CHAPTER 5

SCM: A Correlation of Agricultural Sector and Technology With Retailing
5 SCM: A Correlation of Agricultural Sector and Technology With Retailing

The opportunity presented by the rural economy is significant. According to a McKinsey survey conducted in 2009\textsuperscript{36}, the rural India market would grow almost four times from its existing size in 2007, which was estimated at USD 577 billion. However, the growth of the rural economy is strongly coupled with advances in agriculture, a sector which is blocked by various issues ranging from poor use of water on the input side to poor packaging and storage on the output side, leading to sub-optimal productivity in various stages of the agricultural supply chain.

![Fig: 5.1 Stages of the agricultural supply chain](source)

Source: KPMG Analysis\textsuperscript{37}

India has experienced strong economic growth in recent years fueled by a booming services sector and increased industrial production. However, agriculture continues to remain the mainstay of the Indian economy - engaging nearly 58 percent of the workforce and contributing to about a quarter of India’s GDP. India has a dominant position in world agriculture, with the second largest arable land bank in the world and ranking in the top three producers of rice, wheat, coarse grains, fruits and vegetables, tea, coffee, and jute. India also has some of the largest livestock populations, which combined with the large farming sector help ensures that agri-

\textsuperscript{36} The Bird of Gold: The rise of India’s Consumer Market, McKinsey Report
\textsuperscript{37} Infrastructure Development in Agriculture, KPMG Report- Aug 2009.

[89]
business remains the overwhelming contributor to the economy from both a monetary and employment perspective\textsuperscript{38}.

India does not appear to be very large on a typical world map relative to countries like China, Canada or Russia. However one of the lesser known facts about India is that it possesses the world’s second largest cultivable land area with only the US having more arable land. The table below provides a comparison of India’s arable land resources with a few other major agricultural producers. Table-

<table>
<thead>
<tr>
<th>Global Rank</th>
<th>Arable Land (in million hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>United States 165</td>
</tr>
<tr>
<td>2</td>
<td>India 147</td>
</tr>
<tr>
<td>3</td>
<td>China 138</td>
</tr>
<tr>
<td>4</td>
<td>Russia 121</td>
</tr>
<tr>
<td>5</td>
<td>Brazil 58</td>
</tr>
<tr>
<td>6</td>
<td>Pakistan 19</td>
</tr>
</tbody>
</table>


India is an agriculture based country. Hundreds of fruits and vegetables types are grown in all parts of India. Fresh fruit and vegetable reach small scale fruits vegetables suppliers, they are then sent to local markets as well as fruits and vegetables exporters. Last decades have seen the number of Indian fruit vegetables suppliers and fruits vegetables exporters rising to an all time high. Especially, there has been a steep rise in the number of vegetable exporters.

The total production of fruits and vegetables in the world is around 370 MT. India ranks first in the world with an annual output of 32 MT. While there are almost 180 families of fruits that are grown all over the world, citrus fruits constitute around 20% of world’s total fruit production. Major Indian fruits consist of mango, banana, citrus fruits, apple, guava, papaya, pineapple and

\textsuperscript{38} Agribusiness, CLSA 2006
grapes. The fruits are processed into various products such as fruit juices & concentrates, canned fruit, dehydrated fruit, jams & jellies etc.

India with its current production of around 32 million MT of fruit, accounts for about 8% of the world’s fruit production. The diverse agro-climatic zones the country makes it possible to grow almost all varieties of fresh fruits and vegetables in India. The fruit production in India has recorded a growth rate of 3.9%, whereas the fruit processing sector has grown at about 20% per annum. However, the growth rates have been extensively higher for frozen fruits & vegetables (121%) and dehydrated fruits & vegetables (24%). There exist over 4000 fruit processing units in India with an aggregate capacity of more than 12 lakh MT (less than 4% of total fruits produced). It is estimated that around 20% of the production of processed fruits is meant for exports, the rest caters to the defence, institutional sectors and household consumption, Mango and mango-based products constitute 50% of exports.

India is the second largest producer of vegetables in the world (ranks next to China) and accounts for about 15% of the world’s production of vegetables. The current production level is over 71 million MT and the total area under vegetable cultivation is around 6.2 million hectares which is about 3% of the total area under cultivation in the country. In case of vegetables, potato, tomato, onion, cabbage and cauliflower account for around 60% of the total vegetable production in the country. Vegetables are typically grown in India in field conditions, the concept is opposed to the cultivation of vegetables in green houses as practiced in developed countries for high yields.

The fruit and vegetable processing industry in India is highly decentralized. A large number of units are in the cottage/home scale and small scale sector, having small capacities up to 250 tonnes/annum. But big Indian and multinational companies in the sector have large capacities in the range of 30 tonnes per hour or so. Since liberalization and withdrawal of excise duty on fruit and vegetable products, there has been significant rise in the growth rate of the industry.
As per the KPMG report of August 2009, private sector involvement has resulted in significant gains to farmers, especially in the areas of horticulture. There is a need to apply the learning from these ventures which have negotiated the existing challenges to other agricultural areas such as food grains. In the post-harvest segment, there have been some recent developments including the launch of terminal markets in various parts of the country, which could provide a blueprint for the reform of the infrastructure that is currently in place. Further, it is also to ensure a uniform policy framework across the country while ensuring holistic development of infrastructure as opposed to the skewed nature of existing infrastructure which is underutilized in certain segments of the value chain such as cold storages but simply inadequate in other segments. While there are a few examples of state sponsored initiatives in the area of marketing, this vital area of intervention remains largely unaddressed. Several studies have shown the lower realization to farmers from the price paid by the end consumer, demonstrating the need for reduction in the number of intermediaries in the agri-supply chain thereby improving efficiencies.

The last segment of the agri-value chain that merits attention is certainly not the least important and is perhaps the key to unlocking the potential of Indian agriculture. The need for a second green revolution has long been felt and this could be ushered in by research facilities with closer ties with the agri-business industries, development of human resources employed in the area of agriculture as well as enabling better support infrastructure for the rural population, especially in perishable food products sector.
Indian agriculture witnesses a failure to build critical components of the supply chain. In the absence of on-farm cooling and grading arrangements, the farmer is compelled to sell his produce to the ‘arhtia’ without waiting for a better price. If he is enabled to grade and store his produce close to farm, the farmer will be empowered to demand and obtain a better price from the processors and also add value to his produce.

Considerable investments are required in rural infrastructure and components of the supply chain by way of grading and packing centres, controlled atmosphere, storage facilities, refrigerated vans, testing laboratories, etc., which may not come from private sources. It is, therefore, essential that public investment is significantly increased to fund these components of rural infrastructure to enable private enterprise to take up the remaining components of the supply chain which can be undertaken.
commercially. This is borne out by the experience of developed countries where the State has stepped in to build rural infrastructure in a big way.

The failure to direct significant public investment into storage and processing infrastructure, which could then be managed on a public private partnership basis involving all stakeholders, may be the reason for low levels of investment in processing facilities, lack of value addition and the inability of the farmer to obtain better prices and incomes. The management of the supply chain is better undertaken with the involvement of all stakeholders on a PPP basis.

Empirical research says that India consumes more than 14,000 truckloads of vegetables, 9,000 truckloads of fruits, and milk enough to fill 89 Olympic-size swimming pools, every single day. While fruits and vegetables are subject to seasonal production and have a year-long consumption, milk and meat have
a small shelf life. In terms of transportation, there are only about 5,000 reefer
trucks that move non-milk commodities across the country. Then there is the
fabled 30 percent wastage. Around 25-35 percent of the total produce of
fruits and vegetables (F&V) worth Rs. 35,000 crore are wasted. One
vegetable, the potato, accounts for almost 90 percent of the total volume of
cold infrastructure\textsuperscript{39}.

Guided by such statistics, an integrated cold chain seems to be the obvious
answer. A topic that has been subject to numerous trade conclaves,
academic papers, debates, etc. However, after so many years of hard
deliberations, it seemed to have reached nowhere. India’s global food export
stands at a mere one percent of its production in spite of being the world’s
second largest producer of fruits and vegetables. A significant majority of the
exports is for the less quality-conscious Gulf region. The country would also
require reefer container/vans for transport of perishable items for domestic
and export marketing. At present, their availability in the country is negligible
in comparison to the present production of perishable commodities. For
handling the expected higher production in the next 10 years, at least 3000
reefer containers/vans with a capacity of 8 tons each would be required.
This would require an investment of Rs.600 crores, which should be
couraged in the private and cooperative sector. There is a need to
courage the investors in this area by providing incentives. There are few
companies, like Radhakrishna Foodlands and Snowman, dictating a small
segment of the cold chain in poultry. There is no comprehensive national
policy that promotes farm to fork cold chain. Technically speaking, the
present system continues to use archaic technologies and poorly designed
cold storages.

The cold supply chain business has obviously not lived up to its promise.
The grassroots level revolution that has been on eve for so long just did not
happen. Our cold storage story dates back as far back as 1938. It was set
up in Meerut for storing potatoes. There has been no significant change in

\textsuperscript{39} Shah, Piyush; “Cold Chain – Frozen in Time”, CII Newsletter, 29 Sep 2010
the last 70 years. Overall, our cold storages can store around 22 million metric tons. Of this, Uttar Pradesh and West Bengal have 65 percent of the installed capacity. So except for a few examples, India has a totally un-integrated cold supply chain. In some pockets, individual entrepreneurs have ventured into the cold storage business. Most of these are of poor technical design and do not adhere to the international standards of storing and stacking. Only pharmaceutical companies in Asia and the USA are constrained by laws to use the cold chain for their supply chain; in India the companies hardly use the cold chain. Some people think that most of the fresh product produced locally is consumed locally within the radius of 200 km. and give a false perception that refrigerated transport is not needed.

With regard to the dairy industry, there are few large organized players – despite a yearlong demand. In ice creams, small players have as much as 35 percent of the market share. Overall, the scene in the cold chain supply chain seems like the next big thing that never happened, a sort of broken promise.

Regulations in cold storage infrastructure allow 100 percent Foreign Direct Investment (FDI). This consists of coolers, warehouses, reefer trucks, retail locations, chillers, etc. The Union Budget of 2010-11 provided for accelerated depreciation among other benefits. Yet very little FDI or local investments have come in. Antiquated technologies still continue which create hindrance in optimization of available resources and opportunities.
5.1 COLD CHAIN AND WAREHOUSING

The cold storage and distribution sector is possibly the largest and most diverse sector of the integrated cold chain, representing the initial link between the producer and customer, and including freight forwarding, brokers, distribution, transportation, storage and governmental oversight as products transfer from rural to urban or metro areas. Depending upon the agreement between the buyer and the seller, there can be several other parties involved in the transfer and transport of the perishable products between the time the container departs the plant and arrives at the customer’s facility. Throughout this process, the potential for cold chain abuse is high. Retail sales of perishable food products, throughout region, occur through a diverse spectrum of sales outlets, with a wide array of discrepancy between high and low end markets. The specific observations in respect of retail supply chain are enumerated in following paragraphs.

Multi-tiered system — The retail network of stores throughout the system is diverse, with a combination of small, medium and large chain stores, as well as independent stores and local shops. This diverse network of retail shopping opportunities is accompanied by an equally diverse cold chain standard of practice at few places or cases and majority of cases it is totally absent.

Rapid Deterioration Of The Integrated Cold Chain At Receiving — Almost without fail, the integrated cold chain rapidly deteriorates during the last 30 meters, generally at the receiving end of the final commercial user in the system. In spite of all of the efforts by others in the integrated supply network (where it is available), including but not limited to the supplier, freight forwarder, importer, distributor and processor, abuse by the end user (in this case, the retail store) will result in considerable product damage. It’s a common observation that there are significant breakdowns of the integrated cold chain at the receiving area of retail stores, irrespective of size or reputation.
Receiving practices — Specific receiving issues that result in product damage, cold chain abuse and losses include but are not limited to the following common issues at receiving:

1. Congestion at receiving ends, market areas and traffic resulting in trucks backed up and waiting for extended periods of time.

2. Non-refrigerated receiving areas and markets open to ambient conditions (including direct sunlight and heat), resulting in products being staged in ambient temperatures for extended periods of time without refrigeration or insulation from temperature abuse.

3. Lack of priority status for perishable food products at the receiving end, where many companies do not provide priority status or “front of the line” access for perishables, no arrangement for specific “perishable delivery window” during certain hours of the day. A more sensible approach is for a retail chain to establish a perishable receiving window for each supplier, thereby allowing the supplier to schedule perishable deliveries to multiple customers and still remain within the perishable delivery window. This “staggered window” would allow suppliers to manage the perishable deliveries, and would allow the customer (retailer) time to inventory and store perishable deliveries on a staggered basis rather than receiving all perishables at once.

4. Delays in storing perishable products, whereby refrigerated products received experience long delays between the time they are received and the time they are placed in the retail outlet’s cooler (where it is available). Excessive time spent outside of refrigeration was observed to be in excess of two (2-3) hours at some locations.
**Storage practices** — Storage of perishable products at all but the largest multi-national retail stores throughout system is inadequate and improperly managed. Generally speaking, storage coolers were congested, dis-organized, and of inadequate size and not designed properly.

**Inventory management** — Proper inventory management practices, including labeling of products with production and receiving dates, as well as “First In, First Out” (FIFO) principles were rarely observed. Generally speaking, inventory management programmes were nonexistent, and product placement in coolers as well as proper product rotation was not up to international standards.

**Display units turned off at night** — In order to conserve energy, many retail stores, including large national chains, routinely turn off display cases and units at night, thereby presenting an opportunity for temperature fluctuation, product deterioration and quality degradation.

