

Status of Chemical Industry – West Bengal and States of India

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Abstract: An ample use of chemical products in any industry indicates its diversity and excellence in production process. Present day civilization is solely dependent on chemical products. Without fluent supply of industrial chemicals such as Sulphuric acid, Soda ash, Caustic soda, Chlorine, Nitric acid, the industries like textile, petro-chemicals, paper, coal-chemicals, soap, drugs and medicines, sugar, chemical fertilizers, insecticides, plastics became in-existent.

The location of chemical industries mainly depending on knowledge of science and technology, capital and steady market. With the help of these three factors and availability of natural raw materials Gujarat and Maharashtra are able to capture the first two positions in chemical production in India. The state like West Bengal needs enormous efforts to reach there.

Keywords: Chemical industry, Infrastructure, Natural resource, Gujarat and West Bengal

I. Introduction

Indian chemical and petrochemical industry now ranks twelfth in the world. The Indian chemical industry contributes 35 percent of India's gross domestic products. The total investment in Indian chemical sector is approximately US 60 billion dollar generating an employment of 1 million. Currently per capita consumption of chemical products in India is about $1/10^{\text{th}}$ of that of the world average. Now India is a leading contributor in chemical industrial market. The states like Gujarat, Maharashtra, Tamilnadu are more successful in this field than West Bengal.

Objectives of the study:

- Detail study about the nature of chemical industry in different states of India
- Illustration of the factors favourable for the growth of chemical industry in Gujarat and West Bengal

II. Methodology

The present study is based on qualitative and quantitative approaches. Secondary data were collected from various sources. Simple quantitative techniques were used to derive results, and cartographic techniques were employed to facilitate visual interpretation.

Nature of chemical industry in different states of India:

Chemical and petrochemical industry is a big industry today; many other industries like textile, cosmetics, leather depend on it for their raw materials. The states like Andaman and Nicobar Island, Manipur, Meghalaya and Nagaland still have no chemical factories.

Table:1 Number of chemical factories in different states of India (2004-05)

Name of states	No of factories	Name of states	No of factories	Name of states	No of factories
Andhra Pradesh	858	Gujarat	1883	Puduchery	120
Assam	67	Haryana	227	Punjab	205
Bihar	51	HimachalPradesh	101	Rajasthan	334
Chandigarh	09	Jammu & Kashmir	45	Tamilnadu	1895
Chattisgarh	57	Jharkhand	74	Tripura	08
D&N Haveli	173	Karnataka	444	Uttar Pradesh	703
Daman& Diu	150	Kerala	226	Uttaranchal	73
Delhi	138	MadhyaPradesh	287	Maharashtra	2047
Goa	102	Orissa	96	West Bengal	383

Source: Annual Survey of Industries, 2004-05¹, computed and calculated by author

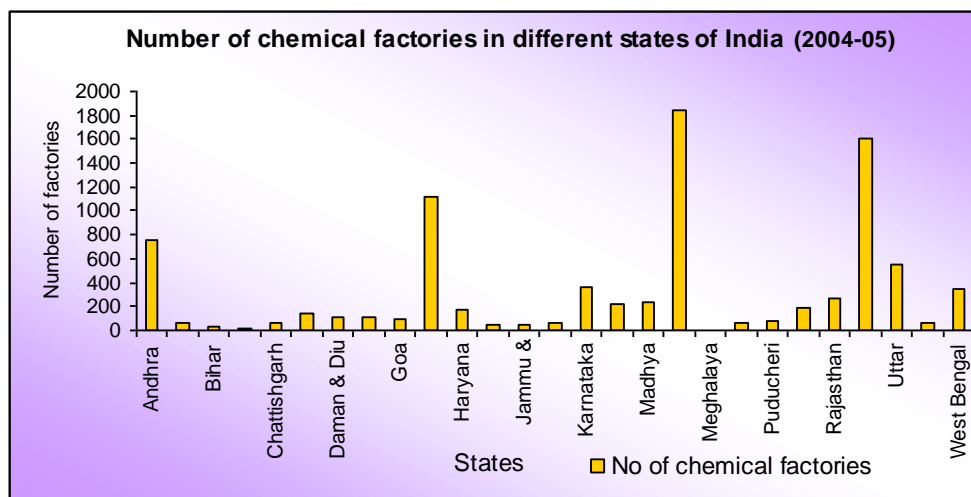


Fig: 1 Source: Annual Survey of Industries, 2004-05¹, computed and calculated by author

The diagram describes that Maharashtra has 2047 chemical factories which are highest in India. Tamilnadu holds the second position with 1895 chemical factories. While Gujarat has 1883 chemical factories and only 383 chemical factories are registered in West Bengal in 2004-05.

