Pre-Feasibility Study

SILO BASED STORAGE SYSTEM

Small and Medium Enterprises Development Authority

Ministry of Industries and Production

Government of Pakistan

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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, Sheikhupura, 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 value of exports of rice from Pakistan was $2.15 billion in 2021 as compared to $2.1 billion in 2020. This shows a growth in export of rice by 2.43% in 2021. On the other hand, the value of exports of maize from Pakistan was $106 million in 2021. The export of maize from Pakistan increased from 2020 to 2021.

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 99.12 million. This includes capital investment of PKR 60.74 million and working

capital of PKR 38.38 million. This project is financed through 100% equity. The Net Present Value (NPV) of project is PKR 3.77 million with an Internal Rate of Return (IRR) of 26% and a Payback period of 4.54 years. Further, this project is expected to generate Gross Annual Revenue of PKR 191.99 million during 1st year, with Gross Profit (GP) ratio ranging from 21% to 22% and Net Profit (NP) ratio ranging from 4% to 12% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 37% with breakeven revenue of PKR 116.97 million (27,415 maund) during first year.

The proposed project may also be established using leveraged financing. At 50% financing from debt sources bearing cost equal to KIBOR+3%, the proposed manufacturing unit provides Net Present Value (NPV) of PKR 14.28 million, Internal Rate of Return (IRR) of 25% and Payback period of 4.68 years. Further, this project is expected to generate Net Profit (NP) ratio ranging from 2% to 11% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 37% with annual revenue of PKR 116.97 million (27,415 maund).

The proposed project will provide employment opportunities to 27 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 Handing 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 3.5 percent of value added in agriculture and 0.7 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 2020-21,[2] the crop was cultivated on 3,335 thousand hectares, reflecting an increase 9.9 percent as compared to last year's sown area of 3,034 thousand hectares. The current year witnessed a record production growth of 13.6 percent to 8.419 million Tons against 7.414 million Tons during previous year. This was essentially due to rising prices and higher demand for the country's rice in export markets. The area, production and yield trends of rice during the last five years are shown in Figure 5 and Figure 6.[3]

[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] https://www.finance.gov.pk/survey/chapters_21/02-Agriculture.pdf
[3] https://www.pbs.gov.pk/

Figure 5: Pakistan's Production of Rice Crop

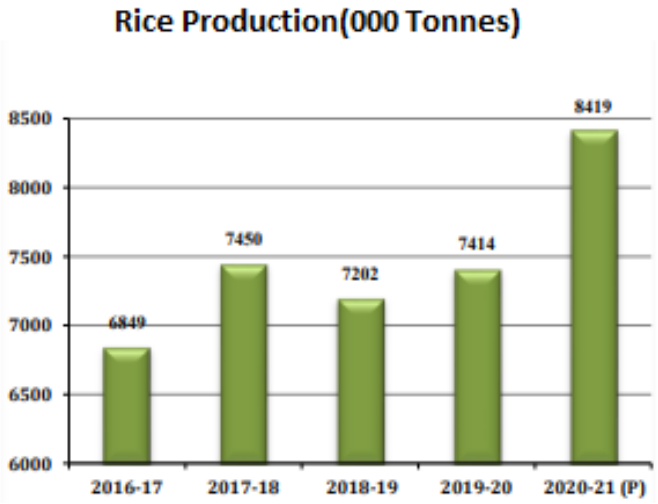


Figure 6: Area, Production and Yield of Rice in Pakistan

Table 2.6: Area, Production and Yield of Rice

Year	Area		Production		Yield	
	(000 Hectare)	% Change	(000 Tonnes)	% Change	(Kgs/Hec.)	% Change
2016-17	2,724	-	6,849	-	2,514	-
2017-18	2,901	6.5	7,450	8.8	2,568	2.1
2018-19	2,810	-3.1	7,202	-3.3	2,563	-0.2
2019-20	3,034	8.0	7,414	2.9	2,444	-4.6
2020-21(P)	3,335	9.9	8,419	13.6	2,524	3.3

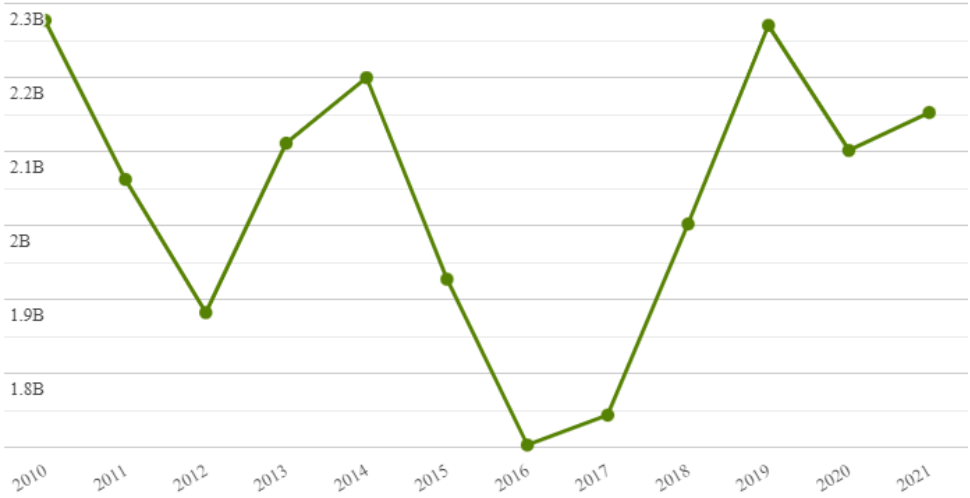
P: Provisional
Source: Pakistan Bureau of Statistics

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 Sheikhupura, Okara, Hafizabad and Sialkot. Rice production is quite concentrated compared to wheat production; indicated by the fact that the top fifteen districts accounted for 84% of the total rice production in 2013-14.

