

# FRESH FOOD SUPPLY CHAIN

LACK OF COLD CHAIN INFRASTRUCTURE AND A FOOD PROCESSING INDUSTRY IS LEADING TO WASTAGE OF ABOUT 20% OF ALL FOODS PRODUCED IN INDIA (₹500 BILLION)

By Ritika Banerjee

According to the Federation of Indian Chambers of Commerce and Industry, food wastage reached the incredible figure of ₹30,000 crore in 2010 (representing a decline from the ₹58,000 crore in 2004). This persists despite the fact that India is the second largest producer of fruits and vegetables in the world, although cold storage facilities are available for only 10% of the produce. Industry sources disclose that the country is the fifth largest

producer of eggs and the sixth largest producer of fish, but with an abysmal supply chain system, 35% of production is consigned with depressing regularity to the trash can. India has certain vital attributes and natural resources—it has 52% of the total land that can be cultivated as against 11% in the rest of the world and

20 diverse agro-climatic regions in the country. These advantages, if properly harnessed, could equip the country to feed not just its own people, but the rest of the world. A well-defined logistics and cold supply chain system working in tandem could power the country to this enviable position and also immeasurably energize its growth.

“Apart from rejuve-



nating its own economy, India could be the food basket of the world if we had an efficient cold chain supply system,” says Pawanexh Kohli, Founder of CrossTree technovisors and Senior Vice-President, Arshiya International Limited. “To be the food basket you have to export food to Europe, Dubai, Singapore, the US and maybe, one day, Africa and only the cold chain will allow India to expand its portfolio of food exports.”

India can become the food supplier of the world. It has the cultivable land, all the seasons for production of all varieties of fruits and vegetables, an agribusiness system that works although it needs to be vastly improved. The

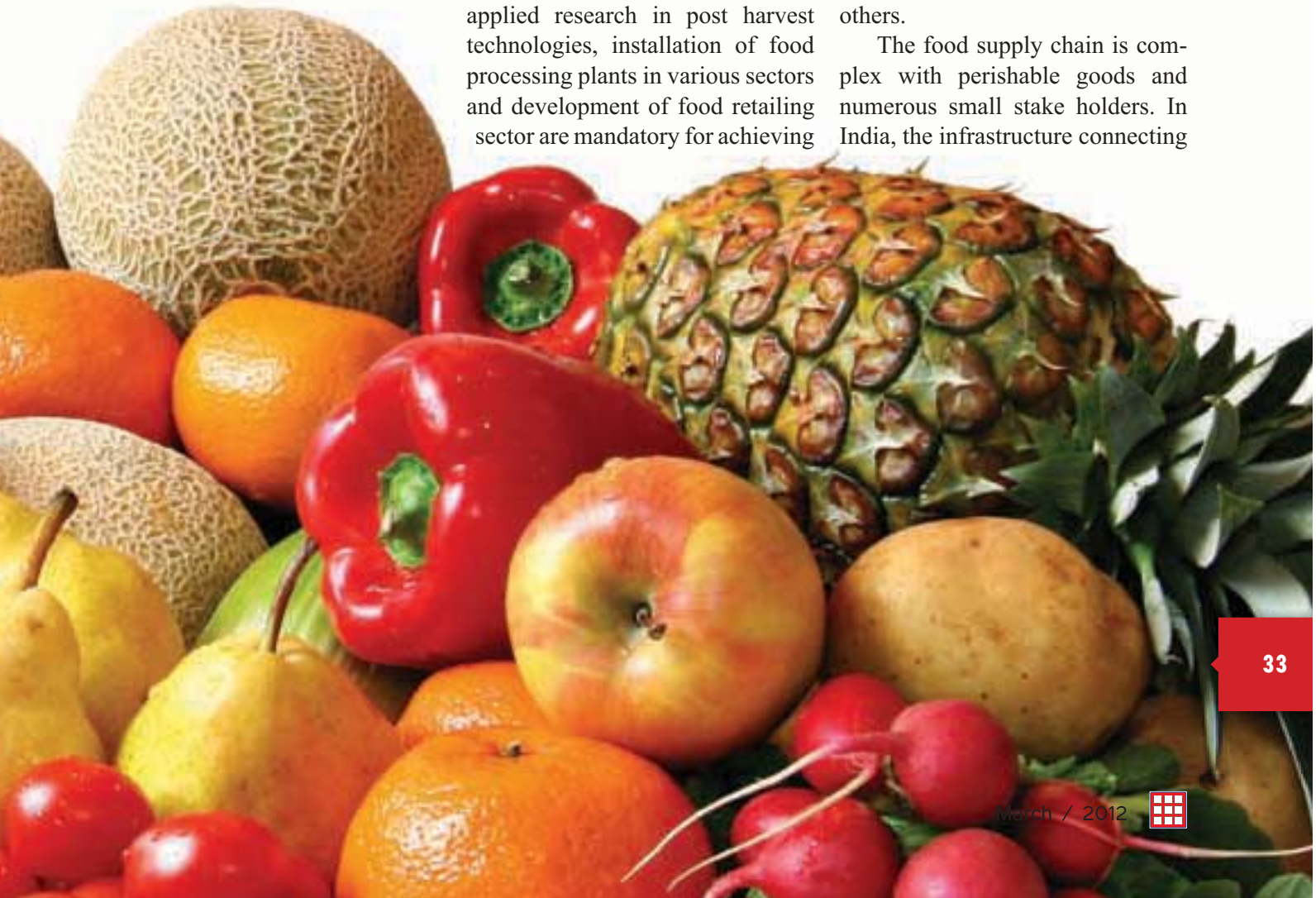
single most important problem facing the Indian agricultural industry is the highly inefficient supply chain. Because of lack of cold chain infrastructure and also a food processing industry about 20% of all foods produced in India (₹500 billion) are wasted. By building an efficient and effective supply chain using state of the art techniques it is possible to serve the population with value added food while simultaneously ensuring remunerative prices to the farmers. The surplus of cereals, fruits, vegetables, milk, fish, meat and poultry can be processed as value added food products and marketed aggressively both locally and internationally. Investments in cold chain infrastructure, applied research in post harvest technologies, installation of food processing plants in various sectors and development of food retailing sector are mandatory for achieving