Table: 2 Capital invested in chemical industries of India (state wise), 2004-05

States	Invested capital (in Rs. lakh)	States	Invested capital (in Rs. lakh)
Andhra Pradesh	537178	Madhya Pradesh	179820
Gujarat	2609171	Maharashtra	1737371
Haryana	72023	Rajasthan	338657
Karnataka	363971	Tamilnadu	514027
Kerala	182962	Uttar Pradesh	469874
	West Bengal		862801

Source: Annual Survey of Industries, 2004-05¹, computed and calculated by author

Table:3 Total input and output in chemical industries of different states in India (2004-05)

States	Total input (In Rs. lakh)	Total output (In Rs. lakh)
Andhra Pradesh	1200320	939895
Gujarat	6019749	4499359
Haryana	355877	300220
Karnataka	772047	467041
Kerala	350293	287028
Madhya Pradesh	594896	457280
Maharashtra	4441273	3436554
Rajasthan	664644	534236
Tamilnadu	1223209	969367
Uttar Pradesh	1154594	919770
West Bengal	114554	898687

Source: Annual Survey of Industries, 2004-05¹, computed and calculated by author

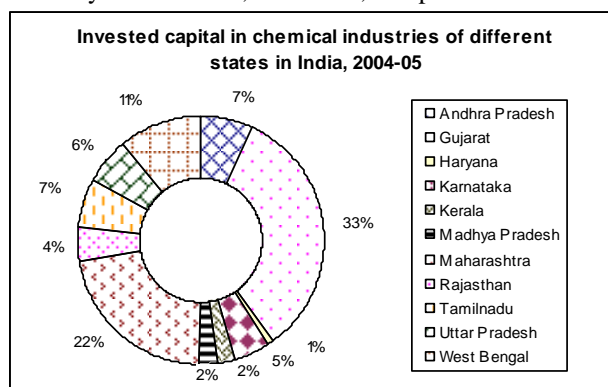


Fig: 2 Source: Annual Survey of Industries, 2004-05, computed and calculated by author

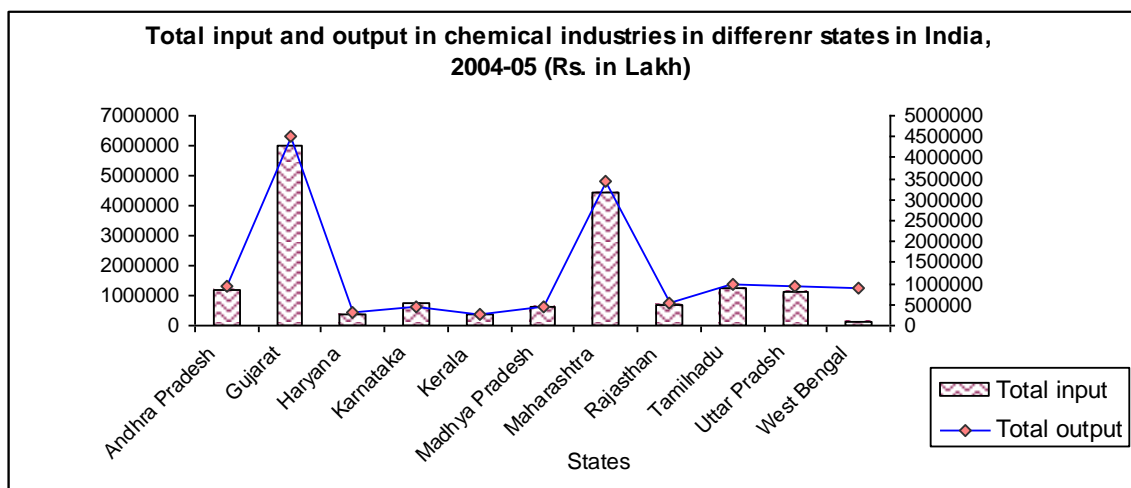


Fig: 3 Source: Annual Survey of Industries, 2004-05, computed and calculated by author

