

Pre-Feasibility Study

(Rental Unit for Maize Silage)



Small and Medium Enterprises Development Authority

Ministry of Industries & 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. 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

Maize Silage processing unit is proposed to be located at fodder sufficient areas with suitable land, water, and climatic conditions. These areas include, Jafferabad, and Lasbela (Baluchistan), Bannu, Charsada, D.I. Khan, Kohat, Mardan, Newshehra, and Swabi (Khyber Pakhtunkhwa), Badin, Hyderabad, Mirpurkhas, Tando Adam, and Tando Jam (Sind), Arifwala, Bhurewala, Chiniot, Faisalabad, Khanewal, Multan, Melsi, Sahiwal, and Vehari (Punjab). Few areas of GB may also be considered for the project.

The proposed project will have the installed capacity of 7,488 Hours per year, but the operation will start with a capacity of 58% (4,320 Hours/Year) and continue with the same.

The total Project Cost is **Rs. 6,525,570** including the Capital Cost of **Rs. 5,000,369** and the Working Capital of **Rs. 1,525,200**. Given the cost assumptions, Internal

Rate of Return (IRR) and payback are 97% and **1.32** years respectively, hence making the project viable. The NPV @ 20% is **Rs. 38,493,201**.

The most critical consideration or factors for success of the project are:

- Location must have sufficient maize crop. It should preferably be an area with 10,000 tons, however with a minimum 6,000 tons of harvest area the machine will need to be moved to nearest area for capacity optimization.
- Availability of 03 phase electricity and tractor.
- Proximity of commercial dairy farms.

3. 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 facilitate potential investors in Maize Silage by providing them with a general understanding of the business with the intention of supporting potential investors in crucial investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business set-up and its successful management.

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

4. INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs", SMEDA has carried out 'sectoral research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

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

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

5. BRIEF DESCRIPTION OF PROJECT AND PRODUCT

The project is related to setting up Maize Silage Unit with following detail:

- **Technology:** This proposed unit will start with imported Single Row Maize Chopper and Baler. Generator may be added in case of unavailability of three phase electricity connection.
- **Location:** The unit may be located at areas having abundant maize crops and preferably nearest to dairy farms with availability of three phase electricity connection.
- **Product:** The farm will process maize silage into 50 bales per hour (60 Kg weight per bale).
- **Target Market:** Dairy farms in the nearest areas of farm's location as well as other provinces.
- **Employment Generation:** The proposed project will initially provide direct employment to 01 person by the machinery owner and 03 people by the client. The indirect employment is at the time of maize harvesting season.
- **Profitability:** The Financial Analysis shows the unit to be profitable from the very first year of the operation.

5.1) Production Process Flow

Maize Harvesting

The single row maize chopper can harvest about 4 acres crop per day, provided it is being pulled by 70 hp tractor.

Inoculant Spray

Before loading on the maize bailer and wrapper, the maize is sprayed with inoculant for better preservation. A bottle costing Rs. 8,500 per pack is sufficient for treatment of 260 bales.

Making Bales

Silage is wrapped in shape of bales weighing 60 kg each. At this stage wrapping paper and rope are required. T



5.2) Installed and Operational Capacities

Though the installed capacity of this machinery with 24 hours working and 06 Months season assumption is 7,488 hours per year but keeping in view the ground realities, the machine will operate a maximum of 12 hours a day. This report considers the maize season to be of 06 months, that is, from May to October. The farm will start with operational capacity producing 4,320 hours per year (50 bales per hour with weight of 60 Kg per bale) which is the optimum capacity as well.

6. CRITICAL FACTORS

The following factors should be considered thoroughly:

- Location must have sufficient maize crop. It should preferably be an area with 10,000 tons, however with a minimum 6,000 tons of harvest area the machine will need to be moved to nearest area for capacity optimization.
- Availability of 03 phase electricity and tractor.
- Proximity of commercial dairy farms.

