Techno-Economic Project Report

on

Dal Mill Tur Dal

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Kothurd Pune

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Chapter I

PROJECT HIGHLIGHTS

I. About the Promoter

Name	Onkar Kulkarni
Address	Kothurd Pune
Educational Qualifications	BE
Experience Experience	10
PAN No.	AOBPK0543D
Aadhar Card No.	7774584
Constitution	Proprietary
Industry	Food Processing
Project Location	Pune

II. Project Parameters

Product	Dal Mill
Product Type (if any)	Tur Dal
Processing Capacity tons per day	1
No. of Working Days	300

III. Financial Highlights

Cost of Land	50000
Cost of Building	150000
Plant & Machinery	80000
Miscellaneous Fixed Assets	0
Preliminary Expenses	10000
Pre-Operative Expenses	20000
Working Capital	850000
Total Project Cost	1160000
Own Contribution	33%
Term Loan	67%
Rate of Interest (In % per Annum)	14%
Repayment Period	8
Rate Per KG	25

Chapter II

ABOUT THE PROJECT

Pulses occupy an important place in human nutrition due to their high protein content than cereal grains. In Indian dietary regime it occupies an important place. Since majority of Indians are vegetarians, they depend largely on grain legumes (pulses) for their dietary protein. Legumes contribute a major portion of lysine in the vegetarian diet. They are also a fairly good source of vitamins like thiamine, machine, riboflavin and much needed iron.

'Pulses' - also called 'grain legumes' â€“ is the name given to the edible dried seeds of leguminous plants. Legumes are plants which produce a double-seamed pod containing a single row of seeds. They are quite different to cereals/ grain which are the seeds of a grass plant.

Pulses have been a main food source in the diets of many cultures around the world for thousands of years. Pulse crops are one of the most sustainable crops a farmer can grow, with many varieties needing much less water and energy input than grain crops with a comparable nutritional yield. Being legumes they also contribute to soil fertility by fixing nitrogen in the soil.

Dal Mill is a processing unit that processes various types of pulses produced from farm. In India there are Dal mills located across various regions where ample raw material is available. In view of diverse food culture or cuisine diversity seen across the country, a wide range of pulses are used. The common types of dals processed are Tur, Chana, Moong, Masoor, and Urad dal. The raw material is processed in dal mill by removing husk / outer cover. Then it is divided in smaller portions (split pulses) which are used for cooking. In order to have increased shelf life and appearance, the dal is polished using different edible oils. Pulses with their outer hull intact are also quite popular in India as the main cuisine. Over 50 different varieties of pulses are known and used in India.

Technological Aspect / Technology Used in the Project

The proposed dal mill could have lower energy consumption & may be less capital intensive in nature, with high de-husking efficiency (about 88% to 90% maximum potential recovery of splits).

There are many agricultural universities; ICAR recognized institutions in the country which have played a large role in developing improved dal mills. Some of these institutes are PKV Akola, CFTRI-Mysore, CIAE Bhopal etc. Such advanced technologies are deployed in the project.

Selection of Location : Proposed Project Site / Location Details

The proposed project may be located either near the pulses producing regions in India; or in the vicinity of the major markets (consumption centres) such as Mumbai, Kolkata, Chennai, Hyderabad and New Delhi.

Typically Commercially viable Unit Size

The typical commercially viable unit size may range from 0.5 tons per day onwards.

Other relevant details (In the context of the project)

A typical Dal Milling Unit

A typical dal mill unit is simple in construction and easy to operate and easy to maintain. It has been developed for de-husking and splitting of a wide range pulses. It consists of horizontal tapered roller the roller is covered with emery coating surrounded by screen through which husk powder is discharged. The shelled dals pass through aspirating fan on oscillating sieve unit where appropriate grading of dals is done. The vibratory sieves are provided with different size holes to match the requirements of the type of dal being processed.

Process of Dal Milling

Basic processes involved in dal milling are cleaning, grading, conditioning, de-husking, splitting, and separation, polishing and bagging. Some type of customization is involved with de-husking process only. Sometimes various types of edible oils also used during dry milling operation to impart shine or better appeal to the milled dal. The removal of the outer layer of husk and splitting the grain into two equal halves is known as milling of pulses. To facilitate de-husking and splitting of pulses alternate wetting and drying method is used.

