

9.0 Cost Presentation

This chapter addresses the cost presentation for the project, encompassing:

- Estimates of Project Costs
- Estimates of Operating Costs
- Financial Statements including Profit and Loss Statement, Projected Cash Flow Statement and Balance Sheet

The bases of cost estimation are:

- The Bhutan Schedule of Rates (BSR) for arriving at all construction related costs.
- Budgetary offers and quotations received from manufacturers of plant, machinery, raw materials and consumables.
- Estimation of earthwork required at the actual site of plant
- Land lease rates as provided by the Department of Industry.
- Power rates as provided by the Bhutan Power Corporation (BPC).
- Availability of Aipoly spring water without any cess.

9.1 Capital Cost

The total project cost estimate for the proposed project works out to Nu. 486.44 lacs. This includes the capital cost for the project as well as the margin for working capital requirement.

The project cost has been arrived on the requirement of fixed and non-fixed assets to meet the prescribed production requirements.

Cost of Project:

S. No.	Particulars	Value (Nu. in Lacs)
1	Land 4,000 sq. metres (On lease)	
2	Building & Civil Construction	119.71
3	Plant & Machinery	165.54
4	Misc. Fixed Assets	67.10
5	Preliminary Expenses	1.00
6	Pre Operative Expenses	51.26
7	Margin Money for Working Capital	46.59
8	Contingencies 10%	35.24
	Total	486.44

Table 9.1: Cost of Project

Means of Finance:

S. No.	Particulars	Value (Nu. in Lacs)
1	Promoters' Equity	243.22
2	Term Loan from FI's	243.22
	Total	486.44

Table 9.2: Means of Finance

The term loan has been arrived at based on the break up of individual investment items and bank's financing pattern as given in table 9.14. The sub-sections of the project cost have been worked out in the following pages:

9.1.1 Land and Site Development

A land area of 4,000 sq. metres has been considered for setting up of the plant, catering to the current requirements, since no increase in spring water availability is envisaged. The land shall be obtained on long term lease from the Royal Government of Bhutan. The expenditure for land acquisition and associated legal fees has been considered suitably. The current lease rental is Nu. @ 4.00/ft²/p.a. for the first 3 years and Nu. @ 6.00/ft²/p.a. for 4th year and subsequently @ 3% increase every year as per the current lease rates.

S. No.	Year	Lease Rate Per sq. ft. Per Year (Nu.)	Lease Charges Per Annum (Nu. in Lacs)
1	1 st Year	4.00	1.70
2	2 nd Year	4.00	1.70
3	3 rd Year	4.00	1.70
4	4 th Year	6.00	2.56
5	5 th Year	6.20	2.64
6	6 th Year	6.40	2.73
7	7 th Year	6.60	2.81
8	8 th Year	6.80	2.90
9	9 th Year	7.00	2.98
10	10 th Year	7.20	3.07

Table 9.3: Land Lease Charges

The plot for the proposed plant is located at Iddi village about 1.5 km away from the source and 6 km from Gelephu Jongkhar. It is estimated that Nu. 15.00 lacs will be required to develop the site and additional Nu.10.00 lacs for building the access road from highway to plant and Nu. 5.00 lacs for boundary wall and gates.

Above items considered under these heads include internal roads, compound wall and gates. A separate provision has been kept for development of green belt, etc. Investments on these items have been suitably estimated based on cost information available with the consultant, as stated above.

Fixed Assets

9.1.2 Building and Civil work

The requirement of various civil structures has been derived and shown in the proposed layout for the plant. Broadly, this comprises of two groups viz. plant structures and non-plant buildings. About 1482 sq. metre of land will be required for built up area consisting of plant structures, classified under the following heads:

- Main factory buildings
- Water storages
- Auxiliary services

Approximately 80 – 90% of the cost of structures is attributable to the following eight items of civil works:

- Excavation
- Plain Cement Concrete (PCC)
- Reinforced Cement Concrete (RCC)
- Form Work (Ordinary/slipform)
- Reinforced Steel
- Structural Steel
- Sheetting (CGI/AC)
- Masonry (RR/Block/Brick)

The cost for each of these items has been worked out based on the Bhutan Schedule of Rates (BSR) Edition 2007. Correction towards the current market rate for cement has been made to the BSR for computing the costs. A housing

colony has not been considered at present, as it is expected that personnel will be transported by company vehicle from Gelephu, where rented accommodation would be available.

