



**Pre-feasibility Study**

# **FIBERGLASS BOAT MANUFACTURING UNIT**

**May 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

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## 1. DISCLAIMER

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

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## 2. EXECUTIVE SUMMARY

Agriculture is the art and science of cultivating the soil, growing crops and raising livestock. It includes producing plant and animal products for people and distributing those products to markets. Agricultural sector holds a very important position for any country due to its crucial role in economic growth, food security, employment generation and poverty alleviation, particularly at the rural level.

Agriculture farming originates from very early civilizations and has been in existence since the earliest available history of mankind. Early agriculture was mostly based around sowing and taking care of certain plants; however, as demand for food increased, a need arose for new farming equipment and machinery, commonly known as agricultural implements. In today's modern farming, agricultural implements play a crucial role in minimizing labor time, reducing effort and lowering the cost of agriculture produce, thereby increasing the overall agricultural productivity and meeting the rising demand of agricultural produce for the increasing global population. It is not possible to obtain the required agricultural production without the use of modern agricultural implements.

Agricultural implements comprises a wide range of machinery and tools that are used in various farming processes to increase output and enhance the overall productivity and crop quality. In Pakistan, a large variety of implements is used for farming. With increasing awareness about modern practices, the use of traditional tools like Sickle, Plough, Spade, Winnowing, Khurpa, etc. is decreasing and these tools are being replaced with new agricultural equipment like Reaper, Rotavator, Disc Harrow, etc.

Majority of agriculture implements manufacturers, operating in Pakistan, fabricate various types of tillage implement, land preparation implements, sowing implements, harvesting & threshing machines, tractor trolleys etc. These manufacturers buy specialized parts (forged, heat treated, casting parts) and standard parts (bearing, chains, nut bolts, etc.) and structural steel from vendors. After procuring all the required parts, implements are assembled at the site by the manufacturer.

This "Pre-feasibility Document" provides details for setting up an Agricultural Implements Manufacturing Unit. It may be established in cities like Faisalabad, Daska, Mian Channu, Okara, Multan, Hafizabad, Jahanian, etc. These cities are well known for manufacturing of agricultural implements and skilled labor is easily available in these cities. The proposed project will be manufacturing Reaper, Cultivator, Zero Tillage, Wheat Straw Chopper, Rotavator, Disc Harrow, Border Disc, Chisel Plough, Ridger, Wheat Thresher, Maize Sheller, Rabi Drill and Silage Machine.

The proposed manufacturing unit has a maximum annual capacity of manufacturing 492 implements which includes 75 Reapers, 60 Cultivators, 14 Zero Tillages, 12 Wheat Straw Choppers, 65 Rotavators, 21 Disc Harrows, 21 Border Discs, 21 Chisel Ploughs, 41 Ridgers, 9 Wheat Threshers, 7 Maize Shellers, 10 Rabi Drills, 11 Silage Machines, 120 Chaff Cutters (Toka) and 5 Super Seeders.



Initially, the project is estimated to manufacture 297 agriculture implements at 60% of the total production capacity, which includes 45 Reapers, 36 Cultivators, 9 Zero Tillages, 7 Wheat Straw Choppers, 39 Rotavators, 13 Disc Harrows, 13 Border Discs, 13 Chisel Ploughs, 25 Ridgers, 5 Wheat Threshers, 4 Maize Shellers, 6 Rabi Drills, 7 Silage Machines, 72 Chaff Cutters (Toka) and 3 Super Seeders.

The “Agricultural Implements Manufacturing Unit” will be set up in a rented area of 6,725 square feet. The project requires a total investment of PKR 16.31 million. This includes capital investment of PKR 13.70 million and working capital of PKR 2.62 million. This project is financed through 100% equity. The Net Present Value (NPV) of project is PKR 32.47 million with an Internal Rate of Return (IRR) of 55% and a Payback period of 2.61 years. Further, this project is expected to generate Gross Annual Revenues of PKR 54.12 million during 1<sup>st</sup> year, with Gross Profit (GP) ratio ranging from 28% to 38% and Net Profit (NP) ratio ranging from 6% to 20% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 45% (223 Implements) with breakeven revenue of PKR 40.58 million.

The proposed project may also be established using leveraged financing. With 50% debt financing, at a cost of KIBOR+3%, the proposed production unit provides Net Present Value (NPV) of PKR 38.79 million, Internal Rate of Return (IRR) of 53% and Payback period of 2.79 years. Further, this project is expected to generate Net Profit (NP) ratio ranging from 5% to 20% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 47% (229 Implements) with breakeven revenues of PKR 41.71 million.

The proposed project will provide employment opportunities to 24 people. High return on investment and steady growth of business is expected with the entrepreneur having some prior experience similar businesses. The legal business status of this project is proposed as “Sole Proprietorship”. Further, the proposed project may also be established as a “Partnership Concern”.

### **3. INTRODUCTION TO SMEDA**

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with 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 "Agricultural Implements Manufacturing Unit". The document provides a general understanding of the business to facilitate potential investors in crucial and effective investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by

trial and error, and certain industrial norms that become a guiding source regarding various aspects of business setup and its successful management.

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

## **5. BRIEF DESCRIPTION OF PROJECT & PRODUCTS**

Agriculture is a labor-intensive process, which traditionally used to be done by hand, with some harder activities being performed with the help of cattle. Farmers had to levy self-force for ploughing, sowing the seeds, planting, watering, and the ready crops were reaped and harvested. The farmers had to spend their days and nights to perform this hard job, along with their families and cattle. With the passing times, as the technology advanced, agricultural implements and tools were developed and introduced which made the lives of farmers easier and not only increased the overall agricultural productivity, but also improved the quality of the produce.

Agricultural implements are the tools which are required to carry out various agricultural practices, such as, land preparation, sowing, irrigation, reaping, harvesting, threshing, hay making, shedding, etc. Large number of agricultural implements is used in today's farming world. Use of agriculture implements helps saves labor time and reduces the cost of production. Agriculture implements are effective for increasing farm production as well as their use leads to doing more work in lesser time.

Manufacturing of agriculture implements involves a series of multiple operations. The process flow of agricultural implements is relatively short and simple and the final product is completed after going through the required operations, which differ with the type of the implement. The process flow starts from the procuring the required raw materials, (steel and other metals bars, sheets, angle bars, etc.) and standard parts / components for manufacturers, who serve as vendors. These procured parts go to fabrication / assembling units, where final products are manufactured and sold in local and export markets.

Agricultural implements have replaced human work with machine work. These implements cannot be used alone because these are much heavier to pull hence, tractors are commonly used to pull them. The products which have been included in this project are Reaper, Cultivator, Zero Tillage, Wheat Straw Chopper, Rotavator, Disc Harrow, Border Disc, Chisel Plough, Ridger, Wheat Thresher, Super Seeder, Maize Sheller, Chaff Cutter, Rabi Drill and Silage Machine. These implements are briefly described below.

## **Reaper**

A reaper is a machine to cut down crops at harvest. The cut crops are laid down by the machine for collection. There are different models. Reapers can be attached to a power tiller or can be standalone machines. Figure 1 shows a reaper.

**Figure 1: Reaper**



## **Cultivator**

Cultivators are farming machines used by the farmers to loosen hard soil surface, distributing equal amount of fertilizer in each part of the land and removing unwanted plants and weeds from the soil. Cultivators are usually either self-propelled or drawn as an attachment behind a four-wheel tractor. It is usually attached by means of a three-point hitch with a tractor and driven by a PTO (Power Take-Off). Figure 2 shows a cultivator.

**Figure 2: Cultivator**



## **Zero Tillage Seed Drill**

Zero Tillage is used for Zero Tillage Farming.<sup>1</sup> The zero till consists of a seed box, fertilizer box, seed and fertilizer metering mechanisms, seed tubes, furrow openers, seed and fertilizer rate adjusting lever and transport cum power transmitting wheels.

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<sup>1</sup> Zero Tillage farming is an agricultural technique for growing crops or pasture without disturbing the soil through tillage. No/zero-till farming decreases the amount of soil erosion caused by tillage in certain soils, especially in sandy and dry soils on sloping terrain



By using these machines, the seeds are placed into the ground. Zero tillage not only helps farmer in significantly reducing cost of the land cultivation and irrigation requirement but also helps saving the environment from issues like soil erosion and weed effect. Figure 3 shows a zero-tillage machine.

**Figure 3: Zero Tillage Seed Drill**



### **Wheat Straw Chopper**

Wheat Straw Chopper machine is operated by tractor's PTO. Wheat straw chopper is a resource conservation technology that makes chaff<sup>2</sup> from combine-harvested wheat straw and saves the environment from smoke pollution, by preventing the straw to be burnt in the field. Figure 4 shows a wheat straw chopper.

**Figure 4: Wheat Straw Chopper**



<sup>2</sup> Chaff is the dry, scaly protective casing of the seeds of cereal grains or similar fine, dry, scaly plant material.

### **Rotavator**

Rotavator is a rotary tillage implement driven by power take of a tractor. It cuts, mixes and levels the soil in single pass. Rotavator can be used in any type and texture of soil, and for any type of crop. It is especially suitable for uprooting the stubbles of sugarcane, cotton, banana and jowar etc. Fixing the rotavator to tractor is as simple as fixing any other implement and needs no special skills. Figure 5 shows a rotavator.

**Figure 5: Rotavator**



### **Disc Harrow**

This machine is used to form ridges around the fields. The straight and strong ridges can be formed by it in short time and by less working. There are bushes and grass on the edges of field, which creates problems in plowing which are also removed by disc harrow. Figure 6 shows a disc harrow.

**Figure 6: Disc Harrow**



### **Border Disc**

A border disc is a farm implement that is used for temporary irrigation. A border disc creates field boundaries and ridges. It also checks for soil erosion. A border disc earths up plants like sugarcane and potatoes for enabling a better root system. Figure 7 shows border disc.

**Figure 7: Border Disc**



### **Chisel Plough**

This plough is best for those lands particularly having upper layer of soil more fertilized than deep soil, and also have salt at a deep layer of soil. After using chisel plough, the natural factors like air, sunlight and rain water can affect the soil's layers. In this way, the natural fertility of the soil increases significantly before the cultivation of wheat, cotton, sugarcane and before tree plantation. If deep ploughing is done with chisel plough, then the growth of these crops and plants increases extraordinarily. Figure 8 shows a chisel plough.

**Figure 8: Chisel Plough**





### **Ridger**

Ridger is a primary soil tillage machine which is mounted and trailed from tractor's hydraulic lifting unit and universal three-point linkage system. As per crop type, it helps in making perfect ridges and also helps in uprooting unwanted roots. Figure 9 shows a ridger.

**Figure 9: Ridger**



### **Wheat Thresher**

Wheat Thresher threshes the wheat to separate the grains and the straw. In addition to wheat, mustard and soya bean can also be threshed with this equipment. It is operated with a tractor. Without standing on the height, the wheat can be put into the thresher by standing on the ground level very easily. Two or four men can work easily. It is soundless and does not overload the tractor. In case any technical problem occurs, the field service team can handle it immediately. Figure 10 shows a wheat thresher.

**Figure 10: Wheat Thresher**





### **Maize Sheller**

This machine is used for shelling of Maize. It is operated through shaft of the tractor and is available in different sizes. Figure 11 shows a maize sheller.

**Figure 11: Maize Sheller**



### **Rabi Drill**

This device is used in agriculture for sowing seeds of crops by positioning them in the soil and burying them to a specific depth. Seed boxes, along with cup feed type seed metering mechanism, are mounted on the cultivator frame and the seeds are dropped in the furrows opened by the cultivator shovels. This arrangement ensures even distribution of seeds. The seed drill sows the seeds at the proper seeding rate and depth, ensuring that the seeds are covered by soil and saving the seeds from being eaten by birds and animals, or being dried up due to exposure to the sunlight. Figure 12 shows a rabi drill.

**Figure 12: Rabi Drill**



### **Silage Machine**

Silage<sup>3</sup> making machine makes and wraps silage bales. Proper wrapping of bales retains their oxygen free condition through the storage period so that the silage is perfectly preserved until fed to animals. Figure 13 shows a silage machine.

**Figure 13: Silage Machine**



### **Chaff Cutter (Toka)**

A chaff cutter is a mechanical device to cut straw or hay into small pieces before being mixed with other forage and fed to horses and cattle. Figure 14 shows chaff cutter.

**Figure 14: Chaff Cutter**



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<sup>3</sup> Silage, also called ensilage, forage plants such as corn (maize), legumes and grasses that have been chopped and stored in tower silos, pits, or trenches for use as animal feed

## **Super Seeder**

Super Seeder is a combination of rotary tiller and seed planter with press wheels. It is extensively used for planting a wide variety of seeds like wheat, soybean and grass. It is useful for removing the paddy stubbles and mixing it with soil, preparing land, and simultaneously sowing seeds. Figure 15 shows super seeder.

**Figure 15: Super Seeder**



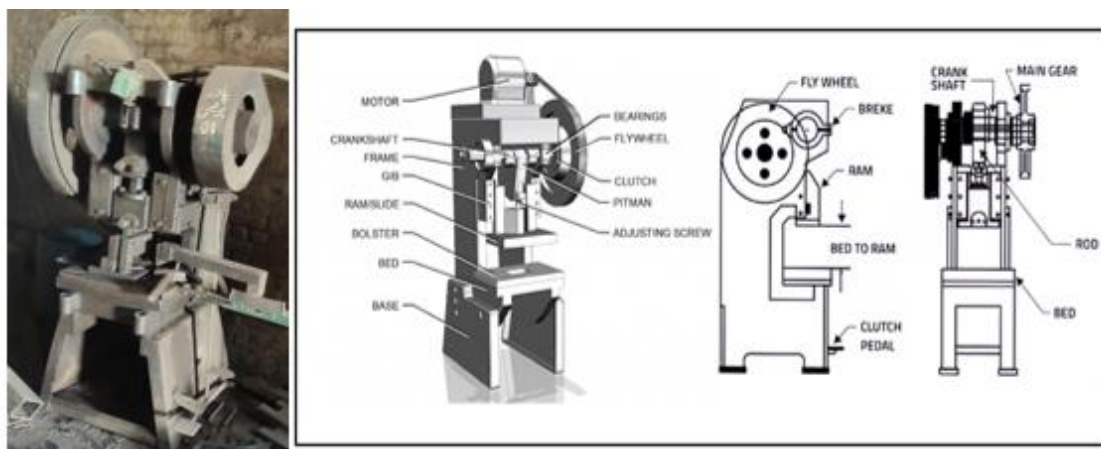
## **5.1. Machinery and Equipment**

Different types of machines are used for manufacturing agricultural implements. The machinery and equipment used in the proposed project are described below.

### **Power Press**

Power press is a locally available metal working machine, used primarily to cut, punch, or form metal using tooling (dies) attached to the slide (ram) and bed.<sup>4</sup> Power press is used to form hard parts of the machinery. The agriculture implements manufacturers prefer to purchase local power press than the imported one due to easy access to technical assistance and repair services. Figure 16 shows power press.

**Figure 16: Power Press**



<sup>4</sup> The slide and bed are equipped with combination dies that allow metal sheets to be shaped into particular forms.

### **Hand Grinder**

A hand grinder, also known as a side grinder or disc grinder, is a handheld power tool used for grinding and polishing. Although, developed originally as a tool for rigid abrasive discs, the availability of an interchangeable power source has encouraged the use of this machine with a wide variety of cutters and attachments. The proposed project will use small and large hand grinder. Figure 17 shows a hand grinder.

**Figure 17: Hand Grinder**



### **Hydraulic press**

A hydraulic press is a machine press that generates compressive force using a hydraulic cylinder. Hydraulic press is used for forging, molding, blanking deep drawing and metal forming operations. Hydraulic press allows more versatility in drawing and forming complex parts as compared to power press. Figure 18 shows hydraulic press.

**Figure 18: Hydraulic Press**





## **Shearing Machine**

Shearing machines are multipurpose devices used in the cutting of alloys and other metal sheets. Some shearing machines use a scissor-like, angular shear action to cut metal into sheets or strips. Other, larger machines use a straight shear action with the blade fixed at an angle as opposed to the angular movement. Figure 19 shows shearing machine.

