

Model Project Report on Dal Milling Plant

Government of West Bengal

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PROJECT PROFILE OF PULSE/DAL MILL

I. INTRODUCTION

Pulses refer to the dried, edible seeds of leguminous crops. Pulses play a fundamental role as a low-fat, high fibre source of protein and an essential component of traditional food baskets. These are most essential element for a well-balanced diet and major source of protein to vegetarian people of India. There are several varieties of pulses in India. Most of them are produced and consumed locally. Chickpeas (Chana), pigeonpeas (Arhar / Toor Dal), Urad (Urad Dal), Mung (Moong) and red lentils (Masoor) are the top five pulses grown in India. These pulses account for over 80 per cent of the total production in the country. The conversion of pulses seed into Dal is done through the process of milling.

The traditional method of Dal milling is very cumbersome and produces inferior quality Dal resulting in lesser benefit compared to milled Dal. The present losses being encountered by the milling industry can be minimized to a great extent by the use of improved Dal mills. A Dal mill should be located in area rural or semi-urban area which have excess production of pulses and connected to market.

II. OBJECTIVES

The commercial Dal milling will have a following objective

- Production of Dal from pulses which should be free of husks, stones and other foreign material
- Improve milling efficiency and minimization of losses using improved Dal mills.

III. RAW MATERIAL AVAILABILITY

Pulses constitute an essential part of the Indian diet. The country produces a quarter of the world's pulses, accounting for the largest share in world production. The production of pulses in India for the year 2010-11 was 18.24 million tons of which 0.18 million tons was shared by West Bengal.

IV. MARKET OPPORTUNITIES

The market for pulses/Dal is present largely in India where ninety per cent of the produce is consumed locally. Conservatively, taking the national consumption norm of 2.8 kg and the total population of nine crore in the West Bengal region, the demand for pulses is estimated at over 2.5 lakh tonne per year. There is no organised Dal milling activity in the region. The total production of pulses in the region is estimated to be 180 thousand tonne. Assuming that 80% of this quantity is available for Dal milling, there is scope for setting of new Dal milling units. Setting up a Dal-mill allows farmers to engage in value addition & more profits.

V. PROJECT DESCRIPTION

- **Product and its Uses**

Pulses are generally used along with rice and Chapatti as Dal. Dal, garnished with onions, tomatoes and spices is an indispensable nibble in household. Split chick peas converted into fine flour, which is used for making sweet dishes, snacks and mixed with wheat flour for making Chapattis (flat bread).

- **Capacity**

The capacity of the unit depend upon number of factors such availability of raw materials, market potential and investment capacity of the entrepreneurs. The capacity also depends upon the availability of technology and degree of automation. Keeping all these factors into consideration a capacity of 4800 MT of pulses per annum with a finished product of 4180 MT of processed pulses has been considered for this model.

- **Manufacturing Process with Flow Chart**

In the first step of Dal milling, the cleaned and size graded raw pulses are scarified followed by oil and water addition. An emery roller machine is used to obtain cracking and scratching of clean pulses passing through it. For loosening of husk, to facilitate the subsequent oil penetration this is required. A screw conveyor allows passing the scratched or pitted material through it and mixing of some edible oil like linseed oil is completed. The linseed oil is used at the rate of 1.5 to 2.5 kg/tones of pulses. In the second step, the removal of husk and splitting into two cotyledons is done by passing the material through pulse de-husker. In one pass or single operation, about 50% of pulses are de-husked. De-husked split pulses are separated by sieving and the husk is aspirated off.



VI. PROJECT COMPONENTS

- **Land and Land Development**

The project needs to be set up in an ideal location free from water logging and good connectivity of road and other infrastructure facilities. A Dal mill requires a factory shed of approximately 1000 sq.mt. Therefore, in order to construct sheds for housing machinery, utilities and other miscellaneous fixed assets with a scope for future expansion, a land area around 0.5 acre has been considered enough for the project. The land should have load bearing capacity to withstand the load. If the land is purchased for the cost of the same can be reckoned toward promoters' contribution in the project subject to a ceiling of 10 per cent of the project cost. The cost of land @Rs.5 lakh/ acre works out to Rs.2.50 Lakhs. The cost of land development will vary from place to place, however, cost of land development considered is Rs. 5.0 Lakhs.