S. No.	Structure Type	Coverage	Basis
1	Main Factory Building	Pet preform, Pet blowing, complete water treatment & bottling plant	Preliminary civil designs based on the capacity and general arrangement drawings
2	Water Storages Tanks	Water storage from source	SS 304 sheet fabrication
3	Auxiliary Services	Substation, plant utilities, MCC rooms, cable galleries (OH) & trenches etc.	Consultants databank for similar installations
4	Non-plant	Administrative office, canteen, parking, gate house, time office etc.	Consultants databank for similar installations

Table 9.4: Basis for Civil Estimation

Therefore, for the purpose of this report, the quantity estimation for these items has been done for each structure and average rates per sq. ft. has been arrived, which are shown in table 9.5 given below:

S. No.	Particulars	Dimensions (ft.)		Area (sq. ft.)	Rate per sq. ft. (Nu.)	Total (Nu. in Lacs)
1	Office	40	25	1000	600.00	6.00
2	Raw Material Store	30	15	450	550.00	2.48
3	S. S. 304, 1, 5000 litre storage tank 6 pcs.*	12	15			15.00
4	Treatment Plant	40	25	1000	600.00	6.00
5	Blowing Plant	40	40	1600	550.00	8.80
6	Filling & Capping Labeling	40	45	1800	600.00	10.80
7	Finished Goods Storage	50	55	2750	550.00	15.13
8	Dispatched Dock	35	30	1050	550.00	5.78
9	Lab	25	15	375	600.00	2.25
10	Source Room	20	15	300	600.00	1.80
11	Pipeline Protection Embankment (Lump Sum)					2.00
12	Corridor	15	80	1200	550.00	6.60
13	Built up Plinth Area	30	60	1800	250.00	4.50
14	Guard Room & Time Office	15	15	225	350.00	0.79
15	Service Road Inside Boundary	12	200	2400	75.00	1.80
16	Land Development					15.00
17	Access Road (Highway to Plant)					10.00
18	Boundary Wall & Gates					5.00
Total Built up Area				15950		
					Total	119.71

Table 9.5: Building and Civil Work

* Inclusive of cost of tanks and installation

9.1.3 Plant & Machinery

The cost of plant & machinery is estimated at Nu.165.54 lacs including excise duty 18.51 lacs and installation and commissioning. The cost estimates for plant & machinery have been worked out based on the budgetary offers received from leading plant and machinery suppliers based on the water sample test reports, duly updated to cover the price escalation in the intervening period. Freight and insurance have been considered with the assumption that all machineries will be transported by road.

The bases for the costs considered, are given in table 9.6:

S. No.	Type	Coverage	Basis
1	Main Machinery of Indian Origin	Water treatment Plant, PET preform plant and PET Blowing machine	Budgetary offer
2	Auxiliary Equipment	SS water storage tank, mould sets, hoppers, dryers, cooling tower, chilling plant, compressors, water pipe lines from source, shrink packaging inspection and quality control labs.	Budgetary offer and Consultant databank for similar related equipment
3	Electrical Equipment	Transformer, electrical panels, distributions board, cabling and electrical installation etc.	Consultant databank for similar rated equipment
4	Control System	Control and Instrumentation	Ordered prices for similar equipment

Table 9.6: Cost Basis for Plant Machinery

Installation & commissioning charges have been considered @ 10% of the C.I.F. cost. This is based on the information available with the consultant. Department-wise costs of plant and machinery on a C.I.F. basis (for plant & machinery of Indian origin) have been shown in the following table 9.7.