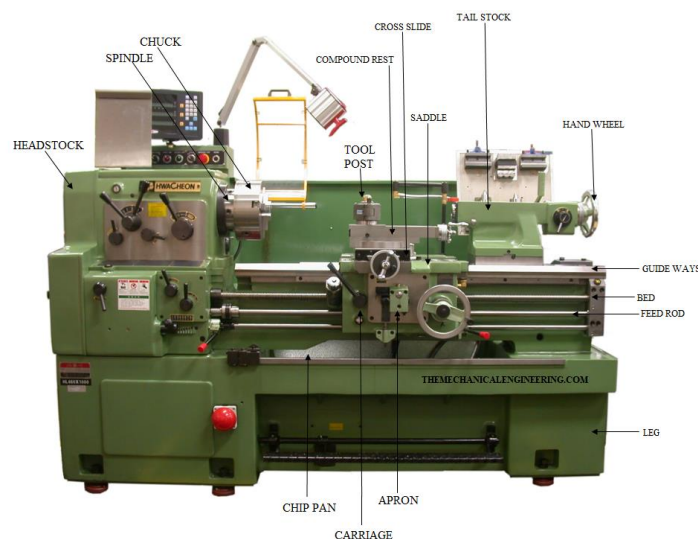
**Figure 19: Shearing Machine**



## **Lathe Machine**

Lathe machine is used for turning, facing, grooving, threading, boring, knurling and tapping on the piece of metal to get the desired shape of metal. Turning is the most common use of lathe machine. During the turning process, cutting tool removes material from the outer diameter of the work piece rotating on lathe machine. The main objective of turning is to reduce the work piece diameter to the desired dimension. The proposed project will use lathe machine of 2 different bed sizes, 10 feet and 6.5 feet. Bed size indicates the maximum diameter workpiece can turn on a lathe machine. Figure 20 shows lathe machine.

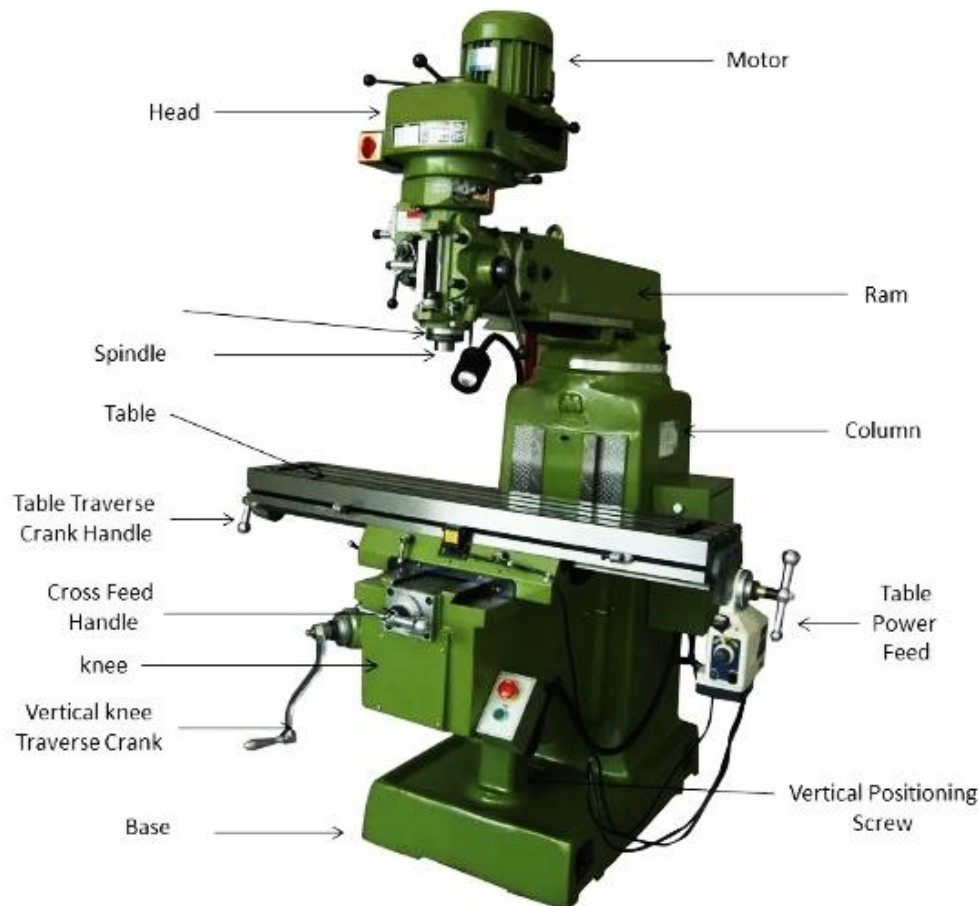
**Figure 20: Lathe Machine**



## **Milling Machine**

Milling machines are also known as the multi-tasking machines (MTMs) which are multi-purpose machines capable of milling and turning the materials as well. The milling machine has the cutter installed on it which helps in removing the material from the surface of the work piece. When the material gets cooled down then it is removed from the milling machine. Figure 21 shows milling machine.

**Figure 21: Milling Machine**



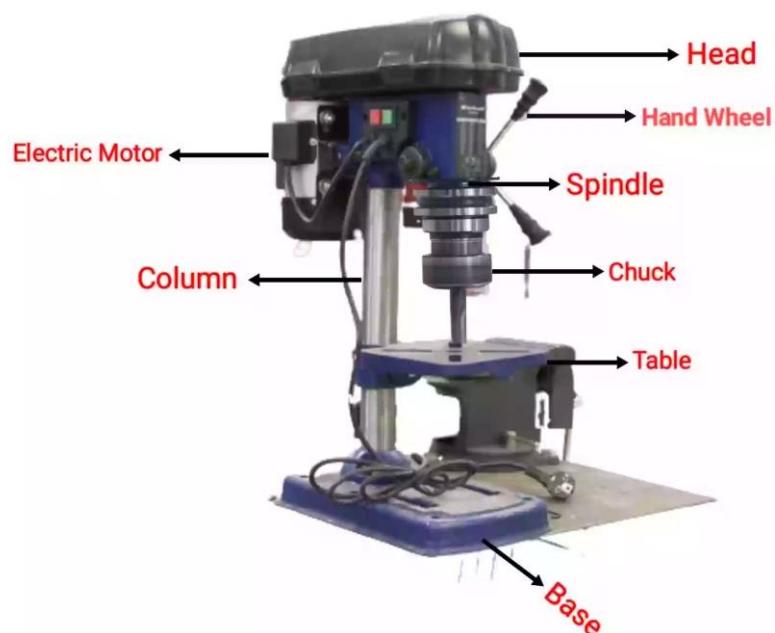
## **Welding Plant**

A welding plant is used to join metals together. Welding machines produce heat that melts electrodes on the metal parts so that the two metals parts can be joined. When melted electrode cools, it becomes a fixed and resistant joint. Electrode welding, Arc welding and CO2 Welding are the common types of welding techniques in Agricultural Implements manufacturing industry. Proposed business will use digital welding plant and CO2 welding plant. Figure 22 shows welding plant.

**Figure 22: Welding Plant**

### **Vertical Drill Machine**

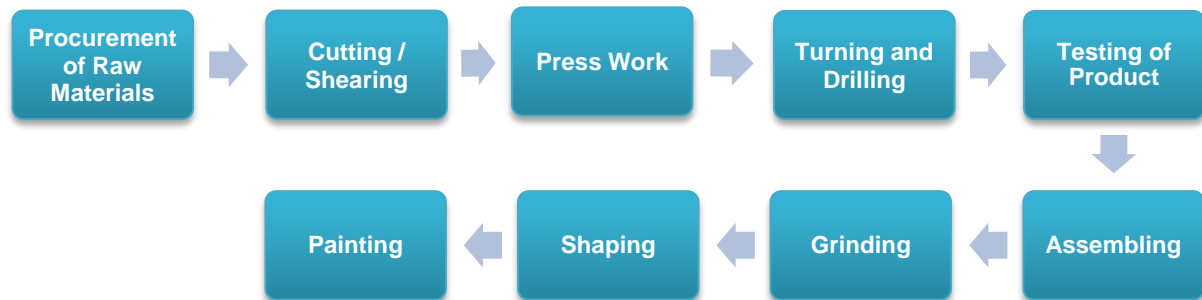
Vertical drilling machine is used to cut holes on the components or work pieces with the help of drill bits, also known as multiple-point cutting tools. It removes the material at faster rate making holes on the work piece. The proposed project will use vertical drill machine of 3 different sizes i.e., large, medium and small vertical drill machines to cut different size of holes as per the requirements. Size of the drill machine is determined by the maximum drilling diameter of a drill machine. Figure 23 shows a vertical drill machine

**Figure 23: Vertical Drill Machine**

## 5.2. Production Process Flow

A general production process flow of manufacturing agriculture implements is shown in Figure 24.

**Figure 24: Production Process**



### Procurement of Raw Materials

Iron and Steel are the two major materials used in the manufacturing of agricultural implements. These raw materials are in the form of steel rods, sheets and angles. In addition to iron and steel, some other alloys are also used. The main suppliers of the raw materials are located in Karachi, Lahore, Gujranwala and Faisalabad. They sell steel bars, steel sheets and various types of alloys to fabricators/assemblers of agricultural implements. Alternatively, some manufacturers also purchase raw materials from scrap houses. In case of purchase of raw materials from scrap houses, the quality of raw material is not certain. Other standard parts such as bearings, gear, chains, paints, nuts and bolts, etc. are also used in manufacturing of agricultural implements and are procured from the local vendors.

### **Raw Materials for Reaper**

Major raw materials for manufacturing reaper includes iron sheet, iron rod, flat bar, steel casting, angle, iron plates, pipes, gear, chain, blade, fingers, bearings, belt, nut bolts, springs plastic stars. Table 1 shows the materials required for reaper.

**Table 1: Raw Materials for Reaper**

Material	Specification
Iron Sheet	MS sheet of 0.160 inches (8 gauge), 0.128 inches (10 gauge), 0.080(14 gauge) thickness
Iron Rod	5 mm of thickness (1060 number iron)
Flat Bar	0.036 inches (20 gauge) thickness.
Steel Casting	3 mm diameter



Angle	width 2 inches, 0.276 inches thickness
Iron Plates	4-8 ft length, thickness 0.40-0.48 inches
Pipe	0.60 inches, 0.80 inches or 1 inch of diameter pipe
Gear (Grari)	(11 inch diameter & 18 teeth)
Chain	Peer 60 Roller chain
Blade	29 number having 2 mm Thickness
V Shaped Fingers	Manufacture from 1070 number hard pig iron
Bearings	6202 (15mm bore diameter, 35mm outside Diameter, 11mm width), 6207 (35mm bore diameter, 72mm outside Diameter, 17 mm width)
Belts	B size belt (top width 21/32 inch, depth 5/16 inches)
Nuts Bolts	Locally available nuts and bolts
Spring	0.078 inches of wire thickness
Plastic Stars Wheel	locally available Star wheel for reaper of 1.5 inch size ,made up of hard plastic.

### Raw materials for Rotavator

Major raw materials for rotavator includes gear box upper, gear box side, blades, iron sheet, pipe, and cast iron. Table 2 shows the materials required for rotavator.

**Table 2: Raw Materials for Rotavator**

Material	Specification
Gear Box Upper	Bearing number 6218 (90mm bore diameter ,160mm outside Diameter, 30mm width), grari 24 Teeth, internal hole 62 mm
Gear Box Side	Grari of 18 Teeth and 19 Teeth
Blades	1070 number iron
Iron Sheet	0.160 inches (8 gauge) thickness
Pipe	0.128 inches (10 gauge) thickness, 1.5-2 inches diameter
Cast Iron	1060 number of soft pig iron.

### Raw Materials for Zero Tillage

Raw materials for zero tillage includes angle, flat bar, iron plates, iron rods, steel casting, steel corter, box, seed and fertilizer dropper, tyre and rim, gear, bearing, plastic pipe and clamps, nut bolts. Table 3 shows the materials required for zero tillage.

**Table 3: Raw Materials for Zero Tillage**

Material	Specification
Angle	3 inch width and 0.125 (1.5 sootar) thickness
Flat Bar	3 inch width and 0.42 inch (5 sootar) thickness
Iron Plate	12-14 inches Diameter and 0.25 inch thickness (18 mm)
Iron Rod	3 inch width and 0.42 inch (5 sootar) thickness
Steel Casting	4 mm in diameter steel
Steel Corter	0.42 inch (5 sootar) thickness and 6 inch diameter
Seed Box	Locally available seed box
Seed and Fertilizer Dropper	Locally available seed Dropper
Tyre and rim	165/70 R12 size tyre (165/70 inch width, 12 inch rim diameter)
Gear (Grari)	22 Teeth and 30 Teeth Grari
Roller Bearing	Sizes 6202 (15mm bore diameter, 35mm outside Diameter, 11mm Width), 6207 (35mm bore diameter, 72mm outside Diameter, 17 mm width)
Plastic pipe and clamps	Locally available clamps
Nuts Bolts	Locally available nuts and bolts

**Raw materials for Cultivator**

Major raw materials for cultivator includes angle, pipe, flat bar, round rod, iron plate, tyre, spring, nut bolts, paint and stickers. Table 4 shows the materials required for cultivator.

**Table 4: Raw Materials for Cultivator**

Material	Specification
Angle	3 inch width and 0.232 inches in thickness
Pipe	3 inch diameter, 0.265 inch thick
Flat Bar	2 inch width and 0.252 inch thick
Round Rod	0.14 inch diameter
Iron Plate	3 inch width and 0.276 inch of thickness
Tyne	0.252-0.232 inches (3-4 sootar)
Spring	0.252 inch of wire thickness and 21-24 curve
Nuts Bolts	Locally Available Nuts and bolts

### Raw materials for Wheat Thresher

Major raw materials for wheat thresher includes iron sheet, angle, cast iron, bearing, and tyre. Table 5 shows the materials required for wheat thresher.

**Table 5: Raw Materials for Wheat Thresher**

Material	Specification
Iron Sheet	MS sheet of 0.160 inches (8 gauge), 0.128 inches (10 gauge), 0.080(14 gauge) thickness
Angle	3-4 inch width and 0.3 inch thickness
Cast Iron	1060 number of soft pig iron.
Roller Bearing	6304 (20 mm bore diameter, 52 mm outside Diameter, 15 mm width), 6306 (30 mm bore diameter, 72 mm outside Diameter, 19 mm width) and 6310 (45 mm bore diameter, 100 mm outside Diameter, 25 mm width)
Tyre	165/70 R12 size tyre (165 inch width, 12 inch rim diameter)

### Raw Materials for Chisel Plough

Major raw materials for chisel plough includes tynes, iron sheet, and welding rod. Table 6 shows the materials required for chisel plough.

**Table 6: Raw Materials for Chisel Plough**

Material	Specification
Tynes (cor) <sup>5</sup>	85*25 mm width, 940 mm long
Iron Sheet	0.160 inch thick (8 gauge)
Welding rod	Locally Available rods for Welding

### Raw Materials for Silage Machine

Major raw material for silage machine includes iron sheet, channel, bearings, gear, cutter blade, bracket and cross. Table 7 shows the materials required for silage machine.

**Table 7: Raw Materials for Silage Machine**

Material	Specification
Iron Sheet	0.160 inch (8 gauge), 0.128 inch (10 gauge), 0.080 inch (14 gauge) of sheet thickness
Channel	3 inch width and 0.265 inch thickness
Bearings	7/50 R16 size tyre (7/50 inch width, 16 inch rim diameter)

<sup>5</sup> Tynes, prongs or teeth are parallel or branching spikes forming parts of a tool or natural object.

Belts	Sizes 6202 (15mm bore diameter, 35mm outside Diameter, 11mm Width), 6207 (35mm bore diameter, 72mm outside Diameter, 17 mm width)
Gear (Grari)	Belt number C, 86 inch diameter
Cutter Blade	grari 22 Teeth , grari 25 Teeth
Bracket	Blade having 5.5 inches width
Cross	35 mm width, 45 mm Length

### Raw Materials for Maize Sheller

Major raw material for maize sheller includes iron sheet, angle, tyre, rim, bearings, cross, shaft, paint and stickers. Table 8 shows the materials required for maize sheller.

**Table 8: Raw Materials for Maize Sheller**

Material	Specification
Iron Sheet	0.160 inch (8 gauge), 0.128 inch (10 gauge), 0.080 inch (14 gauge) of sheet thickness
Angel	3 inch width and 0.276 inch thickness
Tyre and Rim	7/50 R16 size tyre (7/50 inch width, 16 inch rim diameter)
Bearings	6207 (35 mm d, 72 mm D, 17 mm width)
Cross	35 mm d, 17 mm width
Shaft	0.276 inch thickness

### Raw Materials for Disc Harrow

Major raw materials for disc harrow includes channel, angle, flat bar, iron plate, steel casting, pipe, disc, round rod, bearing, nut bolts, tyre and rim. Table 9 shows the materials required for disc harrow.