- **Building and Civil Works**

A Dal mill requires a factory shed of 1000 sq. meter. The shed should have proper ventilation and windows should be provided with a standard wiremesh to restrict the entry of insects. The construction cost is considered as Rs. 6000 per sq. meter. Hence, the total construction cost for built up area is Rs.60.00 Lakh. Another 300 sq. meter area is required for office, lab boundary wall, parking area etc. An amount of Rs. 10.00 Lakh is necessary to take care of miscellaneous civil work.

- **Plant and Machinery:**

S. No	Name of Machinery	Qty (Nos.)	Cost (Rs/unit)	Value (Rs.)
1	Combined grain Cleaner with Motor & Blower of capacity 2 ton per hour, complete	1.00	2,10,000.00	2,10,000.00

	with all Std. Accessories.			
2	Modern mini Daal Mill of capacity 500kg per hour, with Screw Press, Roller Machine, Air Blower, Pneumatic Arrangement & all other Std. Accessories, but without Electric Motor.	2.00	3,75,000.00	7,50,000.00
3	Grains Polisher Machine of capacity 500kg per hour, complete set, with Blower & Electric Motor, & including all Std. Accessories.	2.00	2,20,000.00	4,40,000.00
4	All Required Elevators & accessories set	2.00	1,50,000.00	3,00,000.00
5	15 H.P Electric Motor, of CROMPTON make, TEFC Model, Complete with Starters And Main Switch.	2.00	43,000.00	86,000.00
6	Platform Digital Weighing Machine of Weighing Capacity up to 100kg, complete set.	2.00	18,000.00	36,000.00
				18,22,000.00
	Taxes, transportation and installation			2,86,616.176
		Grand Total in INR Lakh		21.09

- **Miscellaneous Fixed Assets**

The cost of miscellaneous fixed assets will be approximately Rs. 5.00 Lakhs. Cost of miscellaneous fixed assets includes cost of office furniture and other infrastructure, telephone installation, electrical infrastructure etc.

- **Preliminary Preoperative Expenses**

There will be different preoperative expenses like registration, establishment, travelling, market survey, administrative, interest during construction period, trial run expenses etc. Rs 17.00 Lakhs is required to pay these expenses.

- **Contingency**

Contingency charges are considered as a 2 % of the cost of project excluding the pre-operative expenses.

- **Margin Money for Working Capital**

Margin money for working capital is considered for one cycle in the project cost while calculating the project components.

VII. PROJECT COST

S.	Particulars	Amount
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No.		(Rs. In Lakhs)
1	Land & Land Development	07.50
2	Civil Works	70.00
3	Plant & Machinerics	21.09
4	Miscellaneous Fixed Assets	05.00
5	Working Capital Margin Money	50.41
5	Preliminary & Preoperative Expenses	17.00
6	Contingency	02.02
Total Project Cost		173.01

VIII. MEAN OF FINANCE

S. No.	Source of Finance	Amount (Rs. In Lakhs)
1	Equity (25%)	043.25
2	Term Loan from Bank (75%)	129.76
Total Project Cost		173.01

IX. WORKING CAPITAL ASSESMENT

The working capital required to run the plant is worked as underassessment is given as under:

(Rs in Lakh)

Working Capital Assessment				
Particulars	Days	Yr1	Yr2	Yr3
Raw material	15	53.12	84.99	95.62
WIP	5	18.06	28.90	32.52
Finished Goods	15	54.19	86.71	97.55
Debtors	21	76.25	122.67	137.84
Total		201.63	323.27	363.52
Creditors		0	0	0
Total		0	0	0
WCG		201.63	323.27	363.52
Margin	25%	50.41	80.82	90.88
MPBF		151.22	242.45	272.64
Interest	14%	21.17	33.94	38.17

- **Manpower Requirement**

- a. **Administrative and Supervisory**

Designation	Quantity	Salary Per Month
Factory Manager	1	30000.00
Clark	1	14000.00

Operator	1	10000.00
Store Keeper	1	11000.00
Skilled Worker	10	6000.00
Unskilled Worker	10	5000.00
Guard	1	5000.00
Peon	4	5500.00
Total Salary in INR Lakh		24.24

b. Unskilled Labour

Ten labours are required for unskilled work like handling, packing etc. Wages per person per months Rs. 5000/-. This would be cost for Rs. 6.00 Lakhs per annum.

