Pre-feasibility Study

WOOD SAW MILL AND SEASONING PLANT

December 2022

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

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2 EXECUTIVE SUMMARY

Wood, also known as timber, has been a very important material for the man since ancient times. Over centuries, wood has been used for variety of purposes; with its major uses being in construction and furniture manufacturing. In addition, wood is also used as a fuel source. For majority of wood's applications, logs must be chopped into beams and planks. Typically, wood saw mills are used for this purpose. Furthermore, soundness and durability of the timber is a must for ensuring the structural stability and long-lasting performance of the products and structures made from it. Construction and furniture sectors represent the largest market of timber products.

For ensuring the strength and durability of timber, it has to be seasoned. Seasoning is a process of properly drying the wood to reduce moisture from the cells of wood walls, below the prescribed limits. Seasoning enhances the strength, elasticity and durability of wood. Moreover, it reduces the likelihood of stain, mildew, or decay developing in transit, storage, or subsequent use of wood. The blue stain fungi and wood-destroying fungi cannot grow in a wood having moisture content of less than 20 percent.

Seasoned wood tends to have superior dimensional stability than the unseasoned one. Seasoned wood is much less prone to warping[1] and splitting in service. In higher grades of wood, particularly hardwoods, the process of seasoning can enhance the basic properties of wood such as, stiffness, bending strength and compression strength.

The concept of the proposed wood saw mill and seasoning plant business is based on converting the imported wooden logs from European countries into planks and beams, which are then seasoned to reduce their moisture content. Pakistan, currently, imports value-added wooden planks instead of the raw wooden logs which uses precious foreign exchange. The idea of this project is to import logs (raw material) and convert those into seasoned wooden planks and beams (value-added products). The business deals in seasoned wooden planks obtained from Ashwood log, Walnut log, Yellow Pine log and Spruce-White log. In addition to seasoned wooden planks, the unit also sells waste wood cuttings and saw dust as its byproducts, generated during processing. The main product (Grade 1 wood) of the proposed business is intended for furniture manufacturers, construction industry and domestic households.

The proposed project should be located in large to medium cities of the country, including Karachi, Lahore, Hyderabad, Faisalabad, Multan, Quetta, Peshawar, Rawalpindi, In addition, cities like Gujrat and Chiniot which have large wooden furniture making clusters, are also suitable locations to establish such a business.

The proposed wood saw mill and seasoning plant is assumed to have a maximum capacity to sell 19,000 cubic feet of hard wood, 40,850 cubic feet of soft wood, 286,281 kg of grade 2 wood (used as fuel) and 39,038 kg of saw dust[2] during a year. During

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[1] Warping is deformity in wood occurring when the moisture content of different parts of a piece of wood changes unevenly.

[2] Saw dust is dust and very small pieces of wood which are produced when wood is sawed.

the 1st year of operations, it is assumed that the project will operate at 50% of its total capacity, which comes out to be 9,500 cubic feet wood of hard wood, 20,425 of soft wood, 143,141 kg of grade 2 wood (as fuel) and 19,519 kg of saw dust. The capacity utilization is assumed to increase at a rate of 10% per annum with a cap at 90% of total capacity.

The proposed project will be set up in a self-constructed building on a rented land having an area of 5,641 sq. ft. (25 Marla). The project requires a total investment of PKR 86.64 million. This includes capital investment of PKR 70.37 million and working capital of PKR 16.27 million. The project will be established using 100% equity financing. The Net Present Value (NPV) of project is PKR 143.14 million with an Internal Rate of Return (IRR) of 49% and a Payback period of 3.13 years. Further, the proposed project is expected to generate Gross Annual Revenues of PKR 155.66 million in 1st year, Gross Profit (GP) ratio ranging from 32% to 49% and Net Profit (NP) ratio ranging from 9% to 25% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at a capacity of 32% (19,281 cubic feet) with gross revenue of PKR 100.29 million in a year.

The proposed project may also be established using leveraged financing. At 50% financing at a cost of KIBOR+3%, the proposed project provides Net Present Value (NPV) of PKR 178.87 million, Internal Rate of Return (IRR) of 48% and Payback period of 3.18 years. Further, this project is expected to generate Net Profit (NP) ratio ranging from 9% to 25% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 34% (20,288 Cubic Feet) with breakeven revenue of PKR 105.53 million.

The project will generate direct employment opportunity for 31 people. It is evident from the above financial figures, that the proposed wood saw mill and seasoning plant shows reasonable profitability and is economically and financially viable. The legal form 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 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 this 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 potential investors about establishing a business of "Wood Saw Mill and Seasoning Plant". The document provides a general understanding of the business to facilitate the potential investor 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 &PRODUCT

Wood has always been a very important material for man due to its suitability for large number of applications. For majority of wood's applications, logs must be converted into beams and planks which is the preferred raw material to be used in further applications. This conversion is carried out on wood saw mills. Soundness and durability of the wood (also known as timber) is a must for ensuring the structural stability and long-lasting performance of the products and structures made from it. Buildings construction and furniture manufacturing sectors are the two largest markets for timber products.

For ensuring the strength and durability of wood, it has to be seasoned. Seasoning is a process of properly drying the wood to reduce moisture content from the cells of wood walls and bring it within the prescribed limits. Seasoning enhances the strength, elasticity and durability of wood. Moreover, it reduces the likelihood of stain, mildew, or decay developing in transit, storage, or subsequent use of wood. The blue stain fungi and wood-destroying fungi cannot grow in a wood having moisture content of less than 20 percent.

Seasoned wood tends to have superior dimensional stability than the unseasoned one. Seasoned wood is much less prone to warping and splitting in service. In higher grades of wood, particularly hardwoods, the process of seasoning enhances the basic properties of wood such as, stiffness, bending strength and compression strength.

The concept of the proposed wood saw mill and seasoning plant business is based on converting the imported wooden logs from European countries into planks and beams, which are then seasoned to reduce their moisture content. Pakistan, currently, imports value-added wooden planks instead of the raw wooden logs which uses precious foreign exchange. The idea of this project is to import logs (raw material) and convert those into seasoned wooden planks and beams (value-added products). The business deals in seasoned wooden planks obtained from Ashwood log, Walnut log, Yellow Pine log and Spruce-White log. In addition to seasoned wooden planks, the unit also sells waste wood cuttings and saw dust as its byproducts, generated during processing. The main product (Grade 1 wood) of the proposed business is intended for furniture manufacturers, construction industry and domestic households.

Timber logs are imported from European countries and cut into wooden planks by using horizontal and vertical band saw machine. Wooden planks are then moved to seasoning chambers to do their seasoning. The seasoned wooden planks are then stored to be sold to the customers.

The proposed project will sell two types of seasoned wood, hardwood and softwood. Hardwood comes from angiosperms trees[3] having a higher density than most softwoods. Hardwood in the proposed project includes Ashwood and Walnut wood. Whereas, soft wood comes from gymnosperm[4] trees which usually have needles and cones and have lower density than most hardwoods. Softwood in the proposed project includes Yellow pine wood and spruce-white wood.

The seasoned wood has high demand as it is stronger and has superior dimensional stability than green wood which has high moisture content. The seasoned wood is used in the construction of ships, houses, bridges, furniture and many other wooden structures.

The proposed wood saw mill and seasoning plant will also sell byproducts which are grade 2 wood and saw dust. Grade 2 wood mostly includes the outer bark of the cut tree logs and the waste wood cuttings obtained during the process of cutting wooden planks.

Seasoning of Woods

Seasoning reduces the chances of decay, improves load bearing properties, reduces weight and exhibits more favorable properties like thermal and electrical insulation, increased strength and stability etc. The moisture content is high before seasoning, in both hardwoods and softwoods. The required moisture content post-seasoning should be between 9% to 20%, for the woods to be used.

There are four methods of wood seasoning, namely, air seasoning, chemical seasoning, electrical seasoning and kiln seasoning. These methods are described as under:

Air Seasoning of Wood

Air seasoning is a traditional method of wood seasoning. In this process, wooden planks are arranged in layers in a shed. These planks are placed at 300 mm height from the ground. The logs are arranged in such a way that air is circulated freely between the logs. The movement of air through the planks reduces the moisture content and seasoning occurs. Air seasoning is a slow process, which typically takes 6-9 months to reach the required moisture level.

Chemical Seasoning of Wood

In case of chemical seasoning, wood is stored in suitable salt solution (sodium chloride or ferrous sulfate) for 24 hours. The salt solution has the tendency to absorb water from the wood. Then, the moisture content is removed and wood is allowed for drying. A drawback of chemical seasoning is that it reduces the strength of the wood.

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[3] **Angiosperm** trees have broad leaves that usually change color and die every autumn.
[4] **Gymnosperms** are flowerless plants that produce cones and seeds.

Electrical Seasoning of Wood

In the method of electrical seasoning, wood is subjected to high frequency alternating currents. The resistance to electric current is low when moisture content in timber is high. As the moisture content reduces the resistance reduces. Measure of resistance is used to stop the seasoning at appropriate level. It is also known as rapid seasoning. The electrical seasoning of wood is not preferred because the equipment used for electrical seasoning is very costly. Furthermore, high consumption of electricity in this process makes it un-economical. The cells of the wood lose their strength during electrical seasoning.

