



# Indian Cold Chain Industry Modernization of the Cold Storage Infrastructure



ONICRA CREDIT RATING AGENCY OF INDIA LIMITED.

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## EXECUTIVE SUMMARY

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Cold chains are essential for extending the shelf life, period of marketing, avoiding over capacity, reducing transport bottlenecks during peak period of production and maintenance of quality of produce. The development of cold chain industry has an important role to play in reducing the wastages of the perishable commodities and thus providing remunerative prices to the growers. Also, it acts like a backbone for pharma industry and helps to maintain the efficacy of the drug throughout the supply chain by providing temperature controlled environment to sensitive pharma products.

With the growth on the domestic manufacturing and retail segments, the demand for efficient warehouse management service has improved. Despite of the growing demand, warehousing continues to see little investment. Current spending on organized warehousing in India constitutes 9 percent of total logistics spending, as against 25 percent in the US.

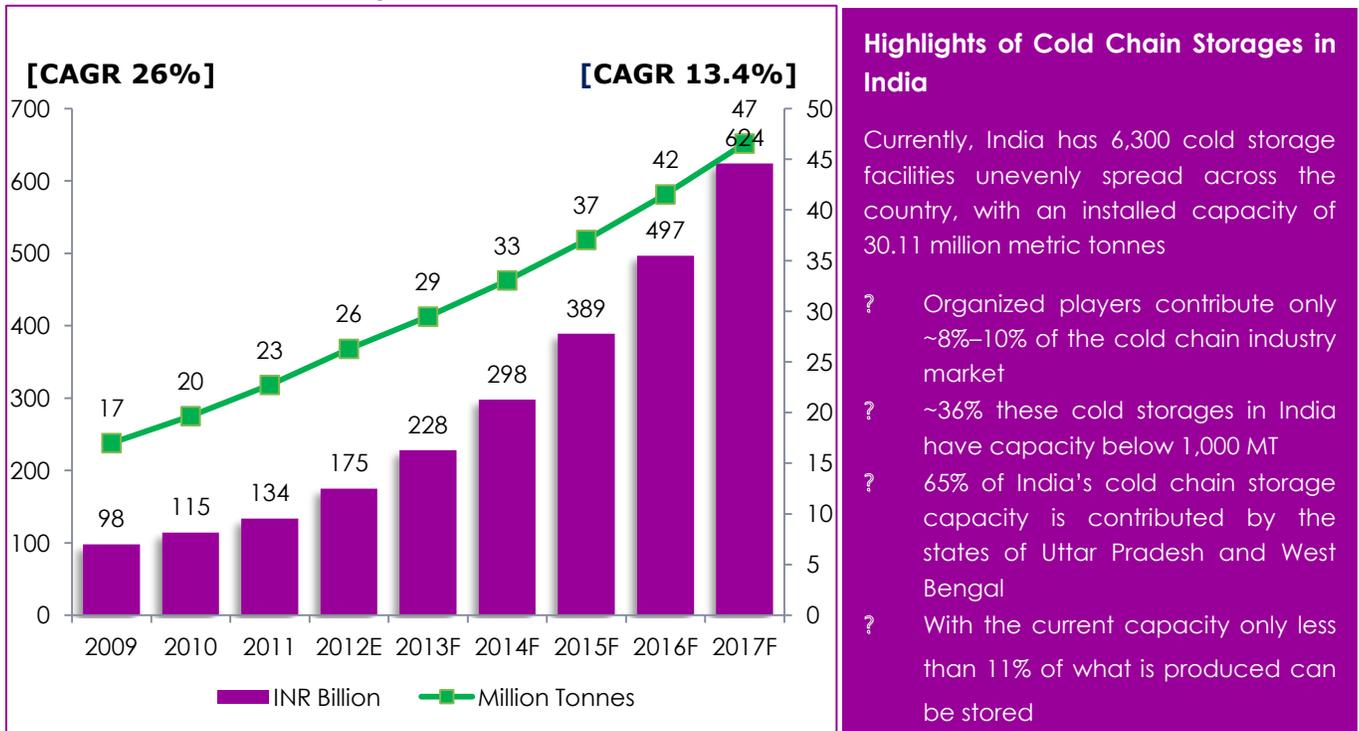
According to the World Bank's 2014 Logistics Performance Indicator, India is ranked 54th and is behind countries such as Japan, the United States, Germany and China. Logistics costs account for around 6-10 percent of average retail prices in India as against the global average of 4-5 percent. Therefore, there is a clear scope to improve margins by 3-5 percent by improving the efficiency of the supply chain and logistics processes. Developing an integrated supply chain, including cold chain can save up to ₹300 billion annually and at the same time reduce the wastage of perishable horticulture produce. It is worth noting that the price of vegetables, fruits, milks and eggs, meat and fish have been rising faster in spite of the fact that India is the second highest producer of fruits and vegetables. This is led by inadequate supply chain and logistics infrastructure and management.