Total input includes cost of raw materials, transportation cost, purchase of machinery, enshipment of finished products, maintenance of the plant, labour cost, infrastructure cost etc. Gujarat spends Rs 6019749 lakh for chemical factory holding the first position in India. Maharashtra holds the second position and spends Rs. 4441273 lakh. West Bengal contributes only Rs. 1145554 lakh for chemical sector. The output from chemical industry in West Bengal is also very negligible amounting Rs. 898687 lakh where Gujarat’s output from chemical sector is Rs. 4499359 lakh in the year 2004-05.

Table:4 Persons engaged in Indian chemical industries (state wise), 2004-05

States	No. of person engaged	States	No. of person engaged
Andhra Pradesh	64489	Madhya Pradesh	21020
Gujarat	75897	Maharashtra	149375
Haryana	13433	Rajasthan	20715
Karnataka	26871	Tamilnadu	140313
Kerala	16353	Uttar Pradesh	37257
	West Bengal		25033

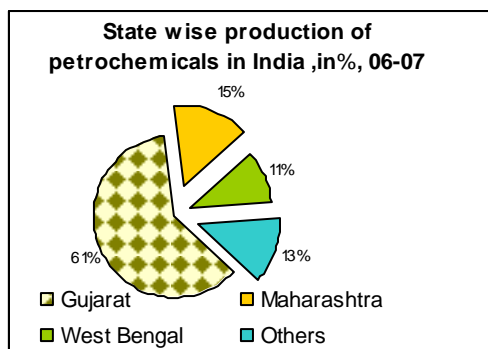
Source: Department of Chemicals and Petrochemicals, GOI, 2007²

It is evident from the diagram that highest number of workers engaged in chemical industries of Maharashtra in 2004-05. Only 25033 persons are engaged in the chemical industries of West Bengal in the same year.

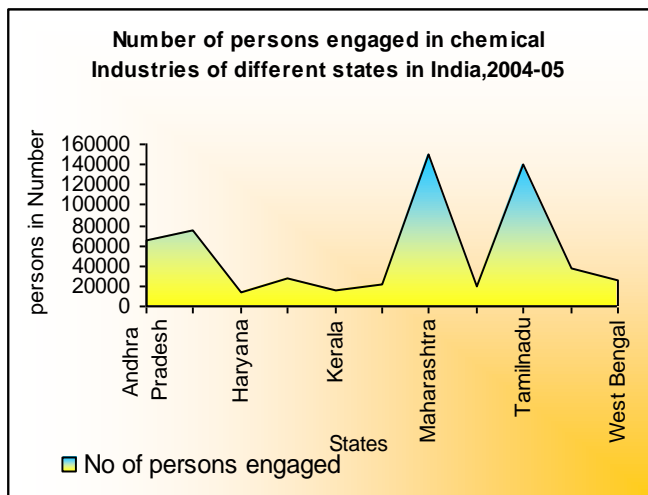
Table: 5 State wise capacity and production of chemicals in India, 2004-06

States	Capacity			Production		
	(in '000 metric tonnes)					
	Mar'04	Mar'05	Mar'06	2003-04	2004-05	2005-06
Gujarat	4331	4449	4474	3744	2940	4055
Maharashtra	1004	1014	1011	708	725	698
Uttar Pradesh	486	527	637	423	440	486
Tamilnadu	509	509	525	468	475	468
Madhya Pradesh	475	477	463	318	331	341
Punjab	342	364	364	279	288	312
Andhra Pradesh	312	312	416	228	229	256
Rajasthan	270	278	410	158	159	248
Kerala	311	261	280	201	215	185
West Bengal	248	256	255	151	160	163