Kiln Seasoning of Wood

In this method, wood is subjected to hot air in an airtight chamber. The hot air circulates in between the wooden planks and reduces their moisture content. The temperature inside the chamber is raised by heating coils. When the required temperature is obtained, moisture content gets reduced and the wood gets seasoned. The proposed business uses kiln seasoning, which is cost effective and consumes less time as compared to other seasoning processes. Kiln seasoning process generally takes 10-45 days to season the wood. Figure 1 shows a kiln seasoning chamber.

Figure 1: Kiln Seasoning Plant

A brief explanation of the types of wood used in the proposed project are as follows:

Hard Woods

- **Ashwood (Fraxinus)**

The scientific name of Ashwood is Fraxinus. It is commonly found throughout the world. Ash wood is smooth to touch and have different tones and degrees of lightness. Ashwood is robust, durable and generally light in color. Although, it is coarse but its

grain is straight. Ashwood has several applications but is commonly used to make tool handles[5] furniture and frames.

- **Walnut (Juglans Regia)**

The scientific name of Walnut is Juglans Regia. It is dark, hard, dense and tight. It is well known for having wavy, curly and mottled forms. It is praised by wood workers for its strength, grain and color. Grains are straight and have distinct figures. Walnut wood is highly desired for high end-furniture.. It is commonly used to make furniture, cabinets, millwork, flooring etc.

Soft Woods

- **Yellow Pine (Pinus Palustris)**

Scientific name of Yellow Pine is Pinus Palustris. It is medium durable and easy to treat. It generally has a creamy-yellowish color. Other than having good strength and aesthetics it is also characterized with having great nail-holding capacity. It is mostly used structurally, for floor and roof trusses, joists[6] and rafters. Ease of treatment makes it particularly good for decking and outdoor use. Character and impact resistance make it suitable for flooring and paneling.

- **Spruce-White (Picea Glauca)**

Scientific name of spruce-white is Picea Glauca. It is white or yellowish colored and having a fine and even texture. The wood of white spruce is used primarily for pulpwood and lumber for various construction, prefab houses, mobile homes, furniture, boxes, crates, and pallets. It also is used for house logs, musical instruments, and paddles.

Timber is imported in the form of logs on volume basis (usually cubic meters). Grade-1 seasoned timber is sold on volume basis (cubic feet) to furniture manufacturers, construction companies and other customers. Grade-2 wood and saw dust is sold on weight basis (kilograms). The types of wood seasoned in the proposed project are shown in Table 1.

Table 1: Common Types of Seasoned Wooden Planks

Products	
Grade-1 Wood	
Hard Wooden Planks	
Product 1	Ash wood Planks
Product 2	Walnut Wooden Planks
Soft Wood Wooden Planks	

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[5] Handles for tools such as chisels, axes and shovels etc.

[6] Joist is, small timbers or metal beams ranged parallel from wall to wall in a structure to support a floor such as upper storey floors.

Product 3	Yellow Pine Wooden Planks
Product 4	Spruce- White Wooden Planks
By-products	
Product 5	Grade 2 Wood (used as Fuel)
Product 6	Saw Dust

Grade-1 Wood

Grade 1 wood is obtained after cutting wooden logs, which is further cut into planks for seasoning. These wooden planks are sent to seasoning department for to produce seasoned wood, which is the main product of the proposed business.

Grade-2 Wood

Sometimes, wood logs are damaged from inside which is only discovered at the time of peeling the logs. In addition to the damaged wood, during the cutting, small wood pieces are also produced which can only be used as fuel. This damaged wood and small pieces of wood obtained during the cutting process is called Grade-2 wood. It is sold in the market as byproduct. According to market research, on an average, 20%-25% of total purchase is sold as Grade-2 woods. For the purpose of this study, 22% of total processed wood in a year has been considered as Grade-2 wood.

Saw Dust

Saw dust is produced as a byproduct during cutting process. According to market research, normally 3-5% of total processed wood is obtained as saw dust. Saw dust is normally required by carpenters and furniture manufacturers for gluing the joints together. It is mixed with glue and pasted in the joint to make the hold strong. It is also used by the paper industry as raw material.

5.1 Machinery and Equipment

The details of machinery and equipment used in the proposed project are described below:

Seasoning Plant

For kiln seasoning of wood, a seasoning plant is required to be set up in the proposed project. The seasoning plant is a chamber, equipped with fully automated system for controlling temperature and humidity. Temperature is maintained through heating coils and humidity is maintained through steam. The steam is transferred from boilers to the seasoning chamber through steam jets equipped inside the chamber. Temperatures inside the kiln ranges from 120 to 190 degrees F (48 to 88 degrees C). Large fans are used to circulate the air inside the chamber, which allows the timber to dry uniformly.

Two seasoning plants are used in the proposed project, one for soft wood and other for hard wood. The required area for setting up each seasoning plant is 500 square feet (with dimensions of 25 feet Length, 20 feet Width and 12 feet height). The electricity requirement for the seasoning plants will be fulfilled mostly by solar panel system whereas, during cloudy days and few days of winter season government provided electricity and generator during load shedding would be used for the seasoning plant. Solar system is used due to continuously increasing electricity prices. Therefore, use of solar system instead of government provided electricity is economically more viable. Figure 2 shows the working of a seasoning plant.

Figure 2: Wood Seasoning Plant
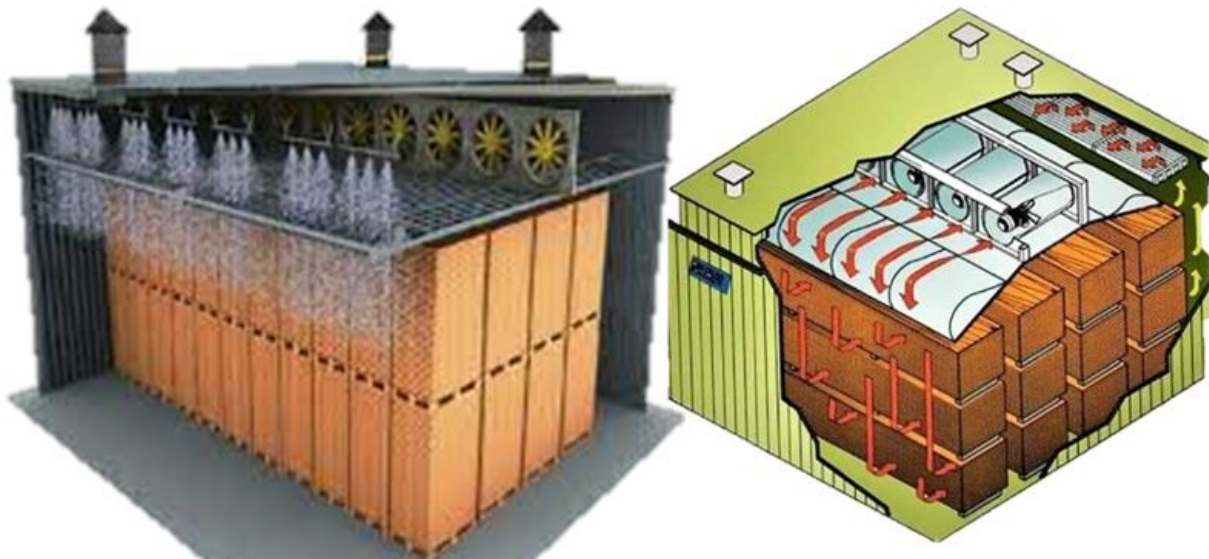
Solar Panel System

Solar panel system of 100 KVA is installed (complete backup with batteries) which provides electricity to seasoning plant. The solar panel system fulfills the electricity requirement of both the seasoning plants (seasoning plant for hard wood and soft wood). Figure 3 shows a solar panel system.

Figure 3: Solar Panel System

Horizontal Band Saw Machine (Aara Machine)

The horizontal band saw machine is used to cut large pieces of logs. The electricity consumption of horizontal band saw machine is 12 KW. Figure 4 shows a Horizontal Band Saw machine (Aara Machine).

Figure 4: Horizontal Band Saw Machine (Aara Machine)

Vertical Band Saw Machine (Aara Machine)

Vertical band saw machine cuts only small pieces of logs. It requires less power to operate as compared to horizontal band saw machine. The electricity consumption of vertical band saw machine is about 10 KW. Figure 5 shows a vertical band saw machine (Aara Machine).

Figure 5: Vertical Band Saw Machine (Aara Machine)

Moisture Meter

A moisture meter is an essential instrument used to detect moisture content in the wooden planks. Figure 6 shows a moisture meter.

Figure 6: Moisture Meter

Fork Lifter

A fork lifter is used to carry heavy logs and heap of planks across different areas of the proposed business. It is used to lift, carry and transport heavy materials from one part of the unit to another. Figure 7 shows a fork lifter.

Figure 7: Fork Lifter

5.2 Production Process Flow

The process of producing seasoned wooden planks from tree logs is shown in Figure 8.

