MINI RICE MILL

1. INTRODUCTION:

India is the second largest producer of rice in the world. The major portion of the paddy is being processed through hullers. The hullers are usually low capacity mills. In these hullers, both shelling and polishing operations are carried out simultaneously. Hence, there is no control on the polishing of rice, bran and higher breakage of rice occurs. To overcome all these a mini rice mill was designed to meet the needs of the villagers and a substitute for a huller mill, to get polished rice, rice bran and paddy husk. Paddy in its raw form cannot be consumed by human beings. Therefore, it needs to be suitably processed for obtaining rice. Basically, rice milling is the process that helps in removal of hulls and bran's from paddy grains to produce polished rice. If you live in a highly paddy producing area, you can establish a rice mill plant of your own.The improved rice mills have a better husk and rice bran aspiration system. The same prevents mixing of finely broken with rice bran. Therefore, the quality of rice bran obtained is better. First of all, you must figure out the requirement of the area. Generally, it broadly depends on two aspects. Whether the unit will be using a parboiling unit for pre-treatment of paddy before the commencement of milling operation or it will be directly milling raw paddy.

2. PRODUCT & ITS APPLICATION:

Rice is the kernel part of paddy and is obtained by removal of the paddy husk and thin layer of bran. Rice milling is the process of removal of these and then polishing it. The whole process has to be accomplished with care to avoid breakage of rice and improve recovery. The rice again is available in the husk, market in two varieties- Raw and parboiled. The raw rice is obtained by simply milling the raw paddy, while parboiled variety is the one in which the paddy is first partly boiled and dried before milling. Par boiled rice is preferred in some parts of the country such as Assam, West Bengal, Orissa, some parts of Bihar etc. The

process of milling for both is same except the boiling part of paddy. The milling process provides whole rice as the main product and Husk, Bran and Broken rice as Bye products. Husk is sold in the market as a fuel, Bran for extraction of Oil and broken rice is consumed as a cheaper variety of rice.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Anyone can start this project. There is no special requirement for promoter, as this is an old traditional project. However, adoption of new machineries is the demand of present process.

4. INDUSTRY LOOKOUT AND TRENDS

India is the second largest rice producer in the world after China, with 21% of the global production share. The rice production has increased by 3.5 times in the last 60 years. The country's productivity is higher than Thailand and Pakistan at 2.2tons/ha. Major rice producing states in India are West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab, Tamil Nadu, Odisha, and Bihar. India has been the top exporter in global rice trade, accounting for 25% of the export in the last four years. Indian rice caters to the Middle East and Africa for non-Basmati, and the EU and the US for Basmati variety.

The drought-affected crop during the 2014-15 crop year has put a crunch on the Indian rice market. However, a better monsoon forecast, government intervention, and better farming practices are expected to result in higher yield despite lower crop acreage. Overall, the sentiment for the global rice market is moderate in terms of market demand and production for the next five years. The country's rice market is competitively positioned, as the pricing of the rice crop is cheaper than any other country, except Pakistan. India's MSP of non-Basmati paddy is around USD 224/MT.

Climatic conditions are affecting the rice production in the major producing regions of India. Levy procurement by state governments has enhanced the market availability of the crop in the domestic market. As a major global development, Iran has lifted the ban on import of

Basmati from India. This development would result in an increase in Basmati rice exports to Iran, the world's largest importer of aromatic rice. Indonesia has also decided to open its market to Indian rice, which would further help India to diversify its export reach to the Indonesian market. Amid higher demand from the African and Middle Eastern countries, India is expected to emerge as the largest exporter of rice, both for basmati and non-basmati crops.

Surplus rice stockpiles and improved methods of production have helped India position itself competitively in the global rice trade market. Several medium-to-small sized private companies from the open market are undertaking the export of rice in India.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

Rice being the staple food of majority population, no problem is envisaged in marketing. Besides, the mill can be utilised as a service unit for custom milling. It also noticed the tribal are going for long distance to convert paddy to rice for domestic consumption. Thus, there exists demand for non-trading rice mill in some important centres. Rice is an essential food for the population of India. India is a large market with a widening middle-income group and an increasing number of double-income households. It holds great potential for the packaged rice segment. The by-product of such Mills, Rice bran, could find great demand as raw material among solvent Extraction Plants.India leads globally in the production and export of Basmati rice. The country has exported 37,02,260.12 MT of Basmati Rice to the world for the worth of Rs. 27,597.87 crores during the year 2014-15. Major export destinations are Saudi Arabia, Iran, United Arab Emirates, Iraq and Kuwait. Rice mill plant is the largest agro-processing industry of the country. Establishing rice mill plant is a profitable business in India. Rice is a staple food in most parts of the country particularly in South, East and North Eastern States. It is also consumed on regular basis in Kashmir and not so regularly in the Northern states of Punjab, Haryana and some parts of Uttar Pradesh. The demand for any food product is always there particularly if it is a regular diet item like Rice or wheat. It is an essential for survival. It is consumed by all the members of the population

may be either in fine costly variety by rich or the coarse cheap variety by the poor. The demand for rice will always be there so long the humanity survives.

