

STARCH FROM TAMARIND SEEDS



1.0 INTRODUCTION

Tamarind trees are grown almost in all parts of India. The fruits are used for edible purposes and seeds are generally thrown away. These seeds could be used for producing starch which is used for sizing in textile industry and as a general adhesive material. This is one of the cheapest available non-edible starch. Production process is simple and easy and no special skills are required. It is necessary that adequate arrangements for procurement of tamarind seeds are made.

This project profile is for setting up of a Tamarind Seed processing unit for production of Starch with installed processing capacity of 450 Tonnes per annum of tamarind seeds.

2.0 MARKET POTENTIAL

Starch made from tamarind seeds is considered to be the cheapest non-edible starch with many industrial

applications. Tamarind fruits are used for edible purposes and seeds are wasted. Processing of these seeds will result in substantial value-addition. This starch is used by textile units and industries manufacturing starch based adhesives. Plywood industry is yet another bulk consumer. Thus, this product has growing market and with the anticipated growth in textile and plywood industry in coming years, demand is bound to go up.

3.0 PROCESS DETAILS

Tamarind seeds are roasted in oil-fired roaster and then they are decorticated to remove the skin. Seeds are then broken into small pieces in a grinder. These broken pieces are finally pulverised to make starch. Starch is packed in polythene lined gunny bags. The yield is around 60%.

4.0 COST OF THE PROJECT

The estimated project cost is given below.

Particulars	Amount (Rs lacs)
Land and Site Development	-
Building & Civil Works	4.84
Plant & Machinery	4.83
Misc. Fixed Assets	2.00
Preliminary & Pre-operative Expenses	0.92
Contingencies & Escalation @ 3%	0.35
Working Capital	2.52
TOTAL	15.46

4.1 Land & Site Development: No cost has been considered for land & site development. It is assumed that the unit will be set up in own land.

4.2 Building & Civil Works: Details of building & civil works are given below.

Particulars	Area (Sqm)	Rate (Rs)	Amount (Rs)
Work Shed (Open shed, CGI sheet roof, Concrete Floor)	80	3000	240000
Office & Store (Brick wall, CGI sheet roof, Concrete Floor)	40	5000	200000
Sub total			440000
Add: Electrification, Water Supply, etc @ 10%			44000
TOTAL			484000
Say (Rs. in lacs)			4.84

4.3 Machinery & Equipment: Details of machinery & equipment are given below.

Particulars	Qty	Rate (Rs)	Amount (Rs)
Oil-fired Roaster complete with accessories	1	60000	60000
Decorticator	1	100000	100000
Elevator with conveyor	1	35000	35000
Beater type pulveriser with accessories	1	150000	150000
Miscellaneous items	LS	LS	40000
Sub total			385000
Add: Transportation, installation, etc @ 15%			57750
TOTAL			482750
Say (Rs. in lacs)			4.83

4.4 Misc. Fixed Assets: Details of miscellaneous fixed assets are given below.

Particulars	Qty	Rate (Rs)	Amount (Rs)
Power connection (50 HP)	1	100000	100000
Water supply system (STW boring, 3 HP pump set, storage, pipes & fittings)	1	80000	80000
Furniture & Fixtures	LS	LS	10000
Miscellaneous items	LS	LS	10000
TOTAL			200000
Say (Rs. in lacs)			2.00

4.5 Preliminary & Pre-operative Expenses: Details of preliminary & pre-operative expenses are given below.

Particulars	Amount (Rs lacs)
Travelling expenses	0.40
Professional & other fees	0.20
Interest during implementation	0.22
Miscellaneous expenses	0.10
TOTAL	0.92

4.6 Contingencies & Escalation: Contingencies & escalation has been assumed at 3% of the cost of building & civil works, machinery & equipment and miscellaneous fixed assets.

4.7 Working Capital: Details of working capital are given below.

	Period (days)	Amount (Rs lacs)		
		Yr 1	Yr 2	Yr 3
Raw Materials & Consumables	30	0.74	0.88	1.03
Utilities	30	0.14	0.17	0.20
Salary	30	0.34	0.34	0.34
Finished Goods	15	0.62	0.71	0.81
Receivables	15	0.68	0.82	0.96
TOTAL		2.52	2.93	3.33
Working Capital Margin in Yr 1 (100%)	2.52			

5.0 MEANS OF FINANCE

The means of finance for the project is estimated as below.