The warehousing services sector plays an important role in the economy of the country. Warehousing services are an important cog both in inbound logistics, as raw materials, parts, and stores have to be stocked, inventory control maintained, and materials which do not meet specifications returned to suppliers, as well as outbound logistics as the goods produced have to be stored in different geographical locations before shipping / dispatch as per demand/ order inflows. In India, the most important component of warehousing is agricultural storage for agro-produce, food grains, fertilizers, manure, etc. and special warehouses for cold and temperature controlled storage. The warehousing sector also provides ancillary services like handling, transportation, pest control, farmer extension schemes, dedicated warehousing at doorsteps, consultancy, and project execution.

The Government has established the Central Warehousing Corporation (CWC) with the objective of providing scientific storage facilities for agricultural implements and produce and other notified commodities.
Besides, with the same objective, 17 State Warehousing Corporations (SWCs) were also set up under the Warehousing Corporations Act 1962. The CWC and the respective State Governments are equal shareholders of these SWCs. The commercial outreach with social objectives has resulted in the CWC operating a large warehousing network across the country. As on 31 December 2010, the CWC was operating 476 warehouses, with a total storage capacity of 102.24 lakh MTs and an average utilization of 85 per cent. It made an entry into operation of public bonded warehouses in the late 1970s, when the Central Board of Excise and Customs, acknowledging the expertise of the CWC in the field of storage and warehousing, identified it as a custodian for dutiable goods. The CWC has also diversified its business into CFSs/ICDs and also started Container Rail Transportation from Loni (UP) to Jawaharlal Nehru Port. The expansion of the overall capacity of the CWC has been slow as it is cost intensive. The profits generated are being ploughed back to construct additional warehouses thereby strengthening the warehousing infrastructure throughout the country. At state level, the 17 SWCs meet the storage requirements and complement the work of the CWC. As on 31 October 2010, these SWCs were operating a network of 1585 warehouses with an aggregate storage capacity of 214.41 lakh MT.40

Major policy initiatives taken recently by the Government include construction of godowns under the seven-years guarantee scheme of the Government of India, most of them being managed by the CWC or SWCs; permission of up to 100 per cent FDI in the construction of warehousing infrastructure; and construction of warehouses under the Grameen Bhandaran Yojana of NABARD and the Rastriya Krishi Vikas Yojana. In the year 2007-08, the Government enacted the Warehousing (Development & Regulation) Act 2007 to make the warehouse receipt fully negotiable. Recently the Government took another major initiative for construction of godowns under its Private Enterpreneurs Godown (PEG) scheme. The CWC

---

has constructed 0.9 lakh MT godowns during the year 2009-10 and has planned to construct additional capacity to the tune of 1.77 lakh MT during the year 2010-11.\textsuperscript{41}

Some issues related to the warehousing sector include increasing high quality storage capacity as well as the numbers of trained samplers / graders; addressing issues like storage loss due to deterioration of the produce during storage, lack of provision for dealing with cases where stocks are pledged with banks and the depositor either absconds or refuses to take delivery; delay in delivery and deposit of stocks due to extension of ‘no-entry’ zones in cities, levy of property tax on warehouses and high fees by ports.

The supply chain for perishable produce consists of four major players’ viz. the farmer, the buying agent, wholesaler and the retailer. One of these four players would have to take up the responsibility of storage. Storage, by any player, happens when the storage cost is lower than off-season price trend. The storage cost comes at a price, since with storage the cash inflow is pushed forward into the future. It also includes the cost of loss during storage, which includes a cold storage direct cost and an element of risk margin. The risk margin is an indirect cost.

Marginal farmers have few resources to invest to build up their own warehouses. Crops like potatoes are stored by farmers in shacks at an ambient temperature, and do not invest in any new cold storage equipment. Over days, this causes a reduction in the produce of around 20 percent. The farmer bears this loss. Brokers, on the other hand, are players who operate at low volumes and significantly high margins. Their skill lies in acquiring produce at low cost and selling it off to wholesalers as fast as possible. They do have access to capital required to set up cold storages. But since they earn high margins, they have little incremental revenue to gain by way of

\textsuperscript{41} Economic Survey 2010-2011 pp 250
additional investments. Same is the case with wholesalers. The retailers are too small to invest. Most cold storages are designed for a single product. This is because every product needs a specific storage temperature and humidity. Such specialization creates high utilization during the harvest period and a lull in between. The national average for utilization is lower than 50 percent. Thus cold storage owners are compelled to charge higher prices for the products stored in the off seasons to recover the cost of capital. This dissuades others from using the service and creates a vicious circle. High price of storage leads to less users, and less users cause prices to go high.

India produces 134.5 million tons of fruits and vegetables and the output is likely to go up during the next 10 years. It is a matter of concern that more than 30 to 35 per cent of fruits and vegetables produced in the country are lost due to lack of proper handling, storage and processing facilities. Cold storages are most important infrastructural need for perishable and semi perishable commodities which need an immediate attention. Presently a total of 4199 cold storages are existing in the country with a total storage capacity of 15.38 million tonnes. The sector-wise availability of storage capacity is enumerated in further tables.
Table 5.2

<table>
<thead>
<tr>
<th>SL NO</th>
<th>State/UT</th>
<th>PRIVATE SECTOR</th>
<th>COOPERATIVE SECTOR</th>
<th>PUBLIC SECTOR</th>
<th>TOTAL NO.</th>
<th>TOTAL CAPACITY IN MTs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Andaman &amp; Nicobar Islands (UT)</td>
<td>01</td>
<td>170</td>
<td>00</td>
<td>00</td>
<td>01</td>
</tr>
<tr>
<td>2.</td>
<td>Andhra Pradesh</td>
<td>269</td>
<td>885557</td>
<td>11</td>
<td>11598</td>
<td>10</td>
</tr>
<tr>
<td>3.</td>
<td>Arunachal Pradesh</td>
<td>01</td>
<td>5000</td>
<td>00</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>4.</td>
<td>Assam</td>
<td>19</td>
<td>85948</td>
<td>01</td>
<td>1000</td>
<td>04</td>
</tr>
<tr>
<td>5.</td>
<td>Bihar</td>
<td>236</td>
<td>1100641</td>
<td>10</td>
<td>46400</td>
<td>00</td>
</tr>
<tr>
<td>6.</td>
<td>Chandigarh (UT)</td>
<td>05</td>
<td>11216</td>
<td>01</td>
<td>1000</td>
<td>00</td>
</tr>
<tr>
<td>7.</td>
<td>Chhattisgarh</td>
<td>67</td>
<td>341815</td>
<td>01</td>
<td>29</td>
<td>01</td>
</tr>
<tr>
<td>8.</td>
<td>Delhi</td>
<td>77</td>
<td>103277</td>
<td>02</td>
<td>5201</td>
<td>16</td>
</tr>
<tr>
<td>9.</td>
<td>Gujarat</td>
<td>372</td>
<td>1230198</td>
<td>21</td>
<td>30669</td>
<td>05</td>
</tr>
<tr>
<td>10.</td>
<td>Goa</td>
<td>29</td>
<td>7705</td>
<td>01</td>
<td>1000</td>
<td>00</td>
</tr>
<tr>
<td>11.</td>
<td>Haryana</td>
<td>234</td>
<td>378319</td>
<td>04</td>
<td>3403</td>
<td>06</td>
</tr>
<tr>
<td>12.</td>
<td>Himachal Pradesh</td>
<td>09</td>
<td>12896</td>
<td>02</td>
<td>767</td>
<td>07</td>
</tr>
<tr>
<td>13.</td>
<td>Jammu &amp; Kashmir</td>
<td>15</td>
<td>40689</td>
<td>03</td>
<td>2134</td>
<td>01</td>
</tr>
<tr>
<td>14.</td>
<td>Jharkhand</td>
<td>37</td>
<td>142733</td>
<td>08</td>
<td>27415</td>
<td>00</td>
</tr>
<tr>
<td>15.</td>
<td>Kerala</td>
<td>176</td>
<td>55335</td>
<td>06</td>
<td>1080</td>
<td>11</td>
</tr>
<tr>
<td>16.</td>
<td>Karnataka</td>
<td>135</td>
<td>390882</td>
<td>18</td>
<td>6689</td>
<td>17</td>
</tr>
<tr>
<td>17.</td>
<td>Lakshadweep (UT)</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>01</td>
</tr>
<tr>
<td>18.</td>
<td>Maharashtra</td>
<td>379</td>
<td>507678</td>
<td>55</td>
<td>25346</td>
<td>32</td>
</tr>
<tr>
<td>19.</td>
<td>Madhya Pradesh</td>
<td>172</td>
<td>704270</td>
<td>20</td>
<td>101348</td>
<td>05</td>
</tr>
<tr>
<td>20.</td>
<td>Manipur</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>21.</td>
<td>Meghalaya</td>
<td>01</td>
<td>1200</td>
<td>00</td>
<td>00</td>
<td>02</td>
</tr>
<tr>
<td>22.</td>
<td>Mizoram</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>23.</td>
<td>Nagaland</td>
<td>01</td>
<td>5000</td>
<td>01</td>
<td>1150</td>
<td>00</td>
</tr>
<tr>
<td>24.</td>
<td>Orissa</td>
<td>81</td>
<td>248739</td>
<td>16</td>
<td>38100</td>
<td>04</td>
</tr>
<tr>
<td>25.</td>
<td>Pondicherry(UT)</td>
<td>02</td>
<td>35</td>
<td>01</td>
<td>50</td>
<td>00</td>
</tr>
<tr>
<td>26.</td>
<td>Punjab</td>
<td>404</td>
<td>1306101</td>
<td>18</td>
<td>39092</td>
<td>00</td>
</tr>
<tr>
<td>27.</td>
<td>Rajasthan</td>
<td>100</td>
<td>320380</td>
<td>09</td>
<td>3832</td>
<td>01</td>
</tr>
<tr>
<td>28.</td>
<td>Sikkim</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>01</td>
</tr>
<tr>
<td>29.</td>
<td>Tamilnadu</td>
<td>130</td>
<td>225712</td>
<td>13</td>
<td>7562</td>
<td>05</td>
</tr>
<tr>
<td>30.</td>
<td>Tripura</td>
<td>03</td>
<td>12750</td>
<td>01</td>
<td>5000</td>
<td>07</td>
</tr>
<tr>
<td>31.</td>
<td>Uttar Pradesh</td>
<td>1505</td>
<td>9842000</td>
<td>84</td>
<td>276000</td>
<td>00</td>
</tr>
<tr>
<td>32.</td>
<td>Uttarakhand</td>
<td>12</td>
<td>60499</td>
<td>00</td>
<td>00</td>
<td>03</td>
</tr>
<tr>
<td>33.</td>
<td>West Bengal</td>
<td>413</td>
<td>5380000</td>
<td>50</td>
<td>302000</td>
<td>00</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>4885</td>
<td>23406745</td>
<td>356</td>
<td>936865</td>
<td>140</td>
</tr>
</tbody>
</table>

Table 5.3

**COMMODITYWISE DISTRIBUTION OF COLD STORAGES AS ON 31/12/09**

<table>
<thead>
<tr>
<th>Sl.no</th>
<th>State/ut</th>
<th>Potatoes</th>
<th>Multipurpose</th>
<th>Fruits &amp; veg.</th>
<th>Meat &amp; fish</th>
<th>Milk &amp; milk products</th>
<th>Others</th>
<th>Total no.</th>
<th>Total capa-city in mts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Andaman &amp; Nicobar Islands (UT)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>210</td>
</tr>
<tr>
<td>2.</td>
<td>Andhra Pradesh</td>
<td>0</td>
<td>21</td>
<td>83</td>
<td>1</td>
<td>984</td>
<td>210</td>
<td>0</td>
<td>290</td>
</tr>
<tr>
<td>3.</td>
<td>Arunachal Pradesh</td>
<td>0</td>
<td>01</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>01</td>
</tr>
<tr>
<td>4.</td>
<td>Assam</td>
<td>0</td>
<td>24</td>
<td>88</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>5.</td>
<td>Bihar</td>
<td>2</td>
<td>106</td>
<td>18</td>
<td>77</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>246</td>
</tr>
<tr>
<td></td>
<td>Chandigarh (UT)</td>
<td>2018</td>
<td>2019</td>
<td>2020</td>
<td>2021</td>
<td>2022</td>
<td>2023</td>
<td>2024</td>
<td>2025</td>
</tr>
<tr>
<td>---</td>
<td>----------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>6</td>
<td>288</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>85</td>
</tr>
<tr>
<td>7</td>
<td>Chhattisgarh</td>
<td>392</td>
<td>42</td>
<td>52</td>
<td>30</td>
<td>25</td>
<td>43</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Delhi</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>54</td>
<td>11</td>
<td>73</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Gujarat</td>
<td>967</td>
<td>000</td>
<td>97</td>
<td>26</td>
<td>55</td>
<td>74</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Goa</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>36</td>
<td>33</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Haryana</td>
<td>225</td>
<td>991</td>
<td>0</td>
<td>0</td>
<td>610</td>
<td>0</td>
<td>0</td>
<td>78</td>
</tr>
<tr>
<td>12</td>
<td>Himachal Pradesh</td>
<td>974</td>
<td>8</td>
<td>0</td>
<td>38</td>
<td>37</td>
<td>0</td>
<td>0</td>
<td>73</td>
</tr>
<tr>
<td>13</td>
<td>Jammu &amp; Kashmir</td>
<td>112</td>
<td>81</td>
<td>12</td>
<td>31</td>
<td>47</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Jharkhand</td>
<td>274</td>
<td>15</td>
<td>37</td>
<td>14</td>
<td>27</td>
<td>33</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Kerala</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>Karnataka</td>
<td>165</td>
<td>30</td>
<td>96</td>
<td>37</td>
<td>82</td>
<td>44</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>Lakshadweep (UT)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>Maharashtra</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>479</td>
<td>14</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>Madhya Pradesh</td>
<td>564</td>
<td>600</td>
<td>67</td>
<td>23</td>
<td>77</td>
<td>37</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>Manipur</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>Meghalaya</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>Mizoram</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>23</td>
<td>Nagaland</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>61</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>24</td>
<td>Orissa</td>
<td>139</td>
<td>630</td>
<td>35</td>
<td>13</td>
<td>00</td>
<td>60</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td>Pondicherry(UT)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26</td>
<td>Punjab</td>
<td>109</td>
<td>760</td>
<td>9</td>
<td>76</td>
<td>23</td>
<td>69</td>
<td>94</td>
<td>0</td>
</tr>
<tr>
<td>27</td>
<td>Rajasthan</td>
<td>658</td>
<td>96</td>
<td>79</td>
<td>25</td>
<td>64</td>
<td>45</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>Sikkim</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
The present storage capacity available is sufficient only for 10 per cent of total production of fruits and vegetables. In next 10 years with the anticipated increase in production of fruits and vegetables and other perishable commodities, the cold storage capacity requirement would be much higher. Foreseeing the future requirements of the fresh/precooked/frozen fruits and vegetables and their products as well as anticipated change in the food habits in favour of processed food, the capacity requirement for post harvest management of perishables is estimated at more than five times the presently available capacity. In next 10 years, 15000 additional cold storage units with a capacity of 45 million tonnes should be created. The additional capacity requirement would need an investment of the order of Rs.27,000 Crores. The investment should basically be made by the private sector only.