7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

These areas include, Jafferabad, and Lasbela (Baluchistan), Bannu, Charsada, D.I. Khan, Kohat, Mardan, Nowshehra, and Swabi (Khyber Pakhtunkhwa), Badin, Hyderabad, Mirpurkhas, Tando Adam, and Tando Jam (Sind), Arifwala, Bhurewala, Chiniot, Faisalabad, Khanewal, Multan, Melsi, Sahiwal, and Vehari (Punjab). Though the maize production season in GB is limited to only September, but still this option may be considered for investment due to acute shortage of green fodder in the region.

8. POTENTIAL TARGET CUSTOMER/MARKETS

The product can be sold across Pakistan, especially within the areas having shortage of green fodder.

9. PROJECT COST SUMMARY

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

9.1) Project Economics

All the figures in this financial model have been calculated for installed and operational capacity as mentioned in the above section.

The following table shows internal rates of return and payback period.

Table 01 - Project Economics

Description	Details
Internal Rate of Return (IRR)	97%
Payback Period	1.32 Years
Net Present Value (NPV) @ 20%	Rs. 38,493,201

9.2) Project Financing

Following table provides details of the equity required and variables related to bank loan;

Table 02 - Project Financing

Description	Details
Total Equity (60%)	Rs. 3,915,342
Bank Loan (40%)	Rs. 2,610,228

9.3) Project Cost

Following requirements have been identified for operations of the proposed business.

Table 03: Project Cost

Description	Amount Rs.
Capital Cost	
Land (500 Sq. Ft)	300,000
Infrastructure Development	757,500
Machinery and Equipment	3,870,000
Furniture and Fixtures	-
Office Equipment	60,000
Pre-operating Cost	12,869
Total Capital Cost	5,000,369
Working Capital	
Raw Material Inventory	731,700
Upfront Insurance Payment	193,500
Cash	600,000
Total Working Capital	1,525,200
Total Project Cost	6,525,570

9.4) Space Requirement

This proposed project may be established on 500 Sq. Ft land acquired on ownership or lease. This study assumes own land for working.

Table 04: Space Requirement

Space Requirement (in Sq. ft.)	Rs/Unit	Units	Amount (Rs.)
Machinery Parking Place	3,000	225	675,000
Grounds	300	275	82,500
Total			757,500

9.5) Machinery and Equipment

Following table provides list of machinery and equipment. Costs may vary from area to area and underground water table.

Table 05: List of Machinery and Equipment

Space Requirement (in Sq. ft.)	Rs/Unit	Units	Amount (Rs.)
Single Row Maize Cutter	1,500,000	01	1,500,000
Baler	2,350,000	01	2,350,000
Miscellaneous Tools/Utensils	Lump Sum		20,000
Total			3,870,000

9.6) Furniture and Fixtures

Not required

9.7) Office Equipment

Such type of project only requires a cell phone for communication. However, in order to get things right from the beginning, following items are advised:

Table 06: List of Furniture and Fixtures

Description	Units	Cost Rs/unit	Total (Rs.)
Cell Phone	01	60,000	60,000
Total			60,000

9.8) Human Resource Requirement

Table 07: Payroll For Financial Analysis (Human Resource Requirements)

Description	No. of People	Monthly Salary /Person (Rs.)	No. of Months	Total (Rs.)
Machinery Operator	01	80,000	06	480,000
Total			06	480,000

9.9) Utilities and Other Costs (Raw Material and Other Expenses)

This working of baler is based on 108,000 bales (6,480,000 Kg) per year.

Table 08: Raw Material Cost

Item	Rs./Kg of Silage	Total Cost (Rs.)
Wrapping film	1.64	10,627,200
Rope	0.40	2,592,000
Inoculants	0.67	4,341,600
Total	2.71	17,560,800¹

Table 09: Miscellaneous

Description	Rs./Year
Machinery Maintenance	216,029
Travelling Expenses	120,000
Communication Expenses	35,000
Total	371,029

Note: For Guidance of Client (Expenses to be incurred by client)

Chopper will be attached with the tractor that may be rented or owned by the silage producing client. The electricity Rs. 0.11 per Kg of silage are based on the assumption of baler operating for 12 hours a day, and 180 days per year. Direct electricity charges will be Rs. 712,800 per cycle.

