



Pre-feasibility Study

SILO BASED STORAGE SYSTEM

December 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, 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 user. 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

Silos are the bins commonly used for bulk storage of grains. There are different types of silos that may be used for the storage of grains such as concrete silos, tower silos, bunker silos, bag silos etc. Tower silo is most commonly used for the storage of grains. Tower silo is in the form of a cylindrical structure which is made of stainless-steel. The grade number of steel used for the construction of tower silo is stainless steel 316L.

The purpose of silo-based storage system is to maximize grain storage life and preserve its quality. Silos are high capacity commercial or industrial structures that are used for storage of grain for a long period of time.

In the past, paddy (rice before threshing/husk) and maize were stored in traditional way in the form of bags in covered warehouses. However, now there is an increasing trend of silo-based storage system where the paddy and maize can be safely stored in large quantities.

The main grain used by the proposed business will be super basmati paddy and DK-6317 maize. Paddy and maize will preferably be purchased directly from the farmers, after harvesting of rice and maize crops. Alternately, these may also be procured from the grain market (mandi). Purchasing of paddy is done once a year while the procurement of maize is done twice a year. The proposed business will also provide cleaning and drying services for grain (super basmati paddy and DK-6317 maize) in its season.

The procured paddy and maize in first pre-cleaned, then dried to reduce the moisture level of paddy and maize to 15% and 11-13% respectively. After passing through drying process, these grains are transferred into silos by conveyer belts. They are stored in the silos until sold to the customers

The proposed business unit targets the rice processing companies and food processing companies that use finished paddy and maize as their main raw materials to process those into value-added rice and food products. The unit is proposed to be ideally located in or around large and medium agricultural districts like Okara, Sheikhpura, Gujranwala, Hyderabad, Multan, Sialkot, Faisalabad, Peshawar, Larkana, Narowal, Nawab Shah, Sargodha, etc. These cities are preferred due to easy availability of paddy and maize crops.

The proposed business "Silo Based Storage System" will be established on owned land with an area of 13,500 square feet (60 Marla). The project requires a total investment of PKR 131.63 million. This includes capital investment of PKR 77.77 million and working capital of PKR 53.86 million. This project is financed through 100% equity. The Net Present Value (NPV) of project is PKR 21.44 million with an Internal Rate of Return (IRR) of 29% and a Payback period of 4.15 years. The proposed project will achieve its

estimated breakeven point at capacity of 35% with breakeven revenue of PKR 135.68 million (26,022 maund) during first year.

The proposed project may also be established using leveraged financing. At 50% financing from debt sources bearing cost equal to 26%, the proposed storage unit provides Net Present Value (NPV) of PKR 10.13 million, Internal Rate of Return (IRR) of 27% and Payback period of 4.32 years. The proposed project will achieve its estimated breakeven point at capacity of 46% with annual revenue of PKR 177.98 million (34,134 maund).

The proposed project will provide employment opportunities to 28 people. High return on investment and steady growth of business is expected with the entrepreneur having some prior experience or education in the related field of business.

The proposed project for Silo Based Storage System shows reasonable profitability and is financially viable. The legal form of this project is proposed as "Private Company" or "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 'Sectorial research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need-based capacity building programs of different types in addition to business guidance through help desk services.

National Business Development Program for SMEs (NBDP) is a project of SMEDA, funded through Public Sector Development Program of Government of Pakistan.

The NBDP envisages provision of handholding support / business development services to SMEs to promote business startup, improvement of efficiencies in existing SME value chains to make them globally competitive and provide conducive business environment through evidence-based policy-assistance to the Government of Pakistan. The Project is

objectively designed to support SMEDA's capacity of providing an effective handholding to SMEs. The proposed program aimed at facilitating around 314,000 SME beneficiaries over a period of five years.

4 PURPOSE OF THE DOCUMENT

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document/study covers various aspects of project concept development, start-up and production, marketing, finance and business management.

The purpose of this document is to provide information to the potential investors about “Silo Based Storage System”. 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 “Silo Based Storage System” reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules, best practices developed by existing enterprises by trial and error and certain industrial norms that become a guiding source regarding various aspects of business setup and its successful management.

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

5 BRIEF DESCRIPTION OF PROJECT & PRODUCTS

This pre-feasibility document provides information for setting up a business of “Silo Based Storage System”. Silos are the bins commonly used for bulk storage of grains. There are different types of silos that may be used for storage of grains such as concrete silos, tower silos, bunker silos and bag silos etc. Tower silos are most commonly used to store grain. Tower silo is in the form of a cylindrical structure that is made of stainless steel. The proposed business will construct tower silos for storage of grains. The grains to be stored by the proposed silo based storage system are paddy (super basmati variety) and maize (DK-6317 variety). The proposed business will also provide cleaning and drying services for grain (super basmati paddy and DK-6317 maize) in its season. Figure 1, Figure 2, Figure 3 and Figure 4 respectively show tower silos, concrete silos, bunker silos and bags silos.

Figure 1: Tower Silos



Figure 2: Concrete Silos



Figure 3: Bunker Silos**Figure 4: Bag Silos**

Advantages of Silo Storage

Silo based storage system offer the number of advantages over the traditional warehouse storage system.

- **Preservation of Grain Quality**

Silo based storage system offers the provision of maintaining optimal storage conditions for the grains by controlling the temperature and humidity. It also protects the stored products from insects, pests, molds and birds which can damage the grain quality. High quality grains can be sold at higher prices which increases the profitability for the business.

- **Lower Wastages**

Maintenance of optimal storage conditions prevents wastage of grains and thus reduces the possibility of economic loss, thereby increasing the profitability of the owner of these grains.

- **Lesser Land Requirement**

The silo bins need less area to store the same amount of grain than if it were stored in a traditional warehouse (in sacks, etc.). Cost to store the grain in silo bins is also lower than that of other storage systems.

- **Easier Handling and Saving of Bags Cost**

The silos store grain in bulk form without any need for bags. Grain is directly loaded into vehicles and transported in bulk, which makes its handling easier. Bags constitute a significant cost in grain trading which is saved in the grain is stored in silos.

- **Low Loading/Unloading Cost**

Since there is no involvement of bags, the loading/unloading cost of bags is also not relevant in case of bulk storage in silos. Grain is usually loaded into transporting vehicles using machines. These factors improve the profitability of the grain owners.

5.1 Rationale for Selecting Paddy for Silo Based Storage

Paddy/rice is an important food crop which is defined as pre-formed of finished rice or rice before threshing. There are different varieties of rice that are grown in Pakistan. The proposed business deals in super basmati variety because of its higher demand in local as well as in the export market.

Paddy crop is cultivated once in a year from mid of October to mid of March while maize crop is cultivated twice in a year. The spring crop of maize is cultivated in February and March and harvested in May and June. The autumn crop of maize is cultivated in July and August and harvested in October and November.

Rice is an important food crop. It is the second main staple food crop after wheat and the second major exportable commodity after cotton. It contributes 1.9 percent of value added in agriculture and 0.4 percent in GDP.¹ Rice production comprises of basmati (fine) and coarse types. During the last few years, production of coarse types has been increasing. During 2022-23,² the crop was cultivated on 2,976 thousand hectares, reflecting an decrease of 15.9 percent as compared to last year's sown area of 3,537 thousand hectares.

