Growth of Chemical Industry: An Indian Perspective

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ABSTRACT

The Indian chemical industry is a promising sector which is growing immensely every passing year and serves as a catalyzing enabler for other downstream industries. In addition to this, it is cornerstone of industrial as well as agricultural development of the nation. The study was designed to investigate the growth of chemical sector since 2010-11 in terms of Net Value Added, profit or loss, total persons engaged and number of factories. The research purely relies on secondary data retrieved from reports of Annual Survey of industries. In order to analyze the growth of chemical industry, various statistical tools such as average, standard deviation, coefficient of variance and Exponential Growth Rate has been used. The results found that chemical industry of India has recorded the positive growth rate in terms of Net Value Added, profit or loss, total persons engaged and number of factories and India has potential to become top producer of chemicals in near future.

Keywords: *Chemical industry, Exponential Growth Rate, Net Value Added, Total person engaged, profit or loss, Number of chemical factories*

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INTRODUCTION

Economic development depends basically upon the industrial growth rate in developing nations. The growth of corporate sector plays a significant role in development of industry as well as economy as it contributes major portion of country's Gross Domestic Product (GDP). The manufacturing sector contributes approximately 17.1 per cent of India's GDP whereas chemical industry stands first among manufacturing industries both in terms of export as well as production performance, having 17.6 per cent share in Indian manufacturing industry. The Indian chemical sector occupies prominence in overall growth of economy in terms of its huge potential for generating income, employment and exports and the energizer of economic development (Indian chamber of commerce, 2015). India is the 6th largest producer of chemicals in the world and 3rd largest in Asia (next to China and Japan) in terms of output. The Indian chemical sector, most diversified industry, exhibits significant economic importance in domestic as well as international markets. Low cost and high-end products, manufacturing expertise along with world class manufacturing technology are the leveraging factors resulting into growth of India's chemical industry (Muthusamy, 2011). The Indian chemical industry is an integral component of an economy constituting 7 per cent of India's GDP. Chemical industry is the key sector which contributes to the world employment and economic output. The chemical industry of India is estimated at USD 163 Billion in FY18 (FICCI Report, 2018). According to National Accounts Statistics 2017, the size of chemical sector was Rs. 922,908 crores (2016-17) in terms of value of output. The chemical sector has attracted FDI investment amounts to USD 1.3 Billion in FY18 which is around 3 per cent of total FDI inflow of India. Chemical industry add value to raw materials like crude oil, air, water, natural gas, metals and minerals by converting them into various utility driven products that uplifts the living standard of consumer and community as a whole. The chemical industry also identified as 'Industries Industry' as produces and supplies more than 70,000 products to virtually all downstream sectors such as automotive, papers, textiles, soaps, detergents, personal care, food processing, consumer durables, constructions and engineering, etc. leading to agricultural and industrial development (Department of chemicals and petrochemicals). The major exports of chemical sector are to US, Europe and SAARC nations, accounts for 13-14 per cent of the total exports of India. The fundamental nature of this industry can be understood easily from the fact that out of its total production, sector itself consume one-third proportion of chemical produce. The growth in per capita consumption and demand for chemical products offers humongous scope of growth for the sector in the future. Under the flagship 'Make in India' campaign, the government has recognized this industry as a priority sector and consequently, through a conducive policy framework, it lays great emphasis on the growth of chemical sector. Hence, the present paper has been made an

attempt to analyze the growth in Indian Chemical industry.

OBJECTIVE OF THE STUDY

The present paper attempts to analyze the growth of Indian chemical industry during the period 2010-11 to 2017-18 on the basis of four variables viz. number of factories, total persons engaged, net value added and profit or loss.

LITERATURE REVIEW

Nithya and Dharshini (2019) explored the growth of textile industry in India for period of five financial years ranged from 2012-13 to 2016-17. For the purpose of conducting research, top five textile companies were selected as sample. The study concluded that Welspun India Ltd has been leading all textile companies in terms of compounded annual growth rate (CAGR) of 15.98 per cent whereas lowest CAGR of -8.85 per cent obtained in case of Vardhman Ltd.

Singh (2017) analyzed the growth of Indian automobile industry and its impact on economy in terms of production of vehicles, FDI, GDP contribution, exports, employment, sales, etc. Through analysis of data, researcher found that automobile sector has significant role as employment generator, GDP contributor, export generator, FDI earner in economic development.