6. RAW MATERIAL REQUIREMENTS:

Rice is the most important staple food crop in India. It provides food for 65% of the population in India. The crop occupies about 37 % of the total cropped area and 44% (2001-02 position) of the total production of food grains in India. West Bengal is the leading producer of paddy in the country. It accounts for 16.39% of the total production, and the other leading states are Uttar Pradesh (13.38%), Andhra Pradesh (12.24%), Punjab (9.47%), Orissa (7.68%) and Tamil Nadu (7.38%); the remaining states account for 33.45% of the production. Generally, 1.00 to 1.50 acre of land is required for establishing an improved rice milling unit having an installed processing capacity of 2 MT/ hr. The total power requirement will to the tune of 75 KW. However, the essential power requirement of the unit is about 90 HP. Additionally, you have to arrange water for parboiling and domestic consumption purpose. Therefore, you must ensure suitable arrangements for continuous water supply of desired quality and quantity. The basic raw material for the unit is paddy which is locally available.

7. MANUFACTURING PROCESS:

Rice milling unit operation includes several steps. Those are:
Step 1 Pre-Cleaning: Removing all impurities and unfilled grains from paddy
Step 2 De-stoning: Separating small stones from paddy
Step 3 Parboiling: It helps to improve the nutritional quality by gelatinization of starch inside the rice grain. It improves the milling recovery percent during deshelling and polishing/whitening operation
Step 4 Husking: Removing husk from paddy
Step 5 Husk Aspiration: Separating the husk from brown rice/ unhusked paddy
Step 6 Paddy Separation: Separating the unhusked paddy from brown rice
Step 7 Whitening: Removing all or part of the bran layer and germ of brown rice

Step 8 Polishing: Improving the appearance of milled rice by removing the remaining bran particles and by polishing the exterior of the milled kernel

Step 9 Length Grading: Separating small and large broken from head rice

Step 10 Blending: Mixing head rice with predetermined amount of broken, as required by the customer

Step 11 Finally, weighing and bagging. This is the last step in rice mill plant operation. Preparing the milled rice for transport to the customer. The process of rice milling for retrieval of rice kernel is an age old one. Even today in villages' rice is de-husked from paddy manually by women using wooden bars and wooden vessels. The paddy is constantly subjected to slow soft hammering for removing the husk sheath and then the fine bran layer is removed. The modern rice mill converts this manual process into a mechanized one using mechanical devices. The process comprises cleaning of the paddy to remove stones, dust, chaff etc. The cleaned lot is fed into the de-husker machine where with the help of rubber rollers husk is separated. The Brown rice so obtained is then taken to huller where polishing is done by mild friction created within the polishing chamber. The resulting polished rice and bran are separated and collected. Recovery of edible rice is around 80%.

8. MANPOWER REQUIREMENT :

The enterprise requires 6 employees as detailed below**:**

Sr. No.	**Designation**	**Salary**	**Salary ₹**	**Number of Employees**				
	Working Staff		**Per Annum**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
2	Operators	20000	12000	1	1	1	1	1
3	Helpers	12000	20000	2	2	2	2	2
			32000	3	3	3	3	3
1	**Fixed Staff:**							
2	Admin Manager	15000	15000	1	1	1	1	1
	Office Boy	9000	9000	1	1	1	1	1
	Sub-Total		24000	3	3	3	3	3
	Total		56000	6	6	6	6	6

9. IMPLEMENTATION SCHEDULE:

The project can be implemented in 4 months' time as detailed below:

Sr. No.	Activity	Time Required
1	Acquisition of premises	2.00
2	Construction (if applicable)	2.50
3	Procurement & installation of Plant & Machinery	2.50
4	Arrangement of Finance	1.00
5	Recruitment of required manpower	1.00
	Total time required *(some activities shall run concurrently)*	4.00

10. COST OF PROJECT:

The project shall cost ₹18.40 lacs as detailed below:

Sr. No.	Particulars	₹ in Lacs
1	Land	0.00
2	Building	0.00
3	Plant & Machinery	8.00
4	Furniture, other MiscEquipments	1.50
5	Other Assets including Preliminary / Pre-operative expenses	0.80
6	Margin for Working Capital	8.10
	Total	**18.40**