Major production clusters of rice are present in the eastern Punjab in a belt extending from north to center of the province. Gujranwala is the largest rice producing district; followed by Sheikhpura, Okara, Hafizabad and Sialkot. Rice production is quite concentrated compared to wheat production; indicated by the fact that the top fifteen

¹ Gross domestic product is a monetary measure of the market value of all the final goods and services produced and sold in a specific time period by countries.

² Economic Survey of Pakistan 2022-23

districts accounted for 84% of the total rice production in 2013-14. The value of exports of rice from Pakistan was \$ 2.35 billion in 2022.

Due to greater consumption of rice in the local as well as in the foreign market, the production of rice has also increased to fulfill the demand of local markets. For such large level of production there is greater need to build storage system like silo based storage system. This is a great opportunity for the investors to invest in the business to have healthy returns.

5.2 Rationale for Selecting Maize for Silo Based Storage

Maize, also known as Corn, is also an important food crop. Maize is used for production of different industrial products, such as starch, sweeteners, corn oil, beverages and industrial food products.

Maize is the third important cereal crop of Pakistan after wheat and rice. It contributes 3% to the value added in agriculture and 0.7% to GDP. Maize is cultivated as a multipurpose crop for food, feed and fodder. While human consumption is declining, its utilization in feed and wet milling industry is growing at a fast pace. During 2022-23, maize was cultivated on an area of 1,720,000 hectares reflecting an increase of 4.1% over last year's area of 1,653,000 hectares. Its production increased by 6.9% to 10.183 million Tons compared to last year's production of 9.53 million Tons. The production increase was largely due to increase in area, availability of improved variety of seed and better economic returns. The value of exports of maize from Pakistan was \$ 264 million in 2022.

5.3 Machinery and Equipment

The machinery and equipment required for the proposed project of Silo-based Storage System is described in the following paragraphs:

Pre-Cleaner

Pre-Cleaner is made of stainless steel having a capacity of processing 4 Tons per hour. Pre-cleaner is used to remove dust particles and small pieces of straw from both the paddy and maize. The proposed business will have two pre-cleaners, one will be used for pre-cleaning of paddy and other for pre-cleaning of maize. The electricity consumption of each pre-cleaner is 2.8 KW. Pre-cleaners are not locally manufactured. These are imported from different countries which may include China, India, Japan,. Figure 5 shows pre-cleaner.

Figure 5: Pre-Cleaner**Grain Dryer**

Grain Dryer is made of stainless steel having a capacity of drying 5 Tons per hour. The purpose of these dryers is to reduce the moisture level of paddy and maize to increase their life during the storage period. The proposed business will have two dryers. One dryer will be used for drying of paddy and other for drying of maize. Electricity consumption of each dryer is 18.65 KW. These dryers are not locally manufactured and are imported. Figure 6 shows grain dryer.

Figure 6: Dryer

Silos or Silo Bins

Silos are made of stainless steel. 316L Stainless steel is the most effective material, used for construction of silos to be used for grains storage. These silos are constructed by the owner of the proposed business. Each silo has a diameter of 3600 mm (approximately 12 feet), with a storage capacity of 500 Tons. The proposed project have 4 silos which means that the total storage capacity of the project is 2,000 Tons. Two silos are used for storage of super basmati paddy and the other two for storage of DK-6317 maize. Figure 7 shows tower silos.

Figure 7: Tower Silos



Silo Roof Exhaust Fans

Silo roof Fan is used to extract the humid air and grain dust from inside the silo. Roof exhaust fans are installed on silo bins and the number of these fans depends on the size of the silo bins. In the proposed business, four roof fans are installed on one silo bin. Figure 8 shows silo roof exhaust fan.

Figure 8: Silo Roof Exhaust Fan



Silo Sweep Augers

Silo sweep auger or sweep auger is used to push the grain remaining at the bottom of a silo bin toward the bin's discharge sump opening. It rotates around the discharge opening to "sweep" the grain toward that opening. One sweep auger is required for one silo bin. Figure 9 shows silo sweep auger.

Figure 9: Silo Sweep Auger



Aeration System

Aeration helps protect the quality of the stored grain by passing controlled flow of air through storages. It stabilizes temperature and moisture levels, prevents localized temperature increases or 'hot spots' and discourages moisture migration. Figure 10 show an aeration system installed at the silos.

Figure 10: Installed Aeration System



Silo Temperature Control System

Temperature control system is also installed to maintain the temperature of the grain.

Chain Bucket Conveyor System

Bucket conveyors represent an efficient mean of moving grain. Chain Bucket conveyors are designed for vertical elevation of fine aggregates and minerals. Bucket conveyors are used to transport grain from dryer to silo bins. Grain is transported and discharged gently without causing any damage or loss. Figure 11 shows Chain Bucket Conveyor System.

Figure 11: Chain Bucket Conveyor System



Moisture Analyzer

A moisture analyzer is used to determine the moisture content of the grains. Same analyzer is used to determine the moisture content of both paddy and maize. Quality controller takes a sample from the grain and check the moisture content of that sample, and based on sample analysis, determines the moisture content of the whole grain volume. Figure 12 shows moisture analyzer.

Figure 12: Moisture Analyzer



Manual Weighing Scale (Kanda)

Manual weighing scale is used to measure the weight of super basmati paddy at the time when it is filled in the sacks (each having capacity of 65 kg).Figure 13 shows manual

weighing scale.

Figure 13: Manual Weighing Scale (Kanda)



Manual Pallet Jack

A manual pallet jack is a hand-powered jack, most commonly seen in warehousing operations. These are used predominantly for lifting, lowering and steering pallets/sacks from one place to another. Figure 14 shows manual pallet jack.

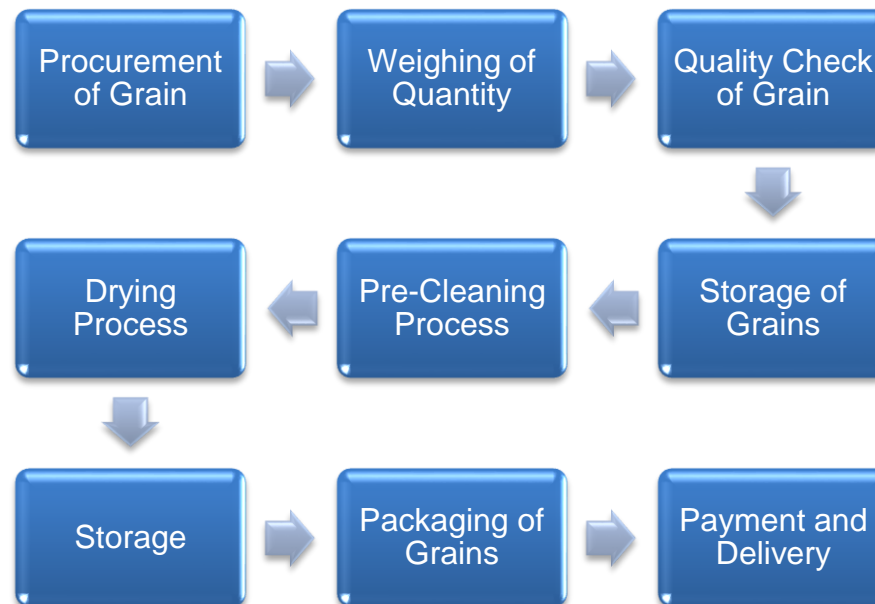
Figure 14: Manual Pallet Jack



5.4 Process Flow

The process flow of silo-based storage system is shown in Figure 15.