## INDIA'S COLD CHAIN INDUSTRY

The cold chain involves the transportation of temperature sensitive products along a supply chain through thermal and refrigerated packaging methods to protect the integrity of these shipments. There are several means in which cold chain products can be transported, including refrigerated trucks and railcars, refrigerated cargo ships as well as by air cargo.

India's integrated cold chain industry - a combination of surface storage and refrigerated transport - has been growing at a CAGR of ~20 percent for the last three years. The cold chain market in India is anticipated to reach ₹624 Billion by 2017.

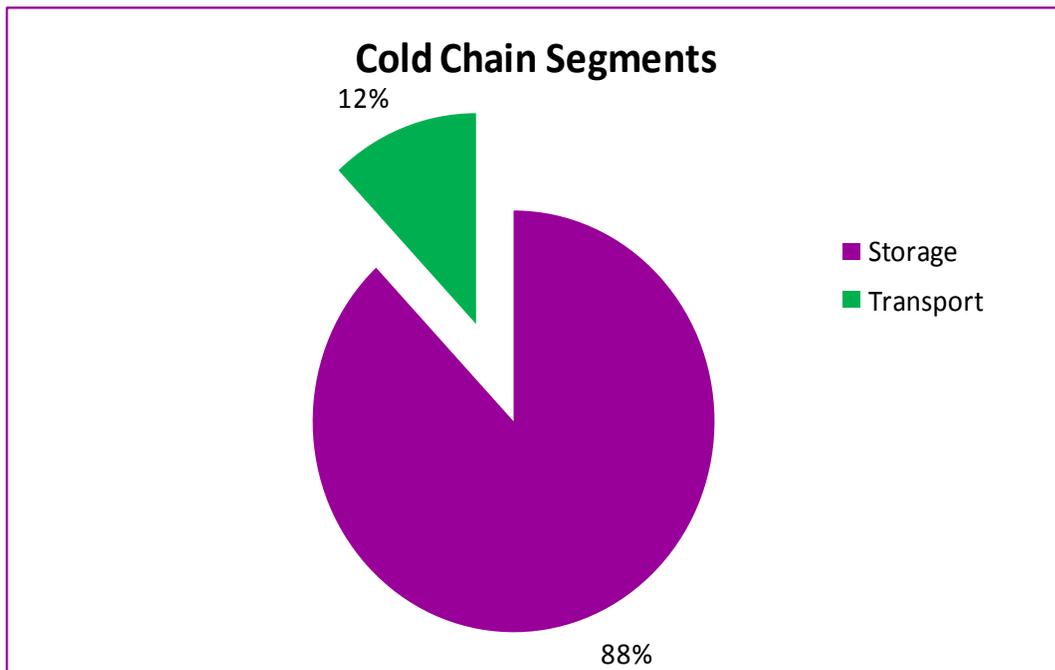
Figure 1: Growth of the Indian Cold Chain Industry



Source: National Summit on Cold Chain: ASSOCHAM & Tech Sci Research

## COLD CHAIN INDUSTRY STRUCTURE

Cold chain infrastructure includes cold storage infrastructure, transport infrastructure and point of production infrastructure. There are approximately 6300 cold storages in India designed originally for single commodity storage. Refrigerated transport or cold chain distribution is still in its nascent stage in India and is way behind if compared to world standards for cargo movement. Presently reefer transport business in India is estimated at ₹10-12 billion which includes reefer transportation demand for both exports and domestic.



