Pre-feasibility Study

AGRICULTURAL IMPLEMENTS MANUFACTURIN UNIT

November 2023

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

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

Table of Contents

Table of Tables

Table of Figures

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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, Winnower, 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 17.89 million. This includes capital investment of PKR 15.03 million and working capital of PKR 2.86 million. This project is financed through 100% equity. The Net Present Value (NPV) of project is PKR 0.72 million with an Internal Rate of Return (IRR) of 26% and a Payback period of 4.85 years.

The proposed project will provide employment opportunities to 19 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 DESCRIP TION 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.[1] 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.

[1] 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[2] 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

[2] 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[3] 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

[3] 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

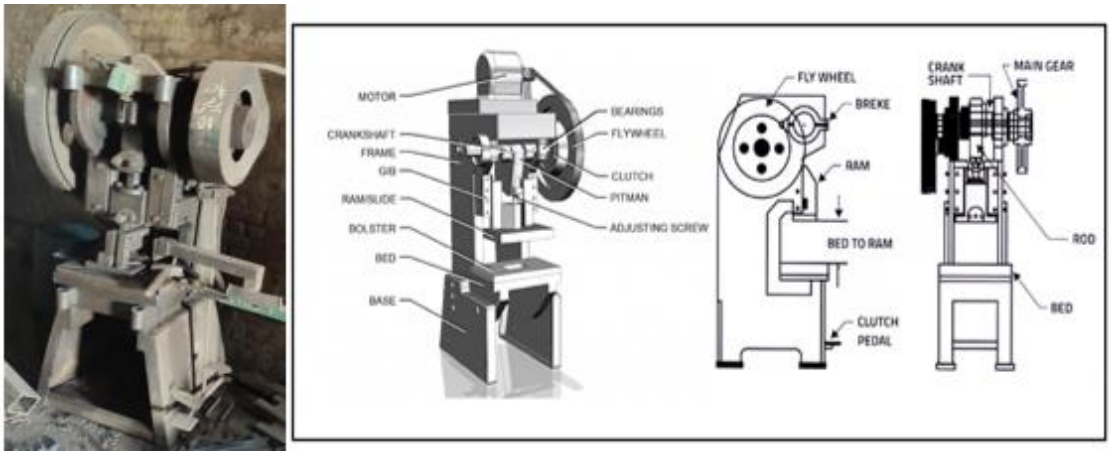
5.1. Machinery and Equipment

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.[4] 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



[4] 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 dep 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

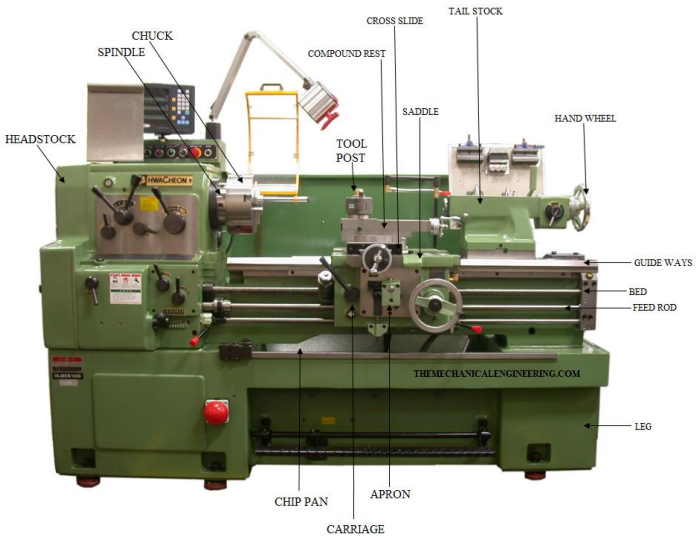
Shearing machines are multipurpose devices used in the cutting of alloys and other metal sheets. Some shearing machines use a scissor-like, angular shear action to cut metal into sheets or strips. Other, larger machines use a straight shear action with the blade fixed at an angle as opposed to the angular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

