



Pre-feasibility Study

PRODUCTION UNIT FOR CORRUGATED AND SOLID FIBER BOXES

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, 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

Table of Contents

1. DISCLAIMER	5
2. EXECUTIVE SUMMARY	6
3. INTRODUCTION TO SMEDA	7
4. PURPOSE OF THE DOCUMENT	8
5. BRIEF DESCRIPTION OF PROJECT & PRODUCTS	8
5.1. Proposed Machinery	12
5.2. Production Process Flow	16
5.3. Installed and Operational Capacities	22
6. CRITICAL FACTORS	24
7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT	24
8. POTENTIAL TARGET MARKETS.....	24
9. PROJECT COST SUMMARY	26
9.1. Project Economics	26
9.2. Project Cost.....	26
9.2.1. Land	27
9.2.2. Building.....	27
9.2.3. Machinery and Equipment.....	28
9.2.4. Furniture & Fixtures	29
9.2.5. Office Equipment	29
9.2.6. Office Vehicles	30
9.2.7. Pre-Operating Cost.....	30
9.2.8. Security against Building Rent.....	31
9.2.9. Working Capital Requirements	31
9.3. Financial Feasibility Analysis.....	31
9.4. Financial Feasibility Debt Financing.....	32
9.4.1. Breakeven Analysis.....	32
9.4.2. Revenue Generation.....	33
9.4.3. Variable Cost Estimate	33
9.4.4. Raw Material Cost	34
9.4.5. Fixed Cost Estimate	39
9.4.6. Human Resource Requirement	40
10. CONTACT DETAILS.....	41

11. USEFUL LINKS 42

12. ANNEXURES 43

 12.1. Income Statement 43

 12.2. Balance Sheet 44

 12.3. Cash Flow Statement 45

13. KEY ASSUMPTIONS 46

 13.1. Operating Cost Assumptions 46

 13.2. Revenue Assumptions 46

 13.3. Financial Assumptions 46

 13.1. Cash Flow Assumptions 46

 13.1. Debt Related Assumptions 47

Table of Tables

Table 1: Annual Production Capacity of Corrugated Boxes	23
Table 2: Annual Production Capacity of Solid Fiber Boxes	23
Table 3: Project Cost.....	26
Table 4: Breakup of Space Requirement.....	27
Table 5: Building Renovation Cost.....	28
Table 6: Machinery and Equipment	28
Table 7: Dies.....	29
Table 8: Furniture and Fixtures	29
Table 9: Office Equipment.....	29
Table 10: Office Vehicle.....	30
Table 11: Pre-Operating Cost.....	30
Table 12: Security against Building Rent	31
Table 13: Working Capital Requirements	31
Table 14: Financial Feasibility Analysis	31
Table 15: Financial Feasibility Debt Financing	32
Table 16: Breakeven Analysis	32
Table 17: Revenue Generation	33
Table 18: Variable Cost Estimate.....	33
Table 19: Raw Material Cost.....	34
Table 20: Dimensions of a Corrugated Box.....	34
Table 21: Material Cost per Corrugated Box.....	36
Table 22: Kraft Paper Consumption	36
Table 23: Material Cost per Solid Fiber Box.....	37
Table 24: Kraft Card Consumption	38
Table 25: Fixed Cost Estimate.....	39
Table 26: Human Resource Requirement	40
Table 27: Contact Details of Suppliers	41
Table 28: Useful Links.....	42
Table 29: Operating Cost Assumptions	46
Table 30: Revenue Assumptions	46
Table 31: Financial Assumptions	46
Table 32: Cash Flow Assumptions	46
Table 33: Debt Related Assumptions	47

Table of Figures

Figure 1: Samples of Corrugated and Solid Fiber box	9
Figure 2: Types of Paper	10
Figure 3: Corrugation Machine	12
Figure 4: Cutting Machine	13
Figure 5: Pasting Machine.....	13
Figure 6: Die Cutting Machine	14
Figure 7: Sheet Bending Machine.....	15
Figure 8: Pin Stitching Machine.....	15
Figure 9: Process Flow – Corrugated Box.....	16
Figure 10: Kraft Paper Reels	16
Figure 11: Corrugating Roll	17
Figure 12: Types of Flute.....	17
Figure 13: Layers in Corrugation and Types of Flute	18
Figure 14: Die-Cutting Process	19
Figure 15: Process Flow – Solid Fiber Box	19
Figure 16 Bleach and Kraft card Reels	20
Figure 17: Die-Cutting Process	21
Figure 18: Major Consumers of Packaging Industry	25
Figure 19: Construction of Corrugated Boxes.....	35

1. DISCLAIMER

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Document Control

Document No.	221
Prepared by	SMEDA-Punjab
Revision Date	September 2021
For information	helpdesk.punjab@smeda.org.pk

2. EXECUTIVE SUMMARY

Product packaging is very important for all products being sold in the market. It is important to ensure that packaging is strong enough to maintain the safety of products against any damage during shipping. Corrugated and solid fiber boxes are primarily used as the main packing material for this purpose. This material used for making corrugated and solid fiber boxes is 70% (in case of food items packaging) and 100% (in case of dry packaging) recyclable and biodegradable. Recycling not only saves the environment from deterioration by reducing pollution but also conserves valuable resources. Thus, it reduces environmental footprint and degradation by offering “green” packaging solutions. Corrugated boxes are made up of multiple layers of material rather than just single sheet-like cardboard. The three layers of corrugated packaging include an inside liner, an outside liner made of Kraft card, and a medium that goes between the two, which is fluted. The two linerboards of the Kraft card sandwich a middle sheet that is in a wave-shaped pattern of arches known as flutes. These flutes are pasted to the linerboard with an adhesive.

Corrugated boxes are used for packing large variety of products; including food, medicines, textiles, electronics, furniture products, etc. Corrugated is a resilient as well as lightweight material which are the two important considerations in using this package. Corrugated cartons can be customized to carry nearly any item, from pharmaceutical supplies to bulk food products, and are used on daily basis by a wide range of industries.

Solid Fiber boxes are also made up of layers of Kraft cards glued together; however, they do not include the fluted medium that goes in between the two layers. Unlike corrugated boxes, solid fiber boxes are mostly used for applications where stylish and fancy packaging is required. Common products for which this packaging is required include shoe boxes, watch boxes, wallet boxes, mobile phone/laptop boxes, medicine boxes, etc. Hence, the solid fiber boxes are usually small or medium-sized. They can be utilized for transporting goods and fragile objects efficiently and safely. These boxes can be customized in numerous ways to protect and preserve products.

With an outburst of e-commerce, the pattern of shopping has shifted from traditional ways to online ordering, which has made packaging more important than ever. Most of the suppliers of online products choose corrugated and solid fiber boxes for their packaging.

This “Pre-feasibility Document” provides details for setting up “Production Unit for Corrugated and Solid Fiber Boxes”, which has a capacity of manufacturing 628,058 corrugated boxes and 2,160,000 solid-fiber boxes, total 2,788,058 boxes in a year at a maximum capacity of 100%. The production capacity in the initial year is assumed to be 60%, with the production of 376,835 corrugated boxes and 1,296,000 solid-fiber boxes total 1,672,835 boxes annually.

The unit is proposed to be ideally located in metropolitan cities like Lahore, Karachi, and Islamabad, and other cities where major industrial activity is carried out, such as Faisalabad, Sialkot, Gujranwala, Hyderabad, Peshawar, Quetta, Rawalpindi, Multan, Gujrat, Mardan, etc. These cities are also suitable due to the convenient availability of raw materials and skilled labor and presence of large clusters of manufacturing units.

A small size "Production Unit for Corrugated and Solid Fiber Boxes" will be set up in a rented building with an area of 5,600 square feet. The project requires a total investment of PKR 17.44 million. This includes a capital investment of PKR 11.58 million and working capital of PKR 5.86 million. This project is financed through 100% equity. The Net Present Value (NPV) of the project is PKR 95.48 million with an Internal Rate of Return (IRR) of 60% and a Payback period of 2.49 years. Further, this project is expected to generate Gross Annual Revenues of PKR 85.93 million during 1st year, with Gross Profit (GP) ratio ranging from 28% to 31% and Net Profit (NP) ratio ranging from 9% to 19% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at the capacity of 38% (1,048,663 boxes) with annual revenues of PKR 53.87 million.