X. PROJECT PROFITABILITY

- Installed Capacity and Capacity Utilization**

The installed capacity of the plant is processing of 4000 MT of pulses per year. During first year only 50% capacity will be utilized and in second year 80% and from third year onwards 90% of total capacity will be utilized.

- Yield and Production**

Product	Yield in %	Total Production in MT
Tur Dal	87%	1392
Urad Dal	87%	1392
Mung Dal	87%	1392

- Sales Revenue**

S. N.	Products	Price/MT (Rs)	Income/year (Rs in Lakhs)
1	Tur Dal	53500.00	744.72
2	Urad Dal	54000.00	851.68
3	Mung Dal	56000.00	779.58
Total Sale at 100% CU			2275.92

- Profit Calculations**

Particulars	Amount (Rs. In lakhs)				
Installed Capacity (MT of pulses/ Year)	4000				
Years	1	2	3	4	5

Capacity utilization (%)	50	80	90	90	90
Income					
1 Tur Dal	372.36	595.78	670.25	670.25	770.40
2 Urad Dal	375.84	601.34	676.51	676.51	676.51
3 Mung Dal	389.76	623.62	701.57	701.57	701.57
Total income	1137.96	1820.74	2048.33	2048.33	2148.48
Total expenditure	1095.93	1762.56	1980.56	1980.76	1981.48
PBDIT	42.03	58.18	67.77	67.56	167.00
Depreciation	10.68	12.51	11.01	9.69	8.54
Interest on term loan	15.57	15.57	14.97	13.65	12.33
Interest on working capital	21.17	33.94	38.17	38.17	38.17
Intangible assets written off	0.00	3.40	3.40	3.40	3.40
Profit after depreciation and interest	-5.39	-7.24	0.22	2.65	104.57
Tax @ 36%	0.00	0.00	0.08	0.96	37.64
PADIT	-5.39	-7.24	0.14	1.70	66.92
Surplus available for repayment	20.86	20.83	26.12	25.04	87.79

XI. FINANCIAL PARAMETERS

- Cash Flow Statement**

The statement of cash flow is concerned with the flow of cash in and out of the business.

Cash inflow= Equity + Loan from bank + cash accruals from the business

Cash Out flow= Increase in fixed assets + Repayment of term loan + Preoperative expenses + cash required for the payment of dividend

Particulars	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
Cash Inflow	178.31	5.26	11.15	11.39	75.46
Cash outflow	173.01	5.00	11.00	11.87	25.87
Opening Balance	0.00	5.29	5.56	5.70	5.23
Surplus	5.29	0.26	0.15	-0.48	49.59
Closing Balance	5.29	5.56	5.70	5.23	54.82

- Break Even Analysis**

Particulars (Rs. In Lakhs)	Year 1	Year 2	Year 3	Year 4	Year 5
Sales Revenue	1137.96	1820.74	2048.33	2048.33	2148.48
Total Variable Cost	1083.84	1734.14	1950.91	1950.91	1950.91

Contribution	54.12	86.60	97.42	97.42	197.57
Total Fixed Cost	27.66	43.89	44.37	43.00	42.14
Break Even Point (%)	51.11	50.68	45.55	44.14	21.33

The unit is expected to breakeven at approximately 51% capacity utilisation and during the third year breakeven will be at 45%.