Figure 8: Process Flow for Producing Timber Products
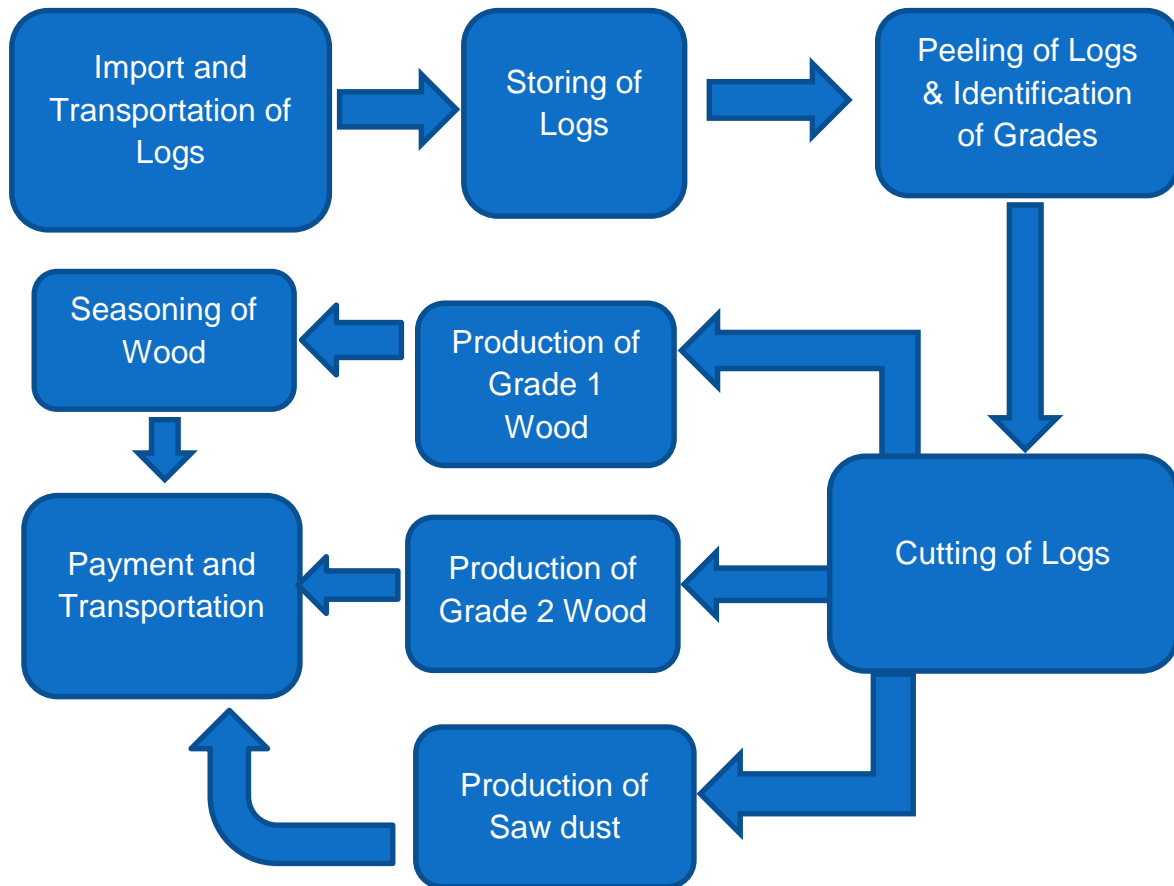
Brief description of process flow is as follows:

Import and Transportation of Trees/Logs

Ashwood, Walnut, Yellow pine, and Spruce-white timber logs will be imported by the proposed business from Europe in 20 feet containers. All ordered wood logs are 19 feet in length, with the average diameter of ash wood being 1 foot, and the average diameters of walnut, yellow pine, and spruce-white being 2 feet. The containers carrying logs will reach Karachi port. The imported log containers are loaded on trucks for transportation after paying Delivery Order (DO) and terminal handling charges.

The logs are unloaded in the lumber area. The proposed seasoning plant maintains one-month of raw material inventory (logs). Figure 9 shows the procured logs in the store area.

Figure 9: Procured Logs

Storing of Timber

After procurement of logs, different types of the wood logs are stored separately. Logs must be stored horizontally on a flat surface, so that the wood is exposed to air. The surface should be stable and evenly structured to prevent the timber from sinking in.

Peeling of Logs

The logs are peeled off using horizontal band saw machine (locally called *Aaraa* machine). Peeling helps to increase the longevity of wood. It helps in improving the condition of the wood to be used in other products. While peeling the wood, the staff identifies the grade 1 and grade 2 wood. Saw dust is also produced during the peeling process. Wood is peeled and kept in the form of large lumber. Grade 2 wood is identified and stored separately from grade 1 wood. Peeled logs will be stored in open area for lumber area. Figure 10 shows the machine used for peeling of logs.

Figure 10: Peeling of Logs by Horizontal Band Saw Machine

Cutting of Logs

Vertical band saw machine is used to cut the peeled wooden logs. Wooden logs are cut to obtain grade 1 wood in planks form. They are further cut to obtain the required size of planks, varying in thickness from 12 mm to 25 mm. Use of thinner strips results in slower drying, but thicker strips are suitable for most species of wood. Most commonly demanded thickness in the market is 19 mm. Satisfactory size of plank is about 30 mm wide and 19 mm thick. During this process, grade 2 wood in the form of pieces and saw dust is also obtained as byproducts. Figure 11 shows the machine used for cutting of logs of timber.

Figure 11: Vertical Band Saw Machine

Kiln Seasoning of Wood

After cutting of wooden planks, they have to be seasoned. In seasoning, the wooden planks are subjected to hot air in an air-tight chamber. Hot air circulates between the timber logs to reduce the moisture content. The temperature inside the chamber is raised with the help of electric heating coils. When the required temperature is obtained, moisture content gets reduced and timber gets seasoned. Kiln seasoning of wood is more economical and gives good results in a timely manner. Two types of wood are seasoned in the proposed project which are hardwood and softwood. The time required for seasoning differs for both type of woods. Furthermore, the time also differs during summer and winter due to increased moisture content during winter. The time requirement of hard wood and soft wood is shown in Table 2 and Table 3.

Table 2: Time Requirement for Hardwood Seasoning

Particulars	No of Months	Available Days	Days required for 1 seasoning Batch	Total No of Seasoning Batches Per Year
Summer Months	8	240	15	16
Winter Months	4	120	30	4

Table 3: Time Requirement for Softwood Seasoning

Particulars	No of Months	Available Days	Days required for 1 seasoning Batch	Total No of Seasoning Batches Year
Summer Months	8	240	7	34
Winter Months	4	120	14	9

After seasoning, the seasoned wood is stored into the finished goods store.

Payment and Transportation

After seasoning, the seasoned wood is ready to be sold into the market. Usually, the payment is made in cash but for reliable customers, credit facility is also provided for grade 1 product for a period of maximum 30 days. The customers arrange transport facility for taking the delivery of seasoned wood. Grade 2 wood and saw dust are sold on cash.

5.3 Installed and Operational Capacities

The total annual installed capacity of the proposed wood saw mill and seasoning plant for seasoned wooden plants is 19,000 cubic feet of hard wood, 40,850 cubic feet of soft wood, 286,281 kg of grade 2 wood and 39,038 kg of saw dust. However, during the first year of operations, the proposed saw mill and seasoning plant is expected to achieve 50% of its total installed capacity. Based on 360 working days in a year, the proposed unit will season 9,500 cubic feet of hard wood, 20,425 cubic feet of soft wood, 143,141 kg of wood used for fuel and 19,519 kg saw dust during 1st year at 50% capacity. Table 4 shows the installed and operational capacity seasoning plant at 100% capacity of hardwood, Table 5 installed and operational capacity of seasoning plant at 100% capacity of softwood and Table 6 shows the product wise capacity of seasoning plant.