**Table 9: Raw Materials for Disc Harrow**

Material	Specification
Channel	6 inch width 4 mm thickness
Angle	3 inch width 6.35 mm thickness
Flat Bar	1.5 inch of length, 0.62 inch of thickness
Iron Plate	0.25 inch of thickness
Steel Casting	4 mm in diameter steel is used for this.
Pipe	10 gauge

Disc	22 inch 6 mm
Round Rod	12 mm diameter and 2.45 inches in length
Roller Bearing	7512( 60 mm bore diameter, 110 outside diameter ,29.75 mm width)
Nuts Bolts	0.375 inches of thickness and length varies from 3-6 inches
Tyre & Rim	Rubber tyre of 6.00-16 size ( 6 mm width and 16 inches of diameter)

### Raw Materials for Rabi Drill

Major raw materials for rabi drill includes iron sheet, plastic stars and gear set. Table 10 shows materials required for rabi drill.

**Table 10: Raw Materials for Rabi Drill**

Material	Specification
Iron Sheet	0.028 inches (22 gauge) thickness
Plastic Stars	Manufactured from hard plastic usually (ABS type plastic)
Gear Set	Seed (12 Teeth) and fertilizer (9 teeth, 110 teeth, 212 teeth)

### Raw Materials for Ridger

Major raw material for ridger include iron sheet. Table 11 shows materials required for ridger.

**Table 11: Raw Materials for Ridger**

Material	Specification
Iron Sheet	0.160 inches (8 gauge), 0.128 inches (10 gauge), 0.080 inches (14 gauge) thickness

### Raw Materials for Border Disc

Major raw materials for border disc includes iron sheet and angle. Table 12 shows materials required for border disc.

**Table 12: Raw Materials for Border Disc**

Material	Specification
Iron Sheet	MS sheet of 0.160 inches (8 gauge), 0.128 inches (10 gauge), 0.080 (14 gauge) thickness
Angle	3 inch width, 0.17 inch thickness and 3-4 ft length

## Raw Materials for Wheat Straw Chopper

Major raw materials for wheat straw chopper includes iron sheet, channel, flat bar, angle, iron plate, round rod, steel casting, pipe, bearing, blade, fingers, and, gear, chain, plastic bush, spring, bubble box, tyre, rim, hub, belts, and nut bolts. Table 13 shows the materials required for wheat straw chopper.

**Table 13: Raw Materials for Wheat Straw Chopper**

Material	Specification
Iron Sheet	MS sheet of 0.160 inches (8 gauge), 0.128 inches (10 gauge), 0.080(14 gauge) thickness
Channel	5.5 inch width 4 mm thickness
Flat Bar	3 inch width and 0.072 inch (20 gauge) thickness
Angle	3 inch width and 0.17 inch (2 sootar)
Iron Plate	12-14 inches Diameter and 0.25 inch thickness (18 mm)
Round rod	0.104 inch (12 gauge)
Steel Casting	4 mm in diameter steel is used for this.
Pipe	0.128 inch (10 gauge) diameter
Roller Bearing	6308 (40 mm bore diameter, 90mm outside diameter, 23mm width)
Blade	Locally available Blade for chopper (length 2-3 cm and upto 5 mm thickness)
Fingers	Locally available Finger for chopper
Gear (Grari)	grari 20 Teeth
Chain	Peer 60 Roller chain
Plastic Bush	28 mm
Spring	0.252 inch of wire thickness and 21 curve
Bubble Box	Locally made bubble box for wheat straw chopper
Tyre,Rim, HUB	Rubber tyre of 6.00-16 size ( 6 mm width and 16 inches of rim diameter)
Belts	Belt number C 86 inch diameter
Nuts & Bolts	Locally available nuts and bolts

### Raw Materials for Chaff Cutter

Major raw materials for chaff cutter includes cast iron, nut bolts, bearing. Table 14 shows the materials required for chaff cutter.

**Table 14: Raw Material for Chaff Cutter**

Material	Specification
Cast Iron	1060 number of soft pig iron.
Nut Bolt	Locally available Nut and bolt for Chaff Cutter
Roller Bearing	6205 (25mm bore diameter, 52mm outside Diameter, 15mm width), 6206 (30mm bore diameter, 62mm outside Diameter, 16 mm width)

### Raw Materials for Super Seeder

Major raw materials for super seeder includes iron sheet, steel casting, pipe, flat bar, round rod, iron plate, forged iron, gear, chain gear, bearing, nut bolts, blade, cross, box seed fertilizer, dropper seed fertilizer, chain, plastic pipe clamps, and discs. Table 15 shows the materials required for super seeder.

**Table 15: Raw Materials for Super Seeder**

Material	Specification
Iron Sheet	0.144 inch thickness(9 gauge)
Steel Casting	4 mm in diameter steel is used for this.
Pipe	0.128 inch diameter (10 gauge)
Flat Bar	5 mm
Round Rod	0.104 inch diameter (12 gauge)
Iron Plate	0.144 inch thickness (9 gauge)
Forged Iron	1070 number hard pig iron
Gear (Grari)	grari 22, grari 25
Chain Gear	grari 30 (60 teeth)
Bearings & Seals	Sizes 6205 (25mm d, 35mm D, 15mm Width), 6207 (35mm d, 72mm D, 17 mm width)
Nuts Bolts	0.33 inch (4 sootar) thick
Blade	locally available blade for super seed
Cross	0.25 inch
Box Seed Fertilizer	locally available seed box

Dropper Seed Fertilizer	locally available seed & fertilizer dropper
Chain	60 number
Plastic Pipe Clamps	Locally available clamps
Discs	10, 11 inch

### **Cutting / Shearing**

The first step in the production process is the fabrication of metal sheet, which involves cutting steel into different sections and lengths, e.g., flats, angles, channels, squares, pipes, plates, bars and rods. This is done by shearing machine which uses scissors like angular shear action to cut the sheet according to the required measurements. Shearing operations are performed by the action of two blades, one fixed in the shear bed and the other moving vertically with little or no clearance. Shear action moves progressively from one side of the material to the other.

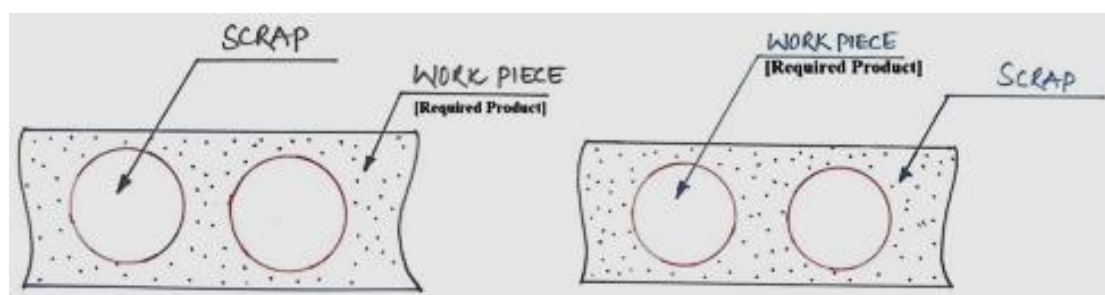
### **Press Work**

After cutting, press work is performed by power press or hydraulic press on the metal sheet to produce the desired shapes. Press work includes the following processes:

### ***Punching & Blanking Operation***

When a force is applied by using the punch on to the sheet, the cutting action takes place on the sheet producing a piece/blank and leaving a hole in the sheet. In punching operation, the punch size is made equal to hole size and clearance is provided on the die and also in the punching operation. The shear is provided only on the Punch. Figure 25 shows punching and blanking operation.

**Figure 25: Punching and Blanking Operation**

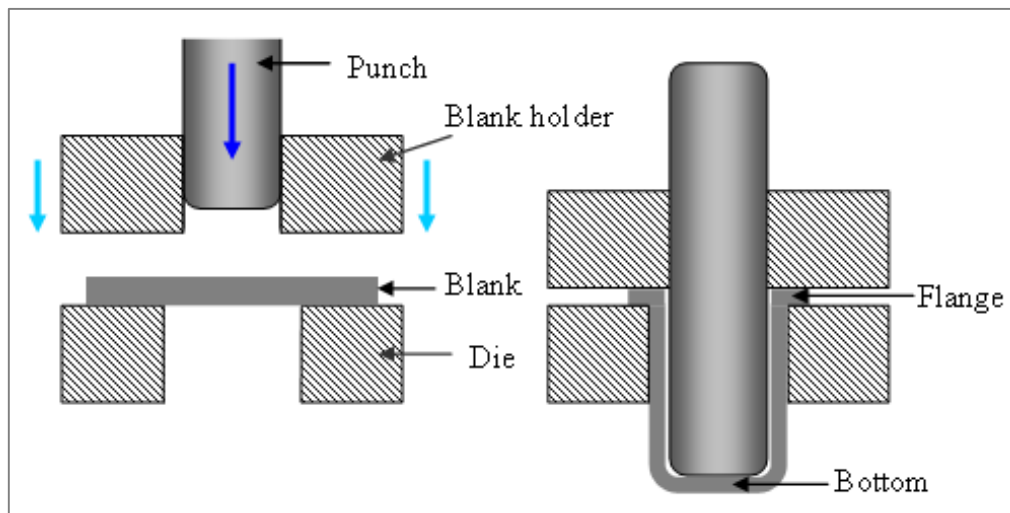




### Deep Drawing Operation

It is a sheet metal forming process in which a sheet metal blank is radially drawn into a forming die by the mechanical action of a punch. Deep drawing is mainly used for cup-shaped components. Figure 26 shows deep drawing operation.

**Figure 26: Deep Drawing Operation**



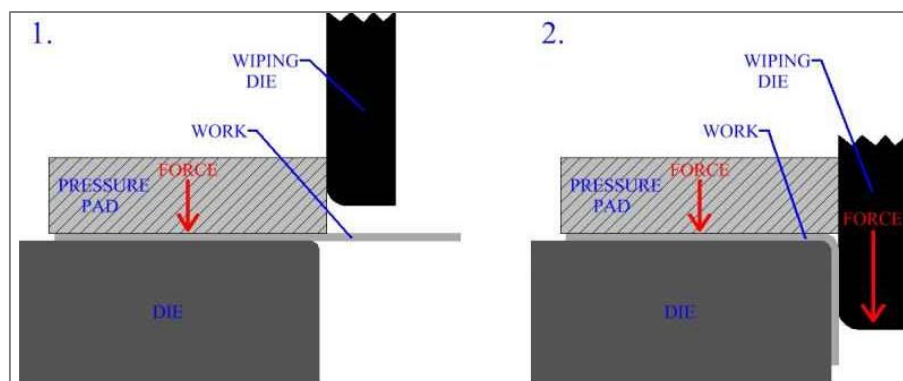
### Bending Operation

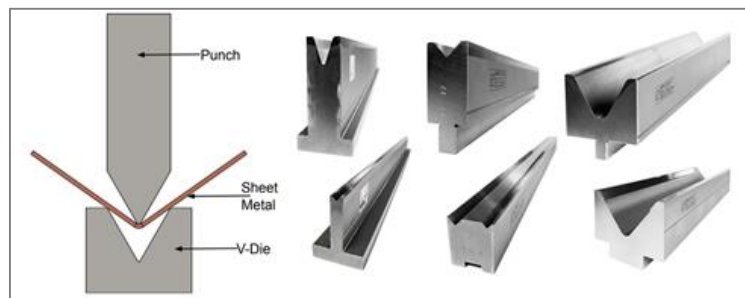
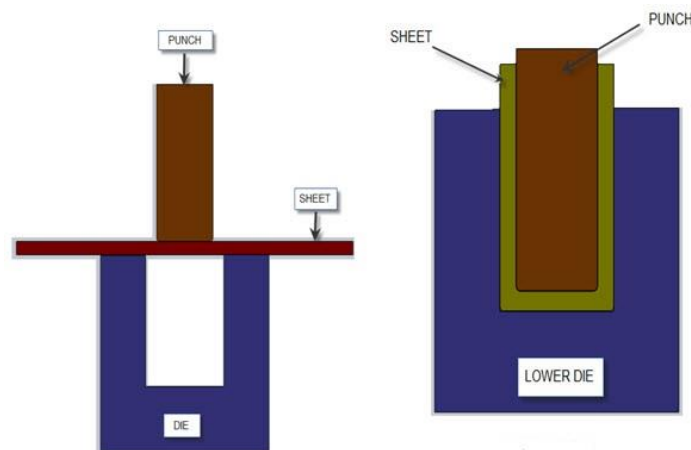
Bending Operation is performed to bend the sheet in required angles. There are three types of bending operations:

- Edge Bending
- V Bending
- U Bending

Figure 27 shows edge bending, Figure 27 shows V bending and Figure 29 shows U bending.

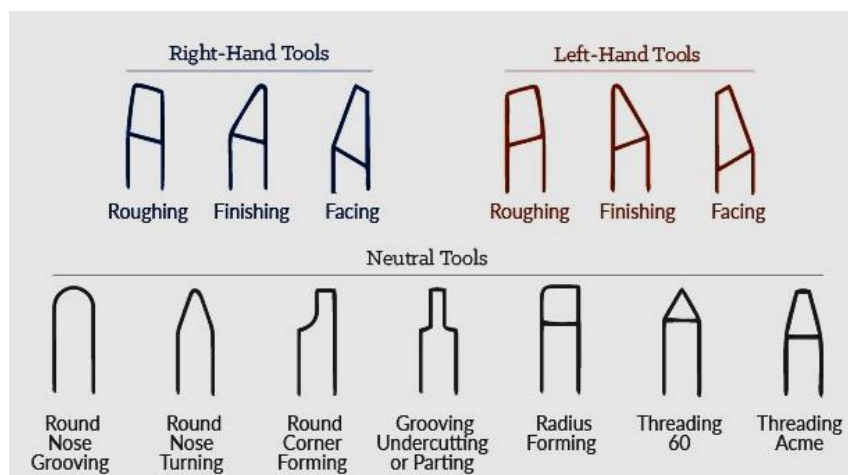
**Figure 27: Edge Bending**



**Figure 28: V bending****Figure 29: U bending**

### **Turning and Drilling**

Turning involves rotation of the work piece while the cutting tool moves in a linear motion. This results in forming a cylindrical shape. A lathe machine is the preferred machine for performing all turning operations. Like most machining operations, turning is either done manually or automatically. Turning may be done on the external or the internal surface of the part. Single point cutting tools, used in turning, come in various shapes. They are placed at different angles for a variety of outcomes. Figure 30 shows single point cutting tools.

**Figure 30: Single Point Cutting Tool**

Drilling is done to create holes on the metal sheets and other components of the product. The drill bit is pressed against the work piece and rotates at rates from hundreds up to even thousands rotations per minute which makes holes. Figure 31 shows drilling process.

**Figure 31: Drilling Process**



### **Shaping**

For production of products like wheat straw chopper and super seeder, shaper machine is used to produce horizontal, vertical and flat surfaces.

### **Grinding**

Grinder is used to remove the extra material from the components produced in the above processes using a grinding wheel. This process is necessary to make the rough surfaces of the finished components smooth and to show high surface quality and maintain high accuracy of shape and dimensions. Figure 32 shows grinding process.

**Figure 32: Grinding Process**



### **Assembling**

Smaller parts like chains, blades, tynes, discs are brought together with the holders or the main body and are permanently connected using heat and filler. The filler is

connected to the point where it melts and pools between the two objects. This results in a strong joint. Welding plant is used for this process. Other parts are connected using general tool kit. Figure 33 shows assembling of implements.

**Figure 33: Assembling**



### **Product Testing**

After assembling process, the product is passed through test runs to check its performance in the field. If the product's performance is not satisfactory the defect is identified and removed before painting. Figure 34 shows product testing.

**Figure 34: Product Testing**





## **Painting**

The products satisfactorily passing the performance test are painted and the business logo is fixed on the product. Spray paint is used to paint the implements. Painting job is usually outsourced by majority of agricultural implements manufacturers. Figure 35 shows painting of implements.

**Figure 35: Painting Process**



### **5.3. Installed and Operational Capacities**

The proposed manufacturing unit has a maximum annual capacity of manufacturing 492 products which includes 15% Reapers, 12% Cultivators, 3% Zero Tillage, 2% Wheat Straw Choppers, 13% Rotavators, 4% Disc Harrows, 4% Border Discs, 4% Chisel Ploughs, 8% Ridgers, 2% Wheat Threshers, 1% Maize Shellers, 2% Rabi Drills, 2% Silage Machines, 24% Chaff Cutters (Toka) and 1% Super Seeders. It translates into 75 Reapers, 60 Cultivators, 14 Zero Tillages, 12 Wheat Straw Choppers, 65 Rotavators, 21 Disc Harrows, 21 Border Discs, 21 Chisel Ploughs, 41 Ridgers, 9 Wheat Threshers, 7 Maize Shellers, 10 Rabi Drills, 11 Silage Machines, 120 Chaff Cutters (Toka) and 5 Super Seeders.