Various industries covered under cold chain are agriculture, horticulture & floriculture, dairy, confectionery, pharmaceuticals, chemicals, poultry, etc. India has around ~6300 cold storage units, but can only store less than 11 percent of the country's total produce. While ~105mn MT of perishable produce is transported across India annually, only ~4mn MT is transported via reefers.

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With initiatives by the Indian government and a steep growth in the consumption of processed foods, cold chain logistics is expected to witness huge growth in the coming years. High growth prospects for the food-processing sector along with attractive government incentives (including 51 percent FDI) make cold chain business a lucrative proposition for foreign investors as well. It should be specifically mentioned that a large number of cold storage projects, located in different parts of the country, are based on old and inefficient technology. The user industry would expect modern plants with more automation, mechanised operations and operating conditions that are more hygienic. Currently, one of the focus areas is to make reefer trucks more energy efficient to withstand the variations in the ambient temperatures at drop-off points.

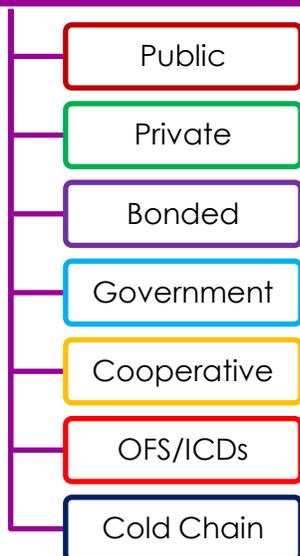
## INDIAN WAREHOUSING MARKET OVERVIEW

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Indian warehousing market has evolved from traditional transport companies to full-fledged logistics service provider. The economic environment in India has been pushing the demand for services such as warehousing, transportation, express cargo delivery, shipping services, container services, etc. as the freight volume is increasing significantly. In India, logistics is a critical factor for the growth of agriculture, manufacturing and service sectors and even in future, the growth of all these sectors would be impacted by the availability of logistics.

Warehousing plays a vital role in the complete value chain and forms approx. 20 percent of the total logistic market. Over the time and with the changing role of the sector, traditional warehouses have transformed to collection and storage points, where raw material, intermediate and manufactured goods are collected, assorted, stored and distributed to the point of consumption/sale. The warehousing market in India is expected to grow at a rate of 35 to 40 percent annually, displaying high potential for growth over the next few years. Currently, the sector is highly fragmented with small players holding small units distributed across states with many challenges. Almost 92 percent of the market is dominated by unorganised players, while 70 to 75 percent of the organised market is being controlled by Public Sector Undertakings (PSUs) such as Central Warehousing Corporation (CWC), the Food Corporation of India (FCI) and State Warehousing Corporations (SWCs).

## Warehouse



**Public Warehouse:** Public warehouses are licensed by government to private players, individuals or co-operative societies to store goods of the general public. They are rented out against a fee and are generally located near railways, highways, ports, etc.

**Private Warehouse:** These warehouses are owned by the private entities and are used to store goods owned, imported on behalf of the license. They are located at strategic locations and are flexible enough for the storage of different nature of products.

**Bonded Warehouse:** These are the types of warehouse in which dutiable goods are deposited until duty is paid or the goods are cleared for export. These warehouses are owned managed and controlled by both government and private entities and are established near ports so that the goods are stored until the custom duties are paid off.

**Co-operative Warehouse:** these are owned managed and controlled by co-operative societies. They provide their members with warehouse facilities at cheaper rate.

**OFS/ICDs:** A common user facility with public authority status equipped with fixed installations and offering services for handling and temporary storage of import/export laden and empty containers carried under customs control

**Cold Storage:** 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 current capacity of the organised warehouses, controlled by corporates, cooperative and private sectors, is 108.75 million metric tonnes (MT), of which the private sector has only 18 million MT, while Public Private Partnerships (PPP) are yet to start off in the sector.