Sarwade (2015) studied the growth of automobile industry in India by examining present status and its prospects. The sample consisted of eight automobile companies on the basis of their long standing in the industry, broad product range, scale of operations and extensive infrastructure for manufacturing. The outcomes concluded that industry has a positive growth trend and have massive potential to grow in future.

Muthumurugan *et al.* (2014) has attempted to analyze the growth and productivity performance of chemical sector in Tamil Nadu during pre and post liberalization period of 22 years from 1980-81 to 2001-02. The growth analysis of industry was undertaken on the basis of selected variables such as number of factories, total emoluments, fixed capital, total person engaged and gross value added (GVA). The study revealed that growth of selected variables shows increasing trend except total person engaged and total emoluments. Apart from that, capital productivity was low whereas labor productivity was better during the period. The study suggested that in order to sustain growth of chemical industry, government needs to extend financial support as well as promote research and development.

Kumar *et al.* (2013) investigated the progress of India's cement industry in terms of its growth in production, export, installed capacity, value additions, etc. over the period of fifteen years pertaining to 1991-92 to 2005-06. The result of analysis revealed that all parameters had shown a significant progress in Indian cement sector. The findings suggested industry to pay attention towards expansion and export acceleration for future growth.

Vadde and Srinivas (2012) has made an attempt to examine global scenario of steel sector along with production, consumption and growth of Indian steel industry for a period of 5 years ranging from 2005 to 2010. The results showed that production of steel has constant growth while the consumption pattern of steel also revealed its constant demand every year during 2005-10.

Sampath Kumar (2006) in his research paper evaluated the trend in growth of total productivity of chemical industry in India. The research study period has been divided into two phases i.e. pre reform period (1981 to 91) and post reform period (1992 to 2002). The study revealed that total factor productivity growth of various segments of chemical industry were better in post reform period. It also suggested the industry to take into consideration intra-sectoral variation while formulating policies.

METHODOLOGY AND DATABASE

The study is entirely based on secondary data extracted from reports of Annual Survey of Industries (ASI), Central Statistical Organization (CSO), Ministry of Statistics and Programme Implementation (MoSPI), Statistical Handbook of Department of Chemicals and Petrochemicals, etc. The secondary data on different variables used in study is taken from different sources for the period of eight years starting from 2010-11 to 2017-18. The growth performance of chemical industry in India has been analyzed by taking into consideration selected variables such as number of factories, net value added, total person engaged and profit or loss. Data is presented in a tabular form to facilitate the study, where table shows the data changes over a period of time and reveals the trends. For analysis of the data, various statistical tools such as average, standard deviation, coefficient of variation and exponential growth rate have been employed.

ANALYSIS OF DATA

(a) NUMBER OF CHEMICAL FACTORIES

Chemical factories comprises the companies producing industrial chemicals by

converting raw materials such as natural gas, air, oil, water, mineral and metals into other utility driven products. It produces and supplies products to other downstream sectors such as paper, textile, personal care, food processing, automotive, consumer durables and many more resulting into industrial as well as agricultural development.

Table: 1 State-wise growth of number of chemical factories in India

(Values in numbers)

