

Pre-Feasibility Study

SEED PROCESSING UNIT (Wheat & Rice)



Small and Medium Enterprise Development Authority Government of Pakistan

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1 INTRODUCTION

1.1 Project Brief

Seed processing unit is a project in agriculture sector in which Approved/Certified seeds of wheat and rice will be produced through the multiplication¹ of Basic Seed (Breeder seed), which will be acquired from seed research institutes & Seed Corporations. This business can be started in the rural and peri-urban areas. Under the proposed project, the approved seed will be processed and marketed in the local market. The processing of the seed involves cleaning, grading, treating, packing, and storing operations.

Currently, there is a shortage of the approved seed, due to which its price has spiraled up. Hence, it has become difficult for a farmer to purchase seed at a higher price. The proposed project will facilitate in fulfilling this gap and will provide wheat and rice seed suitable for sowing. Moreover, this project in the long-run can be considered as a lucrative investment because the potential for quality seed is quite high in the agriculture market.

Processing is a value addition activity which improves the physical purity and health of seed stock by removing various contaminants including undersized and shriveled grains, inert matter and seeds of other crops.

1.2 The Main Components of Undesirable Materials in Seed Lots

The harvested seeds from a Sheller or thresher or a combine harvester machine contain many types of undesirable materials.

- a) Plant parts and inert matter (stem, leave, stone, soil etc.)
- b) Weed seeds (Noxious and obnoxious).
- c) Other crop seeds (other cultivars).
- d) Seeds of the variety which are immature, broken, damaged and deteriorated.

Therefore, uncleaned seed has to be processed to remove the above mentioned contaminants to upgrade the quality of seed and to apply seed treatment with chemicals.

1.3 Types of Seed Processing Plants

There are two types of seed processing plants.

1.3.1 Mobile.

It consists of one or two combined machines. Generally, it is an air screen cleaner above or combined with an indented cylinder. A separate treater may accompany the processing machine.

¹ Multiplication is the growth of certified seeds through supplying basic seed to the selected registered growers, from whom the output of their crops of wheat and rice will be purchased.

1.3.2 Fixed

It has two types of layout which are used for processing of large quantity of seed:

a) Vertical-Processing machines are put in different floors in a multistoried building. The incoming seeds are first elevated to bins from machine on one floor to the other machine for the next operation. The ground floor is used for seed packaging and storage.

b) Horizontal-In this type of lay out, seeds are elevated in to surge bins and pass on through machine by gravity and then re-elevated for the next cleaning operation. The construction and supervision of this type of arrangement is economical than fixed type of lay out.

1.4 Opportunity Rationale

Seeds are the foundation of human and animal life on earth-the foods we eat, the fiber we wear, and most of the products we use in our daily life, are created from a seed. There is no substitute for a quality seed as quality seed is essential for growing quality crops, which ultimately results in a better quality of life.

Since the evolution of civilization, mankind has been involved in a plethora of agriculture activities but this practice has reduced with the passage of time. Today, approximately three percent of the world's population is engaged in crop production in most of the industrialized countries, yet more food is produced now than ever in history of mankind.

Agriculture sector contributes 24% of the total GDP for Pakistan. However, the massive population influx in Pakistan, has greatly burdened the agriculture sector as its productivity is not able to meet the current food requirements. Furthermore, the lands are underutilized, due to conventional farming practices i.e. use of conventional seeds, improper usage of fertilizer and pesticides, etc. One can say that the current agricultural production system has reached the 'point of diminishing returns'. Further infusion of physical inputs without basic structural and technological reforms is not going to bring a response from the agricultural sector. If the current trend is allowed to persist, not only will it put severe strain on food supplies with unimaginable social and political ramifications, but bring down the whole edifice of national economic viability because agricultural production forms the bedrock of Pakistan's industrial production.

The solution lies in concurrent and integrated approach towards re-planning the agricultural production systems in Pakistan, a part of which is also the development of better seed. The idea revolves around increasing the crop yield by developing high yielding crop seeds having disease resistance and high germination percentage.

The Government of Pakistan has also declared this sector as an industry, to meet the rising demand in the agriculture sector, especially in wheat and rice, as these two crops are considered to be the staple crops. Wheat fulfils the basic need of food of majority of the populace, whereas the rice is capable of generating great profits as it has a huge export potential.

In this context, Small & Medium Enterprise Development Authority (SMEDA) has commissioned to undertake a Pre-Feasibility study for finding the underlying potential in the seed processing industry.