(Nu. in Lacs)

S. No.	Particulars	Manufacturer	Specification	Qty.	Rate	Value	Excise Duty @16%
1	Pet Preform Injection Moulding M/C	Esemplast (India)	SMG-110	2	11.50	23.00	3.68
2	Mould Set	Esemplast (India)	10 Cavity	2	3.00	6.00	0.96
3	Hopper Dryer with Loader	Prasad Koch (India)	200 LTR	2	1.50	3.00	0.48
4	Dehumidifier	Prasad Koch (India)	200 LTR HD	2	0.50	1.00	0.16
5	Cooling Tower	Oceanic (India)	30 TR	1	0.38	0.38	0.06
6	Chilling Plant	Prasad Gwk (India)	7 TR	1	3.25	3.25	0.52
7	Pet Blowing Machine	Ampee Packaging (India)	350 mm	2	4.75	9.50	0.00
8	Compressor	Ingersoll Rand (India)	40 HP 35Kg/ cm ²	1	4.87	4.87	0.78
9	Mould Cost	Ampee Packaging (India)	2/4 Cavity	6	0.84	5.04	0.00
10	Treatment Plant Complete	EPIP Ltd. (India)	2000 LTR per Hr.	1	16.50	16.50	2.64
11	Washing, Filling, Capping, Sealing	Venus (India)	CVP 25	2	28.35	56.70	9.07
12	CO ₂ Gas Cylinders with manifolds	Bongaingaon, India	31 Kg.	18	0.09	1.62	0.00
13	Batch Coding	Hitachi	2 Line Automatic	2	2.25	4.50	0.00
14	Semi Automatic Taping Machine	Ampee Packaging (India)	Semi-Auto	2	0.65	1.30	0.00
15	Inspection Station	Venus (India)	Visual	2	0.50	1.00	0.16
Add Excise Duty (Wherever Applicable)						18.51	
Add : Freight, Handling, Insurance @6%						9.37	
Total						165.54	18.51

Table 9.7: Plant and Machinery Cost

9.1.4 Project Consultancy Fees

Technical management skills are vital for the project. While the technology itself is well known, the project requires high order management skills. Thus, a project consultancy fee has been considered for

- Preparation of Detailed Project Report
- Preparation of detailed site plans and building plans
- Preparation of drawings and designs for product and tooling
- Preparation of tender documents for inviting quotations for civil work and plant and machinery
- Coordination with all stake holders till successful trial production

A provision has been made for Nu. 10.00 lacs to cover these consultancy costs. The project consultancy has been considered from India so this cost is reasonable.

9.1.5 Expenses on Training

The training needs for plant personnel have been discussed in chapter 4.0 section 4.6. Based on these, the cost of this has been estimated @ Nu.2.00 lacs.

9.1.6 Miscellaneous Fixed Assets

Nu.67.10 lacs have been estimated under the heading of MFA. The details of electrical installations for power distribution have been considered commensurate with the power load and process control requirements described in chapter 5.9 viz. Electrical Engineering Considerations.

Other miscellaneous fixed assets including furniture, office machinery & equipment, pipeline & equipment for water supply, laboratory, workshop, vehicles, fire fighting equipment, etc have been provided on a lump sum basis as per information available with the consultant for similar assets. Environment mitigation measures have been provided for and an investment of Nu 3.15 lacs made on this account.

The details of all miscellaneous fixed assets and their associated costs have been shown in the following table 9.8.

S. No.	Particular	Qty.	Rate (Nu. in Lacs)	Amount (Nu. in Lacs)
1	Office Equipment	1	2.25	2.25
2	Computers with Accessories	1	0.45	0.45
3	Laptop	1	0.50	0.50
4	Furniture & Fixture with Interior	1	3.00	3.00
5	CC TV Installation	1	2.00	2.00
6	Online Data Acquisition System	1	0.80	0.80
7	Lab Instruments	1	3.00	3.00
8	Fire Fighting Equipments (Set)	1	0.60	0.60
9	Collection Pipe & Insertion	1	2.25	2.25
10	Source Sealing	1	2.50	2.50
11	Pipe Line Approx. 3,000 ft. with Installation	1	5.25	5.25
12	Electrical Installation, Distribution & Lighting	1	16.55	16.55
13	Air Curtains	2	0.25	0.50
14	Positive Air Pressure System	1	4.00	4.00
15	Car	1	6.00	6.00
16	Tata Mini Truck	2	5.00	10.00
17	Transformer 33/433 kv Uttam Bharat	1	2.00	2.00
18	Distribution Board with Busbar	1	1.00	1.00
19	Earthing	8	0.10	0.80
20	Capacitor Bank	1	0.50	0.50
21	Sedimentation Tanks (6'x8')	4	0.10	0.40

S. No.	Particular	Qty.	Rate (Nu. in Lacs)	Amount (Nu. in Lacs)
22	Septic Tanks	4	0.35	1.40
23	Tree Plantation	In lot	0.75	0.75
24	Waste Enclosures	4	0.15	0.60
Total				67.10

Table 9.8: Miscellaneous Fixed Assets

9.1.7 Preliminary Expenses

Nu. 1.00 lacs have been estimated under the heading of Preliminary Expenses.

