
Sector	Agro and Food Processing
Sub - sector	Food Processing
Project No.	AF-11
Project Title	De-hulled and Roasted Sesame Seed Oil Processing Unit

Project Description

The project envisages setting up of an Export Oriented Unit (EOU) for De-hulled Sesame Seed and Roasted Sesame Seed Oil.

Product Application

De-hulled sesame seed is mainly used to add texture, taste and aesthetic value to a variety of bakery products like bread, bread sticks, cookies, sesame bars etc; and also as an additive to cereal mixes and crackers. The whole seed is most important ingredient while preparing confectionery tahini (a halvah made from crushed, roasted and sweetened seeds) in the Gulf countries. The seed is rich in protein, carbohydrates, fibre, fat and some minerals content.

Sesame Oil is mostly used as traditional cooking oil in Chinese food items and in Japan. Other than for cooking the oil is an essential ingredient in manufacture of soaps, pharmaceuticals (as healing oil) and lubricants with additional use in cosmetic and skin care industries.

Market & Growth Drivers

Since the proposed project will be an EOU it will be producing De-hulled sesame seeds and roasted sesame seed oil as per the specifications required in the global market.

Global sesame seed production for the year 2004-2005 was 3283075 MT, dominated by Asian and African countries. The global trade was 1705294 MT valued at US \$ 1495.51 million.

Japan, Egypt, South Korea, USA, Netherlands, and Gulf countries import substantial quantity of De-hulled sesame seed. Japan is the largest importer, accounting for 20% of the world trade, importing nearly 1.6 Lac tons per annum.

China dominated the world in production and trade of de-hulled sesame seed accounting for 25% of the world trade producing around 725470 MT of sesame seed and 214803.49 MT of sesame oil in the year 2005.

India ranks second in the world accounting for 22% of the world trade with a production of around 680000 MT of sesame seed and 157000 MT of sesame oil in the year 2005.

The other major producers of sesame seed in the year 2005 were Myanmar (550000 MT), Sudan (300000 MT), Uganda (110000 MT), Nigeria (75000 MT), Pakistan (68000 MT), Ethiopia (65000 MT), Bangladesh (50000 MT) and Central African Republic (42800 MT).

While Myanmar (197410.05 MT), Japan (43000 MT), Bangladesh (19100.40 MT), Thailand (8652.26 MT), Nigeria (8000 MT) and Tanzania (4055.23 MT) were the leading producers of sesame oil in the year 2005.

Some of the global manufacturers and traders of sesame seed and oil are

- Saint First man Foodstuff Products (Nanjing) Inc. – China
- Ozsoy Tarim San. Ve Tic. Ltd. – Turkey
- Anhui Sinoresource Ltd. - China

The Indian production has subsequently registered sizeable growth from 587100 MT in 2000 to 680000 MT in 2005. The states of Gujarat and West Bengal contribute maximum in the production of sesame seed producing around 1 to 2 Lac tonnes annually. The other major sesame producing states are Rajasthan, Tamilnadu, Orissa, Madhya Pradesh, Andhra Pradesh, Maharashtra, UP, Punjab and Karnataka.

India exports around 25% of the produced Sesame seeds annually, mainly to Germany, Turkey, The Netherlands, USA, Israel, Greece, Italy, China, Japan and UK. Some manufacturers and exporters of Sesame seed from India are

- Sagar International, Rajkot - Gujarat
- Utsav Overseas Private Limited, Jalgaon - Maharashtra
- Shyam Industries, Ahmedabad – Gujarat
- Satnam Overseas – New Delhi

The following table summarizes India's traded quantum of De-hulled seeds and Sesame Oil for last 4 years period.

Sr. No	Particulars	Export				Import			
		Years	03-04	04-05	05-06	06-07*	03-04	04-05	05-06
1	De-hulled Q	52037	168280	199808	30822	878	1486	3048	NIL
	Seeds V	140281	70895	74660	11776	334	580.09	878.26	NIL
2	Sesame Q	499.72	1147	2113	382.1	6.19	2.36	2.06	0.86
	Oil V	295.89	733	1260	242.64	21	15.28	21	7.93

Source: Department of Commerce, India. Quantity (Q) in MT, Value (V) in INR Lacs. * indicates year 2006-2007(Apr-Jun)

Growth Drivers

- The current annual growth rate registered by the bakery industry is 7.5% and the confectionery industry is 9%.
- Changing lifestyle and adoption of cosmopolitan food habits.
- Increasing popularity of Chinese vegetarian food world wide has increased the demand for roasted sesame seed oil.
- People becoming more health conscious the usage of sesame seed oil is bound to increase as it is low in cholesterol.

Why Gujarat?

- Gujarat's contribution to the national sesame seed production in the year 2004-2005 was approx 23.45% with a production of around 117100 MT which is the highest as compared to other states.
- Agriculture activities will intensify in the state with the accessibility of Narmada canal irrigation in Saurashtra and North Gujarat region which are main sesame growing area. Furthermore this will also have prospects of increasing the present production and per hectare yield.
- Well developed oil seed industry in Gujarat, makes availability of technical and commercial manpower easy.