Year / States	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Mean	SD	CV (%)	EGR (%)
-Andhra Pradesh	822	892	378	375	401	401	405	368	505.25	218.33	43.21	-10.51
Assam	75	72	79	82	82	109	129	120	93.50	22.30	23.85	8.91
Bihar	47	35	43	45	48	51	61	44	46.75	7.42	15.87	3.50
Chandigarh	0	03	03	04	0	0	0	0	1.25	1.75	140.20	15.47
Chhattisgarh	84	87	96	94	94	102	113	109	97.38	10.08	10.36	4.02
Dadra & N Haveli	197	192	188	181	172	168	177	167	180.25	11.23	6.23	-2.29
Daman & Diu	127	133	154	140	113	108	118	152	130.63	17.29	13.23	-0.73
Delhi	77	79	88	78	75	77	72	69	76.88	5.59	7.27	-1.97
Goa	44	51	50	43	49	45	45	38	45.63	4.27	9.37	-2.16
Gujarat	2002	2058	1974	2160	2241	2316	2459	2596	2225.75	222.25	9.99	3.91
Haryana	247	220	212	203	258	257	305	333	254.38	45.41	17.85	5.55
Himachal Pradesh	182	188	214	225	200	228	235	208	210.00	19.13	9.11	2.55
Jammu & Kashmir	134	126	130	131	155	131	126	148	135.13	10.62	7.86	1.06
Jharkhand	94	87	95	92	83	96	107	100	94.25	7.40	7.85	1.67
Karnataka	484	503	467	507	553	567	581	591	531.63	47.12	8.86	3.37
Kerala	202	145	217	141	140	149	141	139	159.25	31.44	19.74	-4.52
Madhya Pradesh	259	275	250	271	259	278	268	319	272.38	21.02	7.72	1.92
Maharashtra	1903	1809	1941	1851	1860	1898	1842	1790	1861.75	50.34	2.70	-0.47
Manipur	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Meghalaya	06	05	08	04	03	03	04	05	4.75	1.67	35.14	-6.47
Nagaland	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Odisha	87	79	84	78	78	82	95	104	85.88	9.28	10.81	2.53
Puducherry	119	137	128	134	106	91	97	96	113.50	18.34	16.16	-5.20
Punjab	184	182	160	154	158	156	147	180	165.13	14.52	8.79	-1.50
Rajasthan	308	325	356	326	323	308	336	398	335.00	29.75	8.88	1.82

Sikkim	05	04	04	04	04	04	03	03	3.88	0.64	16.54	-5.79
Tamil Nadu	2315	2398	2432	2477	2495	2588	2521	2639	2483.13	103.53	4.17	1.63
Telangana	0	0	520	512	528	548	519	558	398.13	246.21	61.84	1.23
Tripura	06	07	10	11	10	09	10	08	8.88	1.73	19.46	4.11
Uttar Pradesh	688	678	636	646	688	675	685	716	676.50	25.28	3.74	0.68
Uttarakhand	195	183	217	201	240	243	219	232	216.25	21.80	10.08	3.18
West Bengal	307	322	294	297	291	322	342	333	313.50	19.04	6.07	1.34
All India	**11202**	**11276**	**11426**	**11465**	**11715**	**12015**	**12168**	**12568**	**11729.38**	**481.53**	**4.11**	**1.63**

Source: Various Issues of Annual Survey of Industries (from 2010-11 to 2017-18)

Table.1 exhibits state-wise growth of number of chemical factories in India during the period 2010-11 to 2017-18. It shows that the number of chemical factories have been increased from 11202 in FY 2010-11 to 11276 in FY 2011-12. In 2012-13 the number of factories further increased to 11426 and in 2013-14 the number became 11465. Moreover, the number of chemical factories again increased to 11715 in FY 2014-15 and in FY 2015-16 it rose to 12015 followed by increase in number of such factories to 12168 in FY 2016-17. Furthermore, the number of factories increased to 12568 during year 2017-18. The table further reveals that the mean value of number of factories in chemical sector of India was 11729.38 with a variation of 4.11 per cent. The Exponential Growth Rate of number of chemical factories in India is 1.63 per cent. Thus, adequate growth can be seen at country level in terms of number of factories. Furthermore, it shows increasing trend as Indian chemical factories grew gradually. The maximum number of chemical factories are operating in Tamil Nadu i.e. 2483 lakh factories, whereas there are three states namely Chandigarh, Manipur and Nagaland where there no factories operating.

(b) TOTAL PERSONS ENGAGED

Total persons engaged include (a) all workers who employed in any manufacturing process, or in cleaning premises or part of machinery or any other work related to manufacturing of chemicals, (b) labour engaged in electricity generation, repair and maintenance, etc., (c) persons working at clerical, supervisory or managerial level and (d) all working proprietors and their family members working in factory.