Figure 15: Silo Based Storage System Process Flow



Brief description of process flow is as follows:

Procurement of Grain (Paddy and Maize)

The main grain used in the proposed business is super basmati paddy and DK-6317 maize. Paddy and maize will be procured directly from the farmers. Major cultivation of rice and maize crops is done in Okara, Sheikhpura, Gujranwala, Hyderabad, Multan, Sialkot, Faisalabad, Peshawar, Larkana, Nawab Shah, Sargodha, etc. The paddy is Kharif crop and thus it will be procured in the season from mid of October to mid of March (5 months). The business will maintain 70% share of paddy procured to meet the demand during the non-seasonal period i.e. mid of March to mid of October (7 months) and the remaining 30% share of purchases will be sold out to customers during the season.

The proposed business will procure maize in the maize season which has two crops (both Rabi and Kharif) in a year. Rabi season is from May to June and Kharif from October to November. Paddy and maize are purchased directly from the farmers or from the grain market (mandi).

Procurement procedure of grains (paddy or maize) is done by the procurement officer who visits different grain markets (mandi) of different areas for that purpose. He explores the market to buy the required quantities of the grains of the desired varieties. Price is also negotiated during the procurement process. The proposed business may also make

long term arrangements with the farmers to purchase grains. The relationship between business unit and farmers builds with span of time.

Weighing of Grains

Truck weigh scale/weigh bridge is used to weight the grains procured by the business. Weighing of grains is done at commercial weigh bridges, offering their services (which can be found easily on roads in and around the major agricultural districts)

The quantity is usually measured in maund (40 Kg) and its price is decided in PKR per Maund. The weight of grain is measured on the truck weighing scale at the time of loading into the vehicle. The charges of weighing are borne by the seller (marketer or farmer) when the grain is procured and by the customers when the grain is sold to customers (in the proposed period rice processing mills for paddy and food companies for maize). The proposed business allocates one of its employees to perform purchasing and monitoring of weighing activity. Figure 16 shows truck on the weighing scale.

Figure 16: Truck Weight Scale



Quality Check of Grain (Paddy and Maize)

Once the procured grains reach the business premises, the quality and size of paddy and maize are checked by the Quality Officer to ensure that it is according to the requirements of the proposed business. If any variation in quality and quantity is identified the business informs the supplier and take necessary action to reach at a mutual agreement between of the both parties. The quality depends on size and moisture content of paddy and maize. The size of the grain is checked by quality controller on the basis of his professional experience and judgment. Moisture analyzer is used to check the moisture content of grains.

Pre-Cleaning

The procured grains contain dust particles, small pieces of straw and other impurities. Pre-cleaner is used for the cleaning process of grains. There will no process loss during this process because as per market norm at the time of procurement 1kg extra grain is measured for every 40 kg grain. Figure 17 and Figure 18 shows paddy and maize respectively before and after pre-cleaning process.

Figure 17: Paddy Before and After Pre-Cleaning Process



Figure 18: Maize Before and After Pre-Cleaning Process



Drying

Large dryers are used to reduce the moisture level of paddy and maize. Each dryer has a capacity of drying 5 ton of grain per hour. Normally, the moisture content of paddy and maize after the pre-cleaning process is round about 21% and 18-24% respectively. After the drying process, the moisture level is reduced to 15% and 11-13% for paddy and maize respectively. Figure 19 shows drying process of grain.

Figure 19: Drying process of grain**Storage of Grain (Paddy and Maize)**

After drying, both paddy and maize are transferred to silos from dryers by using conveyer belts. These grains are stored in the silos for selling to the customers. In the proposed project, the total storage capacity of 4 silos is 50,000 maund (each silo has a storage capacity of 500 tons). Two silo bins having storage capacity of 2,000 tons are allocated for paddy storage and two silos are allocated for maize storage. 30% of total paddy procured will be available for sale during the season, whereas 70% of total paddy procured will be available for sale during off-season. There are 2 months in a season of maize for Rabi crop and 2 months in a season of maize for Kharif crop. The maize of Rabi crop will be available for sale during off-season till season of maize of Kharif crop and vice versa (the maize of Kharif crop will be available for sale during off-season till season of maize of Rabi crop). Figure 20 shows transfer of grains to the silos through conveyors.

Figure 20: Transfer of Grains in the Silos

Packaging of Grain (Paddy and Maize)

At the time of sale, the grain will be packed in sacks (the weight of one sack is 65 kg) and weight of grains will be measured on the manual weighing scale (Kanda). The cost of sacks is borne by customers of grain at the time of sale (rice processing companies in case of paddy and food processing companies in case of maize) and by farmers of grain at time of purchase.

Delivery and Payment

According to the market norms, a credit facility of 40 days is usually allowed to the customers. The filled sacks are transported to the customer premises either by the proposed business or by the customers themselves. The customer pays the transportation cost of delivering the products to the customer premises.

5.5 Installed and Operational Capacities

The storage capacity of the unit is based on the storage capacity of silo bins. The proposed production unit will run for 8 hours in a day for 300 days in a year. The proposed business will have maximum storage capacity of 25,000 maund for paddy (super basmati rice). For maize (DK-6317), the proposed business will have maximum storage capacity of 50,000 per annum as maize has two seasons in a year i.e. Rabi and Kharif. In the proposed business unit two silo bins are used to store paddy and two to store maize. The total storage capacity of two silo bins is 25,000 maund. The paddy is Kharif crop and it is grown one time in a year so the proposed business will procure paddy only one time in a year during its season but the maize is Kharif as well as Rabi crop so the proposed business will deal will maize two times in a year.

The project is assumed to attain 70% capacity utilization to store the grain during the first year of operations which is equal to 17,500 maund of paddy and 35,000 for maize (17,500 for Rabi and 17,500 for Kharif). It has been assumed that the operational capacity utilization of the unit will increase at the rate of 5% per annum. From utilized operational capacity of 70% during first year, the unit will attain maximum 95% of its total storage capacity in year 6.

Table 1 and

Table 2 shows details of maximum installed and operational storage capacity during 1st of operations for paddy and maize respectively.

Table 1: Installed and Operational Storage Capacity-Paddy

Particulars	Total Silos Storage Capacity (Maund)	Sale Ratio	Total Capacity @ 100% (Maund)	Capacity Utilization @ 70% (Maund)
Seasonal Sale	25,000	30%	7,500	5,250

Non-Seasonal Sale		70%	17,500	12,250
Total			25,000	17,500

Table 2: Installed and Operational Capacity-Maize

Particulars	Crop Season	Period	Total Silos Storage Capacity (Maund)	Total Capacity @ 100% (Maund)	Capacity Utilization @ 70% (Maund)
Maize-DK6317	Rabi	May-Sep	25,000	25,000	17,500
	Kharif	Oct-Apr		25,000	17,500
Total				50,000	35,000

5.6 Season and Procurement Schedule

The season of paddy (in the proposed business super basmati paddy) starts in the mid of October and ends in mid of March (5 months). The season of paddy (in the proposed business DK-6317) is from May to June (2 months) for Rabi crop and from October to November (2 months) for Kharif crop. Table 3 and Table 4 shows season for paddy and maize respectively.