1.5 Proposed Capacity

The proposed Seed Processing Unit has a maximum capacity of processing 3 tons of seed per hour. This production capacity is estimated to be economically viable and justifies the capital as well as operational costs of the project.

Table 1-1 Plant Capacity

Description	Input (Tons)	Production Per hour (tons)	Out put (%)	Production
Wheat	3	3	86%	2.58
Rice	3	3	90.00%	2.7
Total				5.28

Table 1-2 Product mix

Products	Percentage of products	Production per hour	Production per year (in tons)
Wheat Seed			
Processing Season	1 August ----- 30th November		
Wheat Seed	85%	2.55	612
Small Seed	14%	0.42	100.8
wastages	1%	0.03	7.2
Total	100%	3	720
Rice Seed			
Processing Season	1st February --- 30th April		
Paddy	90%	2.7	486
Animal Seed	9%	0.27	48.6
Wastages	1%	0.03	5.4
Total	100%	3	540

1.6 Total Project Cost

The proposed Seed Processing Unit needs a capital investment of about Rs.12.840 million which includes machinery and equipment. In addition to this, a sum of Rs.0.901 million is required as working capital, which will be used for purchasing raw seeds as well as for meeting the initial expenses of the first year.

2 CURRENT INDUSTRY STRUCTURE

Till the seventies, there was no proper mechanism for the seed processing in Pakistan. In 1976, the Government established Provincial Seed Corporations; Punjab Seed Corporation & Sindh Seed Corporation. Currently, these two Corporations are supplying

only ten percent of the cereal seeds and 30% of the cotton seed of the country's requirement. Apart from this, a few multinationals and some local processing concerns have embarked on the opportunity of realizing the potential existent in this market. However, the practice currently in vogue among the general farming community is that they still are using the part of their crop produce as seed instead of using the quality seed. The reason for the low adoption rate of the quality seed is that the corporations and agencies are supplying only 19% of the wheat seed's requirement and 7.8 % of the rice seed's requirement. The seed market in Pakistan values to approximately US\$ 468 million. The average seed requirement in Pakistan of wheat is 846,000 tons and that of rice is 625,000 tons. Currently, the availability of certified seeds is very low i.e. 19% availability against the total demand for wheat, and 7.8% availability against the total demand for rice. Furthermore, there is a vast network of seed distributors consisting of nearly 1,200 seed dealers across the country. There are approximately 300 seed companies registered with the Government, out of which nearly ten percent are active.

Table 2-1 Distribution of Improved Seed (Tons)²

Province/crop	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Punjab						
Wheat	139.96	122.53	105.02	103.87	128.59	116.75
Paddy	1.88	4.13	4.04	6.85	8.47	8.82
Sindh						
Wheat	7.85	13.40	14.98	20.43	25.00	35.37
Paddy	0.32	0.38	0.19	0.48	1.08	1.74
N.W.F.P						
Wheat	6.91	6.77	8.53	10.25	15.01	12.36
Paddy	0.01	0.27	0.19	0.17	0.17	0.00
Balochistan						
Wheat	4.50	0.55	0.88	0.96	2.60	1.87
Paddy	0.06	0.08	0.04	0.05	0.00	0.00

3 MARKETING

The marketing of approved seed will follow the existing distribution network of the seed dealers, along with the dealers of the agriculture inputs. Furthermore, the farming community has to be sensitized about the usage of the approved seed, which will not only result in enhanced productivity of crop but also lead to increased revenues for the industry. The sensitization can be achieved through a tailored campaign for achieving the

² Federal Seed Certification & Registration Department, Islamabad

desired objective- to increase the sales of the seed. The success of the industry is dependent on the timely availability of the quality seeds at the appropriate places at competitive prices and in proper packaging.

Moreover, due to a massive demand of the quality seeds in the reconstruction and development of the agriculture sector of Afghanistan, this project also has the export potential, if able to meet the international standards required for seed production.