Source: Department of Chemicals and Petrochemicals, GOI, 2007²



Source: Department of Chemicals and Petrochemicals, GOI, 2007

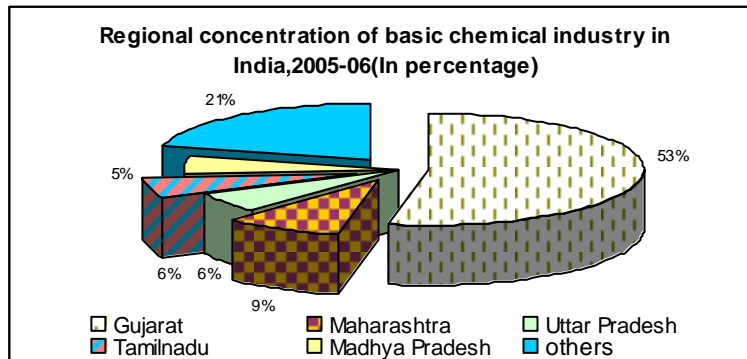


Source: Department of Chemicals and Petrochemicals, GOI (Table-4)²

Table:6 State wise basic chemical production in India, 2005-06

States	Production of basic chemicals (in percentage)
Gujarat	53
Maharashtra	09
Uttar Pradesh	06
Tamilnadu	06
Madhya Pradesh	05
Others	21

Source: Department of Chemical and Petrochemicals, GOI, 2007²



Source: Department of Chemical and Petrochemicals, GOI, 2007²

Though the chemical industry is spread over the country, there is relatively a high concentration along the west coast of Gujarat. Gujarat contributes about 53 percent of the total chemical production in the country, followed by Maharashtra, contributing 9 percent. The other major chemical producing states include Uttar Pradesh, Tamilnadu and Madhya Pradesh. In the case of heavy chemicals, especially inorganic chemicals, availability of fuel is a determining factor, and therefore there is a tendency of these companies to concentrate around power plant. Due to the regional concentration of chemical companies in certain products, logistics costs for the industry have tended to become a significant position of total costs.

Profile of chemical industry- Gujarat and West Bengal:

As far as geographical location is concerned, Gujarat and West Bengal are situated in two opposite sides in India. Gujarat is located near the Thar desert; therefore most of the land is dry and arid in nature. Moreover, the topography is characterized by small hilly tracts. Most of the part of the state is low lying, having very diverse climatic conditions. Agriculture in Gujarat is marked by erratic and uneven rainfall. The state receives only one time rainfall during the months of June-July, August, September and October. Drought prone areas and arid areas cover about 50 percent of the state.

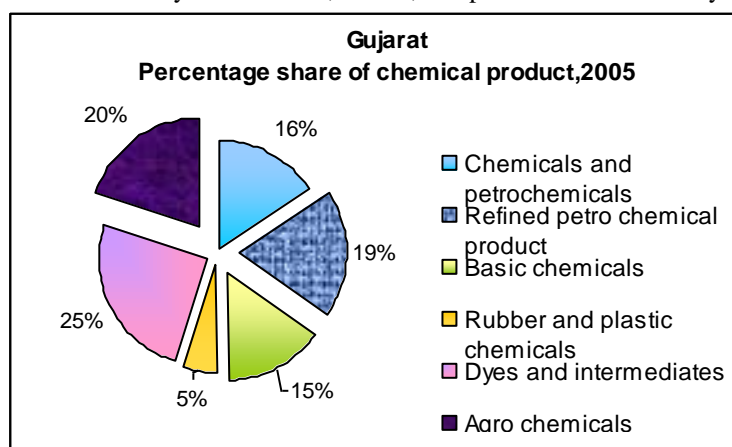
Gujarat is highly industrialized. The yield from agriculture in Gujarat is distressingly low. Infertile soil, inadequate rainfall, frequent droughts and floods, inadequate drainage and poor irrigation lead to dependence on industrial economy. West Bengal is an agricultural state. Rich alluvial soil and monsoon climate always give impetus to the agricultural production. Though the economy of West Bengal is mainly agro-based, the primary importance was given to agricultural sector since 1990's.

Chemical and petrochemical industry is the leading industrial sector in Gujarat. The chemical industry in Gujarat comprises of about 500 large and medium scale industrial units, 16000 small-scale industrial units and other factory sector units. Gujarat's chemical and petrochemical industries are one of the fastest growing sectors in the state's economy and are the leader in the production of chemicals and allied products in India.