9.10) Revenue Generation

The revenue stream is calculated on the basis of service charges against provision of maize chopper and baler to farmers. The maize chopper and baler are rented out on the assumption that:

¹ 100 grams inoculants is required to treat 200 tons maize silage (3,333 bales). Similarly, as a single role of wrapping paper packs 55 bales

- Chopper is rented on per hour basis
- Baler is rented on Rs. 350/Bale, but converted to Rs./Hour for the financial model purpose

Table 9: Revenue Generation

Product	Unit	Service Charges (Rs./Unit)	First Year Production	First Year Revenue (Rs)
Acres of Land chopped	Hr.	4,500	2,160	9,720,000
Bale of 60 Kg ²	Hr.	7,500	2,160	16,200,000
			Total	25,920,000

² Practically the charges of baler are Rs. 350 per bale. This report considers the most conservative prices of Rs. 150 per bale and for uniform reporting the pattern converted into hourly basis. That is, 50 bales per hour x Rs. 150 per bale = Rupees charged per hour

10. CONTACTS

Circles International

Business: Agriculture and livestock farm and processing machinery suppliers.

Contact Person: Dr. Shabbir

Contact Detail: 18 Km Multan Road, Lahore, Punjab

Phone: +92 42 35971504-9 Fax: +92 42 35971501, Cell: 0307 7772975

Email: info@circleinternational.com.pk

Cattle Kit

Business: Agriculture and livestock farm and processing machinery suppliers.

Contact Person: Dr. Arsalan

Bata Factory, opposite Hascol Pump Maraka, Maraka Quarters, Lahore, Punjab

Phone: +92308 8880646

11. USEFUL WEB LINKS

Small & Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
Government of Pakistan	www.pakistan.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	www.sindh.gov.pk
Government of Khyber Pakhtunkhwa	www.khyberpakhtunkhwa.gov.pk
Government of Balochistan	www.balochistan.gov.pk
Government of Gilgit Baltistan	www.gilgitbaltistan.gov.pk
Government of Azad Jamu Kashmir	www.ajk.gov.pk
Security Commission of Pakistan (SECP)	www.secp.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpcci.com.pk
State Bank of Pakistan (SBP)	www.sbp.org.pk
NARC	www.parc.gov.pk

12. ANNEXURES

12.1) Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	25,920,000	28,511,999	31,363,199	34,499,519	37,949,471	41,744,418	45,918,860	50,510,746	55,561,821	61,118,003
Cost of goods sold	18,256,837	18,325,173	18,400,220	18,482,636	18,573,145	18,672,542	18,781,700	18,901,578	19,033,228	19,177,806
Gross Profit	7,663,163	10,186,826	12,962,980	16,016,884	19,376,326	23,071,876	27,137,160	31,609,169	36,528,593	41,940,197
<i>General administration & selling expenses</i>										
Administration expense	-	-	-	-	-	-	-	-	-	-
Rental expense	-	-	-	-	-	-	-	-	-	-
Utilities expense	-	-	-	-	-	-	-	-	-	-
Travelling & Comm. expense (phone, fax, etc.)	-	-	-	-	-	-	-	-	-	-
Office vehicles running expense	-	-	-	-	-	-	-	-	-	-
Office expenses (stationary, etc.)	-	-	-	-	-	-	-	-	-	-
Promotional expense	-	-	-	-	-	-	-	-	-	-
Insurance expense	193,500	174,150	154,800	135,450	116,100	96,750	77,400	58,050	38,700	19,350
Professional fees (legal, audit, etc.)	129,600	142,560	156,816	172,498	189,747	208,722	229,594	252,554	277,809	305,590
Depreciation expense	430,875	430,875	430,875	430,875	430,875	430,875	430,875	430,875	430,875	430,875
Amortization expense	2,574	2,574	2,574	2,574	2,574	-	-	-	-	-
Property tax expense	-	-	-	-	-	-	-	-	-	-
Miscellaneous expense	777,600	855,360	940,896	1,034,986	1,138,484	1,252,333	1,377,566	1,515,322	1,666,855	1,833,540
Subtotal	1,534,149	1,605,519	1,685,961	1,776,382	1,877,780	1,988,680	2,115,435	2,256,801	2,414,239	2,589,355
Operating Income	6,129,014	8,581,308	11,277,019	14,240,502	17,498,546	21,083,197	25,021,725	29,352,368	34,114,355	39,350,842
Other income	-	-	-	-	-	-	-	-	-	-
Gain / (loss) on sale of assets	-	-	-	-	-	-	-	-	-	-
Earnings Before Interest & Taxes	6,129,014	8,581,308	11,277,019	14,240,502	17,498,546	21,083,197	25,021,725	29,352,368	34,114,355	39,350,842
Interest expense	585,772	439,109	362,949	267,749	148,750	-	-	-	-	-
Earnings Before Tax	5,543,242	8,142,199	10,914,070	13,972,752	17,349,796	21,083,197	25,021,725	29,352,368	34,114,355	39,350,842
Tax	1,773,838	2,605,504	3,492,502	4,471,281	5,551,935	6,746,623	8,006,952	9,392,758	10,916,593	12,592,269
NET PROFIT/(LOSS) AFTER TAX	3,769,405	5,536,695	7,421,567	9,501,471	11,797,862	14,336,574	17,014,773	19,959,610	23,197,761	26,758,572