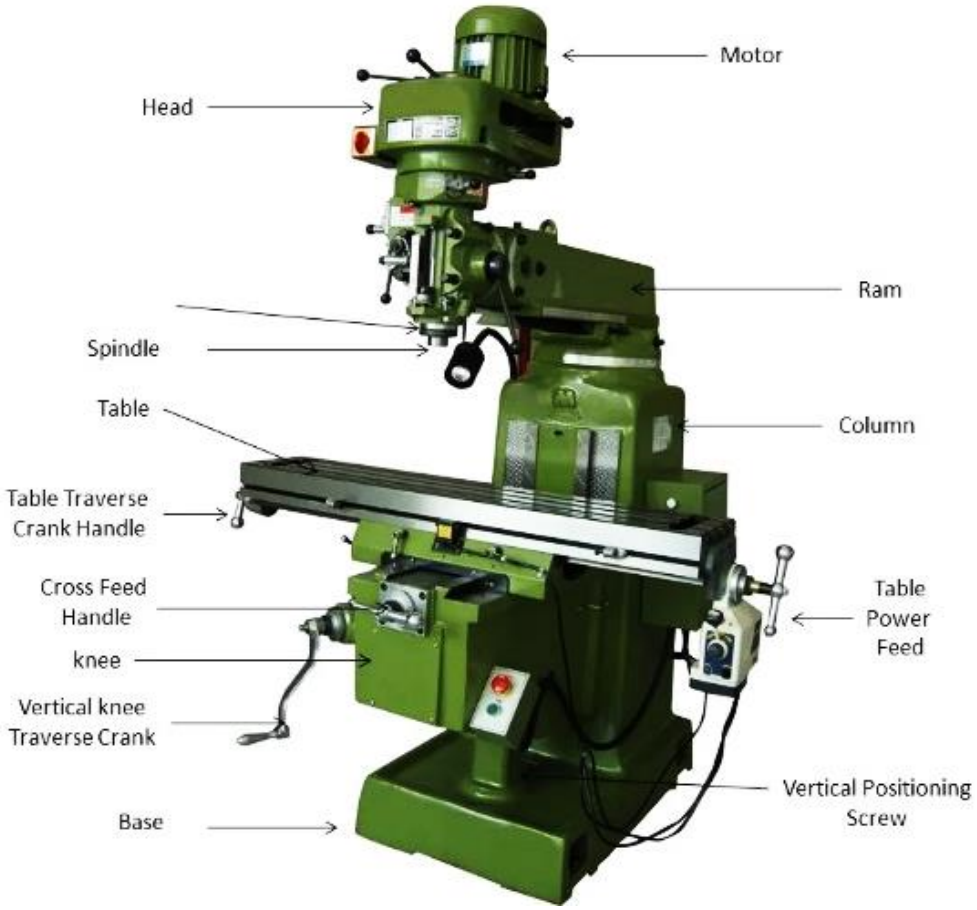
Figure 20: Lathe Machine



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.

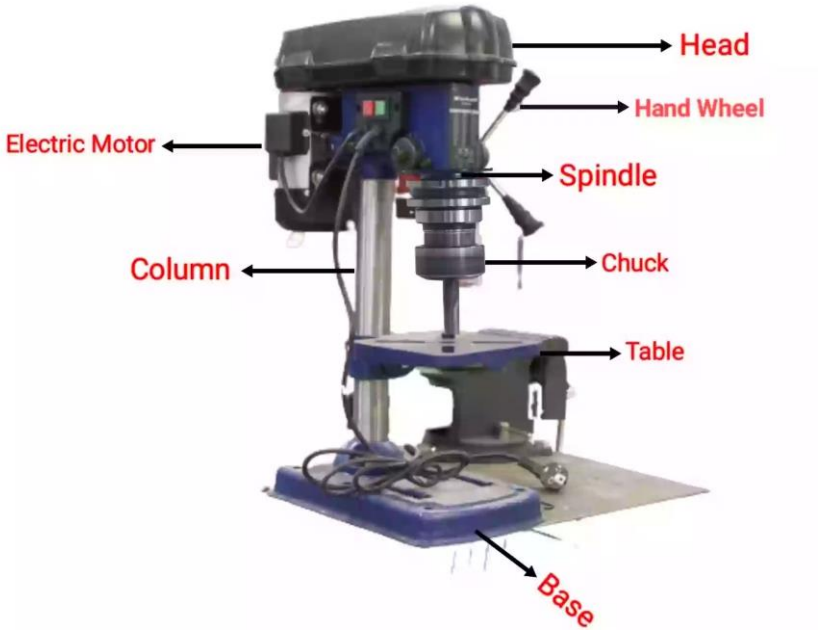
Figure 22: Welding Plant

Digital Welding Plant CO2 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

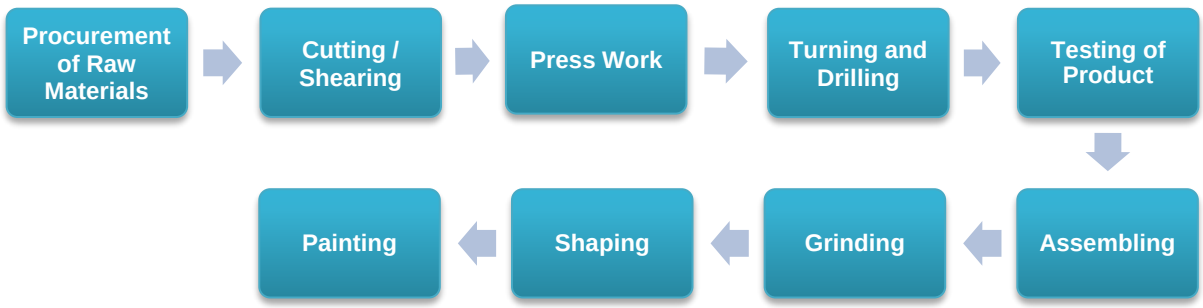
Figure 23: Vertical Drill Machine



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 inche (5 sootar) thickness
Iron Plate	12-14 inches Diameter and 0.25 inch thicness (18 mm)
Iron Rod	3 inch width and 0.42 inche (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, tyne, 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)[5]	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 thicknes
Channel	3 inch width and 0.265 inch thickness
Bearings	7/50 R16 size tyre (7/50 inch width, 16 inch rim diameter)

[5] 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	Manufacured 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), 0.080inches (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 inche (20 gauge) thickness
Angle	3 inch width and 0.17 inch (2 sootar)
Iron Plate	12-14 inches Diameter and 0.25 inch thicness (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 Chauff 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.

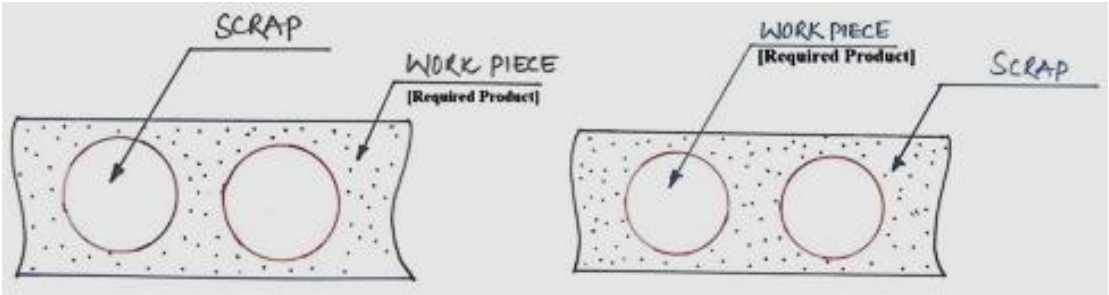
Press Work

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.