4 RAW MATERIAL/MODUS OPERANDI

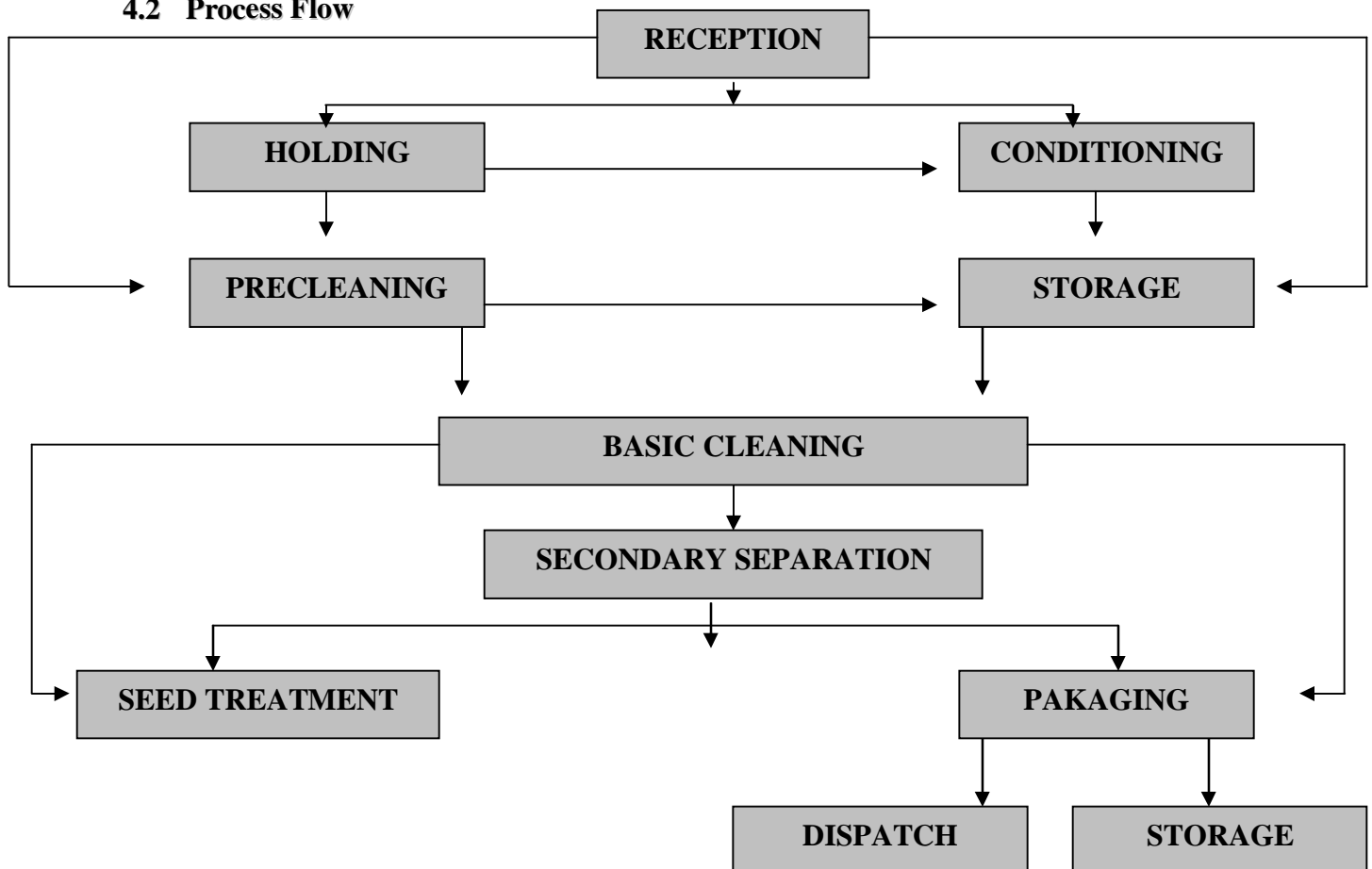
4.1 Raw Material

The raw-material for the said project will follow the following mode:

Basic Seed: The Basic Seed which is the basic raw material for the production of approved seed, can be obtained from the seed corporations.

Approved Seed: The Basic seed will be cultivated under the controlled environment at various seed farms, which will result in multiplying it and producing approved seed through processing. The approved seed is the final product of the project, which will then be distributed and sold through marketing for growing crops with higher yields.

4.2 Process Flow



4.3 Modus Operandi/Seed Processing

In the process of seed processing for wheat and rice, Basic Seed will be acquired by the entrepreneur from the seed corporations like Punjab Seed Corporation. This Basic Seed, will then be distributed among the selected growers/farmers, who will sow this seed and grow it in a controlled environment. Subsequently, the output produce from these farms of wheat and rice i.e. their crop, will be purchased by the entrepreneur for further processing. After purchasing, the processing of wheat and rice seed will be as follows:

4.3.1 Drying

At the time of harvest, the seed normally contains very high moisture content i.e. above 16% on average. In order to avoid any negative effects of high moisture, the seed has to be dried and the moisture content has to be reduced to 8-12%. If the seed is stored at high moisture content, it loses germination quickly and is infested with pest and diseases.