Initially, the project is estimated to manufacture agriculture implements at 60% of the total production capacity, which is equal to 297 implements, including 45 Reapers, 36 Cultivators, 9 Zero Tillages, 7 Wheat Straw Choppers, 39 Rotavators, 13 Disc Harrows, 13 Border Discs, 13 Chisel Ploughs, 25 Ridgers, 5 Wheat Threshers, 4 Maize Shellers, 6 Rabi Drills, 7 Silage Machines, 72 Chaff Cutters (Toka) and 3 Super Seeders. Table 16 shows capacity calculations of Agriculture implement.

In the proposed business, labor will work in three teams. Each team has 2 skilled labor and 1 unskilled labor.

Table 16: Capacity Calculation

Products	Total Available Skilled Man Hours Annually	Division Ratio of Man Hours per Product	Available hours Per Product	Skilled Labor Hours Required per unit	Annual Production @100% Capacity Utilization	Units Produced @ 60 % Capacity
<i>Formulas</i>	<i>A</i>	<i>B</i>	<i>C=A*B</i>	<i>D</i>	<i>E=C*D</i>	<i>F= E*60%</i>
Reaper	18,000	20%	3,600	48	75	45
Cultivator		15%	2,700	45	60	36
Zero Tillage		4%	720	50	14	9
Wheat Straw Chopper		5%	900	75	12	7
Rotavator		9%	1,620	25	65	39
Disc Harrow		4%	720	35	21	13
Border Disc		4%	720	34	21	13
Chisel Plough		3%	540	26	21	13
Ridger		5%	900	22	41	25
Wheat Thresher		6%	1,080	120	9	5
Maize Sheller		3%	540	80	7	4
Rabi Drill		4%	720	75	10	6
Silage Machine		5%	900	80	11	7
Chaff Cutter (Toka)		10%	1,800	15	120	72
Super Seeder		3%	540	100	5	3
<b>Total</b>		<b>100%</b>	<b>18,000</b>		<b>492</b>	<b>297</b>

## 6. CRITICAL FACTORS

The following factors should be carefully considered while making investment decision:

- Good understanding of the industry
- Good knowledge of market demand
- Keeping organized business records
- Evaluating prospective customer base
- Availability of skilled workforce
- Knowing major competitors
- Knowledge about the modern machinery and equipment

## 7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

An Agriculture Implements Manufacturing Unit can be established in cities like Faisalabad, Daska, Mian Channu, Okara, Multan, Hafizabad, Jahanian, etc. These cities are well known for manufacturing of agriculture implements. Hence, there is an easy availability of skilled labor and raw materials in these cities. Furthermore, sub-urban areas of all major cities of Pakistan also have potential for this investment. The selected city should preferably be located within the area where agricultural activity is carried out round the year.

## 8. POTENTIAL TARGET CUSTOMERS

According to economic survey of Pakistan 2020-21 agriculture, the mainstay of Pakistan's economy, accounted for 19.2% of GDP and 38.5% of the labor force. More than 65-70% of the population depends on agriculture for its livelihood. After Livestock (60% share), crops sector is the second largest contributor that accounted for around 35.81% of agricultural GDP.<sup>6</sup> Major share of this is contributed by larger crops like wheat, rice, cotton and sugarcane whereas fruits, vegetables and condiments claim a smaller share of the total agricultural GDP. The province of Punjab is the largest agricultural producer in the country and thus possesses a high potential to contribute towards high-paced, sustainable economic growth of Pakistan. With the growth of agriculture sector, the demand for updated agricultural implements is also increasing.

Currently, in the agriculture implements industry, two types of sales channels are used for local sale by manufacturers. Majority of agriculture implements manufacturers only sell their products directly to farmers; whereas, the remaining manufacturers sell their products to both dealers/agents and farmers. Two major clusters of this industry,

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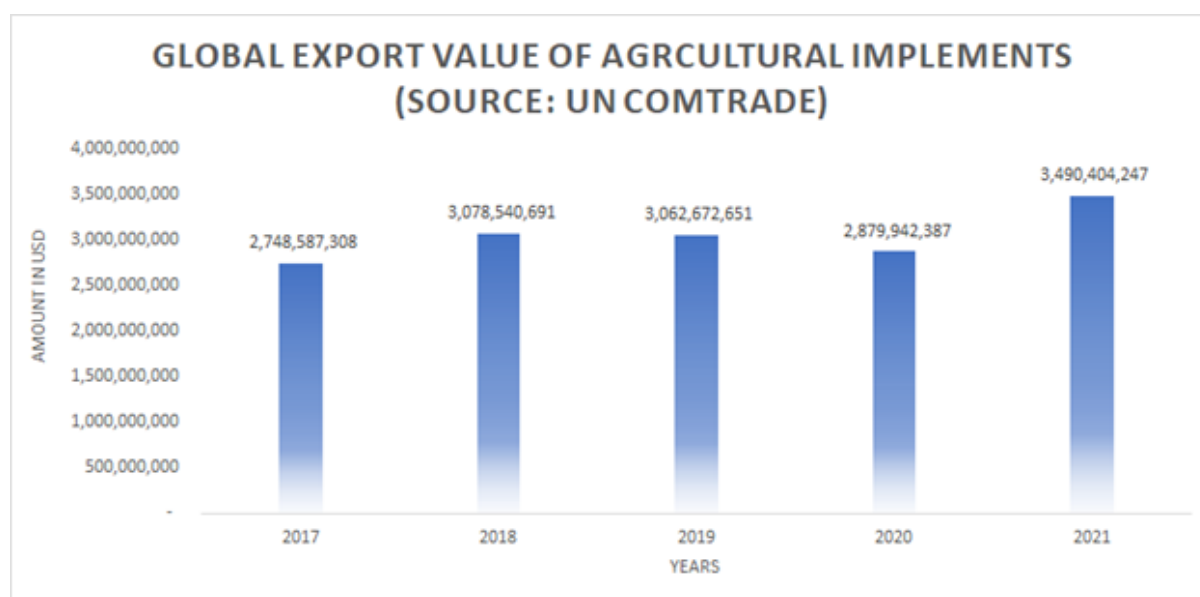
<sup>6</sup> [https://www.finance.gov.pk/survey/chapters\\_21/02-Agriculture.pdf](https://www.finance.gov.pk/survey/chapters_21/02-Agriculture.pdf)

Daska and Faisalabad, have an established dealer system and their dealers are working all over the country. However, Mian Channu and Okara clusters mostly sell directly to the farmers, whereas Faisalabad cluster sells implements to both dealers and farmers. There are total of 63 agricultures implements manufacturing units in Daska cluster, 32 units in Faisalabad, 40 in Mian Channu and Multan and 21 in Okara. The agriculture implement units operate in three legal structures; sole proprietorship, partnership and private limited company.

The machinery used by the majority of current manufacturers is obsolete and fully depreciated. Many manufacturers have shown interest in updating their machinery as technologically advanced machinery will increase the quality of the product and also the latest machinery consumes less energy which will reduce the cost of production.

Furthermore, there are few exporters of agriculture implements in Pakistan as well who export their products to regional and African countries regularly. Moreover, Agricultural implements are traded around the world in large numbers. The international trade of these products is reported under HS Code 843680. Total global exports of these products in in 2017 was USD 2.74 Billion which increased to USD 3.49 Billion by 2021. The export quantity trends show an uneven pattern of increase and decrease during the last four-year period from 2017 to 2020. Export value and quantity trends are respectively shown in Figure 36.

**Figure 36: Global Export Value Trend of Agricultural Implements**



During the period from 2017 to 2021, the average fluctuation in exports in terms of value was 26% This translates into average compounded annual growth rate (CAGR) of 4.9% in value. The fluctuated rates indicate that the growth of Agricultural Implements depends on the consumer demand.



## 9. PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of the proposed Agriculture Implements Manufacturing Unit. 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

Total cost of the project has been calculated to be PKR 16.31 million. The project will be financed through 100% Equity. Table 17 provides the details of the costs calculated for the proposed production unit.

**Table 17: Project Cost**

Description	Amount (PKR)	Reference
Land	-	9.2.1
Building / Infrastructure	626,308	9.2.2
Machinery & equipment	8,685,000	9.2.3
Lab Equipments	231,900	9.2.4
Furniture & fixtures	505,000	9.2.5
Office vehicles	1,452,000	9.2.6
Office equipment	986,000	9.2.7
Pre-operating costs	460,176	9.2.8
Advance Against Building Rent	750,000	9.2.9
<b>Total Capital Cost</b>	<b>13,696,384</b>	
<b>Working capital</b>		
Equipment spare part inventory	14,475	
Raw material inventory	1,352,136	
Upfront Building Rent	250,000	
Cash	1,000,000	
<b>Total Working capital</b>	<b>2,616,611</b>	
<b>Total Project Cost (PKR)</b>	<b>16,312,995</b>	

### 9.2.1 Land

The proposed Agriculture implements will be established on a rented land to avoid the high cost. Suitable locations for setting up a facility like this can be easily found on rent. Therefore, no land cost has been added to the project cost. Total space requirement for the proposed unit has been estimated as 6,725 sq. feet (29.89 Marla). The breakup of the space requirement is provided in Table 18.

**Table 18: Breakup of Space Requirement**

Break-up of Land Area	Number	% Break-up	Area (Sq. Ft.)
Owners' Office	1	2%	110
Admin Area	1	7%	441
Production Area	1	68%	4,550
Raw Material Store Area	1	6%	400
Finished Good Store Area	1	13%	900
Washroom	4	5%	324
<b>Total</b>		<b>100%</b>	<b>6,725</b>

### 9.2.2 Building and Renovation Cost

There will be no construction cost of building since the unit will be started on a rented building. However, there will be a renovation cost, required to make the building usable for the business. The proposed project requires electricity load of around 60.83 KW for which an electricity connection under the Industrial three phase will be required. Building rent of PKR 250,000 per month has been included in the operating cost. Building renovation cost is shown in Table 19.

**Table 19: Renovation Cost**

Cost Item	Unit of Measurement	Total Liter / Area / Number	Cost/ Unit/ Sq.feet	Total Cost (PKR)
Paint Cost	Liter	118	800	94,768
Labour Cost- Paint	Sq. Feet	11,846	15	177,690
Blinds	Units	6	7,000	42,000
Glass Partition	Sq. Feet	567	550	311,850
<b>Total (PKR)</b>				<b>626,308</b>

### 9.2.3 Machinery & Equipment

Table 20 provides details of Machinery and equipment required for the project.

**Table 20: Machinery & Equipment**

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Power Press	1	600,000	600,000
Hydraulic Press	1	1,200,000	1,200,000
Shearing Machine	1	1,000,000	1,000,000
Small Hand Grinder	2	7,000	14,000
Large Hand Grinder	1	16,000	16,000
Lathe Machine (10 Ft)	1	1,400,000	1,400,000
Lathe Machine (6.5 Ft)	1	500,000	500,000
Milling Machine	1	1,000,000	1,000,000
Digital Welding Plant	2	70,000	140,000
CO2 Welding Plant	1	150,000	150,000
Vertical Drilling Machine (Large)	2	300,000	600,000
Vertical Drilling Machine (Medium)	1	225,000	225,000
Vertical Drilling Machine (Small)	2	70,000	140,000
Generator (60 Kva)	1	1,700,000	1,700,000
<b>Total</b>			<b>8,685,000</b>

### 9.2.4 Lab Equipment

Table 21 provides details of Lab equipment required for the project.

**Table 21: Lab Equipment Cost**

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Portable Hardness Tester	1	150,000	150,000
Vernier Caliper and Scale	4	5,000	20,000
Height Gauge	1	40,000	40,000
Thread Gauge	2	10,000	20,000
Thickness Gauge	2	500	1,000
Measuring Tape	3	300	900
<b>Total</b>			<b>231,900</b>

### 9.2.5 Furniture & Fixtures

Table 22 provides details of the furniture and fixture requirement of the project.

**Table 22: Furniture & Fixtures**

Cost Item	No.	Unit Cost (PKR)	Total Cost (PKR)
Executive Table	1	60,000	60,000
Office Table	6	30,000	180,000
Executive Chairs	1	30,000	30,000
Office Chair	10	14,000	140,000
Staff Plastic Chair(s)	10	2,000	20,000
Staff Table	5	6,000	30,000
Sofa Sets	1	45,000	45,000
<b>Total</b>			<b>505,000</b>

### 9.2.6 Office Equipment

Details of office equipment required for the project are provided in Table 23.

**Table 23: Office Equipment**

Cost Item	No.	Unit Cost(PKR)	Total Cost (PKR)
Air Conditioner (1 Ton Inverter )	2	85,000	170,000
Laptop	1	150,000	150,000
Desktop Computer	4	50,000	200,000
Printer	1	42,000	42,000
LED/LCD 32	1	40,000	40,000
Water Dispenser	2	25,000	50,000
Ceiling Fan	17	8,000	136,000
Exhaust Fan	11	4,500	49,500
Pedestal Fan	7	10,000	70,000
Wi-Fi Router and Connection	1	3,500	3,500
Security System (1 MP)	18	2,500	45,000
DVR	2	15,000	30,000
<b>Total</b>			<b>986,000</b>

### 9.2.7 Office Vehicles

Details of office vehicles required for the project are provided in Table 24.

**Table 24: Office Vehicles**

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Carry Van	1	1,300,000	1,300,000
Motorcycle	1	120,000	120,000
Registration / Transfer Fee			32,000
<b>Total</b>			<b>1,452,000</b>

### 9.2.8 Pre-Operating Cost

Details of pre-operating cost for the project are provided in Table 25.

**Table 25: Pre-Operating Cost**

Cost Item	Number of Months	Total Cost (PKR)
Administration expense	1	342,500
Utilities expense	1	117,676
<b>Total</b>		<b>460,176</b>

### 9.2.9 Security against Building

Details of security against building for the project are provided in Table 26.

**Table 26: Security against Building**

Cost Item	Months	Unit Cost / Month (PKR)	Total Cost (PKR)
Security against Building	3	250,000	750,000

## 9.3. Financial Feasibility Analysis

The financial feasibility analysis given in Table 27 provides the information regarding projected IRR, NPV and payback period of the study based on 100% equity.

**Table 27: Financial Feasibility Analysis**

Description	Project
IRR	55%
NPV (PKR)	32,468,644
Payback Period (years)	2.61
Projection Years	10

Discount Rate used for NPV	25%
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#### 9.4. Financial Feasibility Debt Financing

Table 28 provides the information regarding projected IRR, NPV and payback period of the study based on combination of equity (50%) and debt (50%) financing for the proposed project.

**Table 28: Financial Feasibility Debt Financing**

Description	Project
IRR	53%
NPV (PKR)	38,793,697
Payback Period (years)	2.79
Projection Years	10
Discount Rate used for NPV	22%

#### 9.5. Breakeven Analysis

Breakeven analysis is provided in Table 29.

**Table 29: Breakeven Analysis**

Particulars	Amount First Year (PKR)	Ratio
Sales (PKR) – A	54,115,000	100%
Variable Cost (PKR) – B	39,808,584	74%
Contribution (PKR) (A-B) = C	14,306,416	26%
Fixed Cost (PKR) – D	10,728,231	20%
Break Even Revenue (PKR) (D/CM) =E	40,580,269	
Breakeven No. of Services		223
Breakeven Capacity		45%



### 9.6. Revenue Generation

Based on the 60% capacity utilization of the unit, sales revenues during the first year of operations is estimated in Table 30.

**Table 30: Revenue Generation**

Particulars	Number of Units (A)*	Price Per Unit (PKR)(B)	Total Revenue (PKR) (A*B)
Reaper	43	170,000	7,310,000
Cultivator	34	130,000	4,420,000
Zero Tillage	9	235,000	2,115,000
Wheat Straw Chopper	7	895,000	6,265,000
Rotavator	37	280,000	10,360,000
Disc Harrow	12	375,000	4,500,000
Border Disc	12	50,000	600,000
Chisel Plough	12	180,000	2,160,000
Ridger	24	130,000	3,120,000
Wheat Thresher	5	710,000	3,550,000
Maize Sheller	4	280,000	1,120,000
Rabi Drill	6	140,000	840,000
Silage Machine	7	330,000	2,310,000
Chaff Cutter (Toka)	69	55,000	3,795,000
Super Seeder	3	550,000	1,650,000
<b>Total</b>	<b>284</b>		<b>54,115,000</b>

\* 15 days finished goods inventory is considered

### 9.7. Variable Cost Estimate

Variable costs of the project have been provided in detail in Table 31.