In future, there would be a need for multi-chamber type of cold storage units for various perishable and other products. For encouraging private entrepreneurs there is a need to provide subsidy to make the units viable for some initial years. This apart, the regulatory arrangements should also be reviewed and simplified for attracting private investment in this venture.
There is a need to provide incentives in reducing current expenses such as tax relief in electricity.

Rural Roads have been identified as one of the six components of Bharat Nirman and a goal has been set to provide connectivity to all villages with a population of 1000 (500 in hilly or tribal areas) with all-weather roads. New connectivity is proposed to be provided to a total of 54,648 habitations under Bharat Nirman. This will involve construction of 1,46,184 km of rural roads. In addition to new connectivity, Bharat Nirman envisages upgradation/renewal of 1,94,130 km of existing rural roads. Under the rural roads component of Bharat Nirman, 38,575 habitations have been provided all-weather road connectivity up to December 2010 and projects for connecting 14,995 habitations are at different stages of implementation. During 2010-11, over 28,963 km of all-weather roads has been completed up to December 2010. New connectivity has been provided to nearly 3949 habitations with an expenditure of ‘Rs 9,677 cr under PMGSY.  

The horticultural sector covers a wide spectrum of crops, including fruits, vegetables, spices, flowers, medicinal and aromatic plants, mushrooms, and plantation crops like cashew, cocoa, and coconut. The National Horticulture Mission was launched in 2005-06 for the holistic development of this sector in the country. During 2009-10, under NHM, 201 new nurseries were setup and vegetable seed was produced in a 2,062 hectare area. An area of about 2.96 lakh hectare was brought under new gardens of various horticulture crops and an area of 0.37 lakh hectare under old and senile plantations was rejuvenated. Under the post harvest management component, 153 pack houses, 157 cold storages, 3 Controlled Atmosphere storages, 1 refrigerated van, 101 mobile/primary processing units, and 83 rural markets were set up and functional infrastructure for collection, grading, etc., was created, which helped in the proper handling and marketing of horticulture produce. The

---

Economic Survey 2010-11 Chapter 12 pp 305
cost norms and patterns of assistance for most components of the NHM scheme have recently been revised.\(^{43}\)

Another issue is the absence of well developed futures market for agriculture and lack of information availability. There is drastic fluctuation in prices and players are not sure of their realization. There are numerous players between the producers and the consumer. The long chain adds to the information distortion. Users of cold storage thus keep a high element of risk margin. The unsure a user is about future price, the less he is likely to invest additionally in cold storage.

Most existing warehouses in India are nothing but corrugated metal sheets covering a piece of land. They are extremely low cost to erect and maintain. Goods are typically dumped at a location and then somehow recovered and forwarded. A medium sized storage of 5000 MT would cost around Rs 2 cr to set up. The warehouses need technical people to maintain it. The existing breed of warehouse owners is in no position to handle this business. Modern organized retailing has not been much organized across various business processes. Most chains are struggling for existence and their immediate attention is definitely not something that entails a huge capital investment. They still need to learn the art of selling as a chain, develop better merchandising policies and improve in-store management along with learning to focus on cold chain logistics. Though F&V constitutes a significant part of their sale, all retailers can’t be expected to invest very high amount in cold chain infrastructure.

The more concern is the regular availability of electricity at reasonable rates. This is a major problem in most Indian cities. Keeping a diesel generator back-up set seems sensible, but this is bound to increase capacity cost.

\(^{43}\) AR 2009-10, pp6, Department of Agriculture and Co-operation, MoA, GoI, www.agricoop.nic.in.
The various problems have created a sort of an equilibrium situation. Players have accepted that some part of their produce is going to waste and so price their wares accordingly. This is a major reason for the exorbitant price escalation from the farm to the consumer. This has also curtailed the availability of certain fruits and vegetables in parts of the country. In the export market, Indian fruits and vegetables are exported as commodity products majorly to the Gulf and East European region. The two regions alone make up around 90 percent of India's agriculture exports. Here again, instead of selling produce to the highly profitable European and American markets, exporters have compromised and sell in markets that are less quality conscious.

In the case of local consumers, while it becomes necessary for them to buy, they limit the purchases to an absolute minimum. This limits the scale of operations in the market. Lack of proper storage facility has ensured that Indian fresh foods have a limited international market and in turn low export revenue.

**Cleaning, Grading and Packaging:**

The importance of these facilities can be hardly over emphasized. At present, the grading facility is available only in 1321 markets out of total number of 7127 regulated markets. The quantity graded at producers' level is almost negligible. There is a need to create facilities for cleaning, grading and packaging not only at primary level but also in the villages from where produce is brought to the market for sale. In the absence of such facility at the village level, the kind of pollution and congestion created at market yards during the peak arrivals period is well known. The APMCs should encourage private entrepreneurs to promote such units in or around the yard/sub-yards. There is need to promote proper packaging after grading so
that further chances of adulteration or temptation may not be there. Besides this there is a strong need to educate the farmers for proper packaging and grading before they bring the produce to the market. Scientific packaging should be encouraged at the farm level through subsidy support. The Expert Committee feels that this is an important activity, and an investment of Rs.2000 crores should be earmarked for this purpose during the next 10 years.

**Processing and Value Addition**

Considering the increase in demand for value added and processed products, there is a need to enhance the capacity of agro-processing sector. This will not only help in stabilizing the prices realized by farmers but also in creating employment in rural areas. The food-processing sector alone provides tremendous potential in this area. For attracting private initiative and investment in food processing, the Government of India through Department of Food Processing and National Horticulture Board have already formulated several schemes of assistance. A ten year tax holiday has been announced. However, the state governments should also come forward and grant relief in terms of sales tax and other local taxes on processed products. Cheaper processed products will expand demand for such products. At present, value addition is estimated at only seven per cent and processing only two percent of the total production. Within next ten years, there is a need to increase value addition to 35 percent and processing to at least 10 percent. Quality control and standardization will be extremely important in this endeavour. The government has to establish or encourage a network of food analysis laboratories in the country. This will also be necessary to face competition from imported processed products.

The investment potential in value addition and food processing is quite large. According to estimates, the potential is Rs.150,000 crores. The creation of conducive policy environment and incentive frame work would attract private sector to make investment of this magnitude.
**Warehouse Receipt System**

The recently introduced warehouse receipt system involves the issuing of documents and warehouse receipts as evidence that specified commodities of stated quantity and quality have been deposited at a particular location by the depositor. Standards are used to define the quality of product deposited. Each deposit needs to meet these standards. The system offers clear mechanism for tapping and protecting the use of deposited produce as collateral. The issuer of the warehouse receipt holds the stored commodity by way of safe custody and is legally liable to make good any loss through theft or damage. The warehouse receipt system helps in lowering post harvest losses and getting the farmers remunerative prices for their produce. The major benefits of warehouse receipt system are:

a) Warehouse commodity can be used as collateral for getting an advance from bank.
b) It helps the depositor to wait until conducive market conditions,
c) Application of standardized grades allows trading by description, thereby reducing transaction cost and handling of produce,
d) Shortens the marketing chain and increases the producers’ margin.

**Collection/ Distribution Centres of Retail Chain**

The input, market constraints includes the lack of information about markets, lack of business and negotiating experience and lack of collective organization which deprive farmers from interacting on equal terms with the other market participants or market intermediaries. As a result, the prices they receive are lower due to their weak bargaining power and holding capacity.

Fresh food organized retail chains have not made much difference to the producer’s share in consumer’s rupee so far. The retail chain has their own collection centres in producing areas which has lowered the cost of
marketing for producers. But, these retail chains buy only ‘A’ grade produce which is only small part of farmer’s produce. The farmer has to go to mandi to dispose off the remaining or rejected produce. Recent studies across chains and states reveal that other than lower transaction costs, the farmer did not realize any major benefits from these chains\textsuperscript{44}. The chains were procuring from ‘contact’ farmer without any contract or commitment to buy regularly.

The increase in production of perishable produce, mainly vegetables has been taken place largely by area expansion in the regions situated in the close proximity to capital town and metropolis.

**Export Zones and Food Parks**

With a view to taking advantage of new international trade environment, there is a need to encourage export of high value traditional/non-traditional products grown in various parts of the country. Commodities having export potential are several fruits and vegetables, raw as well as processed and packed spices like cumin, fennel, coriander and other farm products like fenugreek and henna for which there is significant demand by Indian Diaspora and others in several countries. However, there is a need to educate and train the growers of these crops in producing, grading and packing for overseas markets and create necessary infrastructure. A scheme of creating Export Oriented Agro-Zones (EOAZ) has been announced by the Govt. of India (Ministry of Commerce) which requires to be promoted by providing institutional and physical infrastructure in each of these as per the needs of the specific commodity. In some of EOAZs, there is also a need to establish what is called Food Parks. In these parks, some common facilities like electricity and warehouse should be created with central government assistance which will help in attracting investment by the private sector and the state government. While most of the investment should be made by the private entrepreneurs, as a way of incentive, government should invest in common facilities, and quality certification. The

\textsuperscript{44} Singh Sukhpal, “Major Issues in Agri-Business: A Smallholder Perspective”, YOJANA, January 2011.
estimated public investment is Rs. 200 crores and private investment of around Rs 400 crores on fifty such EOAZs. In identification of EOAZs and Food Parks, the Government of India, through APEDA and DMI should take an active stance, rather than leaving it to the state governments. The Committee further recommends that commodity wise export potential studies be commissioned before establishing EOAZs.

**Technology for Integration**

Safety concerns, competitive pressures and regulatory requirements are creating demand for more traceability in the food service industry than ever before. Also use of IT for tracking the sales and demand forecasting is widely accepted. The use of IT & ITES for inventory management and utilization of integrated software for organized and unorganized retail will further enhance the level of consumer satisfaction and provide more value for money to consumer. There are several others such as training, financing, standards development etc where there could be collaborative ventures between Indian and Foreign companies.

Wherever perishables originate around the world, new technologies will precisely track product inventory, movement and temperature with active RFID chips which will offer seamless temperature records from the point of harvest to point of purchase. (Steve Brayant, Global Director of Cold chain Logistics at Ingersoll-Rand Climate control)\(^45\)

The Indian Food and retail story has lots of future and everything points in its favourable growth. There is lot of scope for foreign investment in all aspects of food and retail.

The various National Horticulture Development schemes are designed to promote capital intensive commercial horticulture farms. A number of

---

production clusters have been developed for crops like grapes, pomegranate, sapota, mangoes, banana, citrus fruits, guava, amla etc. Post harvest management (PHM) and cold chain infrastructure is also required to be promoted in a big way with simultaneous development of world class pack houses and farm mechanization. The PHM infrastructure like pack houses, cold storages and fleets of refrigerated vans etc. are coming up under custom-service business model where services are provided for horticulture produce largely on ‘owners risk’ basis. NHB has bench-marked the technical standards for cold storages for fresh horticulture produce, modern fruit ripening units, specialized transport vehicles including refrigerated vans.