Table: 7 Chemical production of Gujarat in India, 2005

Products	Production in US billion dollar		Gujarat's production to India's total (in percentage)
	Gujarat	India	
Chemicals and petrochemicals	23.60	75.5	31
Refined petrochemical product	12.20	32.1	38
Basic chemicals	10.60	35.6	30
Rubber and plastic chemicals	0.80	7.9	10
Dyes and intermediates	0.80	1.50	50
Agro chemicals	0.25	0.6	40

Source: Annual Survey of Industries, 2005¹, computed and calculated by author



Source: Annual Survey of Industries, 2005

Favorable actors for growth: Gujarat has about 54 percent of India's onshore crude and 39 percent of offshore natural gas. It has an estimated reserve of 418 million tonnes of crude oil³. Crude oil is obtained from Ankleshwar, Mehsana, Bharuch region. The state also has a well established gas grid of 550 kilometres natural gas and bio-diesel, which play an important role in the growth of chemical industry in Gujarat. With huge waste land as its assets, the state produces some quantity of bio-diesel. It reduces the state's dependency on crude oil. The major factor for the growth of chemical and petrochemical industry in the state is the availability of feedstock. Gujarat has about 1230 kilo tonnes per annum of ethylene capacity and 1475 kilo tonnes per annum of propylene capacity. Well-developed infrastructure and close proximity to the Middle East enabled the state to become self sufficient in natural gas storage.

West Bengal has no such significant reserve of crude oil and natural gas. For its chemical industry, West Bengal mainly depends on Assam and Bombay high oil field in Maharashtra.

Gujarat has 1600-kilometres long seashore. The chemical port storage terminal, situated at Dahej, used for handling liquid and gaseous chemicals falling in "A", "B" and "general" classes, including petroleum products. It is a modern port and storage terminal, fully computerized, with state-of-the-art technology and added leverage of "single window" operations. The jetty can berth ships of 6000 dead weight tonnage to 60000 dead weight tonnages and the initial capacity of the storage terminal is more than three hundred thousand cubic metres. Additional capacities can be created to suite specific requirements of the customer at attractive commercial term. The main objective of the port is to sustain and ensure the growth of Indian chemical industry by providing sophisticated infrastructure and comprehensive services to facilitate import as well as export of

liquid or gaseous chemicals, including petroleum products. The port also serves the customer by providing prompt, efficient and safe services of international standards. The percentage of product loss and damage is zero.

Therefore, this port has enough contribution behind the growth of chemical industries in Gujarat. Through this port, hazardous chemicals handling become very easy. It ensures the state by minimizing wastage and losses of crude oil and hazardous chemical products. It encourages establishing chemical industry at Dahej in the vast hinterland. The port has the proximity to Asia's largest chemical industry zone and vast hinterland in western, central and northwestern India. It is also nearer to the major sea routes resulting in less deviation for international carriers. The port has also close proximity to Gulf countries which are the big reservoir of oil and gas. Other than chemical port, Gujarat has liquefied natural gas ports at Dahej and Hazira and 41 other ports with big one at Kandla. Gujarat port handles over 50 percent of imports of crude oil and petroleum products of the country. West Bengal has two important ports namely Kolkata port and Haldia port. Presently the conservancy limit of Kolkata port stretches from the outfall of the feeder canal at Jangipur (about 300 kilometres upstream) of Kolkata to the eastern channel at sand heads. It also includes shores of the river Hugli that are within 45.7 metres from the highest high water levels on either side of the bank.

Throughout this long stretch from sand heads, no sea-going vessel over 200 gross registered tonnage is allowed to navigate without a qualified pilot. The distance to Kolkata is 221 kilometres comprising 148 kilometres of river and 75 kilometres of sea whereas the pilotage distance to Haldia is 121 kilometres comprising 46 kilometres of river and 74 kilometres of sea pilotage.

Present dimension of vessels accepted at Haldia dock at present are restricted to length over all 240 metres, beam 32.26 metres. For oil jetties the largest vessels that are accepted at present are length over all 250 metres, beam 44 metres. Tidal bore in the river have been a constraint to shipping for the port. In spring tide, the tidal waves make an onrush with height which makes difficult for a ship to remain in the river.