**Table 31: Variable Cost Estimate**

Variable Cost	Cost (PKR)
Material Cost	32,451,262
Direct Labor	5,136,000
Direct Electricity Cost	799,289
Fuel Cost-Generator	159,858
Machinery Maintenance – Cost	173,700

Communications expense (phone, fax, mail, internet, etc.)	492,000
Office vehicles running expense	350,475
Office expenses (stationery, entertainment, janitorial services, etc.)	246,000
<b>Total Variable Cost</b>	<b>39,808,584</b>

### 9.7.1. Raw Material Cost of Reaper

**Table 32: Raw material cost of Reaper**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Iron Sheet	Kg	100	250	25,000
Iron Rod	Kg	60	215	12,900
Flat Bar	Kg	10	210	2,100
Steel Casting	Kg	50	250	12,500
Angle	Kg	20	210	4,200
Iron Plates	Kg	40	250	10,000
Pipe	Kg	10	250	2,500
Gear (Grari)	No	9	550	4,950
Chain	No	2	4,000	8,000
Blade	No	31	50	1,550
V Shaped Fingers	No	16	310	4,960
Bearings	No	32	160	5,120
Belts	No	2	300	600
Nuts Bolts	No	15	330	4,950
Spring	No	14	35	490
Plastic Stars Wheel	No	7	285	1,995
Sticker	No	1	1,000	1,000
Paint Coat	No	2	2,000	4,000

<b>Sub Total</b>				<b>106,815</b>
Wastage		1%		1,068
<b>Total Cost</b>				<b>107,883</b>

### 9.7.2. Raw Material of Rotavator

**Table 33: Raw material cost of Rotavator**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Gear Box Upper	No.	1	25,000	25,000
Gear Box Side	No.	1	10,000	10,000
Blades	No.	48	250	12,000
Iron Sheet	KG	160	250	40,000
Pipe	KG	30	250	7,500
Cast Iron	KG	110	260	28,600
Paint Coat	No.	1	2,500	2,500
Sticker set	No.	1	1,000	1,000
<b>Sub Total</b>				<b>126,600</b>
Wastage		1%		1,266
<b>Total Cost</b>				<b>127,866</b>

### 9.7.3. Raw Material of Rabi Drill

**Table 34: Raw material cost of Rabi Drill**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Iron Sheet	Kg	220	250	55,000
Plastic Stars	No	9	200	1,800
Gear Set	No	1	20,000	20,000
Paint Coat	No	1	2,000	2,000
Sticker Set	No	1	1,000	1000

<b>Sub Total</b>				<b>79,800</b>
Wastage		1%		798.00
<b>Total Cost</b>				<b>80,598</b>

#### 9.7.4. Raw Material of Ridger

**Table 35: Raw material cost of Ridger**

<b>Particulars</b>	<b>Unit of Measurement</b>	<b>Consumption per Unit</b>	<b>Cost per KG/No. (PKR)</b>	<b>Total Cost (PKR)</b>
Iron Sheet	Kg	350	250	87,500
Paint Coat	No	1	1,000	1,000
Sticker set	No	1	500	500
<b>Sub Total</b>				<b>89,000</b>
Wastage		1%		890.00
<b>Total Cost</b>				<b>89,890</b>

#### 9.7.5. Raw Material of Zero Tillage

**Table 36: Raw material cost of Zero Tillage**

<b>Particulars</b>	<b>Unit of Measurement</b>	<b>Consumption per Unit</b>	<b>Cost per KG/No. (PKR)</b>	<b>Total Cost (PKR)</b>
Angle	Kg	80	210	16,800
Flat Bar	Kg	100	210	21,000
Iron Plate	Kg	40	250	10,000
Iron Rod	Kg	30	215	6,450
Steel Casting	Kg	50	250	12,500
Steel Corter	No	15	270	4,050
Seed Box	No	1	20,000	20,000
Seed and fertilizer Dropper	No	30	830	24,900
Tyre and rim	No	1	10,000	10,000
Gear (Grari)	No	11	1,500	16,500
Roller Bearing	No	12	250	3,000

Plastic pipe and clamps	No	30	130	3,900
Nuts Bolts	No	15	330	4,950
Paint Coat	No	2	1,500	3,000
Sticker set	No	1	1,000	1,000
<b>Sub Total</b>				<b>158,050</b>
Wastage		1%		1,580.50
<b>Total Cost</b>				<b>159,631</b>

#### 9.7.6. Raw Material of Border Disc

**Table 37: Raw material cost of Border Disc**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Iron Sheet	Kg	35	250	8,750
Angle	Kg	35	250	8,750
Paint Coat	No	1	1,000	1,000
Sticker set	No	1	300	300
<b>Sub Total</b>				<b>18,800</b>
Wastage		1%		188.00
<b>Total Cost</b>				<b>18,988</b>

#### 9.7.7. Raw Material of Wheat Straw Chopper

**Table 38: Raw material cost of Wheat Straw Chopper**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Iron Sheet	Kg	600	250	150,000
Channel	Kg	80	250	20,000
Flat Bar	Kg	300	210	63,000
Angle	Kg	300	210	63,000

Iron Plate	Kg	50	250	12,500
Round rod	Kg	300	215	64,500
Steel Casting	Kg	300	250	75,000
Pipe	Kg	60	250	15,000
Roller Bearing	No	34	1,750	59,500
Blade	No	325	45	14,625
Fingers	No	15	330	4,950
Gear Grari	No	2	40,000	80,000
Chain& Grari	No	3	1,000	3,000
Plastic Bush	No	20	50	1,000
Spring	No	70	35	2,450
Bubble Box	No	1	15,000	15,000
Tyre,Rim ,HUB	No	6	8,500	51,000
Belts	No	9	650	5,850
Nuts Bolts	No	30	650	19,500
Sticker	No	1	1,000	1,000
Paint Coat	No	2	7,500	15,000
<b>Sub Total</b>				<b>735,875</b>
Wastage		1%		7,358.75
<b>Total Cost</b>				<b>743,234</b>

#### 9.7.8. Raw Material of Cultivator

Table 39: Raw material cost of Cultivator

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Angle	Kg	50	210	10,500
Pipe	Kg	10	250	2,500
Flat Bar	Kg	60	210	12,600
Round Rod	Kg	10	210	2,100
Iron Plate	Kg	20	300	6,000



Tyne	No	9	1,100	9,900
Spring	No	29	850	24,650
Nuts Bolts	No	6	330	1,980
Paint Coat	No	1	2,000	2,000
Sticker set	No	1	1,000	1,000
<b>Sub Total</b>				<b>73,230</b>
Wastage		1%		732.30
<b>Total Cost</b>				<b>73,962</b>

### 9.7.9. Raw Material of Disc Harrow

**Table 40: Raw material cost of Disc Harrow**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Channel	Kg	200	250	50,000
Angle	Kg	100	210	21,000
Flat Bar	Kg	60	210	12,600
Plate	Kg	150	250	37,500
Steel Casting	Kg	90	250	22,500
Pipe	Kg	30	250	7,500
Disc	No	18	4,500	81,000
Round Rod	Kg	160	215	34,400
Roller Bearing	No	12	660	7,920
Nuts Bolts	No	10	300	3,000
Tyre& Rim	No	2	8,000	16,000
Sticker	No	1	500	500
Paint Coat	No	2	2,000	4,000
<b>Sub Total</b>				<b>297,920</b>
Wastage		1%		2,979.20
<b>Total Cost</b>				<b>300,899</b>

**9.7.10. Raw Material of Wheat Thresher****Table 41: Raw material cost of Wheat Thresher**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Iron Sheet	Kg	600	250	150,000
Angle	Kg	700	225	157,500
Cast Iron	Kg	700	200	140,000
Roller Bearing	No	17	1,200	20,400
Tyre	No	2	10,000	20,000
Paint Coat	No	1	10,000	10,000
Sticker set	No	1	600	600
<b>Sub Total</b>				<b>498,500</b>
Wastage		1%		4,985
<b>Total Cost</b>				<b>503,485</b>

**9.7.11. Raw Material of Chaff Cutter****Table 42: Raw material cost of Chaff Cutter**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Cast Iron	KG	100	105	10,500
Nut Bolt	No.	1	250	250
Bearing	No.	2	200	400
Silicon	KG	0.4	650	260
Paint Coat	No.	1	2,000	2,000
Sticker set	No.	1	700	700
<b>Sub Total</b>				<b>14,110</b>
Wastage		1%		141.10
<b>Total Cost</b>				<b>14,251</b>

**9.7.12. Raw Material of Chisel Plough****Table 43: Raw material cost of Chisel Plough**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Tynes	No.	3	15,000	45,000
Iron Sheet	KG	80	250	20,000
Welding rod	No.			6,000
Paint Coat	No.	1	3,000	3,000
Sticker set	No.	1	1,000	1,000
<b>Sub Total</b>				<b>75,000</b>
Wastage		1%		750
<b>Total Cost</b>				<b>75,750</b>

**9.7.13. Raw Material of Super Seeder****Table 44: Raw material cost of Super Seeder**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Iron Sheet	KG	140	250	35,000
Steel Casting	KG	80	250	20,000
Pipe	KG	120	250	30,000
Flat Bar	KG	50	210	10,500
Round Rod	KG	40	250	10,000
Iron Plate	KG	150	250	37,500
Forged Iron	KG	50	300	15,000
Gear (Grari)	no.	5	5,400	27,000
Chain Gear	No.	9	1,650	14,850
Bearing & Seals	No.	26	1,000	26,000
Nuts Bolts	NO.	20	400	8,000
Blade	No.	48	1000	48,000

Cross	No.	1	12,000	12,000
Box Seed Fertilizer	no.	1	18,000	18,000
Dropper Seed Fertilizer	No.	20	600	12,000
Chain	No.	3	2,000	6,000
Plastic Pipe Clamps	No.	40	125	5,000
Discs	No.	1	2,000	2,000
Sticker	No.	1	1,300	1,300
Paint Coat	No	1	5,000	5,000
<b>Sub Total</b>				<b>343,150</b>
Wastage		2%		6,863
<b>Total Cost</b>				<b>350,013</b>

#### 9.7.14. Raw Material of Silage Machine

Table 45: Raw material cost of Silage

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Iron Sheet	KG	80	250	20,000
Channel	KG	5	250	1,250
Bearings	No.	8	1,200	9,600
Belts	No.	4	15,000	60,000
Gear (Grari)	No.	4	20,000	80,000
Cutter Blade	No.	12	300	3,600
Bracket	No.	1	12,000	12,000
Cross	No.	4	3,000	12,000
Paint Coat	No.	1	6,000	6,000
Sticker set	No.	1	1,000	1,000
<b>Sub Total</b>				<b>205,450</b>
Wastage		1%		2,054.5

<b>Total Cost</b>				<b>207,505</b>
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### 9.7.15. Raw Material of Maize Sheller

**Table 46: Raw material cost of Maize Shelter**

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Iron Sheet	KG	150	250	37,500
Angel	KG	100	200	20,000
Tyre and Rim	No	2	13,000	26,000
Bearings	No	15	1,200	18,000
Cross	No	1	5,000	5,000
Shaft	KG	4	5,000	20,000
Paint Coat	No.	1	5,000	5,000
Sticker Set	No	1	1,000	1,000
<b>Sub Total</b>				<b>132,500</b>
Wastage		1%		1,325
<b>Total Cost</b>				<b>133,825</b>

### 9.8. Fixed Cost Estimate

Table 47 provides details of fixed cost for the project.

**Table 47: Fixed Cost Estimate**

Fixed Cost	Cost (PKR)
Management Staff	4,920,000
Administration benefits expense	402,240
Building rental expense	3,000,000
Indirect Electricity	612,825
Promotional expense	270,575
Depreciation expense	1,430,556
Amortization of pre-operating costs	92,035
<b>Total Cost (PKR)</b>	<b>10,728,231</b>

### 9.9. Human Resource Requirement

For the 1<sup>st</sup> year of operations, the center shall require the workforce at a salary cost. Table 48 provides details of human resources.

**Table 48: Human Resource**

Designation	No of Persons	Average Monthly Salary (PKR)	Total Salary (PKR)
Production Incharge	1	80,000	960,000
Procurement Officer	1	45,000	540,000
Admin and Accounts Officer	1	45,000	540,000
Quality Controller	1	60,000	720,000
Labour – Skilled	6	35,000	2,520,000
Labour –UnSkilled	3	26,000	936,000
Marketing Officers	2	40,000	960,000
Stores Incharge	1	40,000	480,000
Office Boy	2	25,000	600,000
Security Guard	3	25,000	900,000
Driver	1	25,000	300,000
Sweepers	2	25,000	600,000
<b>Total</b>	<b>24</b>		<b>10,056,000</b>



## 10. CONTACT DETAILS

Details of some supplier of iron and steel alloy are provided in Table 49.

**Table 49: Contact Details**

Name of Supplier	Nature of Supplier	Address	Contact	Email	Website
MWP Business and Presentations Pvt Ltd	Iron Alloy	Office # 25, Mumtaz Market, City Saddar Road, Rawalpindi	+92 (333) 44 85 888	<a href="mailto:info@mw-pbnp.com">info@mw-pbnp.com</a>	<a href="https://www.mw-pbnp.com/#">https://www.mw-pbnp.com/#</a>
Mughal steels	Steel Alloy	41 Peco Road Badami Bagh, Lahore, Pakistan	042-35960841-3	<a href="mailto:fahadhaf-eez@mu-ghalsteel.com">fahadhaf-eez@mu-ghalsteel.com</a>	<a href="https://www.mughalsteel.com/?v=null">https://www.mughalsteel.com/?v=null</a>
ARSALAN CHAUDHARY ENTERPRISES	Steel Tools	S-36-R, 67/3, Ghalib Street, Railway Road, Lahore	03324375 857	<a href="mailto:arsalance@hotmail.com">arsalance@hotmail.com</a>	<a href="mailto:arsalance@hotmail.com">arsalance@hotmail.com</a>
Prime Bearing Centre	Bearings	Shop No.28, Aziz Mansion, Noman Street, Plaza Quarters Karachi	(92 21) 32736871,	<a href="mailto:primebearing@hotmail.com">primebearing@hotmail.com</a>	<a href="mailto:primebearing@hotmail.com">primebearing@hotmail.com</a>
International Steels Limited	Steel	101 Beaumont Plaza, 10 Beaumont Road, Karachi-75530	+92 (21) 111 019 019	<a href="mailto:info@isl.com.pk">info@isl.com.pk</a>	<a href="mailto:info@isl.com.pk">info@isl.com.pk</a>
A.K STEEL & RE-	Steel plates	Eminabad Road G.T. Road	+92 55 3409692	<a href="mailto:info@akgroup.com.pk">info@akgroup.com.pk</a>	<a href="mailto:info@akgroup.com.pk">info@akgroup.com.pk</a>

ROLLING MILLS		Gujranwal a			
A.N INDUSTRIES (PRIVATE) LIMITED	Iron and steel pipes	9-KM G.T. Road, Ferozewal a, Shahdara Lahore 54950, Pakistan	+ 92 42 37963771	<a href="mailto:info@anpipe.com.pk">info@anpipe.com.pk</a>	<a href="mailto:info@anpipe.com.pk">info@anpipe.com.pk</a>

## 11. USEFUL LINKS

**Table 50: Useful Links**

<b>Name of Organization</b>	<b>Website/ E-mail Address</b>
Small and Medium Enterprises Development Authority (SMEDA)	<a href="http://www.smeda.org.pk">www.smeda.org.pk</a>
National Business Development Program (NBDP)	<a href="http://www.nbdp.org.pk">www.nbdp.org.pk</a>
Government of Pakistan	<a href="http://www.pakistan.gov.pk">www.pakistan.gov.pk</a>
Ministry of National Health Services Regulations and Coordination	<a href="http://www.nhsrsc.gov.pk">www.nhsrsc.gov.pk</a>
Ministry of Federal Education and Professional Training	<a href="http://www.mofept.gov.pk">www.mofept.gov.pk</a>
Government of Punjab	<a href="http://www.punjab.gov.pk">www.punjab.gov.pk</a>
Government of Sindh	<a href="http://sindh.gov.pk/">sindh.gov.pk/</a>
Government of Balochistan	<a href="http://balochistan.gov.pk/">balochistan.gov.pk/</a>
Government of KPK	<a href="http://kp.gov.pk/">kp.gov.pk/</a>
Government of Gilgit Baltistan	<a href="http://gilgitbaltistan.gov.pk/">gilgitbaltistan.gov.pk/</a>
Government of Azad Jammu & Kashmir	<a href="http://ajk.gov.pk/">ajk.gov.pk/</a>
Trade Development Authority of Pakistan	<a href="http://www.tdap.gov.pk">www.tdap.gov.pk</a>
Securities and Exchange Commission of Pakistan	<a href="http://www.secp.gov.pk">www.secp.gov.pk</a>
State Bank of Pakistan	<a href="http://www.sbp.gov.pk">www.sbp.gov.pk</a>
Federal Board of Revenue	<a href="http://www.fbr.gov.pk">www.fbr.gov.pk</a>
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	<a href="http://www.fpcci.com.pk">www.fpcci.com.pk</a>
Pakistan Stock Exchange (PSX)	<a href="http://www.psx.com.pk">www.psx.com.pk</a>
Pakistan Agricultural Machinery and Implements Manufacturer Association	<a href="mailto:amjadbrothers@hotmail.com">amjadbrothers@hotmail.com</a>