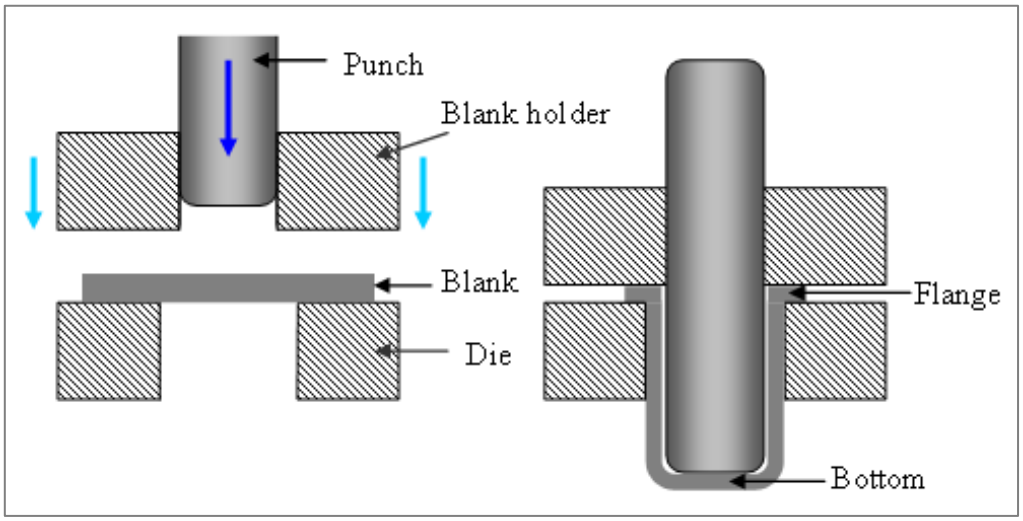
Figure 25: Punching and Blanking Operation



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

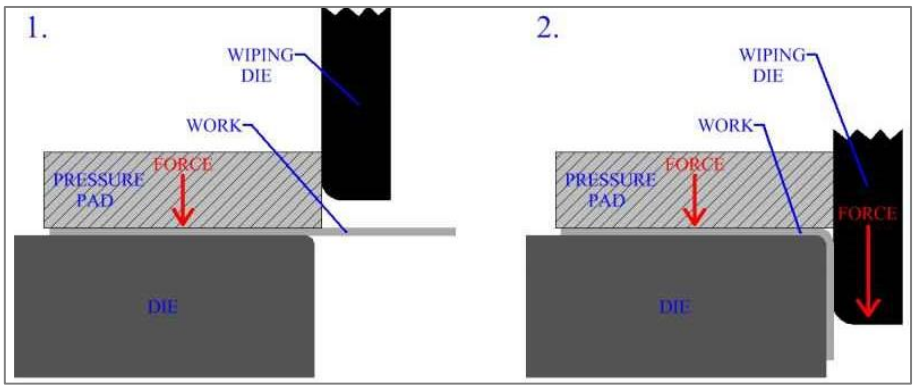


Figure 28: V bending

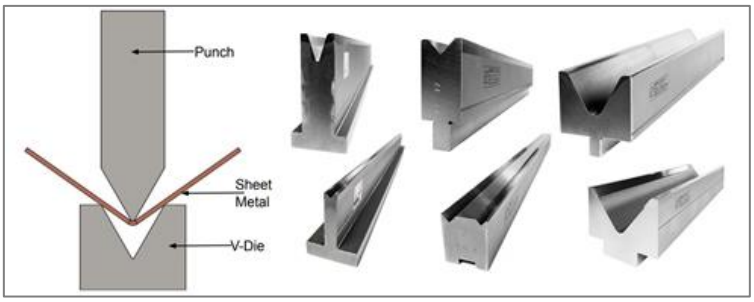
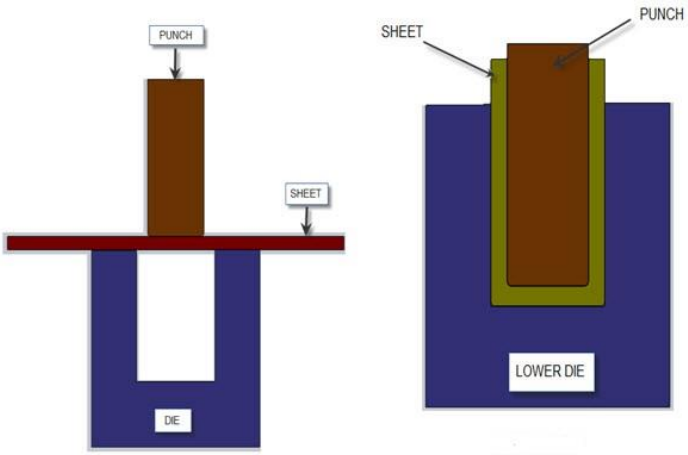