Process Description

Basic processes involved in dal milling are cleaning & grading, conditioning, de-husking, splitting, and separation, polishing and bagging.

Cleaning & Grading

Cleaning & grading consists of a vibratory inclined sieve, hopper, grain collector, waste collector and motor. The vibratory sieves are providing with different size holes to match the requirements of the type of dal being process. The vibrations are inducing by a cam-operated link, which is mounts on a motor driven shaft.

Conditioning

Pitting of dalls: An emery roller machine is used for cracking the husk layer and for scratching of clean pulses passing through it. This is done for loosening the husk from sticking to the cotyledons in order to facilitate subsequent oil penetration in the following unit operations. Gradually the clearance between the emery roller and cage (housing) is narrowed from inlet to outlet. Cracking and scratching of husk takes place mainly by friction between pulses and emery as the material is passed through the narrowing clearance. During the operation some of the pulses are de husked and split which are separated by sieving.

Pretreatment with oil and water: A screw conveyor allows passing the scratched or pitted material through it and mixing of some edible oil is complete. The edible oil is used at the rate of 1.5 to 2.5 kg/tones of pulses. These are keeping on floors as required to diffuse the oil.

De-husking, Splitting

For de-husking of conditioned pulses emery stone coated emery rollers are used. In one pass about 50-75% of pulses are de husked. De-husked pulses are split into two parts. De-husked split pulses are separated by sieving and the husk is aspirated off. For complete de-husking and splitting the whole process is repeated two to three times.

Separation, polishing and packaging (Pre Milling)

To obtain best results during de-husking and splitting of pulses in the pulse de husking machine, pre milling including grading of pulses size wise is very essential. The raw pulses are first clean of dust, chaff, stones and other extraneous materials. Sieves grade cleaned pulses or pulses graded and soaked in water in cement's tanks having 6" depth. Height of pulses soaked is 5" and the water level should be 1" above the pulses.

Soaked pulses are taken out of the water after specific time and put on the sieve. Swollen pulses which do not pass through sieve (from which un-swollen pulses earlier passed through the same) are ready for heaping in shade whereas the pulses which pass through the same sieves. Then these pulses are ready for heaping in shade. Degree of happing of swollen pulses in shade should be 30 to 40. This process should be continuing until the pulses are swill to the desired extent. This is followed by pulses arranged in thin layers in the open sun drying. Duration of sun drying of pulses vary according to weather condition prevailing at the time of processing.

After sun drying, the pulses are again heap in shade so moisture contents in the pulses may become uniform as need in them for de-husking. Then the pulse are graded again fed in to the pulse de husking machine in Jas mini dal mill in graded lots to achieve he best results with minimum brokenness.

Chapter III

MARKETING FEASIBILITY

Global and Indian Overview of Pulses

Pulses are seeds of annual legumes that include plants such as Bambara beans, dry beans, horse beans, dry chickpeas, cow peas, dry lentils, lupins, dry peas, pigeon peas, and vetches that are used for feeding humans as well as cattle. Pulses play an important and varying role in farming systems and in the diets of poor people worldwide. They are ideal in achieving three developmental goals in developing countriesâ€"improving nutrition and health conditions, reducing poverty through higher food security, and enhancing ecosystem resilience.

Besides their nutritional benefits and use as cattle feed, pulses production provides a number of agronomic advantages to the producers. The rotational benefit of pulses tends to raise the supply of soil nitrogen, reducing, as a result, the requirement of not only additional nitrogenous chemical fertilizers for the following crops, but also that of chemical pesticides and weedicide, disrupting thereby the periodical crop disease and insect cycles.

A multi-layer planning horizon by farmers would capture such benefits through pulses cultivation for the crops grown the year after pulses, realizing their optimum yields, and lower, consequently, the cost for herbicides and fungicides.

The worldâ€™s major producers of pulses are India, Canada, China, Myanmar and Brazil, which together account for half of the global output.

India is the largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses in the world.

Pulses account for around 20% of the area under food grains and contribute around 7-10 per cent of the total food grains production in the country. Though pulses are grown in both Kharif and Rabi seasons, Rabi pulses contribute more than 60 per cent of the total production.

The area under pulses has increased from 19 million ha. in 1950-51 to 25 million ha. till date, indicating an increase of 31% whereas the production of pulses during the same period has increased from 8.41 million ha. to 19.27 million ha. till date.

Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and Karnataka are the top five pulses producing states.

Government Initiatives (in the context of the project)

The policy prescription for ensuring reasonable price to the farmers largely centres on procuring the pulses by providing Minimum Support Prices (MSP) to the farmers through National Agricultural Cooperative Marketing Federation of India (NAFED) and more recently through Small Farmers Agri Consortium (SFAC). The movement of MSP for major pulses in the last five years has exhibited a continuous growing or increasing trend.

Way Forward

Pulses have tremendous scope for area expansion. According to the estimates, about 2.5 million ha. Of additional area can be brought under different pulses through cropping system improvisation like moong bean and urad bean as catch crop in summer/spring under cereal based cropping systems, intercropping short-duration pulses (moong bean, urad bean, cowpea) in sugarcane, millets, cotton, etc. advocating new cropping systems such as pigeon peaâ€“wheat in the north, riceâ€“lentil in the east and urad beanâ€“rice in the southern peninsula. Pulses have captured the attention of the United Nations and General Assembly of the UN has voted to declare 2016 as the â€˜International Year of Pulsesâ€™. The Food and Agriculture Organization of the United Nations (FAO) has been nominated to facilitate the implementation of the Year in collaboration with Governments, relevant organizations, non-governmental organizations and all other relevant stakeholders. The Year and future provides an unique opportunity to encourage connections throughout the food chain that would better utilize pulse-based proteins, further global production of pulses, better utilize crop rotations and address the challenges in the trade of pulses.

Chapter IV

FINANCIAL DETAILS

II. Project Parameters

Product	Dal Mill
Product Type (if any)	Tur Dal
Processing Capacity tons per day	1
No. of Working Days	300

A. PROJECT COST

Sr. No.	Title	Cost.
A1	Land	50000
A2	Building	150000
A3	Plant & Machinery	80000
A4	Miscellaneous Fixed Assets	0
A5	Preliminary Expenses	10000
A6	Pre-Operative Expenses	20000
A7	Working Capital	850000
	Total Project Cost	**1160000**

B. Means Of Finance

Sr. No.	Title	%	Cost
B1	Promoter's Contribution	33	382800
B2	Term Loan	67	777200
		Total means of finance	**1160000**

PROFITABILITY / WORKING RESULTS

Sr.No.	Particulars	Operating Years							
		1	2	3	4	5	6	7	8
(A) SALES									
1	Annual Capacity In Tons	300	300	300	300	300	300	300	300
2	Capacity Utilization in %	70	75	80	85	90	95	95	95
3	Annual Production	210	225	240	255	270	285	285	285
4	Unit Sale Price	25	25	25	25	25	25	25	25
5	Annual Sale	5250000	5625000	6000000	6375000	6750000	7125000	7125000	7125000
(A) COST OF MANUFACTURE									
6	Raw Material Consumed	4725000	5062500	5400000	5737500	6075000	6412500	6412500	6412500
7	Packing & Other Consumables	15000	15750	16538	17365	18233	19145	20102	21107
8	Utility Cost	52500	56250	60000	63750	67500	71250	71250	71250
9	Repairs & Maintenance	0	0	0	0	0	0	0	0
10	Labour Charges	105000	112500	120000	127500	135000	142500	142500	142500
11	Other Direct Cost	105000	112500	120000	127500	135000	142500	142500	142500
12	Inventory Add:Opening/Purchase	0	0	0	0	0	0	0	0
SUB TOTAL (6 to 12)		**5002500**	**5359500**	**5716538**	**6073615**	**6430733**	**6787895**	**6788852**	**6789857**
GROSS PROFIT		**247500**	**265500**	**283462**	**301385**	**319267**	**337105**	**336148**	**335143**
(C) ADMINISTRATIVE & SALES EXPENSE									
13	Administrative Charges	5000	5250	5513	5789	6078	6382	6701	7036
Operating Cost (B+C)		5007500	5364750	5722051	6079404	6436811	6794277	6795553	6796893
(D) EBDIT		**242500**	**260250**	**277949**	**295596**	**313189**	**330723**	**329447**	**328107**
14	Financial Expenses	108808	108808	108808	108808	108808	108808	108808	108808
15	Depreciation	12000	12000	12000	12000	12000	12000	12000	12000
(E) EBT		**121692**	**139442**	**157141**	**174788**	**192381**	**209915**	**208639**	**207299**
16	Provision for Tax	18254	20916	23571	26218	28857	31487	31296	31095
(F) EAT		**103438**	**118526**	**133570**	**148570**	**163524**	**178428**	**177343**	**176204**
17	Net Cash Accruals	103438	221964	355534	504104	667628	846056	1023399	1199603
18	Repayment	108808	108808	108808	108808	108808	108808	108808	108808