Table: 2 State-wise growth of total persons engaged in chemical factories

(Values in numbers)

Year / States	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Mean	SD	CV (%)	EGR (%)
Andhra Pradesh	32314	44877	19702	19646	18389	18969	24201	23113	25151.38	9176.20	36.48	-6.46
Assam	7379	9946	7243	7971	8364	18143	11834	10833	10214.13	3610.82	35.35	7.86
Bihar	937	707	1386	1423	1512	1354	1694	2266	1409.88	469.90	33.32	13.37
Chandigarh	0	113	95	110	0	0	0	0	39.75	55.10	138.62	-1.33
Chhattisgarh	2303	2025	2173	2215	2639	2104	2695	1908	2257.75	279.73	12.38	0.22
Dadra & N Haveli	6698	7068	8028	49147	10270	6139	9887	10602	13479.88	14512.83	107.66	3.04
Daman & Diu	6035	6013	7580	11132	7000	6636	7499	13837	8216.50	2792.91	33.99	5.10
Delhi	1201	1793	1986	1888	2235	1971	2151	2120	1918.13	323.73	16.87	33.72
Goa	3425	6348	5450	5689	5111	4804	3731	3492	4756.25	1097.71	23.07	-3.51
Gujarat	155226	160575	151512	160071	171350	184091	196508	213686	174127.00	22112.47	12.69	4.75
Haryana	8891	8825	10416	9169	12416	13511	16695	17407	12166.25	3459.64	28.43	11.27
Himachal Pradesh	15498	12277	18850	21245	26398	20708	19157	19737	19233.75	4145.63	21.55	5.39
Jammu & Kashmir	10210	15396	8556	12707	8587	15947	12327	12657	12048.38	2799.11	23.23	2.24
Jharkhand	4260	5703	4433	4125	3713	4797	3595	5485	4513.88	769.53	17.04	-0.48
Karnataka	16997	21627	19400	23895	25722	28407	26526	27677	23781.38	4101.39	17.24	6.95
Kerala	11999	10331	11526	12315	13921	10856	11036	12115	11762.38	1108.36	9.42	0.40
Madhya Pradesh	13367	17264	14243	17532	16964	23018	17792	26339	18314.88	4332.32	23.65	7.79
Maharashtra	97993	10284	107464	111881	114798	122738	142375	128139	116029.00	14525.82	12.51	4.78
Manipur	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Meghalaya	436	520	433	265	253	257	429	217	351.25	114.88	32.70	-8.49
Nagaland	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Odisha	9359	9390	7992	9247	8349	7023	7522	5917	8099.88	1247.74	15.40	-5.56
Puducherry	15244	6618	5992	6779	7124	5492	5391	6621	7407.63	3226.39	43.55	-8.07
Punjab	8509	9523	10583	11160	12939	13326	12574	16843	11932.13	2602.84	21.81	8.70
Rajasthan	17722	24396	18173	16610	15727	15437	24200	18713	18872.25	3536.45	18.73	-0.24
Sikkim	279	735	959	996	994	620	240	282	638.13	334.17	52.36	-7.81
Tamil Nadu	111448	115928	101397	105725	113809	114864	109155	119080	111425.80	5789.03	5.19	0.73
Telangana	0	0	14711	12213	18930	15374	20213	18030	12433.88	8080.95	64.99	6.85
Tripura	189	169	175	176	148	59	54	46	127.00	62.41	49.14	-20.27
Uttar Pradesh	33731	37532	34114	34859	37702	37352	39014	42842	37143.25	2988.55	8.04	2.67
Uttarakhand	20408	16908	21534	21252	30587	30671	41525	45871	28594.50	10564.86	36.94	8.09

West Bengal	17839	18559	17549	16951	16913	18616	20086	22291	18600.50	1815.90	9.76	2.56
All India	**630017**	**674018**	**633659**	**708401**	**712994**	**743438**	**790263**	**828315**	**715138.00**	**70588.28**	**9.87**	**3.87**

Source: Various Issues of Annual Survey of Industries (from 2010-11 to 2017-18)

Table 2 depicts state-wise growth of number of persons engaged in Indian Chemical Industry since 2010- 11 till 2017-18. In chemical sector, 630017 people were employed in FY 2010-11 which increased to 674018 in FY 2011-12. In FY 2012-13 the number of persons engaged in chemical sector reduced to 633659. However, in 2013-14 the total persons engaged rose to 708401 which further increased to 712994 and 743438 in FY 2014-15 and 2015-16 respectively. In 2016-17 and 2017-18, the number of persons employed in chemical industries of India became 790263 and 828315. The table further reveals that the mean value of the total persons engaged in chemical industry was 715138 with a variation of 9.87 per cent. The Exponential Growth Rate of total persons engaged is 3.87 per cent. It can be analyzed that Indian chemical sector experienced adequate growth in terms of providing employment since 2010. It also shows a positive trend in terms of increasing employment in the chemical sector of India. Gujarat is the state which provides maximum employment in chemical sector i.e., 174127 lakhs, whereas less people are employed in chemical sector in Tripura i.e., 127 lakhs.