Table 3: Season of Paddy

Particulars	Crop Season	Season Months	No. of Months
Paddy-Super Basmati	Kharif	Mid of October - Mid of March	5

Table 4: Season of Maize

Particulars	Crop Season	Season Months	No. of Months
Maize-DK6317	Rabi	May – June	2
	Kharif	Oct – Nov	2

There are 5 months in a season of paddy and a season passes through three phases such as starting phase, peak level and ending phase of paddy. Starting phase is a phase when rice crop starts to be cultivated and the paddy is not much available in the market. The starting phase for paddy remains for one month i.e. mid of October to mid of November. The peak level is a phase during which supply of paddy is at its peak level. The peak level remains for 2 months i.e. mid of November - mid of January. The ending phase for paddy is a phase during which supply of paddy declines. The ending phase remains for 2 months i.e. mid of January-mid of March. The business unit sets targets based on its experience and market norms for procurement of paddy during each phase. The procurement targets by the proposed business unit are based on assumptions i.e. procurement during starting phase, peak level and ending phase will be 10%, 60% and 30% of storage capacity respectively. Table 5 shows Procurement Schedule of super basmati paddy.

Table 5: Procurement Schedule of Super Basmati Paddy (Super Basmati)

Crop Season	Seasonal Phase	Season Tenure	Seasonal Months	Total Silos Storage Capacity (Maund)	Process Loss (%age of purchased grain)	Targeted Purchase (Maund)	Targeted Procurement Ratio	Seasonal Purchase (Maund)
				A	B	$C=A/(1-B)*1$	D	$E=C*D$
Kharif	Starting	Mid of October - Mid of November	1	25,000	5%	26,316	10%	2,632
	Peak Level	Mid of November - Mid of January	2				60%	15,789
	Ending	Mid of January - Mid of March	2				30%	7,895
Total								26,316

There are 2 months in a season of maize for Rabi crop and 2 months in a season of maize for Kharif crop. A season of maize is also passes through three phases such as starting phase, peak level and ending phase. Starting phase is a phase when maize crop starts to be cultivated and the maize is not much available in the market. The starting phase for maize remains for 10-15 days. The peak level is a phase during which supply of maize is at its peak level. The peak level remains for almost one month. The ending phase for maize is a phase during which supply of maize declines. The ending phase remains for 10-15 days. The business unit set targets based on its experience and market norms for procurement of maize during each phase. The procurement targets by the proposed business unit are based on assumptions i.e. procurement during starting phase, peak level and ending phase will be 20%, 50% and 30% of storage capacity respectively. Table 6 shows Procurement Schedule of maize (DK-6317).

Table 6: Purchased Schedule of Maize (DK-6317)

Table of Purchased Quantity of Maize (DIT 001)								
Seasonal Phase	Seasonal Phase	Season Tenure	Seasonal Months	Total Silos Storage Capacity (Maund)	Process Loss (%age of purchased grain)	Total Silos Storage Capacity (Maund)	Procurement Ratio	Seasonal Purchase (Maund)
				A	B	C=(A/1-B)*1	D	E=C*D
Rabi	Starting	May – June	2	25,000	7%	26,882	20%	5,376
	Peak Level						50%	13,441
	Ending						30%	8,065
Total								26,882
Kharif	Starting	Oct - Nov	2	25,000	7%	26,882	20%	5,376
	Peak Level						50%	13,441
	Ending						30%	8,065
Total								26,882

6 CRITICAL FACTORS

Following factors should be considered while making the investment decision:

- Technical knowhow and basic knowledge of the agriculture crops
- Availability of quality raw materials
- Maintaining good relationship with suppliers
- Availability of specialized workforce
- Regular and strict checks on quality standards
- Up-to-date knowledge of technological innovations
- Rigorous supervision of the production process at all process stages
- Regular checks on the machinery and equipment for proper working

7 GEOGRAPHICAL POTENTIAL FOR INVESTMENT

The silo based storage system is proposed to be established in large and medium cities of Pakistan like Okara, Sheikhpura, Gujranwala, Hyderabad, Multan, Sialkot, Faisalabad, Peshawar, Larkana, Nawab-Shah and Sargodha etc. These cities are preferred due to easy availability of grain (rice and maize crops).

8 POTENTIAL TARGET CUSTOMERS / MARKETS

The target customers of the proposed grain are mainly rice processing companies for paddy and food production companies for maize. The rice processing companies remove the husk from the paddy and convert into the edible form of finished rice. The food production companies, through further processing of maize, convert it into products such as starch, sweeteners, corn oil, beverages and other industrial food products.

9 PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of silo based storage system unit. Various costs 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 Annexure.

Project is proposed to be financed through 100% equity. Total project cost has been estimated as PKR 131,631,284 which comprises of capital investment and working capital of PKR 77,769,602 and PKR 53,861,682 respectively.

9.1 Initial Project Cost Estimates

The details of initial project cost calculated for the proposed unit as shown in Table 7.

Table 7: Initial Project Cost

Cost Item	Cost (PKR)
Land	10,500,000
Building Renovation / Infrastructure	31,500,000
Machinery & equipment	9,414,000
Office equipment	9,200,000
Furniture & fixtures	3,628,400
Office vehicles	1,240,000
Pre-operating costs	10,584,800
License	1,690,802
Total Capital Cost	11,600
	77,769,602
Working Capital	
Spares inventory	78,450
Consumables inventory	114,058
Cash required (to purchase grain)	50,216,274
Upfront insurance payment	452,900
Cash	3,000,000
Total Working Capital Cost	53,861,682
Total Project Cost	131,631,284

9.1.1 Land

The proposed unit will be set up on owned land of 3 Kanals (13,500 sq.feet). Total land price is taken as Rs. 10.50 million. The breakup of space requirement is given in Table 8.

Table 8: Land Requirement

Production Area	No.	Length	Width	Area (Sq. Ft.)
Executive Office	1	15	10	150
Admin Office	1	15	10	150
Procurement Office	1	15	15	225
Accounts Department	1	15	15	225
Grain Store Area (Before transferring to Silos)	1	75	60	4,500
Quality Control Department	1	15	15	225
Sales and Marketing Department	1	15	15	225
Storage Area - Paddy (Silo and Installed Machinery)	1	50	50	2,500
Storage Area - Maize (Silo and Installed Machinery)	1	50	50	2,500
Parking and Gate area	1	60	40	2,400
Reception Area	1	16	10	160
Washroom	6	8	5	240
Total Area				13,500

9.1.2 Building

Factory buildings will be built over the purchased land area of 13,500 sq. feet. Industrial electricity connection of 24 KW load (B2a) will be required for the proposed project. Table 9 provides details for cost of building or civil works.

Table 9: Building Renovation Cost

Cost Item	Area (Sq. Feet)	Rate per Seq. Feet	Total Cost (PKR)
Executive Office	150	4,000	600,000
Admin Office	150	4,000	600,000

Procurement Office	225	4,000	900,000
Accounts Department	225	4,000	900,000
Grain Store Area (Before transferring to Silos)	4,500	2,000	9,000,000
Quality Control Department	225	4,000	900,000
Sales and Marketing Department	225	4,000	900,000
Storage Area - Paddy (Silo and Installed Machinery)	2,500	2,500	6,250,000
Storage Area - Maize (Silo and Installed Machinery)	2,500	2,500	6,250,000
Parking and Gate area	2,400	1,500	3,600,000
Reception Area	160	4,000	640,000
Washroom	240	4,000	960,000
Total			31,500,000

9.1.3 Machinery and Equipment Requirement

Table 10 provides details of machinery and equipment required for the project.