## 12. ANNEXURES

### 12.1. Income Statement

Calculations	SMEDA									
Income Statement										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Revenue</b>	<b>54,115,000</b>	<b>68,171,160</b>	<b>80,956,536</b>	<b>97,242,612</b>	<b>114,922,726</b>	<b>135,207,352</b>	<b>159,671,857</b>	<b>186,984,764</b>	<b>208,581,688</b>	<b>231,942,837</b>
<b>Cost of sales</b>										
Material Cost	32,451,262	40,544,128	47,641,054	56,867,887	66,684,086	77,714,902	91,219,350	105,722,995	116,892,593	128,932,530
Direct Labor	5,136,000	5,634,192	6,180,709	6,780,237	7,437,920	8,159,399	8,950,860	9,819,094	10,771,546	11,816,386
Fuel Cost-Generator	159,858	191,017	226,899	268,145	315,482	369,725	431,796	502,730	554,511	611,626
Machinery Maintenance - Cost	173,700	191,591	211,325	233,091	257,100	283,581	312,790	345,007	380,543	419,739
Direct Electricity Cost	799,289	865,896	932,504	999,111	1,065,719	1,132,326	1,198,934	1,265,541	1,265,541	1,265,541
Total cost of sales	38,720,109	47,426,824	55,192,490	65,148,472	75,760,307	87,659,933	102,113,730	117,655,367	129,864,734	143,045,822
Gross Profit	15,394,891	20,744,336	25,764,045	32,094,139	39,162,419	47,547,419	57,558,128	69,329,397	78,716,954	88,897,015
<b>General administration &amp; selling expenses</b>										
Management Staff	4,920,000	5,397,240	5,920,772	6,495,087	7,125,111	7,816,246	8,574,422	9,406,141	10,318,537	11,319,435
Administration benefits expense	402,240	441,257	484,059	531,013	582,521	639,026	701,011	769,009	843,603	925,433
Building rental expense	3,000,000	3,300,000	3,630,000	3,993,000	4,392,300	4,831,530	5,314,683	5,846,151	6,430,766	7,073,843
Indirect Electricity	612,825	661,238	713,476	769,840	830,658	896,280	967,086	1,043,485	1,125,921	1,214,869
Communications expense (phone, fax, mail, internet, etc.)	492,000	539,724	592,077	649,509	712,511	781,625	857,442	940,614	1,031,854	1,131,944
Office vehicles running expense	350,475	386,574	426,391	470,309	518,751	572,183	631,117	696,122	767,823	846,909
Office expenses (stationery, entertainment, janitorial services, etc.)	246,000	269,862	296,039	324,754	356,256	390,812	428,721	470,307	515,927	565,972
Promotional expense	270,575	340,856	404,783	486,213	574,614	676,037	798,359	934,924	1,042,908	1,159,714
Depreciation expense	1,430,556	1,430,556	1,430,556	1,430,556	1,456,234	1,456,234	1,309,084	1,891,829	1,928,880	1,928,880
Amortization of pre-operating costs	92,035	92,035	92,035	92,035	92,035	-	-	-	-	-
Subtotal	11,816,706	12,859,342	13,990,188	15,242,317	16,640,990	18,059,972	19,581,926	21,998,584	24,006,220	26,166,998
Operating Income	3,578,185	7,884,994	11,773,858	16,851,822	22,521,429	29,487,447	37,976,201	47,330,813	54,710,734	62,730,017
Revenue from Scrap	310,403	374,222	447,151	533,160	632,824	744,572	877,366	1,030,565	1,145,988	1,274,339
Gain / (loss) on sale of office equipment	-	-	-	-	-	-	246,500	-	-	-
Gain / (loss) on sale of office vehicles	-	-	-	-	-	-	363,000	-	-	-
Earnings Before Interest & Taxes	3,888,588	8,259,216	12,221,009	17,384,982	23,154,253	30,232,019	39,463,067	48,361,378	55,856,722	64,004,356
Earnings Before Tax	3,888,588	8,259,216	12,221,009	17,384,982	23,154,253	30,232,019	39,463,067	48,361,378	55,856,722	64,004,356
Tax	676,438	1,409,804	2,405,777	3,825,870	5,412,420	9,525,406	10,133,920	12,803,413	15,198,435	17,846,416
<b>NET PROFIT/(LOSS) AFTER TAX</b>	<b>3,212,150</b>	<b>6,849,412</b>	<b>9,815,232</b>	<b>13,559,112</b>	<b>17,741,834</b>	<b>20,706,613</b>	<b>29,329,147</b>	<b>35,557,965</b>	<b>40,658,287</b>	<b>46,157,940</b>

## 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
<b>Assets</b>											
<i>Current assets</i>											
Cash & Bank	1,000,000	2,213,459	5,436,533	8,331,581	11,044,880	14,102,671	16,038,933	37,229,306	70,139,472	108,085,139	145,487,179
Accounts receivable		1,482,603	1,675,153	2,042,845	2,441,084	2,906,374	3,426,439	4,039,441	4,748,721	5,418,719	6,034,583
Raw material inventory	1,352,136	1,863,341	2,415,022	3,179,672	4,112,567	5,286,529	6,844,296	8,749,572	10,670,379	12,981,679	-
Equipment spare part inventory	14,475	17,499	21,154	25,573	30,915	37,372	45,179	54,616	66,025	79,817	-
Finished Goods inventory	-	1,779,512	2,404,163	3,085,995	4,017,862	5,153,568	6,577,229	8,450,871	10,740,008	13,075,539	15,886,165
Pre-paid building rent	250,000	275,000	302,500	332,750	366,025	402,628	442,890	487,179	535,897	589,487	-
Total Current Assets	2,616,611	7,631,413	12,254,525	16,998,417	22,013,333	27,889,143	33,374,966	59,010,986	96,900,502	140,230,380	167,407,927
<i>Fixed assets</i>											
Land	-	-	-	-	-	-	-	-	-	-	-
Building/Infrastructure	626,308	563,677	501,046	438,416	375,785	313,154	250,523	187,892	125,262	62,631	-
Machinery & equipment	8,685,000	7,816,500	6,948,000	6,079,500	5,211,000	4,342,500	3,474,000	2,605,500	1,737,000	868,500	21,720,777
Tools and Equipment	231,900	173,925	115,950	57,975	334,613	250,960	167,307	83,653	482,820	362,115	241,410
Furniture & fixtures	505,000	429,250	353,500	277,750	202,000	126,250	50,500	959,324	815,425	671,527	527,628
Office vehicles	1,452,000	1,234,200	1,016,400	798,600	580,800	363,000	145,200	3,014,585	2,562,397	2,110,209	1,658,021
Office equipment	986,000	838,100	690,200	542,300	394,400	246,500	98,600	1,873,056	1,592,098	1,311,139	1,030,181
Advance Against Building Rent	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000
Total Fixed Assets	13,236,208	11,805,652	10,375,096	8,944,541	7,848,598	6,392,364	4,936,130	9,474,010	8,065,001	6,136,121	25,928,018
<i>Intangible assets</i>											
Pre-operation costs	460,176	368,141	276,106	184,070	92,035	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	460,176	368,141	276,106	184,070	92,035	-	-	-	-	-	-
<b>TOTAL ASSETS</b>	<b>16,312,995</b>	<b>19,805,206</b>	<b>22,905,727</b>	<b>26,127,028</b>	<b>29,953,966</b>	<b>34,281,507</b>	<b>38,311,096</b>	<b>68,484,996</b>	<b>104,965,503</b>	<b>146,366,501</b>	<b>193,335,944</b>
<b>Liabilities &amp; Shareholders' Equity</b>											
<i>Current liabilities</i>											
Accounts payable		1,886,135	2,364,988	2,792,545	3,350,672	3,952,445	4,636,761	5,481,514	6,404,057	7,146,767	7,958,270
Other liabilities											
Total Current Liabilities	-	1,886,135	2,364,988	2,792,545	3,350,672	3,952,445	4,636,761	5,481,514	6,404,057	7,146,767	7,958,270
<i>Other liabilities</i>											
Total Long Term Liabilities	-	-	-	-	-	-	-	-	-	-	-
<i>Shareholders' equity</i>											
Paid-up capital	16,312,995	16,312,995	16,312,995	16,312,995	16,312,995	16,312,995	16,312,995	16,312,995	16,312,995	16,312,995	16,312,995
Retained earnings		1,606,075	4,227,744	7,021,488	10,290,300	14,016,067	17,361,340	46,690,487	82,248,452	122,906,739	169,064,679
Total Equity	16,312,995	17,919,070	20,540,739	23,334,483	26,603,295	30,329,062	33,674,335	63,003,482	98,561,447	139,219,734	185,377,674
<b>TOTAL CAPITAL AND LIABILITIES</b>	<b>16,312,995</b>	<b>19,805,206</b>	<b>22,905,727</b>	<b>26,127,028</b>	<b>29,953,966</b>	<b>34,281,507</b>	<b>38,311,096</b>	<b>68,484,996</b>	<b>104,965,503</b>	<b>146,366,501</b>	<b>193,335,944</b>

### 12.3. Cash Flow Statement

Calculations	SMEDA										
Cash Flow Statement											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Operating activities</i>											
Net profit		3,212,150	6,849,412	9,815,232	13,559,112	17,741,834	20,706,613	29,329,147	35,557,965	40,658,287	46,157,940
Add: depreciation expense		1,430,556	1,430,556	1,430,556	1,430,556	1,456,234	1,456,234	1,309,084	1,891,829	1,928,880	1,928,880
amortization of pre-operating costs		92,035	92,035	92,035	92,035	92,035	-	-	-	-	-
Pre-paid building rent	(250,000)	(25,000)	(27,500)	(30,250)	(33,275)	(36,603)	(40,263)	(44,289)	(48,718)	(53,590)	589,487
Cash provided by operations	(1,616,611)	2,819,534	7,450,818	9,916,535	13,338,212	17,073,858	19,297,601	27,037,338	33,392,986	37,945,667	59,122,817
<i>Financing activities</i>											
Issuance of shares	16,312,995	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing activities	16,312,995	-	-	-	-	-	-	-	-	-	-
<i>Investing activities</i>											
Capital expenditure	(13,696,384)	-	-	-	(334,613)	-	-	(5,846,965)	(482,820)	-	(21,720,777)
Cash (used for) / provided by investing activities	(13,696,384)	-	-	-	(334,613)	-	-	(5,846,965)	(482,820)	-	(21,720,777)
<b>NET CASH</b>	<b>1,000,000</b>	<b>2,819,534</b>	<b>7,450,818</b>	<b>9,916,535</b>	<b>13,003,599</b>	<b>17,073,858</b>	<b>19,297,601</b>	<b>21,190,373</b>	<b>32,910,166</b>	<b>37,945,667</b>	<b>37,402,040</b>



## 13. KEY ASSUMPTIONS

### 13.1. Operating Cost Assumptions

**Table 51: Operating Cost Assumptions**

Description	Details
Building rent growth rate	10%
Furniture and fixture depreciation	15%
Vehicle depreciation	15%
Office equipment depreciation	15%
Inflation 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 52: Revenue Assumptions**

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

### 13.3. Financial Assumptions

**Table 53: Financial Assumptions**

Description	Details
Project life (Years)	10
Debt: Equity	0:100
Discount Rate used for NPV	25%

### 13.4. Debt related Assumptions

**Table 54: Debt Related Assumptions**

Description	Details
Project life (Years)	10
Debt: Equity	50:50
Discount Rate used for NPV	22%
Debt Tenure	5 years
Grace Period	1 Year
Interest Rate (KIBOR+3%)	19%

### 13.5. Cash Flow Assumptions

**Table 55: Cash Flow Assumptions**

Description	Days
Accounts Receivable Cycle	10
Accounts Payable Cycle	20

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## 1 DISCLAIMER

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

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## 2 EXECUTIVE SUMMARY

Fiberglass is very lightweight, solid and durable material, which can be fabricated into different type of products and shapes. Fiberglass boat manufacturing became popular in the 1960s and is perhaps the most common way boats are built today. Fiberglass boats are mainly used for fishing, tourism, transportation and water sports etc.

This particular pre-feasibility study provides basic information for setting up a 'Fiberglass Boat Manufacturing Unit'. The proposed unit can manufacture 188 Fiberglass Boats of 3 different sizes (i.e. 8 feet, 24 feet and 48 feet) per year based on 300 working days with 12 hours shift per day. However, starting operational capacity is assumed at 65% (i.e. 123 Boats) with an annual increase of 5% up to maximum capacity of 95% (i.e. 179 Boats) in year 7 (i.e. 179 boats). This production capacity is estimated to be economically viable and justifies the capital and operational cost of the project.

Entrepreneur's knowledge of the fiberglass manufacturing, availability of skilled worker and product quality are critical factors for the success of this business. Some of the recommended locations are Karachi, Ormara, Pasni and Gwadar for establishing the proposed business. The unit will operate on order manufacturing basis, especially targeting fishermen, beach resort owners, water sports organizers and administrators of water based recreational and tourist places.

The project cost is estimated as Rs. 55.77 million with a capital investment of Rs. 53.49 million and working capital of Rs. 2.27 million. Based on an equity finance model, the project NPV is around Rs. 47.28 million, with an IRR of 33% and a Payback Period of 3.70 years. The project will provide employment opportunities to 22 individuals, including the owner. 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 the development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through the 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 investment areas have 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 the 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.

## **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, production, marketing, finance and business management.

The purpose of this document is to facilitate potential investors in the Fiberglass Boat Manufacturing Unit business by providing them with a general understanding of the business with the intention of supporting potential investors in crucial 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 set-up and its successful management.

Apart from carefully studying the whole document, one must consider critical aspects provided later on, which form the basis of an informed Investment Decision.

## **5 BRIEF DESCRIPTION OF PROJECT AND PRODUCT**

Fiberglass is a Fiber-Reinforced Polymer (FRP) made of plastic reinforced by glass fibers. It is an attractive, lightweight, solid and durable material. It is also highly resistant to environmental extremes and corrosion. FRP can be tooled, molded, and fabricated into almost any shape or design. Fiberglass products are chemically inert, structurally stable and exhibit the least amount of expansion and contraction with temperature fluctuations compared to traditional materials. In addition to that fiberglass products are very affordable and cost-effective solutions for virtually any application, component, or part. All these qualities make fiberglass ideal for the production of boats.

As a material for boat manufacturing, fibreglass has gained popularity over wood and metal in both developed and developing countries since 1960s, mainly due to



relatively simple manufacturing process, ability to produce many identical structures from a single mold and ease of repair and maintenance. Presently, fiberglass is perhaps the most common material used for manufacturing of all types of boats. Generally, fiberglass boats are used for multipurposes ranging from catching fish to water sports, tourism, recreational activities and transporation.

The key to producing high-quality fiber glass boats is a good mold. Once the mold is created, it can propduce hundreds of boats with precisely the same shape as the original boat. The proposed unit will construct three sizes of molds (i.e. 8 feet, 24 feet and 48 feet) using wooden frames for manufacturing boats. The labour and time required in manufacturing of a boat will vary according to size of boat. Machinery will include Fiberglass Spray Gun, Compressor, Welding Plant and Gantry Crane. The raw material will be purchased from the local market.

The manufacturing unit is proposed to be established on the coastal belt, where the basic raw materials can easily be transported. Karachi, Ketī Bandar, Gadani, Jiwani, Ormara, Pasni and Gwadar are some of the suitable locations. The unit will operate on order manufacturing basis, especially catering to needs of fishermen, beach resort owners, water sports organizers and administartors of water based recreational and tourist places. Financial analysis shows the unit shall be profitable from the very first year of operation. The legal status is proposed to be 'Sole Proprietorship'.

### **5.1 Production Process Flow**

The brief overview of the production process flow of the proposed 'Fiberglass Manufacturing Unit' mainly comprises of the following steps.

#### Mold Design and Development:

Mold is the essential part of the process and should be developed by experts to view both customer requirements and design requirements to comply with the regulations. If the entrepreneur does not have the required expertise mold design and development should be outsourced.

#### Mold Preparation and Cleaning:

The mold should be thoroughly cleaned and prepared for the first gel coat. A coat of wax and mold release agents are applied at this step.

#### Application of Gel Coat and Curing:

Gel coat (resin) is applied to the surface of a mold before placing plastic material in the mold for production; the gel coat becomes an integral part of the finished laminate and improves surface appearance by providing the shiny clear coat to fiberglass reinforced plastic. It also acts as a separator between the fiberglass and the mold during the molding process.

