

# Model Project Report on Fish Processing Plant

Government of West Bengal

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## PROJECT PROFILE OF FISH PROCESSING

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### I. INTRODUCTION

India has long coastal line of 8118 km and the total fish production is about 90 lakh tons. West Bengal is the largest fish producing state and accounts for about 17 per cent of the total fish production India. Fish production in India might also cross 13 million tonnes mark by 2016. India's total fisheries exports are about \$3.5 billion. The fresh fish is only available at costal part of the country. To make available at other part of country it is necessary to process the fresh fish into different value added products. As fish being highly perishable, it is essential that it is handled in appropriate manner to avoid post-harvest loss and to enhance its shelf life without loss of quality. Canning of fish is a most scientific method of fish processing to enhance shelf life and value addition. Canned marine product has a huge demand in local as well as world market.

Location of the processing plant has to be close proximity to the sea where raw material is easily available and other facilities like transportation, market. Fish processing involves canning as well as by product utilization. Integration of fish canning plant and fish meal production plant will increase the project profitability and helps in by product utilization.

### II. OBJECTIVES

- Increase the shelf life of fish by the processing like canning
- Make the availability of fish at different part of the country.

### III. RAW MATERIAL AVAILABILITY

Different types of fish varieties are found in West Bengal with the annual production of about 18 lakhs tons. The compound annual growth rate of fish production in the state is about 3.5 percent which can grow up to 7 percent

during the course of next four-five years. The varieties like tuna, prawn, pomfret, sardine, mackerel, etc. can be processed.

#### IV. MARKET OPPORTUNITIES

In India fish eaters account for over half of the country's total population. Numbers of non-vegetarians are increasing day by day, so that the popularity of fish and marine products is also increasing tremendously with change in life style and consumption preference for convenience food. Therefore, the demand for processed ready to serve marine products is rising day by day.

Processed marine products are consumed not only in household but it has great demand in restaurant, hotels, railways & flights kitchens, defence departments, retail suppliers like shopping malls, bazars and stores.

#### V. PROJECT DESCRIPTION

- **Product and its Uses**

Canned fish are used for the direct consumption at the places where fresh marine products are not available easily. Other processed products like fish cutlets, fish pickles and prawns pickle are prepared using canned fish/prawns.

- **Capacity**

The installed capacity of fish processing plant is 8 lakhs tin and bottles per year.

- **Manufacturing Process with Flow Chart**

Fish processing means canning of fish and prawns in brine solution to increase its shelf life. Fresh as well as stored fish are used for canning. For frozen fish thawing to room temperature is necessary before processing. Washing of whole fish is carried out remove dirt. The detailed manufacturing process of canning of fish and prawns are given below:

**Precooking** which helps to remove the fish oils and coagulates the protein in the fish to loosen the meat. Precooking is carryout out by using steam/ hot air/ oil or smoke.

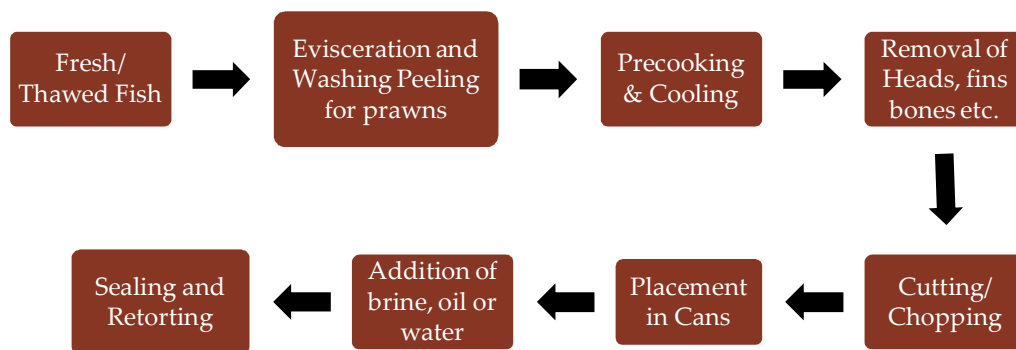
**Cooling:** fish are then cooled using refrigeration or cold air. Method and time required for cooling depend on the type and size of the fish.