(c) NET VALUE ADDED

Gross Value Added is additional value created by production process, and calculated by deducting total input from total output whereas Net Value Added is obtained by deducting total input and depreciation from total output of the industry. Net value added is the value obtained by deducting both value of intermediate and fixed capital consumption from value of output.

Table: 3 State-wise growth in Net Value Added

(Values in Rs. Lakhs)

Year / States	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Mean	SD	CV (%)	EGR (%)
Andhra Pradesh	249609	336627	223568	215696	199905	356785	273180	168808	253022.30	65844.77	26.02	-2.88
Assam	51577	102241	99406	115585	116905	230922	163632	214412	136835.00	61300.20	44.79	19.35
Bihar	1254	2428	3670	2183	3822	2634	4607	14039	4329.63	4063.79	93.85	26.39
Chandigarh	0	294	289	360	0	0	0	0	117.88	164.06	139.17	10.65
Chhattisgarh	8124	4635	16308	11435	10321	8822	10425	6126	9524.50	3566.17	37.44	0.15

Dadra & N Haveli	78666	85120	90013	65010	188773	77741	193124	208317	123345.50	61436.68	49.80	114.72
Daman & Diu	74591	58693	57404	99869	102160	131900	83903	138330	93356.25	30621.62	32.80	10.81
Delhi	8811	18407	93160	60127	38789	18561	13941	19808	33950.50	29093.95	85.69	-1.17
Goa	1329	65483	249395	103491	178583	199385	155544	131354	135570.50	78610.46	57.98	54.15
Gujarat	1897499	2234878	2322675	2507270	1822544	3069051	3562013	3673397	2636166.00	717531.80	27.21	9.30
Haryana	112873	78454	67599	93155	204776	229572	260202	264802	163929.10	84195.73	51.36	21.58
Himachal Pradesh	326690	215477	486811	383709	752694	803302	541131	689657	524933.90	211532.40	40.29	15.37
Jammu & Kashmir	104248	159334	152720	140226	171917	206799	212695	204927	169108.30	37827.46	22.36	9.06
Jharkhand	29850	48929	2557	31956	40040	74855	97143	104333	53707.88	35385.87	65.88	30.78
Karnataka	196469	123680	182166	223262	273167	275474	256542	296281	228380.10	58272.38	25.51	9.94
Kerala	169249	162394	94241	96987	102759	93028	350569	251509	165092.00	93067.53	56.37	8.22
Madhya Pradesh	71662	168939	149900	141362	261125	166794	323835	319038	200331.90	90811.44	45.33	19.04
Maharashtra	1204666	1423489	1665381	1944879	1540849	2489046	2025128	2086789	1797528.00	415781.60	23.13	8.14
Manipur	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Meghalaya	2749	5291	3760	3745	3205	4374	4053	2314	3686.38	939.96	25.49	-2.63
Nagaland	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Odisha	113104	61034	87670	200696	151979	52006	309782	379344	169451.90	119785.60	70.69	19.19
Puducherry	70938	94575	46246	126304	80818	177504	182257	175107	119218.60	53828.66	45.15	17.01
Punjab	84990	88738	69248	74064	40257	28802	74258	126571	73366.00	30006.15	40.89	-1.58
Rajasthan	62716	482178	355895	208120	206000	244318	438230	292909	286295.80	136617.60	47.71	11.53
Sikkim	12355	19694	34778	26774	31433	41768	24146	8887	24979.38	11146.49	44.62	-0.68
Tamil Nadu	240804	445651	348964	288069	440726	540262	590194	879584	471781.80	203134.80	43.05	15.64
Telangana	0	0	95090	107008	84145	617583	92655	163440	144990.10	198603.10	136.90	12.97
Tripura	6548	177	246	256	269	191	30	60	972.00	2254.74	231.93	-39.65
Uttar Pradesh	365485	479736	374708	376476	468086	437300	463148	626060	448874.90	85146.88	18.96	5.22
Uttarakhand	166496	263534	316791	329762	590503	1245031	775134	548002	529406.60	351331.00	66.36	24.52
West Bengal	290772	97427	-24267	-46398	1238	74342	488676	410950	161592.50	207397.90	128.34	35.61
All India	**60015**	**73276**	**76665**	**79315**	**81083**	**118988**	**119709**	**124059**	**91639.00**	**25105.00**	**27.39**	**11.14**