4.3.2 Cleaning

In order to make the seed suitable for cultivation, impurities like weeds, immature seeds, inert matters, infected seeds, other crop seeds have to be removed.

4.3.3 Grading

After cleaning, the seed requires grading. The grading is of the following types:

Length grading

The clean seed is further graded in this process from the point of view of its length and the immature/infected seeds or any foreign matter that may not have been removed in the cleaning process are removed in the length grading process.

Gravity Separating

Gravity separating is followed after length grading and is helpful in removing light and immature seeds having low germination.

Treating

This process is followed after gravity separating. In the process, a suitable fungicide and color is used to protect the seed from fungus and various soil related diseases. The color also gives a suitable appearance to the seed and proving that a check has been performed, confirming that all seeds have been uniformly treated.

Packing

To avoid any moisture contents the processed seed is stored in bags which are stored properly.

5 HUMAN RESOURCE REQUIREMENTS

The proposed Seed Processing Unit requires the following human resources/staff:

Table 5-1

Positions	Required	Salary per Month	Salary per Annum
Chief executive	1	75,000	900,000
General Manager	1	60,000	720,000
Agronomist	1	25,000	300,000
Researcher	1	18,000	216,000
Field Assistants	2	8,000	192,000
Plant operators	4	6,500	312,000
Plant Supervisor	1	12,000	144,000
Sales officers	2	12,000	288,000
Accounts Assistant	1	12,000	144,000
Store Keeper	1	6,500	78,000
Guard	2	6,000	144,000
peon/sweeper	2	5,000	120,000
Total	19		3,558,000

6 MACHINERY & EQUIPMENT DETAILS

The type of equipment needed for the Seed Processing Unit is as under:

Table 6-1 Plant and Machinery³

Description		Unit Cost	Total Cost
Pre Cleaning System	1		
Gravity Separating System	1		
Length Grader	1	1,150,000	1,150,000
Elevator	4		
Rotary Dryer Plant	1	700,000	700,000
Treater Plant Iron	1	400,000	400,000
Generator	1	100,000	100,000
Total			2,350,000

7 OFFICE EQUIPMENT

Following equipment will be required to cater the needs of administrative block.

Table 7-1 Required Office equipment

Description	Quantity	Cost / Rate	Amount
Computers	1	25,000	25,000
Computer printer (s)	1	12,000	12,000
Telephones	2	3,500	7,000

³ Alhamra Mechanical Works, Bhawalnagar Road Kabula Sharif, Tel # 0457-851110, 852430

Fans	5	1,850	9,250
Total			53,250

Table 7-2 Furniture and Fixtures

Furniture & Fixtures	Price per unit	Quantity	Total cost
chairs	3,500	10	35,000
tables	6,000	5	30,000
stools	500	4	2,000
Lighting	10,000		10,000
Total			77,000

8 LAND & BUILDING

8.1 Recommended Mode for Acquiring Land

It is recommended that the proposed project should be started in an acquired land, which is approximately 8 kanals (one acre). The land should be somewhere near the major cities of Punjab in a rural or a peri-urban location, preferably near Lahore, but outside the municipal limits.

Table 8-1 Land Requirement

Required Land (in sq. ft)	In kanals	Per Marla Cost	Total Cost
36,000	8	150,000	1,200,000

8.2 Infrastructure Requirements

The project will have the following infrastructure components:

Table 8-2 Construction Cost

Space requirement	In sq.ft	Cost per sq. Ft	Construction Cost
Production Hall	3,200	650	2,080,000
Stores	4,800	650	3,120,000
Office	360	850	306,000
Security Room	80	850	68,000
Total Covered Area	8,440		
Open Space	27,560	100	2,756,000
Total	36,000		8,330,000

9 PROJECT ECONOMICS

9.1 Project Cost

The cost of the project will be as follows:

Head	Cost (Rs.)
Land	1,200,000
Building	8,330,000
Furniture	77,000
Office equipment	53,250
Plant & Machinery:	2,350,000
Preliminary Expenses ⁴	180,000
Office vehicle ⁵	650,000
Sub total	12,840,250
Total working capital	901,733
Total Project Cost	13,741,983

9.2 Project Return

Project's Internal Rate of Return (IRR)	38%
Payback Period (Years)	3.68
Net Present Value (NPV) (Rs)	12,256,164

9.3 Financing Plan

Financing	Share	Rs
Sponsors Equity	50%	6,870,991
Bank Finance	50%	6,870,991

9.4 Estimated Time Frame for Project Completion

The estimated time frame for the completion of the project will be one year.