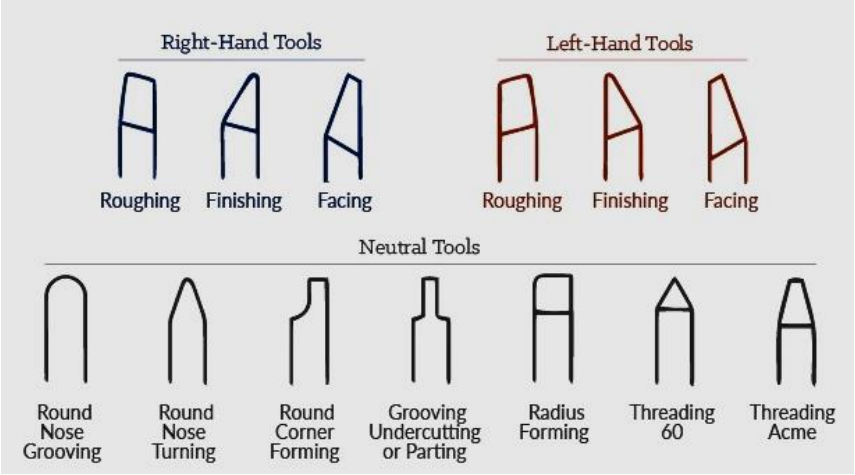
Figure 29: U bending



Turning and Drilling

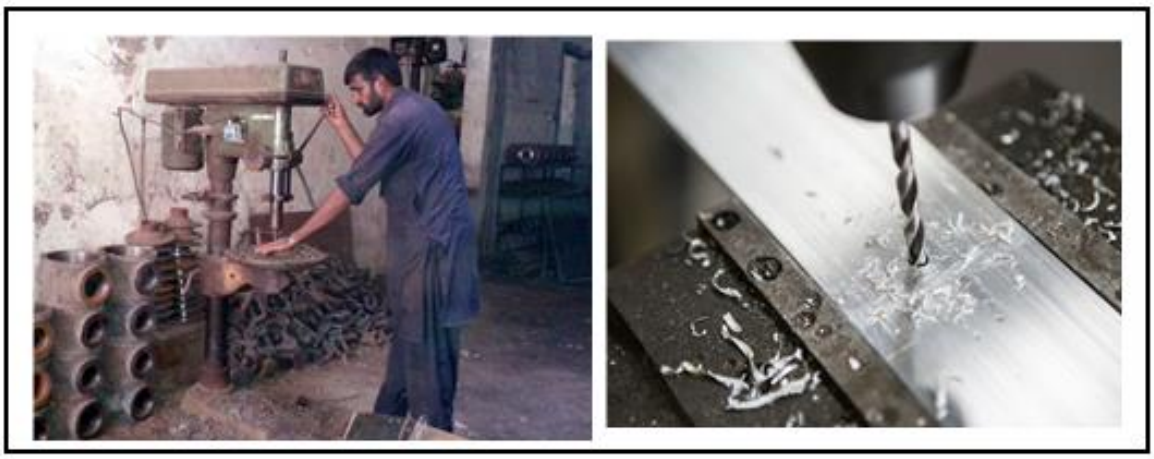
Turning involves rotation of the work piece while the cutting tool moves in a linear motion. This results in forming a cylindrical shape. A lathe machine is the preferred machine for performing all turning operations. Like most machining operations, turning is either done manually or automatically. Turning 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
Formulas	***A***	***B***	***C=A*B***	***D***	***E=C*D***	***F= E*60%***
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
Total		**100%**	**18,000**		**492**	**297**

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

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, 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.

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)
Building / Infrastructure	336,250
Machinery & equipment	9,540,000
Lab Equipments	259,650
Furniture & fixtures	505,000
Office vehicles	1,750,000
Office equipment	1,257,500
Pre-operating costs	626,731
Advance Against Building Rent	750,000
Total Capital Cost	**15,025,131**
Working capital	
Equipment spare part inventory	15,900
Raw material inventory	1,595,279
Upfront Building Rent	250,000
Cash	1,000,000
Total Working capital	**2,861,179**
Total Project Cost (PKR)	**17,886,310**

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
Total		**100%**	**6,725**

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	Area (Sq. ft.)	Unit Cost (PKR)	Total Cost (PKR)
Renovation	6.750	50	336,250

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	8,000	16,000
Large Hand Grinder	1	17,000	17,000

Lathe Machine (10 Ft)	1	1,500,000	1,500,000
Lathe Machine (6.5 Ft)	1	750,000	750,000
Milling Machine	1	1,150,000	1,150,000
Digital Welding Plant	2	125,000	250,000
CO2 Welding Plant	1	189,000	189,000
Vertical Drilling Machine (Large)	2	350,000	700,000
Vertical Drilling Machine (Medium)	1	290,000	290,000
Vertical Drilling Machine (Small)	2	89,000	178,000
Generator (60 Kva)	1	1,700,000	1,700,000
Total			**9,540,000**

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	9,000	36,000
Height Gauge	1	45,000	45,000
Thread Gauge	2	12,000	24,000
Thickness Gauge	2	1,500	3,000
Measuring Tape	3	550	1,650
Total			**259,650**

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
Total			**505,000**

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	185,000	370,000
Laptop	1	150,000	150,000
Desktop Computer	4	50,000	200,000
Printer	1	50,000	50,000
LED/LCD 32	1	60,000	60,000
Water Dispenser	2	25,000	50,000
Ceiling Fan	17	8,000	136,000
Exhaust Fan	11	7,500	82,500
Pedestal Fan	7	12,000	84,000
Wi-Fi Router and Connection	1	10,000	10,000
CCTV Camera System	8	2,500	65,000
Total			**1,257,500**

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 (Used)	1	1,500,000	1,500,000
Motorcycle	1	175,000	175,000
Registration / Transfer Fee			75,000
Total			**1,750,000**

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	355,000
Utilities expense	1	271,731
Total		**626,731**

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	26%
NPV (PKR)	718,143
Payback Period (years)	4.85
Projection Years	10
Discount Rate used for NPV	25%

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	20%
Payback Period (years)	5.88
Projection Years	10

9.5. Breakeven Analysis

Breakeven analysis is provided in Table 29.