**Cleaning:** after cooling undesirable parts of the fish like heads, fins, bones are removed.

**Cutting** or chopping the fish into desirable sizes using cutter or slicer.

**Canning:** Pieces of fish are then canned with brine or oil

**Retorting:** After sealing of cans using sealer, the cans are placed in autoclave/retort for sterilization. The general process flow chart of fish canning is given below.



## VI. PROJECT COMPONENTS

- **Land and Building**

A plot of land of around 0.5 acre shall be required which would cost around Rs.2.5 lakhs. In addition to the land an average Rs. 5.0 Lakhs are required for the development of land depending on the topography of land.

- **Civil Work**

Area of 500 sq. meters will be essential for plant building. The construction cost is considered as Rs. 6500 per sq. meter. Therefore the total construction cost for built up area is around Rs. 32.50 Lakhs. Remaining 300 sq. meter area required for boundary wall, parking, storage etc. Hence there will be a provision of Rs. 3 Lakhs to take care of other miscellaneous civil work.

- **Plant and Machineries**

S. N.	NAME OF MACHINERY	QTY IN NOS	PRICE IN RS
1	Boiler, with pressure of 7 kg per square cm, approx. evaporation 182 kg/hr, oil fired.	1	4,58,000.00
2	Autoclave 30" X 36" size, with crate capacity of about 360 can., with dial thermometer, safety valve and pressure gauge.	2	2,30,000.00
3	Double seamer – motor driven, complete with stand, motor, starter, switch gear, and change parts, chuck for 301 X 208 (Type MIBA)	2	1,85,000.00
4	Balancing tank SS made, with steam piping arrangement.(90 cm X 45 cm X 45 cm)	1	1,10,000.00
5	Brine heating tank SS with steam heating type, of 100 kg capacity	1	1,30,000.00
6	Exhaust box, straight line type, 275 cm X 60Cm X 450 cm	1	2,70,000.00
7	Treadle embossing system with one set of double row die, or 5 letter figures range	1	65,000.00
8	Platform balance	2	16,000.00
9	Pan balance	3	9,000.00
10	Rack for cooling meat under fan 180cm X 120 Cm X 45 Cm	2	90,000.00
11	Rack for arranging cans, 180 cm X 150 Cm x 45 cm	6	3,00,000.00
12	Process table with AL top	6	1,92,000.00
13	Washing tanks 120cm X 90 cm x 45 cm	2	1,70,000.00
14	Bottle washer	1	65,000.00
15	PP capping machine	1	85,000.00
16	Pulveriser	1	2,15,000.00
17	Pickling vat	1	35,000.00
	Plant and Machineries		26.25
	Transportation, Erection, VAT, Excise duty etc.		4.13
	<b>Total Cost of Plant and Machineries (Rs. In Lakhs)</b>		<b>30.38</b>

- **Miscellaneous Fixed Assets**

Cost of office furniture and other infrastructure, telephone installation, electrical infrastructure is considered under miscellaneous fixed assets. A provision of Rs. 3.78 Lakhs is needed to take care of above expenditure.

- **Preliminary Preoperative Expenses**

An amount of Rs. 2.00 Lakhs will be required to pay the preliminary and preoperative expenses like interest during construction period, registration, travelling expenses etc.

- **Contingency**

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

- **Margin money for working capital**

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

## VII. PROJECT COST

S. No.	Particulars	Amount (Rs. In Lakhs)
1	Land & Land Development	07.50
2	Civil Works	33.00
3	Plant & Machineries	30.38
4	Miscellaneous Fixed Assets	03.78
5	Working capital margin money	11.00
6	Preliminary & Preoperative Expenses	02.00
7	Contingency	01.49
<b>Total Project Cost</b>		<b>89.10</b>

## VIII. MEAN OF FINANCE

S. No.	Source of Finance	Amount (Rs. In Lakhs)
1	Equity (25%)	22.17
2	Term Loan from Bank (75%)	66.82

## IX. WORKING CAPITAL ASSESMENT

Working capital assessment is worked out as under.