Source: Various Issues of Annual Survey of Industries (from 2010-11 to 2017-18)

Table.3 shows state-wise growth in NVA of Indian chemical sector since 2010 till 2018. The table depicts that the net value added at India level has increased to Rs.73276 lakhs in FY 2011-12 from Rs.60015 lakhs in FY 2010-11. Then, this increased to Rs.76665 lakhs in 2012-13, and further raised to Rs.79315 lakhs and Rs.81083 lakhs in 2013-14 and 2014-15 respectively. In FY 2015-16, the amount of NVA in Indian chemical industry increased

at high rate to Rs.118988 lakhs. Overall, NVA increased from Rs.60015 lakhs to Rs. 124059 lakhs from FY 2010-11 to 2017-18. The mean value of the NVA was 91639 with the variation of 27.39 per cent and growth of 11.14 per cent. It also shows that amount of NVA in chemical sector of India rose at decreasing rate till 2014-15 but started growing at increasing rate in 2015-16. The maximum net value has been added by chemical industries established in Gujarat i.e., Rs. 2636166 lakhs during period ranging from 2010 to 2018. On the other hand, Tripura has added least net value i.e., Rs. 972 lakhs.

(d) PROFIT OR LOSS

Profit earned or loss incurred is used as a yardstick to measure financial strength of any company. The company earning high amount of profits become able to pay off its debts and liabilities and can use funds for modernization or diversification. Thus, every company strives for high profit earning for its smooth functioning and survival.

Table: 4 State-wise growth in Profit or Loss

(Values in Rs. Lakhs)

Year / States	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Mean	SD	CV (%)	EGR (%)
Andhra Pradesh	109682	186740	120552	115679	96194	233625	129702	22185	126794.90	62506.65	49.29	-12.49
Assam	22655	67825	71732	87985	87497	183554	129092	165292	101954.00	53688.73	52.66	26.80
Bihar	594	1883	2253	552	1800	646	1621	10681	2503.75	3369.99	134.60	22.30
Chandigarh	0	31	98	78	0	0	0	0	26.00	40.17	155.23	58.62
Chhattisgarh	3365	546	11491	5423	2754	2251	530	-879	3185.13	3884.37	121.95	-13.75
Dadra & N Haveli	61136	60586	60953	42613	155780	53274	150626	168219	94148.38	53611.60	56.94	16.09
Daman & Diu	40735	36912	41802	58347	76549	105872	53908	87412	62692.13	24919.17	39.75	13.04
Delhi	4300	13039	76997	45518	21785	4311	4963	4258	21896.38	26428.49	120.70	-15.64
Goa	-17460	34502	211902	64250	138985	145197	113273	87903	97319.00	71428.85	73.40	8.83
Gujarat	1266486	1545143	1619600	1677861	927625	1880734	2273937	2343519	1691863.00	476758.10	28.18	7.53
Haryana	85083	39635	17461	47501	137687	162302	170906	169239	103726.80	63749.20	61.46	26.69
Himachal Pradesh	279908	179605	435807	306181	628868	733306	476462	599029	454895.80	191946.50	42.20	16.02
Jammu & Kashmir	87547	141676	139397	116450	154546	165935	181891	177678	145640.00	31877.70	21.89	8.70
Jharkhand	5390	34382	-8483	23520	29731	58485	85690	57738	35806.63	30613.47	85.50	42.17
Karnataka	141557	58646	114311	130468	146932	133905	132849	142263	125116.40	28638.04	22.89	5.78
Kerala	98474	90519	17191	15916	16570	5964	238972	151323	79366.13	83121.44	104.73	5.79