The proposed project may also be established using leveraged financing. With 50% debt financing, at KIBOR+3%, the proposed project provides Net Present Value (NPV) of PKR 109.75 million, Internal Rate of Return (IRR) of 56%, and a Payback period of 2.75 years. Further, this project is expected to generate a Net Profit (NP) ratio ranging from 9% to 19% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at a capacity of 38% (1,070,058 boxes) with annual revenues of PKR 54.97 million.

The proposed project will provide employment opportunities to 21 people including the owner. High return on investment and steady growth of the 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 "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 is 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 provide information to the potential investors about "Production Unit for Corrugated and Solid Fiber Boxes". 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.

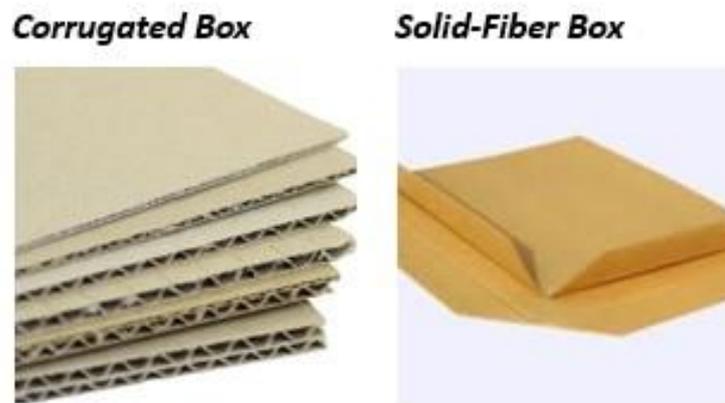
5. BRIEF DESCRIPTION OF PROJECT & PRODUCTS

This study provides information about establishing a "Production Unit for Corrugated and Solid Fiber Boxes" in Pakistan.

The main difference between corrugated boxes and solid fiber boxes is the corrugation process. In the corrugation process for making corrugated boxes, flute

paper is used as a medium layer between two Kraft paper layers. Flute paper serves as a protective cushioning to provide the required shock absorption capacity and helps strengthen a carton. In the production process of solid boxes, multiple layers of Kraft paper are pasted to form a solid card according to the packaging requirements of the specific products. Pictures of corrugated and solid fiber materials are shown in Figure 1.

Figure 1: Samples of Corrugated and Solid Fiber box



The most common corrugated boxes include one layer of fluted paper¹ between two liners of Kraft paper² (The strength of the corrugated box can be divided into categories 3, 5, 7, and 9 plies). The most common type used is 3 ply box.³ It can vary in durability, thicknesses, and sizes depending on the weight (grams) of the paper per unit area (per square meter), the number of layers, and the type of the Kraft paper/ card used. Kraft paper can vary in weight from 70 to 135 grams per square meter. Kraft cards can vary in weight from 200 to 400 grams per square meter. Different types of Kraft papers/cards may be used for making corrugated boxes. Common types include:

- Kraft Card/Paper
- Brown Recycled Kraft Card
- Brown Fresh Kraft Card
- Bleach Card (white)

¹Flute paper look like wavy lines which when glued to a paperboard, forms the corrugated board.

²Kraft paper is the most used material in packaging. It is made by the sulfate pulping process.

³A 3-ply corrugated box will have one fluted paper placed between two-line boards.

Figure 2: Types of Paper

Kraft paper or Brown Fresh Kraft paper is a paper or paperboard produced from chemical pulp. It is used for the production of corrugated boxes. Brown recycled card is paper made from recycled material whereas Bleach card is made purely from bleached chemical pulp. Brown and Bleach cards are used to produce Solid-fiber boxes. Brown Fresh card and bleach cards are of food grade and are mostly used for packaging food products. Two types of glue are used in the manufacturing of these boxes. A food-grade glue (with starch as the main component) is used in the boxes to pack food items. For other products, a simple glue (solution) is used.

Fragile content, including glass products, electronic items, and chemical liquids, remains secure and protected with corrugated cardboard packaging. The corrugated material also has tear-resistant qualities that keep the packaging intact and protect the products from exposure. For objects such as food products, which must withstand long shipping times and remain fresh upon delivery, corrugated packaging protects against moisture and keeps foods from spoiling during transport.

Furthermore, corrugated packaging is a preferred choice of many brands and its popularity and demand have further increased, pioneered by the explosion of e-commerce. The paradigm of shopping has shifted from traditional ways to online ordering, which means that packaging is more important than ever. The brands can no longer rely on attention-grabbing displays in stores. They need to continue their brand narrative online, in transit, and in their consumers' hands.

The packaging industry works normally on order basis. The labor works in 12-hour shifts, according to packaging industry norms. Both skilled and unskilled labor is required. In the proposed project, total staff of 20 persons is required.

Key benefits, triggering high demand for corrugated packaging, include:

- Protective, strong and durable material
- Easy-to-customize according to the requirements

- Cost-effective and sustainable
- Biodegradable
- Eco-friendly, green packaging solution

Following products will be produced in the proposed unit:

Proposed Products

Corrugated Boxes

The raw material used for corrugated boxes is Kraft paper/card. The corrugated boxes manufactured in the proposed project are of the following sizes:

- 3-ply with dimensions (8 x 4 x 4 inches)
- 3-ply with dimensions (20 x 10 x 10 inches)
- 5-ply with dimensions (24 x 12 x 12 inches)
- 5-ply with dimensions (30 x 15 x 15 inches)

Solid-Fiber Boxes

The raw material used for proposed products includes brown recycled cards, brown fresh cards, and bleach cards. The corrugated boxes manufactured in the proposed project are following:

Brown Recycled Card Boxes

- Single-layer (6 x 4 x 2 inches)
- Double layer (10 x 6 x 4 inches)

Brown Fresh Card Boxes

- Single-layer (6 x 4 x 2 inches)
- Double layer (10 x 6 x 4 inches)

Bleach Card Boxes

- Single-layer (6 x 4 x 2 inches)
- Double layer (10 x 6 x 4 inches)

5.1. Proposed Machinery

Machines used in the proposed project are discussed in the following paragraphs:

Corrugation Machine

In corrugation process, Kraft paper is passed through a set of corrugating rolls under high heat and pressure to form flutes that gives corrugated board its strength and cushioning ability. A pressure roll loads the correct pressure and also brings the liner into contact with fluted medium after adhesive is applied to the flute tips by glue roll. Adhesive should be consistent and given a proper temperature to form a strong bond between liner and fluted medium. Flute serves as protective cushioning and helps strengthen a carton. Different widths and configurations offer distinctive performance advantages with the design speed up to 100 square meters/minute and width from 1.4m to 2.5m. The machine is locally manufactured in Pakistan. It is a semi-automatic machine and needs a skilled operator to handle it. The corrugation machine is shown in Figure 3.

Figure 3: Corrugation Machine



Cutting Machine

The paper is cut in the required size through an automated paper cutting machine. Paper cutting machines generally work the same way that commercial graphics cutters do, only on a smaller scale. Details are manually fed to the machine's control panel, and the paper is automatically cut as per specifications demanded by the client. A skilled operator is required to handle the machine. The cutting machine is shown in Figure 4.

Figure 4: Cutting Machine**Pasting Machine**

The pasting Machine is semi-automatic and it contains two different types of drums. One drum is dipped with the glue that is loaded into the machine. The second drum is on the opposite side to roll out the paper. They both roll together to evenly stick glue to one side of the sheet. Two persons then carry that glued piece from each end and paste that on the other layer. The combined layers of the corrugated sheet, are converted from 3 plies to 5, 7, or 9 plies. Similarly, for solid fiber sheets, same machine is used for pasting the required number of sheets. It requires at least 3 workers to operate and handle the pasting process. Unskilled operators are required to operate the machine as the operation is not very complex. The pasting machine is shown in Figure 5.

Figure 5: Pasting Machine

Die Cutting Machine

A rotary die cutter is an automatic cutter that uses a cylindrical die to cut the paper at a high speed and in multiple number. A flat bed die cutter operates at a lower speed and uses a flat die and the sheet momentarily stops to enable the required cutting, with one output at a time. Die-cutting machines are operated with an easy-to-turn crank and use specialized metal shapes to cut sheets. As the material pass through the machine's rollers, it applies pressure and the die cuts the sheet into the shape of the die. A skilled operator is required to operate the machine. The Die-Cutting machine is shown the Figure 6.

Figure 6: Die Cutting Machine



Sheet Bending Machine

This machine is used to bend the sheet in the process, to form the given shape of a box. A box comes in a proper shape after this process. This is a semi-automatic machine and requires skilled labor to operate. A person puts the sheet in the machine and the machine presses at specific points to make it bend at a given angle. The sheet bending machine is shown in Figure 7.