**Table 1: Storage Capacity of the Organised Warehouses in India**

S. No.	Name of the Organisation/ Sector	Storage Capacity (In Million MT)
1	Food Corporation of India (FCI)	32.05
2	Central Warehousing Corporation (CWC)	10.07
3	State Warehousing Corporations (SWCs)	21.29
4	State Civil Supplies	11.30
5	Cooperative Sector	15.07
6	Private Sector	18.97

## THE CURRENT STATE OF FOOD PRODUCTION & WASTAGE IN INDIA

India is bestowed with a varied agro climatic conditions which are highly favourable for growing a large number of horticulture crops such as vegetables, fruits, aromatic plants, herbs and spices, etc. India is among the foremost countries in horticulture production, just behind China. However, despite the rise, India is way behind its nearest rival in per-hectare yield and processing of horticulture products. India stores only two percent of its horticulture products in temperature-controlled conditions, while China stores 15 percent and Europe and North America stores 85 percent of their products in such conditions. Adequate cold storage facilities are available for just about 10 percent of India's horticulture production. Of the total annual production, 30-40 percent is wasted before consumption. During the peak production period, the gap between the demand and supply of cold storage capacity is approx. 25 million tonnes.

**Table 2: The total production of fruits and vegetables in the country during the last three years<sup>1</sup>**

	Production (in Million MT)		
	2010-11	2011-12	2012-13(prov.)
<b>Vegetable</b>	146.55	156.32	159.51
<b>Fruits</b>	74.87	76.42	77.70

Although cold storage capacity of over 30 million tonnes has been created in the country, the concept of cold-chain is still in its infancy in India. Considering the fact that India is producing about 270 million tonnes of horticulture produce every year, the development of cold-chain networks assumes high priority. Owing to the tremendous pressure on improving supply chain and reducing losses during produce handling and movement, the need for creation of a cold chain network is crucial for perishable food commodities.

Regionally, the existing cold storage capacity is concentrated in terms of both number and capacity in the northern region. Uttar Pradesh and West Bengal contain over 65 percent of the cold storage units in the country and the rest are spread across India.

<sup>1</sup> <http://pib.nic.in/newsite/PrintRelease.aspx?relid=101875>

**Table 3: Region wise Number and Capacity of Cold Storages in India (2011)**

	Central	East/North East	North	South	West	All India
<b>Number</b>	430 (7.0%)	975 (15.8%)	2895 (47.0%)	866 (14.1%)	990 (16.1%)	6156 (100%)
<b>Capacity (Million MT)</b>	1.71 (6.0%)	7.82 (27.3%)	14.95 (52.1%)	1.95 (6.8%)	2.25 (7.9%)	28.68 (100%)

Cold storage in India has been largely adopted for long-term storage of potatoes, onions and high value crops like apples, grapes and flowers. 75 percent of the cold storage capacity is used to store potatoes, while only 23 percent fall in the multi-product category. Cold storages for meat, fish and dairy items and for other items such as chillies and other spices account for only 1 percent of total cold storage capacity. These cold storages are also usually smaller in capacity. Much of this multi-purpose cold storage capacity is located in the states of Karnataka, Maharashtra, West Bengal, Tamil Nadu and in the National Capital Region (NCR).

