

AN OVERVIEW OF CHEMICAL LOGISTICS IN INDIA

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Abstract:

Chemical logistics in India is one of the major industrial contributors in Indian economy and showing an upward growth trend for the past few years. Industrial experts forecast a significant growth in Indian chemical manufacturing and export/import operations. The objective of this study about the chemical logistics in India based on the numbers of shipping and in production. Logistics being one of the key operations in the safe transport of these products key indicators in infrastructure development is also monitored and analyzed to get an understanding of the support system. Research scope in this field is very wide and welcoming as there are currently only limited studies done. The difficulty of not having a centralized operational control tower in the governmental level exclusively for chemical logistics is found to be holding back such research because of data inadequacies.

Keywords: Chemical logistics, CAGR, EXIM

Introduction: The industry is quickly growing considering the demand the chemical industry possesses and the contribution it makes to the country's economic growth. Industrial chemicals and other variations of chemicals which is broadly categorized as high risk and low risk chemicals is getting transported from around the globe in and out of India. A greater percentage of the transportation primarily depend on marine mode for international carriage and by road for the domestic needs. This requires extensive experience and highly qualified professionals as the material volatility is very delicate and may possess greater threat on mishandling. Indian port infrastructure has been growing in a positive way and the business is also getting increases year by year. The journal work is trying to understand the chemical industry in India along with the infrastructure development for the past years. Indian chemical industry is the 3rd largest in Asia and it is included in the top ten list of the global list.

Chemical Industry in India:

The ministry of India is forecasting steep increase in the chemical manufacturing and thus to reduce the import dependency. In also foresee to implement the inclusion of high-quality technology. As the chemical manufacturing and transportation is growing in a such a pace and the industry is yet to be very well organized, there are several plans and process in pipeline to make this more refined and thus give more productivity. The chemical industry involves high investment, this is very large, and the government assumes to be identifying a very wide portfolio with more than 80,000 categories inside this. As per the latest reports the major chemicals alone

contribute around 6487 ('000 MT) production the previous year alone. Total chemical and petrochemical production are estimates close to 26570 (000'MT) for the year 2022 -2023 (Till date).