5.2 INVESTMENT IN INFRASTRUCTURE: THE OPPORTUNITIES GALORE

The important issue on which growth rate impinges is availability of infrastructure (both qualitatively and quantitatively), which will ensure growth trajectory. As in most other developing countries, sound infrastructure will be the backbone of the Indian economy and play a significant role in its development. Infrastructure consists of a combination of national assets which sustain the addition of place, time and form utilities to the products and services. These include apart from the Government institutions and organizations, roads, railways, warehouses, market yards, cold stores, processing units, research and training institutions, means of communication
and transportation including air cargo, sea cargo etc. The basic rationale of any infrastructure is the sustenance it provides to production activity, income generation and social service supplies. It has also positive effect on income distribution because low per capita infrastructure limits the access of small and marginal farmers to the market. The relationship between agricultural development and investment in infrastructure has been long recognized. Roads stimulate agricultural change and modernization not only through their immediate effects on relative prices and marketing opportunities but also through backward linkages. The roads open up opportunities for commercial agriculture and encourage shifts to production of higher value, transport – sensitive products (fruits, vegetables, dairy, poultry and marine products). Roads also improve access of the people to extension agents, banks, markets and health services. Market infrastructure is important not only for the performance of various marketing functions and expansion of the size of the market but also for transfer of appropriate price signals leading to improved marketing efficiency. Infrastructure facilities lead to reduction in marketing costs which is crucial for increasing the realization of growers and reducing the costs to the consumer.

The infrastructural facilities can be classified as physical and institutional. The roads, railways, transport facilities, electrification and storage structures are physical infrastructure whereas cooperatives, local self-government, banking institutions, extension agencies, marketing organizations and market intelligence network are institutional infrastructure. For over four decades after independence, the public sector in India held a monopoly in the provision of most of the infrastructures. Till 1991, when the current period of economic reforms started, electricity, railways, roads, telecommunications, postal services and ports were among the sectors reserved for the public sector. However, after 1991, virtually all sectors of infrastructure have been opened to private investment. Nevertheless, for providing infrastructure in remote and difficult areas, the public sector would need to continue to play an important role. In order to assess the adequacy of agricultural marketing infrastructure in the country, it is imperative to
estimate the availability of agricultural production and marketed surplus. Generally, there is positive association between production and marketed surplus.

The development of every sector in the country is directly or indirectly linked to infrastructure and this applies to the logistics sector as well. For too long has poor infrastructure been a hurdle for the logistics sector, but lately the government has been taking several initiatives to improve it. There has been a lot of focus on hard infrastructure building with planned and enhanced activities. An efficient and successful infrastructure design should be a three-tier model which comprises hard infrastructure, soft infrastructure and middle infrastructure. Middle infrastructure connects the hard and soft components and makes the whole model a success. This category consists of warehouses, multi-modal logistics parks, cold chains, cross docks, etc. It also includes the right linkages to truck terminals, transport nagars, toll collection systems, checkposts, anything which facilitates trade both directly and indirectly and makes the entire process function in a seamless manner. Even though a preliminary base has been made for building infrastructure in the country over the last decade, it is still not substantial. Unfortunately, there has not been much focus on the upgrading and improving of this middle infrastructure. There is a grave need to create large scale warehouses, logistics parks, hubs, modern truck terminals and set up cold chain networks in the country. The construction of more transportation hubs and logistics SEZs should be initiated as that will create common, shared facilities for logistics providers to bring about overall operational efficiencies.

<table>
<thead>
<tr>
<th>Year</th>
<th>Investment in Agriculture &amp; Allied sectors (Rs.Crore)</th>
<th>Share in investment (per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Public</td>
</tr>
<tr>
<td>2004-05</td>
<td>78848</td>
<td>16183</td>
</tr>
<tr>
<td>2005-06</td>
<td>93121</td>
<td>19909</td>
</tr>
<tr>
<td>2006-07</td>
<td>94400</td>
<td>22978</td>
</tr>
</tbody>
</table>
The seemingly discouraging situation is in fact a big opportunity. One good thing is the government intent to support the establishment of cold chain infrastructure where there are no restrictions for FDI. A CII task force has recommended the creation of a Green Grid. The grid will ensure availability of fresh foods, dairy products, etc. in a seamless manner across the country. Virtual Private Network (VPN) and satellite communication technologies are being explored to ensure last mile connectivity and fast information availability. Significant investments have been planned in the 11th Plan for provision of refrigerated containers and vehicles. The need of the hour is for an organized player to enter this domain with a sound business proposal. The Green Grid has to be implemented along with cold warehouses at specific farm, district and central locations. Entrepreneurs and business houses need to create a network of service providers who can build and provide warehouses and reefer trucks so that seamless service is available to an entire area. The sound model created by Pepsi and McDonalds in India can benefit every business entity.

It will be difficult for the cold storage and transportation service provider to be merely an infrastructure operator providing services. But involving more people could increase the number of players in the already long supply chain. That India’s farms are fragmented and largely rain fed is a reality that cannot be changed easily. The largest proportion of wastage happens close to these farms and possibly locating the cooling infrastructure there would be the greatest opportunity. Entrepreneurs would need to create trust among these farmers and have a process of being able to deal with the large number of small farmers and each possibly having different variety. That

<table>
<thead>
<tr>
<th>Year</th>
<th>Cold Storage</th>
<th>Transport</th>
<th>Total Value</th>
<th>Growth</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-08</td>
<td>110006</td>
<td>23039</td>
<td>86967</td>
<td>20.9</td>
<td>79.1</td>
</tr>
<tr>
<td>2008-09</td>
<td>138597</td>
<td>24452</td>
<td>114145</td>
<td>17.6</td>
<td>82.4</td>
</tr>
</tbody>
</table>

would require working with the farmers, creating a uniform variety, increase yield and help the farmer earn a higher income from the same farm. A farmer whose basic needs are met with is more likely to welcome the opportunity of using advance services than a marginal cultivator who is trying to make ends meet. The technical issues of a cold chain need to be kept in focus. Potato stored for seeds can be stored at higher temperatures as compared to potato stored for consumption. However, in absence of temperature control the entire lot is stored together. A multipurpose warehouse with the right technology have to be set up so that they can be used throughout the year. The focus would be to ensure good utilization, low energy usage and maintaining the right conditions necessary to store the produce. Somewhere the talks and newspaper reports on events in the cold chain logistics has to transfer into action. It is the desperate need of hour where another ground based approach, something like an e-Choupal, which interacts with users closely, is required. The false equilibrium that forces low quality has to be broken. Cold chain infrastructure provides us with a business case that has national appeal. It is about benefitting the farmer with higher prices and the consumer with lower prices simultaneously.

**Cold Chain Infrastructure**

Investments in cold chain infrastructure are capital intensive and will yield slow returns. However, 100 percent foreign direct investment (FDI) is allowed in this sector. The Infrastructure consists of items such as Coolers, Warehouses, Refrigerated Trucks, and Carriers. Power disruptions and high petrol and diesel prices make efficient operation of the facilities very expensive. This is the right time for building cold chain infrastructure and giving it for rentals. There are many corporates who have announced investments in organized retail and in agro business. Cold chain is a necessary ingredient for their success. A good proposal might be to form joint ventures with the corporations who are constructing retail malls and also with those who have announced huge investments in retail.

**Investment Cash and Carry Wholesale Trading**

[118]
Hundred percent FDI is allowed in wholesale trading, which involves building of a large distribution infrastructure to assist local manufacturers. The business model is built such that the wholesaler deals only with smaller retailers and not consumers. ‘Metro AG’, Germany was one of the first significant global players to enter India through this route. ‘Shoprite’ of South Africa has effectively used a combination of cash and carry wholesale trading and franchising to set up their hypermarket in various parts of the country.

Investment in Logistics

Movement of materials in the food supply chain is an important element for the success. Several international logistics companies have an expertise in this area. This is an area for active consideration. This is also highly asset intensive. Temperature controlled warehouses, warehouse management systems (WMS) and Transport management systems (TMS), Refrigerated trucks, Hygiene handling of food cartons, etc are involved. Third party logistics providers (3PLs) will be in demand if large international retailers move into India (This will happen when FDI is further liberalized in retail). As happened in other controlled economies, liberalization of FDI will induce joint ventures between retail chains and global logistics multinationals. Home delivery is one of the strong options for big retailers who are located on the outskirts of the city. Customers can order by telephone or Internet and collect the delivery at the nearby outlet. Assistance of logistics service providers will be needed for order fulfillment. This will also reduce wastage due to inappropriate handling by small retailers or even consumer.

It is a much bandied about fact that logistics costs in India amount to 13 percent of GDP compared to the developed world’s figure of around 6 to 8 percent. Logistics players in India attribute the high cost to government a policy, duty structure etc., and also, to a large extent, on our dependence on the unorganized sector comprises of small fragmented players who work with unskilled labour, restricted assets and infrastructure. Unlike other sectors, logistics involve costs at every level; every aspect of the logistics
processes, irrespective of the size and quantum, adds up to the overall costs. Therefore, the reduction in the overall costs at the macro level has to begin at the micro level.

The cost effective long distance transport facilities are critically required for high volume- low value perishable food products. With improvement in road transport, the situation is changing favourably but the same is not cost effective over long haulage distances.

Figure below provides the cost of transport (for imports) as a percentage of total cost of imports.

Table 5.5 Transport Costs (purchases) as % Imports

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Country</th>
<th>Transport cost(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mexico</td>
<td>01</td>
</tr>
<tr>
<td>2</td>
<td>China</td>
<td>04</td>
</tr>
<tr>
<td>3</td>
<td>United States</td>
<td>05</td>
</tr>
<tr>
<td>4</td>
<td>Brazil</td>
<td>06</td>
</tr>
<tr>
<td>5</td>
<td>European Union</td>
<td>08</td>
</tr>
<tr>
<td>6</td>
<td>South Africa</td>
<td>09</td>
</tr>
<tr>
<td>7</td>
<td>India</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: IMF International Finance Statistics and CII Report

Up to 25% of the total import cost is transport in India’s case. This is an average figure for all imports with substantial variation for different products and country of origin. However, it is clear from Figure that India has by far the highest incidence of transport cost for its imports. All other comparable countries spend less than 10% of the value of their imports on transporting them. While similar aggregate average data on transport costs for India’s exports is not available, one can infer that it is substantial. In a global economy, where integrated production requires that imported inputs can be transported cheaply and quickly, such high costs do not augur well for India’s competitiveness and economic security. One must also remember that the costs represented in figure is just the cost of getting goods into Indian ports and airports, further cost escalation takes place as goods often need to travel to the hinterland.
The world over, the logistics industry is estimated at USD 3.5 trillion and the logistics costs typically range between 9 percent and 20 percent of GDP. In India, the logistics market accounts for an estimated 13 percent of GDP and is expected to grow by 20 percent in the coming years. Various segments of the logistics industry are expected to grow by healthy double digits and the fortunes of the organized sector are even brighter, on account of the above mentioned changes resulting in increased market shares.

**Initiation of Indian Railways for SCM**

Indian Railways has provided the concessional transport support but is not very effective because the producers/traders are not organized as interest groups resulting in poor market access. It is also noteworthy that the present system of long distance transport of perishable produce by Rail rake may provide an economical solution to transport bottleneck but the same results

46 Nihon And Bharat, A White paper, KPMG in India, August 2007
in avoidable post harvest losses. These items are first stacked in open railway yards and then loaded in to ordinary railway wagons which are not ventilated and get very hot during summer season.

Introduction of a modern multi-modal transport system for long distance transport of fresh perishable products proposed as “Bagbani Rail” by the joint effort of National Horticulture Board (NHB), Container Corporation of India (CONCOR) and Indian railways may give desired result after implementation.

A suitable combination of refrigerated freight containers and specially designed insulated and ventilated freight containers shall form a containerized rail rake which will be exclusively used for perishable produce transportation between identified origin-destination pairs on point to point and assured transit time basis. The value added services like picking from pack houses and making delivery at warehouses at market centres or ports with insurance cover.

The Indian Railways have decided to run special trains for perishables and set up cold storages and temperature-controlled cargo centres in an effort to eliminate food wastage and contribute to India’s second green revolution. Railways Minister Mamata Banerjee said while presenting the rail budget in the Lok Sabha, “Railways will encourage creation of facilities of setting up cold storage and temperature-controlled perishable cargo centres and its transportation through public-private partnership mode.”

Railways proposes to make a contribution to the second green revolution by introducing special trains to carry perishable products like fruits and vegetables and fish from identified production clusters to consumer centres and maintain quality and freshness of perishable produce. The green revolution had made India self-sufficient in food production by investing in technologies that produced high-yielding seeds and transformed the irrigation system in key farming states. According to the “India Food Report 2008” of markets data provider Research and Markets, while developed
countries process up to 80 percent of their produce, India lags far behind, resulting in much of its output going waste. The Indian food industry is estimated at over $182 billion - or two-thirds of the country's retail sector. Acknowledging the huge losses incurred by the country, Banerjee said: “Our country at present suffers an unacceptable loss of about Rs.35-40,000 crores every year towards wastage of fruits and vegetables.”

Both the Economic Survey and the 100-day agenda unveiled by the food processing industries ministry have called for developing cold storage and transport facilities in the country47. “We need to strengthen our cold chain and supply chain infrastructure and increase the number of processing hubs,” Food Processing Industries Minister Subodh Kant Sahai has said. The Economic Survey, a status report on the economy and a policy document which suggests the way ahead, also had called for setting up modern logistics systems like cold supply chains jointly with other organized retailers.

Industry- Farmer Collaboration : An Urgent Need

Industry has taken initiative to collaborate with farmers to develop business model to make agriculture more profitable. The national policy for farmers placed in parliament in November 2007 is intended to introduce measures which can help to attract and retain youth in farming and processing of farm products for value addition, by making farming intellectually stimulating and economically rewarding. At present, our country is deriving very little demographic dividend in agriculture. On the other hand, the pressure of population on land is increasing and average size of farm holding is

47 July 3rd, 2009 - 9:02 pm ICT by IANS
decreasing to less than one hectare. Farmers are getting indebted and temptation to sell prime farm land for non-farm purpose is growing, in view of steep rise in the price of land. Over 45% of farmers interviewed by national sample survey organization want to quit farming. Under these conditions, it is difficult to persuade educated youth to stay in village and take agriculture as profession. Therefore to shape the future of agriculture, a three-pronged strategy is required.