S. No.	Particular	Estimation (Nu. in Lacs)	Amount (Nu. in Lacs)
1	Company Formation Expenses, Legal & Liaison	1.00	1.00
Total			1.00

Table 9.9: Preliminary Expenses

9.1.8 Pre-operative Expenses

Pre-operative expenses include establishment cost, rent, taxes, traveling expenses, salary during construction, interest during construction, insurance during construction, water testing charges, designing charges, trade mark charges and other miscellaneous expenses.

Based on the financing pattern envisaged, interest during construction has been estimated considering the phasing in the cash requirements and the norms prevalent for various sources of funds. It has been assumed that the funds from various sources shall be available, as required. Provision has been made towards payment of project consultancy fees as well as the geo-electric survey necessary to establish the long-term potential of the spring source.

Other expenses, under this head have been estimated on a block basis, based on information available for similar projects.

Based on the project implementation schedule, the expected completion dates of various activities and the estimated phasing of cash requirements, interest during construction has been computed in table 9.11 and total pre-operative expenses are given below in the table 9.10 as follows:

S. No.	Particular	Estimation on Basis (Nu. in Lacs)	Amount (Nu. in Lacs)
1	Interest up to Production (details are in table 9.11)	For 1 year on term loan	13.81
2	Insurance During Construction Period	0.25% of factory assets	0.88
3	Electricity Charges Construction Period		1.75
4	Salary During Construction Period as per table 9.22		7.57
5	Geo-electric Survey for Suitable Depth		2.25
6	Water Testing & Certification (IS 13428)		3.00
7	Marketing Launch Expenses		6.00
8	Project Consultancy Fees	For turnkey project startup	10.00
9	Training Expenses		2.00
10	Traveling Expenses		2.00
11	Design & Development Charges : Labels/Seals		1.00
12	Registration of Trade Mark		1.00
Total			51.26

Table 9.10: Pre-operative Expenses

a. Interest during Construction

(Nu. in Lacs)

Description	Cost	Pre Zero		Quarters (From Zero Date i. e. after placement of main machinery order)								Total
		1	Value	1 st	Value	2 nd	Value	3 rd	Value	4 th	Value	
Land and Site Development	0	0%	0	100%	0.00	0%	0.00	0%	0.00	0%	0.00	100%
Factory Buildings	119.71	0%	0	20%	23.94	20%	23.94	30%	35.91	30%	35.91	100%
Plant and Machinery	165.54	0%	0	10%	16.55	20%	33.11	30%	49.66	40%	66.22	100%
Office Equipment	2.25	0%	0	10%	0.23	20%	0.45	30%	0.68	40%	0.90	100%
Computer, Furniture etc.	3.95	0%	0	0%	0.00	20%	0.79	30%	1.19	50%	1.98	100%
Water Piping and Storage	26.55	0%	0	0%	0.00	0%	0.00	0%	0.00	100%	26.55	100%
Vehicles	16.00	0%	0	20%	3.20	30%	4.80	25%	4.00	25%	4.00	100%
Miscellaneous Fixed Assets	18.35	0%	0	20%	3.67	20%	3.67	30%	5.51	30%	5.51	100%
Preliminary Exp.	1.00	20%	0.20	50%	0.50	30%	0.30	0%	0.00	0%	0.00	100%
Project Consultancy Fees	10.00	20%	2.00	40%	4.00	20%	2.00	20%	2.00	0%	0.00	100%
Expenses on Training	2.00	0%	0	0%	0.00	20%	0.40	30%	0.60	50%	1.00	100%
Marketing Launch Exp.	6.00	0%	0	0%	0.00	10%	0.60	20%	1.20	70%	4.20	100%
Pre-operative Expenses Excl. Int.	19.45	0%	0	10%	1.95	20%	3.89	30%	5.84	40%	7.78	100%
Contingency	35.24	0%	0	0%	0.00	20%	7.05	30%	10.57	50%	17.62	100%
Provision for Margin Money	46.59	0%	0	0%	0.00	0%	0.00	0%	0.00	100%	46.59	100%
Total	472.63		2.20		54.04		81.00		117.15		218.25	472.63
Fund Flow												
Equity			1.10		27.02		40.50		58.57		109.13	236.32
Term Loan			1.10		27.02		40.50		58.57		109.13	236.32
Total			2.20		54.04		81.00		117.15		218.25	472.63
Interest			0.13		3.24		3.64		3.51		3.27	13.81
Total Interest Cost (i.e. Interest + Upfront charges)												13.81