10 KEY SUCCESS FACTORS

There are a number of factors which contribute towards the success of a project. In case of the project of Seed Processing Unit, some of the Key Success Factors are as follows:

- The seed must be free from inert material, weed seed and seed of other varieties and crops; have safe moisture content; have high germination and vigor; and be relatively free of damage and disease. The seed must also be treated, bagged and labeled properly.

⁴ Includes ,utility connection charges, salaries of administrative staff and expense related to company's incorporation

⁵Price of Suzuki Shehzore

- The harvested seed must be dried to the level of safe moisture content. This is to reduce physiological activity and damage from storage fungi and insects.
- Generally, seed has contaminants of various kinds when it comes into the processing plant, especially if it has been harvested with an improperly adjusted combine or thresher or threshed directly on the ground. Cleaning can be done because seeds differ in length, width, thickness, density, shape, surface texture, color, affinity for liquids, and electrical conductivity, but the most commonly used characteristics are seed size and density. Cleaning increases the seed quality by improving physical purity and germination. That means that inert matter must be removed.
- After the seeds are treated, they are bagged, labeled and stored. Bagging and labeling should be done so that the content of the bag can be guaranteed to farmers purchasing the seed.
- Seeds should be stored under conditions, which maintain seed quality. The ambient conditions and the storage period will determine the type of storage that is required.
- Relative humidity and temperature are very important. High relative humidity and high temperature reduce the viability of seed.
- All inside parts of cleaning machines should be accessible so that hidden seeds can be removed.
- All seed plants should have an internal seed-quality control system. Laboratories to assess quality before and after processing and to monitor the efficiency of the different processing machines are essential.
- While planning and purchasing seed plants, it is important to include sufficient spare parts. Proper maintenance is essential.
- Only properly-trained seed staff should operate plants. A comprehensive training program needs to go hand in hand with the establishment of new seed plants.

11 THREATS FOR THE BUSINESS

11.1 Government Regulations

Various government regulations such as price regulations and red-tapism in the process of seed certification can result in delaying the intended project plan.

11.2 Inadequate supply of other agriculture inputs

Inadequate supply of agriculture inputs such as fertilizer, irrigation water, pesticides, etc. can result in hampering the intended project benefits.

11.3 Mis-leading Research

Improper identification of varieties, which are not suitable for the Pakistani climatic and agriculture conditions, or varieties prone to diseases, or requiring high inputs (having low returns on investment) can be a major threat to the project.

11.4 Intrusion in Production Chain

Since this project is dependent on the contract growers, therefore, if the entrepreneur is not able to maintain a controlled environment through constant monitoring mechanism, it may result in the altered seed variety, hence resulting in disturbing the production chain.

11.5 Weak Marketing

Weak or improper marketing strategies can result in failure of the project.

12 REGULATIONS

12.1 Mandatory Registration of Seed Processing Units, Dealers: Higher Fines for Substandard Sale Proposed

ISLAMABAD (August 01 2007): The government is making registration of private sector companies, seed dealers and seed processing units mandatory, to settle legal disputes, and enhance penalties on sale of substandard seed, official sources told Business Recorder.

These measures would be taken through amendments in the `ineffective` Seed Act 1976, to be placed before the Cabinet in its meeting on Wednesday. The Ministry of Food, Agriculture and Livestock (Minfal) is of the view that the existing Seed Act is unable to meet the changing scenario of the emerging seed industry and the requirements of private sector.

Moreover, the definitions given in the Act are not compatible with the advancement in the field of seed technology and trade. The penalties given in the Seed Act are not deterrent to curb the sale of substandard seed in the market, which is one of the reasons to propose amendments in the Act, sources said

Minfal, after detailed consultations with the stakeholder, has proposed following amendments in the Seed Act, 1976.