- Improve productivity and profitability of small holdings through appropriate technology and market linkage.
- Enlarge the growth of agro-processing, agro-industries and agri-business.
- Promote opportunity for the service sector to expand in a manner that will trigger the technological and economic upgradation of farm operations.

In succeeding paragraph, some illustration has been given to demonstrate the importance of these collaborations from international and Indian context.

a) Unilever helps farmers in USA to cultivate the right variety of tomatoes, which would be used for its food processing operations. Unilever conducted research on four farms in USA, which helped it to select a wider range of beneficial rotation crops for soil health; reduce nutrient applications and further implement integrated pest management; and establish biodiversity programs. The company runs seminars to educate farmers on best practice and it employs a dedicated field agronomist to support farmers.

b) Jain Irrigation system Ltd. (JISL) has the largest onion dehydration unit in Asia with an annual capacity of 120,000 million tones. In order to procure onions for processing, JISL has adopted contract

---

48 Swaminathan MS, “Harnessing the demographic Dividend for Agriculture Rejuvenation”, Yojana, January 2011.
49 Source: Unilever sustainable agriculture report
farming model with 3000 farmers. The company undertook a study to identify the right variety of onions suitable for its process as well as the country’s climate. The main objective of the study was to improve production and productivity of the white onions suitable for dehydration and standardize a package of agronomical practices under short day tropical condition using hi-tech inputs.

The other objective was to disseminate the improved technology through farmers’ participatory demonstration, training and contract farming. The selection of right variety of crops coupled with an innovative production process and research extension efforts has made JISL one of the trusted and largest providers of white onions not only in India but also globally. The company accounts for about 40% of the dehydrated onion export from India. The company is now planning to enter in to contract farming for tomato in Maharashtra and Andhra Pradesh.

c) McCain Foods entered in India in 1997 with intent to invest INR 1 billion in potato fry business. After a thorough study, the company concluded that Indian potato was not the ideal one for the business as potatoes which are larger in size with less water content were required. For the kind of potato needed, it was necessary to develop the seed in cold climate. A team of researchers that took up the task of developing seeds at Lahaul spiti in Himachal Pradesh. After developing the seeds the company stated the area best for growing new breeds. That search ended in Mehasana in north Gujarat, as the region is blessed with a stretched wintry condition, which is vital for potato growth. The company picked contract farming as the best option but neither asked farmers to grow only potato nor promised to buy out 100% of the produce. As a result the farmers were not dependent only on the company. The company worked closely with farmers and encouraged them to share the new agronomy practices like relying on quality seeds, drip and sprinkler irrigation
system, new planting techniques and adopting contemporary methods of potato storing. Today, Deesa, Vijapur, Palanpur, Himmatnagar in north Gujarat and Anand in central Gujarat have emerged as India’s hubs of new breeds of potato.

McCain Foods India’s Process of Growing Shepody potatoes: A Logistical Masterpiece

- The yield per hectare with McCain’s varieties, based on its technology of lesser tubers of greater mass, has increased by as much as 60-70 per cent.
- While the Indian average yield for potatoes is about 15 tonnes per hectare, in Gujarat’s it has increased from about 22 to 27.5 tonnes per hectare.
- McCain Foods India has begun supplying to markets in Sri Lanka, Pakistan, Bangladesh and Nepal, as well as India. The company exports 10-15 per cent of its output to South and South-east Asian countries and the Middle East.
- By 2010, all MacFries to be made in India

**d) Packaging solution to farmers (Leno bags)**: Reliance organized extensive awareness programmes on improved packaging solutions for potato and other vegetables for farmers all over India. This included demonstration on use of Leno bags, which are more durable, functionally more efficient and cheaper than traditional materials. This programmes helped the farmers reduce the cost of packaging of potato. These bags also helped farmers to reduce wastage while keeping in cold storage. The Company’s efforts helped the farmers to improve their earnings. The programme covered more than 10,000 farmers across India.
e) **Metro AG to double its Indian presence**: Metro Cash & Carry, the wholly owned Indian subsidiary of Germany's largest retailer, Metro AG, is looking at doubling the number of its wholesale retail stores in India from the present four to eight. Metro plans to pump in USD 120 million for this expansion and set up stores in the state of West Bengal. Metro is one of the early entrants in the wholesale cash and carry format in India. The expansion comes at the time when global rivals have struck deals to enter the attractive Indian retail space with similar formats. Wal-Mart Stores Inc, which has a venture with Bharti Enterprises, plans to open its first wholesale centre in India next year, and aims to roll out 10-15 centres over 7 years. Britain's Tesco Plc, which tied up with Tata Trent, also plans to set up its first wholesale centre in India towards the end of 2009, while Carrefour also plans to make its foray into the country.

f) **Nestle India to invest USD 256 million in 2009**: Global FMCG major Nestle plans to double its investment in India from USD 128 million in 2008 to USD 256 million in 2009, as a part of its expansion strategy. The funds are planned to be utilized for research and development, advertising and capacity building. The company plans to continue to reinvest and expand in India and provide Nestle India with the financial resources to grow in one of the fastest growing markets. Nestle's sales in India grew by 25 percent in the first half of 2008 and India contributed 1.5 percent of its global turnover.

g) Texas Chicken, the fast-food brand of the US-based Church's Chicken, has forayed into the Indian food market. The company launched its Indian operations by setting up its first outlet in Hyderabad and plans to launch an additional 30 in the Andhra Pradesh region in the next 5 years. The company plans to open at least 300 outlets in the next 10 years and would first target the major metros for expansion. The fast food retailer has undertaken
the franchisee route in India and appointed the SH Group as franchisee for Andhra Pradesh. Texas Chicken has a network of 1,600 outlets in 20 countries and about 425 stores are outside the US.

**Contract Farming**

In contract farming organized retailer generally provides inputs, skill, technology, extension facilities and financial services to various stakeholders. All such services are generally linked to purchase agreement. This agreement can be tacit or formal. The loan can be issued in cash or kind. Generally in contract system, the corporate body gets bank loan and passes it on to the farmers. A number of ways are adopted to recover the capital cost. They may pass the interest rate charged by the bank on to the producers or adjust prices for inputs, lower prices for products, or a commission or fee that is assessed. They may also charge a fixed interest rate on outstanding advances. As the earning of the lender depends more on sale rather than offering financial services. They concentrate more on the borrowers’ ability to deliver the required quantity and quality of the products. In the process, farmers get access to the inputs and gain higher productivity with reduced risk and reliable access to market.

**Importance of FDI and Impact on SCM Improvement**

In India, retail trade is a state subject. There is no national framework for its regulation and development and states have their own regulations. At central level, only the flow of FDI into the sector is regulated. While FDI in cash and carry wholesale trading is permitted in India, FDI in multi-brand retailing is prohibited. FDI in single brand retailing up to 51 per cent has been allowed since 2006. A total of 94 proposals have been received till May 2010, of which 57 were approved. During the period April 2006 to March 2010, FDI inflows valued at US $ 194.69 million have come into this sector, accounting for 0.21 per cent of total FDI inflows during this period. FDI in retail trading is
permitted in Brazil, Argentina, Singapore, Indonesia, China, and Thailand without limits on equity participation, while Malaysia has equity caps on FDI in the retail sector. Permitting FDI in retail in a phased manner beginning with metros and incentivizing the existing retail shops to modernize could help address the concerns of farmers and consumers. FDI in retail may also help bring in technical know-how to set up efficient supply chains which could act as models of development.50

FDI flows remained disappointing through 2011 and will not be encouraging in coming years, according to the 2010 A.T. Kearney Foreign Direct Investment Confidence Index, a regular assessment of senior executive sentiment at the world’s largest companies. The Index also found executives are wary of making investments in the current economic climate and revealed that they expect the economic turnaround to happen in near future. Half of the companies surveyed also report that they are postponing investments as a result of market uncertainty and difficulties in obtaining credit.

China remains the top-ranked destination by foreign investors, a title it has held since 2002. The United States retakes second place from India, which had surpassed it in 2005. India, Brazil and Germany complete the top five favoured investment destinations.

Overall, developed economies rose in the Index as investors looked for safety. The most striking exception is the United Kingdom, whose reliance on financial services left it exposed in the current crisis. At the same time, the placement of China, India and Brazil in the top five shows a strong vote

50 Source: Based on the Department of Industrial Policy and Promotion’s Discussion paper, ‘FDI in Multi brand Retail trading’, Department of Consumer Affairs’ inputs, and working paper No.1. 2010, Department of Economic Affairs. Cited in Economic Survey 2010-2011 Chapter 10 (Service sector), page 247
Website: http://indiabudget.nic.in
of confidence for the strength of these economies. Investors also expressed the most optimism about the future outlook for China, India and Brazil.

**2010 FDI Confidence Index**

<table>
<thead>
<tr>
<th>Top 25</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) 1</td>
<td></td>
<td>China</td>
</tr>
<tr>
<td>(3) 2</td>
<td></td>
<td>United States</td>
</tr>
<tr>
<td>(2) 3</td>
<td></td>
<td>India</td>
</tr>
<tr>
<td>(4) 4</td>
<td></td>
<td>Brazil</td>
</tr>
<tr>
<td>(10) 5</td>
<td></td>
<td>Germany</td>
</tr>
<tr>
<td>(22) 6</td>
<td></td>
<td>Poland</td>
</tr>
<tr>
<td>(11) 7</td>
<td></td>
<td>Australia</td>
</tr>
<tr>
<td>(19) 8</td>
<td></td>
<td>Mexico</td>
</tr>
<tr>
<td>(14) 9</td>
<td></td>
<td>Canada</td>
</tr>
<tr>
<td>(4) 10</td>
<td></td>
<td>United Kingdom</td>
</tr>
<tr>
<td>(8) 11</td>
<td></td>
<td>United Arab Emirates</td>
</tr>
<tr>
<td>(12) 12</td>
<td></td>
<td>Vietnam</td>
</tr>
<tr>
<td>(13) 13</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>(5) 14</td>
<td></td>
<td>Hong Kong</td>
</tr>
<tr>
<td>(17) 15</td>
<td></td>
<td>Other Gulf states</td>
</tr>
<tr>
<td>(**) 16</td>
<td></td>
<td>Romania</td>
</tr>
<tr>
<td>(25) 17</td>
<td></td>
<td>Czech Republic</td>
</tr>
<tr>
<td>(9) 18</td>
<td></td>
<td>Russia</td>
</tr>
<tr>
<td>(**) 19</td>
<td></td>
<td>Saudi Arabia</td>
</tr>
<tr>
<td>(21) 20</td>
<td></td>
<td>Indonesia</td>
</tr>
<tr>
<td>(16) 21</td>
<td></td>
<td>Malaysia</td>
</tr>
<tr>
<td>(**) 22</td>
<td></td>
<td>Chile</td>
</tr>
<tr>
<td>(20) 23</td>
<td></td>
<td>Turkey</td>
</tr>
<tr>
<td>(7) 24</td>
<td></td>
<td>Singapore</td>
</tr>
<tr>
<td>(**) 25</td>
<td></td>
<td>Egypt</td>
</tr>
</tbody>
</table>

Source: A.T. Kearney analysis

Fig 5.6

5.3 **ROLE OF ITC IN DEVELOPMENT OF SUPPLY CHAIN**

ITC’s Agri-Business Division, one of India’s largest exporters of agricultural commodities, has conceived e-Choupal as a more efficient supply chain aimed at delivering value to its customers around the world on a sustainable basis. The e-Choupal model has been specifically designed to tackle the challenges posed by the unique features of Indian agriculture, characterized by fragmented farms, weak infrastructure and the involvement of numerous intermediaries, among others.
The Value Chain - Farm to Factory Gate

‘e-Choupal’ also unshackles the potential of Indian farmer who has been trapped in a vicious cycle of low risk taking ability > low investment > low productivity > weak market orientation > low value addition > low margin > low risk taking ability. This made him and Indian agribusiness sector globally uncompetitive, despite rich & abundant natural resources.

Source: http://www.echaupal.com/

Such a market-led business model can enhance the competitiveness of Indian agriculture and trigger a virtuous cycle of higher productivity, higher incomes, enlarged capacity for farmer risk management, larger investments and higher quality and productivity. Further, a growth in rural incomes will also unleash the latent demand for industrial goods so necessary for the continued growth of the Indian economy. This will create another virtuous cycle propelling the economy into a higher growth trajectory. Appreciating the imperative of intermediaries in the Indian context, ‘e-Choupal’ leverages Information Technology to virtually cluster all the value chain participants,
delivering the same benefits as vertical integration does in mature agricultural economies like the USA. ‘e-Choupal’ makes use of the physical transmission capabilities of current intermediaries – aggregation, logistics, counter-party risk and bridge financing – while disintermediating them from the chain of information flow and market signals. With a judicious blend of click & mortar capabilities, village internet kiosks managed by farmers called, sanchalaks – themselves, enable the agricultural community access ready information in their local language on the weather & market prices, disseminate knowledge on scientific farm practices & risk management, facilitate the sale of farm inputs (now with embedded knowledge) and purchase farm produce from the farmers’ doorsteps (decision making is now information-based).