Table 9.11: Interest during Construction

9.1.9 Provision for Contingency

A provision for contingency at the rate of @10.00% has been made against various cost heads viz. Building and Civil Construction, Plant and Machinery and Miscellaneous Fixed Assets.

9.1.10 Working Capital Requirement

Working capital requirements have been computed keeping in view the PET bottle raw material, caps, other packaging requirements, cash expenses like lease rentals, salaries, electricity charges, sales receivables etc and the norms adopted by commercial banks for financing working capital. The details are given in table 9.12 net working capital requirement & table 9.13 increase in working capital in subsequent years.

a. Net Working Capital Requirement

S. No.	Particulars	Period	Margin %	Amount (Nu. in Lacs)	Own Contribution (Nu. in Lacs)	Bank Loan (Nu. in Lacs)
1	Raw Material & Consumables	15 Days	50%	15.08	7.54	7.54
2	Receivable	30 Days	50%	61.61	30.80	30.80
3	Cash for Expenses	30 Days	50%	16.49	8.24	8.24
Net Working Capital Requirement				93.18	46.59	46.59

Table 9.12: Net Working Capital Requirement

b. Increase in Working Capital

(Nu. in Lacs)

Description	No. of Days	% of Bank Finance	I Year			II Year			III Year		
			Amount	Bank Finance	Margin Money	Amount	Bank Finance	Margin Money	Amount	Bank Finance	Margin Money
Raw Materials	15	50%	14.37	7.18	7.18	16.76	7.18	9.58	19.15	7.18	11.97
Consumables	15	50%	0.72	0.36	0.36	0.84	0.36	0.48	0.96	0.36	0.60
Labour & Factory Overheads	30	50%	4.65	2.33	2.33	4.88	2.33	2.56	5.13	2.33	2.80
Selling Expenses	30	50%	9.24	4.62	4.62	10.78	4.62	6.16	12.32	4.62	7.70
Work in Progress	0	50%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finished Goods	0	50%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accounts Receivable	30	50%	61.61	30.80	30.80	71.87	30.80	41.07	82.14	30.80	51.34
Other Misc. Overheads	30	50%	2.60	1.30	1.30	2.71	1.30	1.41	2.83	1.30	1.53
Total			93.18	46.59	46.59	107.84	46.59	61.25	122.53	46.59	75.94
Increase in Working Capital						14.67			14.68		

Table 9.13: Increase in Working Capital in Subsequent Years

9.1.11 Term Loan Requirement:

The financing of the project has been considered on the basis of 50% margin on building cost, 50% margin on cost of plant & machinery & misc. fixed assets. It has been calculated on the basis of debt equity ratio of 1:1.

Term loan requirement from financial institution has been worked out in the table 9.14 as below:

S. No.	Particulars	Margin %	Amount (Nu. in Lacs)	Own Contribution (Nu. in Lacs)	Bank Loan (Nu. in Lacs)
1	Building & Civil Construction	50%	119.71	59.86	59.86
2	Plant & Machinery	50%	165.54	82.77	82.77
3	Misc. Fixed Assets	50%	67.10	33.55	33.55
4	Preliminary Expenses	50%	1.00	0.50	0.50
5	Pre-operative Expenses	50%	51.26	25.63	25.63
6	Margin Money for Working Capital	50%	46.59	23.29	23.29
7	Contingencies	50%	35.24	17.62	17.62
Total			486.44	243.22	243.22