The value of exports of rice from Pakistan was $ 2.15 billion in 2021. Sales of rice from Pakistan went up by 2.43% in 2021 as compared to 2020. The exports of rice went up by $ 51 million in 2021 and cumulative exports of rice from Pakistan amounted to $2.1 billion in 2020.[4] Figure 7 shows rice export trend from the year 2010 to 2021.

[4] https://trendeconomy.com

Figure 7: Trend of Export of Rice in Pakistan



The top 5 countries export destinations of Pakistan's rice are listed below:

- China, with a share of 17.7% (381 million US$)
- Malaysia, with a share of 6.62% (142 million US$)
- Kazakhstan, with a share of 5.91% (127 million US$)
- United Arab Emirates, with a share of 5.68% (122 million US$)
- Afghanistan, with a share of 5.62% (121 million US$)

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 3.4% to the value added in agriculture and 0.6% 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 2020-21, maize was cultivated on an area of 1,418,000 hectares reflecting an increase of 1.0 % over last

year's area of 1,404,000 hectares. Its production increased by 7.4% to 8.465 million Tons compared to last year's production of 7.883 million Tons. The production increase was largely due to increase in area, availability of improved variety of seed and better economic returns. The area, production and yield of maize during the last five years are shown in Figure 8 and Figure 9.

Figure 8: Production of Maize Crops (000 tonnes)

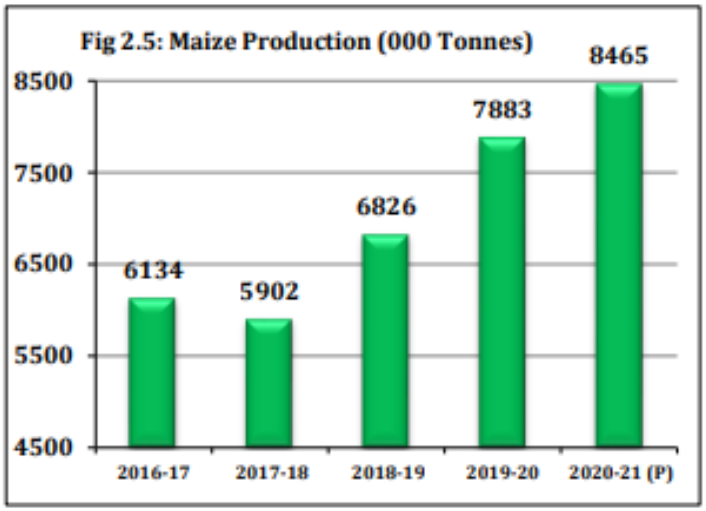


Figure 9: Area, Production and Yield of Maize in Pakistan

Maize Production (000 Tonnes)

Year	Area		Production		Yield	
	(000 Hectares)	% Change	(000 Tonnes)	% Change	(Kgs /Hec.)	% Change
2016-17	1,348	-	6,134	-	4,550	-
2017-18	1,251	-7.2	5,902	-3.8	4,718	3.7
2018-19	1,374	9.8	6,826	15.7	4,968	5.3
2019-20	1,404	2.2	7,883	15.5	5,615	13.0
2020-21 (P)	1,418	1.0	8,465	7.4	5,970	6.3

P: Provisional
Source: Pakistan Bureau of Statistics

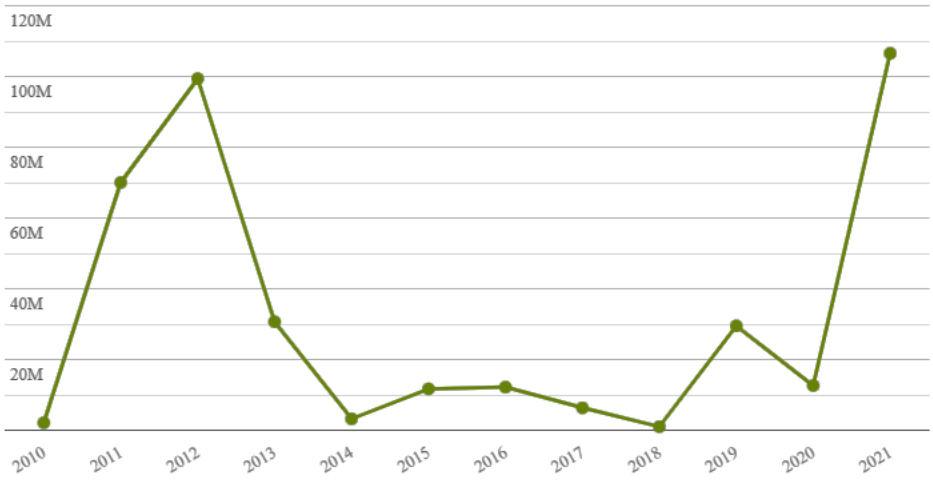
In Pakistan, maize accounts for 4.8% of the total cropped area and 3.5% of the value of agricultural output. It is planted on an estimated area of 0.9 million hectares with an annual production of 1.3 million tons. The bulk (97%) of the total production comes from two major provinces, KPK accounting for 57% of the total area and 68% of total production. Punjab contribute 38% of total area with 30% of total maize grain production.[5]

[5] https://agri.sindh.gov.pk/about-maize

Very little maize 2-3% is produced in the province of Sindh and Balochistan. Maize is also an important crop of AJK with about 0.122 million hectares of maize being planted during kharif.