Table 29: Breakeven Analysis

Particulars	Amount First Year (PKR)	Ratio
Sales (PKR) – A	57,903,050	100%
Variable Cost (PKR) – B	47,479,402	82%
Contribution (PKR) (A-B) = C	10,423,648	18%
Fixed Cost (PKR) – D	10,878,162	19%
Break Even Revenue (PKR) (D/CM) =E		60,427,858
Breakeven No. of Services		310
Breakeven Capacity		63%

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	181,900	7,821,700
Cultivator	34	139,100	4,729,400
Zero Tillage	9	251,450	2,263,050
Wheat Straw Chopper	7	957,650	6,703,550
Rotavator	37	299,600	11,085,200
Disc Harrow	12	401,250	4,815,000
Border Disc	12	53,500	642,000
Chisel Plough	12	192,600	2,311,200
Ridger	24	139,100	3,338,400
Wheat Thresher	5	759,700	3,798,500
Maize Sheller	4	299,600	1,198,400
Rabi Drill	6	149,800	898,800
Silage Machine	7	353,100	2,471,700
Chaff Cutter (Toka)	69	58,850	4,060,650
Super Seeder	3	588,500	1,765,500
Total	**284**		**57,903,050**

***** 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	38,286,699
Direct Labor	6,000,000
Direct Electricity Cost	1,860,086
Fuel Cost-Generator	372,017
Machinery Maintenance – Cost	190,800

Communications expense (phone, fax, mail, internet, etc.)	408,000
Office vehicles running expense	157,800
Office expenses (stationery, entertainment, janitorial services, etc.)	204,000
Total Variable Cost	**47,479,402**

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	295	29,500
Iron Rod	Kg	60	254	15,240
Flat Bar	Kg	10	248	2,480
Steel Casting	Kg	50	295	14,750
Angle	Kg	20	248	4,960
Iron Plates	Kg	40	295	11,800
Pipe	Kg	10	295	2,950
Gear (Grari)	No	9	649	5,841
Chain	No	2	4,720	9,440
Blade	No	31	59	1,829
V Shaped Fingers	No	16	366	5,856
Bearings	No	32	189	6,048
Belts	No	2	354	708
Nuts Bolts	No	15	389	5,835
Spring	No	14	41	574
Plastic Stars Wheel	No	7	336	2,352
Sticker	No	1	1,180	1,180
Paint Coat	No	2	2,360	4,720

Sub Total				**126,063**
Wastage		1%		1,261
Total Cost				**127,324**

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	29,500	29,500
Gear Box Side	No.	1	11,800	11,800
Blades	No.	48	295	14,160
Iron Sheet	KG	160	295	47,200
Pipe	KG	30	295	8,850
Cast Iron	KG	110	307	33,770
Paint Coat	No.	1	2,950	2,950
Sticker set	No.	1	1,180	1,180
Sub Total				**149,410**
Wastage		1%		1,494
Total Cost				**150,904**

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	295	64,900
Plastic Stars	No	9	236	2,124
Gear Set	No	1	23,600	23,600
Paint Coat	No	1	2,360	2,360
Sticker Set	No	1	1,180	1180

Sub Total				**94,164**
Wastage		1%		941.64
Total Cost				**95,106**

9.7.4. Raw Material of Ridger

Table 35: Raw material cost of Ridger

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Iron Sheet	Kg	350	295	103,250
Paint Coat	No	1	1,180	1,180
Sticker set	No	1	590	590
Sub Total				**105,020**
Wastage		1%		1,050.20
Total Cost				**106,070**

9.7.5. Raw Material of Zero Tillage

Table 36: Raw material cost of Zero Tillage

Particulars	Unit of Measurement	Consumption per Unit	Cost per KG/No. (PKR)	Total Cost (PKR)
Angle	Kg	80	248	19,840
Flat Bar	Kg	100	248	24,800
Iron Plate	Kg	40	295	11,800
Iron Rod	Kg	30	254	7,620
Steel Casting	Kg	50	295	14,750
Steel Corter	No	15	319	4,785
Seed Box	No	1	23,600	23,600
Seed and fertilizer Dropper	No	30	979	29,370
Tyre and rim	No	1	11,800	11,800
Gear (Grari)	No	11	1,770	19,470

Roller Bearing	No	12	295	3,540
Plastic pipe and clamps	No	30	153	4,590
Nuts Bolts	No	15	389	5,835
Paint Coat	No	2	1,770	3,540
Sticker set	No	1	1,180	1,180
Sub Total				**186,520**
Wastage		1%		1,865.20
Total Cost				**188,385**

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	295	10,325
Angle	Kg	35	295	10,325
Paint Coat	No	1	1,180	1,180
Sticker set	No	1	354	354
Sub Total				**22,184**
Wastage		1%		221.84
Total Cost				**22,406**

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	295	177,000
Channel	Kg	80	295	23,600
Flat Bar	Kg	300	248	74,400