Table 9.14: Term Loan Requirement

9.2 Operating Costs

The proposed project has been conceived to produce ‘sparkling spring natural mineral water’ in different size packaging. The following product mix has been considered to match the projected demand requirements for each bottle size:

S. No.	Product Mix	Production per Hour	Production per Day	Production per Year (Lacs Bottle)
1	200 ml	4000	4000	12.00
2	500 ml	3350	6700	20.10
3	1,000 ml	3000	36000	108.00

Table 9.15: Production Estimates

The capacity utilization, as given in table 9.16, in terms of total processing facility and unit operations, for different years of operation for the plant works out to:

Year of Operation	Installed Cap (Bottles in lacs)	Utilization (%)
1 st	143.70	60.00
2 nd	143.70	70.00
3 rd	143.70	80.00
4 th	143.70	80.00
5 th	143.70	80.00
6 th	143.70	80.00
7 th	143.70	80.00
8 th	143.70	80.00
9 th	143.70	80.00
10 th	143.70	80.00

Table 9.16: Installed Capacity

- Installed capacity is based on the smallest economic size of the specific production line. However, bottling size mix will be based on the demand forecast for specific packaging.
- Greater than 100% utilization is envisaged by adopting one or more of the following means:
 - Triple shift operations for the plants (presently considered on double shift basis).
 - Adding additional line for plant.

The expenses on consumable stores for the plant have been estimated based on feedback available with the consultant. The landed cost for PET and packaging raw materials has been calculated and given in table 9.17. Total unit costs of products are as follows and detail calculation is in table 9.18.

Total unit cost of production

Product Range	(Nu./bottle)
▪ 200 ml	5.15
▪ 500 ml	6.26
▪ 1,000 ml	7.56

The operational costs have been worked out as follows:

9.2.1 Cost of Raw Material

S. No.	Particular	Qty per Pcs. (in grams)	Rate per Kg. (in Nu.)	Value per Pcs. (in Nu.)	Production per Day	Value per Annum (Nu. in Lacs)
1	Pet Granules					
	For 200 ml Bottle	16	80	1.28	0	0.00
	For 500 ml Bottle	21	80	1.68	20100	101.30
	For 1000 ml Bottle	29	80	2.32	30000	208.80
	For 2000 ml Bottle	42	80	3.36	0	0.00
2	Gas Filling Charges CO ₂	5 Kg For 1000 Liters		150.00	40050	18.02
3	Caps @0.25 Nu. per Cap	unit Cost		0.35	50100	52.61
4	Body Labels @ 0.45 Nu. Per Label	unit Cost		0.45	50100	67.64
5	Corrugated Box 3 Ply	unit cost for Package of 12 Bottle 200 ml		4.00	0	0.00
6	Corrugated Box 3 Ply	unit cost for Package of 12 Bottle 500 ml		6.00	1675	30.15
7	Corrugated Box 3 Ply	unit cost for Package of 12 Bottle 1,000 ml		8.50	2500	63.75
8	Corrugated Box 3 Ply	unit cost for Package of 6 Bottle 2,000 ml		9.00	0	0.00
9	Cap Holographic Neck Seal	unit cost		0.19	50100	28.56
10	Bopp Tape Roll 28 mm X 65 metres	per roll		21.00	60	3.78
Total						574.60

Table 9.17: Cost of Raw Material

- Total Raw Material Requirement At 100% Capacity (Nu. in Lacs) Nu. 574.60
- First Year 60% Nu. 344.76
- Second Year 70% NU. 402.22
- Third Year 80% NU. 459.68

9.2.1.1 Unit Cost of Production

S. No.	Description	Unit	Nu./Unit	Quantity (gms/bottle)				Cost (Nu./kg)	Cost (Nu./bottle)			
				200 ml	500 ml	1000 ml	2000 ml		Granules	200 ml	500 ml	1000 ml
1	Raw Materials & Consumables											
1.1	Relpet Plus Aqua 5760 Pet Resin	gms.		16	21	29	42	80.00	1.28	1.68	2.32	3.36
1.2	Gas CO ₂ Filling Charges	gms.	900/30 Kg						0.03	0.08	0.15	0.30
1.3	Corrugated Boxes For 12 Bottles	nos.	8						0.33	0.50	0.71	1.50
1.4	Caps	nos.							0.35	0.35	0.35	0.35
1.5	Body Label	nos.							0.45	0.45	0.45	0.45
1.6	Shrink Holo -- graphic Cap Seals	nos.							0.19	0.19	0.19	0.19
1.7	Bopp Tape Roll	Sq.	21						0.02	0.02	0.03	0.03