**Table 4: Commodity Wise Break up of Cold Storages (as on 31<sup>st</sup> Dec 2009)**

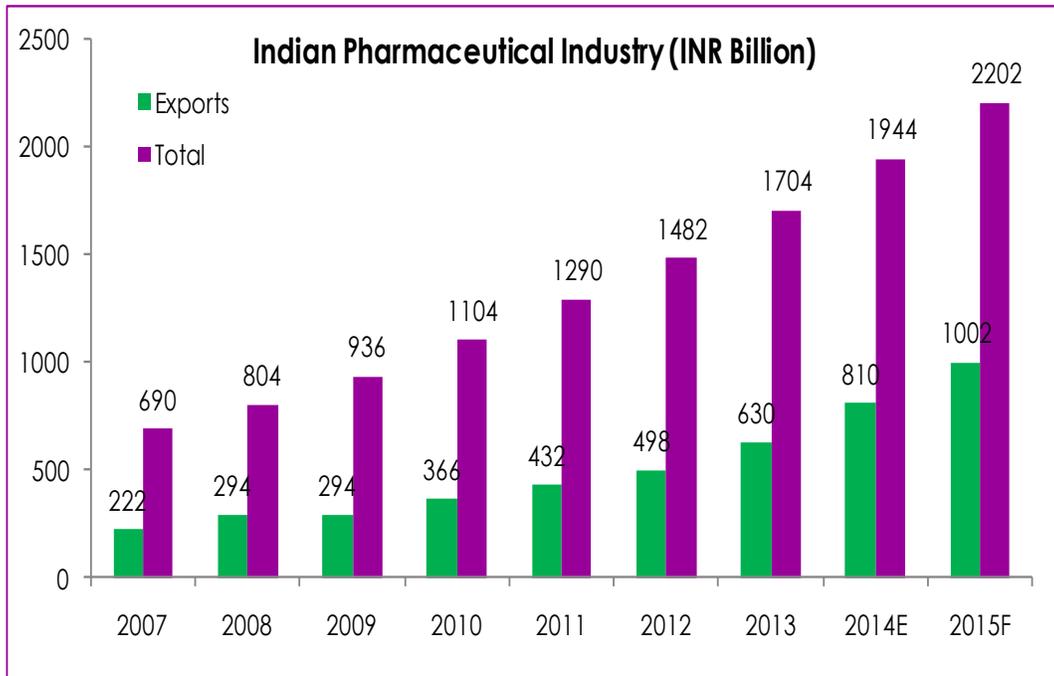
Commodity	Capacity (Million MT)	% of Total	No. of Cold Storages
Potato	18.43	75.4	2862
Multi-Purpose	5.64	23.1	1584
Fruits & Vegetables	0.10	0.4	160
Meat & Fish	0.19	0.8	497
Milk/ Milk Products	0.07	0.3	191
Others	0.03	0.1	87
<b>Total</b>	<b>24.46</b>		<b>5381</b>

Source: Ministry of Agriculture, Government of India

Further enhancement in the cold storage capacity would be very beneficial to both the farmer and the consumer as it minimizes wastages and provides fresher and off-seasonal food items to the consumers.

## COLD CHAIN STORAGE CRITICAL TO PHARMA INDUSTRY

Pharmaceutical companies are increasingly relying, and spending, on cold-chain storage as temperature sensitive drugs are becoming more prevalent. The demand for generic drug in emerging markets such as India, China and Brazil are expected to increase the need for low temperature handling and transportation facilities. As a result, it is estimated that the value of generic drug that require cold-chain storage will exceed ₹7200 billion by 2018.



Cold chain for pharmaceuticals needs to be temperature controlled as the shelflife of the products needs to be maintained. A well-organised cold chain system has the capability of reducing the deterioration of drugs as well as retaining the quality of the product. The cold chain segment is of critical importance as the pharmaceutical compounds being exported have the likelihood of getting damaged with excessive heat or freezing during shipment, resulting in reduced efficacy.

## INDUSTRY GROWTH DRIVERS

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**Growth in Organised Retail:** Over the last few years, organised retail and food service industries have emerged as new segments of cold chain, mainly due to the changing consumption pattern. With the entry of big corporate into retailing, the supply chain including cold chain for food and beverages distribution is expected to get streamlined. India would be in need of over 33 million tonnes of cold storage capacity to be added in the next four years, with investment requirement of about ₹3,000 crore per annum. There is an increasing demand not only for capacity addition of cold storage facilities for a set of highly perishable products, but also for a wide variety of vegetables, fruits and grains.

**Growth in End user segments (food processing, horticulture):** As of 2013, India ranks 5th in the world in terms of the value of food processing. The industry is expected to grow to ₹126,840 crore by 2016, growing at 13 percent each year since 2012. The industry is critical from the economic point of view and hence the government has its focus on the development of this industry. With the growth in this end user segment, cold chain infrastructure is expected to get a boost and help in reducing the wastage.