gains in this sector. Strategic growth plans for achieving both national and international competitiveness of the food industry are essential.

## The Food Supply Chain

India has a huge opportunity to become a leading global food supplier if only it has the right marketing strategies and of course agile, adaptive and efficient supply chain. India has diversity in terms of its population with several religious groups with different food habits and culture. This diversity should be used to advantage to become the “Halal Food Hub”, the “Organic food hub”, the “Vegetarian food hub” the “Sea food hub” among others.

The food supply chain is complex with perishable goods and numerous small stake holders. In India, the infrastructure connecting





scheduling, are very well practiced in high technology industries with immense benefits. These best practices should find their way in to the food supply chains. Cold chain logistics supply chains should take

well designed and well supported using IT tools and software.

The food supply chain can be subdivided into a number of sectors. Agriculture, horticulture, fisheries and aquaculture are the primary producers, the manufacturers who process the food for ready to eat or cook format together with the packaging companies are in the intermediate stage, and the retailers, wholesalers and caterers are in the last stage of the supply chain. At each stage value is added by the new ownership such as processors, distributors, packers, etc. and the cost and profits are part of the business. The food items can go to the final consumer from any of the three stages: from farmers in the form of fresh produce, to the caterers directly from the manufacturer, and finally from the retailer (small or big) to the consumer. The movement of goods from one stake holder to another is facilitated by the in house or third

these partners is very weak. Each stake holder: farmers, wholesalers, food manufacturers, retailers all work in silos. Also, demand forecasting is totally absent and the farmers try to push what they produce in to the market. Data integration, financial flow management, supply-demand matching, collaborative forecasting, information sharing, goods movement synchronization through efficient transport

advantage of technology improvements in data capture and processing, product tracking and tracing, synchronized freight transport transit times for time compression along the supply chain and supply-demand matching. Also, the supply chain needs to be designed and built as a whole in an integrated manner with the processes of new product development; procurement and order to delivery processes



party logistics service provider. The information management is done by all the stake holders and their information systems are all interconnected seamlessly. What we described above is the state of food chain in the advanced countries. In India and other developing countries, the state of food chain is more fragmented and primitive we have dealt with it in the earlier sections.

Masters of food supply chain taking over from the food manufacturers. In India, with no superstores, no economies of scale, too many intermediaries, there is a vacuum, meaning there is no real channel master managing the supply demand situation and coordinating the supply chain and managing the logistical activities. This provides a tremendous opportunity for smart players to enter a growing market with a high potential of retail FDI. But one needs to remember that the infrastructure capital outlays

are high and the returns are long term. Also there are various risks associated with owning a cold chain. Some of these include country risk, monsoon risk, crop or raw material supply failures due to pests, diseases, etc., partner risk, and numerous others. In India, there are very few large food manufacturers. Amul, Ruchi Soya, Nestle, MTR, ITC, Dabur, Britannia, HLL's food and beverages section, beverage companies such as Coke and Pepsi are some of the big names. In poultry Godrej Agrovet, Suguna, Pioneer and Venkateswara hatcheries are some of the companies integrating operations end to end from breeding to ready to eat chicken foods. High taxes on processed food, high import duties, nascent contract forming, make the profitability a big issue in India. There are several regulatory changes that need to be made all along the supply chain so that they are consistent and mutually reinforcing

### The Cold Chain

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
- Warehouse and Information Management systems
- Traceability
- Financial and Insurance Institutions

The temperature controlled





governmental regulations in all countries and the responsibility to maintain hygiene and standards falls on the food retailer or manufacturer. The recent developments in electronic tagging could be useful for monitoring the temperatures and also the shelf life of the product.