**Mixing:**

Resin and other additives such as catalyst are mixed.

**Application of Fiber Glass and Resin:**

Fibers strands and resin can be applied through spray or manual lay-up; several resin layers are applied to achieve the required thickness.

**Frame Development:**

Based on the size of the boat, frames are developed at equal distances to provide structural support to the boat. These frames are from the ribs of the boat.

**Curing:**

The boat is cured at varying time and temperature, depending on the size and design of the boat and resin cure requirements.

**De-molding:**

The boat is carefully removed from the mold.

**Cleaning of equipment:**

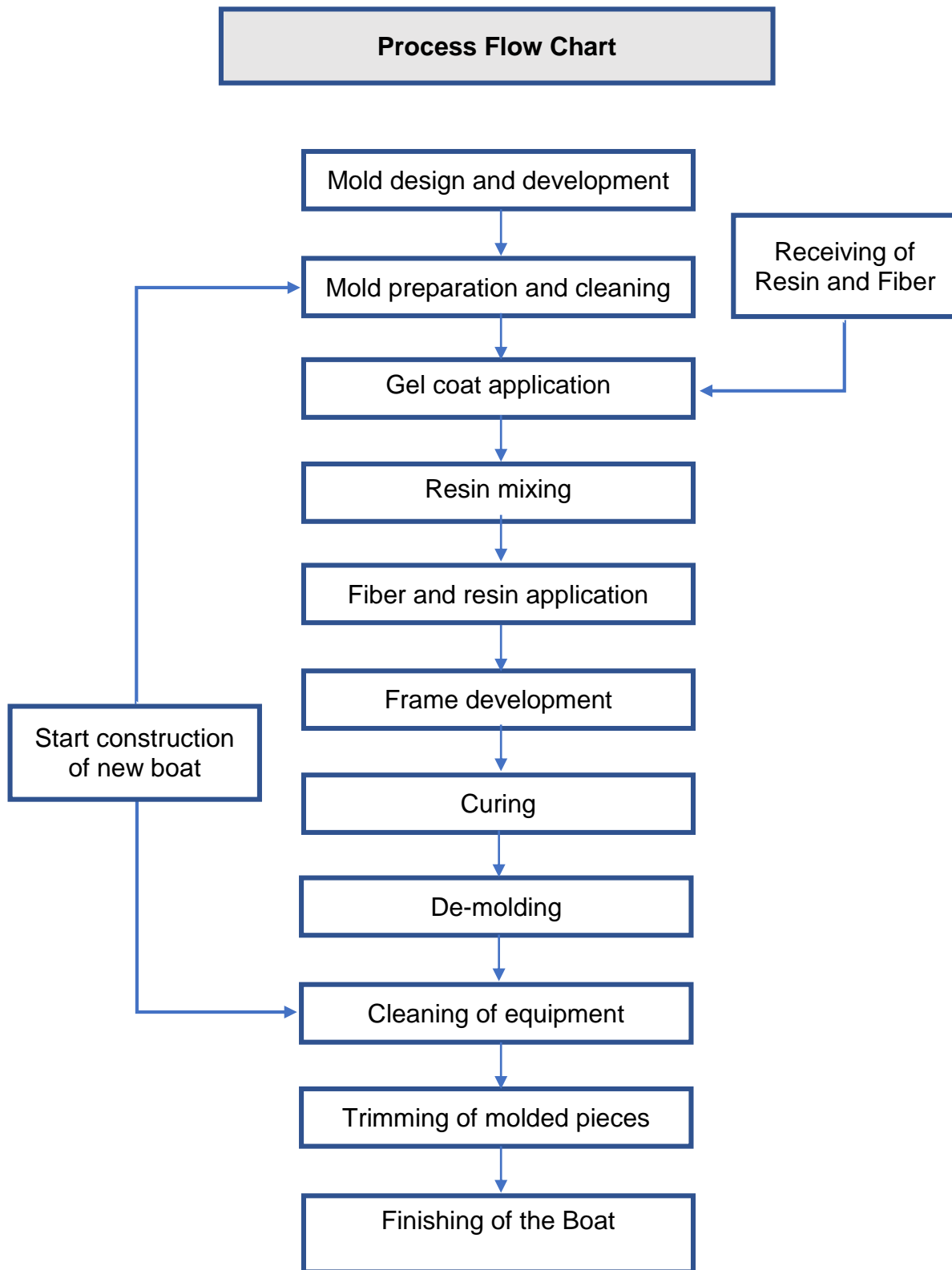
Mold, tools, rollers, transfer hoses, drums, spray guns, and other tools and equipment that come in contact with resins are thoroughly cleaned.

**Trimming:**

Trimming of the molded piece is done.

**Finishing of the Boat:**

The finishing touches are performed on the boat before the delivery

**Figure 1: Process Flow Diagram**

## 5.2 Proposed Product Mix

The proposed manufacturing unit will produce fiber glass boats of 8, 24 and 48 feet size in length. Detailed production mix is given in the table below:

**Table 1: Product Mix**

Boat Size	Production Percentage
8 Feet	53%
24 Feet	27%
48 Feet	20%
<b>Total</b>	<b>100%</b>

## 5.3 Installed and Operational Capacity

The installed and operational capacity of the Fiberglass Boat Manufacturing Unit mainly depends upon the installed machinery.

The proposed unit will have the capacity to manufacture 188 fiberglass boats per annum on 12 hours operational day basis. Subsequently, the unit is assumed to operate 300 days annually. However, during the 1<sup>st</sup> year of operation unit will operate at 65% capacity, while maximum capacity utilization of the unit is assumed at 95% in the 7<sup>th</sup> year of operation. The details of installed and operational capacity of the proposed unit is provided in the table below.

**Table 2: Installed and Operational Capacity**

Description	Total Installed Capacity	Operational Capacity 65% (Year 1)	Maximum Operational Capacity 95% (Year 7)
Fiberglass Boat (8 ft.)	100	65	95
Fiberglass Boat (24 ft.)	50	33	48
Fiberglass Boat (48 ft.)	38	25	36
<b>Total</b>	<b>188</b>	<b>123</b>	<b>179</b>

## 6 CRITICAL SUCCESS FACTORS

Following are critical success factors associated with this business:

- Background knowledge and related experience of the entrepreneur in the field of fiberglass manufacturing and mold making.

- Molds should be fabricated by experts who have extensive knowledge of the industry, keeping in view all the specific requirements.
- Selection of quality raw material based on the best analysis of cost and revenues; cost efficiency through better management.
- Exceed customer expectations by offering high-quality products at reasonable prices with short turnaround time.
- Stringent supervision of the production process.
- Induction of trained human resource for the handling of business operations, especially in production.
- Best management practices are essential in other areas of operations, such as resin and chemical management and storage, air filtration and ventilation, employee health and safety, and solid waste management and recycling.

## **7 GEOGRAPHICAL POTENTIAL FOR INVESTMENT**

The fiberglass boats can be used in lakes, rivers and dams for different purposes. However, significant demand exists in the coastal areas of Pakistan, especially for fishing. Therefore, proposed manufacturing unit may ideally be established on the coastal belt where the basic raw materials can easily be transported and other utilities, especially electricity, is readily available. Karachi, Ormara, Pasni and Gwadar are recommended for starting such a facility in Pakistan.

## **8 POTENTIAL TARGET CUSTOMERS / MARKETS**

Fiberglass boats are primarily used for fishing, tourism, transportation and water sports etc. However, significant demand for boats comes from the fisheries sector. There are no distributors or whole sellers involved in the marketing of boats. Most buyers directly contact the manufacturer, and depending upon the requirements, design and materials are finalized. Therefore, unit will operate on order manufacturing basis.

## **9 PROJECT COST SUMMARY**

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

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

## 9.1 Project Economics

All the figures in this financial model have been calculated for estimated sales of Rs. 41.70 million in year one.

To financially appraise the project, a 100% Equity-Based Business Model has been assumed. The following table shows the Internal Rate of Return, Payback Period and Net Present Value of the proposed venture:

**Table 3: Project Economics (Equity Financed)**

Description	Details
Internal Rate of Return (IRR)	33%
Payback Period (Yrs.)	3.70
Net Present Value (Rs.)	47,277,068

Calculation of break-even analysis is as follows:

**Table 4: Breakeven (100% Equity-Based)**

Break-Even Analysis	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Break-Even Revenue	17,194,001	17,462,280	17,832,176	18,387,529	18,947,088	19,333,559	20,102,342	21,071,520	22,147,802	23,341,399
Break-Even Units	31	29	28	27	26	24	24	23	23	22
Margin of Safety	59%	64%	68%	71%	74%	76%	78%	79%	79%	80%

However, for further explanation, the Project Economics based on Debt:Equity (i.e. 50:50) Model has also been computed. Based on the Debt:Equity model, the Internal Rate of Return, Payback Period and Net Present Value of the proposed project are provided in the table below:

**Table 5: Project Economics Based on Debt (50%):Equity (50%)**

Description	Details
Internal Rate of Return (IRR)	33%
Payback Period (Yrs.)	3.58
Net Present Value (Rs.)	62,943,127

The financial assumptions for Debt: Equity is as follows:

**Table 5.1: Financial Assumptions for Debt: Equity Model**

Description	Details
Debt	50%

Equity	50%
Interest Rate on Debt	12%
Debt Tenure (Years)	5
Debt Payment / Year	1

The projected Income Statement, Balance Sheet and Cash Flow Statement attached as annexures are based on a 100% Equity-Based Business Model.

## 9.2 Project Cost

Following fixed and working capital requirements have been identified for operations of the proposed business.

**Table 6: Project Cost**

Description	Amount Rs.
<b>Capital Cost</b>	
Land	18,757,895
Building / Infrastructure	23,809,981
Machinery and Equipment	9,092,856
Pre-operating Costs	1,036,000
Office Equipment	549,500
Furniture And Fixtures	168,200
Office Vehicle (Motor Bike)	80,237
<b>Total Capital Cost</b>	<b>53,494,669</b>
<b>Working Capital</b>	
Cash	1,303,506
Raw Material Inventory	545,440
Up-Front Insurance Payment	321,058
Equipment Spare Parts Inventory	102,500
<b>Total Working Capital</b>	<b>2,272,504</b>
<b>Total Project Cost</b>	<b>55,767,173</b>



### 9.3 Land and Building Requirement

Approximately 4 Kanals of land would be required for the establishment of the proposed unit. The cost of land is estimated at the rate of Rs. 4.4 million per Kanal. The infrastructural requirements of the project mainly comprise of production and finishing area, storage etc. However, the units operating in the industry do not follow any set pattern.

The following table provides the details of the space requirement and cost of construction.

**Table 7: Infrastructure Requirement**

Description	Area (Sq.Ft.)	Unit Cost (Rs.)	Total Cost (Rs.)
Production Area	11,500	1,250	14,375,000
Finishing Area	4,850	1,250	6,062,500
Store	1,425	1,250	1,781,250
Design Cost			580,731
Management Office	225	2,500	562,500
Boundary Wall	560	800	448,000
<b>Total</b>			<b>23,809,981</b>

### 9.4 Machinery and Equipment Requirement

Machinery and equipment for the proposed project are stated below:

**Table 8: Machinery and Equipment**

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Fiberglass Spray Gun	1	2,211,712	2,211,712
Generator (Hyundai-Korea Diesel 80KW)	1	1,989,000	1,989,000
Compressor	1	845,546	845,546
Welding Plant	1	775,075	775,075
Gantry Crane	1	732,323	732,323
Mold 48 Ft.	1	1,314,200	1,314,200
Mold 24 Ft.	1	657,100	657,100
Mold 8 Ft.	1	167,900	167,900

Installation Cost (Fabrication Cost)	1	200,000	200,000
Mics Tools	1	200,000	200,000
<b>Total</b>			<b>9,092,856</b>

### 9.5 Furniture and Fixtures Requirement

Details of the furniture and fixture required for the project are given below:

**Table 9: Furniture and Fixture**

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Sitting Chairs	5	13,160	65,800
Table	2	25,000	50,000
Sofas	1	25,000	25,000
Guest Chairs	3	5,800	17,400
Sofa Table	1	10,000	10,000
<b>Total</b>			<b>168,200</b>

### 9.6 Office Equipment Requirement

Following office equipment will be required for Fiberglass Boat Manufacturing Unit.

**Table 10: Office Equipment**

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Laptop	2	65,000	130,000
AC	1	83,000	83,000
Flood Lights	8	7,000	56,000
Fridge	1	51,500	51,500
Water Cooler	1	45,000	45,000
LED	1	32,500	32,500
Desktop Computers	1	30,000	30,000
Fans	10	3,000	30,000
CCTV	1	30,000	30,000
Energy Savers	23	800	18,400
Computer Printer	1	16,000	16,000
Water Dispenser	1	16,000	16,000

Microwave Oven	1	7,500	7,500
Telephones	3	1,200	3,600
<b>Total</b>			<b>549,500</b>

## 9.7 Raw Material Requirement

The raw material required for manufacturing fiberglass boat will be 'unsaturated polyester' Following are the details of the raw material necessary for the proposed project.

**Table 11: Raw Material Requirement (Year 1)**

Description	Unit Price (Kg/Qty)	8 Feet Boat		24 Feet Boat		48 Feet Boat	
		Kgs/Qty	(Rs.)	Kgs/Qty	(Rs.)	Kgs/Qty	(Rs.)
Unsaturated Polyester	360	40	14,400	160	57,600	400	115,200
Resins							
MEKP	1,000	1	1,000	4	4,000	10	8,000
COBALT	3,000	1	3,000	4	12,000	10	24,000
Chopped Stlan MAT	330	6	1,980	24	7,920	60	15,840
Woven Roving	400	6	2,400	24	9,600	60	19,200
PU Form	1,000	2	2,000	8	8,000	20	16,000
Hook – Qty	100	3	300	10	1,000	25	2,000
Rubber – Feet	75	3	2,250	100	7,500	250	15,000
Aluminium Plate - Qty	1,000	1	1,000	4	4,000	8	8,000
OAR Holder – Qty	1,200	1	1,200	3	3,600	6	7,200
Planks	1,350	3	4,050	12	16,200	20	32,400
<b>Total</b>			<b>33,580</b>		<b>131,420</b>		<b>262,840</b>

## 9.8 Human Resource Requirement

In order to run the operations of Fiberglass Boat Manufacturing Unit smoothly, details of human resources required along with the number of employees and monthly salary are recommended as under:

**Table 12: Human Resource**

Description	No. of Employees	Monthly Salary Per Person (Rs.)
CEO	1	100,000
Foreman/Quality In charge	1	40,000
Admin And Accounts Officer	1	35,000
Skilled Labor	17	20,000
Office Boy	1	18,000
Security Guards	1	18,000
<b>Total</b>	<b>22</b>	

For this particular pre-feasibility, the salary amount will be Rs. 551,000 per month in Year 1.

### 9.9 Utilities and Other Costs

An essential cost to be borne by the project is the cost of electricity. The electricity expenses are estimated to be around Rs. 4.78 million in year 1. Furthermore, promotional expense being essential for marketing of Fiberglass Boat unit is calculated as 5.0% of revenue.

### 9.10 Revenue Generation

Based on the operational capacity utilization of 65%, sales revenue during the first year of operations is provided in the table below.

**Table 13: Revenue Generation (Year 1)**

Description	No. Of Units Produced / Sold	Sale Price/ Unit (Rs.)	Sales Revenue (Rs.)
Fiberglass Boat (8 Ft.)	65	150,000	9,750,000
Fiberglass Boat (24 Ft.)	33	400,000	13,200,000
Fiberglass Boat (48 Ft.)	25	750,000	18,750,000
<b>Total</b>	<b>123</b>		<b>41,700,000</b>

## 10 CONTACT DETAILS

In order to facilitate potential investors, contact details of private-sector vendors relevant to the proposed project are given below.