Table 4: Installed and Operational Capacity-Hard Wood

Production Season	No of Months	Available Days	Days required for 1 Seasoning Batch	Total No of Seasoning Batch per Year	Room Capacity (cubic feet)	Average Volume loss during Seasoning (%)	Product Volume after Shrinkage loss per Batch (Cubic Feet)	Annual Seasoned Wood @ 100% Capacity (Cubic Feet)
Summer Months	8	240	15	16	1,000	5%	950	19,000
Winter Months	4	120	30	4				
Total	**12**	**360**		**20**	**1,000**			**19,000**

Table 5: Installed and Operational Capacity-Soft Wood

Production Season	No of Months	Available Days	Days required for 1 Seasoning Batch	Total No of Seasoning Batch per Year	Room Capacity (cubic feet)	Average Volume loss during Seasoning (%)	Product Volume after Shrinkage loss per Batch (Cubic Feet)	Annual Seasoned Wood @ 100% Capacity (Cubic Feet)
Summer Months	8	240	7	34	1,000	5%	950	40,850
Winter Months	4	120	14	9				
Total	**12**	**360**		**43**	**1,000**			**40,850**

Table 6: Product Wise Capacity

Product	Production Ratio	Wood Required For Seasoning (Cubic Feet)	Volume Loss Due to Shrinkage (Cubic Feet)	Total Production @ 100% (cubic feet)/(kg)	Intial Year Production @50%	Price Per cubic feet/kg
Hard Wood						
Ashwood-Black Logs	60%	12,000	600	11,400	5,700	8,000
Walnut Wood Logs	40%	8,000	400	7,600	3,800	8,500
Subtotal	**100%**	**20,000**	**1000**	**19,000**	**9,500**	
Soft Wood						
Yellow Pine Wood Logs	40%	17,200	860	16,340	8,170	6,000
Sprucewood-White Wood Logs	60%	25,800	1,290	24,510	12,255	3,500
Subtotal	**100%**	**43,000**	**2,150**	**40,850**	**20,425**	
Total				**59,850**	**29,925**	
Grade 2 Wood (used as Fuel) (kg) (waste)				286,281	143,141	15
Saw Dust (kg)				39,038	19,519	10
Total				**325,319**	**162,660**	

6 CRITICAL FACTORS

Following factors should be taken into account while making the investment decision:

- Updated knowledge of market linkages

- Good quality of products

- Using upgraded machinery

- Consistent marketing with good quality furniture manufacturers

- Availability of skilled workforce

- Efficiency in production operations

- Procurement of good quality raw material

7 GEOGRAPHICAL POTENTIAL FOR INVESTMENT

Two major uses of timber are in construction industry and furniture manufacturing. A good quantity of low-grade wood is also used by general households as fuel. Therefore, the geographical potential for investing in the proposed Wood Saw Mill and Seasoning Plant is in large to medium cities/towns, including Karachi, Lahore, Hyderabad, Faisalabad, Multan, Quetta, Peshawar, Rawalpindi, In addition, cities like Gujrat and Chiniot which have large wooden furniture making clusters, are also suitable locations to establish such a business.

8 POTENTIAL TARGET CUSTOMERS / MARKETS

The services provided by the proposed unit will be mainly used by the businesses such as furniture manufacturing and construction companies. The wooden furniture industry represents 95%[7] of the total furniture market of Pakistan. The leading furniture making clusters of Pakistan are in Chiniot, Gujrat, Peshawar, Lahore and Karachi. Other than furniture, construction industry is another major customer of timber which is currently growing at a high rate, hence this ever-growing demand of wood in the country makes this business model a great investment opportunity.

According to the data obtained from UNCOMTRADE, in the year 2021, Pakistan's total import of Ashwood (HS code 440795) was $5,366,189(10,664 cubic meters), Yellow pine wood (HS code 4407) was $109,236,411(498,517 cubic meters), and Spruce wood (HS code 440712) was $11,152,612 (53,265 cubic meters) . Table 7 shows import trend over last five years of Ashwood, Yellow Pinewood and Spruce Wood.

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[7] Source: https://tribune.com.pk/story/19304/prospects-and-fears-for-pakistans-furniture-industry

Table 7: Import Trends
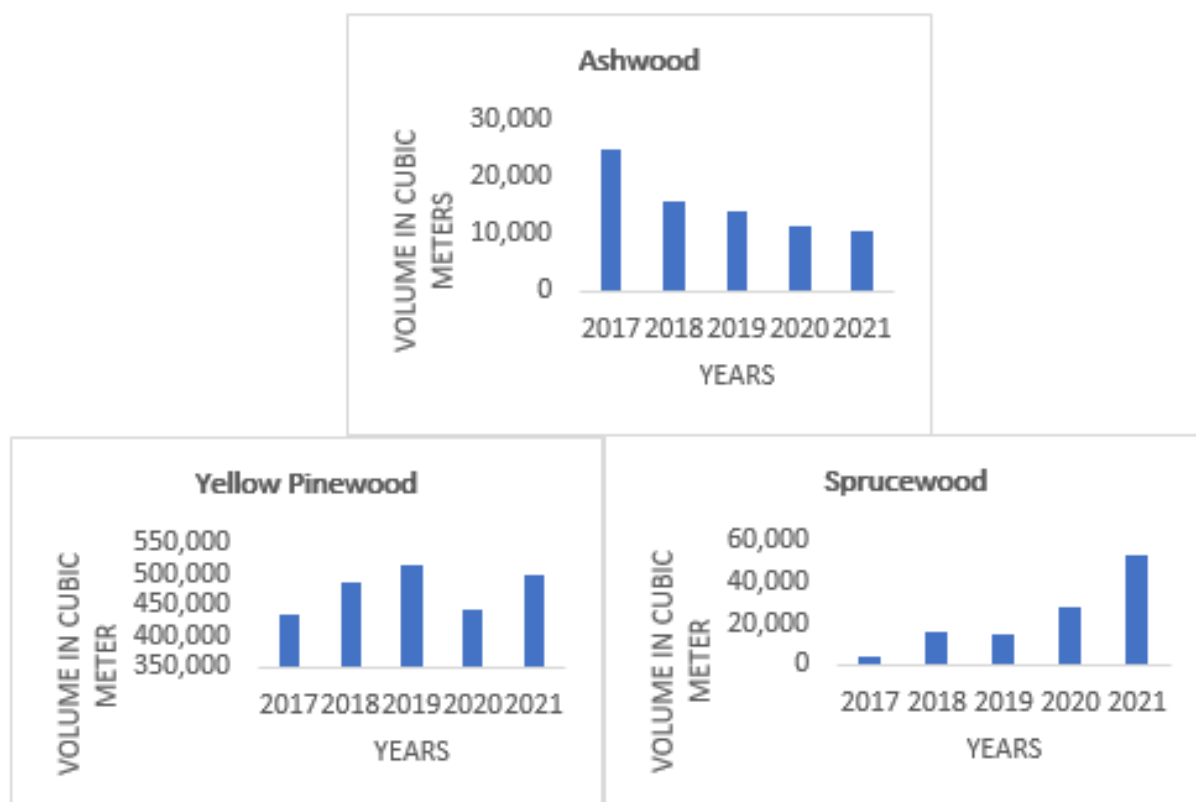
In 2021[8] the construction industry contributed PKR 993 billion in the Gross Domestic Product (GDP) of Pakistan form PKR 340 billion in 2020, and registered a growth of 8.1%. The growth in construction industry is expected to directly raise the demand for timber products. Figure 12 shows construction industry growth trend.

Figure 12: Construction Industry growth Trend

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[8] Source: https://tradingeconomics.com/pakistan/gdp-from-construction
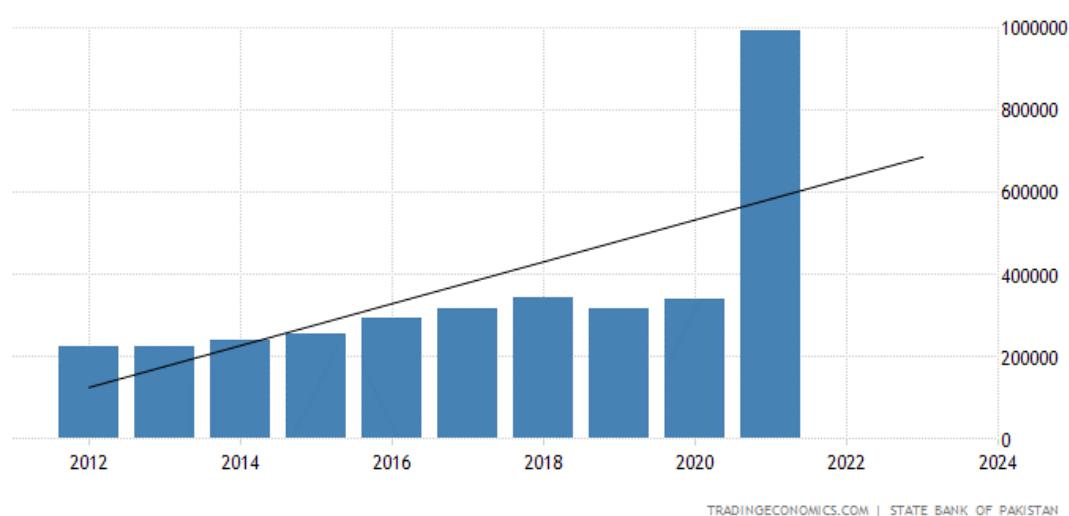
Seasoned wood planks primarily used in carpentry, planks are critical in the construction of boats, houses, bridges and many other structures. Planks also serve as supports to form wooden shelves and tables.

The potential target customers of this business are listed below:

- Furniture manufacturers

- Domestic Households

- Plywood manufacturers

- Sports goods manufacturers

The seasoning plants currently operational in Pakistan mostly seasons the local wood. The imported seasoned wood which is being sold in the local market is imported in the form of seasoned planks which cost very high. Due to which, this is a great window of opportunity to import the wood in logs form which cost very low as compared to seasoned planks, then cut them into planks form and season it. Table 8 shows a price comparison between imported logs and seasoned planks.