Angle	Kg	300	248	74,400
Iron Plate	Kg	50	295	14,750
Round rod	Kg	300	254	76,200
Steel Casting	Kg	300	295	88,500
Pipe	Kg	60	295	17,700
Roller Bearing	No	34	2,065	70,210
Blade	No	325	53	17,225
Fingers	No	15	389	5,835
Gear Grari	No	2	47,200	94,400
Chain& Grari	No	3	1,180	3,540
Plastic Bush	No	20	59	1,180
Spring	No	70	41	2,870
Bubble Box	No	1	17,700	17,700
Tyre,Rim ,HUB	No	6	10,030	60,180
Belts	No	9	767	6,903
Nuts Bolts	No	30	767	23,010
Sticker	No	1	1,180	1,180
Paint Coat	No	2	8,850	17,700
Sub Total				**868,483**
Wastage		1%		8,684.83
Total Cost				**877,168**

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	248	12,400
Pipe	Kg	10	295	2,950
Flat Bar	Kg	60	248	14,880

Round Rod	Kg	10	248	2,480
Iron Plate	Kg	20	354	7,080
Tyne	No	9	1,298	11,682
Spring	No	29	1,003	29,087
Nuts Bolts	No	6	389	2,334
Paint Coat	No	1	2,360	2,360
Sticker set	No	1	1,180	1,180
Sub Total				**86,433**
Wastage		1%		864.33
Total Cost				**87,297**

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	295	59,000
Angle	Kg	100	248	24,800
Flat Bar	Kg	60	248	14,880
Plate	Kg	150	295	44,250
Steel Casting	Kg	90	295	26,550
Pipe	Kg	30	295	8,850
Disc	No	18	5,310	95,580
Round Rod	Kg	160	254	40,640
Roller Bearing	No	12	779	9,348
Nuts Bolts	No	10	354	3,540
Tyre& Rim	No	2	9,440	18,880
Sticker	No	1	590	590
Paint Coat	No	2	2,360	4,720
Sub Total				**351,628**

Wastage		1%		3,516.28
Total Cost				**355,144**

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	295	177,000
Angle	Kg	700	266	186,200
Cast Iron	Kg	700	236	165,200
Roller Bearing	No	17	1,416	24,072
Tyre	No	2	11,800	23,600
Paint Coat	No	1	11,800	11,800
Sticker set	No	1	708	708
Sub Total				**588,580**
Wastage		1%		5,886
Total Cost				**594,466**

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	124	12,400
Nut Bolt	No.	1	295	295
Bearing	No.	2	236	472
Silicon	KG	0.4	767	307
Paint Coat	No.	1	2,360	2,360
Sticker set	No.	1	826	826
Sub Total				**16,660**

Wastage		1%		166.60
Total Cost				**16,826**

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	17,700	53,100
Iron Sheet	KG	80	295	23,600
Welding rod	No.		-	6,000
Paint Coat	No.	1	3,540	3,540
Sticker set	No.	1	1,180	1,180
Sub Total				**87,420**
Wastage		1%		874.20
Total Cost				**88,294**

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	295	41,300
Steel Casting	KG	80	295	23,600
Pipe	KG	120	295	35,400
Flat Bar	KG	50	248	12,400
Round Rod	KG	40	295	11,800
Iron Plate	KG	150	295	44,250
Forged Iron	KG	50	354	17,700
Gear (Grari)	no.	5	6,372	31,860
Chain Gear	No.	9	1,947	17,523

Bearing & Seals	No.	26	1,180	30,680
Nuts Bolts	NO.	20	472	9,440
Blade	No.	48	1180	56,640
Cross	No.	1	14,160	14,160
Box Seed Fertilizer	no.	1	21,240	21,240
Dropper Seed Fertilizer	No.	20	708	14,160
Chain	No.	3	2,360	7,080
Plastic Pipe Clamps	No.	40	148	5,920
Discs	No.	1	2,360	2,360
Sticker	No.	1	1,534	1,534
Paint Coat	No	1	5,900	5,900
Sub Total				**404,947**
Wastage		2%		8,099
Total Cost				**413,046**

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	295	23,600
Channel	KG	5	295	1,475
Bearings	No.	8	1,416	11,328
Belts	No.	4	17,700	70,800
Gear (Grari)	No.	4	23,600	94,400
Cutter Blade	No.	12	354	4,248
Bracket	No.	1	14,160	14,160
Cross	No.	4	3,540	14,160

Paint Coat	No.	1	7,080	7,080
Sticker set	No.	1	1,180	1,180
Sub Total				**242,431**
Wastage		1%		2,424.31
Total Cost				**244,855**

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	295	44,250
Angel	KG	100	236	23,600
Tyre and Rim	No	2	15,340	30,680
Bearings	No	15	1,416	21,240
Cross	No	1	5,900	5,900
Shaft	KG	4	5,900	23,600
Paint Coat	No.	1	5,900	5,900
Sticker Set	No	1	1,180	1,180
Sub Total				**156,350**
Wastage		1%		1,564
Total Cost				**157,914**

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	4,080,000
Administration benefits expense	403,200
Building rental expense	3,000,000
Indirect Electricity	1,400,688

Promotional expense	289,515
Depreciation expense	1,579,413
Amortization of pre-operating costs	125,346
Total Cost (PKR)	**10,878,162**

9.9. Human Resource Requirement

For the 1st 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)
Production Incharge	1	80,000
Procurement Officer	1	55,000
Admin and Accounts Officer	1	50,000
Quality Controller	1	60,000
Labour – Skilled	6	45,000
Labour –UnSkilled	3	30,000
Marketing Officers	1	60,000
Stores Incharge	1	40,000
Security Guard	2	35,000
Driver	1	35,000
Sweepers	1	30,000
Total	**19**	