- a) Renaming the department to meet legal proceedings in the court and addition of more compatible definitions of various terms.
- b) Registration of private sector companies, seed dealers and seed processing units to settle the arising legal disputes.
- c) Access to pre-basic seed to the private sector, provision for which did not exist before.
- d) Training of private seed sector personnel, especially to work under WTO regime.
- e) Enhancement of penalties/fines for effective seed enforcement.
- f) Promotion of research in seed science and technology to strengthen seed industry and the research-based regulatory mechanism.
- g) Restriction on sale of unapproved/banned varieties and effectively control various cheating practices through the provision of misbranding clause.

- h) Registration of plant variety and horticulture nurseries; and
- i) Establishment of accredited seed testing laboratories in public as well as in private sector.
- j) Establishment of federal seed and variety evaluation committee

The Federal Seed Certification & Registration Department controls the quality of seeds. This department has the following functions:

- Registration of the Growers
- Field inspection of the Crops
- Sampling and testing of seeds
- Control of the quality of seeds
- Certification of Seeds
- Issuance of the quality certificate

This department, for achieving the quality standards and for insuring genetic identity/purity of seeds, adopts the following modus operandi for seed certification;

Field Inspections

Field Inspections are carried out for determining the crops in which seed development is necessary. Furthermore, the origin and history as well as the progress of various seeds is also determined during these inspections.

Seed Tests

The department also carries out various laboratory tests, which includes germination, purity analysis, moisture analysis, seed diseases, seed pests, seed health.

13 FINANCIAL ANALYSIS

13.1 Projected Income Statement

Rs(000)

	Year - I	Year - II	Year - III	Year - IV	Year - V	Year - VI	Year - VII	Year - VIII	Year - IX	Year - X
Sales/Revenue	11,856	13,715	15,860	18,213	20,790	23,612	26,697	30,068	33,747	37,759
<i>Cost of Sales</i>	<i>2,464</i>	<i>2,424</i>	<i>2,401</i>	<i>2,392</i>	<i>2,398</i>	<i>2,430</i>	<i>2,462</i>	<i>2,507</i>	<i>2,564</i>	<i>2,632</i>
Gross Profit	9,392	11,292	13,459	15,820	18,393	21,182	24,235	27,561	31,183	35,126
Operating Expenses:										
Electricity	144	145	147	148	150	151	153	154	156	157
Administrative Salaries	2,394	4,215	4,425	4,647	4,879	5,123	5,677	5,960	6,259	6,571
Printing & Stationary	24	24	24	25	25	25	25	26	26	26
Entertainment	48	48	49	49	50	50	51	51	52	52
Marketing	119	107	96	86	78	70	63	57	51	46
Telephone Fax and Postage	48	48	49	49	50	50	51	51	52	52
<i>Administrative Expenses</i>	<i>2,777</i>	<i>4,588</i>	<i>4,791</i>	<i>5,005</i>	<i>5,232</i>	<i>5,470</i>	<i>6,020</i>	<i>6,300</i>	<i>6,595</i>	<i>6,906</i>
<i>Consultants share</i>	<i>2,371</i>	<i>2,743</i>	<i>3,172</i>	<i>3,643</i>	<i>4,158</i>	<i>4,722</i>	<i>5,339</i>	<i>6,014</i>	<i>6,749</i>	<i>7,552</i>
Operating Profit	4,244	3,960	5,497	7,173	9,003	10,989	12,876	15,247	17,838	20,669
Financial Charges	914	721	529	337	144	-	-	-	-	-
Profit before Taxation	3,330	3,239	4,968	6,836	8,859	10,989	12,876	15,247	17,838	20,669
Taxation 13%	416	405	621	855	1,107	1,374	1,609	1,906	2,230	2,584
Profit after Taxation	2,914	2,834	4,347	5,982	7,751	9,616	11,266	13,341	15,609	18,085
Acc. Profit b/f	-	2,914	5,748	10,095	16,076	23,828	33,444	44,710	58,052	73,660
Accumulated Profit c/f	2,914	5,748	10,095	16,076	23,828	33,444	44,710	58,052	73,660	91,745

