,623	98,754,623	98,754,623	98,754,623
Retained earnings		1,979,869	4,200,769	7,632,673	12,073,035	17,478,559	23,961,496	71,754,594	110,739,883	154,977,884	205,009,916
Total Equity	53,420,527	55,400,396	57,621,296	61,053,201	65,493,562	70,899,086	77,382,023	170,509,216	209,494,506	253,732,507	303,764,538
TOTAL CAPITAL AND LIABILITIES	**53,420,527**	**66,951,506**	**71,633,786**	**77,664,804**	**85,109,765**	**93,986,438**	**104,477,872**	**202,095,144**	**244,541,963**	**292,649,353**	**342,571,061**

12.3. Cash Flow Statement

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
Operating activities											
Net profit		3,959,737	6,421,670	11,064,577	16,513,396	22,884,083	30,444,432	47,793,098	38,985,289	44,238,001	50,032,032
Add: depreciation expense		6,576,865	6,576,865	6,576,865	6,576,865	6,576,865	6,576,865	4,476,350	12,181,680	12,181,680	12,181,680
amortization of pre-operating costs		192,416	192,416	192,416	192,416	192,416	-	-	-	-	-
amortization of training costs		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Accounts receivable		(14,130,270)	(2,723,652)	(3,129,620)	(3,589,919)	(4,111,192)	(4,701,223)	(5,368,401)	(3,813,182)	(4,198,313)	(4,622,343)
Finished goods inventory		(2,931,193)	(593,211)	(617,163)	(705,912)	(806,274)	(919,731)	(1,047,860)	(765,511)	(842,436)	(927,094)
Equipment inventory	(51,200)	(10,583)	(12,770)	(15,410)	(18,595)	(22,438)	(27,076)	(32,673)	(39,426)	(47,576)	277,748
Raw material inventory	(5,116,668)	(1,745,614)	(2,096,052)	(2,676,644)	(3,409,202)	(4,332,194)	(5,493,309)	(5,277,372)	(6,397,235)	(7,754,735)	44,299,026
Pre-paid building rent	(225,000)	(22,500)	(24,750)	(27,225)	(29,948)	(32,942)	(36,236)	(39,860)	(43,846)	(48,231)	530,538
Advance insurance premium	(592,083)	88,812	88,812	88,812	88,812	88,812	88,812	(1,054,812)	167,103	167,103	779,814
Accounts payable		11,551,110	2,461,379	2,599,114	3,004,599	3,471,149	4,008,497	4,490,079	3,461,530	3,869,389	(110,324)
Cash provided by operations	(5,984,951)	3,532,281	10,294,207	14,059,223	18,626,013	23,911,784	29,944,531	43,942,048	43,739,901	47,568,383	102,444,577
Financing activities											
Issuance of shares	53,420,527	-	-	-	-	-	-	45,334,095	-	-	-
Cash provided by / (used for) financing activities	53,420,527	-	-	-	-	-	-	45,334,095	-	-	-
Investing activities											
Capital expenditure	(46,435,576)	-	-	-	-	-	-	(79,375,734)	-	-	-
Cash (used for) / provided by investing activities	(46,435,576)	-	-	-	-	-	-	(79,375,734)	-	-	-
NET CASH	**1,000,000**	**3,532,281**	**10,294,207**	**14,059,223**	**18,626,013**	**23,911,784**	**29,944,531**	**9,900,409**	**43,739,901**	**47,568,383**	**102,444,577**

13. KEY ASSUMPTIONS

13.1. Cost of Sales Assumptions

Table 30: Cost of Sales Assumptions

Description	Details
Utilities Cost	Industrial Tariff – Industrial (B2)
Direct Labor	Monthly Salaries
Cost of Sales Growth Rate	10.1%

13.2. Operating Cost Assumptions

Table 31: Operating Cost Assumptions

Description	Details
Operating costs growth rate	10.1%
Administration benefits expense	5.0% of administration expenses
Communication expenses	3.50% of administration expenses
Office expenses (stationery, entertainment etc.)	2% of administration expenses
Promotional Expense	0.3% of revenue

13.3. Revenue Assumptions

Table 32: Revenue Assumptions

Description	Details
Sale price growth rate	10.1%
Capacity utilization	60%
Capacity utilization growth rate	5%
Maximum capacity	90%

13.4. Financial Assumptions

Table 33: Financial Assumptions

Description	Details
Project life (Years)	10
Debt: Equity	0:100
Discount Rate	15%

13.5. Debt Related Assumptions

Table 34: Debt Related Assumption

Description of Cost	Details
Project Life (Years)	10
Debt: Equity	50:50
Discount Rate	11%
Debt Tenure	5 years
Grace Period	1 Year
Interest Rate (KIBOR+3%)	10.3%

13.6. Cash Flow Assumptions

Table 35: Cash Flow Assumption

Description of Cost	Details
Accounts receivable cycle (in days)	30
Accounts payable cycle (in days)	30

Small and Medium Enterprises Development Authority

HEAD OFFICE

4th Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road, Lahore
Tel: (92 42) 111 111 456, Fax: (92 42) 36304926-7

www.smeda.org.pk, **helpdesk@smeda.org.pk**

REGIONAL OFFICE PUNJAB	REGIONAL OFFICE SINDH	REGIONAL OFFICE KPK	REGIONAL OFFICE BALOCHISTAN
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