Technology/Process

Aqua de-hulling of sesame seeds is suggested for the proposed unit.

The seeds available from market yards through brokers / traders or from farmers directly are cleaned in close vibratory type seed cleaners and aspiration system is provided to remove dust and other light weight impurities.

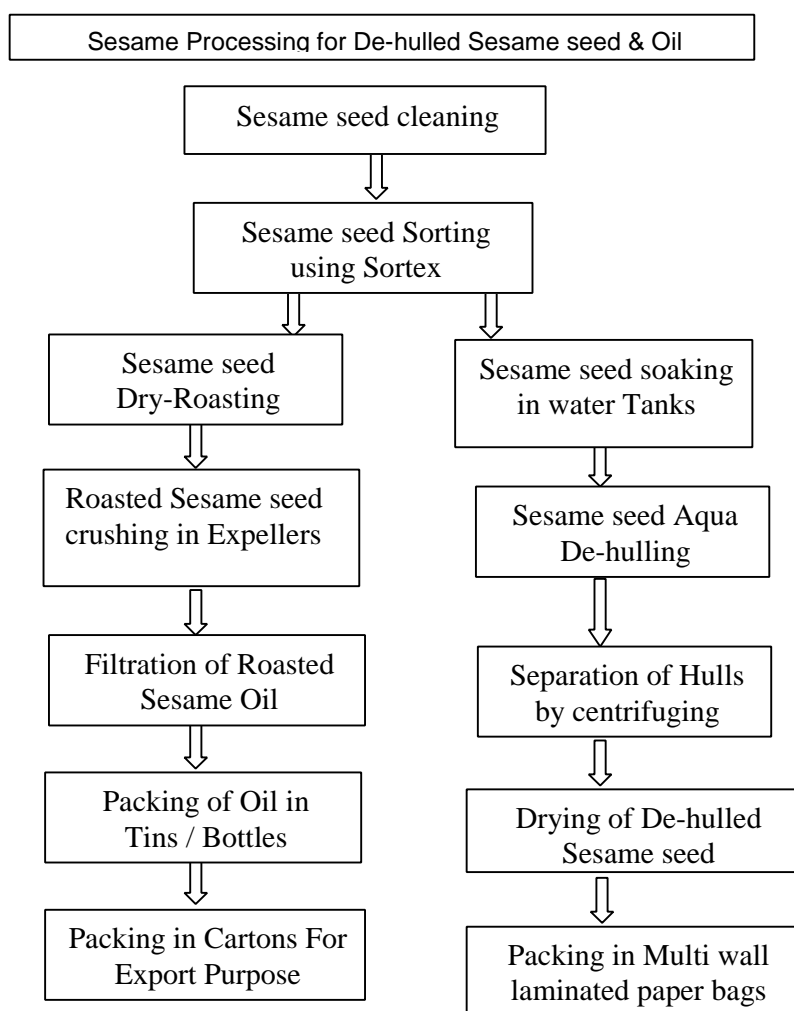
These seeds are passed through "Sortex" machine (Electronic eye) for removal of inferior quality seeds.

Cleaned seed are soaked in water for 4 to 6 hours and than put in aqua-De-huller machines, where hulls are removed using water force and water is finally drained out, and light weight hulls and other impurities are also removed.

Wet De-hulled sesame seeds are dried using hot air under precise temperature control, so that moisture is removed as per the buyer's requirement.

Except Sortex machines all other Indigenous process technology is available and suppliers are:

- BÜheller India Ltd- Bangalore
- Desmet-Chemfood Pvt. Ltd- Mumbai
- Troika Process Pvt Ltd- Mumbai.



Raw Material

Gujarat is the second largest producer of sesame seed in India. Sesame is one of the major oil seed crop grown in the state and a principle ingredient in the proposed unit. The crop being seasonal its availability is limited to 6 to 8 months.

As per the statistics available with the Government of Gujarat the area, production and yield per kg hectare for the last 5 years is summarized in the following table:

Last 5 Years Area, Production and Yield of Sesame seed in Gujarat

Sr. No	Year	Area ('00 Hectares)	Production ('00 MT)	Yield, Kg/hectare
1	2000-2001	3569	984	276
2	2001-2002	3796	2266	597
3	2002-2003	3441	1232	358
4	2003-2004	4024	2408	598
5	2004-2005	3719	1171	315

Source: Directorate of Agriculture, Government of Gujarat

The major Sesame seed producing districts considering area under cultivation and production are Surendranagar, Bhavnagar, Amreli, Rajkot, and Kutch.

Suggested Plant Capacity & Project Cost

Capacity - 3000 MTPA or 15 MT per day.

Capital cost of project is estimated to be INR 31 million (US \$ 0.69 million).