S. No.	Description	Unit	Nu./Unit	Quantity (gms/bottle)				Cost (Nu./kg)	Cost (Nu./bottle)			
				200 ml	500 ml	1000 ml	2000 ml	Granules	200 ml	500 ml	1000 ml	2000 ml
		metre										
1.8	Consumables							0.13	0.16	0.21	0.31	
	Sub Total (1)							2.78	3.43	4.41	6.49	
2	Utilities											
2.1	Power							0.09	0.10	0.12	0.29	
2.2	Water							0.01	0.01	0.01	0.01	
	Sub Total (2)							2.88	3.55	4.54	6.79	
3	Wages & Salaries Incl. Benefits							0.48	0.58	0.65	1.62	
4	Factory Overheads							0.10	0.12	0.14	0.34	
5	Sales Tax							0.00	0.00	0.00	0.00	
6	Administrative Expenses							0.08	0.09	0.10	0.26	
7	Interest							0.31	0.37	0.41	1.02	
8	Depreciation							0.33	0.40	0.45	1.11	
9	Selling & Distribution Expenses		7.5%					0.48	0.57	0.64	1.60	
10	Freight Cost		7.5%					0.48	0.57	0.64	1.60	
Total Unit Cost of Production								5.15	6.26	7.56	14.35	

Table 9.18: Unit Cost of Production

9.2.2 Electrical and Water Consumption Charges

Based on the technical concept as detailed in the various relevant chapters, specific power consumption has been worked out in table 9.20 and the unit cost of electricity has been considered @ Nu 1.45/ kwh assuming that the entire power requirement is met from the grid. This seems a valid assumption on account of the negligible incidence of power outages. The electrical and water consumption charges are as follows:

S. No.	Description	Amount per Annum (Nu. in Lacs)
1	Power Consumption	10.00
2	Water Consumption	0.25
Total		10.25

Table 9.19: Electrical and Water Consumption Charges

9.2.2.1 Electrical Power Load Calculation Sheet

S. No.	Equipment	No. of Units	Load/ Unit (KW)	Total Load (KW)	Working Hours	Total (KWH)	Unit Cost	Total (Cost/Day)	Total per Year
1	Treatment Plant Complete	1	20.00	20.00	24	480	1.45	696.00	208,800
2	Pet Preform Injection Moulding M/C	2	25.00	50.00	16	800	1.45	1160.00	348,000
3	Dehumidifier	2	2.00	4.00	16	64	1.45	92.80	27,840
4	Hopper Dryer with Loader	2	2.00	4.00	16	64	1.45	92.80	27,840
5	Cooling Tower	1	0.75	0.75	16	12	1.45	17.40	5,220
6	Chilling Plant	1	5.00	5.00	16	80	1.45	116.00	34,800
7	Pet Blowing Machine	2	1.20	2.40	16	38.4	1.45	55.68	16,704
8	Preheater	1	10.00	10.00	16	160	1.45	232.00	69,600
9	Compressor	1	15.00	15.00	16	240	1.45	348.00	104,400
10	Washing, Filling, Capping, Sealing	2	5.00	10.00	16	160	1.45	232.00	69,600

S. No.	Equipment	No. of Units	Load/ Unit (KW)	Total Load (KW)	Working Hours	Total (KWH)	Unit Cost	Total (Cost/Day)	Total per Year
11	Batch Coding	2	0.10	0.20	16	3.2	1.45	4.64	1,392
12	Inspection Station	1	0.30	0.30	16	4.8	1.45	6.96	2,088
13	Plant Lighting	1	8.00	8.00	18	144	1.45	208.80	62,640
14	Outdoor Lighting	1	4.00	4.00	10	40	1.45	58.00	21,170
Total				133.65		2290.4		3321.08	1,000,094

Table 9.20: Electrical Power Load Calculation Sheet

*Power factor has been considered at one (1).