The value of exports of maize from Pakistan was $106 million in 2021. Sales of maize from Pakistan went up by 743% as compared to that in 2020. The exports of maize went up by $ 93 million in 2021 and cumulative exports of maize from Pakistan amounted $12.6 million in 2020.[6] Figure 10 shows Pakistan's maize export trend.

Figure 10: Export of Maize from Pakistan



The top five export destinations of Pakistan's maize (corn) in 2021 are listed below:

- Vietnam, with a share of 47% (50 million US$)
- Malaysia, with a share of 25% (27 million US$)
- Oman, with a share of 19.1% (20 million US$)
- Bahrain, with a share of 2.16% (2.3 million US$)
- United Arab Emirates, with a share of 1.09% (1.16 million US$)

[6] https://trendeconomy.com

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, and Japan. Figure 11 shows pre-cleaner.

Figure 11: 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 12 shows grain dryer.

Figure 12: 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 13 shows tower silos.

Figure 13: Tower Silos

Silo Roof Exhaust Fans

Soli 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 14 shows silo roof exhaust fan.

Figure 14: 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 15 shows silo sweep auger.

Figure 15: 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 16 show an aeration system installed at the silos.

Figure 16: 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 17 shows Chain Bucket Conveyor System.

Figure 17: 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 18 shows moisture analyzer.

Figure 18: 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 19 shows manual weighing scale.

Figure 19: Manual Weighing Scale (Kanda)

Manual Pallet Jack

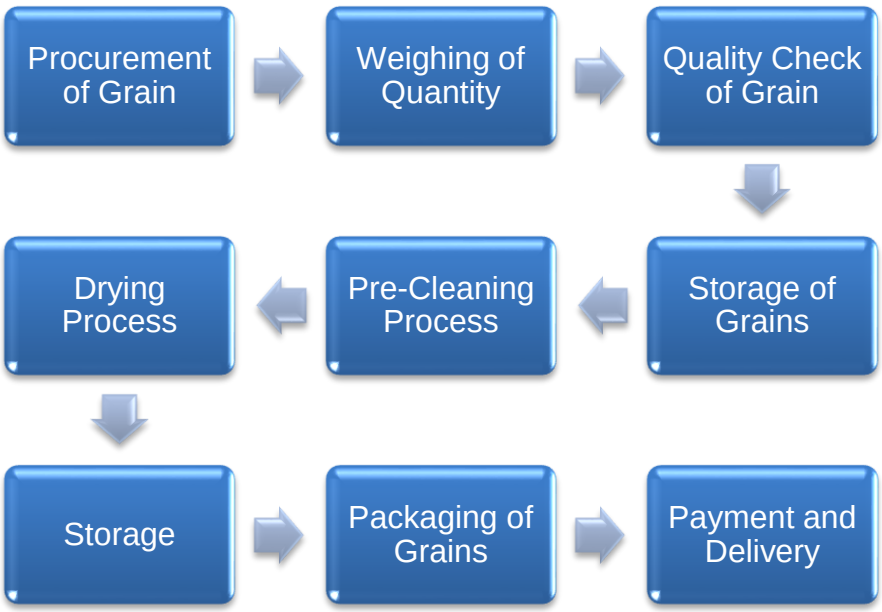
A manual pallet jack is a hand-powered jack, most commonly seen in warehousing operations. These are used predominantly for lifting, lowering and steering pallets/sacks from one place to another. Figure 20 shows manual pallet jack.

Figure 20: Manual Pallet Jack

5.4 Process Flow

The process flow of silo-based storage system is shown in Figure 21.

Figure 21: 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, Sheikhupura, 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 22 shows truck on the weighing scale.

Figure 22: 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 23 and Figure 24 shows paddy and maize respectively before and after pre-cleaning process.

Figure 23: Paddy Before and After Pre-Cleaning Process

Figure 24: 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 25 shows drying process of grain.

Figure 25: 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 26 shows transfer of grains to the silos through conveyors.

Paddy will be stored for maximum 1 year, whereas maize will be stored for maximum 6 months due to two seasons of rabi and kharif.