Madhya Pradesh	41530	116105	98887	86596	194944	85550	245440	216400	135681.50	73288.65	54.02	20.51
Maharashtra	745177	794933	1083904	1280617	740313	1665448	1137912	1181894	1078775.00	317466.10	29.43	7.10
Manipur	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Meghalaya	2090	4565	3109	3141	2702	3834	3274	1762	3059.63	900.27	29.42	-2.79
Nagaland	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Odisha	55140	7239	18649	131611	80938	-11031	230712	304797	102256.90	113334.00	110.83	62.07
Puducherry	36445	81221	30973	110526	63147	157098	163640	152740	99473.75	54399.42	54.69	23.67
Punjab	35759	25118	-10263	-18215	-72263	-63308	-8105	32766	-9813.88	41309.60	-420.93	-4.28
Rajasthan	-3415	395807	275949	136399	126772	163574	280487	172081	193456.80	121382.30	62.74	-7.84
Sikkim	10891	17873	33516	25541	29926	40837	23373	8091	23756.00	11173.50	47.03	0.01
Tamil Nadu	-7318	129127	17722	-84037	-15738	-7385	315941	559125	113429.60	218408.20	192.55	107.04
Telangana	0	0	60006	72395	21930	570789	30425	98505	106756.30	190704.10	178.64	9.38
Tripura	6415	80	166	165	188	157	-5	29	899.38	2229.78	247.92	-40.90
Uttar Pradesh	252079	340755	196973	171876	250830	209833	252198	344602	252393.30	62881.57	24.91	1.50
Uttarakhand	129764	237396	268421	277160	511104	1162985	684487	438824	463767.60	333010.10	71.81	25.13
West Bengal	196754	-1905	-87010	-199127	-141707	-69445	317840	164619	22502.38	183190.90	814.10	-8.53
All India	**36879.02**	**46400.59**	**49241.31**	**47330.50**	**44165.70**	**77785**	**78223.39**	**78624**	**57331.00**	**17666.70**	**30.82**	**11.59**

Source: Various Issues of Annual Survey of Industries (from 2010-11 to 2017-18)

Table 4 exhibits state-wise growth in profit earned or loss incurred by chemical industry during the period 2010-2011 to 2017-2018 at India level and state level. It shows that the amount of profit has been increased from Rs. 36879 lakhs in FY 2010-11 to Rs. 46400 lakhs in FY 2011-12. In FY 2012-13, the profit amount increased to Rs. 49241 lakhs and in FY 2013-14 the amount became Rs. 47330 lakhs. Furthermore, the company's profit earning again rose to Rs. 44165 lakhs in FY 2014-15 and in FY 2015-16 it became Rs. 77785 lakhs followed by rise in amount of profit earning to Rs. 78223 lakhs in FY 2016-17. In 2017-18, the chemical industry earned profit amounting Rs.78624 lakhs. The table further reveals that mean value of profit in chemical sector of India was 57331 with a variation of 30.82 per cent. The exponential growth rate of profit earned by Indian chemical industry is 11.59 per cent. Hence, it shows rising trend and concluded that chemical sector is earning enough profits for its growth and progress. The maximum amount of profit was earned by chemical sector in Gujarat i.e. Rs. 1691863 lakhs, whereas chemical industry in Chandigarh earned least amount of amount i.e. Rs. 26 lakhs.

FINDINGS

The following major findings are emerged from the analysis of growth performance of Indian chemical industry during 2010-11 to 2017-18:

- The chemical sector witnessed an EGR of 1.63 per cent in number of factories during 2010-11 to 2017-18 which indicates increasing growth rate.
- The number of persons engaged in chemical industry grew at rate of 3.87 per cent showing significant growth of this sector.
- It also evidenced 11.14 per cent rate of growth in case of NVA of chemical companies proving its positive performance.
- Among all increasing growth rate variables, profit or loss has showed an impressive performance in terms of EGR of 11.59 per cent.
- Overall, the chemical industry of India has witnessed a spectacular growth since 2010-11 and it continues till the end of the study period.

LIMITATIONS OF THE STUDY

- The research study carries all limitations inherent to the secondary data.
- The study limited for the period of eight years only.
- Statistical tool employed for analysis of data have its own incidental limitations.

CONCLUSION

In recent time chemical sector is one of the fastest growing sectors in India as well as in the world. This paper examined the growth of chemical industry in India during period ranging from 2010-11 to 2017-18. The results showed that all factors such as NVA, total persons engaged, profit or loss and total number of factories extend positive contribution in growth of this sector. The brief analysis gives the optimistic view about chemical industry and the overall industry witnessed an impressive growth leading to economic development. Even though, this study suggests the government to encourage Research and Development activities in the chemical sector to enhance its growth potential. To recapitulate, Indian chemical industry has witnessed phenomenal growth over the recent few years.