Particulars	Percent	Amount (Rs lacs)
EQUITY		
A. Equity from Promoters	40%	6.18
B. Subsidy from Central/State Govt.	-	
DEBT		
Term Loan from Banks/FIs	60%	9.27
TOTAL	100%	15.46

6.0 PROFITABILITY STATEMENT

(Rs. in lacs)

Particulars	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
A. INCOME							
Production capacity (MT)	270	270	270	270	270	270	270
Capacity utilisation	50%	60%	70%	70%	70%	70%	70%
Production/annum at C. U.	135	162	189	189	189	189	189
Price of starch (Rs/MT)	12300	12300	12300	12300	12300	12300	12300
Income from sales/annum	16.61	19.93	23.25	23.25	23.25	23.25	23.25
B. OPERATING EXPENSES							
Raw Materials & Consumables	8.96	10.75	12.54	12.54	12.54	12.54	12.54
Utilities	1.72	2.07	2.41	2.41	2.41	2.41	2.41
Salary	4.08	4.12	4.16	4.20	4.25	4.29	4.33
Repair & Maintenance	0.12	0.14	0.17	0.20	0.24	0.29	0.35
Selling Expenses	0.17	0.20	0.23	0.23	0.23	0.23	0.23
Miscellaneous Expenses	0.08	0.10	0.12	0.12	0.12	0.12	0.12
Total Operating Expenses	15.13	17.38	19.63	19.71	19.79	19.88	19.98
Less: Working expenses capitalised	2.52	0.00	0.00	0.00	0.00	0.00	0.00

Operating profit	3.99	2.55	3.61	3.54	3.45	3.36	3.26
C. FINANCIAL EXPENSES							
Depreciation	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Interest on Term Loan	0.74	0.66	0.54	0.42	0.30	0.18	0.06
Net Profit	2.63	1.26	2.45	2.49	2.53	2.55	2.57
Net cash accruals	3.25	1.89	3.07	3.12	3.15	3.18	3.20
Principal Repayment	0.37	1.48	1.48	1.48	1.48	1.48	1.48

6.1 Estimation of Production Capacity: Production of Tamarind Starch at installed capacity is estimated as below.

Rated processing capacity (tonnes/annum of Tamarind seeds)	450
Recovery of starch from seeds (%)	60%
Production/annum of starch at installed capacity (tonnes)	270

6.2 Raw Materials & Consumables: Expenses on raw materials & consumables at installed capacity is estimated as below.

Particulars	Unit	Quantity	Rate (Rs)	Amount (Rs)
Tamarind seed	MT	450	3500	1575000
Jute Bags (80 kg capacity)	Nos	3375	16	54000
Sub total				1629000
Add: Expenses on additives, etc @ 10%				162900
Expenses on raw materials & consumables at installed capacity (Rs)				1791900

6.3 Utilities: Expenses on utilities at installed capacity is estimated as below.

Expenses on power

Connected Load (kw)	37
Avg. load factor	70%
Hrs/day	8
Days/annum	300
Annual power consumption (kwh)	62664
Rate per unit (Rs)	5
Expenses on power per annum at installed capacity (Rs)	313320
Add: Expenses on oil for Roaster @ 10%	31332
Expenses on utilities per annum at installed capacity (Rs)	344652

6.4 Salary: Expenses on salary in the 1st year is estimated as given below. It is assumed that salary expenses will increase @ 1% every subsequent year.

Particulars of Employees	Numbers	Salary/Month (Rs)	Cost/annum (Rs)
Manager	Self	0	0
Skilled Workers/Machine Operators	2	7000	168000
Sales Staff	1	4000	48000
Helpers	2	3000	72000
Casual labour	4	2500	120000
Expenses on salary in the 1st year (Rs)			408000

- 6.5 Repair & Maintenance:** Expenses on repair & maintenance in the 1st year is estimated as given below. It is assumed that expenses on repair & maintenance will increase @ 20% every subsequent year.