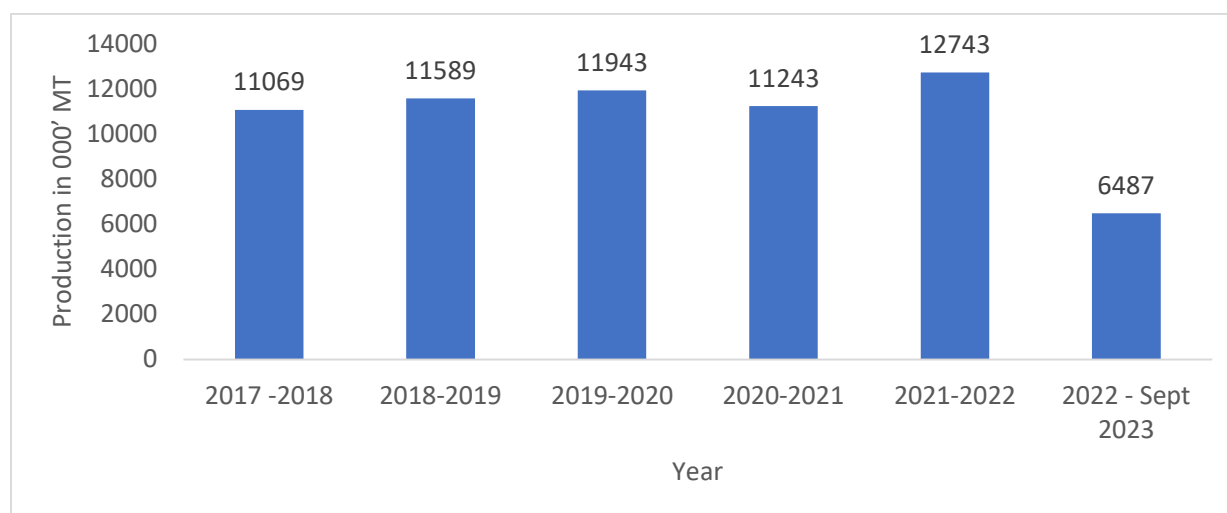


Figure 1: Production trend over years for major chemicals in India

With reference to this the valuation done for the export and import of the chemicals are also such that the revenue growth in this segment of trade is significantly going up. The report prepared by the Directorate general of commercial intelligence and statistics shows the exact trend separately for both import and export in India for the industry. The total compound annual growth rate (CAGR%) for the chemical and chemical product is validated as 13.86 % with a valuation of 196739 Crores in the year 2022 -Till September 2023.

The top categories of the chemical and chemical products excluding the pharmaceuticals and fertilizers are as mentioned in the table for export business.

Commodity	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	CAG R%	2022-Sept 2023
Inorganic Chemicals	11175	14056	12512	12301	19800	15.37	12041
Organic Chemicals	95381	127855	124195	133637	164815	14.65	88620
Tanning or dyeing	18951	23124	24409	22660	29513	11.71	14334
Miscellaneous chemical products	25080	32397	35663	37886	52416	20.24	31922
Plastic and articles thereof	40928	56079	48970	51004	67440	13.3	3304
Synthetic rubber and factice	571	739	759	821	1141	18.92	537
Man-made filaments	13984	16018	16962	11470	18070	6.62	7981
Man-made staple fibers	13212	13308	11824	9559	15402	3.91	7256

Total chemicals and chemical products	21928 1	28357 5	27529 4	27933 7	36859 7	13.86	196739
% Share in Total Export	11.2	12.3	12.4	12.9	11.7		10.8

Similarly, the data for the import business in India is as tabulated below:

Commodity	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	CAG R%	2022-Sept 2023
Inorganic Chemicals	38927	52237	45045	50955	76356	18.34	54803
Organic Chemicals	124761	15655 2	14020 5	14583 0	21261 5	14.49	124950
Tanning or dyeing	12995	15460	14518	14036	19431	10.58	10893
Miscellaneous chemical products	35521	41748	39069	45324	58634	13.35	36525
Plastic and articles thereof	89768	10659 1	10060 7	98392	14906 7	13.52	95934
Synthetic rubber and factice	6687	7896	6079	6269	9154	8.17	6334
Man-made filaments	5538	6843	7351	6727	11144	19.1	6954
Man-made staple fibers	4658	6508	6785	6180	7714	13.44	5333
Total chemicals and chemical products	317856	39483 4	35966 0	37371 4	54411 5	14.38	341925
% Share in Total Import	10.6	11	10.7	12.8	11.9		11.6

As per the above-mentioned data the import and export statistics for chemicals show a positive trend in the growth rate throughout the year and in the whole timeline. The import business in all together contributed about 11.6 % of the total business as an average for the period of 2017-2023 till September also while considering the export we could see that it covers and average of 10.8 % of the business in the same period.

Transportation Industry in India:

As per the latest survey report entitled as Transportation Industry in India – Analysis of growth trend and forecast (2020-2025), by Mordor Intelligence an independent agency transportation industry contributed roughly 6.3 % of GDP and majority of this is road sector. In the past few years, the country witnessed over 100 road projects with public-private partnership model. In India, more than 50 % of freight and 90% passenger traffic are handled through roads and

highways. With an upward trend in the rise of Tier1 and Tier 2 cities interconnection of these with logistics parks and major metropolitan cities are planned in the due course.

Road Transport

Indian road transportation is building much more efficient road and transportation system consistently. Road transportation is always a feasible option in any country and a backbone for the development of industrial sector and a critical infrastructure in economic development in a country's economy. A dedicated ministry is formed, and they are responsible for the development and maintenance of roads and highways in India. According to the report from the ministry of transportation and highways India is the second largest road network in the world with a mesmerizing 63.32 lakh kms.