Table 8: Price Comparison of Imported Logs and Planks

Particulars	Average Logs Import Price per Cubic Meter (PKR)	Average Seasoned Planks Import Price per Cubic Meter (PKR)
Ashwood	45,000	65,000
Walnut	80,000	105,000
Yellow Pinewood	55,000	76,000
Spruce wood	35,000	51,000

9 PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of Wood Saw Mill and Seasoning Plant. 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 annexure of this document.

Project is proposed to be financed through 100% equity. Total project cost has been estimated to be PKR 86,636,682 which comprises of capital investment of PKR 70,368,233 and working capital of PKR 16,268,449.

9.1 Initial Project Cost Estimates

Table 9 provides fixed and working capital requirements for establishment and operations of the wood saw mill and seasoning plant.

Table 9: Initial Project Cost

Cost Item	Cost (PKR)	Details Reference
Land	-	9.1.1
Building / Infrastructure	6,112,142	9.1.2
Machinery & equipment	30,090,000	9.1.3
Office equipment	1,849,000	9.1.4
Furniture & fixtures	825,000	9.1.5
Office vehicles	4,798,000	9.1.6
Pre-operating costs	763,326	9.1.7
Security against land	930,765	9.1.8
Solar Panel System	25,000,000	
Total Capital Cost	**70,368,233**	
Working Capital		
Equipment spare part inventory	229,542	
Raw Material Inventory	8,728,653	
Upfront Building Rental	310,255	
Cash	7,000,000	
Total Working Capital	**16,268,450**	
Total Project Cost	**86,636,682**	

9.1.1   Land

The proposed wood saw mill and seasoning plant will be established on a leased land. Suitable location for setting up of the unit like this can be easily found on lease. Therefore, no land cost has been added to the project cost. Total space requirement for the proposed manufacturing unit has been estimated as 5,641 sq. ft. (25 Marla). The breakup of the space requirement is provided in Table 10.

Table 10: Land Area Break-up

Description	% Break-Up	No.	Area Sq. Ft.
Reception Area	2%	1	120
Office Area	12%	1	660

Showroom Area	4%	1	225
Finished Goods Store	23%	1	1,296
Machine Area	28%	1	1,600
Soft Wood Seasoning Room Chamber	13%	1	750
Hard Wood Seasoning Room Chamber	13%	1	750
Washroom(s)	4%	3	240
Total	**100%**		**5,641**

9.1.2 Building

The proposed wood saw mill and seasoning plant for timber products will be established by constructing building on leased land. The building will include office area, storage for processed wood, machine area, open area for lumber and washrooms. The proposed store requires an estimated electricity load of around 110.73 KW for which an electricity connection under the General Supply Tariff-Industrial three phase will be required. Cost of the electricity connection has been included in the capital cost. Table 12 provides details of building cost,

Table 13 shows the details of Precast Boundary Wall (110*95 Area) Sq. Feet Table 14 provide details of Iron Gate.

Table 11: Renovation Cost

Cost Item	Units	Total Units	Cost/Unit/ Sq.feet (PKR)	Total Cost (PKR)
Paint Cost	Liter	95	800	76,112
Labour Cost – Paint	Feet	9,514	15	142,710
Curtains	Units	5	3,000	15,000
Blinds	Units	5	7,000	35,000
Tiles	Sq. Feet	2,196	350	768,600
Labour Cost – Tiles	Sq. Feet	2,196	40	87,840
Wall Racks - Production and Store Rooms	No.	40	15,000	600,000
Wall Racks – Office	No.	10	10,000	100,000
Total				**1,825,262**

Table 12: Building Cost

Description	Area (Sq. Feet)	Construction Cost (PKR/Sq. Feet)	Total Construction Cost (PKR)
Office Area	660	3,000	1,980,000
Washroom(s)	240	3,000	720,000
Boundary Wall	4,500		668,000
Precast Roof	2,896	280	810,880
Precast Pillar	6	18,000	108,000
Total (PKR)			**4,286,880**

Table 13: Precast Boundary Wall (110*95 Area) Sq. Feet

Description	Length	Height	Total Length (Runing Feet)	Cost per Running feet (PKR)	Total Cost (PKR)
Boundary Wall 110 feet- Length	110	8	210	1,500	315,000
Boundary Wall 95 feet- Width	95	8	190	1,500	285,000
Iron Gate					68,000
Total (PKR)					**668,000**

Table 14: Iron Gate

Description	Length	Height	Total Area (Sq.feet)	Cost per Sq. feet (PKR)	Total Cost (PKR)
Iron Gate	10	8	80	850	68,000
Total Cost					**68,000**

9.1.3 Machinery and Equipment Requirement

Table 15 provides details of machinery and equipment required for the project.

Table 15: Machinery and Equipment Requirement

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Seasoning Plant (1,000 Cubic Feet)	2	10,000,000	20,000,000
Horizantal Band Saw Machine (Aara Machine)	1	450,000	450,000
Vertical Band Saw Machine (Aara Machine)	1	400,000	400,000
General Tool Kit	2	10,000	20,000
Moisture Meter	4	5,000	20,000
Fork Lifter	2	3,500,000	7,000,000
Generator 125 KV	1	2,200,000	2,200,000
Solar Panel System (including Backup Batteries) (100KVA)	1	25,000,000	25,000,000
Total Cost			**55,090,000**

9.1.4 Office Equipment Requirement

Table 16 shows the office equipment requirement proposed for the unit.

Table 16: Office Equipment Requirement

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Laptop	4	150,000	600,000
Desktop Computer	4	50,000	200,000
LED/LCD (Survellience 32")	2	45,000	90,000
Air Conditioner	4	130,000	520,000
Water Dispenser	2	34,000	68,000
Ceiling Fan	8	9,000	72,000
Pedestal Fan	4	12,000	48,000
Security Cameras - 2MP	24	3,500	84,000
Digital Video Recorder (DVR)	2	18,000	36,000
Inkjet Printer	2	48,000	96,000
Wi-Fi/ Internet router	2	5,000	10,000
Exhaust Fans	5	5,000	25,000
Total Cost			**1,849,000**

9.1.5   Furniture and Fixture Requirement

Table 17 gives details of the furniture and fixture required for the project.

Table 17: Furniture and Fixtures Requirement

Cost Item	No.	Unit Cost(PKR)	Total Cost (PKR)
Reception & Sales Counter	1	40,000	40,000
Owner Tables	1	75,000	75,000
Owner Chairs	1	35,000	35,000
Staff Table	3	45,000	135,000
Staff Chair(s)	9	20,000	180,000
Plastic Chair(s)	15	3,000	45,000
Visitor Chair(s)	10	15,000	150,000
Sofa Sets	3	55,000	165,000
Total Cost			**825,000**

9.1.6 Vehicle Requirement

Details of vehicles required for the project is given in Table 18.

Table 18: Vehicle Requirement

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Hyundai H100	1	4,000,000	4,000,000
Loader Rickshaw	1	400,000	400,000
Motorcycle	2	145,000	290,000
Registration-Hyundai H100		2%	80,000
Registration-Loader Rickshaw		14,000	14,000
Registration-Motorcycle		7,000	14,000
Total Cost			**4,798,000**

9.1.7   Pre-Operating Cost Requirement

Details of pre operating cost required for the project is given in Table 19.

Table 19: Pre-Operating Cost Requirement

Costs Item	Hiring Months Before in Year 0	Cost (PKR)
Administrative Expenses	1	525,000
Utilities Expense		238,326
Total Cost (PKR)		**763,326**

9.1.8 Security against Land

Details of security against land required for the project is given in Table 19.

Table 20: Security against Land

Description	No of Months.	Rent per month (PKR)	Total (PKR)
Security against land	3	310,255	930,765
Total			**930,765**

9.2 Breakeven Analysis

Table 21 shows calculation of break-even analysis.

Table 21: Break-Even Analysis

Description	Amount First Year (PKR)	Ratios
Sales (PKR) – A	155,661,458	100%
Variable Cost (PKR) – B	109,748,815	71%
Contribution (PKR) (A-B) = C	45,912,643	29%
Fixed Cost (PKR) – D	29,582,221	19%
Contribution Margin	29%	
Breakeven Revenue (PKR)	100,295,068	
Contribution Margin Per Cubic Feet	1,534	
Breakeven Quantity (Cubic Feet)	19,281	
Breakeven Capacity	32%	

9.3 Revenue Generation

Based on 50% capacity utilization, sales revenues, obtained by selling the proposed products during the first year of operations are shown in Table 22. Table 23 shows other income (by products)

Table 22: Revenue Generation

Product	Production Ratio	Intial Year Production @50%	Closing Stock (Cubic Feet)	Unit Sold (Cubic Feet)	Price Per cubic feet	Total Revenue (PKR)
Hard Wood						
Ashwood-Black	60%	5,700	475	5,225	8,000	41,800,000
Walnut	40%	3,800	317	3,483	8,500	29,608,333
Sub Total	**100%**	**9,500**		**8,708**		**71,408,333**
Soft Wood						
Yellow Pine	40%	8,170	681	7,489	6,000	44,935,000
Sprucewood-White	60%	12,255	1,021	11,234	3,500	39,318,125
Sub Total	**100%**	**20,425**		**18,723**		**84,253,125**
Total Revenue						**155,661,458**

Table 23: Other Income (By-Products)

Product	Intial Year Production @50%	Price Per KG	Total Revenue (PKR)
Grade 2 Wood (used as Fuel) (kg) (waste)	143,141	15	2,147,108
Saw Dust (kg)	19,519	10	195,190
Total			**2,342,298**

9.4 Variable Cost Estimate

Variable costs of the project have been provided in Table 24.