- **Debt Service Coverage Ratio (DSCR)**

• DSCR	Year 1	Year 2	Year 3	Year 4	Year 5
Coverage Available	20.86	20.83	26.12	25.04	87.79
Debt	15.57	20.57	25.97	24.65	37.33
DSCR Ratio	1.340	1.013	1.006	1.016	2.352
Average DSCR Ratio	1.70				

The debt service coverage ratio based on the assumed techno economic parameters is found satisfactory. The average DSCR is 1.70

- **Internal Rate of Return (IRR)**

The internal rate of return is found to be more the 50% and BCR is about 1.03.

- **Projected Balance Sheet**

Liabilities	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Equity	43.25	43.25	43.25	43.25	43.25	43.25	43.25
Term Loan	129.76	124.76	113.76	102.76	77.76	52.76	27.76
Reserve & Surpluses	-5.39	-12.64	-15.89	-18.46	44.20	113.10	182.60
Total	167.62	155.38	141.12	127.55	165.21	209.12	253.62
Assets							
Gross Fixed Assets	156.01	156.01	156.01	156.01	156.01	156.01	156.01
Less Depreciation	10.68	23.19	34.20	43.89	52.42	59.95	66.58
Net Fixed Assets	145.33	132.82	121.82	112.13	103.59	96.07	89.43
Intangible Assets	17.00	17.00	13.60	10.20	6.80	6.80	6.80
Cash & Bank Balance	5.29	5.56	5.70	5.23	54.82	106.25	157.38
Total	167.62	155.38	141.12	127.55	165.21	209.12	253.62
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TNW	210.88	198.63	184.37	170.81	208.47	252.37	296.87
TOL	129.76	124.76	113.76	102.76	77.76	52.76	27.76
TOL/TNW	0.62	0.63	0.62	0.60	0.37	0.21	0.09

XII. ASSUMPTIONS

- a. The unit will work for 8 hours a day for 300 days per annum.
- b. In first year 50% of installed capacity would be utilized and in second year 80% and from third year onwards the capacity utilization will be 90% of installed capacity.
- c. The wages for unskilled workers are taken as per prevailing rates in this type of industry.
- d. Interest rate for term loan is 12% per annum and that is for working capital is 14% per annum.
- e. Margin money considered at 25% of the financial outlay.
- f. Insurance charges for the fixed assets considered as 0.5% of the depreciated cost of the assets.
- g. Repayment period of eight years with one year grace period for repayment of principal.
- h. Costs of machinery and equipment are based on average prices of machinery manufacturers.
- i. Power cost is considered as Rs. 6.00 per unit and that for the fuel is Rs. 55 per litre whereas the rate may vary from urban to rural.
- j. The cost of water is considered as 30 paisa per L.
- k. Repair and maintenance is considered as a percentage of total project cost excluding preliminary preoperative expenses, land and land development cost. The percentages are 0.10, 0.25 and 0.5 for first three years respectively and 0.75 for fourth year onwards.
- l. The administrative expenses will be considered as Lump sum Rs. 50 thousand per annum.
- m. The 0.5% of total income would be considered to take care of promotion and marketing expenses.
- n. Insurance of the fixed assets is a function of their depreciated cost. It is considered as a 0.5% of depreciated cost (WDV method) of assets.
- o. Land cost is considered as Rs.5 Lakh per acre.
- p. Taxes assumed on the plant and machinery may vary from state to state.

SUPPLIER OF PLANT AND MACHINERY

1. Shankar Engg. Corp.
Burdwan, (W.B), India
Branch Office:
CA-230, Sector-1,
Salt Lake
Kolkata-700064, (W.B)
2. Rising Industries
Teghoria Loknath Mandir, Jhowtala,
Ghosh Dutta Para, Near Honda Service Center,
Tanushree Apartment, Kolkata - 700157,
West Bengal, India

3. Kissan Agro Industries,
No. 115, Vill Holambi Khurd,
Near Railway Station, Narela ,
New Delhi - 110082, Delhi, India

4. Suan Scientific Instruments & Equipments
P - 814, Ground Floor, Block - A,
Lake Town , Kolkata - 700089,
West Bengal, India

5. Rathore & Company
Plot No. 27, S - III, Gali No. 6,
Mangal Bazaar Road, Swarn Park Extension 1,
Nangloi, New Delhi - 110041, Delhi, India