Figure 26: 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 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 maund 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 60% capacity utilization to store the grain during the first year of operations which is equal to 15,000 maund of paddy and 30,000 maund for maize (15,000 for Rabi and 15,000 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 60% during first year, the unit will attain maximum 90% of its total storage capacity in year 7. 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 @ 60% (Maund)
Seasonal Sale	25,000	30%	7,500	4,500
Non-Seasonal Sale		70%	17,500	10,500
Total			**25,000**	**15,000**

Table 2: Installed and Operational Capacity-Maize

Particulars	Crop Season	Period	Total Silos Storage Capacity (Maund)	Total Capacity @ 100% (Maund)	Capacity Utilization @ 60% (Maund)
Maize-DK6317	Rabi	May-Sep	25,000	25,000	15,000
	Kharif	Oct-Apr		25,000	15,000
Total				**50,000**	**30,000**

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 in 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 set 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 in 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)

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

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 99,116,137 which comprises of capital investment and working capital of PKR 60,740,145 and PKR 38,375,992 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)	Details Reference
Land	7,499,999	9.1.1
Building Rennovation / Infrastructure	23,100,000	9.1.2
Machinery & equipment	7,505,000	9.1.3
Silo Bins	7,200,000	
Office equipment	2,749,300	9.1.5
Furniture & fixtures	1,150,000	9.1.6
Office vehicles	10,468,145	9.1.7
Pre-operating costs	1,146,101	9.1.8
License	11,600	
Total Capital Cost	**60,740,145**	
Working Capital		
Spares inventory	62,542	
Consumables inventory	79,999	
Cash required (to purchase grain)	34,821,648	
Upfront insurance payment	411,804	
Cash	3,000,000	
Total Working Capital Cost	**38,375,992**	
Total Project Cost	**99,116,137**	

9.1.1 Land

The proposed unit will be set up on owned land of 3 Kanals (13,500 sq.feet). 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	3,000	450,000
Admin Office	150	3,000	450,000

Procurement Office	225	3,000	675,000
Accounts Department	225	3,000	675,000
Grain Store Area (Before transferring to Silos)	4,500	1,600	7,200,000
Quality Control Department	225	3,000	675,000
Sales and Marketing Department	225	3,000	675,000
Storage Area - Paddy (Silo and Installed Machinery)	2,500	1,500	3,750,000
Storage Area - Maize (Silo and Installed Machinery)	2,500	1,500	3,750,000
Parking and Gate area	2,400	1,500	3,600,000
Washroom	160	3,000	480,000
Total			**23,100,000**

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)	4ton/Hour	1	950,000	950,000
Dryer (18.65kw)	5ton/Hour	1	700,000	700,000
For Maize				
Pre-cleaner (2.8kw)	4ton/Hour	1	950,000	950,000
Dryer (18.65kw)	5ton/Hour	1	700,000	700,000
Other				
Roof Exhaust Fans		16	20,000	320,000
Silo Sweep Augers		4	100,000	400,000
Aeration System				500,000
Silo Temperature Control System				500,000

Chain Bucket Conveyor System				700,000
Moisture Analyzer		2	50,000	700,000
Back-up Generator (25KVA)				1,000,000
Manual Weighing Scale (Kanda)		2	20,000	40,000
Manual Pallet Jack		3	15,000	45,000
Total Cost (PKR)				**7,505,000**

9.1.4 Silo Bins

Table 11 provides details of Silo bins in the proposed unit.

Table 11: Silo Bins

Cost Item	Capacity	Number of Items	Unit Cost (PKR)	Total Cost (PKR)
For Paddy-Basmati				
Silo Bin (Dia=3600mm)	500Ton	2	1,800,000	3,600,000
For Maize				
Silo Bin (Dia=3600mm)	500Ton	2	1,800,000	3,600,000
Total Cost (PKR)				**7,200,000**

9.1.5 Office Equipment Requirement

Table 12 provides details office equipment requirement proposed for the unit.

Table 12: Office Equipment Requirement

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Laptops	6	150,000	900,000
Desktop Computers	8	50,000	400,000
Printer	3	40,000	120,000
CCTV Cameras (2MP)	24	3,000	72,000
DVR	3	14,000	42,000
LED TV (32")	2	40,000	80,000
Air Conditioners	8	105,000	840,000

Exhaust Fan	15	4,500	67,500
Bracket Fan	8	10,500	84,000
Pedastal Fan	3	10,000	30,000
Water Dispenser	2	24,000	48,000
Wi-Fi / Internet Router	2	5,000	10,000
LED Bulbs	136	300	40,800
Flood Light LED	10	1,500	15,000
Total Cost (PKR)			**2,749,300**

9.1.6 Furniture and Fixture Requirement

Table 13 gives details of the furniture and fixture required for the project.

Table 13: Furniture and Fixtures Requirement

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Executive Tables	5	60,000	300,000
Executive Chairs	5	30,000	150,000
Office Table	8	20,000	160,000
Office Chairs	14	15,000	210,000
Sofa Set	2	45,000	90,000
Visiting Chairs	10	15,000	150,000
Total Cost			**1,060,000**

9.1.7 Vehicle Requirement

Details of vehicles required for the project is given in Table 14.

Table 14: 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	121,500	364,500
Registration / Transfer Charges			103,645

Total Cost (PKR)			**10,468,145**

9.1.8 Pre-Operating Cost Requirement

Details of pre operating cost required for the project is given in Table 15.

Table 15: Pre-Operating Cost Requirement

Description	No.of Months	Total (PKR)
Administration expense	1	705,000
Utilities expense		441,101
Total (PKR)		**1,146,101**

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 16.

Table 16: Financial Feasibility Analysis

Description	Project
IRR	26%
NPV (PKR)	3,765,714
Payback Period (years)	4.54
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 17.

Table 17: Financial Feasibility Analysis with 50% Debt

Description	Project
IRR	25%
NPV (PKR)	14,277,172
Payback Period (years)	4.68
Discount rate used for NPV	22%

9.4 Breakeven Analysis

Table 18 shows calculation of break-even analysis.