Real-time information and customized knowledge provided by ‘e-Choupal’ enhances the ability of farmers to take decisions and align their farm output with market demand and secure quality & productivity. The aggregation of the demand for farm inputs from individual farmers gives them access to high quality inputs from established and reputed manufacturers at fair prices. As a direct marketing channel, virtually linked to the ‘mandi’ system for price discovery, ‘e-Choupal’ eliminates wasteful intermediation and multiple handling. Thereby it significantly reduces transaction costs.

‘e-Choupal’ ensures world-class quality in delivering all these goods & services through several product / service specific partnerships with the leaders in the respective fields, in addition to ITC’s own expertise.

While the farmers benefit through enhanced farm productivity and higher farm gate prices, ITC benefits from the lower net cost of procurement (despite offering better prices to the farmer) having eliminated costs in the supply chain that do not add value.

Launched in June 2000, 'e-Choupal', has already become the largest initiative among all Internet-based interventions in rural India. 'e-Choupal' services today reach out to over 4 million farmers growing a range of crops -
soyabean, coffee, wheat, rice, pulses, shrimp - in over 40,000 villages through 6500 kiosks across ten states (Madhya Pradesh, Haryana, Uttarakhand, Karnataka, Andhra Pradesh, Uttar Pradesh, Rajasthan, Maharashtra, Kerela and Tamil Nadu).

The problems encountered while setting up and managing these ‘e-Choupals’ are primarily of infrastructural inadequacies, including power supply, telecom connectivity and bandwidth, apart from the challenge of imparting skills to the first time internet users in remote and inaccessible areas of rural India. (http://www.itcportal.com/agri_exports/e-choupal_new.htm - top dt 27 Apr 2010)

Several alternative and innovative solutions – some of them expensive – are being deployed to overcome these challenges e.g. Power back-up through batteries charged by Solar panels, upgrading BSNL exchanges with RNS kits, installation of VSAT equipment, Mobile Choupals, local catching of static content on website to stream in the dynamic content more efficiently, 24x7 helpdesk etc. Going forward, the roadmap includes plans to integrate bulk storage, handling and transportation facilities to improve logistics efficiencies. As India’s ‘kissan’ Company, ITC has taken care to involve farmers in the designing and management of the entire ‘e-Choupal’ initiative. The active participation of farmers in this rural initiative has created a sense of ownership in the project among the farmers. They see the ‘e-Choupal’ as the new age cooperative for all practical purposes.

This enthusiastic response from farmers has encouraged ITC to plan for the extension of the ‘e-Choupal’ initiative to altogether 15 states across India over the next few years. On the anvil are plans to channelize other services related to micro-credit, health and education through the same ‘e-Choupal’ infrastructure.

ITC's pre- eminent position as one of India's leading corporate in the agricultural sector is based on strong and enduring farmer partnerships that has revolutionized and transformed the rural agricultural sector. A unique
rural digital infrastructure network, coupled with deep understanding of agricultural practices and intensive research, has built a competitive and efficient supply chain that creates and delivers immense value across the agricultural value chain. One of the largest exporters of agri products from the country, ITC sources the finest of Indian Feed Ingredients, Food Grains, Edible Nuts, Marine Products, Processed Fruits, Coffee & Spices.

ITC's Agro Business Division is the country's second largest exporter of agri-products with exports of over Rs. 1000 Crores (Rs. 10 billion). Its domestic sales of agro-products are in excess of Rs. 1500 Crores (Rs. 15 billion). It currently focuses on exports and domestic trading of:

- **Feed Ingredients**: Soyameal
- **Food Grains**: Rice (Basmati & Non Basmati), Wheat, Pulses
- **Edible Nuts**: Sesame Seeds, HPS Groundnuts, Castor oil
- **Marine Products**: Shrimps and Prawns
- **Processed Fruits**: Fruit Purees/Concentrates, IQF/Frozen Fruits, Organic Fruit Products, Fresh Fruits
- **Coffee & Spices**: Coffee, Black Pepper, Chilly, Turmeric, Ginger, Celery and other Seed Spices

**Farmers’ Empowerment through e-Choupals**

ITC's unique strength in this business is the extensive backward linkages it has established with the farmers. This networking with the farming community has enabled ITC to build a highly cost effective procurement system. ITC has made significant investments in web-enabling the Indian farmer. Christened 'e-Choupal', ITC's empowerment plan for the farmer centres
around providing Internet kiosks in villages. Farmers use this technology infrastructure to access online information from ITC's farmer-friendly website [www.echoupal.com](http://www.echoupal.com). Data accessed by the farmers relate to the weather, crop conditions, best practices in farming, ruling international prices and a host of other relevant information. **e-Choupal** today is the world's largest rural digital infrastructure. The unique e-Choupal model creates a significant two-way multi-dimensional channel which can efficiently carry products and services into and out of rural India, while recovering the associated costs through agro-sourcing led efficiencies. Over the next 5 years it is ITC's Vision to create a network of 20,000 e-Choupals, thereby extending coverage to 100,000 villages representing one sixth of rural India.

Supporting the e-Choupal network are ITC's procurement teams, handling agents and contemporary warehousing facilities across India, enabling its Agri Business to source identity-preserved merchandise even at short notice. ITC's processors are handpicked, reliable high quality outfits who ensure hygienic processing and modern packaging. Strict quality control is exercised at each stage to preserve the natural flavour, taste and aroma of the various agro products.

**Choupal Saagar**

Following the success of the e-Choupal, the Company launched Choupal Saagar, a physical infrastructure hub that comprises collection and storage facilities and a unique rural hypermarket that offers multiple services under one roof. This landmark infrastructure, which has set new benchmarks for rural consumers also incorporates farmer facilitation centres with services such as sourcing, training, soil testing, health clinic, cafeteria, banking, investment

[135]
services, fuel station etc. 24 'Choupal Saagars' have commenced operations in the states of Madhya Pradesh, Maharashtra and Uttar Pradesh. ITC is engaged in scaling up the rural retailing initiative to establish a chain of 100 Choupal Saagars in the near future.

**Choupal Fresh**

ITC's fresh food wholesale and retail initiative, leverages its extensive backward linkages with farmers and supply chain efficiencies. It focuses on stocking fresh horticulture produce like fresh fruits and vegetables. Six Choupal Fresh retail stores are currently operational at Hyderabad. The company has also set up a complete cold chain for ensuring the availability of fresh products in the market, besides directly sourcing farm fresh produce from the farmers.

**Choupal Pradarshan Khet**

In line with its mission of improving the quality of life in rural India, ITC's Agro Business has launched a flagship extension programme called 'Choupal Pradarshan Khet' (CPK) or demonstration plots to help farmers enhance farm productivity by adopting agricultural best practices. Started in 2005-06, the crop portfolio includes
soya, paddy, cotton, maize, bajra, wheat, gram, mustard, sunflower and potato. This initiative, has covered over 70,000 hectares and has a multiplier impact and reaches out to 1.6 million farmers.

**Processed Fruits**

In line with its strategy of achieving a higher order of value capture, the business also focuses on the value added segment, steadily enhancing its basket of offerings with several new products. These include frozen foods, IQF (individually quick frozen) fruits, niche products like baby-food quality purees and high brix pulp and organic purees. ITC seeks to focus on this segment and exploit the market opportunity for tropical fruits and fruit products, where India has a natural advantage of growing the complete range, including exotic varieties. In Processed Fruits category, ITC exports from HACCP certified plants to Western Europe, North Africa, West Asia, Japan and North America, a wide range of Processed Fruit products made from Mango (Alphonso, Kesar & Totapuri), Guava, Papaya and Pomegranate. ITC is the leading Indian exporter of Organic Fruit Products certified to European (EC 2092/91) and US (NOP) Standards. Fresh Table Grapes & Pomegranates are sourced from ITC's EUREPGAP certified farmer groups & retailed through prominent supermarkets like Sainsbury's and Albert Heijn in Europe and Daiei in Japan.

**Marine Products**

ITC has been a significant exporter of seafood from India since 1971. It exports frozen as well as cooked shrimps and other seafood products to Japan, USA and Europe. Its well-known brands include Gold Ribbon, Blue Ribbon, Aqua Kings, Aqua Bay, Aqua Feast and Peninsular.

**A Customer Centric Approach**

ITC's Agri Business Division continues to use innovation as its core strategy to retain its position as the one-stop shop for sourcing agri-commodities from India. Besides setting benchmarks in quality, reliability and value-added
services, ITC is a trendsetter in customer care particularly in commodity trading. Major customers include Cargill, Marubeni, Toepfer, among others, who source agriculture commodities and food products from India. Customers can log onto www.itcabd.com, and readily access information on crop production and forecast, market updates, the latest shipment status and the prevailing foreign exchange rates.

**Sourcing for ITC**

ITC's Agri business is progressively aligning its commodity portfolio with the sourcing needs of the Company's Foods business to generate higher order value from its agri procurement infrastructure. The business has commenced procurement of chipstock potatoes, one of the critical raw materials in the manufacture of the Company's 'Bingo!' brand of potato chips. The acquisition of Technico, an Australian company with technology leadership in the production of early generation seed potatoes, helped the business access a ready pipeline of new high-yielding varieties of chipstock potato seeds.

### 5.4 GOVERNMENT INITIATION AND SUPPORT

Inclusive development can be seen in terms of progress in social inclusion and financial inclusion. Despite more than six decades of planned economic development, a large part of the population, particularly segments like landless agricultural labourers, marginal farmers suffers social and financial exclusion. Accordingly, the Government's policies are directed towards economic and social upliftment of these segments so as to enable everyone to reap the benefits of growth. There is a close connection between social inclusion and financial inclusion.  

51 Economic Survey 2010-11 Chapter 12 pp294
objective of reduction of inter-State and inter-regional disparities. The Government of India has accorded highest priority to building rural infrastructure with the objective of facilitating a higher degree of rural-urban integration and for achieving an even pattern of growth for the poor and disadvantaged sections of society. Some of the initiatives taken by the Government to facilitate building of rural infrastructure for rational development which is an important initiative for reducing the gap between rural and urban areas and improving the quality of life of people in rural areas.

Marketing of agricultural commodities has been promoted in the country through a network of regulated markets. Most of the state governments and UTs have enacted legislation (the APMC Act) to provide for regulation of agricultural produce markets. While by the end of 1950, there were 286 regulated markets in the country, the number stands at 7,139 as on 31 March 2009. Besides, the country has 20,868 rural periodical markets, about 15 per cent of which function under the ambit of regulation. The advent of regulated markets has helped in mitigating the market handicap of producers and sellers at the wholesale assembling level. But, rural periodic markets in general and tribal markets in particular, remained out of the developmental ambit of regulated markets.\(^{52}\)

**Constraints in the Present System of Agriculture Marketing in India**

The purpose of state regulation of agricultural markets was to protect farmers from exploitation by intermediaries and traders and also to ensure better prices and timely payment for their produce. Over a period of time these markets have, however, acquired the status of restrictive and monopolistic markets, providing no help in direct and free marketing, organized retailing or smooth raw material supplies to agro-processing. Exporters, processors, and retail chain operators cannot procure directly

\(^{52}\) AR 2009-10, pp58, Department of agriculture and cooperation, MoA, GoI, [www.agricoop.nic.in](http://www.agricoop.nic.in).
from the farmers as the produce is required to be channeled through regulated markets and licensed traders. In the process, there is an enormous increase in the cost of marketing and the farmer ends up getting a low price for his/her produce. Monopolistic practices and modalities of state-controlled markets have prevented private investment in the sector. Post harvest losses are estimated to be of the order of five to seven per cent in food grains and almost 30 per cent in the case of fruits and vegetables.53

To get better price for the produce of farmers and to avoid their exploitation from agents the Government is supporting farmers in many ways. The Maharashtra State Agricultural Marketing Board (MSAMB) is mainly entrusted with activities such as keeping necessary co-ordination in working of market committees, development and promotional activities of Agriculture Produce Marketing Committee (APMC), establishment of agro-export zones, horticultural training centres & grading and packing facilities etc. The total value of arrivals in the market committees in the State was Rs. 17,448 crore and Rs. 23,097 crore during 2005-06 and 2006-07 respectively (Economic Survey of Maharashtra 2008-09).

The MSAMB has established network of computerized APMCs in the State, called as ‘MARKNET’ (Market Network) and has developed a website namely www.msamb.com. The objective of MARKNET is to provide daily arrival and price information to farmers through APMCs and to bring the efficiency and transparency in the functioning of APMCs by computerizing the system. Under MARKNET 291 main markets and 54 sub markets have been computerized and connected to MSAMB’s website. This will facilitate farmers to sell their produce at better price. For dissemination of market information at market yards, MSAMB has installed Information Displays (Projection TVs) at 69 APMCs in the State54.

Since Rabi 1999-2000, the National Agricultural Insurance Scheme (NAIS) is implemented in the State with objectives to encourage the farmers to adopt

---

53 AR 2009-10, pp58,Department of agriculture and cooperation,MoA, GoI, www.agricoop.nic.in
54 Economic Survey of Maharashtra 2008-09
progressive farming practices, high value inputs and higher technology in agriculture.

The MSAMB is promoting the development of infrastructural facilities and amenities for agricultural marketing viz. setting up of cold chain, collection centres and promotion of post harvest technologies among farmers etc. The lack of proper post harvest management practice at farm level and beyond is a bottleneck in the development of an efficient marketing system and the farmers lose out in terms of price for their produce.

**Impact of SCM on Inflation and Price-rise**

Around the average inflation, there will certainly be periods of price spikes and even price declines for different commodities and different classes of commodities. The year 2010-11 has been a year of more than one such skewflationary episode. In 2010-11, inflation in primary food articles was mainly driven by vegetables, potatoes, onions, fruits, milk, eggs, meat and fish.