**Government Initiatives:** The government is taking steps for the sector, such as schemes for capital investment subsidy from the National Horticulture Board (NHB), the National Horticulture Mission (NHM) and the Ministry of Food Processing Industries (MoFPI) for the agri-investors to set up cold chain infrastructure. Government has as well set up National Centre for Cold Chain Development (NCCD) which would help in establishing building standards through international benchmarking and to promote research and development activity in the cold chain sector. The government has also established partnership with Indian Railways to set up cold chain infrastructure.

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**Demand from the Pharmaceutical Sector:** India is among the top five emerging pharma markets and has grown at an estimated compound annual growth rate (CAGR) of 13 percent during the period FY 2009–2013. The Indian pharmaceutical market is poised to grow to ₹3300 billion by 2020 from the 2009 levels of ₹756 billion. The ever-growing pharmaceutical industry is acutely temperature and time sensitive. Cold supply chain acts like a backbone for pharma industry. It is a big responsibility to have a regulatory supervision and to maintain the efficacy of the drug throughout the supply chain in order to main the quality of drugs and comply with statutory requirements.

## GOVERNMENT INITIATIVES

The Department of Agriculture and Cooperation is endeavouring to strengthen the supply chain infrastructure including cold chains through various schemes. Some of the most prominent schemes are National Horticulture Mission (NHM) – a centrally sponsored scheme, Horticulture Mission for North East and Himalayan States (HMNEH) – a central sector scheme and National Horticultural Board (NHB) – central sector scheme.