Table 18: Break-Even Analysis

Description	Amount First Year (PKR)	Ratios
Sales (PKR) – A	191,998,091	100%
Variable Cost (PKR) – B	160,095,966	83%
Contribution (PKR) (A-B) = C	31,902,125	17%
Fixed Cost (PKR) – D	19,435,191	12%
Contribution Margin/ Maund	708.94	
Breakeven Revenue	116,967,741	
Breakeven (Maund)	27,415	
Breakeven Capacity	37%	

9.5 Revenue Generation

Based on 60% capacity utilization, revenue is shown in Table 19 and purchase cost for paddy (super basmati) and maize (DK-6317) during the first year of operations is shown Table 25 and Table 27 respectively.

Table 19: Revenue Generation

Particulars	Category	Revenue (PKR)	Reference
Paddy (Super Basmati)	Seasonal	25,367,727	Table 20
	Non-Seasonal	66,541,364	Table 20
Maize (DK-6317)	Rabi	42,772,500	Table 21
	Kharif	53,955,000	Table 21
Other	Cleaning Service	1,134,000	Table 22
	Drying Service	2,227,500	Table 23
Total		**191,998,091**	

Table 20: Revenue Generation-Paddy*

Particulars	Total Silos Storage Capacity (Maund)	Sale Ratio	Total Capacity @ 100% (Maund)	Capacity Utilized @ 60% (Maund)	Average Sale Price/Maund (PKR)	Revenue @ 60% Capacity (PKR)
	A	B	C=(A*B)	D=(C*60%)	E	F=(D*F)
Seasonal Sale	25,000	30%	7,500	4,500	5,637	25,367,727
Non-Seasonal Sale		70%	17,500	10,500	6,337	66,541,364
Total		**100%**	**25,000**	**15,000**		**91,905,000**

Table 21: Revenue Generation-Maize*

Particulars	Total Silos Storage Capacity (Maund)	Total Capacity @ 100% (Maund)	Capacity Utilized @ 60% (Maund)	Average Sale Price/Maund (PKR)	Revenue @ 60% Capacity (PKR)
	A	B=A	C=(B*60%)	D	E=(C*D)
Rabi	25,000	25,000	15,000	2,852	42,772,500
Kharif	25,000	25,000	15,000	3,597	53,955,000
Total		**50,000**	**30,000**		**96,727,500**

Table 22: 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 @60% (PKR)
	A	*B*	*C=A*B*8*	*D*	*E*	*F=C*D*E*	*G*	*H=F*G*	*I=H*60%*
Paddy	100	1	800	25%	150	30,000	35	1,050,000	630,000
Maize	100	1	800	25%	120	24,000		840,000	504,000
								Total	**1,134,000**

Table 23: 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 @60% (PKR)
	A	***B***	***C=A*B*8***	***D***	***E***	***F=C*D*E***	***G***	***H=F*G***	***I=H*60%***
Paddy	125	1	1,000	25%	150	37,500	55	2,062,500	1,237,500
Maize	125	1	1,000	25%	120	30,000		1,650,000	990,000
								Total	**2,227,500**

* Difference in calculation is due to rounding off.

Table 24 and Table 25 shows the calculation of weighted average purchase price of paddy (super basmati) per maund.

Table 24: 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 purchse	1,316
	November	50% of starting phase purchse 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 25: 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=(67,118,421/14,477)
October	3,290	3,490	3,490	1,316	4,592,105	4,637
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*						
February*						
March*						
Total				**14,474**	**67,118,421**	

***Price for paddy in these months is not available yet as document is prepared before these months.*

Table 26 and Table **27** shows the calculation of weighted average purchase price of maize (DK-6317) per maund.

Table 26: 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 27: 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	1,935	13,441	26,008,065	**2,052**
	June	2,168	13,441	29,139,785	*(55,147,849/26,882)*
Total			**26,882**	**55,147,849**	
Kharif	October	2,565	13,441	34,475,806	**2,597**
	November	2,629	13,441	35,336,022	*(69,811,828/26,882)*
Total			**26,882**	**69,811,828**	

Table 28: Direct Labor

Post	No of personnel	Monthly Salary (PKR)	Annual Salary (PKR)
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	40,000	480,000
Store Incharge	1	40,000	480,000
Operator-Cleaning machine	1	40,000	480,000
Operator-Dryer machine	1	40,000	480,000
Worker-Loading and Un-Loading	4	25,000	1,200,000
Total Direct Labor (PKR)			**6,840,000**

Table 29: Machinery Maintenance Cost

Cost Item	Cost of Machinery (PKR)	Machinery Maintenance Rate (%age of Machinery Cost)	Total Cost (PKR)
Maintenance Cost	7,505,000	10%	750,500

9.6 Variable Cost Estimate

Variable costs of the project have been provided in Table 30.

Table 30: Variable Cost Estimate

Description of Costs	Amount (PKR)
Paddy - Super Basmati	69,559,091
Maize - DK6317	69,727,500
Direct Electricity	3,562,165
Direct Labour	6,840,000
Consumables	959,990
Machinery repair and maintenance	750,500
Indirect electricity	1,191,046

Office vehicles running and maintenance expense	2,681,712
Office expenses (stationery, entertainment, janitorial services, etc.)	984,000
Bad debt expense	3,839,962
Total	**160,095,966**

9.7 Fixed Cost Estimate

Table 31 shows the estimated fixed cost of the project.