Figure 7: Sheet Bending Machine**Pin Stitching Machine**

Usually small boxes does not need staples as these are folded in a way that one flap is fixed in to another to form the shape of a box. Large boxes are stapled, as these are used to pack heavy products, to give the box a firm and proper shape. These are stapled by using a pin stitching machine. It is a semi-automatic machine and needs at least two persons to operate. The person manually puts each box in the pin stitching board and the machine stitches the box to shape it accurately. The machine is shown in Figure 8.

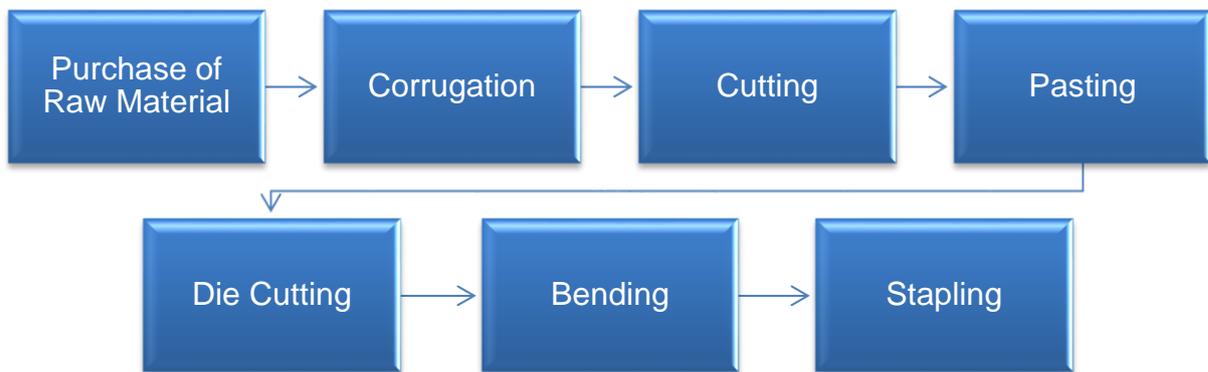
Figure 8: Pin Stitching Machine

5.2. Production Process Flow

Corrugated Boxes

The production process flow of corrugated boxes is given in Figure 9.

Figure 9: Process Flow – Corrugated Box



Purchase of Raw Material

Raw material purchased in the proposed project is as follows:

- Kraft Paper Reels
- Sodium Silicate Glue

Kraft paper used in the proposed project is has approximately specification of 100 grams per square meter. It is purchased from the local markets in the form of Kraft paper reels, shown in Figure 10.

Figure 10: Kraft Paper Reels



Corrugation

In the process of corrugation, Kraft paper passes through a set of corrugating rolls under high heat and pressure to form flutes. Different set of corrugating rolls are used to produce each specific flute. Figure 11 shows a corrugating roll.

Figure 11: Corrugating Roll



There are different types of flutes produced in the corrugation as shown in Figure 12. C-flute is the most commonly used flute as an all-purpose flute.

Figure 12: Types of Flute



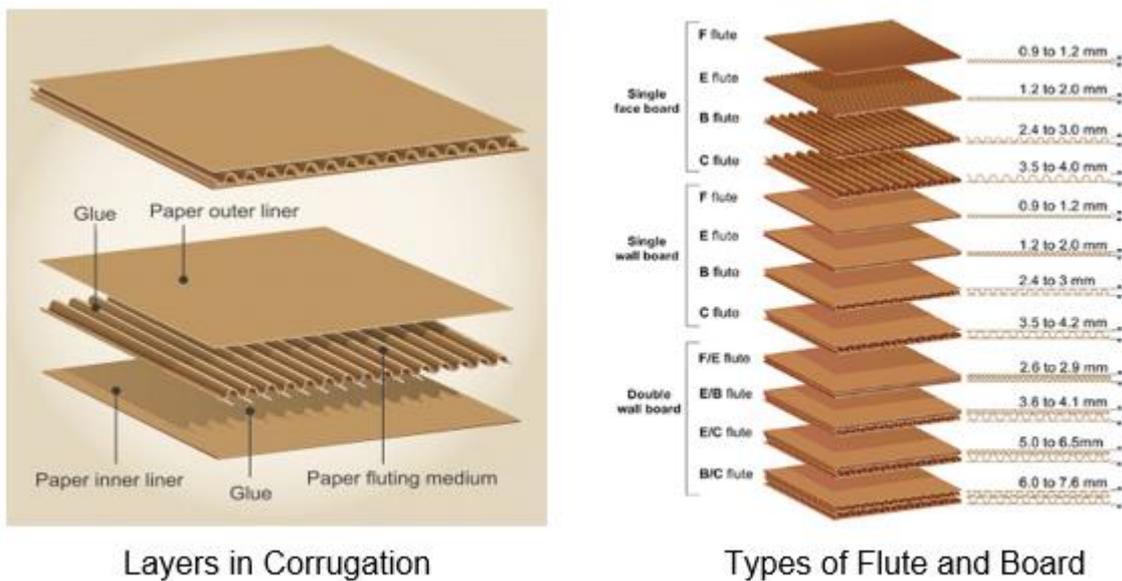
Cutting

A cutting machine is then used to cut the corrugated board in the required sizes. The machine automatically cuts the corrugated board to specific sizes as per requirement, with minimum wastage.

Pasting

In the pasting process, different boards are pasted together using a pasting machine by using glue. Single layered board is prepared by pasting a required type of flute with a Kraft paper. Multiple walled boards are prepared by pasting as many layers of flutes as required. Corrugated paper glued to one sheet on the linerboard is called a single-face board. It is used primarily as a spacer inside packages. If the second sheet of linerboard is glued to the other side, the product is known as the double-face board, and this product accounts for the largest percentage of corrugated board products. Double-wall corrugated boxes are made with three layers of linerboard separated by two layers of corrugating medium, as shown in Figure 13.

Figure 13: Layers in Corrugation and Types of Flute



Die-Cutting

Die-cutting is a process whereby a die is used to cut through materials such as paper and cards using a die-cutting machine. Creating dies for each design is quite costly. However, it is a one-time cost that is recoverable in the long term. Once a die is formed, it can be used multiple times on the press to produce large volumes of corrugated boxes as shown in Figure 14.

Figure 14: Die-Cutting Process**Bending**

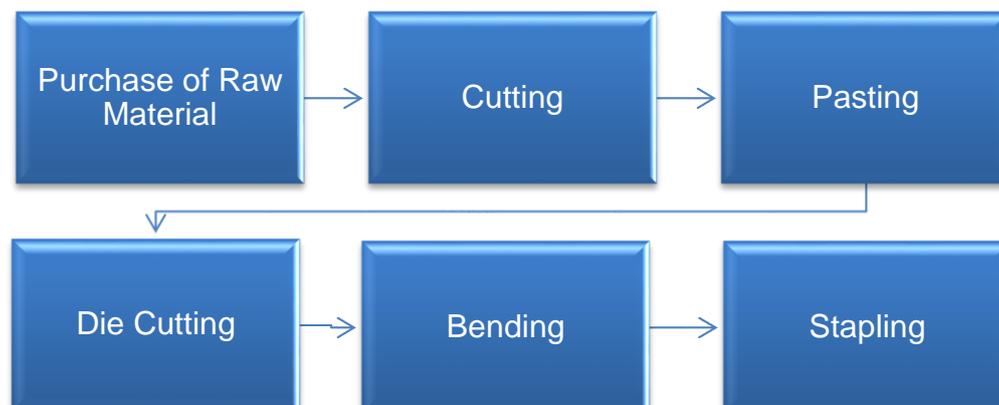
The processed card or paper is then bent to form a proper shape of a box according to the design.

Stapling

To give the box a firm and proper shape, it is finally stapled or taped as per the requirement. Stapling the corrugated boxes makes the products shipping even safer. Stapling is the low-cost alternative for sealing cartons. Stapled cartons are dimensionally stable and provide better stacking ability.

Solid Fiber Boxes

The production process flow of Solid fiber boxes is shown in Figure 15.