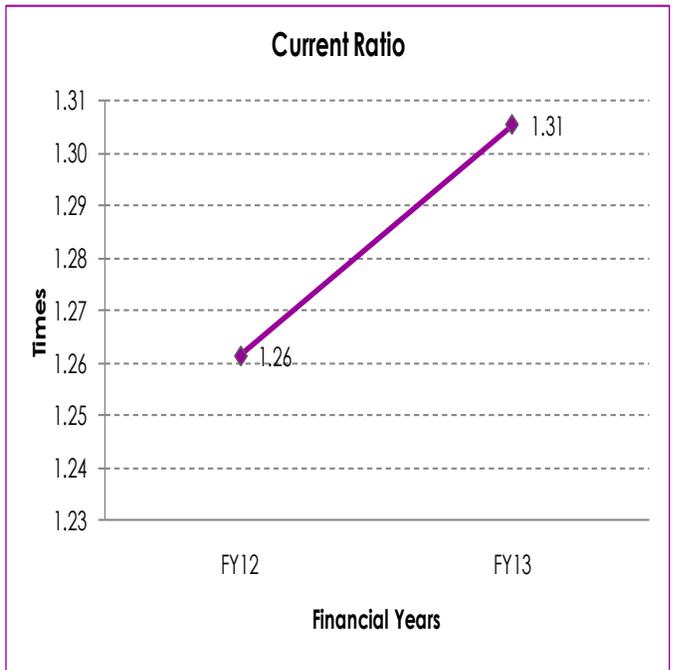
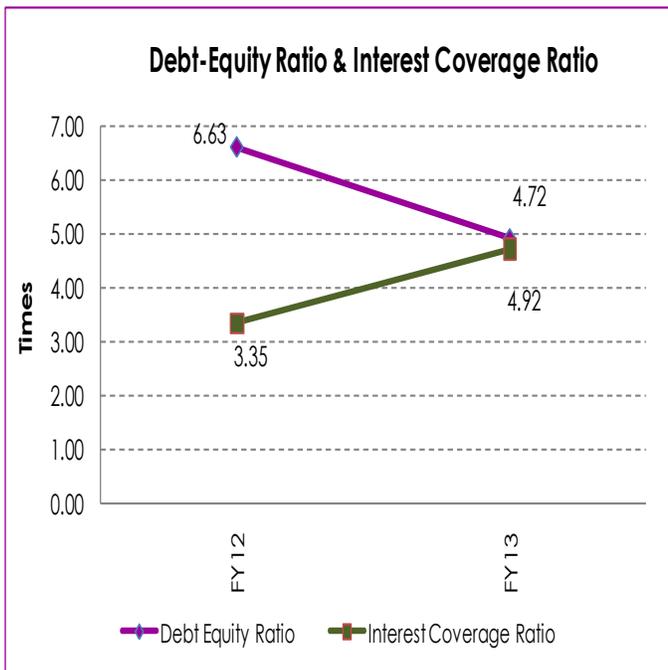
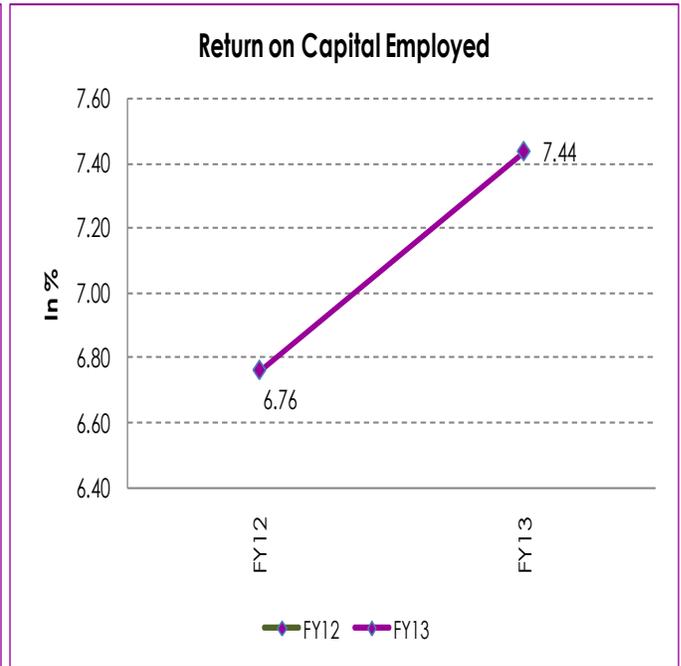
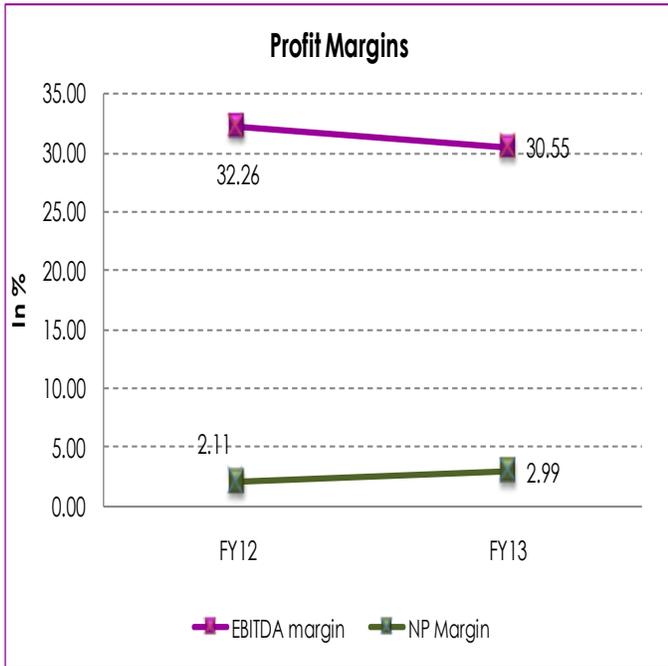
**National Horticulture Mission:** The scheme would be covering following areas:

- (i) Development of Commercial Horticulture through Production and Post Harvest Management of Horticulture Crops;
- (ii) Capital Investment Subsidy Scheme for construction/ expansion/ modernization of Cold Storages/Storages of Horticulture Produce
- (iii) Technology Development and Transfer for promotion of horticulture;
- (iv) Market Information Service for Horticulture Crops; and
- (v) Horticulture Promotion Service

**National Centre for Cold Chain Development:** NCCD has been mandated to

- (i) Provide an enabling environment for the cold chain sector to gain prominence and invite the much needed private sector involvement.
- (ii) To establish standards and protocols related to cold chain testing, verification, certification and accreditation as per international standards.
- (iii) To provide technical assistance to Financial Institutions, Government Departments/ agencies, and industry for selection of cold chain component such as refrigeration units, refrigerated transport equipment, display cabinets, milk tanker etc.
- (iv) To offer HRD and technical advisory services to personnel engaged in this sector.