Table 24: Variable Cost Estimate

Description of Costs	Amount (PKR)
Ashwood-Black Logs	9,339,000
Walnut Wood Logs	11,066,000

Yellow Pine Wood Logs	16,357,917
Sprucewood-White Wood Logs	15,609,000
Transportation Cost (Port to Business Premises)	3,666,034
Import Freight Charges	32,825,557
Delivery Order (DO) Charges	2,355,525
Terminal Handling Charges	1,413,315
Direct Electricity Cost	740,048
Direct Labor	9,060,000
Machinery Maintenance – Cost	2,754,500
Communications expense (phone, fax, mail, internet, etc.)	554,400
Office vehicles running expense	2,819,520
Office expenses (stationery, entertainment, janitorial services, etc.)	1,188,000
Total	**109,748,816**

Table 25: Material Cost

Description of Costs	Cost Per Cubic Meter (PKR) (A)	Cost Per Cubic Feet (PKR) (A/35.3417)
Ashwood-Black Logs	45,000	1,273
Walnut Wood Logs	80,000	2,264
Yellow Pine Wood Logs	55,000	1,556
Sprucewood-White Wood Logs	35,000	990

*1 Cubic Meter =35.3417 Cubic Feet

Table 26: Cost per Cubic Feet (Grade 1 Wood)

Particulars	Raw Wood Required To Extract Grade 1 Wood (Cubic Feet)	Cost of Raw Wood Required To Extract Grade 1 Wood (PKR)	Cost Per Cubic Feet Of Grade 1 Wood (PKR)
Ashwood-Black Logs	16,000	20,372,530	1,698
Walnut Wood Logs	10,667	24,145,250	3,018
Yellow Pine Wood Logs	22,933	35,689,647	2,075
Sprucewood-White Wood Logs	34,400	34,067,417	1,320

Table 27: Total Material Cost

Particulars	Wood Sold (Cubic feet)	Cost Per Cubic Feet	Total Raw Material Cost (PKR)
Ashwood-Black Logs	5,500	1,698	9,339,000
Walnut Wood Logs	3,667	3,018	11,066,000
Yellow Pine Wood Logs	7,883	2,075	16,357,917
Sprucewood-White Wood Logs	11,825	1,320	15,609,000
Total Material Cost			**52,371,917**

Table 28: Transportation Cost

Particular	Rate	Material Cost (PKR)	Total Cost (PKR)
Transportation Cost	7%	52,371,917	3,666,034
Total			**3,666,034**

Table 29: Dimensions of 20 feet Container

Unit of Measurement	Length	Width	Height
Feet	19	7.8	8
Inches	228	93.6	96

Ash wood-Black

Table 30: Ash wood Log Dimensions

Unit of Measurement	Log Length	Log Diameter
Feet	19	2
Inches	228	24

Table 31: Logs per Container

No. of Logs in a row of container	No. of Logs in column of container	No. of Logs in a container	Average Weight of one Log (KG)	Total Average Weight of Logs in 20 ft Container (KG)	Total Average Weight of Logs in 20 ft Container (Metric Ton)	Total Average Cubic Meter of Logs in 20 ft Container
3	4	12	1407.6	16,891	17	31.3

1 Cubic Meter of Ash wood = 833 Kg

Table 32: No. of 20 ft Containers Imported

Ash wood Requirement (Kgs)	Ash wood Requirement (Cubic Meter)	Ash wood Requirement (Metric Ton)	Total Average Weight of Logs in 20 ft Container (Metric Ton)	No. of 20 ft Containers to be Imported
283,055	524.18	283	17	17

Walnut

Table 33: Walnut Log Dimensions

Unit of Measurement	Length	Diameter
Feet	19	2
Inches	228	24

Table 34: Logs per Container

No. of Logs in a row of container	No. of Logs in column of container	No. of Logs in a container	Average Weight of one Log (KG)	Total Average Weight of Logs in 20 ft Container (KG)	Total Average Weight of Logs in 20 ft Container (Metric Ton)	Total Average Cubic Meter of Logs in 20 ft Container
3	4	12	1570.04	18,840	19.0	22.4

1 Cubic Meter of Walnut = 929 Kg

Table 35: No. of 20 ft Containers Imported

Walnut Requirement (Kgs)	Walnut Requirement (Cubic Meter)	Walnut Requirement (Metric Ton)	Total Average Weight of Logs in 20 ft Container (Metric Ton)	No. of 20 ft Containers to be Imported
210,450	250.54	210	19	11

Yellow Pinewood

Table 36: Pinewood log Dimensions

Unit of Measurement	Length	Diameter
Feet	19	2
Inches	228	24

Table 37: Logs per Container

No. of Logs in a row of container	No. of Logs in column of container	No. of Logs in a container	Average Weight of one Log (KG)	Total Average Weight of Logs in 20 ft Container (KG)	Total Average Weight of Logs in 20 ft Container (Metric Ton)	Total Average Cubic Meter of Logs in 20 ft Container
3	4	12	1488.83	17,866	18.0	39.7

1 Cubic Meter of Pinewood = 841 Kg

Table 38: No. of 20 ft Containers Imported

Pinewood Requirement (Kgs)	Pinewood Requirement (Cubic Meter)	Pinewood Requirement (Metric Ton)	Total Average Weight of Logs in 20 ft Container (Metric Ton)	No. of 20 ft Containers to be Imported
409,608	910.24	410.00	18.0	23.0

Spruce wood - White

Table 39: Spruce wood Log Dimensions

Unit of Measurement	Length	Diameter
Feet	19	2
Inches	228	24

Table 40: Logs per Container

No. of Logs in a row of container	No. of Logs in column of container	No. of Logs in a container	Average Weight of one Log (KG)	Total Average Weight of Logs in 20 ft Container (KG)	Total Average Weight of Logs in 20 ft Container (Metric Ton)	Total Average Cubic Meter of Logs in 20 ft Container
3	4	12	893.30	10,720	11.0	23.8

1 Cubic Meter of Spruce wood = 545 Kg

Table 41: No. of 20 ft Containers Imported

Sprucewood Requirement (Kgs)	Sprucewood Requirement (Cubic Meter)	Sprucewood Requirement (Metric Ton)	Total Average Weight of Logs in 20 ft Container (Metric Ton)	No. of 20 ft Containers to be Imported
398,163	884.81	398.00	11.0	36.0

Table 42: No. of 20 ft Containers to be imported

Total Number of Containers to be Imported @ 100% Capacity	Total Number of containers to be imported @ 50% Capacity
87	43.5

Table 43: Direct Labor

Post	No of Personnel	Monthly Salary (PKR)	Annual Salary (PKR)
Production Manager	1	120,000	1,440,000
Production Supervisor	1	80,000	960,000
Labour Skilled - Cutting	2	45,000	1,080,000
Labour - Unskilled	2	30,000	720,000
Seasoning plant Operators	6	40,000	2,880,000
Labour - Loading/Unloading	3	35,000	1,260,000
Quality Assurance Officer	1	60,000	720,000
Total (PKR)			**9,060,000**

Table 44: Machinery Maintenance Cost

Cost Item	Rate	Machinery Cost (PKR)	Total Cost (PKR)
Maintenance Cost	5%	55,090,000	2,754,500
Total (PKR)			**2,754,500**

9.5 Fixed Cost Estimate

Table 45 shows the estimated fixed cost of the project.

Table 45: Fixed Cost Estimate

Description of Costs	Amount (PKR)
Staff Salaries	7,920,000
Administration benefits expense	1,698,000
Rental expense	3,723,060
Promotional expense	3,891,536
Depreciation expense	8,745,514
Indirect Electricity	338,216

Amortization of pre-operating costs	152,665
Bad debt expense	3,113,229
Total Fixed Cost	**29,582,220**

Table 46: Management Staff Salary

Post	No of personnel	Monthly Salary (PKR)	Annual Salary (PKR)
Import Manager	1	100,000	1,200,000
Import Officer	1	60,000	720,000
Marketing Officer	1	50,000	600,000
Accountant	2	75,000	1,800,000
Store Incharge	2	50,000	1,200,000
Office Boy	2	25,000	600,000
Driver(s)	2	25,000	600,000
Security Guard	4	25,000	1,200,000
Total			**7,920,000**

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 47.

Table 47: Financial Feasibility Analysis

Description	Project
IRR	49%
NPV (PKR)	143,141,027
Payback Period (years)	3.13
Projection Years	10
Discount rate used for NPV	25%

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 48.

Table 48: Financial Feasibility Analysis with 50% Debt.

Description	Project
IRR	48%
NPV (PKR)	178,872,509
Payback Period (years)	3.18
Projection Years	10
Discount rate used for NPV	22%

9.8 Human Resource Requirement

For the 1st year of operations, the proposed wood saw mill and seasoning plant shall require the workforce at a salary cost shown in Table 49.