Table 10: Machinery and Equipment Requirement

Cost Item	Capacity	Number of Items	Unit Cost (PKR)	Total Cost (PKR)
For Paddy-Basmati				
Pre-cleaner (2.8kw)	4 ton/Hour	1	1,210,000	1,210,000
Dryer (18.65kw)	5 ton/Hour	1	900,000	900,000
For Maize				0
Pre-cleaner (2.8kw)	4 ton/Hour	1	1,200,000	1,200,000
Dryer (18.65kw)	5 ton/Hour	1	890,000	890,000
Other				0
Roof Exhaust Fans		16	25,500	408,000
Silo Sweep Augers		4	130,000	520,000
Aeration System				650,000

Silo Temperature Control System				650,000
Chain Bucket Conveyor System				900,000
Moisture Analyzer		2	65,000	700,000
Back-up Generator (25KVA)				1,275,000
Manual Weighing Scale (Kanda)		2	25,500	51,000
Manual Pallet Jack		3	20,000	60,000
Total Cost (PKR)				9,414,000

Silo Bins

Cost Item	Capacity	Number of Items	Unit Cost (PKR)	Total Cost (PKR)
For Paddy-Basmati				
Silo Bin (Dia=3600mm)	500 Ton	2	2,300,000	4,600,000
For Maize				
Silo Bin (Dia=3600mm)	500 Ton	2	2,300,000	4,600,000
Total Cost (PKR)				9,200,000

9.1.4 Office Equipment Requirement

Table 11 provides details office equipment requirement proposed for the unit.

Table 11: Office Equipment Requirement

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Laptops	6	150,000	900,000
Desktop Computers	8	60,000	480,000
Printer	3	5,000	15,000
CCTV Cameras (2MP)	24	3,500	84,000
DVR	3	20,000	60,000
LED TV (32")	2	50,000	100,000
Air Conditioners	8	200,000	1,600,000
Exhaust Fan	15	5,500	82,500
Bracket Fan	8	12,500	100,000

Pedastal Fan	3	12,500	37,500
Water Dispenser	2	40,000	80,000
Wi-Fi / Internet Router	2	7,500	15,000
LED Bulbs	136	400	54,400
Flood Light LED	10	2,000	20,000
Total Cost (PKR)			3,628,400

9.1.5 Furniture and Fixture Requirement

Table 12 gives details of the furniture and fixture required for the project.

Table 12: Furniture and Fixtures Requirement

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Executive Tables	6	60,000	360,000
Executive Chairs	6	30,000	180,000
Office Table	8	30,000	240,000
Office Chairs	14	15,000	210,000
Sofa Set	2	50,000	100,000
Visiting Chairs	10	15,000	150,000
Total Cost			1,240,000

9.1.6 Vehicle Requirement

Details of vehicles required for the project is given in Table 13.

Table 13: Vehicle Requirement

Cost Item	Unit	Unit Cost (PKR)	Total Cost (PKR)
Mazda Truck (3500cc, 16 feet)	2	5,000,000	10,000,000
Motorcycle	3	160,000	480,000
Registration / Transfer Charges			104,800
Total Cost (PKR)			10,584,800

9.1.7 Pre-Operating Cost Requirement

Details of pre operating cost required for the project is given in Table 14.

Table 14: Pre-Operating Cost Requirement

Description	Total (PKR)
Administration expense	760,000
Utilities expense	930,802
Total (PKR)	1,690,802

9.2 Financial Feasibility Analysis

The financial feasibility analysis provides the information regarding projected IRR, NPV and payback period of the study, which is shown in Table 15.

Table 15: Financial Feasibility Analysis

Description	Project
IRR	29%
NPV (PKR)	21,444,224
Payback Period (years)	4.15
Projection Years	10
Discount rate used for NPV	25%

9.3 Financial Feasibility Analysis with 50% Debt

The financial feasibility analysis provides the information regarding projected IRR, NPV and payback period of the study on the basis of Debt: Equity Model (50:50), which is shown in Table 16.

Table 16: Financial Feasibility Analysis with 50% Debt

Description	Project
IRR	27%
NPV (PKR)	10,128,350
Payback Period (years)	4.32
Discount rate used for NPV	26%

9.4 Breakeven Analysis

Table 17 shows calculation of break-even analysis.

Table 17: Break-Even Analysis

Description	Amount First Year (PKR)	Ratios
Sales (PKR) – A	273,738,597	100%
Variable Cost (PKR) – B	228,425,137	83%
Contribution (PKR) (A-B) = C	45,313,460	17%
Fixed Cost (PKR) – D	22,459,540	10%
Contribution Margin/ Maund	863.11	
Breakeven Revenue	135,678,077	
Breakeven (Maund)	26,022	
Breakeven Capacity	35%	

9.5 Revenue Generation

Based on 70% capacity utilization, revenue is shown in Table 18 and purchase cost for paddy (super basmati) and maize (DK-6317) during the first year of operations is shown Table 24 and

Table 26 respectively.

Table 18: Revenue Generation

Particulars	Category	Revenue (PKR)	Reference
Paddy (Super Basmati)	Seasonal	31,320,484	Table 19
	Non-Seasonal	81,043,629	Table 19
Maize (DK-6317)	Rabi	69,221,250	Table 20
	Kharif	87,617,234	Table 20
Other	Cleaning Service	1,701,000	Table 21
	Drying Service	2,835,000	Table 22
Total		273,738,597	

Table 19: Revenue Generation-Paddy

Particulars	Total Silos Storage Capacity (Maund)	Sale Ratio	Total Capacity @ 100% (Maund)	Capacity Utilized @ 70% (Maund)	Average Sale Price/Maund (PKR)	Revenue @ 70% Capacity (PKR)
	A	B	C=(A*B)	D=(C*70%)	E	F=(D*F)
Seasonal Sale	25,000	30%	7,500	5,250	5,966	31,320,484
Non-Seasonal Sale		70%	17,500	12,250	6,616	81,043,629
Total		100%	25,000	17,500		112,364,113

Table 20: Revenue Generation-Maize

Particulars	Total Silos Storage Capacity (Maund)	Total Capacity @ 100% (Maund)	Capacity Utilized @ 70% (Maund)	Average Sale Price/Maund (PKR)	Revenue @ 70% Capacity (PKR)
	A	B=A	D=(C*70%)	D	E=(C*D)
Rabi	25,000	25,000	17,500	3,956	69,221,250
Kharif	25,000	25,000	17,500	5,007	87,617,234
Total		50,000	35,000		156,838,484

Table 21: Revenue Generation - Cleaning Service

Grain	Capacity of Pre-Cleaner /Hour (Maund)	No of Pre-Cleaner	Capacity /Day (Maund)	Daily Service (%age of Total Capacity)	Seasonal Days /Annum	Seasonal Service (Maund)	Service Charges/ Maund (PKR)	Revenue @100% (PKR)	Revenue @70% (PKR)
	A	B	C=A*B*8	D	E	F=C*D*E	G	H=F*G	I=H*70%
Paddy	100	1	800	25%	150	30,000	45	1,350,000	945,000
Maize	100	1	800	25%	120	24,000		1,080,000	756,000
								Total	1,701,000

Table 22: Revenue Generation - Drying Service

Grain	Capacity of Dryer /Hour (Maund)	No of Dryer	Capacity /Day (Maund)	Daily Service (%age of Total Capacity)	Seasonal Days /Annum	Seasonal Service (Maund)	Service Charges/ Maund (PKR)	Revenue @100% (PKR)	Revenue @70% (PKR)
	A	B	C=A*B*8	D	E	F=C*D*E	G	H=F*G	I=H*70%
Paddy	125	1	1,000	25%	150	37,500	60	2,250,000	1,575,000
Maize	125	1	1,000	25%	120	30,000		1,800,000	1,260,000
Total								2,835,000	

Table 23 and Table 24 shows the calculation of weighted average purchase price of paddy (super basmati) per maund.