(Rs. in lacs)

Particulars	Cost (Rs)	Rate	Amount
Building & Civil Works	4.84	1%	0.05
Plant & Machinery	4.83	1%	0.05
Misc. Fixed Assets	2.00	1%	0.02
Expenses on repair & maintenance in the 1st year (Rs)			0.12

- 6.6 Selling Expenses:** Selling expenses have been assumed at 1% of sales.

- 6.7 Miscellaneous Expenses:** Miscellaneous expenses have been assumed at 0.5% of sales.

- 6.8 Depreciation:** Depreciation has been calculated by straight line method. The details of calculation are given below.

Description	Cost (Rs)	Rate	Amount/ annum (Rs lacs)
Building & Civil Works	4.84	3.34%	0.16
Plant & Machinery	4.83	7.07%	0.34
Misc. Fixed Assets	2.00	6.23%	0.12
TOTAL			0.63

- 6.9 Interest on Term Loan & Principal Repayment:** Interest rate has been assumed at 8% per annum. Duration of Loan repayment has been considered for a period of 7 years including moratorium period of 9 months with equal monthly instalments. The details of calculation are given below.

(Rs in lacs)

Month	Year	1	2	3	4	5	6	7
Month 1	Opening balance	9.27	8.90	7.42	5.94	4.45	2.97	1.48
	Repayment	0.00	0.12	0.12	0.12	0.12	0.12	0.12
	Interest (8%)	0.06	0.06	0.05	0.04	0.03	0.02	0.01
	Closing balance	9.27	8.78	7.30	5.81	4.33	2.84	1.36
Month 2	Opening balance	9.27	8.78	7.30	5.81	4.33	2.84	1.36
	Repayment	0.00	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.06	0.05	0.04	0.03	0.02	0.01
	Closing balance	9.27	8.66	7.17	5.69	4.20	2.72	1.24
Month 3	Opening balance	9.27	8.66	7.17	5.69	4.20	2.72	1.24
	Repayment	0.00	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.06	0.05	0.04	0.03	0.02	0.01
	Closing balance	9.27	8.53	7.05	5.56	4.08	2.60	1.11
Month 4	Opening balance	9.27	8.53	7.05	5.56	4.08	2.60	1.11
	Repayment	0.00	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.06	0.05	0.04	0.03	0.02	0.01
	Closing balance	9.27	8.41	6.93	5.44	3.96	2.47	0.99
Month 5	Opening balance	9.27	8.41	6.93	5.44	3.96	2.47	0.99
	Repayment	0.00	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.06	0.05	0.04	0.03	0.02	0.01
	Closing balance	9.27	8.29	6.80	5.32	3.83	2.35	0.87
Month 6	Opening balance	9.27	8.29	6.80	5.32	3.83	2.35	0.87
	Repayment	0.00	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.06	0.05	0.04	0.03	0.02	0.01
	Closing balance	9.27	8.16	6.68	5.19	3.71	2.23	0.74
Month 7	Opening balance	9.27	8.16	6.68	5.19	3.71	2.23	0.74
	Repayment	0.00	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.05	0.04	0.03	0.02	0.01	0.00

	Closing balance	9.27	8.04	6.55	5.07	3.59	2.10	0.62
Month 8	Opening balance	9.27	8.04	6.55	5.07	3.59	2.10	0.62
	Repayment	0.00	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.05	0.04	0.03	0.02	0.01	0.00
	Closing balance	9.27	7.91	6.43	4.95	3.46	1.98	0.49
Month 9	Opening balance	9.27	7.91	6.43	4.95	3.46	1.98	0.49
	Repayment	0.00	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.05	0.04	0.03	0.02	0.01	0.00
	Closing balance	9.27	7.79	6.31	4.82	3.34	1.85	0.37
Month 10	Opening balance	9.27	7.79	6.31	4.82	3.34	1.85	0.37
	Repayment	0.12	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.05	0.04	0.03	0.02	0.01	0.00
	Closing balance	9.15	7.67	6.18	4.70	3.22	1.73	0.25
Month 11	Opening balance	9.15	7.67	6.18	4.70	3.22	1.73	0.25
	Repayment	0.12	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.05	0.04	0.03	0.02	0.01	0.00
	Closing balance	9.03	7.54	6.06	4.58	3.09	1.61	0.12
Month 12	Opening balance	9.03	7.54	6.06	4.58	3.09	1.61	0.12
	Repayment	0.12	0.12	0.12	0.12	0.12	0.12	0.12
	Interest	0.06	0.05	0.04	0.03	0.02	0.01	0.00
	Closing balance	8.90	7.42	5.94	4.45	2.97	1.48	0.00
Principal Repayment		0.37	1.48	1.48	1.48	1.48	1.48	1.48
Interest		0.74	0.66	0.54	0.42	0.30	0.18	0.06