REFERENCES

- Associated Chambers of Commerce and Industry of India (2015). ASSOCHAM *Economic Weekly*. Retrieved August 16, 2015,from https://cochinchamber.org/storage/circulars/archive/15848.pdf
- Department of Chemicals and Petrochemicals (2018). Chemical and Petrochemical Statistics at a Glance – 2018. Retrieved March, 2018, from https://chemicals.nic.in/sites/default/files/Chemical%20and%20Petrochemical%20Statistics%20at%20a%20glance%20_2018.pdf
- Federation of Indian Chambers of Commerce & Industry (2018). Re-imagining India's M&E sector. Retrieved March, 2018, from https://ficci.in/spdocument/22949/FICCI-study1-frames-2018.pdf
- Kumar, P. K., John, S. F. & Senith, S. (2013). A Study on the Progress of Indian Cement Industry. *British Journal of Marketing Studies,* 1(1), 01-15.
- Ministry Of Statistics and Programme Implementation (2011). Annual Survey of Industries 2010-2011. Retrieved 2011, from http://www.csoisw.gov.in/cms/UploadedFiles/VolumeI_2010_2011.pdf
- Ministry Of Statistics And Programme Implementation (2012). Annual Survey of Industries 2011-2012. Retrieved 2012, from http://www.csoisw.gov.in/cms/UploadedFiles/VolumeI_2011_2012.pdf
- Ministry Of Statistics And Programme Implementation (2013). Annual Survey of Industries 2012-2013. Retrieved 2013, from http://www.csoisw.gov.in/cms/UploadedFiles/VolumeI_2012_2013.pdf
- Ministry Of Statistics And Programme Implementation (2014). Annual Survey of Industries 2013-2014. Retrieved 2014, from http://www.csoisw.gov.in/cms/UploadedFiles/VolumeI_2013_2014.pdf
- Ministry Of Statistics And Programme Implementation (2015). Annual Survey of Industries 2014-2015. Retrieved 2015, from http://www.csoisw.gov.in/cms/UploadedFiles/VolumeI_2014_2015.pdf
- Ministry Of Statistics And Programme Implementation (2016). Annual Survey of Industries 2015-2016. Retrieved 2016, from http://www.csoisw.gov.in/cms/UploadedFiles/VolumeI_2015_2016.pdf

- Ministry Of Statistics And Programme Implementation (2017). Annual Survey of Industries 2016-2017. Retrieved 2017, from http://www.csoisw.gov.in/cms/UploadedFiles/VolumeI_2016_2017.pdf
- Ministry Of Statistics And Programme Implementation (2018). Annual Survey of Industries 2017-2018. Retrieved 2018, from http://www.csoisw.gov.in/cms/UploadedFiles/VolumeI_2017_2018.pdf
- Muthumurugan, P., Balamurugan, K. & Elumalai, G. (2014). Growth and Productivity analysis of Chemical Industry in Tamil Nadu. *Journal of Economics and Finance,* 5(3), 66-70.
- Muthusamy, K. (2011). Determinants Of Corporate Leverage In Indian Chemical Industry. Karunya University, Tamil Nadu.
- Nithya, L. & Dharshini, D. (2019). A Study on Financial Performance Analysis Of Textile Industries In India. *International Journal of Research and Analytical Reviews*, 1(6), 658-662.
- Sampath Kumar, T. (2006). Productivity In Indian Chemical Sector: An Inter-Sectoral Analysis. *The Economic and Political Weekly*, 41(39), 4148-4152.
- Sarwade, W. K. (2015). Evolution and Growth of Indian Auto Industry. *Journal of Management Research and Analysis,* 2(2), 136-141.
- Singh, V. (2017). Growth Of Automobile Industry and Its Economic Impact: An Indian Perspective. *International Journal of Commerce and Management Research*, 3(8), 06-10.
- Vadde, S. & Srinivas, G. (2012). The Indian Steel Sector: Development and Potential. *International Journal of Multidisciplinary Research,* 2(1), 177-186.