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APPENDIX - A

The income and expenditure for the chitosan plant is based on the following assumptions:

No. of working days in a month	=20 days
No. of shift in a day	=2
No. of working months in a year	= 10 months
Duration of a shift	=8 hrs
Capacity utilization	
60% in the 1 st year	
70% in the 2 nd year	
80% in the 3 rd year	
Yield of chitosan from 1000g of dry matter	= 100g
Production of chitosan per shift	= 100kg
Production per day	= 200kg
Sale price of chitosan	= Rs. 1000/kg
Income from sale of chitosan	
First year (60%)	=120 days x 200 kg x Rs.1000= Rs.240 lakh
Second year (70%)	=140 days x 200 kg x Rs.1000= Rs.280 lakh
Third year (80%)	=160 days x 200 kg x Rs.1000= Rs.320 lakh

List of equipments required for a 40 TPA chitosan plant

Demineraliser mild steel vessel with fiber glass lining of 500 kg capacity	=3 no
Deproteiniser mild steel vessel with 500 kg capacity	=2 no
Deacetylator mild steel vessel with 500 kg capacity	=2 no
Boiler	
Washing vessel stainless steel 1.5 m diameter and 1m height	= 1 no
Screw press	= 1 no
Tray dryer 5m x 2m x 2m	= 1 no
Pulveriser 50 – 70 kg/hr	= 1 no
Water pump 3 hp	= 2 no
Alkali and acidic pumps 3 hp (2 each)	= 4 no
Acid storage tanks 2500 L capacity	= 2 no
Alkali makeup tanks 2500 L capacity	= 2 no
Hot air drive with accessories	= 1 no
Generator set	= 1 no
Drainage equipments	= 2 no
Aluminum trays (100 cm x 50 cm x 4 cm)	= 150 no

APPENDIX – B

Financial requirements for setting up of a 40 TPA chitosan plant

Items	Specification	Rate	Cost(Rs. Lakh)
A. Capital cost			
Land	1 acre	12lakh	12.00
Land development		LS	4.00
Subtotal A			16.00
B. Civil structures			
Plant and machinery room including open shed for raw material and store room	75x100 ft ²	Rs.690/ ft ²	51.75
Office room	500 ft ²	Rs. 805 ft ²	4.025
Internal roads, watchmen shed etc.	LS	LS	1.725
Subtotal B			57.50

Items	Nos	Capacity	Rate	Cost(Rs. Lakh)
Demineraliser	3	500kg	1.725	5.175
Deproteiniser	2	500kg	1.725	3.450
Deacetylato	2	500kg	2.875	5.750
Washing Vessel	1	8000 L	LS	5.750
Screw press	1		LS	5.750
Pulveriser	1	50-70 Kg hr	LS	2.300
Acid storage tanks	2	2500 L	LS	2.300
Alkali makeup tanks	2	2500 L	LS	3.450
Pumps	4	3 hp	0.575	2.300
Water pump	2	3 hp	0.575	1.150
Boiler			LS	4.600
Drainage equipments			LS	11.500
Aluminum trays	150		0.0115	1.725
Generator set			LS	6.900
Vehicle (truck)			LS	11.500
Miscellaneous			LS	8.050
Total C				81.650

Total A+ B+C= Rs. 155.15 Lakh

Recurring expenses

A- Raw material per batch

Particulars	Quantity	Rate	Amount (Rs. In lakh)
Shrimp shell waste	1000 kg	-	-
Commercial grade NaOH	200 kg	50	0.100
Commercial grade HCl	50 L	90	0.045
Commercial grade acetic acid	28 L	225	0.063
Fuel, water and electricity	LS	LS	0.138
Total			0.346

Raw material input cost requirement per year Rs.0.346 lakh x 2 batches x 200 days at

100% utilization =Rs.138.4 lakh

80% utilization= Rs. 110.72 lakh

B- Labor requirement for the factory

Personnel	No. required	Salary(Rs.)/ month	Total (Rs.)
Manager	1	30,000	30,000
Technician	2	20,000	40,000
Supervisors	4	15,000	60,000
Electrician	1	12,000	12,000
Semi skilled	5	10,000	50,000
Unskilled men	6	8,000	48,000
Unskilled women	20	6,000	120,000
Total			360,000

C- Administrative staff

Personnel	No. required	Salary(Rs.)/ month	Total (Rs.)
Manager	1	20,000	20,000
Marketing, financing and purchasing	2	15,000	30,000
Account assistant	2	8,000	16,000
Administrative and marketing assistance	2	8,500	17,000
Quality control technician	1	10,000	10,000
Driver	1	6,000	6,000
Watcher	1	5,000	5,000
Total			104,000

D- Total recurring expenses for one year – Full capacity (Rs.in lakh)

Input cost	138.4
Packing and marketing charges/ ton of chitosan at Rs. 11,500 / ton for 40 tons	4.6
Salaries and wages (12 x (360,000+ 104,000))	55.68
Administrative expenses at Rs. 11,500 / month	1.38
Miscellaneous	2.3
Total	202.36



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APPENDIX –C

Financial analysis of a chitosan plant with a capacity of 40 TPA

Capital cost = Rs. 155.15 lakh

Recurring cost

For 1st year = Rs. 145.16 lakh

For 2nd year = Rs. 159.46 lakh

For 3rd year = Rs. 173.76 lakh

Since the capacity utilization for 1st, 2nd and 3rd year are 60%, 70% and 80%.

Particulars	Year		
	1	2	3
Cash outflows			
Capital cost	155.15		
Recurring cost	145.16	159.46	173.76
Total	300.31	159.46	173.76
Cash inflows			
Income	240.00	280.00	320.00
Profit	-60.31	120.54	146.24
Assuming discount factor as 15%			
	0.869	0.756	0.658
Present value of cash outflows	260.96	120.55	114.33
Present value of cash inflows	208.56	211.68	210.56

The difference between present value of cash inflows and present value of cash outflows is equal to net present value (NPV).

NPV = 134.96

Since NPV is positive this project can be accepted.