## ONICRA'S OUTLOOK ON SMEs IN INDIA



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**High cost of borrowing is keeping the margins low** – EBITDA margin of the company has remained healthy in both the FYs under study. Power (electricity charges) and fuel forms one of the major components of the cold chain industry along with labour and repair & maintenance cost. High cost of borrowings has led to squeezing of the net profit margin.

**Low returns generated by cold chain companies** – Return on capital employed (ROCE) has been low in both the FYs under study. Most of the companies operating in the cold chain industry are capital intensive (cost of real estate and refrigeration equipments) and hence the ROCE is low. Major part of the funding in the cold chain industry is done through debt funding and this has resulted in heavy interest expenses. These interest expenses have had a negative impact on the net profit generated by the company which has further impacted the return on equity.

**High dependence on borrowed funds and satisfactory interest coverage ratio** – As can be seen in the graphs above, the dependence on external borrowings has been high. Although a decline can be seen in the gearing of company in FY13, yet it has remained high. However, due to healthy EBITDA companies are able to have satisfactory interest coverage ratio in both the FYs under study.

**Current Ratio** – Major part of the current assets have been tied up in advances to rentiers and liability side comprised of sundry creditors for expenses and provisions. Current ratio of the company has remained within the comfortable range in both the FYs under study.

## CHALLENGES FORESEEN BY ONICRA FOR COLD CHAIN INDUSTRY

**High Energy Costs:** Operating costs for the cold storage business in India are approximately ₹80-90 per cubic ft. per year as compared to ₹40 per cubic ft. per year in the West. Energy expenses alone make up about 30 percent of the total expenses for the cold storage industry in India compared to 10 percent in the West. These factors pose as a high entry barriers to potential players in the business.

**Rising Real Estate Costs:** With the rising real estate price, the cost of setting up a cold storage units is also rising. It constitutes approximately 10-12 percent of the project cost. Also, as these units are not mobile, so choosing the right location becomes a critical factor. Being a capital-intensive project, it requires heavy investment in fixed assets like plant and machinery, building, insulation and panels. Depending on the size of the project and design of the infrastructure, the Capex is derived. Typically, a traditional cold storage of multi-tier walk in with a capacity of 6,000 tons would cost ₹5 crore, excluding land.

**Uneven Distribution of Capacity:** A majority of investment in setting up cold storages in India has been in states like Uttar Pradesh, Maharashtra, Gujarat, Punjab and West Bengal. Further on analyzing the commodity wise storage capacity it is found that major cold storages have been set up to cater single commodities and this creates bottleneck for other perishable commodities.

## OUTLOOK

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The cold chain industry is emerging as a fast-growing business sector in India, with developments in the food processing sector, organized retail and government initiatives driving growth. To develop a world-class cold chain infrastructure, government and industry bodies need to work in collaboration to encourage the adoption of better and more efficient refrigeration technologies that can prolong the shelf life of food products and bring commensurate economic returns to the farmers.

India needs a more effective, efficient and well-thought-out cold storage infrastructure. The technology of construction has undergone a phenomenal change from conventional brick-wall construction to sandwich insulated panel and reinforced concrete (RCC) structures to pre-engineered buildings (PEB) steel structures. Energy-efficient practices like energy recovery systems, energy-efficient designs of refrigeration equipment and automation are some of the innovative features. Efforts need to be made in order to introduce the concept of green technology, as also the use of renewable energy for the cold chain sector. Special emphasis needs to be laid on development of reefer infrastructure in view of India's exports thrust and potential.

Besides, to boost the investments, financial institutions should play a major role to encourage the investment in cold chain industry in terms of term loan sanctioning, nominal interest rates and disbursement. The growth cannot happen without their support. The state government must make a step towards subsidising the electrical tariffs, encouraging use of renewable energies, etc in order to boost the development of cold chain infrastructure in India.

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<http://www.nccd.gov.in/PDF/NOCCD.pdf>

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