Rupees in Lakh

Working Capital Assessment				
Particulars		Yr1	Yr2	Yr3
Raw material	5	2.20	5.88	6.61
WIP	10	5.93	15.81	17.79
Finished Goods	30	17.79	47.43	53.36
Debtors	30	18.06	48.17	54.19
Total		43.98	117.28	131.94
Creditors		0	0	0
Total		0	0	0
WCG		43.98	117.28	131.94
Margin	25%	11.00	29.32	32.99
MPBF		32.99	87.96	98.96
Interest	14%	4.62	12.31	13.85

## X. MANPOWER REQUIREMENT

### a. Administrative and Supervisory

Particulars	Nos.	Monthly Salary (Rs.)
Manager cum technologist	1	20000
Clerk cum storekeeper	1	10000
Skilled Labour	5	6500
Boiler Man cum Mechanic	1	7000
Watchman	1	7000
Total Salary per month	9	76500
<b>Total salary (Rs. Lakhs Per year)</b>		<b>9.18</b>

### b. Unskilled Labour

Five labours are required for unskilled work like handling, packing etc. Wages per person per day is Rs. 240/-. This would be cost for Rs. 3.60 Lakhs per annum.

## XI. PROJECT PROFITABILITY

### • Installed Capacity and Capacity Utilization

The installed capacity of the plant is 8 lakhs tins and bottles per year. During first year only 30% capacity will be utilized. During second year 80% and third year onwards 90% of total capacity will be utilized.



- **Yield and Production**

The final product in fish processing are canned fish (92%) and fish pickle (8%).

Hence at 90% capacity utilization production target will be;

Products	Nos.of cans/bottles
Canned fish	662400
Bottles of Fish Pickle	57600
<b>Total Production at 90% CU</b>	<b>720000</b>

- **Sales Revenue**

S. No.	Products	Price in Rupees
1	Canned fish/Prawn (Rs/Can)	77
2	Bottles of Fish Pickle (Rs/Bottle)	125

- **Profit Calculations**

Particulars		Details				
Installed Capacity (Cans and bottles per year)		800000				
Years		1	2	3	4	5
Capacity utilization (%)		30	80	90	90	90
Capacity Utilization (no of cans/bottles)		240000	640000	720000	720000	720000
Income		<b>Amount (Rs. In lakhs)</b>				
1	Canned fish	170.02	453.38	510.05	510.05	510.05
2	Fish Pickle	24.00	64.00	72.00	72.00	72.00
<b>Total income</b>		<b>194.02</b>	<b>517.38</b>	<b>582.05</b>	<b>582.05</b>	<b>582.05</b>
<b>Total expenditure</b>		<b>182.30</b>	<b>485.04</b>	<b>545.74</b>	<b>545.92</b>	<b>545.90</b>
PBDIT		11.72	32.34	36.30	36.12	36.15
Depreciation		8.97	7.71	6.63	5.71	4.91
Interest on working capital		8.02	8.02	6.68	5.35	4.01
Interest on term loan		4.62	12.31	13.85	13.85	13.85
Intangible assets written off		0.00	0.40	0.40	0.40	0.40
Profit after depreciation and interest		-5.27	16.21	22.59	24.67	26.83
Tax @ 36%		0.00	5.83	8.13	8.88	9.66
PADIT		-5.27	10.37	14.46	15.79	17.17
Surplus available for repayment		11.72	26.10	27.77	26.84	26.09
Cash Accruals		3.70	18.08	21.09	21.50	22.08

## XII. FINANCIAL PARAMETERS

- **Cash Flow Statement**

The statement of cash flow is concerned with the flow of cash in and out of the business. It is useful in determining the short-term viability of a company, particularly its ability to pay bills. Cash inflow means the source of cash i.e equity, Loan from bank and the cash accruals from the business. Cash outflow is a sum of cash required for the applications like increase in fixed assets, for repayment of term loan, preoperative expenses and cash required for the payment of dividend.