At the beginning of the calendar year 2010 and even in the first months of the fiscal year 2010-11 inflation was high for food grains, sugar, and pulses. During the course of the year, inflation in these commodities stabilized, but by November there was another spike in prices of another set of commodities, led by onions, cabbage, milk, and a couple of other products. While present system is often forced to use the blunt instrument of controlling aggregate demand in the economy through monetary and fiscal instruments, these price spikes should be treated as an occasion to investigate the micro structure of markets, in particular, the production and distribution of goods from farm and factory to retail store and consumer.

While political compulsions sometimes oblige Government to take short-term measures like banning exports and changing tax rates to correct the price

55 Economic Survey 2010-11 Chapter 4, pp 71
spikes, it is important to take a long-run view and be restrained in the use of such interventions. The policy makers should use each such inflationary episode to try and locate and rectify the flaws in the system of production and marketing.

Before going into this, it is important to stress that not all price increase should be met with Government interventions. Prices rise and fall in response to changing demand and supply scenarios in the country. Prices are signals to consumers and producers to alter their behaviour in response to exogenous changes in the economy. It is not advisable for Government to step in and flatten out all these price fluctuations. Trying to control these price increases by legislating price controls runs the risk of prices being lower but goods vanishing from store shelves, as happened in countries which tried this strategy in the 1970s and 1980s. In other words, it’s a risk having low prices for no goods. Such a policy could also give rise to black markets. When an unwarranted price spike occurs, the need is to see if there are defects in our marketing system, take away lessons, and put corrective measures in place to prevent a recurrence. Some such food distribution flaws were isolated during the high inflation in food grains that occurred from November 2009 to May 2010 and corrective measures put in place.\footnote{Economic Survey 2010-11 Chapter 2, pp 26}

It can be argued that the sharp hike in the price of vegetables seen during December 2010 and January 2011, especially of onions, reveals defects in our food production and marketing systems. What came to light during this period was the great difference in prices for the same product at the farm gate and in city retail outlets, and also across different cities and towns. On 7 January 2011, for instance, onions were selling for Rs. 30 in Agra and Rs. 57.5 in Delhi; for Rs. 35 in Nagpur and Rs 62 in Mumbai; for Rs 23 in Thiruvananthapuram and Rs 60 in Dindigul. Surely, with an efficiently functioning and competitive market, such price differentials could not have

\footnote{Economic Survey 2010-11 Chapter 2, pp 26}
survived. What these price differentials suggest more than anything else is not so much hoarding as the cartelization of trade resulting in the prevention of entry of new traders. The problem needs to be tackled using our Competition Act 2002.\textsuperscript{57}

When the system gives free rein to enforcers to check these practices in the market and among traders, the tendency often is to lump together a motley category of behaviour—hoarding, entry deterrence, and collusive price hikes—and treat them all as malpractices to be avoided. Yet such indiscriminate lumping together and punishing traders can do more harm than good. Our enforcers have to be taught to distinguish between legitimate activities and genuine malpractices. Hoarding, for instance, like cholesterol, can be both good and bad. When ordinary citizens hoard for a rainy day, they serve the useful role of evening out price fluctuations. This falls in the category of good hoarding. When Government talks in terms of setting up new warehouses and storage facilities, it implicitly recognizes the socially useful function of this type of hoarding. On the other hand, when hoarding is done by large traders to deliberately manipulate prices, this can be detrimental to the economy and go against the interest of consumers. It is this latter kind of hoarding that need to deter.

The important press release by the Prime Minister’s Office made on 13 January 2011, shows awareness of the need to distinguish between different kinds of hoarding stating as it does, ‘Government will take stringent action against hoarders and black marketers manipulating market prices.’ The last three qualifying words are important. The same paragraph goes on to point out the need to use not just our Essential Commodities Act 1955, but also the Competition Act 2002.\textsuperscript{58}

\textsuperscript{57} Economic Survey 2010-11 Chapter 2, pp 28
\textsuperscript{58} Economic Survey 2010-11 Chapter 2, pp 28
The main relevance of the Competition Act occurs in the context of the natural propensity of established traders to prevent the entry of new traders. It was observed in an earlier paragraph how the same product on the same day had vastly different prices at the farm gate and at different retail locations. This does suggest the occurrence of entry deterrence. For a policy analyst, it is important to realize that the best antidote to these large price margins and the consequent large profits made by the incumbent traders is the drive of others not currently operating in this market to make profit from the large margins. If the system allows new traders to come into the market, buy where prices are low, and sell where prices are high, the large price differentials will vanish. So the critical question is why such new traders and farmers do not come into the market. Though a firm answer is not possible at this stage, it seems likely that there are barriers to their entry, caused by the rules and regulations of the Central and State governments and by deliberate barriers to entry created by the incumbent traders. It is arguable that our Agricultural Produce Market Committees (APMC) Act, by restricting the traders permitted to trade through the main mandis, facilitates collusive pricing.

Also, the various tolls and checks that a trader faces in bringing supplies into a city make it difficult for small, new traders and farmers to bring their products to retail outlets. It is also believed that new traders are deterred by incumbent traders. If this is established, then section 3 of the Competition Act 2002, can be invoked to put an end to these practices.

Another, and quicker, method to curtail the margin between farm gate and retail prices is to bring in modern supply chain management systems and retail sellers into the picture. This will involve a lot of new know-how. A quick way to get at this is to allow foreign direct investment (FDI) in multi-product retail into India. Our country certainly needs to have a regulatory structure within which such foreign companies will be required to function, even if it were argued that large organized-sector firms would be more wary of violating the nation’s antitrust laws. At any rate, we are at a juncture where
FDI in multi-product retail is worth considering. It could enable farmers to get higher prices and consumers to have to pay less. As a first step, consider limiting international multi-product retailers to a few outlets in each major city. This will prevent them from getting full control of the market and, at the same time, set an upper bound on the prices that other retailers will be able to charge for their products. Further opening up can follow depending on the success incurred with the system.

The policy changes discussed in the preceding paragraphs can improve our food delivery and distribution systems and provide great benefit to consumers. They can even achieve a once-and-for-all lowering of retail prices that consumers pay. But this in itself will not cure the risk of long-run inflation, which refers to a sustained across-the-board price increase. Sustained inflation is, in part, a by-product of growth and financial inclusion.

**Agro-processing Co-operatives: Meager participation**

The agro-processing co-operatives provide means to employ rural capital and labour, thereby securing reasonable returns to the cultivators. The State Government provides financial assistance to these societies for setting up processing units. Co-operative sugar factories, co-operative cotton ginning & pressing, co-operative spinning mills, co-operative handloom & power loom societies, co-operative dairy societies & dairy unions and fisheries co-operative societies are the major constituents of agro-processing co-operatives. As on 31st March, 2008, there were 45,323 agro-processing co-operatives. The membership of all these societies was 72.76 lakh and their working capital was Rs. 11,136 crore. Here it is to be noted that though the system is beneficial, the share of fruits, vegetables and other perishable producers is almost negligible which is an area of high concern.
The basic objectives of co-operative marketing societies are to prevent exploitation of farmers from traders and to enable them to have better remuneration for their produce by providing marketing arrangements and to benefit consumers by making goods available at reasonable prices. In view of these, the State Government is providing financial assistance in the form of share capital and loans to these societies.

**Agricultural credit**

The co-operative credit structure has been vital institutional arrangement for development of agriculture and promoting allied activities in the State. Primary Agricultural Credit Societies (PACS) play a prominent role in disbursement of Short term agricultural credits mainly for Seasonal Agricultural Operations. PACS include Farmers Service Societies and Adivasi Co-operative Societies.

**Role of APMC in SCM: Status of Agri-Marketing in Pune**

**Contribution Of Shetkari Bazar**
Agricultural produce markets established under market regulation programmes have been playing an important role in providing market places to the farmers to dispose off their produce. These have also provided physical facilities and an institutional environment to the traders, processors and other market functionaries for conduct of their trading activities. It is observed as well as revealed in various studies that farmers, on an average, get a reasonably higher price by selling their produce in the regulated market yards compared to rural, village and unregulated wholesale markets. The market yards at present lack facilities for handling the produce arriving there. The space for auction platform is less and the number of shops and godowns in the premises is small. It reduces the effective participation of traders. Absence of storage godowns at market level further perpetuates the problems of traders in general and continuous movement of goods in particular. The number of fruit and vegetable markets brought under regulation is small.

The farmer has no say while fixing price of his produce in the market. In present agricultural marketing system a number of middle men are involved till the produce reaches the final consumer, as a result the farmer gets only 30 to 35% of the every rupee paid by the consumer. Farmer's market (Shetkari Bazar) is a concept of direct marketing, by producer (farmer) to consumers. By circumventing the intermediaries, the produce reaches in good shape with minimum handling. This results in better price realization for farmer producer and good quality produce to consumer at reasonably lower prices. This type of marketing has been tried out in the State of Andhra Pradesh (known as Raitu Bazar). This is expected to help small farmers with small quantity of perishables, fruits and vegetables get fair price and escape commercial exploitation in the market place.

As per Government resolution No. APMC- 1099/P.C.305/11-C dated 2nd July 2002, Govt. of Maharashtra has decided to set up Shetkari Bazars in the State and the MSAMB has been appointed as nodal agency for implementing this scheme. The Shetkari Bazars in all Districts and key
taluka places by APMCs from the area and the produce brought by farmers will not be levied cess. As per this resolution, a state level committee is setup under the chairmanship of Hon. Minister of Marketing, Govt. of Maharashtra, for implementation and monitoring of this scheme. The district level committees are also setup under the chairmanship of respective district collectors. For speedy construction of shetkari bazars, the Directorate of Marketing, Govt. of Maharashtra, has conveyed its general sanction to all the APMCs for setting up shetkari bazars required under clause no.12(1) of Maharashtra Agricultural Produce Marketing Regulation Act of 1963 subject to total cost below Rs. 30 Lakhs vide its office order dated 15 March 2002.

**Enhancing SCM: APMC Plans Cold Storage Unit For perishable**

The Pune Agriculture Produce Marketing Committee (APMC) formulated a plan to raise a cold storage unit of its own for handling the large quantity of vegetables and fruits traded under its regulation. The move is also in tune with the State Agriculture Marketing department’s policy of encouraging the APMCs to go for independent cold storages with partial grants from the Central Government. Normally, it costs Rs 10 crores for raising a cold storage and the Centre extends 25 per cent of this amount under a special scheme.

While the APMC has yet to work out the nitty gritty of raising funds for the project, the committee was exploring a site at Khed-Shivapur behind Katraj Ghat on the Pune-Kolhapur highway. As of now, the Pune APMC has been using the MAFCO’s cold storage facility located near its administrative complex on the sprawling 150-acre area in Gultekdi — the nerve centre of food grains, vegetables and fruit trading. Pune APMC is among the few of the 289 committees across the State that are in surplus, with an annual trade turnover of over Rs 1,000 crore and almost 3,000 small, medium and large vehicles arriving each day from different corners of Maharashtra and other states. In the year 2009-10, it placed Rs 10.5 crore in a fixed deposit and the committee’s financial condition has been on the up ever since it was placed under an administrator by the State. It is also to note that the
committee’s cess recovery — a major source of income — has improved considerably while there has been more discipline in trading activity now. Licenses to godown owners, porters and marketing agents, maintenance charges, weighing services are other revenue sources. The committee has a sound infrastructure in place including 750 godowns for food grain and vegetable traders, a 25 acre facility for fruit market and another 5 acre each for animal market and banana trading and one acre space for flower market.

The magnitude of perishable food market can be understood with the following data where receipts of few commodities are shown.

Table 5.6  **Magnitude : Perishable Food Market in Pune**

<table>
<thead>
<tr>
<th>Name of commodity</th>
<th>Season</th>
<th>Average daily arrival (in metric tones)</th>
<th>Minimum daily arrival(in metric tones)</th>
<th>Maximum daily arrival(in metric tones)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onion</td>
<td>Whole year</td>
<td>804</td>
<td>203</td>
<td>2620</td>
</tr>
<tr>
<td>Potato</td>
<td>Whole year</td>
<td>195</td>
<td>47</td>
<td>780</td>
</tr>
<tr>
<td>Tomato</td>
<td>Whole year</td>
<td>43</td>
<td>9</td>
<td>144</td>
</tr>
<tr>
<td>Banana</td>
<td>Whole year</td>
<td>52</td>
<td>9</td>
<td>82</td>
</tr>
<tr>
<td>Lady Finger</td>
<td>Whole year</td>
<td>4</td>
<td>1</td>
<td>15</td>
</tr>
</tbody>
</table>

Data compiled by researcher based on information placed on APMC website [www.msamb.com/english/about/default.htm](http://www.msamb.com/english/about/default.htm) dt. 25/12/2010

**A Step Towards SCM : Training**

The MSAMB is promoting the development of infrastructural facilities and amenities for agricultural marketing viz. setting up of cold chain, collection centres and promotion of post harvest technologies among farmers etc. The lack of proper post harvest management practices at farm level and beyond is a bottleneck in the development of an efficient marketing system and the farmers lose out in terms of price for their produce. Hence, to provide proper training and development of manpower skills in post harvest technology, the MSAMB has established a full fledged Post Harvest Technological Institute registered as a Non Government Organization (NGO) under the Society Act of 1860 on 10.12.98 and as a Trust under the Trust Act of 1950 on 12.1.99.
The key aim of the Institute is to take relevant agricultural research from lab to land. The chief object is to develop core competence in 'Lab to Land' activities in agriculture in general and in agricultural marketing in particular. The institute gives advice to farmers in modern techniques of cultivation, post harvest technology, training to employees of Regulated Markets in grading and quality control aspects and advise to farmer exporters in export quality production, systematic production, harvesting, handling, packaging, pre-cooling, cold storage, transportation and export marketing. The global examples which emphasize the importance of human factor can be taken as catalyst for motivation. Steve Brayant, Global Director of Cold chain Logistics at Ingersoll-Rand Climate control, says that improved training and education programmes are strengthening and spreading professionalism at every link in the cold chain. The world food logistics organization provides annual training programmes to almost 300 cold storage and refrigerated transportation professionals at University of Oklahoma.59

**Observation:** Though the Government is making full effort to stop wastage and is giving training to farmers, nothing has been done for the training of Agent / Unorganized retailers / middle man / wholesalers who are the handlers of produce where wastage occurs at maximum. (No training facilities reflected on the website)60.