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	info@mwpbnp.com	https://www.mwpbnp.com/#
Mughal steels	Steel Alloy	41 Peco Road Badami Bagh, Lahore, Pakistan	042-35960841-3	fahadhafeez@mughalsteel.com	https://www.mughalsteel.com/?v=null
ARSALAN CHAUDHARY ENTERPRISES	Steel Tools	S-36-R, 67/3, Ghalib Street, Railway Road, Lahore	03324375857	arsalance@hotmail.com	arsalance@hotmail.com
Prime Bearing Centre	Bearings	Shop No.28,Aziz Mansion,Noman Street,Plaza Quarters Karachi	(92 21) 32736871,	primebearing@hotmail.com	primebearing@hotmail.com
International Steels Limited	Steel	101 Beaumont Plaza, 10 Beaumont Road, Karachi-75530	+92 (21) 111 019 019	info@isl.com.pk	info@isl.com.pk
A.K STEEL & RE-	Steel plates	Eminabad Road G.T. Road	+92 55 3409692	info@akgroup.com.pk	info@akgroup.com.pk

ROLLING MILLS		Gujranwala			
A.N INDUSTRIES (PRIVATE) LIMITED	Iron and steel pipes	9-KM G.T. Road, Ferozewala, Shahdara Lahore 54950, Pakistan	+ 92 42 37963771	info@anpipe.com.pk	info@anpipe.com.pk

11. USEFUL LINKS

Table 50: Useful Links

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

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	**57,903,050**	**72,155,985**	**84,764,009**	**100,717,302**	**117,744,679**	**137,032,498**	**160,080,909**	**185,440,796**	**204,627,095**	**225,089,804**
Cost of sales										
Material Cost	38,286,699	47,834,504	56,207,262	67,093,722	78,674,882	91,689,430	107,622,258	124,734,125	137,912,342	152,117,313
Direct Labor	6,000,000	6,582,000	7,220,454	7,920,838	8,689,159	9,532,008	10,456,613	11,470,904	12,583,582	13,804,189
Fuel Cost-Generator	372,017	444,530	528,033	624,022	734,182	860,416	1,004,864	1,169,941	1,290,445	1,423,361
Machinery Maintenance - Cost	190,800	210,452	232,129	256,038	282,410	311,498	343,583	378,972	418,006	461,061
Direct Electricity Cost	1,860,086	2,015,093	2,170,100	2,325,108	2,480,115	2,635,122	2,790,129	2,945,136	2,945,136	2,945,136
Total cost of sales	46,709,602	57,086,579	66,357,978	78,219,727	90,860,748	105,028,474	122,217,446	140,699,078	155,149,510	170,751,059
Gross Profit	11,193,448	15,069,406	18,406,031	22,497,575	26,883,931	32,004,025	37,863,463	44,741,718	49,477,585	54,338,745
	19%	21%	22%	22%	23%	23%	24%	24%	24%	24%
General administration & selling expenses										
Management Staff	4,080,000	4,475,760	4,909,909	5,386,170	5,908,628	6,481,765	7,110,497	7,800,215	8,556,836	9,386,849
Administration benefits expense	403,200	442,310	485,215	532,280	583,912	640,551	702,684	770,845	845,617	927,642
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	1,400,688	1,511,342	1,630,738	1,759,566	1,898,572	2,048,559	2,210,395	2,385,017	2,573,433	2,776,734
Communications expense (phone, fax, mail, internet, etc.)	408,000	447,576	490,991	538,617	590,863	648,177	711,050	780,021	855,684	938,685
Office vehicles running expense	157,800	174,053	191,981	211,755	233,566	257,623	284,158	313,426	345,709	381,317
Office expenses (stationery, entertainment, janitorial services, et	204,000	223,788	245,495	269,308	295,431	324,088	355,525	390,011	427,842	469,342
Promotional expense	289,515	360,780	423,820	503,587	588,723	685,162	800,405	927,204	1,023,135	1,125,449
Depreciation expense	1,579,413	1,579,413	1,579,413	1,579,413	1,608,164	1,608,164	1,432,539	2,128,501	2,169,986	2,169,986
Amortization of pre-operating costs	125,346	125,346	125,346	125,346	125,346	-	-	-	-	-
Subtotal	11,647,962	12,640,368	13,712,907	14,899,042	16,225,505	17,525,619	18,921,935	21,341,391	23,229,008	25,249,847
Operating Income	(454,513)	2,429,038	4,693,124	7,598,533	10,658,426	14,478,405	18,941,528	23,400,327	26,248,577	29,088,898
Revenue from Scrap	310,403	370,184	437,553	516,085	605,947	705,255	822,069	955,192	1,050,711	1,155,782
Gain / (loss) on sale of office equipment	-	-	-	-	-	-	314,375	-	-	
Gain / (loss) on sale of office vehicles	-	-	-	-	-	-	437,500	-	-	
Earnings Before Interest & Taxes	(144,111)	2,799,222	5,130,677	8,114,618	11,264,373	15,183,661	20,515,472	24,355,519	27,299,287	30,244,680
Earnings Before Tax	(144,111)	2,799,222	5,130,677	8,114,618	11,264,373	15,183,661	20,515,472	24,355,519	27,299,287	30,244,680
Tax	-	414,805	1,160,736	2,205,116	3,307,530	4,679,281	6,545,414	7,889,431	8,919,750	9,950,637
NET PROFIT/(LOSS) AFTER TAX	**(144,111)**	**2,384,416**	**3,969,941**	**5,909,502**	**7,956,843**	**10,504,380**	**13,970,057**	**16,466,088**	**18,379,538**	**20,294,043**