National Highways	1,44,955 km
State Highways	1,67,079 km
Other Roads	60,19,757 km
Total	63,31,791 km

Indian Road Distance Kilometer (Source: Secondary Data)

India being the seventh largest country and second largest in population the requirement of the quality infrastructure to access all the remote locations is very important. Industries dispersed with various development centric spaces must have interlinked each other with bridging mode of transport. Roads, being the cheapest and most reliable medium, are widely chosen in this case.

Inland Waterways

Even though not developed when compared with other modes of transportation in India, the inland waterways are thriving to be an active partner in Indian domestic logistics. According to the report from the Ministry of Inland waterways the country has a 14500 km long accessible waterway network which can be used for domestic transport. Inland waterway in India is a combination of different sources like canals, backwaters, creeks, and rivers with navigable capability. Almost 50 million tons or more cargo capacity is moved utilizing the transportation medium. Dispersed at different locations, the inland waterways don't have a centralized or interconnecting accessibility which still have a substantial movement of cargo and passenger through them. If monitored and validated this mode can be an eco-friendly, low cost- and fuel-efficient medium which can bring in significant revolutions in supply chain web.

Marine Transport

With a mesmerizing 7517 km coastal lane around the country this medium has always been a legible source for transportation and trade in India. India has 12 major ports and 200 non major

ports actively performing to control the Exim trade of the country. As per the annual report of the ministry of shipping and ports the total trade volume in the country is through ocean with a sound 95% contribution. Also, if validating the value of trade almost 68% is transported through maritime transport only. Shipping in India is given more predominant consideration by investing more in ship design, resource development, ports and harbors, new technologies, construction etc. Cargo traffic through Indian ports has been accounted as 1323.88 MT in the year 2021-2022 with a steep increase of 5.78% than previous year. Infrastructure development to increase the cargo handling capacity is under progress in all the major ports in the country. Indian shipping industry to accommodate the ease of doing business compatibility is smartifying the port with new technologies such as paperless transaction, corridor development, RFID technology implementation and other similar modernizations. Energy security, being a relevant field, has been controlled through shipping. Most of the energy resources are moved through ships. International maritime organization an agency with global members is concentrated on technical aspects of shipping and India is a founder member of the agency.

Rail Transport

Indian railway is the largest accessible government-controlled transportation medium across the country. The freight operations are also one of the cheapest means when it comes to domestic logistics in India. Data as per the railway annual performance report says that the total freight traffic for the financial year was 1497.33 MT. Products like coal, iron, cement, fertilizers, mineral oils, EXIM are the most common resources of the tally. The revenue earning category of the total freight is majorly bulk commodities. The rate fixation for commodity transit is revised annually. Indian railways have taken initiative for the development of private freight terminals through private investment. Focus through this is to provide a more cost effective, networking system with warehousing accessibility for end-to-end users. While analyzing the chemical logistics in Indian rail transport system one of the major changes which we can point out is the procurement of special wagons and high-capacity wagons for chemicals and liquid cargo. Railways has got a material management division which deals with planning and organizing the materials for optimum usage. This is relevant because the public procurement is happening with the Indian railways. Even during the pandemic, the freight distribution through the rail went unhindered balancing with the efficient distribution of essential goods across the country. There are a lot of reforms in the freight management sector of Indian Railways. The development of the goods shed policy through private participation is also such a reform taken up by the authorities last year. Electronic registration of demand for wagons, electronic transmission of railway receipt, terminal management system, online interface to freight customers are some of the examples of the digitization in railway infrastructure. The railway loading rate growth was increased by 15.20% compared to the previous year.

Discussion and overview:

Inferring from the data collected and studied the chemical logistics industry is going to be a significant contributor in future also as the demand for the chemicals are going to be rising as the manufacturing industry in India is getting a greater consideration on the country's journey to become self-sufficient. To backup and support this the logistics infrastructure needs to be updated and upgraded accordingly. Intensive railway network of India can be of greater support as this is still not utilized to maximum. Congestion in roads is one of the major problems in Indian cities and this really is holding back the logistics time and transportation. Inland waterways can also be a much greater dependence than what we are currently relying upon. We are forecasting a much better stable and considerate amount of chemical logistics to be happening soon.

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