1 COLD CHAIN

1.1 Introduction

Cold chain is a logistic system that provides a series of facilities for maintaining ideal storage conditions for perishables from the point of origin to the point of consumption in the food supply chain. The chain needs to start at the farm level (e.g. harvest methods, Pre-cooling) and cover up to the consumer level or at least to the retail level. A well organized cold chain reduces spoilage, retains the quality of the harvested products and guarantees a cost efficient delivery to the consumer given adequate attention for customer service. The main feature of the chain is that if any of the links is missing or is weak, the whole system fails.

The Cold chain logistics infrastructure generally consists of:

- Pre-cooling facilities
- Cold Storages
- Refrigerated Carriers
- Packaging
- Warehousing
- Information Management systems (Traceability and Tracking etc.)

1.2 Objective

The temperature controlled supply chains or cold chains are a significant proportion of the retail food market. The market shares of fast foods, ready meals and frozen products have increased in recent years. There are several food temperature levels to suit different types of products. Frozen, cold chilled, medium chilled, and exotic chilled are some of the frequently used nomenclatures with specified temperature ranges, depending on the products, whether it is meat or ice cream or potatoes or bananas.

With the growing demands to keep and distribute temperature sensitive products in potent condition, organizations are seeking better solutions to maintain and monitor cold chain. The success of implementing cold chain management involves continual monitoring of product temperature throughout distribution and having appropriate corrective action plans in place. A streamlined, well maintained cold chain helps to:

- Reduce costs
- Improve product integrity
- Increase customer satisfaction
- Reduce wastage and returns of expired stock

1.3 Raw Material Availability

All the fruits, vegetables, milk, meat, poultry and fish available in the state can be used in the unit.

1.4 Market Opportunities

- The total cold chain market in India is worth Rs. 21,375 million, which is equivalent to US $ 475 million. (taking 1US$= Rs 45)
- Chiller Segment, which includes F & V packhouses, Potato, apple contributes Rs 16050 million (US$ 357 Million) to the cold chain market.
- The remaining market is segregated into:

Segment	Value (US$ Million)
Imported Fresh Fruits & Vegetables	1.67
Exports By sea (Seafood, Meat, Poultry, Fruits & Vegetables)	46
Chocolate Industry	2
Dairy Industry	2.67
Meat & Poultry (domestic)	1.33
Ice-cream Industry	4.90
Processed potato	4.45
Frozen F & V	1.67
Emerging segments (RTE, RTS, RTC, flavored milk/yoghurt)	13.33
Cool Chain Transportation	40

It is at a threshold of exponential increase due to developments taking place in food and retail industry of India.

- **Retail:** Retail is India's largest industry, accounting for over 10 per cent of the country's GDP. The businesses started with traditional corner stores and have emerged to supermarkets and modern retail stores.
- **Increasing Awareness**: About 30% of the fruits and vegetables grown in India get wasted annually due lack of awareness about proper handling and storage requirements as well as poor infrastructure, insufficient cold storage capacity, unavailability of cold storages in close proximity to farms, poor transportation infrastructure, etc. As a result only 2% of products that should be temperature controlled are handled this way today- a figure that stands in stark contrast to the 15% in China, and 85% compliance with good cold chain practices found in Europe and North America. Even for Asia Pacific region as a whole the comparative figure is about 8% based on share of refrigerated transport in the entire transport market.

1.5 Project description

1.5.1 Target Product Mix

Characteristics of Indian CCM market for important product segments are summarized in the following table.

Product	Characteristics
Potato	- Accounts for almost 90% of existing cold storage capacity
Chocolate	- Highest outsourcing demand among various product segments. - Large variation in peak and non-peak demand. - No dominant player among service providers
Poultry	- Almost 100% demand captured by Snowman and RK Foodland – both pan India players
Fruits & Vegetables	- Stable and High demand throughout the year. - No dominant player yet. - More than 60% demand met by small/ local/regional players
Dairy products (Butter & Cheese)	- Substantial demand throughout the year. - Major players not very active - Significant share of small players
Ice Cream	- Highly seasonal High demand in peak season - High growth - 35% demand shared by small players

Based on the above, it is recommended that Promoters should concentrate on the following products:

- Domestic distribution on all India basis
  - ✓ Fruits & Vegetables (fresh and processed)
  - ✓ Chocolates
  - ✓ Ice Cream
  - ✓ Dairy products
  - ✓ Meat, Poultry & Fish

1.6 Cost of project

The project profile is planned on pan India basis. The total cost of the project is 3771.14 lakhs. The project is planned to pursue in three phases, in which first phase is planned in Indore. After that the project will be expanded phase-wise with expansion spokes.

The cold chain unit is very essential and important as to reduce the post harvest losses of commodities. The viability of the other projects will also get increased with this unit. This is an essential unit for the growth of agriculture and horticulture produce in the state.

The profile for the cold chain unit is created as per requirement of the 3rd / 4th years. Optimum utilization starts in 5th year. Being capital intensive project key indicators considered on the 15th year operation.