Table 31: Fixed Cost Estimate

Description of Costs	Amount (PKR)
Administration expense	9,840,000
Administration benefits expense	984,000
Communications expense (phone, internet etc.)	984,000
Professional fees (legal, audit, consultants, etc.)	688,800
Insurance expense	411,804
Depreciation expense	6,297,367
Amortization of pre-operating costs	229,220
Amortization of legal, licensing, and training costs	1,160
Total	**19,435,191**

Table 32: Management Staff Salary

Post	Number of personnel	Monthly Salary (PKR)	Annual Salary (PKR)
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
Sales and Marketing Manager	1	120,000	1,440,000
Assistant Sales and Marketing	2	70,000	1,680,000
Sweeper	2	25,000	600,000

Office Boy	2	25,000	600,000
Security Guard	4	25,000	1,200,000
Total			**9,840,000**

9.8 Human Resource Requirement

For the 1st year of operations, the proposed unit shall require the workforce at a salary cost shown in Table 33.

Table 33: Human Resource Requirement

Post	No.of Employees	Monthly Salary (PKR)	Annual Salary (PKR)
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	40,000	480,000
Store Incharge	1	40,000	480,000
Sales and Marketing Manager	1	120,000	1,440,000
Assistant Sales and Marketing	2	70,000	1,680,000
Operator-Cleaning machine	1	40,000	480,000
Operator-Dryer machine	1	40,000	480,000
Worker-Loading and Un-Loading	4	25,000	1,200,000
Sweeper	2	25,000	600,000
Office Boy	2	25,000	600,000
Security Guard	4	25,000	1,200,000
Total	**27**		**16,680,000**

10 CONTACT DETAILS

The contact details of all the major suppliers of machinery and equipment and raw materials are given in Table 34.

Table 34: 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
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://zghdjx.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://zghdjx.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 35: 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		25,367,727	30,312,320	36,006,373	42,551,817	50,063,631	58,671,447	68,521,347	75,579,046	83,363,688	91,950,148
Non-Seasonal		66,541,364	79,511,384	94,447,292	111,616,461	131,320,487	153,899,403	179,736,396	198,249,245	218,668,918	241,191,816
Total paddy sale		91,909,091	109,823,705	130,453,665	154,168,278	181,384,118	212,570,849	248,257,744	273,828,291	302,032,605	333,141,964
Maize											
May-Sep		42,772,500	51,109,573	60,710,310	71,746,577	84,412,239	98,925,869	115,533,776	127,433,755	140,559,432	155,037,054
Oct-Apr		53,955,000	64,471,729	76,582,495	90,504,099	106,481,089	124,789,181	145,739,082	160,750,208	177,307,479	195,570,150
Total maize sale		96,727,500	115,581,302	137,292,805	162,250,675	190,893,328	223,715,050	261,272,859	288,183,963	317,866,911	350,607,203
Other Revenue											
Cleaning Service		1,134,000	1,250,802	1,379,635	1,521,737	1,678,476	1,851,359	2,042,049	2,252,380	2,484,375	2,740,266
Drying Service		2,227,500	2,456,933	2,709,997	2,989,126	3,297,006	3,636,598	4,011,167	4,424,318	4,880,022	5,382,665
		191,998,091	229,112,741	271,836,101	320,929,816	377,252,928	441,773,856	515,583,819	568,688,952	627,263,914	691,872,097
Cost of sales											
Paddy - Super Basmati		69,559,091	83,117,317	98,730,585	116,678,395	137,276,021	160,878,917	187,887,649	207,240,076	228,585,804	252,130,142
Maize - DK6317		69,727,500	83,318,552	98,969,621	116,960,885	137,608,380	161,268,420	188,342,542	207,741,824	229,139,232	252,740,573
Direct Electricity		3,562,165	3,843,577	4,147,219	4,474,849	4,828,362	5,209,803	5,621,378	6,065,466	6,544,638	7,061,665
Direct Labour		6,840,000	7,503,480	8,231,318	9,029,755	9,905,642	10,866,489	11,920,538	13,076,831	14,345,283	15,736,776
Consumables		959,990	1,263,557	1,653,591	2,153,310	2,791,931	3,606,181	4,642,184	5,647,723	6,871,071	8,359,406
Machinery repair and maintenance		750,500	827,802	913,065	1,007,111	1,110,843	1,225,260	1,351,462	1,490,662	1,644,201	1,813,553
Total cost of sales		151,399,247	179,874,284	212,645,400	250,304,306	293,521,179	343,055,071	399,765,752	441,262,582	487,130,228	537,842,114
Gross Profit		40,598,844	49,238,457	59,190,701	70,625,511	83,731,749	98,718,785	115,818,066	127,426,369	140,133,686	154,029,983
		21%	21%	22%	22%	22%	22%	22%	22%	22%	22%
General administration & selling expenses											
Administration expense	820,000	9,840,000	10,794,480	11,841,545	12,990,174	14,250,221	15,632,493	17,148,845	18,812,282	20,637,074	22,638,870
Administration benefits expense	82,000	984,000	1,079,448	1,184,154	1,299,017	1,425,022	1,563,249	1,714,884	1,881,228	2,063,707	2,263,887
Indirect electricity	99,254	1,191,046	1,285,139	1,386,665	1,496,211	1,614,412	1,741,950	1,879,564	2,028,050	2,188,266	2,361,139
Communications expense (phone, internet etc.)	82,000	984,000	1,079,448	1,184,154	1,299,017	1,425,022	1,563,249	1,714,884	1,881,228	2,063,707	2,263,887
Office vehicles running and maintenance expen	223,476	2,681,712	2,957,928	3,262,594	3,598,642	3,969,302	4,378,140	4,829,088	5,326,484	5,875,112	6,480,249
Generator Running and Maitenance Cost (PKI	27,250	327,000	360,681	397,831	438,808	484,005	533,857	588,845	649,496	716,394	790,182
Office expenses (stationery, entertainment, jani	82,000	984,000	1,079,448	1,184,154	1,299,017	1,425,022	1,563,249	1,714,884	1,881,228	2,063,707	2,263,887
Promotional expense	159,998	1,919,981	2,291,127	2,718,361	3,209,298	3,772,529	4,417,739	5,155,838	5,686,890	6,272,639	6,918,721
Insurance expense	34,317	411,804	350,033	288,263	226,492	164,721	102,951	41,180	828,476	704,205	579,933
Professional fees (legal, audit, consultants, etc.)	57,400	688,800	755,614	828,908	909,312	997,515	1,094,274	1,200,419	1,316,860	1,444,595	1,584,721
Depreciation expense	524,781	6,297,367	6,297,367	6,297,367	6,297,367	6,297,367	6,297,367	5,208,245	9,514,015	9,514,015	9,514,015
Amortization of pre-operating costs	19,102	229,220	229,220	229,220	229,220	229,220	-	-	-	-	-
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	319,997	3,839,962	4,582,255	5,436,722	6,418,596	7,545,059	8,835,477	10,311,676	11,373,779	12,545,278	13,837,442
Subtotal		30,380,051	33,143,347	36,241,099	39,712,333	43,600,578	47,725,156	51,509,514	61,181,177	66,089,861	71,498,094
Operating Income		10,218,793	16,095,110	22,949,603	30,913,178	40,131,171	50,993,629	64,308,553	66,245,192	74,043,825	82,531,889
Other income (interest on cash)		-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of office equipment		-	-	-	-	-	-	687,325	-	-	
Gain / (loss) on sale of office vehicles		-	-	-	-	-	-	2,617,036	-	-	
Earnings Before Interest & Taxes		10,218,793	16,095,110	22,949,603	30,913,178	40,131,171	50,993,629	67,612,914	66,245,192	74,043,825	82,531,889
Subtotal		-	-	-	-	-	-	-	-	-	-
Earnings Before Tax		10,218,793	16,095,110	22,949,603	30,913,178	40,131,171	50,993,629	67,612,914	66,245,192	74,043,825	82,531,889
Tax		2,879,971	3,436,691	4,077,542	4,813,947	5,658,794	6,626,608	7,733,757	8,530,334	9,408,959	10,378,081
NET PROFIT/(LOSS) AFTER TAX		**7,338,822**	**12,658,419**	**18,872,061**	**26,099,231**	**34,472,377**	**44,367,021**	**59,879,157**	**57,714,858**	**64,634,866**	**72,153,808**