Table 49: Human Resource Requirement

Post	No. of Employees	Monthly Salary (PKR)	Annual Salary (PKR)
Import Manager	1	100,000	1,200,000
Import Officer	1	60,000	720,000
Production Manager	1	120,000	1,440,000
Production Supervisor	1	80,000	960,000
Labour Skilled - Cutting	2	45,000	1,080,000
Labour - Unskilled	2	30,000	720,000
Seasoning plant Operators	6	40,000	2,880,000
Labour - Loading/Unloading	3	35,000	1,260,000
Quality Assurance Officer	1	60,000	720,000
Marketing Officer	1	50,000	600,000
Accountant	2	75,000	1,800,000
Store Incharge	2	50,000	1,200,000
Office Boy	2	25,000	600,000

Driver(s)	2	25,000	600,000
Security Guard	4	25,000	1,200,000
Total	**31**		**16,980,000**

10 CONTACT DETAILS

Names of some relevant contact details of suppliers are provided in Table 50.

Table 50: Contact Details

Supplier Name	Type	Contact Number	Email/Web Address
Ma Sha Allah Trolley and Band Saw Machine (Gujranwala)	Machinery	0333-8211235 0314-4611235	mashaallah.1235@gmail.com
Al-Jeddah Machinery (Lahore)	Machinery	0302-4244914	aljeddahmech@gmail.com
Libra Scale Lahore(Lahore)	Machinery	0300-8616317	www.librascales.com
Wood Gallery (Quetta)	Timber	0300-7765327	
SAK Timber (Karachi)	Timber	021-32761005	www.saktimber.com.pk
United 2 Furniture-Peshawar	Furniture	0300-5686299	
Standard Furniture-Muzaffarabad	Furniture	0333-5045063	
Stylish Furniture House Danyore- Gilgit-Baltistan	Furniture	0313-8897711	

11 USEFUL WEB LINKS

Table 51: Useful Web Links

Name of Organization	Website
Small and Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
National Business Development Program	www.nbdp.org.pk
Government of Pakistan	www.pakistan.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	www.sindh.gov.pk
Government of Balochistan	www.balochistan.gov.pk
Government of Khyber Pakhtunkhwa	www.kp.gov.pk
Government of Azad Jammu and Kashmir	www.ajk.gov.pk
Government of Gilgit Baltistan	www.gilgitbaltistan.gov.pk
Trade Development Authority of Pakistan	www.tdap.gov.pk
Punjab Forest, Wildlife and Fisheries Department	www.fwf.punjab.gov.pk
Wildlife & Forest Department Government of Khyber Pakhtunkhwa	www.few.kp.gov.pk
Sindh Forest Department	www.sindhforests.gov.pk
Wildlife & Forest Department Government of Balochistan	balochistan.gov.pk/departments/forest-and-wildlife/
Forestry, Wildlife & Fisheries Department of AJK	www.forest.ajk.gov.pk/
Pakistan Forests Association	www.facebook.com/globalforesters
Pakistan Furniture Association	https://pakfurnitureassociation.com/
All Pakistan Timber Merchant Association	https://aptta.pk
Punjab Board of Investment and Trade	www.pbit.gop.pk/
Industries Department Government of Khyber Pakhtunkhwa	www.industries.kp.gov.pk
Industries and Commerce Department Balochistan	www.dgicd.gob.pk
Industries and Commerce Department Sindh	www.industries.sindh.gov.pk
Department of Industries and Commerce	www.industries.ajk.gov.pk

12 ANNEXURES

12.1   Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue (PKR)-Ashwood-Black Logs	41,800,000	60,003,520	78,001,196	99,277,666	124,341,619	139,560,104	155,190,836	172,572,209	191,900,296	213,393,130
Revenue (PKR)-Walnut Wood Logs	29,608,333	42,502,493	55,250,847	70,321,680	88,075,314	98,855,074	109,926,842	122,238,648	135,929,377	151,153,467
Revenue (PKR)-Yellow Pine Wood Logs	44,935,000	64,503,784	83,851,285	106,723,491	133,667,241	150,027,112	166,830,148	185,515,125	206,292,819	229,397,614
Revenue (PKR)-Sprucewood-White Wood Logs	39,318,125	56,440,811	73,369,875	93,383,055	116,958,836	131,273,723	145,976,380	162,325,734	180,506,216	200,722,913
Total Revenue	**155,661,458**	**223,450,608**	**290,473,202**	**369,705,892**	**463,043,009**	**519,716,012**	**577,924,205**	**642,651,716**	**714,628,708**	**794,667,124**
Cost of sales										
Ashwood-Black Logs	9,339,000	13,056,431	16,529,994	20,490,222	24,993,973	27,321,449	29,589,129	32,045,027	34,704,764	37,585,259
Walnut Wood Logs	11,066,000	15,470,872	19,586,777	24,279,344	29,615,944	32,373,825	35,060,852	37,970,903	41,122,488	44,535,655
Yellow Pine Wood Logs	16,357,917	22,869,260	28,953,449	35,890,068	43,778,705	47,855,443	51,827,445	56,129,123	60,787,840	65,833,231
Sprucewood-White Wood Logs	15,609,000	21,822,233	27,627,870	34,246,908	41,774,378	45,664,471	49,454,622	53,559,356	58,004,782	62,819,179
Transportation Cost (Port to Business Premises)	3,666,034	5,550,717	7,610,720	10,217,112	13,497,249	15,978,726	18,741,272	21,981,431	25,781,779	30,239,165
Import Freight Charges	32,825,557	42,013,728	53,376,018	66,335,015	80,051,201	86,695,451	93,891,173	101,684,141	110,123,924	119,264,210
Delivery Order (DO) Charges	2,355,525	3,061,240	3,867,877	4,787,327	5,832,759	6,316,878	6,841,179	7,408,997	8,023,944	8,689,931
Terminal Handling Charges	1,413,315	1,836,744	2,320,726	2,872,396	3,499,656	3,790,127	4,104,707	4,445,398	4,814,366	5,213,959
Direct Electricity Cost	740,048	1,145,543	1,677,609	2,359,003	3,215,707	3,469,748	3,743,858	4,039,623	4,358,753	4,703,095
Direct Labor	9,060,000	9,938,820	10,902,886	11,960,465	13,120,631	14,393,332	15,789,485	17,321,065	19,001,208	20,844,325
Machinery Maintenance - Cost	2,754,500	2,983,124	3,230,723	3,498,873	3,789,279	4,103,789	4,444,404	4,813,289	5,212,792	5,645,454
Total cost of sales	105,186,895	139,748,712	175,684,648	216,936,733	263,169,481	287,963,239	313,488,127	341,398,353	371,936,641	405,373,463
Gross Profit	50,474,563	83,701,896	114,788,554	152,769,159	199,873,528	231,752,773	264,436,078	301,253,363	342,692,067	389,293,661
General administration & selling expenses										
Management Staff	7,920,000	8,688,240	9,530,999	10,455,506	11,469,690	12,582,250	13,802,729	15,141,593	16,610,328	18,221,530
Administration benefits expense	1,698,000	1,862,706	2,043,388	2,241,597	2,459,032	2,697,558	2,959,221	3,246,266	3,561,154	3,906,586
Rental expense	3,723,060	4,095,366	4,504,903	4,955,393	5,450,932	5,996,025	6,595,628	7,255,191	7,980,710	8,778,781
Indirect Electricity	338,216	363,566	391,173	421,137	453,593	489,427	528,091	569,810	614,825	663,397
Communications expense (phone, fax, mail, internet, etc.)	554,400	608,177	667,170	731,885	802,878	880,758	966,191	1,059,912	1,162,723	1,275,507
Office vehicles running expense	2,819,520	3,053,540	3,306,984	3,581,464	3,878,725	4,200,659	4,549,314	4,926,907	5,335,840	5,778,715
Office expenses (stationery, entertainment, janitorial services, etc.)	1,188,000	1,303,236	1,429,650	1,568,326	1,720,454	1,887,338	2,070,409	2,271,239	2,491,549	2,733,229
Promotional expense	3,891,536	5,586,265	7,261,830	9,242,647	11,576,075	12,992,900	14,448,105	16,066,293	17,865,718	19,866,678
Depreciation expense	8,745,514	8,684,393	8,629,384	8,579,875	8,535,318	8,495,216	6,581,024	13,622,580	13,593,346	76,090,862
Amortization of pre-operating costs	152,665	152,665	152,665	152,665	152,665	-	-	-	-	-
Bad debt expense	3,113,229	4,469,012	5,809,464	7,394,118	9,260,860	10,394,320	11,558,484	12,853,034	14,292,574	15,893,342
Miscellaneous expense 1										
Subtotal	34,144,141	38,867,166	43,727,610	49,324,613	55,760,223	60,616,451	64,059,197	77,012,825	83,508,767	153,208,627
Operating Income	16,330,422	44,834,730	71,060,943	103,444,546	144,113,306	171,136,322	200,376,881	224,240,538	259,183,300	236,085,034
Other income (interest on cash)	-	-	-	-	-	-	-	-	-	-
Other income (By-Products)	2,342,298	3,125,562	4,054,895	5,153,193	6,446,644	7,168,668	7,971,559	8,864,374	9,857,184	10,961,188
Gain / (loss) on sale of machinery & equipment	-	-	-	-	-	-	7,522,500	-	-	-
Gain / (loss) on sale of office equipment	-	-	-	-	-	-	462,250	-	-	-
Gain / (loss) on sale of office vehicles	-	-	-	-	-	-	1,199,500	-	-	-
Earnings Before Interest & Taxes	18,672,720	47,960,292	75,115,839	108,597,739	150,559,950	178,304,990	217,532,691	233,104,912	269,040,483	247,046,222
Subtotal	-	-	-	-	-	-	-	-	-	-
Earnings Before Tax	18,672,720	47,960,292	75,115,839	108,597,739	150,559,950	178,304,990	217,532,691	233,104,912	269,040,483	247,046,222
Tax	4,179,998	12,683,088	21,460,544	33,179,209	47,865,982	57,576,747	71,306,442	76,756,719	89,334,169	81,636,178
NET PROFIT/(LOSS) AFTER TAX	**14,492,722**	**35,277,204**	**53,655,295**	**75,418,530**	**102,693,967**	**120,728,244**	**146,226,249**	**156,348,193**	**179,706,314**	**165,410,045**