9.2.3 Salary & Wages

Salaries & wages (including benefits) for different categories of employees have been considered based on present day expenses being incurred by other similar industries and work profile. Adequate adjustments have been considered for expatriates. Salary & Wages during construction period has been detailed in table 9.22. The break down of manpower and incidence of salaries & wages has been detailed in the following table 9.21:

S. No.	Description	Requirement (for 2 Shift)	Salary per Month (Nu.)	Salary per Month (Nu. in Lacs)	Salary per Annum (Nu. in Lacs)
A	Administrative				
1	General Manager	1	21,000	0.21	2.52
2	Purchase Officer	1	8,000	0.08	0.96
3	Sales Officer	2	8,000	0.16	1.92
4	Accountant	1	6,500	0.07	0.78
5	Office Assistant	2	5,000	0.10	1.20
	Total (A)	7			
B	Production				
1	Production Manager	1	12,000	0.12	1.44
2	Supervisors	2	8,000	0.16	1.92
3	Chemist	2	8,000	0.16	1.92
4	Storekeeper	2	6,000	0.12	1.44
5	Skilled Workers	18	5,000	0.90	10.80
6	Unskilled Worker	30	3,500	1.05	12.60
7	Maintenance	4	6,000	0.24	2.88
	Total (B)	59			
C	Others				
1	Guard	4	3,500	0.14	1.68
2	Housekeeping	6	3,000	0.18	2.16
3	Drivers, Helpers	8	4,500	0.36	4.32
	Total (C)	18			
	Total (A+B+C)	84			
				Total	48.54

Table 9.21: Salary and Wages

Note: 1. Fringe benefits 15 % of the salary
2. Salary to be increased 5% every year

9.2.4 Salary & Wages during Construction Period

S. No.	Description	Requirement	Salary per Month (Nu.)	Salary per Month (Nu. in Lacs)	Salary I Year (Nu. in Lacs)
A	Planning Phase (from 10th Week)				
1	General Manager	1	21,000	0.21	2.11
2	Production Manager	1	12,000	0.12	1.20
B	Erection Phase (from 44th Week)				
1	Purchase Officer	1	8,000	0.08	0.16
2	Sales Officer	1	8,000	0.08	0.16
3	Accountant	1	6,500	0.07	0.13
4	Supervisors	1	8,000	0.08	0.16
5	Chemist	1	8,000	0.08	0.16
6	Office Assistant	1	5,000	0.05	0.10
7	Storekeeper	1	6,000	0.06	0.12
8	Skilled Workers	11	5,000	0.55	1.10
9	Unskilled Worker	15	3,500	0.53	1.05
10	Maintenance	4	6,000	0.24	0.48
11	Guard	4	3,500	0.14	0.28
12	Housekeeping	3	3,000	0.09	0.18
13	Drivers	2	4,500	0.09	0.18
Total		48			
				Total	7.57

Table 9.22: Salary & Wages during Construction Period

Administrative expenses have been suitably considered and include conveyance exp., telephone exp., tea & refreshment exp., traveling exp. etc.

Factory overhead(s) have been considered as given in table 9.23 below:

Head	Rates
Lease Rent	Nu 4.00/ ft ² /p.a.
Consumables	5% of cost of raw material
Insurance on Factory Assets	0.25% of WDV
Repairs & Maintenance	4% for plant & machinery, 4% for Misc. Fixed Assets

Table 9.23: Factory Overheads

The incidence of these costs is based on those incurred by similar operating installations in India. Sales and distribution expenses, including expenses for advertisement & publicity and freight have been considered @ 15% on sales.

Freight expenses have been worked out based on the envisaged distribution pattern of the packaging mix of the water bottles manufactured from the plant. The distribution plan has been detailed in chapter 3.15 viz. Marketing Strategy. The cost of packing has been worked out @ Nu. 8.00 per carton of 12 bottles of one litre each.

Statutory expenses include excise duty and sales tax. The former is not applicable for goods produced in Bhutan in accordance with the present statute. The local sales tax of the state, in which the goods are sold, shall however, be applicable. The Sales Tax has been assumed to be paid by the consumer over and above the sales price (presently not applicable in Bhutan) and thus, has not been considered for profitability computations.