



Future Trends and challenges in Chemical Logistics in India

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Chemical industry is complex in nature. Products range from solids to liquid to gases which could either be inert or hazardous. The complexity of handling, storage and transportation is compounded with the fragmentation of the industry and lack of domestic standards. A complete discernment of hazard and risk associated with chemicals storage and distribution is essential in choosing processes that ensure compliance at each step.



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The Indian chemical industry is a complex and diverse industry. It plays a significant role in the country's development. The industry was estimated to be ~Rs.5.5 Cr in FY12 and is positioned as the third-largest in terms of production in Asia. India is expected to become the second-largest individual market after China, cornering 20 per cent of the global chemical sales by 2050. Over the next 5 years, India's chemical sector is expected to grow at 13-17% p.a. The key drivers for the sector include increasing commercial consumption of chemicals and, various government initiatives like 100% FDI and plan for formation of six PCPIR's (Petroleum, Chemicals and Petrochemicals Investment Region, PCPIR Policy), of which four have been given final notification.

Chemical industry is broadly divided into 6 segments:

1. Basic organic chemicals: carbon and oxygen based products
2. Basic inorganic chemicals: caustic soda, chlorine
3. Petrochemicals : polymers, yarn, surfactants
4. Fertilizers: NPK, phosphate and sulphate based, urea
5. Agrochemicals: pesticides, fungicides etc.
6. Specialty chemicals: paints, dyes, colorants, textile chemicals
7. Construction chemicals: adhesives, fixtures, sealants

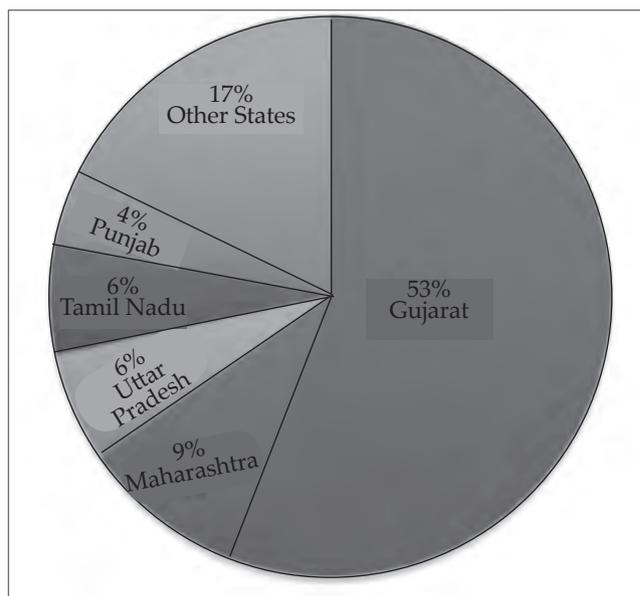
Specialty chemicals are the fastest-growing segment in the chemical industry. These are high value, low volume chemicals known for their end-use applications. Polymers and agrochemicals industries present immense growth opportunities whereas construction chemicals too have ample growth opportunities as it accounts only for 2% of the global demand.

With increasing demand of chemical products for industrial and commercial purpose transportation becomes an important task. Production as well as consumption is well spread across India making chemical logistics an attractive industry.

Future trends in Indian chemical logistic industry

Increased focus on Health, Safety and Environment: Responsible care is a priority in logistics, especially when it comes to an industry such as chemicals. Every chemical logistic provider has to be certi-

Fig 1. State-wise production of major chemicals



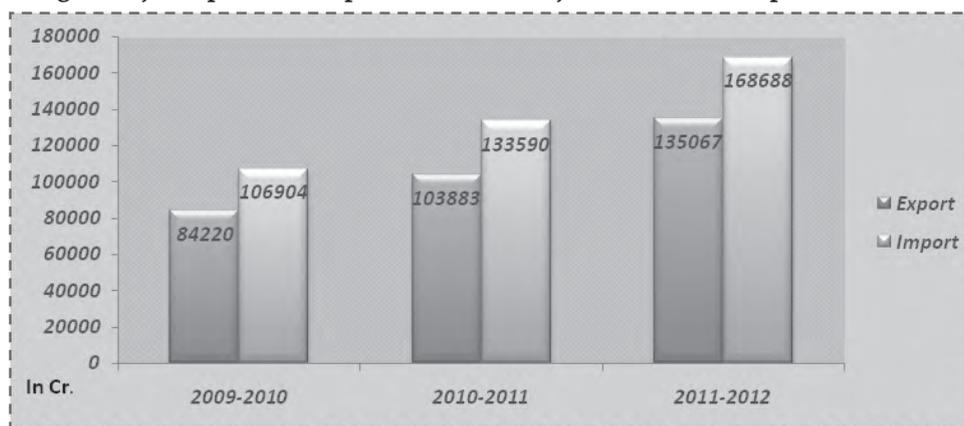
(Source: Working group of Chemicals - Planning Commission (11th Five Year Plan)

fied under Responsible Care. It has become a mantra for safe and environmentally conscious management. Responsible care is an ethic as well as commitment to build trust and confidence in an industry that is essential to improve the living standard and quality of life.