12.2   Balance Sheet

Calculations											SMEDA
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	7,000,000	7,060,613	12,871,178	20,728,870	28,546,067	40,296,272	52,942,540	134,545,901	283,286,329	451,887,174	690,450,394
Accounts receivable	-	12,971,788	18,620,884	24,206,100	30,808,824	38,586,917	43,309,668	48,160,350	53,554,310	59,552,392	62,025,856
Finished goods inventory		8,765,575	12,612,321	17,171,549	22,963,454	30,169,499	35,751,814	42,151,263	49,714,076	58,656,396	69,235,715
Equipment spare part inventory	229,542	272,459	323,400	383,865	455,636	540,825	641,942	761,964	904,427	1,073,526	-
Raw material inventory	8,728,653	13,215,993	18,120,762	24,326,458	32,136,306	38,044,585	44,622,075	52,336,741	61,385,188	71,998,012	-
Pre-paid building rent	310,255	341,281	375,409	412,949	454,244	499,669	549,636	604,599	665,059	731,565	
Total Current Assets	16,268,449	42,627,707	62,923,953	87,229,791	115,364,532	148,137,768	177,817,674	278,560,819	449,509,389	643,899,065	821,711,964
Fixed assets											
Land	-	-	-	-	-	-	-	-	-	-	-
Building/Infrastructure	6,112,142	5,500,928	4,950,835	4,455,752	4,010,176	3,609,159	3,248,243	2,923,419	2,631,077	2,367,969	2,131,172
Machinery & equipment	30,090,000	25,576,500	21,063,000	16,549,500	12,036,000	7,522,500	3,009,000	57,160,506	48,586,430	40,012,354	31,438,278
Solar Panel System	25,000,000	22,500,000	20,000,000	17,500,000	15,000,000	12,500,000	10,000,000	7,500,000	5,000,000	2,500,000	-
Furniture & fixtures	825,000	701,250	577,500	453,750	330,000	206,250	82,500	1,567,212	1,332,130	1,097,049	861,967
Office vehicles	4,798,000	4,078,300	3,358,600	2,638,900	1,919,200	1,199,500	479,800	9,961,416	8,467,204	6,972,991	5,478,779
Office equipment	1,849,000	1,571,650	1,294,300	1,016,950	739,600	462,250	184,900	3,512,455	2,985,587	2,458,719	1,931,850
Security against building	930,765	930,765	930,765	930,765	930,765	930,765	930,765	930,765	930,765	930,765	930,765
Total Fixed Assets	69,604,907	60,859,393	52,175,000	43,545,617	34,965,741	26,430,424	17,935,208	83,555,774	69,933,193	56,339,847	42,772,812
Intangible assets											
Pre-operation costs	763,326	610,661	457,996	305,330	152,665		-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	763,326	610,661	457,996	305,330	152,665	-	-	-	-	-	-
TOTAL ASSETS	**86,636,682**	**104,097,761**	**115,556,949**	**131,080,738**	**150,482,938**	**174,568,192**	**195,752,882**	**362,116,593**	**519,442,582**	**700,238,912**	**864,484,776**
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable		2,968,357	4,035,304	5,173,927	6,501,926	7,912,361	8,742,504	9,620,915	10,598,711	11,688,727	10,524,547
Total Current Liabilities	-	2,968,357	4,035,304	5,173,927	6,501,926	7,912,361	8,742,504	9,620,915	10,598,711	11,688,727	10,524,547
Other liabilities											
Total Long Term Liabilities	-	-	-	-	-	-	-	-	-	-	-
Shareholders' equity											
Paid-up capital	86,636,682	86,636,682	86,636,682	86,636,682	86,636,682	86,636,682	86,636,682	105,895,733	105,895,733	105,895,733	105,895,733
Retained earnings		14,492,722	24,884,963	39,270,129	57,344,330	80,019,149	100,373,696	246,599,945	402,948,138	582,654,452	748,064,497
Total Equity	86,636,682	101,129,404	111,521,645	125,906,811	143,981,012	166,655,831	187,010,379	352,495,678	508,843,870	688,550,185	853,960,229
TOTAL CAPITAL AND LIABILITIES	**86,636,682**	**104,097,761**	**115,556,949**	**131,080,738**	**150,482,938**	**174,568,192**	**195,752,882**	**362,116,593**	**519,442,582**	**700,238,912**	**864,484,776**

12.3   Cash Flow Statement

Calculations										SMEDA
Cash Flow Statement										

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Operating activities											
Net profit		14,492,722	35,277,204	53,655,295	75,418,530	102,693,967	120,728,244	146,226,249	156,348,193	179,706,314	165,410,045
Add: depreciation expense		8,745,514	8,684,393	8,629,384	8,579,875	8,535,318	8,495,216	6,581,024	13,622,580	13,593,346	76,090,862
amortization of pre-operating costs		152,665	152,665	152,665	152,665	152,665	-	-	-	-	-
Accounts receivable		(12,971,788)	(5,649,096)	(5,585,216)	(6,602,724)	(7,778,093)	(4,722,750)	(4,850,683)	(5,393,959)	(5,998,083)	(2,473,464)
Finished goods inventory		(8,765,575)	(3,846,747)	(4,559,228)	(5,791,905)	(7,206,045)	(5,582,315)	(6,399,448)	(7,562,813)	(8,942,320)	(10,579,319)
Equipment inventory	(229,542)	(42,917)	(50,941)	(60,465)	(71,770)	(85,189)	(101,117)	(120,023)	(142,463)	(169,099)	1,073,526
Raw Material Inventory	(8,728,653)	(4,487,340)	(4,904,769)	(6,205,696)	(7,809,849)	(5,908,279)	(6,577,490)	(7,714,666)	(9,048,447)	(10,612,824)	71,998,012
Pre-paid land rent	(310,255)	(31,026)	(34,128)	(37,541)	(41,295)	(45,424)	(49,967)	(54,964)	(60,460)	(66,506)	731,565
Advance insurance premium	-	-	-	-	-	-	-	-	-	-	-
Accounts payable		2,968,357	1,066,947	1,138,623	1,327,999	1,410,435	830,143	878,411	977,796	1,090,016	(1,164,180)
Other liabilities		-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(9,268,449)	60,613	30,695,528	47,127,821	65,161,527	91,769,354	113,019,964	134,545,901	148,740,427	168,600,845	301,087,046
Financing activities											
Issuance of shares	86,636,682	-	-	-	-	-	-	19,259,050	-	-	-
Purchase of (treasury) shares											
Cash provided by / (used for) financing activities	86,636,682	-	-	-	-	-	-	19,259,050	-	-	-
Investing activities											
Capital expenditure	(70,368,233)	-	-	-	-	-	-	(72,201,590)	-	-	(62,523,827)
Acquisitions											
Cash (used for) / provided by investing activities	(70,368,233)	-	-	-	-	-	-	(72,201,590)	-	-	(62,523,827)
NET CASH	7,000,000	60,613	30,695,528	47,127,821	65,161,527	91,769,354	113,019,964	81,603,361	148,740,427	168,600,845	238,563,220

13 KEY ASSUMPTIONS

13.1   Operating Cost Assumptions

Table 52: Operating Cost Assumptions

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

13.2   Revenue Assumptions

Table 53: Revenue Assumptions

Description	Details
Sale price growth rate	11.2%
Initial year capacity utilization	50%
Capacity growth rate	10%
Maximum capacity utilization	90%

13.3   Financial Assumptions

Table 54: Financial Assumptions

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

13.4   Cash Flow Assumptions

Table 55: Cash Flow Assumptions

Description	Details
Accounts Receivable Cycle (in days)	30
Accounts Payable Cycle (in days)	10

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
3rd 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	5TH 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