Table 23: Month-Wise Bifurcation of Seasonal Purchase - Paddy (Super Basmati)

Particular	Seasonal Months	Bifurcation Basis (Based on Assumption)	Month-Wise Seasonal Purchase (Maund)
Paddy-Super Basmati	Mid of October	50% of starting phase purchase	1,316
	November	50% of starting phase purchase and 25% of peak phase purchase	5,263
	December	50% of peak phase purchase	7,895
	January	25% of peak phase purchase and 25% of ending phase	5,921
	February	50% of ending phase purchase	3,947
	Mid of March	25% of ending phase purchase	1,974

Table 24: Total Purchased Cost–Paddy (Super Basmati)

Seasonal Months	Minimum Purchase Price (PKR)	Maximum Purchase Price (PKR)	Average Price (PKR)	Month-Wise Seasonal Purchase (Maund)	Total Purchase Cost (PKR)	Weighted Avg. Price/Maund (PKR)
	A	B	$C=(A+B)/2$	D	$E=C*D$	$F=\text{Total (E/D)}$
October	3,290	3,490	3,490	1,316	4,592,105	4,766
November	4,160	4,440	4,440	5,263	23,368,421	
December	4,840	4,960	4,960	7,895	39,157,895	
January	4,950	5,080	5,080	5,921	30,078,947	
Total				20,395	97,197,368	

Table 25 and

Table 26 shows the calculation of weighted average purchase price of maize (DK-6317) per maund.

Table 25: Month-Wise Bifurcation of Seasonal Purchase - Maize

Crop Season	Seasonal Phase	Seasonal Months	Bifurcation Basis (Based on Assumption)	Month-Wise Seasonal Purchase (Maund)
Maize-DK6317	Rabi	May	50% of total Rabi seasonal purchase	13,441
		June	50% of total Rabi seasonal purchase	13,441
	Kharif	October	50% of total Kharif seasonal purchase	13,441
		November	50% of total Kharif seasonal purchase	13,441

Table 26: Total Purchased Cost–Maize (DK-6317)

Crop Season	Minimum Purchase Price (PKR)	Average Price (PKR)	Month-Wise Seasonal Purchase (Maund)	Total Purchase Cost (PKR)	Weighted Avg. Price/Maund (PKR)
		A	B	C=A*B	E
Rabi	May	3,059	13,441	41,115,591	2,956
	June	2,852	13,441	38,333,333	
Total			26,882	79,448,924	
Kharif	October	2,565	13,441	54,502,063	3,757
	November	2,629	13,441	46,484,471	
Total			26,882	100,986,534	

9.6 Human Resource Requirement

For the 1st year of operations, the proposed unit shall require the workforce at a salary cost shown in Table 27.

Table 27: Human Resource Requirement

Post	No.of Employees	Monthly Salary (PKR)	Annual Salary (PKR)
Owner	1		
Admin Manager	1	120,000	1,440,000
Assistant Admin	1	60,000	720,000
Accounts Manager	1	120,000	1,440,000
Assistant Accounts	1	60,000	720,000
Procurement Manager	1	120,000	1,440,000
Assistant Procurement	2	60,000	1,440,000
Quality Controller	1	70,000	840,000
Assistant Quality Control	1	45,000	540,000
Store Incharge	1	45,000	540,000
Sales and Marketing Manager	1	120,000	1,440,000
Assistant Sales and Marketing	2	75,000	1,800,000
Operator-Cleaning machine	1	45,000	540,000
Operator-Dryer machine	1	45,000	540,000
Worker-Loading and Un-Loading	4	35,000	1,680,000
Sweeper	2	35,000	840,000
Office Boy	2	35,000	840,000
Security Guard	4	35,000	1,680,000
Total	28		18,480,000

10 CONTACT DETAILS

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

Table 28: Details of Suppliers

Name of Supplier	Cost Item	Location	E-mail/Web Address
Shandong Muhe Machinery Co. Ltd.	Silos Supplier	China	https://muhechina.en.alibaba.com
Hena SRON Silo Engineering Company	Silos Supplier	Henan, China	https://steelsilos.en.alibaba.com
Shandong DOM Machinery Equipment	Silos Supplier	Shandong, China	https://sddom.en.alibaba.com
Jiangsu SUNSHINE Machinery Company	Paddy Dryer Supplier	Jiangsu, China	https://tzsanxi.en.alibaba.com
Kaifeng Hyde Machinery Co. Ltd.	Paddy Dryer Supplier	Henan, China	https://zghdix.en.alibaba.com
Xiamen Greatbond Technology Co. Ltd.	Pre-Cleaner Supplier	Fujian, China	https://farm.en.alibaba.com
Taian Shelley Engineering Co. Ltd	Pre-Cleaner Supplier	Shandong, China	https://hxt.en.alibaba.com
Kaifeng Hyde Machinery Co. Ltd.	Paddy Pre-Cleaner Supplier	Henan, China	https://zghdix.en.alibaba.com
Jiangsu Jingxin Lifting Equipment Co. Ltd.	Manual Pallet Jack Supplier	Jiangsu, China	https://jxforklift.en.alibaba.com
Hebei Jiali Rigging Manufacturing Co., Ltd	Manual Pallet Jack Supplier	Hebei, China	https://cnjialiqizhong.en.alibaba.com

11 USEFUL WEB LINKS

Table 29: Useful Web Links

Name of Organization	E-mail Address
Small and Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
National Business Development Program (NBDP)	www.nbdp.org.pk
Government of Pakistan	www.pakistan.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	sindh.gov.pk/
Government of Balochistan	balochistan.gov.pk/
Government of Khyber Pakhtunkhwa	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 & 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 Standards and Quality Control Authority (PSQCA)	http://www.psqca.com.pk
Punjab Small Industries Corporation	https://www.psic.gop.pk/
Sindh Small Industries Corporation	https://ssic.gos.pk/
Government of Khyber Pakhtunkhwa	https://small_industries_de.kp.gov.pk/
Government of Balochistan Industries and Commerce	https://balochistan.gov.pk/departments-download/industries-and-commerce/
Department of Agriculture Punjab	https://www.agripunjab.gov.pk/
Department of Agriculture Sindh	https://agri.sindh.gov.pk/
Department of Agriculture Balochistan	https://balochistan.gov.pk/agri/
Department of Agriculture KPK	https://agriculture.kp.gov.pk/