Infrastructure facilities: Infrastructure development holds the key in promoting chemical industrial development in any region. Government of Gujarat has given specific emphasis on infrastructure development, particularly in backward areas. The state has already set up Gujarat Infrastructural Development Board to allow single point expeditious clearance of infrastructure development projects with private sector participation. The board would also lay down guidelines and norms for identification of such projects and their clearances. Investment in specified infrastructure will be provided due weightage in determining the quantum of incentive under the new incentive policy.

Easy availability of right type of land is a crucial factor in the location of an industrial unit. The present laws governing grant of land for industries are rather cumbersome. The state government will introduce suitable amendments in the present land laws to make land available for setting up industries without protracting paper work and delay. At present non-agriculturalists cannot purchase agricultural land without the prior approval of the government. The provision causes undue delay in acquiring land for industrial use. Amendments will be carried out in the Bombay Tenancy and agricultural land act that bonafied entrepreneurs could purchase land for setting up industrial projects without any delay. Conversion of agricultural land for industrial use would also be simplified by the introduction of the concept of deemed non-agricultural.

With rapid industrialization and urbanization of Gujarat, in order to ensure easy availability of land, government intends to introduce the concept of land use planning to ensure optimum utilization of land. It will identify specific sites in backward regions of the state, which could be developed for the setting up of industrial estates with necessary infrastructural arrangements. One of the main objectives of zoning is based on land use planning for industries in clusters so that the environmental protection measures can be adopted through setting up of common effluent treatment plants, disposal of treated effluents etc.

Gujarat government's initiatives towards the growth of chemical industry: Gujarat has made credible changes in economic policies. Investment policies have also been applied. It attracts investors to Gujarat. Government of Gujarat has given the concept of 'Vibrant Gujarat'. The aim of this programme is to increase capital investment there. Gujarat has held 'Global Investors Summit' in 2003, 2005, 2007 and 2009 to attract the investors. With the help of summit 2003, they got capital investment of 66000 crores. In 2005, it was 160160 crores and in 'Summit January 2007' Gujarat got 460000 crores capital investment. In summit 2007, twelve investors were interested invest in Gujarat.

In Gujarat, 33 Special Economic Zones have been developed under the new SEZ policy where relaxation in taxes, and benefits of infrastructure facilities have been given to attract industrialists. Many big industrialists have preferred Gujarat for investment. Gujarat provides quality production at a low rate and competes with international companies.

Advantages given by the government to Special Economic Zone:

- i) 10 years corporate tax holiday on export profit- 100 percent for initial 5 years and 50 percent for the next 5 years.
- ii) 10 years exemption of electricity duty.

- iii) Duty free procurement of capital good, raw materials and consumable spares from domestic market.
- iv) 100 percent tax holiday for a period of only 10 consecutive years out of 15 years beginning from the year in which the SEZ is notified.
- v) Exemption from dividend distribution tax.
- vi) Tax exempt on interest of long term finance.
- vii) Full freedom in allocation of developed plots approved for SEZ units on purely commercial basis.
- viii) No custom and excise duty.
- ix) Exemption from central sales tax and service tax.

Gujarat is the first state who has formed disaster management committee. In Gujarat, many major academic institutions are offering chemical engineering courses. There are 39 engineering colleges and 49 polytechnic colleges offering chemical engineering courses.

Government of Gujarat has much contribution behind the rapid growth of chemical industry in this state. In chemical sector, 100 percent Foreign Direct Investment is permissible. Manufacture of most chemical products both organic and inorganic, dyestuffs and pesticides are delicensed.

There are also some benefit given to chemical industries in Gujarat-

- i) The peak rate of custom duty on most chemicals is 7.5 percent.
- ii) On basic raw materials like acid grade fluorspar, sulphur, rock phosphate, natural borates is 5 percent.
- iii) On most building rocks and feedstock the duty is 5 percent (ethylene, propylene, crude oil, naphtha, benzene, toluene, xylene, ethyl benzene)

III. Conclusion

Economy evolves out of regional development. Chemical industry of India passing through several constraints like paucity of some raw materials (sulphur, soda ash, crude oil) lack of hydal power, scarcity of skilled personnel. But regional factors determine industrial development. As chemical products enters into every corner of our daily life as well as our economy, special impetuous should have to be given by the government to flourish this industry by overcoming the regional factors. Above all the hazardous nature of the chemical industry should not be overlooked.

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