Figure 15: Process Flow – Solid Fiber Box

Purchase of Material

The raw materials used for solid-fiber boxes in the proposed project is as follows:

- Brown Fresh Kraft Card Reels
- Brown Recycled Kraft Card Reels
- Bleach Card Reels
- Starch-Based Glue
- Sodium Silicate Glue

Brown fresh Kraft card is produced from chemical pulp produced in the Kraft process. The reels used in the proposed project weighs about 135 grams per square meter. The recycled Kraft card weighs around 70 grams per square meter. Recycled Kraft card is relatively cheaper but has less strength. Bleach card is formed through the same production process but a strong bleaching agent is used. Starch-Based glues are made from natural carbohydrates derived from roots, tubers and plant seeds, and LD Davis starch glues are derived from these renewable natural sources while Sodium silicate glue is considered to be one of the most effective adhesive for papers and porous surfaces.

The Reels comes in several sizes, ranging from (1x720 feet) to (5x720 feet). Both imported and locally produced materials are available in the market. Figure 10 shows different reels of paper.

Figure 16 Bleach and Kraft card Reels



Cutting

A cutting machine is used to cut the solid fiberboard in the required sizes. The machine automatically cuts the Kraft card to specific sizes as per requirement. The size is selected with the consideration of minimizing wastage.

Pasting

Different boards are pasted together using a pasting machine using glue to form a material of the required thickness. The standard weight of a single-layered Kraft card varies from 350 to 400 grams per square foot.

Die-Cutting

Die-cutting is a process in which a die is used to cut through materials such as paper and cards using a die-cutting machine. Die-cutting machines are operated with an easy-to-turn crank and use specialized metal shapes to cut sheets. As the material and metal die pass through the machine's rollers, it applies pressure and the die cuts the sheet into the shape of the die. Making dies for each design is expensive. However, it is a one-time cost that is usually recoverable in the long term. Once a die is made, it can be fitted in the machine and used multiple times on the press to produce large volumes of corrugated and fiber boxes as shown in Figure 14.

Figure 17: Die-Cutting Process



Bending

The processed card or paper is then bent to form the shape of the box according to the design.

Stapling

To give the box a firm and proper shape, it is finally stapled or taped as per requirement using a stitching machine. This gives the box a firm and proper shape. Stapling is the low-cost alternative for sealing cartons. Stapled cartons are dimensionally stable and provide better stacking ability.

5.3. Installed and Operational Capacities

The proposed project has a capacity of manufacturing 628,058 corrugated boxes and 2,160,000 solid-fiber boxes, with a total of 2,788,058 boxes in a year at a maximum capacity of 100%. The operational capacity of the proposed manufacturing unit during the initial year of operation has been assumed to be 60% of its total production capacity with a production of 376,835 corrugated boxes and 1,296,000 solid-fiber boxes, and a total of 1,672,835 boxes annually. It has further been assumed that during the projected period of 10 years, the facility will continue to operate with a 5% annual increase in capacity utilization each year with a cap at 90% of its total production capacity, which is expected to be achieved during the 7th year after commencement of operations. The facility shall, at a maximum capacity of 90%, will produce 2,509,253 boxes annually. The unit would operate for 12 hours per day, working in one shift per day for 300 working days in a year. Table 1 depicts the installed and operational capacities of the proposed Corrugated and Solid Fiber manufacturing unit

Table 1: Annual Production Capacity of Corrugated Boxes

Type of Box	Corrugation Machine Capacity (Square meter per hour) (A)	Total Working Days (B)	Annual Corrugation Machine Capacity (Square meter) (A*B*12 hours)	Ratio	Annual Capacity (No. of Boxes) @ 100% Capacity
Box-1 (3Ply)	100	300	360,000	25%	464,763
Box-2 (3 Ply)				25%	76,191
Box-3 (5 Ply)				25%	53,055
Box-4 (5 Ply)				25%	34,049
Total				100%	628,058

Table 2: Annual Production Capacity of Solid Fiber Boxes

Type of Box	Die Cutting Machine Capacity (No. of Boxes/ hour) (A)	Total Working Days (B)	Annual Die Cutting Machine Capacity (No. of Boxes) (A*B*12 hours)	Ratio	Annual Capacity (No. of Boxes) @ 100% Capacity
Brown recycled card- Single Layer	600	300	2,160,000	10%	216,000
Brown recycled card- Double Layer				10%	216,000
Brown Fresh card- Single Layer				20%	432,000
Brown Fresh card- Double Layer				20%	432,000
Bleach card- Single Layer				20%	432,000
Bleach card- Double Layer				20%	432,000
Total				100%	2,160,000

6. CRITICAL FACTORS

The following factors should be taken into account while making an investment decision:

- Adequate technical knowhow of the process
- Good knowledge of the packaging industry
- Good quality raw material compatible as per the international standards
- Production of quality products, specific to users' needs
- The hiring of a skilled workforce
- Up-to-date knowledge of market trends
- Selection of appropriate machinery and human resources
- Close supervision of the production processes
- Ability to generate work orders through industrial networking (B2B and B2C)
- Assurance of timely order fulfillment

7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

The metropolitan cities of Lahore and Karachi have good potential for investment in corrugated and solid fiber manufacturing units. Other big cities with large industrial clusters such as Faisalabad, Gujranwala, Hyderabad, Sialkot, Peshawar, Quetta, Multan, etc. Sub-urban areas of all major cities of Pakistan also have the potential for this investment.

Availability of skilled labor is vital while selecting a location. The above-mentioned cities have good availability of skilled labor, raw material, and existence of large industrial clusters. The proposed production unit for corrugated and solid-fiber boxes is proposed to be established in outskirts areas of the cities.

8. POTENTIAL TARGET MARKETS

Pakistan's packaging industry has shown high growth in recent years. Along with the large manufacturers fulfilling a major share of the local demand, there remains a lot of room for medium and small packaging units. There is an increasing consumer awareness towards sustainable packaging. The corrugated boxes market is gaining momentum in the food and beverages sector. Other than that, manufacturers, traders, distributors, and suppliers in the local retail and wholesale trade are the major customers of this industry. Following are some of the major clients for this industry:

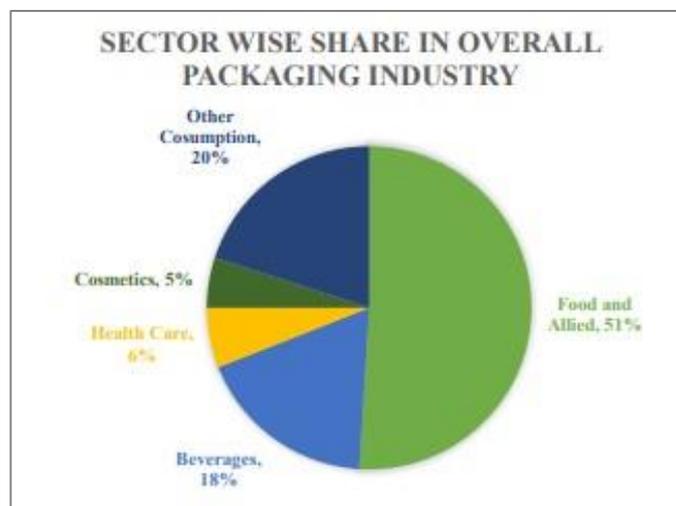
- Pharmaceutical industry

- Textile industry
- Leather industry
- Home appliances industry
- Furniture industry
- Garments industry
- Jewelry industry
- Confectionary industry
- Fruits and vegetable processing industry
- Footwear industry
- Cosmetics industry
- Toys industry

The market for global corrugated boxes stood at USD 61.29 Billion in 2015 and is projected to reach USD 76.76 Billion by 2021, at an estimated CAGR of 3.94%.⁴

Pakistan's total market value of the packaging industry in 2019 was estimated at US 5 billion dollars.⁵ Shares of the major customers of the packaging industry in Pakistan are shown in Figure 18.

Figure 18: Major Consumers of Packaging Industry⁶



The largest segment within the global industry is paper and board packing which accounts for 34% of the market. Flexible plastic and rigid plastic packing have

⁴ <https://www.marketsandmarkets.com/Market-Reports/corrugated-boxes-market-123154454.html>

⁵ https://www.pacra.com/sector_research/Packaging%20Industry_PET_Nov19_1573041661.pdf

⁶ https://www.pacra.com/sector_research/Packaging%20Industry_PET_Nov19_1573041661.pdf

market shares of 22% and 17%, respectively. Metal packing occupies 11% of the total market while glass packing has a market share of 6%.⁷ In 2019, the total paper production in Pakistan was 0.60 million metric tons. Imports and exports were 0.455 and 0.017 metric tons respectively. Paper used for Corrugation and Packaging was 0.439 metric tons.⁸

The proposed project's primary targets will be the retail and wholesale trade which needs customized boxes for products like garments, clothes, toys, stationery, jewelry, food, beverages, medicines, home appliances, etc.

9. PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of "Production Unit for Corrugated and Solid Fiber Boxes". Various costs and revenue-related assumptions along with results of the analysis are outlined in this section.

The projected Income Statement, Cost of Goods Sold, 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. Project Cost

The total cost of the project has been calculated to be PKR 17.44 million. The project will be financed through 100% Equity. Table 3 provides the details of the costs calculated for the proposed manufacturing unit.

Table 3: Project Cost

Description of Costs	Amount (PKR)
Capital Cost	
Building / Infrastructure	981,550
Machinery & equipment	7,000,000
Furniture & fixtures	643,000
Office vehicles	414,100
Office equipment	1,177,000

⁷ https://www.pacra.com/sector_research/Paper%20and%20Packaging%20Sector%20PACRA_1604587222.pdf

⁸ <https://paperonweb.com/Pakistan.htm>

Pre-operating costs	465,949
Security Against Building	900,000
Total Capital Costs	11,581,599
Working Capital Requirement	
Machinery spare parts inventory	233,333
Raw material inventory	4,510,035
Upfront insurance payment	115,353
Cash	1,000,000
Total Working Capital	5,858,721
Total Project Cost	17,440,320

9.2.1. Land

The Corrugated and Solid Fiber Boxes Production Unit will be established in a rented building to avoid the high cost of land. Suitable locations for setting up a manufacturing business like this can be easily found on rent. Therefore, no land cost has been added to the project cost. The total space requirement for the proposed unit has been estimated as 5,600 sq. ft. The breakup of the space requirement is provided in Table 4.

Table 4: Breakup of Space Requirement

Department	No.	% Break-up	Area (Sq. Ft.)
Raw Material Store Room	1	25%	1,400
Production Dept	1	39%	2,200
Finished Goods Store room	1	18%	1,000
Executive Office	1	3%	150
Admin and Accounts Dept	1	3%	150
Sales and Marketing Dept	1	5%	260
Parking and Gate area	1	5%	300
Washroom	4	3%	140
Total Area		100%	5,600

9.2.2. Building

There will be no cost of the building since the unit will be started in rented premises. However, there will be a renovation cost; required to make the building usable for the business. The proposed project requires an electricity load of around

30 KW for which an electrical connection under the General Supply Tariff-Industrial three-phase will be required. Building rent of PKR 300,000 per month has been included in the operating cost. The building renovation cost is shown in Table 5.

Table 5: Building Renovation Cost

Particulars	Unit of Measurement	Total Units (PKR)	Cost per Unit (PKR)	Total Cost (PKR)
Paint Cost	Litre	122	500	60,850
Labour Cost	Square feet	12,170	10	121,700
Wall Racks	No.	26	15,000	390,000
Curtains	No.	8	3,000	24,000
Blinds	No.	5	5,000	25,000
Glass Partition and Doors	Square feet	450	800	360,000
Total				981,550

9.2.3. Machinery and Equipment

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

Table 6: Machinery and Equipment

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Corrugation Machine (100 Sq. meter/ Hour)	1	3,000,000	3,000,000
Sheet Cutter Machine (80 meter per minute)	1	300,000	300,000
Pasting Machine (80 meter per minute)	1	600,000	600,000
Die Cutting Machine (10 boxes per minute)	2	800,000	1,600,000
Dies (Table 7)	10		220,000
Bending Machine (10 Boxes per minute)	2	450,000	900,000
Pin Stitching Machine (250 nails/ minute)	1	200,000	200,000
Material Handling Trolleys	6	20,000	120,000
Mechanical Tool Kit	2	30,000	60,000
Total Cost (PKR)			7,000,000

Table 7: Dies

Type of Boxes	No. of Dies	Cost Per Unit (PKR)	Total Cost (PKR)
Box-1 (3 Ply)	1	25,000	25,000
Box-2 (3 Ply)	1	25,000	25,000
Box-3 (5 Ply)	1	25,000	25,000
Box-4 (5 Ply)	1	25,000	25,000
Box-1 (Single layer)	1	20,000	20,000
Box-2 (Double layer)	1	20,000	20,000
Box-1 (Single layer)	1	20,000	20,000
Box-2 (Double layer)	1	20,000	20,000
Box-1 (Single layer)	1	20,000	20,000
Box-2 (Double layer)	1	20,000	20,000
Total	10		220,000

9.2.4. Furniture & Fixtures

Table 8 provides details of the furniture and fixture requirements of the project.

Table 8: Furniture and Fixtures

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Office Table	2	25,000	50,000
Executive Tables	5	35,000	175,000
Executive Chairs	5	20,000	100,000
Office Chairs	4	10,000	40,000
Sofa Set	2	35,000	70,000
Racks	26	8,000	208,000
Total			643,000

9.2.5. Office Equipment

Details of office equipment required for the project are provided in Table 9.

Table 9: Office Equipment

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Laptops	3	80,000	240,000
Desktop Computers	6	40,000	240,000
Printer	2	40,000	80,000

CCTV Cameras (2MP)	9	2,000	18,000
DVR	1	12,000	12,000
LED TV (32")	1	40,000	40,000
Air Conditioners	4	90,000	360,000
Exhaust Fan	9	4,000	36,000
Bracket Fan	4	4,500	18,000
Ceiling Fan	8	6,000	48,000
Pedestal Fan	5	8,000	40,000
Water Dispenser	2	20,000	40,000
Wi-Fi / Internet Router	1	5,000	5,000
Total			1,177,000

9.2.6. Office Vehicles

Details of the office vehicle required for the project are provided in Table 10.

Table 10: Office Vehicle

Cost Item	Unit(s)	Unit Cost (PKR)	Total Cost (PKR)
Loader Rickshaw	1	250,000	250,000
Motorcycle	2	80,000	160,000
Registration Charges		1%	4,100
Total Cost	3		414,100

9.2.7. Pre-Operating Cost

Details of pre-operating cost for the project are provided in Table 11.

Table 11: Pre-Operating Cost

Cost Item	Number of Months	Unit Cost/ Month (PKR)	Total Cost (PKR)
Administration Expense	1	252,000	252,000
Utilities Bill	1	213,949	213,949
Total Cost			465,949

9.2.8. Security against Building Rent

Details of pre-operating cost for the project are provided in Table 12.

Table 12: Security against Building Rent

Cost Item	Months	Unit Cos/Month (PKR)	Total Cost (PKR)
Security against Building Rent	3	300,000	900,000
Total			900,000

9.2.9. Working Capital Requirements

Table 13 provides details of working capital requirements for the project.

Table 13: Working Capital Requirements

Cost Item	No. of Months	Amount (PKR)
Machinery spare parts inventory	2	233,333
Raw material inventory	1	4,510,035
Upfront insurance payment	1	115,353
Cash	1	1,000,000
Total		5,858,721

9.3. Financial Feasibility Analysis

The financial feasibility analysis given in Table 14 provides the information regarding the projected IRR, NPV, and payback period of the study based on 100% equity.

Table 14: Financial Feasibility Analysis

Description	Project
IRR	60%
NPV (PKR)	95,484,214
Payback Period (years)	2.49
Projection Years	10
Discount Rate used for NPV	15%

9.4. Financial Feasibility Debt Financing

Table 15 provides the information regarding the projected IRR, NPV, and payback period of the study based on the combination of equity (50%) and debt (50%) financing for the proposed project.

Table 15: Financial Feasibility Debt Financing

Description	Project
IRR	56%
NPV (PKR)	109,747,416
Payback Period (years)	2.75
Projection Years	10
Discount Rate used for NPV	13%

9.4.1. Breakeven Analysis

Breakeven analysis is provided in Table 16.

Table 16: Breakeven Analysis

Particulars	Amount First Year (PKR)	Ratio
Sales(PKR)–A	85,928,430	100%
Variable Cost(PKR)–B	62,337,060	73%
Contribution (PKR)(A-B) = C	23,591,370	27%
Fixed Cost (PKR)–D	14,788,907	17%
Contribution Margin	27%	
Breakeven		
Breakeven Revenue (PKR)	53,866,629	
Breakeven Units (Boxes)	1,048,663	
Breakeven Capacity	38%	

9.4.2. Revenue Generation

Based on the 50% capacity utilization of the unit, sales revenue during the first year of operations is estimated in Table 17.