**Use of RFID to improve SCM**

The Maharashtra State Road Development Corporation (MSRDC) plans to provide radio-frequency identification (RFID) tags on all commercial vehicles crossing 22 inter-state border check posts. The tags will be mandatory for all


60 http://www.msamb.com/english/activities/publications.htm _dated 25/12/ 10_
the commercial vehicles passing through the check posts. It will be free the first time while the replacement cost is Rs 500. The staff members who sit at the check post will make an entry of the information with respect to the vehicle owner and nature of the cargo at the computer system. According to MSRDC, it will detain vehicles only for 75 seconds at the first check post and 10 seconds in the second barrier and if the papers are in ready mode, the vehicle will be allowed to move in less than 3 minutes. The financing for the tag services to the commercial vehicles will be given under the project for modernization and integration of the check posts with a cost of Rs 1,571 crore. This project would be operational in 18 months of time.\textsuperscript{61}

\textbf{CRITICS OF APMC ACT 1954}

Closer vertical coordination of supply chains is becoming a dominant feature in the Indian agro-food sector. Well known innovations in rural supply chain adapting this coordination are ITC e-choupal, PepsiCo’s contract farming, Tata Kisan Kendra and Hariyali Kisan Bazaar. The case-by-case repealing of the APMC Act under its new guideline is a welcome step as it has facilitated rural supply chain innovations in a big way.

There are so many restrictions to adapt vertical supply chain in agriculture. First it was limited by the regulatory framework. The Agricultural Produce and Marketing Commission (APMC) Act 1954 prevalent in India forced farmers to sell at the mandi and not to agro-food players directly. This draconian act was a major hurdle in making supply-chain transparent and responsive for both farmers and agro-food players.\textsuperscript{62} It was arcane and plagued by the presence of several intermediaries, a lack of transparency in prices, poor marketing infrastructure, and poor linkages of the marketing channel. In a mandi transaction, consumers on an average pay four times more the price paid to a farmer for every kilogram of produce – a mark-up of

\textsuperscript{61} C II Newsletter, dated 22 Apr 2009
\textsuperscript{62} Singh Rakesh, Institute of Supply Chain Management (ISCM), CII Newsletter, 29 Dec 2009
around 400 percent, which is unheard of in developed markets of the world. For agro trade to be competitive as well as beneficial to farmers there is a need for disintermediation of the supply chain and an increase in information transparency within the participants.

Soon, after the harvest the farmer has to take his produce to local mandi about 15-30 kms from his village to Kaccha Adat – local term for a small, unregistered dealer. The auction process held at the mandi is tilted in favour of the dealer intermediaries. Most of the time, the unsuspecting farmer has to bear with the inefficiencies of faulty weighing machines of the Adat. The intermediary system also does not allow the farmer to bypass the Kaccha Adat who then sells it to the Pukka Adat (registered or big trader) often at a very high price.

Currently, the APMC only allows case-to-case contract farming thus increasing the uncertainty in transaction environment. Farmers face the risk of acquiring the right price for their produce, the quality risk to get the right price for quality and quantity risk of selling all that he has produced. The agro-food player too faces the same risks.

In the absence of direct procurement from farmers, firms incur time and money in the search for information about products, prices, input and buyers or sellers. Costs shoot up owing to the physical act of negotiating and writing contracts or paying for the services of an intermediary, or monitoring or enforcement costs (after an exchange has been negotiated). This process may also involve monitoring the quality of goods from a supplier or the behaviour of the supplier/buyer to ensure that all the pre-agreed terms are met. All this makes agro-food operations costly and firms are unable to compete globally in agro-commodity markets. It is thus necessary that the APMC Act be amended and agro-firms allowed to source products directly.

After relaxation in APMC norms in 2002, the agro-firms can directly source soyabean and export it to international markets. Now, there is urgent need to reform APMC Act which promotes investment in agro-business by private
Safety of Perishable Food Product

The food sector in India is governed by a multiplicity of laws under different ministries. The Food Safety and Standards Bill, 2005, aims to integrate the food safety laws in the country in order to systematically and scientifically develop the food processing industry and shift from a regulatory regime to self-compliance.

The Bill makes it mandatory for the distributor of a food article to identify the manufacturer and the seller to identify either the manufacturer or the distributor of a food item. Every packaged food product has to be labeled as per regulations in the Bill. The packaging and labeling of a food product should not mislead consumers about its quality, quantity or usefulness.

Every food business operator is required to have a license in order to operate his food business. Petty manufacturers who make their own food, hawkers, vendors or temporary stall holders do not require a license. Instead, they need to get their businesses registered with the local municipality or Panchayat.

The Bill empowers the FSSA and State Food Safety Authorities to monitor and regulate the food business operators.

Scheme of Up-gradation of Quality Street Food

MFPI has taken initiative along with industry associations, NGOs, municipal bodies, etc. to improve the safety of food in the streets. Scheme is aimed at laying down standards, quality up-gradation and capacity building of street food vendors in 50 cities in the country and up gradation of one food street in
each 25 cities of tourist importance in the country. The Scheme envisages
capacity building activities amongst the street food vendors and formation of
viable micro finance linkages and regulatory mechanisms in association with
local authorities. Nine Pilot projects have been taken up in Delhi, Chennai,
Kolkata, Agra, Mumbai, Guwahati, Agartala, Bangalore, and Jaipur to
assess the existing status of food vending on streets with respect to storage,
handling, preparation and presentation along with the socio-economic
condition of the vendors. (Source: Ministry of Food Processing industry
Report :07-08)

5.5 LOCAL PERSPECTIVE OF PERISHABLE SUPPLY CHAIN

As we are aware of the complication in supply chain, the evaluation of local
perspective of perishable supply chain is more important where the
researcher has to concentrate. The thorough study of all involved channel
members and stakeholders has been carried out in unorganized and
organized retail as enumerated in further sections.

Unorganized Retail in Mandis of Pune
The various retail markets in Pune were visited by the researcher during the process of information gathering and data collection. In Chandannagar Mandi which starts at 8 P.M., it was observed that about 125-150 vehicles arrived within 3-4 hours, i.e. up to 11.30 P.M. accompanied by farmers. These vehicles were Tempo, Tata Ace, small trucks and carriers of varying capacity. The vegetables were purchased by wholesale agents on the basis of complete vehicle load. Some of the farmers had not sold their produce to the middle men but they themselves occupied the place in the market. Transactions took place the whole night and purchases were made by retailers/ restaurant owners/ other small vendors/ push cart vendors. Early next morning, the business was on pick. After 6.30 A.M., large number of consumers were also seen. At 8 O’ clock, there was a bell by Pune Municipal Corporation garbage vehicle. At that time, all the retailers were trying to sell their produce at throw-away price. Some of them whose quality of produce was comparatively better and could be sold later, were arranging their produce in respective gunny-bags. In the end, approximately more than 10-12 quintals of produce was collected by the garbage vehicle.

In other mandis like Yerwada, Mahatma phule mandi, Shivajinagar etc., there are 100-150 retailers generally present in the market on an average. Some markets are in open place without any platform or covered shade and start at night after 8 P.M. and end up the next morning by 8 O’ Clock. Their daily business ranges from Rs. 3,000 to Rs. 20,000 depending on the capacity of retailers. Their profit margins are not certain and they make losses often. Some of them disclosed that their average profit lies between 10-15% of their investment. The researcher interviewed 50 retailers and 42 of them informed that they are not doing the business more than 20 days in a month due to various reasons. Further, they accepted that generally it takes two days to sell their products i.e. average purchases are performed on alternate day. All the respondents accepted that the business is highly volatile and uncertain.
During the discussion with farmers, it was revealed that price of their produce is fully decided on the basis on supply of produce on that particular date. There is no minimum or maximum price. Some time they have to throw their produce as the cost of transport is also difficult to recover. As the supply increases in mandi, the price goes down. The profit is totally uncertain and fully depends upon their luck in absence of any forecasting. Since there is no forecasting system available to them, they become the victim of oversupply and are unable to recover the cost of their produce. Sometimes, early entrants in the market can sell the produce in lower price and feel dissatisfied. There is no price mechanism in the market which assures the minimum price to the farmer. Therefore, the efforts put for higher production goes in vain as the price level of produce goes down due to good production.

**SCM at Organized Retail in Pune**

There are four major players in organized food retail dealing with perishable products viz. ABRL’s More (28), Reliance Fresh (19), Spencers (14) and Food Bazar (10). There are more than 71 stores operating in and around Pune. There are warehouses known as distribution centres managed by supply chain managers with a staff of 7 to 12 who assist in various functions with two quality control staff having degrees in Agriculture Science. There are 2-4 collection centres at Hadapsar, Narayangoan, Kondhapuri, Ranjangoan managed by 3 to 4 employees with 4 to 5 labourers at each centre depending upon the scale of operation. After collection, perishable products are dispatched to distribution centres by agents or service providers in outsourced vehicles like Mahindra Jeep, Tata 407 or Tata Ace depending on the load. The vehicles reach DC in evening. After that, the products are sorted by 12-15 female workers either same day or next day, depending on the perishability of the produce. For e.g. green leaf products, tomato etc. are sorted at night itself and kept ready in crates for dispatch as per indent or demand received by different stores. The vehicles are loaded with perishable produce with crates and are dispatched to respective stores
as per the challan, early in the morning. The transport network planning has been done so that one vehicle can cover three to four stores in the nearby locations in the same area. Products like tomato and onion etc. are packed in sink plastic bags in ½ Kg or 1kg pack to maintain moisture content in products. The use of crates reduces mishandling to minimize the deterioration of the produce. The crates are filled only ¾ or half depending on the type of produce to minimize wastage. The vehicles are covered and fitted with air blower for efficient transportation.

Pricing decisions are taken by supply chain managers with consultation of marketing and local area store managers. The pricing is discriminating depending on geographical locations. For e.g. the price of particular perishable products at the Vimannagar store is more than that, at the Chandan Nagar store, where as the difference between the two locations is hardly two km. The purchasing capacity of consumers residing in particular areas, realty and other costs of operation are the deciding factors for discriminating pricing policy. The pricing is not based on the cost of procurement but it depends on competitive market forces. For this purpose, daily market survey is performed by agents of supply chain managers at different localities for each product at different times in a day. They collect the quality wise information for each product from the APMC at Market yard, Gultekdi, other mandis like Chandannagar, Hadapsar, Aundh etc and from other competitors in organized retail. Therefore, the pricing is totally based on information networking.

About 80% sourcing is done directly from farmers through collection centres. Each organized retailers have about 100 to 120 farmers-cum- producers-cum –vendors who supply the produce to DCs . The negotiations with them are key challenge for supply chain manager where maximum exploitation is done in favour of organized retail company. It was revealed during discussions with supply chain managers at DC and CC that during high production, farmers are not able to negotiate more and earn higher profit. Poor state of Agri-supply chain, marketing infrastructure and absence of
pricing policy, make the farmers helpless during over production. This also leads to loss of control over negotiation which forces them to sell their produce to agents/traders/organized retailers at a very low price.

The monthly gross sales of organized retailers are high in monetary value. The floor areas used for selling of perishable food products are 5 to 6 percent of total space provided for commodity and food stuff. The sale value of perishable food product is approximately 6 to 7 percent of the total gross sale of organized retail. Therefore, it can be said that the sale value of organized retail is proportionate to the floor area earmarked for selling of perishables at organized retail.

In unorganized retail, the floor areas deployed for perishables are ranging from 20 Sq ft to 200 Sq ft. The small retailers using areas of 20 Sq ft generally invest Rs. 2,000 on a daily average with one or two bags of products generally ranging from 100-2000 Kg. As the floor area increases, the variety of product as well as investment also increases. However, it also depends on various factors like season, type of product, nature and quality of product, forecasting of consumer taste and purchasing pattern etc. The range of profit earned is generally 20% to 30% of investment. It is also observed that there is no exact loss to retailer as he earns by keeping the higher margin by segmenting the product as ‘first quality product’, ‘second quality product’ and so on and charge higher prices for premium quality. The selling price is also lowered/reduced gradually as the quality of produce goes down. They try to sell out the even lowest quality product at throw-away price if possible which is even lower than purchase price. The pure wastage, which is either thrown to dust bin/garbage or given to street cattle, is very small in amount and quantity. But of course, the quality losses are the major concern due to ineffectiveness in supply chain of these products.

Here, it is evident that the retailers are not making any loss but they are able to maintain their profit by extracting from either consumer i.e. selling of product on high price or paying the lower price to producer/Farmer. This is
the reason why the price paid by consumer is four times higher than the price paid to farmer as a cost of production.