7.0 DEBT SERVICE COVERAGE RATIO (DSCR)

(Rs. in lacs)

Year	1	2	3	4	5	6	7	Total
Profit After Tax (Net Profit)	2.63	1.26	2.45	2.49	2.53	2.55	2.57	
Depreciation	0.63	0.63	0.63	0.63	0.63	0.63	0.63	
Interest	0.74	0.66	0.54	0.42	0.30	0.18	0.06	
Total	3.99	2.55	3.61	3.54	3.45	3.36	3.26	23.77
Interest	0.74	0.66	0.54	0.42	0.30	0.18	0.06	
Loan repayment	0.37	1.48	1.48	1.48	1.48	1.48	1.48	
Total	1.11	2.14	2.02	1.90	1.79	1.67	1.55	12.18
DSCR	3.60	1.19	1.79	1.86	1.93	2.02	2.11	

Average DSCR = 1.95

8.0 BREAK EVEN POINT (BEP)

(Rs. in lacs)

Year	1	2	3
A. Net sales (Rs. lakh)	16.61	19.93	23.25
B. Variable cost			
Raw Materials & Consumables	8.96	10.75	12.54
Utilities	1.72	2.07	2.41
Selling Expenses	0.17	0.20	0.23
Miscellaneous Expenses	0.08	0.10	0.12
Total variable cost	10.93	13.12	15.30
C. Contribution (A-B)	5.67	6.81	7.94
D. Fixed & Semi-fixed Costs			
Salary	4.08	4.12	4.16

Repair & Maintenance	0.12	0.14	0.17
Interest on Term Loan	0.74	0.66	0.54
Depreciation	0.63	0.63	0.63
Total fixed cost	5.56	5.55	5.50
E. BREAK EVEN POINT	98.07%	81.47%	69.21%
F. BEP at operating capacity	49.04%	48.88%	48.45%
G. Cash BEP	43.50%	43.35%	42.91%

9.0 INTERNAL RATE OF RETURN (IRR)

(Rs. in lacs)								
Year	0	1	2	3	4	5	6	7
CASH OUTFLOW								
Capital Expenditure	12.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Working Capital	0.00	2.52	0.41	0.41	0.00	0.00	0.00	0.00
Total (A)	12.02	2.52	0.41	0.41	0.00	0.00	0.00	0.00
CASH INFLOW								
Profit After Tax		2.63	1.26	2.45	2.49	2.53	2.55	2.57
Add: Depreciation		0.63	0.63	0.63	0.63	0.63	0.63	0.63
Add: Interest		0.74	0.66	0.54	0.42	0.30	0.18	0.06
Add: Salvage Value (15%)								1.80
Total (B)	0.00	3.99	2.55	3.61	3.54	3.45	3.36	5.07
NET FLOW (B-A)	-12.02	1.48	2.14	3.20	3.54	3.45	3.36	5.07

IRR = 15%

MACHINERY SUPPLIERS

- S. K. Engineering Works
B-28, Sector-10, Noida - Noida. Uttar Pradesh India
- Hind Agro Industries
No.142, IDA, Tummkunta industrial Area, Hindupur, Ananthapur Dist.,
Hindupur - 515201, Andhra Pradesh , India
- Alfa Engineering Works
Goxla No. B/13, L.b.S. Marg, Vardhman Services Complex, Behind Punjab Bank, Vikroli(W),
Mumbai - 400083, Maharashtra , India