Estimated Cost of Project and Means of Finance

Sr. No	Cost of project	INR in Million
1	Land and Land development	1.20
2	Building	4.50
3	Plant & Machinery	14.00
4	Misc. Fixed Assets	2.00
5	Preliminary & preoperative including technology	1.40
6	Provision for contingencies	1.00
	Fixed cost of project	24.10
7	Margin Money for working capital	6.90
	Estimated Total Block Capital Cost of Project	31.00
	Means of Finance	
8	Promoters contribution	10.30
9	Term loan	20.70
	Total Means of Finance	31.00

As indicated above, the proposed project will require an approx 4000 sq. mt of land with an proposed built up area of 1000 sq. mt. Considering 200 working days in a year the unit is proposed to have an installed capacity of 3000 TPA or say 15 MT per day. The total fixed cost of the project is estimated at INR 24.10 million and INR 6.90 million is the working capital margin which sums the block capital cost to INR 31 million. The unit being proposed to cater domestic as well as International demand is suggested to have a Debt equity ratio of 2.5:1. Thus, the estimated term loan amounts to INR 20.70 million and Equity at INR 10.30 million.

Plant and Machinery

Major plant and machinery required for the proposed project are listed below. Except for Sortex machine all other process technology is available indigenously.

List of Plant and Machinery

Sr. No.	Particulars	Quantity	Process/Technology Supplier
1	Seed Cleaning	2 line	Geetha Food Engineers, Mumbai
2	Sortex	1	BÜheller India Ltd- Bangalore, Desmet-Chemfood Pvt. Ltd- Mumbai, Troika Process Pvt Ltd- Mumbai
3	De-hulling of seeds		
a.	Soaking tanks	4	Sifter International, Faridabad
b.	Aqua De-hullers	3	Sifter International, Faridabad
c.	Hull separators	3	Sifter International, Faridabad
d.	Hot air Dyers	3	Shirsat Electronics, Thane
4	Packing section for De-hulled sesame seed bag filling and sealing	1	Target Engineers co. NOIDA, UP
5	Dry roasting	2	Shirsat Electronics, Thane
6	Baby expellers	3	Laxmi Vijay Brass and Iron works, Vadodara
8	Filter presses	2	Laxmi Vijay Brass and Iron works, Vadodara
9	Oil Packing Unit	1	Dolly Packaging, Pimpary, Pune
10	Steam and Hot water generator	2	Walia Engineering, Vatva, Ahmedabad

Utilities

The unit would necessitate utilities like water, electric power and fuel for roasting. 35 KL/day water, 1100 KWH /day power and 25 to 15 MTPD coal / FO respectively as fuel, would be a basic requirement for the proposed unit.

Manpower Required

The proposed unit shall engage labourers as required on contract and seasonal basis. Apart from them the unit would require a supervisor, an accountant to maintain records, sales personnel and a guard. Precisely saying the unit would require around 15- 20 persons.

Suggested Location

Amreli, Bhavnagar, Rajkot, Surendranagar, Banaskantha are districts suggested for location of the proposed project.

Project Time Line

The proposed project will have cumulative period of 10-12 months of which 5 to 6 months would entail obtaining the obligatory clearances from various authorities.

Financial Indicators

Based on the profitability projections worked out for the proposed project, key financial indicators are as summarized below:

Key financial indicators

Sr. No.	Financial Ratios	1 st Year	2 nd Year	3 rd Year
A	Break-Even Point % Capacity	32.7	27.5	24.7
B	Debt-service Coverage Ratio	1.66	2.31	2.77
C	Average DSCR	2.25		
D	Return on Investment (ROI)	36.3	55.9	66.4
E	IRR	37%		

The proposed EOU project will have an indicative IRR of approx 37% considering initial 10 years operation. Proposed project being an Export oriented unit the Debt equity ratio is 2.5: 1.0.

Clearances required

The proposed unit will have to register itself with Secretariat of Industrial Approvals (SIA), Ministry of Industries and Government of India, by filing Industrial Entrepreneur's Memorandum (IEM), as it will have plant and machinery investment of more than INR 10 million.

The proposed unit being an Export Oriented Unit (EOU) and catering the major market of advance countries like Japan, Egypt, USA, South Korea & Netherlands, the unit will require to get approved their products with Food and Drugs Administration (FDA) in these countries, apart from registration with Indian and state food administration departments.

The most critical aspect of this product will be its quality for export consumers and Codex standards of respective countries will be followed by the unit.

The unit will get EOU registration from RBI, DGFT and with IOPEA / APEDA as registered manufacturer exporter to avail export incentives.

Being an EOU the unit will have to follow strict quality standards as accepted in the countries where export is to be done. It is obligatory to meet provisions under the PFA act for all ingredients and quality aspects for marketing product in Indian market.

Agencies to be Contacted

Industrial Extension Bureau

Mott MacDonald India

Gujarat Agro Industries Corporation Ltd