Projected Repayment Schedule

Year	1	2	3	4	5	6	7	8
Loan Outstanding	7.77	7.77	5.71	3.94	2.42	1.11	-0.02	-0.99
Gross Surplus	0	1.19	1.34	1.49	1.64	1.78	1.77	1.76
Principal	0	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Interest	0	1.09	0.80	0.55	0.34	0.16	-0.00	-0.14
Total Repayment	0	2.06	1.77	1.52	1.31	1.13	0.97	0.83
Net Surplus	0	-0.87	-0.43	-0.04	0.33	0.66	0.81	0.93
DSCR	0	0.02	0.02	0.02	0.03	0.03	0.03	0.03

Project Financial Parameters

ECONOMIC INDICATORS

Pay-back period : 7 to 8 Years

Average DSCR : 0.02

Financial Ratios

PROFITABILITY / WORKING RESULTS

Particulars	Operating Years							
	1	2	3	4	5	6	7	8
1)Return On Investment(ROI)								
EAT to Capital Employed	8.92%	10.22%	11.51%	12.81%	14.10%	15.38%	15.29%	15.19%
2)Internal Rate of Return (IRR)								
EAT to Net Worth	29.43%							
3)Consumables to Sales	95.29%	95.28%	95.28%	95.27%	95.27%	95.27%	95.28%	95.30%
4)EBT to Sales (N.P. Ratio)	2.32%	2.48%	2.62%	2.74%	2.85%	2.95%	2.93%	2.91%
5)Operating Ratio	95.38%	95.37%	95.37%	95.36%	95.36%	95.36%	95.38%	95.39%

Product	Dal Mill
Processing Capacity tons per day	1
No. of Working Days	300
Cost of Project	1160000
Term Loan	777200
Own Contribution	382800
Rate of Interest (In % per Annum)	14
Repayment Period	8
Debt to Equity Ratio	
DSCR (Average)	0.02
Project IRR (In %)	29.43

Chapter V

SWOT ANALYSIS

Strengths

* A large consumer base and an annual demand growth of about 15% pushing industrial conglomerates to expand their agricultural products portfolio with branded pulses.
* Huge market potential exists as out of total 18 million tonnes pulses market in India, only 10% to 15% is accounted for by organized players.
* As the basic features of pulses remains the same, corporates look for safety and hygiene as a branding exercise to attract larger consumers.

Weaknesses

* Pulses are in short supply in India; hence a significant part is met through imports.
* Dependence on imports affects the prices of the commodity (pulses) and prompts many consumers to compromise on quality.
* Lack of high-yielding crop varieties, fluctuating prices and an inefficient public procurement system in the country affects the commodity market.

Opportunities

* Growing retail industry pushing the concept of branded pulses.
* Large domestic market ensures consistent demand of pulses.
* India despite being the largest producer of pulses is also the largest importer, due to the perceived large consumption.
* With pulses, the global trade system is largely dependent on India, due to its high production and consumption.

Threats

* Competition from the imports.
* Pulses unlike cereals and vegetable oils, are highly substitutable especially with eggs, meat and fish, etc. For those consumers not concerned with daily protein intake, they can be substituted with vegetables like potatoes, while milk is consumed for protein.

Chapter VI

CONCLUSIONS AND RECOMMEDNATIONS

As stated earlier, pulses occupy an important place in human nutrition due to their high protein content than cereal grains. In the Indian context, considering the dietary regime pulsed do have an important place. Since majority of Indians are vegetarians, they depend largely on grain legumes (pulses) for their dietary protein. Legumes contribute a major portion of lysine in the vegetarian diet. They are also a fairly good source of vitamins like thiamine, machine, riboflavin and much needed iron.

In view of the above and increasing population and demand for food grains, we foresee a good scope for pulses. The said project seems to be technically and financially feasible.