Particulars		Phase 1		Phase 2		Phase 3		Grand Total
LAND			580.80					580.80
DEVELOPMENT COST			80.59					80.59
BUILDING			274.05	159.69		67.77		501.51
PLANT & MACHINERY			659.85	388.71		164.96		1,213.52
MISC. FIXED ASSETS			143.94	42.40		17.99		204.32
LOGISTICS			605.00	291.60		225.50		1,122.10
TOTAL FIXED ASSETS		**-**	**2,344.22**	**882.39**	**-**	**476.22**	**-**	**3,702.84**
PRE-OPERATIVE EXPENSES			68.30					68.30
Total		**-**	**2,412.52**	**882.39**	**-**	**476.22**	**-**	**3,771.14**
MEANS OF FINANCE								
EQUITY	100.00%		2,412.52	882.39		476.22		3,771.14
Total		**-**	**2,412.52**	**882.39**	**-**	**476.22**	**-**	**3,771.14**

1.6.1 Cash flow statement

PARTICULARS	Year 1	Year 3	Year 5	Year 7	Year 9	Year 11	Year 13	Year 15
SOURCES OF FUNDS								
INCREASE IN SHARE CAPITAL	-	882.39	476.22	-	-	-	-	-
NET PROFIT	46.82	285.21	424.97	591.79	564.25	747.86	768.85	789.14
INCREASE IN CURRENT LIABILITIES	14.58	4.83	0.35	0.38	0.42	2.86	0.51	0.56
DEPRECIATION	186.94	186.94	274.86	245.16	228.58	120.96	76.54	35.25
PRELIMINARY EXP.W/O	9.76	9.76	9.76	9.76	-	-	-	-
TOTAL	**258.10**	**1,369.13**	**1,186.16**	**847.09**	**793.25**	**871.68**	**845.91**	**824.96**

1.7 Projected balance sheet

PARTICULARS	Year 1	Year 3	Year 5	Year 7	Year 9	Year 11	Year 13	Year 15
LIABILITIES								
SHARE CAPITAL	2,412.52	3,294.92	3,771.14	3,771.14	3,771.14	3,771.14	3,771.14	3,771.14
RESERVES & SURPLUSES	46.82	526.64	1,421.19	2,560.84	3,719.43	5,070.09	6,600.51	8,174.85
CURRENT LIABILITIES	14.58	23.45	30.92	31.42	32.25	35.55	36.55	37.65
TOTAL	**2,473.92**	**3,845.00**	**5,223.24**	**6,363.40**	**7,522.81**	**8,876.77**	**10,408.19**	**11,983.63**

1.8 Profitability statement

PARTICULARS	Year 1	Year 3	Year 5	Year 7	Year 8	Year 10	Year 12	Year 14	Year 15

NET SALES REALISATION	930.77	1,735.47	2,699.27	3,282.29	3,282.29	3,282.29	3,655.36	3,655.36	3,655.36
TOTAL COSTS	**687.25**	**1,128.01**	**1,774.05**	**2,130.98**	**2,134.22**	**2,167.15**	**2,402.40**	**2,425.70**	**2,438.23**
GROSS PROFIT	**243.52**	**607.45**	**925.23**	**1,151.30**	**1,148.06**	**1,115.13**	**1,252.97**	**1,229.66**	**1,217.13**
DEPRECIATION	186.94	186.94	274.86	245.16	228.58	173.42	95.03	49.57	35.25
PRELIMINARY EXP.W/O	9.76	9.76	9.76	9.76	-	-	-	-	-
PROFIT BEFORE TAX	**46.82**	**410.75**	**640.61**	**896.39**	**919.48**	**941.72**	**1,157.93**	**1,180.10**	**1,181.88**
TAXES	-	125.54	215.64	304.60	325.14	338.92	396.37	394.90	392.74
PROFIT AFTER TAX	46.82	285.21	424.97	591.79	594.34	602.80	761.57	785.20	789.14

1.9 Key indicators

NET PROFIT AFTER TAX	**602.80**
INTERNAL RATE OF RETURN	**19.39**
BREAK EVEN POINT %	**39.62**
PAY BACK PERIOD (YRS)	**6.22**

1.10 Manpower Requirement

PARTICULARS	NOs.
ADMINSTRATIVE STAFF	
MANAGER-ADMN & OPRN	1
ACCOUNTS & DESPATCH	6
TECHNICAL	
MANAGER LOGISTIC DISTRIBUTOON	2
REF. ENGINEER/SUPERVISOR	1
MAINTENANCE SUPERVISOR	1
WORKERS	
SKILLED WORKERS	6
UNSKILLED WORKERS	6
TOTAL	**23**

1.11 Assumption

CAPACITY		
Capacity Per Annum	TPA	6050
CAPACITY UTILIZATION		
Year I		50%
Year II		70%
Year III		90%
SALES PRICE		
Storage-Rent		**MTPA**
Ice Cream		1,350
Chocolate		750
Dairy Products		800
F&V-Imported		2,500
F&V-Frozen		2,500
Potato		800
Horticulture Produce		2,500
POWER		
Connected Load	HP	743
DEPRICIATION AS PER COMPANY'S ACT		
BUILDING		3.34%
PLANT & MACHINERY		10.34%
MISC. FIXED ASSETS		7.07%
DEVELOPMENT COST		1.63%
LOGISTICS COST		16.21%
MAINTENANCE		
REPAIR & MAINTENANCE		2.00%

The actual cost of projects may deviate on change of any of the assumptions.