Table 17: Revenue Generation

Product	Units Sold (Units)(A)	Sale Price Per Box (B)	Total Revenue (PKR)(A*B)
Corrugated Boxes			
Box-1 (3-Ply)	267,239	20	5,344,780
Box-2 (3-Ply)	43,810	95	4,161,950
Box-3 (5-Ply)	30,507	150	4,576,050
Box-4 (5-Ply)	19,578	225	4,405,050
Total of Corrugated Boxes	361,134		18,487,830
Solid Fiber Boxes			
Brown recycled card -Box-1	124,200	7	869,400
Brown recycled card -Box-2	124,200	50	6,210,000
Brown fresh card-Box-1	248,400	18	4,471,200
Brown fresh card-Box-2	248,400	110	27,324,000
Bleach card-Box-1	248,400	15	3,726,000
Bleach card-Box-2	248,400	100	24,840,000
Total of Solid Fiber Boxes	1,242,000		67,440,600
Grand Total			85,928,430

9.4.3. Variable Cost Estimate

Variable costs of the project have been provided in detail in Table 18.

Table 18: Variable Cost Estimate

Variable Cost	Cost (PKR)
Corrugated Boxes	12,391,082
Solid Fiber Boxes	41,729,344
Direct Electricity	2,194,628
Direct Labour	4,416,000
Factory vehicle running and maintenance cost	168,751
Machinery maintenance cost	700,000

Communications expense (phone, internet etc.)	302,400
Office vehicles running and maintenance expense	62,100
Electricity	372,755
Total Variable Cost	62,337,060

9.4.4. Raw Material Cost

Table 19 provides detail of raw material cost used in the manufacturing of corrugated and solid-fiber boxes.

Table 19: Raw Material Cost

Description of Costs	Units Sold (Units)	Cost Per Unit (PKR)	Total Cost (PKR)
Corrugated Box		(Table 21)	
Box-1 (3-Ply)	267,239	12.67	3,385,038
Box-2 (3-Ply)	43,810	63.11	2,764,846
Box-3 (5-Ply)	30,507	103.55	3,159,087
Box-4 (5-Ply)	19,578	157.43	3,082,112
Total of Corrugated Boxes	361,134		12,391,082
Solid Fiber Box		(Table 23)	
Brown recycled card-Single Layer	124,200	4.54	563,328
Brown recycled card-Double Layer	124,200	30.44	3,780,459
Brown fresh card- Single Layer	248,400	10.81	2,685,158
Brown fresh card-Double Layer	248,400	69.48	17,258,271
Bleach card- Single Layer	248,400	9.42	2,338,824
Bleach card-Double Layer	248,400	60.80	15,103,304
Total of Solid Fiber-Boxes	1,242,000		41,729,344
Grand Total			54,120,426

Table 20: Dimensions of a Corrugated Box

Product	Length (inches)	Width (inches)	Depth (inches)	Flipper (inches)	Total Length (inches)	Total Width (inches)
Box-1 (3Ply)	8	4	4	1	25	12
Box-2	20	10	10	1	61	30

(3Ply)						
Box-3 (5Ply)	24	12	12	1	73	36
Box-4 (5Ply)	30	15	15	1	91	45

Figure 19: Construction of Corrugated Boxes

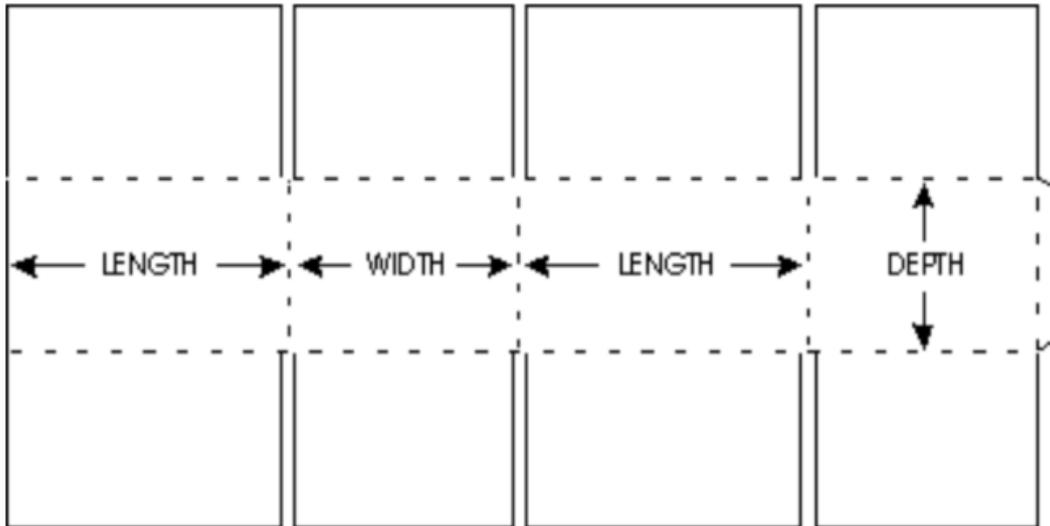


Table 21: Material Cost per Corrugated Box

Cost Item	Unit of Measurement	Consumption Box-1	Consumption Box-2	Consumption Box-3	Consumption Box-4	Cost/ Kg / Unit (PKR)	Box-1 (3Ply)	Box-2 (5Ply)	Box-3 (5Ply)	Box-4 (5Ply)
		(A)				(B)	=(A)/1000)*(B)			
Kraft Paper (Table 22)	Grams	61.97	378	916.03	1427.37	100	6.20	37.80	91.60	142.74
Glue	Grams	10	61	20	25	350	3.50	21.35	7.00	8.75
Staples	No.	6	8	10	12	0.50	2.97	3.96	4.95	5.94
Total Cost							12.67	63.11	103.55	157.43

Table 22: Kraft Paper Consumption

Dimensions	Box Size (Meter)	Box Size (Sq.meter)	Weight /Sheet (Grams)	No. of Layers	Material (Gram)	No. of Flute layers	Flute (20% extra) (Grams)	Total zKraft Paper Required / Box (Grams)
Box-1 (3Ply)								
Length	0.64	0.19	19.36	2	38.73	1	23.24	61.97
Width	0.30							
Box-2 (3 Ply)								
Length	1.55	1.18	118.12	2	236.25	1	141.75	378
Width	0.76							
Box-3 (5 Ply)								
Length	1.85	1.7	169.63	3	508.9	2	407.12	916.03
Width	0.91							
Box-4 (5 Ply)								

Length	2.31	2.64	264.33	3.00	792.99	2.00	634.39	1,427.37
Width	1.14							

Table 23: Material Cost per Solid Fiber Box

Cost Item	Unit of Measurement	Consumption Box-1		Consumption Box-2		Cost/Kg (PKR)		Box-1	Box-2	Box-1	Box-2	Box-1	Box-2
		(A) (Table 24)				(B) (Table 24)		Brown waste card ((A/100)*B)		Brown fresh card ((A/100)*B)		Bleach ((A/100)*B)	
Kraft Card		Brown waste card	23.24	Brown waste card	144.59	Brown waste card	150	3.49	21.69	9.76	60.73	8.37	52.05
		Brown fresh card	32.53	Brown fresh card	202.43	Brown fresh card	300						
		Bleach	27.89	Bleach	173.51	Bleach	300						
Glue	Gram	3		25		350		1.05	8.75	1.05	8.75	1.05	8.75
Total Cost								4.54	30.44	10.81	69.48	9.42	60.80



Table 24: Kraft Card Consumption

Dimensions	Box Size (Meter)	Box Size (Sq.meter)	Weight /Sheet (Grams)
Box-1 (Brown Recycled Card)			
Length	0.46	0.09	23.24
Width	0.20		
Box-1 (Brown fresh card)			
Length	0.46	0.09	32.53
Width	0.20		
Box-1 (Bleach)			
Length	0.46	0.09	27.89
Width	0.20		
Box-2 (Brown Recycled Card)			
Length	0.81	0.29	144.59
Width	0.36		
Box-2 (Brown fresh card)			
Length	0.81	0.29	202.43
Width	0.36		
Box-2 (Bleach)			
Length	0.81	0.29	173.51
Width	0.36		

9.4.5. Fixed Cost Estimate

Table 25 provides details of fixed cost for the project.