### Supply Chain Expertise

There is a need to embrace the concept of Efficient Consumer Response (ECR) which was introduced in the United States in the 1990s and is now followed worldwide in grocery supply chains. ECR refers to a set of strategies that aims to get companies across a supply chain to work closely to serve their customers better and at lower cost. Consumers benefit from improved product availability and choice, while distributors and suppliers derive better efficiency and cost savings. Also collaborative planning forecasting and replenishment is another area that has yielded substantial savings for retailers. Relationship between the stake holders in the supply chain is of paramount importance for ECR, CPFR and other relationship paradigms to work.

Food Packaging Dairy products, edible oils, farm products, sugar, fruit juices, concentrates, preserves, hot and cold beverages, breakfast foods, biscuits and confectionery, atta, are some major foods of

daily necessities where packaging will have excellent potential and growth areas. Package has become the competitive tool to reach the consumer and the task assumes increasing responsibility with more and more of competitive and substitute products being introduced. This has opened the sector for introduction of modern technology for processing and packaging and entry of host of new organizations from all sectors of the economy both domestic and overseas. Cost of packaging ranges anywhere from 10 to 64% of production costs and efforts should be made to reduce these costs through use of manufacturing automation and economies of scale.

### Standards

Standardization is a powerful tool for improving supply chain efficiency. There are two kinds of standards in the food supply chain. The first one is the food standard that concerns itself about the content and the manufacturing process and the packaging etc. There are several such standards for dairy, poultry etc. the second standard concerns regarding the logistics and IT systems like standardization of cartons, pallets and IT software so that seamless transfer of goods and information is possible. Standards enable partners across the supply chain to enjoy increased productivity and economies of scale due to better compatibility and interoperability of their systems and processes.

supply chains or cold chains are a significant proportion of the retail food market. Fast foods, ready meals and frozen products have increased market share in recent years. There are several food temperature levels to suit different types of products. Frozen, cold chill, medium chill, and exotic chill are some of the frequently nomenclatures with identified temperature ranges. The range of temperatures is dependent on the products whether it is meat or ice cream or potatoes or bananas.

Failure to maintain appropriate temperature regimes throughout the product life cycle may shorten the product life or adversely affect its fitness for consumption. Cold chain management involves maintaining appropriate temperature regime when the product travels from the farm in Himachal Pradesh to the consumer in London or New York City. That is why the logistics challenge is formidable in food chains, which is cost conscious industry. There are several

## Food Safety and Hygiene

Food safety is a growing concern across the world. There is increasing need to provide greater assurance about the safety and quality of food to consumers. The increase in world food trade and the advent of the Sanitary and Phytosanitary (SPS) Agreement under the World Trade Organization (WTO) have led to increasing recognition and adoption of food safety measures. The capacity of India to penetrate world markets depends on its ability to meet increasingly stringent food safety standards imposed in developed countries. Food standards are expected to acquire greater importance given increasing concerns on food safety on the back of breakout of diseases such as



BSE, Avian Influenza, Bird Flu etc on the one hand, and growing consumer demand for products which are healthy on the other. Compliance with international food standards is a prerequisite to gain a higher share of world trade.

## Training

The food supply chain is going through a period of great change and needs to be supported through new organizational forms manned by specialists. Training, coaching, counseling and





knowledge of cold chain management to meet the needs of the industry to be a cold chain will be generated. The same applies to other areas in the food supply chain such as procurement, retailing etc.

India is all set to become the food supplier of the world. It has the

cultivable land, all the seasons for production of all varieties of fruits and vegetables, well developed agribusiness system that works in its own way. The business system is tuned to food habits (cooking at home) and convenience (kirana stores) of rural and urban folks of the previous generation. Factors such as rapid growth in the economy, the technological innovations in home appliances such as refrigerators microwave

ovens, rise of families with dual incomes and the changing food habits of the population all point to the increasing need for healthy processed food. The supply chain sector is very weak with no process owner and this can spell disaster. The food supply chain needs the attention of the academics, the industry and the Government.

## **Barriers to Growth of Cold Chain Industry in India**

Cold storage reduces the rate of biochemical changes in fresh foods and also slows down the growth of contaminating micro-organisms. The reason for storing perishables in a cold store is therefore to extend their life beyond the harvest season. This may be because they can achieve a higher sale price out of season or for food security reasons.

Are there any wastages? This is a myth. Every things sell in India. Sadly this demand driven market phenomenon where value loss is not considered either by customers or planners is what clouds everyone's perception and prevent cold chain growth in India.

In the future, the demand for cold chain in India is anticipated to be driven by foods and pharmaceutical categories which compulsorily require cold chain. The growth of categories like ready to eat frozen products, frozen vegetables and imported fruit, there shall be an automatic growth in the infrastructure to handle it.

mentoring have to be extended to all the parties in the supply chain. For example, it is important to conduct courses and training sessions on cold chain management to raise the knowledge and awareness on the importance of implementing the cold chain management to ensure that there is no breakdown in maintaining the required temperature throughout the supply chain. In this way a pool of skilled workforce with good