12.2. Balance Sheet

Calculations **SMEDA**

Balance Sheet

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
Current assets											
Cash & Bank	1,000,000	423,168	2,332,826	3,845,757	4,872,533	5,944,256	6,483,070	11,283,646	24,707,957	39,951,037	51,623,417
Accounts receivable		1,586,385	1,781,631	2,149,589	2,540,840	2,992,630	3,490,098	4,070,047	4,733,174	5,343,396	5,886,533
Raw material inventory	1,595,279	2,198,394	2,849,261	3,751,433	4,852,068	6,237,141	8,075,026	10,322,922	12,589,138	15,316,058	-
Equipment spare part inventory	15,900	19,221	23,236	28,090	33,958	41,051	49,626	59,993	72,525	87,674	-
Finished Goods inventory	-	2,146,695	2,893,835	3,710,295	4,823,998	6,180,771	7,880,411	10,114,643	12,843,521	15,621,358	18,963,011
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	2,861,179	6,648,864	10,183,289	13,817,914	17,489,422	21,798,477	26,421,122	36,338,430	55,482,213	76,909,010	76,472,960
Fixed assets											
Building/Infrastructure	336,250	302,625	269,000	235,375	201,750	168,125	134,500	100,875	67,250	33,625	-
Machinery & equipment	9,540,000	8,586,000	7,632,000	6,678,000	5,724,000	4,770,000	3,816,000	2,862,000	1,908,000	954,000	23,859,092
Tools and Equipment	259,650	194,738	129,825	64,913	374,654	280,991	187,327	93,664	540,596	405,447	270,298
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	1,750,000	1,487,500	1,225,000	962,500	700,000	437,500	175,000	3,633,280	3,088,288	2,543,296	1,998,304
Office equipment	1,257,500	1,068,875	880,250	691,625	503,000	314,375	125,750	2,388,811	2,030,490	1,672,168	1,313,846
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	14,398,400	12,818,988	11,239,575	9,660,163	8,455,404	6,847,241	5,239,077	10,787,954	9,200,049	7,030,063	28,719,169
Intangible assets											
Pre-operation costs	626,731	501,385	376,039	250,692	125,346	-	-	-	-	-	-
Total Intangible Assets	626,731	501,385	376,039	250,692	125,346	-	-	-	-	-	-
TOTAL ASSETS	**17,886,310**	**19,969,236**	**21,798,903**	**23,728,769**	**26,070,172**	**28,645,718**	**31,660,199**	**47,126,384**	**64,682,262**	**83,939,073**	**105,192,129**
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable		2,227,036	2,792,440	3,297,412	3,956,587	4,667,349	5,475,669	6,473,451	7,563,241	8,440,514	9,399,528
Total Current Liabilities	-	2,227,036	2,792,440	3,297,412	3,956,587	4,667,349	5,475,669	6,473,451	7,563,241	8,440,514	9,399,528
Other liabilities											
Total Long Term Liabilities	-	-	-	-	-	-	-	-	-	-	-
Shareholders' equity											
Paid-up capital	17,886,310	17,886,310	17,886,310	17,886,310	17,886,310	17,886,310	17,886,310	18,384,656	18,384,656	18,384,656	18,384,656
Retained earnings		(144,111)	1,120,153	2,545,047	4,227,275	6,092,059	8,298,219	22,268,277	38,734,365	57,113,902	77,407,945
Total Equity	17,886,310	17,742,199	19,006,463	20,431,357	22,113,585	23,978,369	26,184,530	40,652,933	57,119,021	75,498,559	95,792,601
TOTAL CAPITAL AND LIABILITIES	**17,886,310**	**19,969,236**	**21,798,903**	**23,728,769**	**26,070,172**	**28,645,718**	**31,660,199**	**47,126,384**	**64,682,262**	**83,939,073**	**105,192,129**

12.3. Cash Flow Statement

Calculations **SMEDA**

Cash Flow Statement

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Operating activities											
Net profit		(144,111)	2,384,416	3,969,941	5,909,502	7,956,843	10,504,380	13,970,057	16,466,088	18,379,538	20,294,043
Add: depreciation expense		1,579,413	1,579,413	1,579,413	1,579,413	1,608,164	1,608,164	1,432,539	2,128,501	2,169,986	2,169,986
amortization of pre-operating costs		125,346	125,346	125,346	125,346	125,346	-	-	-	-	-
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	(1,861,179)	(576,832)	3,029,811	4,057,978	5,628,704	7,163,783	8,837,033	11,283,646	13,964,907	15,243,079	35,531,472
Financing activities											
Issuance of shares	17,886,310	-	-	-	-	-	-	498,346	-	-	-
Cash provided by / (used for) financing activiti	17,886,310	-	-	-	-	-	-	498,346	-	-	-
Investing activities											
Capital expenditure	(15,025,131)	-	-	-	(374,654)	-	-	(6,981,416)	(540,596)	-	(23,859,092)
Cash (used for) / provided by investing activiti	(15,025,131)	-	-	-	(374,654)	-	-	(6,981,416)	(540,596)	-	(23,859,092)
NET CASH	**1,000,000**	**(576,832)**	**3,029,811**	**4,057,978**	**5,254,050**	**7,163,783**	**8,837,033**	**4,800,577**	**13,424,311**	**15,243,079**	**11,672,380**

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	10%
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	26.05%

13.5. Cash Flow Assumptions

Table 55: Cash Flow Assumptions

Description	Days
Accounts Receivable Cycle	10
Accounts Payable Cycle	20

Small and Medium Enterprises Development Authority

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