Table 25: Fixed Cost Estimate

Fixed Cost	Cost (PKR)
Administration expense	5,040,000
Administration benefits expense	945,600
Building rental expense	3,600,000
Office expenses (stationery, entertainment, janitorial services, etc.)	504,000
Promotional expense	2,577,853
Insurance expense	115,353
Depreciation expense	1,483,270
Amortization of pre-operating costs	93,190
Bad debt expense	429,642
Total	14,788,907

9.4.6. Human Resource Requirement

For the 1st year of operations, the proposed project shall require the workforce at a salary cost as projected in Table 26.

Table 26: Human Resource Requirement

Designation	No of Persons	Monthly Salary(PKR)	Total Salary(PKR)
Owner	1	100,000	1,200,000
Admin cum Accountant	1	60,000	720,000
Manager-Sales and Marketing	1	70,000	840,000
Assistant-Sales and Marketing	1	40,000	480,000
Mechanical Foreman	1	50,000	600,000
Production Supervisor	2	60,000	1,440,000
Labor-Corrugating Machine	2	22,000	528,000
Labor-Cutting Machine	1	22,000	264,000
Labor-Pasting Machine	2	22000	528,000
Labor-Die Cutting Machine	1	22,000	264,000
Labor-Bending Machine	2	22,000	528,000
Labor-Pin Machine	1	22,000	264,000
Store Incharge	2	40,000	960,000
Security Guard	2	25,000	600,000
Office Boy	1	20,000	240,000
Total	21	738,000	9,456,000

10. CONTACT DETAILS

Details of suppliers of Machinery and Equipment are provided in Table 27.

Table 27: Contact Details of Suppliers

Supplier Name	Supplier Type	City/ Origin	Email	Website
Prime Mechanical Works	Machinery Supplier	Lahore	info@primemachines.net	www.primemachines.net/
Iqbal Engineering Works	Machinery Supplier	Lahore	http://iqbaleng.com/	info@iqbaleng.com/
Ideal Machinery	Machinery Supplier	Karachi	http://idealmachinery.pk/	sales@idealmachinery.pk
Monu Graphics	Machinery Supplier	India	monugraphics2004@gmail.com	www.monugraphics.net
Elfy Chemical Industries Pvt. Ltd.	Glue Supplier	Karachi	info@elfychem.com	https://elfychem.com/
SIL Industries Pvt. Ltd.	Glue Supplier	Karachi	info@supersilind.com	http://www.supersilind.com/
Century Paper & Board Mills Limited	Paper Supplier	Lahore		www.centurypapper.com.pk
Dayamer Packages Pvt.Ltd.	Paper Supplier	Karachi		www.dayamerpackages.com.pk
Bulleh Shah Packaging (Pvt.) Limited	Paper Supplier	Lahore & Karachi		http://www.bullehshah.com.pk/

11. USEFUL LINKS

Table 28: Useful Links

Organization Name	Website / 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
Ministry of Industries and Production	www.moip.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 Punjab	www.balochistan.gov.pk/
Government of Gilgit-Baltistan	www.gilgitbaltistan.gov.pk/
Government of Azad Kashmir	www.ajk.gov.pk/
Trade Development Authority of Pakistan	www.tdap.gov.pk
Securities and Exchange Commission of Pakistan	www.secp.gov.pk
Punjab Small Industries Corporation	www.psic.gop.pk
Sindh Small Industries Corporation	www.ssic.gos.pk/
Khyber Pakhtunkhwa Small Industries Development Board	www.small_industries_de.kp.gov.pk/
Industries and Commerce Department Balochistan	www.dgicd.gob.pk/
Small Industries Corporation Azad Jammu & Kashmir	https://sic.ajk.gov.pk/
State Bank of Pakistan	www.sbp.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpccl.com.pk
Pakistan Association of Printing & Graphic Arts Industry (PAPGAI)	https://papgai.org
All Pakistan Paper Merchants Association (APPMA)	https://appma.com.pk
Pakistan Pulp Paper & Board Mills Association	http://www.pakistanpulppaperboardmillsassociation.org.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										
Corrugated Boxes	18,487,830	22,051,356	26,146,236	30,843,009	36,221,841	42,373,206	49,396,910	54,385,998	59,878,983	65,926,761
Solid Fiber Boxes	67,440,600	80,439,776	95,376,823	112,510,588	132,132,435	154,570,174	180,192,453	198,391,891	218,429,472	240,490,849
	85,928,430	102,491,132	121,523,059	143,353,597	168,354,276	196,943,380	229,589,363	252,777,889	278,308,456	306,417,610
Cost of sales										
Material Cost										
Corrugated Boxes	12,391,082	14,779,465	17,523,972	20,671,885	24,276,930	28,399,761	33,107,246	36,451,078	40,132,637	44,186,033
Solid Fiber Boxes	41,729,344	49,772,675	59,015,077	69,616,715	81,757,870	95,641,378	111,495,343	122,756,372	135,154,766	148,805,397
Direct Electricity	2,194,628	2,392,144	2,607,437	2,842,106	3,097,896	3,376,707	3,680,610	4,011,865	4,372,933	4,766,497
Direct Labour	4,416,000	4,844,352	5,314,254	5,829,737	6,395,221	7,015,558	7,696,067	8,442,585	9,261,516	10,159,883
Factory vehicle running and maintenance cost	168,751	185,795	204,560	225,221	247,968	273,013	300,587	330,946	364,372	401,173
Machinery maintenance cost	700,000	770,700	848,541	934,243	1,028,602	1,132,491	1,246,872	1,372,806	1,511,460	1,664,117
Total cost of sales	61,599,805	72,745,131	85,513,841	100,119,907	116,804,486	135,838,907	157,526,725	173,365,654	190,797,684	209,983,101
Gross Profit	24,328,625	29,746,002	36,009,218	43,233,689	51,549,789	61,104,473	72,062,638	79,412,235	87,510,772	96,434,508
General administration & selling expenses										
Administration expense	5,040,000	5,528,880	6,065,181	6,653,504	7,298,894	8,006,887	8,783,555	9,635,559	10,570,209	11,595,519
Administration benefits expense	945,600	1,037,323	1,137,944	1,248,324	1,369,412	1,502,244	1,647,962	1,807,814	1,983,172	2,175,540
Building rental expense	3,600,000	3,960,000	4,356,000	4,791,600	5,270,760	5,797,836	6,377,620	7,015,382	7,716,920	8,488,612
Electricity	372,755	406,303	442,870	482,729	526,174	573,530	625,147	681,411	742,738	809,584
Communications expense (phone, internet etc.)	302,400	331,733	363,911	399,210	437,934	480,413	527,013	578,134	634,213	695,731
Office vehicles running and maintenance expense	62,100	68,372	75,278	82,881	91,252	100,468	110,615	121,788	134,088	147,631
Office expenses (stationery, entertainment, janitorial services, etc.)	504,000	552,888	606,518	665,350	729,889	800,689	878,355	963,556	1,057,021	1,159,552
Promotional expense	2,577,853	3,074,734	3,645,692	4,300,608	5,050,628	5,908,301	6,887,681	7,983,337	9,349,254	10,925,528
Insurance expense	115,353	98,050	80,747	63,444	46,141	28,838	11,535	215,236	182,951	150,666
Depreciation expense	1,483,270	1,483,270	1,483,270	1,483,270	1,483,270	1,483,270	1,021,565	2,706,032	2,706,032	2,706,032
Amortization of pre-operating costs	93,190	93,190	93,190	93,190	93,190	-	-	-	-	-
Bad debt expense	429,642	512,456	607,615	716,768	841,771	984,717	1,147,947	1,263,889	1,391,542	1,532,088
Subtotal	15,526,162	17,147,198	18,958,215	20,980,877	23,239,315	25,667,193	28,018,996	32,572,138	35,468,139	38,653,483
Operating Income	8,802,463	12,598,804	17,051,003	22,252,812	28,310,475	35,437,280	44,043,642	46,840,097	52,042,633	57,781,025
Other income (interest on cash)	-	-	-	-	-	-	-	-	-	-
Other income (Scrap Sale)	239,119	285,210	338,171	398,921	468,493	548,049	638,896	703,424	774,470	852,691
Gain / (loss) on sale of machinery & equipment	-	-	-	-	-	-	1,750,000	-	-	-
Gain / (loss) on sale of office equipment	-	-	-	-	-	-	294,250	-	-	-
Gain / (loss) on sale of office vehicles	-	-	-	-	-	-	103,525	-	-	-
Earnings Before Interest & Taxes	9,041,582	12,884,013	17,389,174	22,651,733	28,778,967	35,985,329	46,830,313	47,543,522	52,817,103	58,633,717
Subtotal	-	-	-	-	-	-	-	-	-	-
Earnings Before Tax	9,041,582	12,884,013	17,389,174	22,651,733	28,778,967	35,985,329	46,830,313	47,543,522	52,817,103	58,633,717
Tax	1,074,105	1,281,139	1,519,038	1,791,920	2,104,428	2,461,792	2,869,867	3,159,724	3,478,856	3,830,220
NET PROFIT/(LOSS) AFTER TAX	7,967,477	11,602,874	15,870,135	20,859,813	26,674,539	33,523,536	43,960,446	44,383,798	49,338,247	54,803,497