12.2) 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	600,000	2,026,592	3,822,131	5,446,567	7,057,737	8,680,938	10,939,403	13,328,952	15,893,166	18,664,751	23,413,928
Accounts receivable	-	2,130,411	2,236,931	2,460,625	2,706,687	2,977,356	3,275,091	3,602,600	3,962,861	4,359,147	4,795,061
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	731,700	804,870	885,357	973,893	1,071,282	1,178,411	1,296,252	1,425,877	1,568,465	1,725,311	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	193,500	174,150	154,800	135,450	116,100	96,750	77,400	58,050	38,700	19,350	-
Total Current Assets	1,525,200	5,136,024	7,099,220	9,016,534	10,951,807	12,933,455	15,588,146	18,415,480	21,463,191	24,768,558	28,208,989
<i>Fixed assets</i>											
Land	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Building/Infrastructure	757,500	719,625	681,750	643,875	606,000	568,125	530,250	492,375	454,500	416,625	378,750
Machinery & equipment	3,870,000	3,483,000	3,096,000	2,709,000	2,322,000	1,935,000	1,548,000	1,161,000	774,000	387,000	-
Furniture & fixtures	-	-	-	-	-	-	-	-	-	-	-
Office vehicles	-	-	-	-	-	-	-	-	-	-	-
Office equipment	60,000	54,000	48,000	42,000	36,000	30,000	24,000	18,000	12,000	6,000	-
Total Fixed Assets	4,987,500	4,556,625	4,125,750	3,694,875	3,264,000	2,833,125	2,402,250	1,971,375	1,540,500	1,109,625	678,750
<i>Intangible assets</i>											
Pre-operation costs	12,869	10,295	7,722	5,148	2,574	-	-	-	-	-	-
Legal, licensing, & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	12,869	10,295	7,722	5,148	2,574	-	-	-	-	-	-
TOTAL ASSETS	6,525,570	9,702,944	11,232,692	12,716,557	14,218,380	15,766,580	17,990,396	20,386,855	23,003,691	25,878,183	28,887,739
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable	-	1,527,264	1,535,655	1,544,885	1,555,038	1,566,206	1,578,491	1,592,005	1,606,870	1,623,222	1,485,221
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	-	1,527,264	1,535,655	1,544,885	1,555,038	1,566,206	1,578,491	1,592,005	1,606,870	1,623,222	1,485,221
<i>Other liabilities</i>											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	619,200	619,200	619,200	619,200	619,200	495,360	371,520	247,680	123,840	0
Long term debt	2,610,228	1,756,436	1,451,797	1,070,998	594,999	-	-	-	-	-	-
Total Long Term Liabilities	2,610,228	2,375,636	2,070,997	1,690,198	1,214,199	619,200	495,360	371,520	247,680	123,840	0
<i>Shareholders' equity</i>											
Paid-up capital	3,915,342	3,915,342	3,915,342	3,915,342	3,915,342	3,915,342	3,915,342	3,915,342	3,915,342	3,915,342	3,915,342
Retained earnings	-	1,884,702	3,710,699	5,566,133	7,533,802	9,665,832	12,001,203	14,507,988	17,233,799	20,215,780	23,487,176
Total Equity	3,915,342	5,800,044	7,626,040	9,481,475	11,449,144	13,581,174	15,916,545	18,423,330	21,149,141	24,131,122	27,402,518
TOTAL CAPITAL AND LIABILITY	6,525,570	9,702,944	11,232,692	12,716,557	14,218,380	15,766,580	17,990,396	20,386,855	23,003,691	25,878,183	28,887,739