11. MEANS OF FINANCE:

The margin is considered at 25 % and bank finance at 75 %

	Particulars	₹ in Lacs
1	Promoter's contribution	4.60
2	Bank Finance	13.80
	Total	**18.40**

12. WORKING CAPITAL CALCULATION:

The project requires working capital of ₹ 5.40 lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	4.05	0.25	1.01	3.04
2	Receivables	2.03	0.25	0.51	1.52
3	Overheads	2.03	100%	2.03	0.00
4	Creditors	-		0.00	0.00
	Total	8.10		3.54	4.56

13. LIST OF MACHINERY REQUIRED:

Machines are: Raw paddy cleaner cum aspirator consisting of large aspiration of desired suction width. It must be fitted with double fans with necessary damper controls. One rubber roll paddy sheller Paddy Separator to separate unshelled paddy from deshelled paddy. Blowers, husk and barn aspirators for aspiration of light particles. It also separates husks from dehusked kernels and bran from milled rice. Cone type paddy polishers Rice grader/ aspirator for purification and grading of polished rice grains Bucket elevators for bulk transport and conveyance. The average Rs 6.5 Lakh /10-20 tonnes per day

Specifications: Output: 950-1350 kg/hr Power: 17.95 kW Motor(1set) Weight of Machine: 1090 kg. Measurement: 2600x2560x2850

Sr. No.	Particulars	UOM	Qtty	Rate (₹)	Value (₹ in Lacs)
	Plant &Machinery / Equipments				
a)	***Main Machinery***				
1	Semi Automatic Rice Mill	NOS	1	6.50	6.50
2	Storage And Handling	NOS	1	0.50	0.50
3	Cleaning And Sorting	NOS	1	0.50	0.50
4	Testing, Packing Machine	L.S.	1	0.25	0.25
5	Utility Equipments	L.S.	1	0.25	0.25

	Installation, Taxes And Transportation	L.S.		0.50	0.50
	Sub-Total				**8.00**
	Furniture / Electrical Installations				
a)	Office Furniture	LS	1	50000	0.00
b)	Stores Cupboard	LS	1	50,000	0.50
c)	Computer & Printer	LS	1	50000	0.50
	Sub Total				**1.50**
	Other Assets				
a)	Preliminary And Preoperative				0.80
	Sub-Total Other Assets				0.80
	Total				**10.30**

All the machines and equipments are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to have modern and flexible designs. It may be worthwhile to look at reconditioned imported machines, dies and tooling. Some of the machinery and dies and tooling suppliers are listed here below:

1. Fry-Tech Food Equipments Private Limited
S. No. 4, Raviraj Industrial Estate,
BhikhubhaiMukhi Ka KuwaBharwadvash,
Ramol, Ahmedabad - 380024,
Gujarat, India

2. Hindustan VibrotechPvt. Ltd.
Office No. 2, Ground Floor,
Vrindavan Building, Vile Parle East,
Mumbai – 400057,
Maharashtra, India

3. Electrons cooling systems Pvt. Ltd.

S-27, SIDCO Industrial Estate
Kakkalur Industrial Estate
Tiruvallur – 602003,
Tamil Nadu, India

4. Springboard Enterprises India Ltd.
1st, 2nd & 3rd Floor,
Plot No. 7, 8 & 9,
Garg Shopping Mall,
Service Centre, Rohini Sector 2
New Delhi – 110085,
Delhi, India

5. Flour Tech Engineers Private Limited
Plot No. 182, Sector 24,
Faridabad - 121005,
Haryana, India

6. P Square Technologies
3, Swami Mahal,
Gurunanak Nagar,
Off. Shankarsheth Road Bhavani Peth,
Pune - 411002,
Maharashtra, India

7. Ricon Engineers
10 To 13, Bhagwati Estate,
Near Amraiwadi Torrent Power,
Behind Uttam Dairy,
Rakhial, Ahmedabad - 380023,
Gujarat, India

8. Kamdhenu Agro Machinery
Plot No. 6, Near Power House,
Wathoda Road Wathoda,
Nagpur - 440035,
Maharashtra, India

14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	24.30	28.35	32.40	36.45	40.50
3	Raw Materials & Other direct inputs	₹. In Lacs	20.39	23.79	27.19	30.59	33.99
4	Gross Margin	₹. In Lacs	3.91	4.56	5.21	5.86	6.51
5	Overheads except interest	₹. In Lacs	2.70	2.87	3.21	3.31	3.38
6	Interest @ 10 %	₹. In Lacs	1.38	1.38	0.92	0.69	0.55
7	Depreciation @ 30 %	₹. In Lacs	2.40	1.68	1.22	0.96	0.72
8	**Net Profit before tax**	₹. In Lacs	**-2.58**	**-1.38**	**-0.15**	**0.90**	**1.86**

The basis of profitability calculation:

This unit will have 600-750 tonnes/Annum capacity. The growth of selling capacity will be increased 10% per year. (This is assumed by various analysis and study, it can be increased according to the selling strategy.)

Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per litre. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at 60.40. % of projected capacity

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	40.50
2	Variable costs	₹. In Lacs	33.99
3	Fixed costs incl. interest	₹. In Lacs	3.93
4	BEP = FC/(SR-VC) x 100 =	% of capacity	60.40%

16. STATUTORY / GOVERNMENT APPROVALS

The Ministry of Food Processing Industries has been operating several plan schemes for the development of processed food sector in the country during the 10th Plan. One of the schemes relates to the Technology Up-gradation/ Establishment/ Modernization of food processing industries.

The Indian food processing industry is regulated by several laws which govern the aspects of sanitation, licensing and other necessary permits that are required to start up and run a food business. The legislation that dealt with food safety in India was the Prevention of Food Adulteration Act, 1954 (hereinafter referred to as "**PFA**"). The PFA had been in place for over five decades and there was a need for change due to varied reasons which include the changing requirements of our food industry. The act brought into force in place of the PFA is the Food Safety and Standards Act, 2006 (hereinafter referred to as "**FSSA**") that overrides all other food related laws.

FSSA initiates harmonization of India's food regulations as per international standards. It establishes a new national regulatory body, the Food Safety and Standards Authority of India (hereinafter referred to as "**FSSAI**"), to develop science based standards for food and to regulate and monitor the manufacture, processing, storage, distribution, sale and import of food so as to ensure the availability of safe and wholesome food for human consumption. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

All food imports will therefore be subject to the provisions of the FSSA and rules and regulations which as notified by the Government on 5th of August 2011 will be applicable.

Key Regulations of FSSA

A. Packaging and Labelling
B. Signage and Customer Notices
C. Licensing Registration and Health and Sanitary Permits

17. BACKWARD AND FORWARD INTEGRATIONS

The objective of the scheme is to provide effective and seamless backward and forward integration for processed food industry by plugging the gaps in supply chain in terms of availability of raw material and linkages with the market. Under the scheme, financial assistance is provided for setting up of primary processing centres/ collection centres at farm gate and modern retail outlets at the front end along with connectivity through insulated/ refrigerated transport.

The Scheme is applicable to perishable horticulture and non-horticulture produce such as, fruits, vegetables, dairy products, meat, poultry, fish, Ready to Cook Food Products, Honey, Coconut, Spices, Mushroom, Retails Shops for Perishable Food Products etc. The Scheme would enable linking of farmers to processors and the market for ensuring remunerative prices for agri produce.

The scheme is implemented by agencies/ organizations such as Govt./ PSUs/ Joint Ventures/ NGOs/ Cooperatives/ SHGs / FPOs / Private Sector / individuals etc.

Backward Linkage:

- Integrated Pack-house(s) (with mechanized sorting & grading line/ packing line/ waxing line/ staging cold rooms/cold storage, etc.)
- Pre Cooling Unit(s)/ Chillers
- Reefer boats

- Machinery & equipment for minimal processing and/or value addition such as cutting, dicing, slicing, pickling, drying, pulping, canning, waxing, etc.
- Machinery & equipment for packing/ packaging.

Forward Linkage:

- Retail chain of outlets including facilities such as frozen storage/ deep freezers/ refrigerated display cabinets/cold room/ chillers/ packing/ packaging, etc.
- Distribution centre associated with the retail chain of outlets with facilities like cold room/ cold storage/ ripening chamber.

18. TRAINING CENTERS AND COURSES

There are few specialised Institutes provide degree certification in Food Technology, few most famous and authenticate Institutions are as follows:

1. Indian Institute of Food Science & Technology,
   Plot No.1, Near Maa-BaapkiDargah,Opp to Nath Seeds,
   Paithan Road Aurangabad
   Aurangabad - 431005
   Maharashtra, India

2. MIT College of Food Technology, Pune
   Gate.No.140, Raj Baugh Educational Complex,
   Pune Solapur Highway,
   LoniKalbhor, Pune – 412201
   Maharashtra, India

3. CSIR - Central Food Technological Research Institute (CFTRI)
   Cheluvamba Mansion, Opp. Railway Museum,
   Devaraja Mohalla, CFTRI Campus, Kajjihundi, Mysuru
   Karnataka – 570020

Udyamimitraportal (link : www.udyamimitra.in) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.