Department of Agriculture Gilgit Baltistan	http://cmgb.gov.pk/initiatives-reforms/agriculture-fisheries-and-livestock
Department of Agriculture AJK	https://agricultureajk.org/
Ministry of National Food Security and Research	http://www.mnfsr.gov.pk/

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										
Paddy - Super Basmati										
Seasonal	31,320,484	37,014,100	43,548,323	51,035,913	59,603,942	69,395,545	76,543,286	84,427,245	93,123,251	102,714,946
Non-Seasonal	81,043,629	95,776,203	112,683,895	132,058,483	154,228,771	179,565,131	198,060,340	218,460,555	240,961,992	265,781,077
Total paddy sale	112,364,113	132,790,303	156,232,218	183,094,395	213,832,713	248,960,676	274,603,626	302,887,799	334,085,243	368,496,023
Maize										
May-Sep	69,221,250	81,804,684	96,245,938	112,794,224	131,730,384	153,370,758	169,167,946	186,592,245	205,811,246	227,009,805
Oct-Apr	87,617,234	103,544,795	121,823,903	142,770,000	166,738,564	194,130,005	214,125,395	236,180,311	260,506,883	287,339,092
Total maize sale	156,838,484	185,349,479	218,069,841	255,564,224	298,468,948	347,500,763	383,293,342	422,772,556	466,318,129	514,348,896
Other Revenue										
Cleaning Service	1,701,000	1,876,203	2,069,452	2,282,605	2,517,714	2,777,038	3,063,073	3,378,570	3,726,563	4,110,398
Drying Service	2,835,000	3,127,005	3,449,087	3,804,342	4,196,190	4,628,397	5,105,122	5,630,950	6,210,938	6,850,664
	273,738,597	323,142,991	379,820,598	444,745,567	519,015,564	603,866,875	666,065,163	734,669,875	810,340,872	893,805,981
Cost of sales										
Paddy - Super Basmati	83,401,613	98,562,835	115,962,460	135,900,756	158,716,095	184,789,622	203,822,953	224,816,717	247,972,839	273,514,041
Maize - DK6317	117,463,484	138,816,667	163,322,436	191,403,687	223,536,989	260,259,148	287,065,841	316,633,622	349,246,885	385,219,315
Direct Electricity	7,966,080	8,595,400	9,274,437	10,007,117	10,797,680	11,650,696	12,571,101	13,564,218	14,635,792	15,792,019
Direct Labour	7,560,000	8,293,320	9,097,772	9,980,256	10,948,341	12,010,330	13,175,332	14,453,339	15,855,313	17,393,278
Consumables	1,368,693	1,782,134	2,310,466	2,984,064	3,841,072	4,929,340	5,997,079	7,296,101	8,876,502	10,799,232
Machinery repair and maintenance	941,400	1,038,364	1,145,316	1,263,283	1,393,401	1,536,922	1,695,225	1,869,833	2,062,426	2,274,855
Total cost of sales	218,701,270	257,088,720	301,112,887	351,539,164	409,233,577	475,176,058	524,327,531	578,633,831	638,649,756	704,992,741
Gross Profit	55,037,327	66,054,271	78,707,711	93,206,403	109,781,987	128,690,816	141,737,632	156,036,044	171,691,115	188,813,240
General administration & selling expenses										
Administration expense	10,920,000	11,979,240	13,141,226	14,415,925	15,814,270	17,348,254	19,031,035	20,877,045	22,902,119	25,123,624
Administration benefits expense	1,092,000	1,197,924	1,314,123	1,441,593	1,581,427	1,734,825	1,903,103	2,087,705	2,290,212	2,512,362
Indirect electricity	2,663,539	2,873,959	3,101,002	3,345,981	3,610,313	3,895,528	4,203,275	4,535,333	4,893,625	5,280,221
Communications expense (phone, internet etc.)	1,092,000	1,197,924	1,314,123	1,441,593	1,581,427	1,734,825	1,903,103	2,087,705	2,290,212	2,512,362
Office vehicles running and maintenance expense	3,230,942	3,563,729	3,930,793	4,335,665	4,782,239	5,274,809	5,818,115	6,417,381	7,078,371	7,807,443
Generator Running and Maintenance Cost (PKR)	372,000	410,316	452,579	499,194	550,611	607,324	669,878	738,876	814,980	898,923
Office expenses (stationery, entertainment, janitorial services, etc.)	1,092,000	1,197,924	1,314,123	1,441,593	1,581,427	1,734,825	1,903,103	2,087,705	2,290,212	2,512,362
Promotional expense	2,737,386	3,231,430	3,798,206	4,447,456	5,190,156	6,038,669	6,660,652	7,346,699	8,103,409	8,938,060
Insurance expense	452,900	384,965	317,030	249,095	181,160	113,225	45,290	907,060	771,001	634,942
Professional fees (legal, audit, consultants, etc.)	764,400	838,547	919,886	1,009,115	1,106,999	1,214,378	1,332,172	1,461,393	1,603,148	1,758,654
Depreciation expense	7,800,080	7,800,080	7,800,080	7,800,080	7,800,080	7,800,080	6,556,720	11,436,098	11,436,098	11,436,098
Amortization of pre-operating costs	338,160	338,160	338,160	338,160	338,160	-	-	-	-	-
Amortization of legal, licensing, and training costs	1,160	1,160	1,160	1,160	1,160	1,160	1,160	1,160	1,160	1,160
Bad debt expense	2,737,386	3,231,430	3,798,206	4,447,456	5,190,156	6,038,669	6,660,652	7,346,699	8,103,409	8,938,060
Subtotal	35,293,954	38,246,788	41,540,696	45,214,064	49,309,584	53,536,572	56,688,259	67,330,857	72,577,954	78,354,271
Operating Income	19,743,373	27,807,483	37,167,015	47,992,339	60,472,403	75,154,244	85,049,373	88,705,187	99,113,161	110,458,969
Gain / (loss) on sale of office equipment	-	-	-	-	-	-	907,100	-	-	-
Gain / (loss) on sale of office vehicles	-	-	-	-	-	-	2,646,200	-	-	-
Earnings Before Interest & Taxes	19,743,373	27,807,483	37,167,015	47,992,339	60,472,403	75,154,244	88,602,673	88,705,187	99,113,161	110,458,969
Subtotal	-	-	-	-	-	-	-	-	-	-
Earnings Before Tax	19,743,373	27,807,483	37,167,015	47,992,339	60,472,403	75,154,244	88,602,673	88,705,187	99,113,161	110,458,969
Tax	4,106,079	4,847,145	5,697,309	6,671,184	7,785,233	9,058,003	9,990,977	11,020,048	12,155,113	13,407,090
NET PROFIT/(LOSS) AFTER TAX	15,637,294	22,960,338	31,469,706	41,321,156	52,687,169	66,096,241	78,611,696	77,685,139	86,958,048	97,051,879