12.3) Cash Flow Statement

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Operating activities</i>											
Net profit	-	3,769,405	5,536,695	7,421,567	9,501,471	11,797,862	14,336,574	17,014,773	19,959,610	23,197,761	26,758,572
Add: depreciation expense	-	430,875	430,875	430,875	430,875	430,875	430,875	430,875	430,875	430,875	430,875
amortization expense	-	2,574	2,574	2,574	2,574	2,574	-	-	-	-	-
Deferred income tax	-	619,200	-	-	-	-	(123,840)	(123,840)	(123,840)	(123,840)	(123,840)
Accounts receivable	-	(2,130,411)	(106,521)	(223,693)	(246,062)	(270,669)	(297,736)	(327,509)	(360,260)	(396,286)	(435,915)
Finished good inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	-	-	-	-	-	-	-	-	-	-	-
Raw material inventory	(731,700)	(73,170)	(80,487)	(88,536)	(97,389)	(107,128)	(117,841)	(129,625)	(142,588)	(156,846)	1,725,311
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	(193,500)	19,350	19,350	19,350	19,350	19,350	19,350	19,350	19,350	19,350	19,350
Accounts payable	-	1,527,264	8,391	9,230	10,153	11,168	12,285	13,514	14,865	16,352	(138,000)
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(925,200)	4,165,086	5,810,877	7,571,367	9,620,972	11,884,032	14,259,667	16,897,537	19,798,012	22,987,365	28,236,353
<i>Financing activities</i>											
Change in long term debt	2,610,228	(853,792)	(304,639)	(380,799)	(475,999)	(594,999)	-	-	-	-	-
Change in short term debt	-	-	-	-	-	-	-	-	-	-	-
Change in export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Add: land lease expense	-	-	-	-	-	-	-	-	-	-	-
Land lease payment	-	-	-	-	-	-	-	-	-	-	-
Change in lease financing	-	-	-	-	-	-	-	-	-	-	-
Issuance of shares	3,915,342	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financ	6,525,570	(853,792)	(304,639)	(380,799)	(475,999)	(594,999)	-	-	-	-	-
<i>Investing activities</i>											
Capital expenditure	(5,000,369)	-	-	-	-	-	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by invest	(5,000,369)	-	-	-	-	-	-	-	-	-	-
NET CASH	600,000	3,311,295	5,506,238	7,190,568	9,144,973	11,289,033	14,259,667	16,897,537	19,798,012	22,987,365	28,236,353

13. KEY ASSUMPTIONS

13.1) Operating Cost Assumptions

Description	Details
Hours Operational Per Day	12
Days Operational Per Month	30
Days Operational Per Year	180
Operating Cost Growth Rate (per annum)	10%

13.2) Production Cost Assumptions

Description	Details
COGS Annual Growth Rate	10%

13.3) Revenue Assumptions

Description	Details
Sales Price Growth Rate	10%
Maximum Capacity Utilization	58%
Initial Capacity Utilization	58%

13.4) Economy Related Assumptions

Description	Details
Inflation Rate	10%
Electricity Price Growth Rate	10%
Wage Growth Rate	10%