13.2 Projected Cash flow Statement

(000)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Profit before Financial Charges & Taxation	4,244	3,960	5,497	7,173	9,003	10,989	12,876	15,247	17,838	20,669
Amortization	27	23	20	17	14	12	10	9	7	6
Depreciation	1,076	968	871	783	705	634	571	513	462	416
	5,347	4,951	6,387	7,973	9,722	11,636	13,457	15,769	18,308	21,090
Working Capital Change	(367)	(58)	(68)	(74)	(81)	(89)	(98)	(107)	(117)	(127)
Cash from other Sources										
Owners	6,871	-	-	-	-	-	-	-	-	-
Bank Finance	6,871	-	-	-	-	-	-	-	-	-
	13,742	-	-	-	-	-	-	-	-	-
Total Sources	18,722	4,893	6,319	7,899	9,641	11,546	13,359	15,663	18,191	20,963
Applications:										
Fixed Assets	11,933	-	-	-	-	-	-	-	-	-
Preliminary Expenses	180	-	-	-	-	-	-	-	-	-
Re -Payment of Loan	2,288	2,096	1,903	1,711	1,518	-	-	-	-	-
L C Charges	-	-	-	-	-	-	-	-	-	-
Tax	416	405	621	855	1,107	1,374	1,609	1,906	2,230	2,584
	14,818	2,501	2,524	2,565	2,626	1,374	1,609	1,906	2,230	2,584
Cash Increase/(Decrease)	3,904	2,392	3,795	5,333	7,015	10,173	11,750	13,757	15,961	18,380
Opening Balance	-	3,904	6,297	10,092	15,425	22,440	32,613	44,362	58,119	74,080
Closing Balance	3,904	6,297	10,092	15,425	22,440	32,613	44,362	58,119	74,080	92,460

13.3 Projected Balance Sheet

Rs(000)

	Year - I	Year - II	Year - III	Year - IV	Year - V	Year - VI	Year - VII	Year - VIII	Year - IX	Year - X
Fixed Assets										
Land	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Buildings	7,497	6,747	6,073	5,465	4,919	4,427	3,984	3,586	3,227	2,904
Office Equipment	45	38	33	28	24	20	17	15	12	10
Plant & Machinery	2,115	1,904	1,713	1,542	1,388	1,249	1,124	910	910	819
Total Fixed Assets	10,857	9,889	9,018	8,235	7,530	6,896	6,325	5,812	5,350	4,934
Preliminary Expenses	153	130	111	94	80	68	58	49	42	35
Current Assets:										
Accounts Receivable	395	457	529	607	693	787	890	1,002	1,125	1,259
Cash in Hand / Bank	3,904	6,297	10,092	15,425	22,440	32,613	44,362	58,119	74,080	92,460
	15,310	16,773	19,749	24,361	30,743	40,363	51,635	64,982	80,597	98,688
Owners Equity:										
Capital	6,871	6,871	6,871	6,871	6,871	6,871	6,871	6,871	6,871	6,871
Accumulated Profit	2,914	5,748	10,095	16,076	23,828	33,444	44,710	58,052	73,660	91,745
Long Term Loan	5,497	4,123	2,748	1,374	-	-	-	-	-	-
Current Liabilities:										
Current Portion of Long Term Loan	-	-	-	-	-	-	-	-	-	-
Accounts Payable	28	31	35	39	44	49	54	60	66	72
	15,310	16,773	19,749	24,361	30,743	40,363	51,635	64,982	80,597	98,688

14 KEY ASSUMPTIONS

Table 14-1 Production Assumptions

Number of Machines	10
Seasonal Production Capacity (tons)	3 ton per hour

Table 14-2 Operating Assumptions

Hours operational per day		8
Shifts Per Day		2
Days operational for Wheat	1 August - 30 November	120
Days operational for Rice	1 February – 30 April	90
Days operational per Year (factory)		300

Table 14-3 Economy/Agriculture Related Assumptions

Electricity consumption growth rate	10 %
Electricity price growth rate	6.5 %
Wage growth rate	5%
Inflation	6.5%

Table 14-4 Cash flow Assumptions

Account receivable cycle (days)	30
Account payable cycle (days)	15

Table 14-5 Revenue Assumptions

Wheat	18
Small Seed	10
Rice	26
Animal Seed	4
Sales growth rate	10% per annum
Sales price growth rate	6.5% per annum

Table 14-6 Expense Assumptions

Purchase price per kg (wheat) from the farmer	Rs.15.6
Purchase price per kg (rice) from the farmer	Rs.16.275
Promotional expenses (% age of expected sales)	1%
Machine maintenance per annum	1% of project cost
Raw material price growth rate	6.5%
Depreciation method	Straight Line

Table 14-7 Financial Assumptions

Project life	10 Years
Debt: equity	50:50
Interest rate on debt	14%
Debt tenure	5 years
Debt payment per year	2