It has eight guiding principles:

- Training
- Legal requirements
- Management of risk
- Ongoing improvements
- Community interactions
- Policies and documentation

Fig 2. Major export and import trends for major chemicals and petrochemicals



(Source: Annual Report 2011-2012-Department of Chemicals)

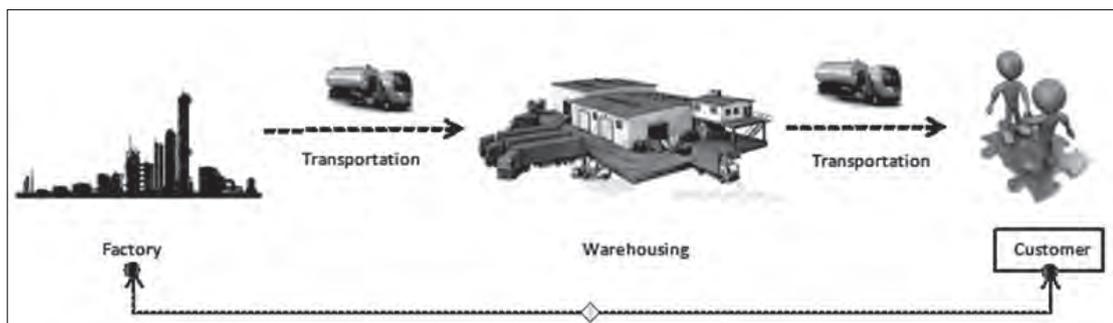


Fig 3. Process flow of logistic industry

increased accidents and also led to a loss in productivity due to delays.

● **Crossing check points:** If a vehicle goes through numerous stoppages e.g. toll booths, greater the chance of it meeting with an accident as the contact with the

- Provision of information
- Emergency response

Chemical companies prefer to partner with logistic providers with improved safety and security procedures and record. This makes it essential for logistics companies to continuously monitor all safety parameters.

- **ISO certified tanks:** Tank containers are extremely safe, secure, cost effective and feasible mode of transportation.
- **Green transportation:** Shift to greener modes of transportation e.g. intermodal transportation saves fuel and reduces CO₂ emission as well.
- Increase in R&D investment in chemical logistics as many more operational sectors to be explored to have cost advantages with boost in demand.
- Potential for high domestic demand with increasing industrial consumption.
- **PCPIR Policy:** The PCPIR policy is expected to attract major investments, both domestic and foreign, in the petroleum, chemical and petrochemical sectors. India has identified 6 PCPIR's, Haldia, Dahej, Vizag, Paradip, Cuddalore and Mangalore. Dahej is already operational.

Challenges in Indian chemical logistic industry:

- **Safe transportation of hazardous chemical:** Safe transportation of hazardous chemicals across the country is one of the biggest challenges. A boom in the chemical industry has also led to an increase in the safety concerns of chemical logistics as freight traffic has increased sharply. An increase in the number of untrained staff to handle packaging and transportation of hazardous chemicals and lack of awareness about the new and emerging trends and technologies are some of the issues that challenge the transportation of hazardous chemicals in India.
- **Poor transportation infrastructure:** India's roads haven't been able to keep up with the transportation demands of rapid urbanization. Poor quality of roads have

human ecosystem increases.

- **Pilferage:** Pilferage is a major concern. Costly chemicals are replaced by some other low value substance with truck drivers being the major culprits. As a consequence, raw material quality is compromised.
- **High level of fragmentation of the industry:** A large share of the pie goes to small truck operators who bulk deliver non hazmat. These do not need handling precautions and are highly cost competitive as compared to the service providers with standards set for all types of carriage handling. The latter suffers in this case.
- **MSDS (Material Safety Data Sheet)** not properly followed which results in various chemical disasters of warehouses resulting in huge losses in property and productivity.
- **Poor storage Infrastructure:** Most of the warehouses are not leak proof, ill-equipped with security systems, without adequate warehousing facilities.
- Lack of proper expertise in warehousing.
- Obstacles in using more intermodal transport.
- Increased competition amongst the service providers.
- Difficulties of obtaining permits for logistics infrastructure.
- Increase in transport costs, e.g. fuel and all other escalations.
- Increasing (local) restrictions on transportation of hazardous goods on certain parts of the transport infrastructure.

Conclusion

A comprehensive review of the supply chain and logistics sector is essential for sector optimization. Although chemical logistics sector faces some challenges, it also presents many opportunities for growth. Personnel training and practicing global operational techniques remain top priority.