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											
<i>Current assets</i>											
Cash & Bank	1,000,000	1,292,487	2,083,503	2,805,253	3,641,410	4,325,626	4,596,177	37,474,033	76,609,935	119,811,103	213,648,717
Accounts receivable		7,062,611	7,743,270	9,206,063	10,885,342	12,809,913	15,012,232	17,528,743	19,823,312	21,825,466	24,029,838
Finished goods inventory		2,566,642	3,031,050	3,563,060	4,171,673	4,866,893	5,659,911	6,563,663	7,223,624	7,949,964	8,749,362
Consumables inventory	233,333	281,562	339,760	409,987	494,730	596,989	720,384	869,284	1,048,962	1,265,778	-
Raw material inventory	4,510,035	5,922,659	7,731,726	10,041,848	12,984,237	16,723,266	21,464,399	26,019,166	31,540,459	38,233,376	-
Pre-paid building rent	-	330,000	363,000	399,300	439,230	483,153	531,468	584,615	643,077	707,384	-
Pre-paid insurance	115,353	98,050	80,747	63,444	46,141	28,838	11,535	215,236	182,951	150,666	-
Total Current Assets	5,858,721	17,554,010	21,373,057	26,488,955	32,662,764	39,834,677	47,996,108	89,254,742	137,072,319	189,943,738	246,427,918
<i>Fixed assets</i>											
Land	-	-	-	-	-	-	-	-	-	-	-
Building / Infrastructure- Renovation Cost	981,550	883,395	785,240	687,085	588,930	490,775	392,620	294,465	196,310	98,155	-
Machinery & equipment	7,000,000	5,950,000	4,900,000	3,850,000	2,800,000	1,750,000	700,000	13,297,559	11,302,925	9,308,291	7,313,657
Furniture & fixtures	643,000	546,550	450,100	353,650	257,200	160,750	64,300	1,221,476	1,038,254	855,033	671,812
Office vehicles	414,100	351,985	289,870	227,755	165,640	103,525	41,410	630,924	536,285	441,647	347,008
Office equipment	1,177,000	1,000,450	823,900	647,350	470,800	294,250	117,700	2,235,890	1,900,506	1,565,123	1,229,739
Security Against Building	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000
Total Fixed Assets	11,115,650	9,632,380	8,149,110	6,665,840	5,182,570	3,699,300	2,216,030	18,580,313	15,874,281	13,168,248	10,462,216
<i>Intangible assets</i>											
Pre-operation costs	465,949	372,759	279,569	186,379	93,190	-	-	-	-	-	-
Total Intangible Assets	465,949	372,759	279,569	186,379	93,190	-	-	-	-	-	-
TOTAL ASSETS	17,440,320	27,559,149	29,801,736	33,341,174	37,938,523	43,533,977	50,212,138	107,835,054	152,946,600	203,111,986	256,890,134
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable		2,151,352	2,576,240	3,073,199	3,654,469	4,334,521	5,130,482	6,003,282	6,731,029	7,558,169	6,532,820
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities											
Total Current Liabilities	-	2,151,352	2,576,240	3,073,199	3,654,469	4,334,521	5,130,482	6,003,282	6,731,029	7,558,169	6,532,820
<i>Other liabilities</i>											
Total Long Term Liabilities	-	-	-	-							
<i>Shareholders' equity</i>											
Paid-up capital	17,440,320	17,440,320	17,440,320	17,440,320	17,440,320	17,440,320	17,440,320	30,229,990	30,229,990	30,229,990	30,229,990
Retained earnings		7,967,477	9,785,176	12,827,655	16,843,734	21,759,137	27,641,337	71,601,782	115,985,580	165,323,827	220,127,324
Total Equity	17,440,320	25,407,797	27,225,495	30,267,975	34,284,054	39,199,456	45,081,656	101,831,772	146,215,570	195,553,818	250,357,314
TOTAL CAPITAL AND LIABILITIES	17,440,320	27,559,149	29,801,736	33,341,174	37,938,523	43,533,977	50,212,138	107,835,054	152,946,600	203,111,986	256,890,134

12.3. Cash Flow Statement

Cash Flow Statement											R.s. in actuals
	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	-	7,967,477	11,602,874	15,870,135	20,859,813	26,674,539	33,523,536	43,960,446	44,383,798	49,338,247	54,803,497
Add: depreciation expense	-	1,483,270	1,483,270	1,483,270	1,483,270	1,483,270	1,483,270	1,021,565	2,706,032	2,706,032	2,706,032
amortization expense	-	93,190	93,190	93,190	93,190	93,190	-	-	-	-	-
Accounts receivable	-	(7,062,611)	(680,659)	(1,462,793)	(1,679,279)	(1,924,571)	(2,202,320)	(2,516,510)	(2,294,569)	(2,002,154)	(2,204,372)
Finished good inventory	-	(2,566,642)	(464,409)	(532,010)	(608,612)	(695,220)	(793,019)	(903,752)	(659,960)	(726,340)	(799,398)
Equipment inventory	(233,333)	(48,229)	(58,198)	(70,227)	(84,743)	(102,259)	(123,395)	(148,900)	(179,678)	(216,816)	1,265,778
Raw material inventory	(4,510,035)	(1,412,623)	(1,809,067)	(2,310,122)	(2,942,390)	(3,739,028)	(4,741,133)	(4,554,767)	(5,521,293)	(6,692,917)	38,233,376
Pre-paid building rent	-	(330,000)	(33,000)	(36,300)	(39,930)	(43,923)	(48,315)	(53,147)	(58,462)	(64,308)	707,384
Advance insurance premium	(115,353)	17,303	17,303	17,303	17,303	17,303	17,303	(203,701)	32,285	32,285	150,666
Accounts payable	-	2,151,352	424,888	496,958	581,271	680,052	795,961	872,800	727,747	827,139	(1,025,349)
Cash provided by operations	(4,858,721)	292,487	10,576,192	13,549,405	17,679,892	22,443,352	27,911,888	37,474,033	39,135,902	43,201,169	93,837,614
<i>Financing activities</i>											
Change in short term debt	-	-	-	-	-	-	-	-	-	-	-
Issuance of shares	17,440,320	-	-	-	-	-	-	12,789,670	-	-	-
Cash provided by / (used for) financing ac	17,440,320	-	-	-	-	-	-	12,789,670	-	-	-
<i>Investing activities</i>											
Capital expenditure	(11,581,599)	-	-	-	-	-	-	(17,385,848)	-	-	-
Cash (used for) / provided by investing ac	(11,581,599)	-	-	-	-	-	-	(17,385,848)	-	-	-
NET CASH	1,000,000	292,487	10,576,192	13,549,405	17,679,892	22,443,352	27,911,888	32,877,856	39,135,902	43,201,169	93,837,614

13. KEY ASSUMPTIONS

13.1. Operating Cost Assumptions

Table 29: Operating Cost Assumptions

Description	Details
Inflation rate	10.1%
Utilities growth rate	9.0%
Fuel price growth rate	8.8%
Wage growth rate	9.7%
Depreciation rate office equipment, furniture and vehicle	15%
Depreciation rate building	10%

13.2. Revenue Assumptions

Table 30: Revenue Assumptions

Description	Details
Sale price growth rate	10.1%
Initial capacity utilization	50%
Capacity growth rate	5%
Maximum capacity utilization	90%

13.3. Financial Assumptions

Table 31: Financial Assumptions

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

13.1. Cash Flow Assumptions

Table 32: Cash Flow Assumptions

Description	Details
Account Receivable Days	30
Account Payable Days	15

13.1. Debt Related Assumptions**Table 33: Debt Related Assumptions**

Description	Details
Debt Tenure (Years)	5
Grace Period (Years)	1
Interest Rate	10.3%
Discount Rate (50:50)	13%

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
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