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											
<i>Current assets</i>											
Cash & Bank	53,216,274	56,673,797	70,052,854	83,526,951	97,474,989	112,133,793	127,543,280	159,525,568	245,163,302	339,606,498	424,150,758
Accounts receivable		22,499,063	26,559,698	31,218,131	36,554,430	42,658,814	49,632,894	54,745,082	60,383,825	66,603,359	73,463,505
Spares Inventory	78,450	94,837	114,648	138,596	167,547	202,546	244,855	296,003	357,834	432,581	-
Consumables inventory	114,058	163,808	234,244	333,698	473,776	670,633	899,936	1,207,642	1,620,558	2,174,659	-
Pre-paid insurance	452,900	384,965	317,030	249,095	181,160	113,225	45,290	907,060	771,001	634,942	-
Total Current Assets	53,861,682	79,816,470	97,278,473	115,466,471	134,851,903	155,779,011	178,366,255	216,681,354	308,296,521	409,452,039	497,614,264
<i>Fixed assets</i>											
Land	10,500,000	10,500,000	10,500,000	10,500,000	10,500,000	10,500,000	10,500,000	10,500,000	10,500,000	10,500,000	10,500,000
Building / Infrastructure	31,500,000	28,350,000	25,200,000	22,050,000	18,900,000	15,750,000	12,600,000	9,450,000	6,300,000	3,150,000	-
Machinery & equipment	9,414,000	8,001,900	6,589,800	5,177,700	3,765,600	2,353,500	941,400	17,883,317	15,200,819	12,518,322	9,835,824
Silo Bins	9,200,000	8,280,000	7,360,000	6,440,000	5,520,000	4,600,000	3,680,000	2,760,000	1,840,000	920,000	23,008,768
Furniture & fixtures	1,240,000	1,054,000	868,000	682,000	496,000	310,000	124,000	2,355,568	2,002,232	1,648,897	1,295,562
Office vehicles	10,584,800	8,997,080	7,409,360	5,821,640	4,233,920	2,646,200	1,058,480	21,975,740	18,679,379	15,383,018	12,086,657
Office equipment	3,628,400	3,084,140	2,539,880	1,995,620	1,451,360	907,100	362,840	6,892,695	5,858,790	4,824,886	3,790,982
Security Against Building	-	-	-	-	-	-	-	-	-	-	-
Total Fixed Assets	76,067,200	68,267,120	60,467,040	52,666,960	44,866,880	37,066,800	29,266,720	71,817,319	60,381,221	48,945,123	60,517,794
<i>Intangible assets</i>											
Pre-operation costs	1,690,802	1,352,641	1,014,481	676,321	338,160	-	-	-	-	-	-
Legal, licensing, & training costs	11,600	10,440	9,280	8,120	6,960	5,800	4,640	3,480	2,320	1,160	-
Total Intangible Assets	1,702,402	1,363,081	1,023,761	684,441	345,120	5,800	4,640	3,480	2,320	1,160	-
TOTAL ASSETS	131,631,284	149,446,671	158,769,274	168,817,872	180,063,903	192,851,611	207,637,615	288,502,153	368,680,062	458,398,323	558,132,057
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable		9,996,741	11,748,498	13,756,989	16,057,242	18,689,054	21,692,575	23,945,417	26,438,186	29,198,399	31,880,254
Total Current Liabilities	-	9,996,741	11,748,498	13,756,989	16,057,242	18,689,054	21,692,575	23,945,417	26,438,186	29,198,399	31,880,254
<i>Other liabilities</i>											
Total Long Term Liabilities	-	-	-	-	-	-	-	-	-	-	-
<i>Shareholders' equity</i>											
Paid-up capital	131,631,284	131,631,284	131,631,284	131,631,284	131,631,284	131,631,284	131,631,284	131,631,284	131,631,284	131,631,284	131,631,284
Retained earnings	-	7,818,647	15,389,493	23,429,599	32,375,377	42,531,273	54,313,757	132,925,453	210,610,592	297,568,640	394,620,520
Total Equity	131,631,284	139,449,931	147,020,776	155,060,883	164,006,661	174,162,557	185,945,041	264,556,736	342,241,876	429,199,924	526,251,803
TOTAL CAPITAL AND LIABILITIES	131,631,284	149,446,671	158,769,274	168,817,872	180,063,903	192,851,611	207,637,615	288,502,153	368,680,062	458,398,323	558,132,057

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		15,637,294	22,960,338	31,469,706	41,321,156	52,687,169	66,096,241	78,611,696	77,685,139	86,958,048	97,051,879
Add: depreciation expense		7,800,080	7,800,080	7,800,080	7,800,080	7,800,080	7,800,080	6,556,720	11,436,098	11,436,098	11,436,098
amortization of pre-operating costs		338,160	338,160	338,160	338,160	338,160	-	-	-	-	-
amortization of training costs		1,160	1,160	1,160	1,160	1,160	1,160	1,160	1,160	1,160	1,160
Accounts receivable		(22,499,063)	(4,060,635)	(4,658,433)	(5,336,299)	(6,104,383)	(6,974,080)	(5,112,188)	(5,638,743)	(6,219,534)	(6,860,146)
Spares inventory	(78,450)	(16,387)	(19,810)	(23,949)	(28,951)	(34,999)	(42,309)	(51,147)	(61,831)	(74,747)	432,581
Consumables inventory	(114,058)	(49,750)	(70,437)	(99,453)	(140,078)	(196,857)	(229,303)	(307,706)	(412,917)	(554,101)	2,174,659
Advance insurance premium	(452,900)	67,935	67,935	67,935	67,935	67,935	67,935	(861,770)	136,059	136,059	634,942
Accounts payable		9,996,741	1,751,758	2,008,491	2,300,253	2,631,811	3,003,521	2,252,842	2,492,769	2,760,213	2,681,855
Other liabilities		-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(645,408)	11,276,170	28,768,549	36,903,697	46,323,416	57,190,077	69,723,245	81,089,607	85,637,734	94,443,196	107,553,029
<i>Financing activities</i>											
Issuance of shares	131,631,284	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares											
Cash provided by / (used for) financing activities	131,631,284	-	-	-	-	-	-	-	-	-	-
<i>Investing activities</i>											
Capital expenditure	(77,769,602)	-	-	-	-	-	-	(49,107,319)	-	-	(23,008,768)
Cash (used for) / provided by investing activities	(77,769,602)	-	-	-	-	-	-	(49,107,319)	-	-	(23,008,768)
NET CASH	53,216,274	11,276,170	28,768,549	36,903,697	46,323,416	57,190,077	69,723,245	31,982,288	85,637,734	94,443,196	84,544,260

13 KEY ASSUMPTIONS

13.1 Operating Cost Assumptions

Table 30: Operating Cost Assumptions

Description	Details
Cost of price growth rate	10.3%
Machinery Maintenance – Cost (%age of Machine Cost)	10.0%
Operating costs growth rate	10.3%
Administration benefits expense	10.0%
Commucation expense	10.0%
Office vehicles insurance rate	2.5%
Office expenses (stationery, entertainment, janitorial services, etc.)	10.0%
Furniture and fixture depreciation	15%
Office equipment depreciation	15%
Vehicle depreciation	15%
Inflation growth rate	10.3%
Wage growth rate	9.7%
Electricity price growth rate	7.9%
Office equipment price growth rate	9.6%
Office vehicle price growth rate	11.0%

13.2 Revenue Assumptions

Table 31: Revenue Assumptions

Description	Details
Sale price growth rate	10.3%
Initial year capacity utilization	70%
Capacity growth rate	5%
Maximum capacity utilization	95%

13.3 Financial Assumptions

Table 32: Financial Assumptions

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

Table 33: Cash Flow Assumption

Description	Details
Accounts receivable cycle (in days)	30
Accounts payable cycle (in days)	40

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