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	37,821,648	40,644,221	50,176,342	60,317,097	71,103,746	82,594,047	94,742,979	112,577,884	177,486,423	248,989,651	312,460,077
Accounts receivable		15,780,665	18,831,184	22,342,693	26,377,793	31,007,090	36,310,180	42,376,752	46,741,558	51,555,938	56,866,200
Spares Inventory	62,542	75,606	91,399	110,491	133,571	161,473	195,203	235,978	285,271	344,861	-
Consumables inventory	79,999	116,142	167,648	240,797	344,370	490,618	696,617	934,804	1,254,432	1,683,348	-
Pre-paid insurance	411,804	350,033	288,263	226,492	164,721	102,951	41,180	828,476	704,205	579,933	-
Total Current Assets	38,375,992	56,966,667	69,554,836	83,237,571	98,124,202	114,356,179	131,986,159	156,953,895	226,471,889	303,153,731	369,326,277
Fixed assets											
Land	7,499,999	7,499,999	7,499,999	7,499,999	7,499,999	7,499,999	7,499,999	7,499,999	7,499,999	7,499,999	7,499,999
Building / Infrastructure	23,100,000	20,790,000	18,480,000	16,170,000	13,860,000	11,550,000	9,240,000	6,930,000	4,620,000	2,310,000	-
Machinery & equipment	7,505,000	6,379,250	5,253,500	4,127,750	3,002,000	1,876,250	750,500	14,256,883	12,118,350	9,979,818	7,841,285
Silo Bins	7,200,000	6,480,000	5,760,000	5,040,000	4,320,000	3,600,000	2,880,000	2,160,000	1,440,000	720,000	18,006,862
Furniture & fixtures	1,060,000	901,000	742,000	583,000	424,000	265,000	106,000	2,013,630	1,711,586	1,409,541	1,107,497
Office vehicles	10,468,145	8,897,923	7,327,702	5,757,480	4,187,258	2,617,036	1,046,815	21,733,546	18,473,514	15,213,482	11,953,450
Office equipment	2,749,300	2,336,905	1,924,510	1,512,115	1,099,720	687,325	274,930	5,222,711	4,439,305	3,655,898	2,872,491
Security Against Building	-	-	-	-	-	-	-	-	-	-	-
Total Fixed Assets	59,582,444	53,285,078	46,987,711	40,690,344	34,392,977	28,095,611	21,798,244	59,816,769	50,302,754	40,788,738	49,281,585
Intangible assets											
Pre-operation costs	1,146,101	916,881	687,661	458,440	229,220	-	-	-	-	-	-
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	1,157,701	927,321	696,941	466,560	236,180	5,800	4,640	3,480	2,320	1,160	-
TOTAL ASSETS	**99,116,137**	**111,179,065**	**117,239,487**	**124,394,475**	**132,753,360**	**142,457,590**	**153,789,043**	**216,774,144**	**276,776,962**	**343,943,629**	**418,607,861**
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable		8,393,517	9,959,435	11,760,350	13,828,613	16,200,959	18,919,148	22,025,093	24,313,053	26,844,854	29,355,279
Total Current Liabilities	-	8,393,517	9,959,435	11,760,350	13,828,613	16,200,959	18,919,148	22,025,093	24,313,053	26,844,854	29,355,279
Other liabilities											
Total Long Term Liabilities	-	-	-	-	-	-	-	-	-	-	-
Shareholders' equity											
Paid-up capital	99,116,137	99,116,137	99,116,137	99,116,137	99,116,137	99,116,137	99,116,137	99,116,137	99,116,137	99,116,137	99,116,137
Retained earnings	-	3,669,411	8,163,915	13,517,988	19,808,609	27,140,493	35,753,757	95,632,914	153,347,772	217,982,638	290,136,445
Total Equity	99,116,137	102,785,548	107,280,052	112,634,126	118,924,747	126,256,631	134,869,895	194,749,051	252,463,909	317,098,775	389,252,583
TOTAL CAPITAL AND LIABILITIES	**99,116,137**	**111,179,065**	**117,239,487**	**124,394,475**	**132,753,360**	**142,457,590**	**153,789,043**	**216,774,144**	**276,776,962**	**343,943,629**	**418,607,861**