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Cash Inflow	92.79	18.08	21.09	21.50	22.08
Cash outflow	89.10	11.14	11.14	11.58	11.58
Opening Balance	0.00	3.70	10.64	20.60	30.51
Surplus	3.70	6.95	9.95	9.91	10.50
Closing Balance	3.70	10.64	20.60	30.51	41.01

- **Break Even Analysis**

Particulars (Rs. In Lakhs)	Year 1	Year 2	Year 3	Year 4	Year 5
Sales Revenue	194.02	517.38	582.05	582.05	582.05
Total Variable Cost	172.28	459.41	516.84	516.84	516.84
Contribution	21.74	57.96	65.21	65.21	65.21
Total Fixed Cost	12.37	18.54	18.41	17.04	15.68
<b>Break Even Point (%)</b>	56.90	31.98	28.23	26.14	24.05

The unit is expected to breakeven at approximately 56% capacity utilisation during first year and during third year the breakeven point will be 28.23%

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

DSCR	Year 1	Year 2	Year 3	Year 4	Year 5
Coverage Available	11.72	26.10	27.77	26.84	26.09
Debt	8.02	19.16	17.82	16.48	15.15
DSCR Ratio	1.46	1.36	1.56	1.63	1.72
<b>Average DSCR Ratio</b>	<b>1.71</b>				

The debt service coverage ratio based on the assumed techno economic parameters is found satisfactory. The average DSCR is 1.71.

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

The financial indicators like Net Present Worth (NPW), Benefit Cost Ratio (BCR), Internal Rate of Return (IRR) etc were analysed by discounting cash flow @15% discounting rate. The internal rate of return is found to be 39.19% and BCR is about 1.03.

- **Projected Balance Sheet**

Year							
Liabilities	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7
Equity	22.27	22.27	22.27	22.27	22.27	22.27	22.27
Term Loan	66.82	55.69	44.55	33.41	22.27	11.14	0.00
Reserve & Surpluses	-5.27	5.10	19.16	34.10	50.43	67.21	85.03
<b>Total</b>	<b>83.83</b>	<b>83.06</b>	<b>85.98</b>	<b>89.79</b>	<b>94.98</b>	<b>100.62</b>	<b>107.31</b>
<b>Assets</b>							
Gross Fixed Assets	87.10	87.10	87.10	87.10	87.10	87.10	87.10
Less Depreciation	8.97	16.68	23.31	29.02	33.93	38.15	41.79
Net Fixed Assets	78.13	70.42	63.79	58.08	53.17	48.95	45.31
Intangible Assets	2.00	2.00	1.60	1.20	0.80	0.40	0.40
Cash & Bank Balance	3.70	10.64	20.60	30.51	41.01	51.27	61.59
<b>Total</b>	<b>83.83</b>	<b>83.06</b>	<b>85.98</b>	<b>89.79</b>	<b>94.98</b>	<b>100.62</b>	<b>107.31</b>
TNW	106.10	105.34	108.26	112.06	117.25	122.89	129.58
TOL	66.82	55.69	44.55	33.41	22.27	11.14	0.00
TOL/TNW	0.63	0.53	0.41	0.30	0.19	0.09	0.00

### XIII. ASSUMPTIONS

- The unit will work for 300 days per annum on single shift basis.
- Capacity utilization: First year -50%, Second year - 80%, Third year onwards - 90%.
- The wages for unskilled workers are taken as per prevailing rates in this type of industry.
- Interest rate for term loan is 12% per annum and that for working capital is 14% per annum.
- 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 seven 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.
- j. The cost of water is considered as 30 paisa per L.
- k. Depreciation rate of 10%, 13.91% and 15% has been considered for civil structures, plant & machineries and miscellaneous fixed assets respectively.
- l. 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.
- m. The administrative expenses will be considered as Lump sum Rs. 25 thousand per annum.
- n. The 0.5% of total income would be considered to take care of promotion and marketing expenses.
- o. Land cost is considered as Rs.5 Lakh per acre.

#### **XIV. ADDRESSES OF PLANT AND MACHINERIES SUPPLIER**

##### **Anjoplus Machines**

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