**Table 14: Private Sector Vendors**

Name of Supplier	Type of Supplies	Address	Phone
ARY Sahulat Bazar	Generator	<a href="http://www.arysahulatbazar.pk/hyundai-korea-diesel-generator-100-kva-80-kw-3-phase">www.arysahulatbazar.pk/hyundai-korea-diesel-generator-100-kva-80-kw-3-phase</a>	92-333-1666981
Alibaba	Machinery		0300-7447245
High Tech Office Furniture	Furniture	(Gulberg III Lahore)	0322-4927264
Craft Vision	Security Cameras	<a href="http://www.facebook.com/craftvisionpk/">www.facebook.com/craftvisionpk/</a>	042-34004994, 0324-4790092
Haier Pakistan	Air conditioners	8th Floor, Mega Tower, Main Boulevard Gulberg II, Lahore	042-111142437
Industrial Techno International	Experts	Dera Muhammad Din Village Handoo Momon Pura Road Ring Road Lahore, Pakistan	+9242-36546681 +92-300-8433290, +92-321-8433290

## 11 USEFUL WEB LINKS

Small and Medium Enterprises Development Authority (SMEDA)	<a href="http://www.smeda.org.pk">www.smeda.org.pk</a>
Government of Pakistan	<a href="http://www.pakistan.gov.pk">www.pakistan.gov.pk</a>
Ministry of Industries and Production	<a href="http://www.moip.gov.pk">www.moip.gov.pk</a>
Ministry of Education, Training and Standards in Higher Education	<a href="http://moptt.gov.pk">http://moptt.gov.pk</a>
Government of Punjab	<a href="http://www.punjab.gov.pk">www.punjab.gov.pk</a>
Government of Sindh	<a href="http://www.sindh.gov.pk">www.sindh.gov.pk</a>

Government of Khyber Pakhtunkhwa	<a href="http://www.khyberpakhtunkhwa.gov.pk">www.khyberpakhtunkhwa.gov.pk</a>
Government of Balochistan	<a href="http://www.balochistan.gov.pk">www.balochistan.gov.pk</a>
Government of Gilgit Baltistan	<a href="http://www.gilgitbaltistan.gov.pk">www.gilgitbaltistan.gov.pk</a>
Government of Azad Jamu Kashmir	<a href="http://www.ajk.gov.pk">www.ajk.gov.pk</a>
Trade Development Authority of Pakistan (TDAP)	<a href="http://www.tdap.gov.pk">www.tdap.gov.pk</a>
Security and Exchange Commission of Pakistan (SECP)	<a href="http://www.secp.gov.pk">www.secp.gov.pk</a>
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	<a href="http://www.fpcci.com.pk">www.fpcci.com.pk</a>
State Bank of Pakistan (SBP)	<a href="http://www.sbp.org.pk">www.sbp.org.pk</a>
Punjab Vocational Training Council (PVTTC)	<a href="http://www.pvtc.gov.pk">www.pvtc.gov.pk</a>
Technical Education and Vocational Training Authority (TEVTA)	<a href="http://www.tevta.org">www.tevta.org</a>
Industrial Techno International	<a href="http://www.itipk.com/">www.itipk.com/</a>
Faisalabad Industrial Estate Development and Management Company (FIEDMC)	<a href="http://www.fiedmc.com.pk">www.fiedmc.com.pk</a>
Punjab Industrial Estate Development and Management Company (PIEDMC)	<a href="http://www.pie.com.pk">www.pie.com.pk</a>
Punjab Small Industries Corporation	<a href="http://www.psic.gov.pk">www.psic.gov.pk</a>
Sundar Industrial Estate	<a href="http://www.sie.com.pk">www.sie.com.pk</a>
Quaid-e-Azam Industrial Estate	<a href="http://www.qie.com.pk">www.qie.com.pk</a>
Sindh Small Industries Corporation	<a href="http://www.ssic.gov.pk">www.ssic.gov.pk</a>
Korangi Industrial Area	<a href="http://www.kati.pk">www.kati.pk</a>
Sundar Industrial Estate, Lahore	<a href="http://www.sie.com.pk">www.sie.com.pk</a>
Khyber Pakhtunkhwa Economic Zones Development And Management Company	<a href="http://www.kpezdmc.org.pk">www.kpezdmc.org.pk</a>
Lasbela Industrial Estates and Development Authority	<a href="http://www.lieda.gov.pk/IndustrialEstates">www.lieda.gov.pk/IndustrialEstates</a>

## 12 ANNEXURES

### 12.1 Income Statement

Calculations										SMEDA
Income Statement										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	41,700,000	48,106,250	55,701,125	62,735,992	72,048,560	81,830,872	93,292,577	100,289,521	107,811,235	115,897,077
<i>Cost of sales</i>										
Cost of goods sold - 8 Feet	2,182,700	2,468,130	2,776,646	3,109,844	3,469,419	3,857,178	4,275,039	4,488,791	4,713,231	4,948,892
Cost of goods sold - 24 Feet	4,336,860	4,829,685	5,505,841	6,085,403	6,868,899	7,547,802	8,453,538	8,876,215	9,320,025	9,786,027
Cost of goods sold - 48 Feet	6,571,000	7,451,514	8,403,652	9,128,105	10,223,477	11,405,567	12,680,307	13,314,322	13,980,038	14,679,040
Operation costs 1 (direct labor)	4,560,000	5,016,000	5,517,600	6,069,360	6,676,296	7,343,926	8,078,318	8,886,150	9,774,765	10,752,241
Operating costs 2 (machinery maintenance)	1,230,000	1,386,000	1,565,550	1,736,438	1,944,810	2,156,916	2,398,771	2,518,710	2,644,645	2,776,878
Operating costs 3 (direct electricity)	4,646,876	5,330,218	6,159,763	7,097,226	8,156,675	9,353,915	10,706,692	11,628,851	12,643,227	13,759,039
Total cost of sales	21,344,736	24,013,417	27,152,406	30,116,531	33,870,157	37,808,125	42,317,626	45,224,248	48,362,700	51,753,225
Gross Profit	20,355,264	24,092,833	28,548,719	32,619,461	38,178,403	44,022,746	50,974,951	55,065,273	59,448,534	64,143,853
<i>General administration &amp; selling expenses</i>										
Administration expense	2,052,000	2,257,200	2,482,920	2,731,212	3,004,333	3,304,767	3,635,243	3,998,767	4,398,644	4,838,509
Administration benefits expense	205,200	225,720	248,292	273,121	300,433	330,477	363,524	399,877	439,864	483,851
Electricity expense	135,912	149,503	164,454	180,899	198,989	218,888	240,776	264,854	291,339	320,473
Water expense	60,000	63,000	66,150	69,458	72,930	76,577	80,406	84,426	88,647	93,080
Gas expense	180,000	189,000	198,450	208,373	218,791	229,731	241,217	253,278	265,942	279,239
Travelling expense	205,200	225,720	248,292	273,121	300,433	330,477	363,524	399,877	439,864	483,851
Communications expense (phone, fax, mail, internet, etc.)	123,120	135,432	148,975	163,873	180,260	198,286	218,115	239,926	263,919	290,311
Office vehicles running expense	56,166	61,782	67,961	74,757	82,232	90,456	99,501	109,451	120,397	132,436
Office expenses (stationary, entertainment, janitorial services, etc.)	102,600	112,860	124,146	136,561	150,217	165,238	181,762	199,938	219,932	241,925
Promotional expense	2,085,000	2,105,850	2,126,909	2,148,178	2,169,659	2,191,356	2,213,270	2,235,402	2,257,756	2,280,334
Insurance expense	321,058	288,672	256,285	223,898	191,512	163,648	130,918	98,189	65,459	32,730
Professional fees (legal, audit, consultants, etc.)	417,000	481,063	557,011	627,360	720,486	818,309	932,926	1,002,895	1,078,112	1,158,971
Depreciation expense	2,242,552	2,242,552	2,242,552	2,242,552	2,242,552	2,282,712	2,282,712	2,282,712	2,282,712	2,282,712
Amortization of pre-operating costs	207,200	207,200	207,200	207,200	207,200	-	-	-	-	-
Subtotal	8,393,008	8,745,554	9,139,596	9,560,561	10,040,028	10,400,920	10,983,895	11,569,594	12,212,589	12,918,421
Operating Income	11,962,256	15,347,280	19,409,123	23,058,900	28,138,375	33,621,826	39,991,056	43,495,679	47,235,945	51,225,431
Other income (interest on cash)	185,087	508,361	886,304	1,333,052	1,849,724	2,459,246	3,182,912	3,999,009	4,886,162	5,879,641
Gain / (loss) on sale of office equipment	-	-	-	-	219,800	-	-	-	-	-
Gain / (loss) on sale of office vehicles	-	-	-	-	32,095	-	-	-	-	-
Earnings Before Interest & Taxes	12,147,343	15,855,641	20,295,427	24,391,952	30,239,994	36,081,072	43,173,968	47,494,688	52,122,107	57,105,072
Earnings Before Tax	12,147,343	15,855,641	20,295,427	24,391,952	30,239,994	36,081,072	43,173,968	47,494,688	52,122,107	57,105,072
Tax	3,371,570	4,669,474	6,223,399	7,657,183	9,703,998	11,748,375	14,230,889	15,743,140	17,362,737	19,106,775
<b>NET PROFIT/(LOSS) AFTER TAX</b>	<b>8,775,773</b>	<b>11,186,167</b>	<b>14,072,028</b>	<b>16,734,769</b>	<b>20,535,997</b>	<b>24,332,697</b>	<b>28,943,080</b>	<b>31,751,548</b>	<b>34,759,370</b>	<b>37,998,297</b>



## 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
<b>Assets</b>											
<i>Current assets</i>											
Cash & Bank	1,303,506	13,503,437	27,165,464	43,738,834	62,905,299	85,072,636	111,667,025	142,965,971	176,954,734	213,938,224	256,433,077
Equipment spare part inventory	102,500	121,275	143,835	167,512	196,994	229,403	267,882	295,340	325,612	358,987	-
Raw material inventory	545,440	645,283	766,520	883,815	1,041,375	1,213,028	1,418,764	1,564,187	1,724,516	1,901,279	-
Pre-paid insurance	321,058	288,672	256,285	223,898	191,512	163,648	130,918	98,189	65,459	32,730	-
Total Current Assets	2,272,504	14,558,667	28,332,104	45,014,060	64,335,179	86,678,715	113,484,589	144,923,686	179,070,322	216,231,220	256,433,077
<i>Fixed assets</i>											
Land	18,757,895	18,757,895	18,757,895	18,757,895	18,757,895	18,757,895	18,757,895	18,757,895	18,757,895	18,757,895	18,757,895
Building/Infrastructure	23,809,981	22,619,482	21,428,983	20,238,484	19,047,985	17,857,486	16,666,987	15,476,488	14,285,989	13,095,490	11,904,991
Machinery & equipment	9,092,856	8,183,570	7,274,285	6,364,999	5,455,714	4,546,428	3,637,142	2,727,857	1,818,571	909,286	-
Furniture & fixtures	168,200	151,380	134,560	117,740	100,920	84,100	67,280	50,460	33,640	16,820	-
Office vehicles	80,237	64,190	48,142	32,095	16,047	129,222	103,378	77,533	51,689	25,844	-
Office equipment	549,500	439,600	329,700	219,800	109,900	701,317	561,053	420,790	280,527	140,263	-
Total Fixed Assets	52,458,669	50,216,117	47,973,565	45,731,013	43,488,461	42,076,448	39,793,735	37,511,023	35,228,310	32,945,598	30,662,885
<i>Intangible assets</i>											
Pre-operation costs	1,036,000	828,800	621,600	414,400	207,200	-	-	-	-	-	-
Total Intangible Assets	1,036,000	828,800	621,600	414,400	207,200	-	-	-	-	-	-
<b>TOTAL ASSETS</b>	<b>55,767,173</b>	<b>65,603,584</b>	<b>76,927,268</b>	<b>91,159,473</b>	<b>108,030,840</b>	<b>128,755,163</b>	<b>153,278,324</b>	<b>182,434,709</b>	<b>214,298,632</b>	<b>249,176,818</b>	<b>287,095,963</b>
<b>Liabilities &amp; Shareholders' Equity</b>											
<i>Current liabilities</i>											
Accounts payable		1,060,637	1,198,155	1,358,332	1,494,930	1,683,256	1,873,720	2,087,025	2,199,401	2,318,217	2,239,064
Total Current Liabilities	-	1,060,637	1,198,155	1,358,332	1,494,930	1,683,256	1,873,720	2,087,025	2,199,401	2,318,217	2,239,064
<i>Other liabilities</i>											
<i>Shareholders' equity</i>											
Paid-up capital	55,767,173	55,767,173	55,767,173	55,767,173	55,767,173	55,767,173	55,767,173	55,767,173	55,767,173	55,767,173	55,767,173
Retained earnings		8,775,773	19,961,940	34,033,968	50,768,737	71,304,733	95,637,431	124,580,510	156,332,058	191,091,428	229,089,725
Total Equity	55,767,173	64,542,946	75,729,113	89,801,141	106,535,910	127,071,907	151,404,604	180,347,684	212,099,231	246,858,601	284,856,899
<b>TOTAL CAPITAL AND LIABILITIES</b>	<b>55,767,173</b>	<b>65,603,584</b>	<b>76,927,268</b>	<b>91,159,473</b>	<b>108,030,840</b>	<b>128,755,163</b>	<b>153,278,324</b>	<b>182,434,709</b>	<b>214,298,632</b>	<b>249,176,818</b>	<b>287,095,963</b>

## 12.3 Cash Flow Statement

Calculations											SMEDA
Cash Flow Statement											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Operating activities</i>											
Net profit		8,775,773	11,186,167	14,072,028	16,734,769	20,535,997	24,332,697	28,943,080	31,751,548	34,759,370	37,998,297
Add: depreciation expense		2,242,552	2,242,552	2,242,552	2,242,552	2,242,552	2,282,712	2,282,712	2,282,712	2,282,712	2,282,712
amortization of pre-operating costs		207,200	207,200	207,200	207,200	207,200	-	-	-	-	-
Equipment inventory	(102,500)	(18,775)	(22,560)	(23,677)	(29,482)	(32,409)	(38,479)	(27,458)	(30,272)	(33,375)	358,987
Raw material inventory	(545,440)	(99,843)	(121,236)	(117,296)	(157,559)	(171,654)	(205,736)	(145,423)	(160,329)	(176,763)	1,901,279
Advance insurance premium	(321,058)	32,387	32,387	32,387	32,387	27,864	32,730	32,730	32,730	32,730	32,730
Accounts payable		1,060,637	137,518	160,177	136,598	188,326	190,464	213,305	112,375	118,816	(79,153)
Cash provided by operations	(968,998)	12,199,931	13,662,027	16,573,370	19,166,464	22,997,876	26,594,389	31,298,946	33,988,763	36,983,490	42,494,853
<i>Financing activities</i>											
Issuance of shares	55,767,173	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing activities	55,767,173	-	-	-	-	-	-	-	-	-	-
<i>Investing activities</i>											
Capital expenditure	(53,494,669)	-	-	-	-	(830,539)	-	-	-	-	-
Cash (used for) / provided by investing activities	(53,494,669)	-	-	-	-	(830,539)	-	-	-	-	-
<b>NET CASH</b>	<b>1,303,506</b>	<b>12,199,931</b>	<b>13,662,027</b>	<b>16,573,370</b>	<b>19,166,464</b>	<b>22,167,337</b>	<b>26,594,389</b>	<b>31,298,946</b>	<b>33,988,763</b>	<b>36,983,490</b>	<b>42,494,853</b>

## 13 KEY ASSUMPTIONS

### 13.1 Operating Cost Assumptions

Description	Details
Operating Costs Growth Rate	5.0%
Administration Benefits Expense	10.0% of Admin Expense
Travelling Expense	10.0% of Admin Expense
Communication Expense	6.0% of Admin Expense
Office Expenses (Stationary, Entertainment, Janitorial Services, Etc.)	5.0% of Admin Expense
Promotional Expense	5.0% of Revenue
Professional Fees (Legal, Audit, Consultants, Etc.)	1.0% of Revenue
Machinery And Equipment Insurance Rate	3.5%
Office Vehicles Insurance Rate	3.5%
Depreciation Method	Straight Line Method
Depreciation Rate	5% on Building & Infrastructure 10% on Machinery & Equipment and Furniture & Fixture 20% on Vehicle and Office Equipment

### 13.2 Production Cost Assumptions

Description	Details
Machinery Maintenance	Rs. 10,000 Per Unit
Raw Material Cost - 8 Ft. Boat	Rs. 33,580
Raw Material Cost - 24 Ft. Boat	Rs. 131,420
Raw Material Cost - 48 Ft. Boat	Rs. 262,840
Cost Of Goods Sold Growth Rate	5.0%
Hours Operational / Day	12
Operational Days in a Year	300

### 13.3 Revenue Assumptions

Description	Details
Sale Price - Year 1 - 48 Ft. Boat	Rs.750,000
Sale Price - Year 1 - 24 Ft. Boat	Rs.400,000
Sale Price - Year 1 - 8 Ft. Boat	Rs.150,000
Sale Price Growth Rate	7.5%
Production Capacity (No. of Fiberglass Boats)	188
Production Capacity Utilization	65%
Production Capacity Utilization Growth Rate	5%
Maximum Capacity Utilization	95%

# 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](http://www.smeda.org.pk), [helpdesk@smeda.org.pk](mailto:helpdesk@smeda.org.pk)

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