12.3 Cash Flow Statement

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		7,325,322	12,644,919	18,858,561	26,085,731	34,458,877	44,353,521	59,870,157	57,689,213	64,609,221	72,128,162
Add: depreciation expense		6,310,867	6,310,867	6,310,867	6,310,867	6,310,867	6,310,867	5,217,245	9,539,661	9,539,661	9,539,661
amortization of pre-operating costs		229,220	229,220	229,220	229,220	229,220	-	-	-	-	-
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		(15,780,665)	(3,050,519)	(3,511,509)	(4,035,100)	(4,629,297)	(5,303,090)	(6,066,572)	(4,364,805)	(4,814,380)	(5,310,262)
Spares inventory	(62,542)	(13,064)	(15,793)	(19,092)	(23,080)	(27,901)	(33,730)	(40,776)	(49,293)	(59,590)	344,861
Consumables inventory	(79,999)	(36,143)	(51,506)	(73,150)	(103,573)	(146,248)	(205,999)	(238,187)	(319,628)	(428,915)	1,683,348
Advance insurance premium	(411,804)	61,771	61,771	61,771	61,771	61,771	61,771	(787,296)	124,271	124,271	579,933
Accounts payable		8,393,517	1,565,918	1,800,915	2,068,263	2,372,347	2,718,189	3,105,944	2,287,961	2,531,801	2,510,424
Other liabilities		-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(554,344)	6,491,984	17,696,036	23,658,743	30,595,258	38,630,794	47,902,689	61,061,675	64,908,539	71,503,229	81,477,288
Financing activities											
Issuance of shares	99,206,137	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares											
Cash provided by / (used for) financing activities	99,206,137	-	-	-	-	-	-	-	-	-	-
Investing activities											
Capital expenditure	(60,830,145)	-	-	-	-	-	-	(43,397,738)	-	-	(18,006,862)
Cash (used for) / provided by investing activities	(60,830,145)	-	-	-	-	-	-	(43,397,738)	-	-	(18,006,862)
NET CASH	37,821,648	6,491,984	17,696,036	23,658,743	30,595,258	38,630,794	47,902,689	17,663,936	64,908,539	71,503,229	63,470,426

13 KEY ASSUMPTIONS

13.1 Operating Cost Assumptions

Table 36: Operating Cost Assumptions

Description	Details
Cost of price growth rate	10.3%
Machinery Maintenance – Cost	10.0% of Machinery Cost
Operating costs growth rate	10.3%
Administration benefits expense	10.0% of Admin Expense
Commuication expense	10.0% of Admin Expense
Office vehicles insurance rate	2.5%
Office expenses (stationery, entertainment, janitorial services, etc.)	10.0% of Admin Expense
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 37: Revenue Assumptions

Description	Details
Sale price growth rate	10.3%
Initial year capacity utilization	60%
Capacity growth rate	5%
Maximum capacity utilization	90%

13.3 Financial Assumptions

Table 38: Financial Assumptions

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

Table 39: Debt Related Assumption

Description of Cost	Details
Project Life (Years)	10
Debt: Equity	50:50
Discount Rate	22%

Table 40: Cash Flow Assumption

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