

The Locational Pattern of SSIs in Gujarat

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This is an attempt to analyze the structure of SSIs in terms of localization of different groups of SSIs across the districts of Gujarat state. To study the localization pattern in the state the location quotient (LQ) and Coefficient of localization (CL) has been worked out. The LQ has been worked out for all the industrial groups of SSIs for all the 26 districts while the CL is worked out for all the industrial groups of SSIs using the census data for the reference year of 2006-07. The location quotient and coefficient of localization of different industrial groups of SSIs across the districts of Gujarat indicates that no any district has achieved specialization in production of any product. All types of SSIs have possibility to get localized at anywhere in the state.

Since the formation of Gujarat as a state, it has made remarkable progress in industrialisation especially in terms of small scale industries (SSIs). In 1960 there were 2169 total SSIs in the state which are found to have increased to 312782 in September 2006. According to the fourth MSME census 229635 SSIs are found in working condition in the state. They are found providing employment to 1243924 persons and gross output of the sector is found Rs. 3841.93 crore in the fourth census. The sector is found to have exported commodities worth Rs. 495.97 crore in 2006-07. Thus SSIs are found to have played a vital role in the economy of the state.

The analysis of structure of SSIs is very important precisely because it provides guidelines about strengths and weaknesses of this sector. It gives a clear idea about which industry groups are very important for an economy of Gujarat in terms of contribution of income, export, employment etc. this in turn provides various policy implications for growth and development of important industry groups of SSIs in the state. Many researchers have made attempt to examine the industrial structure. The important studies relating to this are carried out by Dhar (1961), Hajra (1965), Sandesara (1966 and 1969) and Mehta (1969), Alagh et al (1969), Patel V. A (1970), Pathak (1970), Alagh et al (1973), Datt et al (1978), Bhavani (1980), Dagli (1980), ICICI (1980), Mukherjee & Mukherjee (1980), Advani (1981), Chowdhury (1982), Hamid (1983), Thangamuthu (1983), Anbumani (1985), Goldar (1985), Nagraj (1985), Little et al (1987), Goldar (1988), Ramaswamy (1990), Bhavani (1991), Panda & others (1992), Sandesara (1993), Stokke (1994), Subrahmaniam et al (1994), Gupta et al (1996), Sidhu H. (1998), Mukherjee et al (1999), Sidhu (1999-2000), Kumar et al (2002), Jain (2004), Bagchi et al (2005), Nayak A. (2007), Keshab Das (2008), Bhatia et al (2009), Kumar S. & others (2009), Pooja (2009), Coad & others (2011), Vijayarani K. R. (2011), Chanda (2013), Prabal & others (2013) and Rao (2015). According to these researchers there are several aspects and parameters which are required to be examined to appropriately study the industrial structure. The researchers have used many parameters such as (1) number of units, (2) investment in plant and machinery, (3) fixed asset, input, (4) production, (5) gross output, (6) gross value added, (7) employment, (8) wage, (9) export and (10) structural ratios viz.; (a) Fixed Capital/Unit, (b) Capital/Output, (c) Capital Productivity (Output/Capital), (d) Capital/Value Added, (e) Production/Fixed Assets, (f) Net Value Added/Fixed Assets, (g) Employment/Unit, (h) Output/Employment, (i) Capital/Labour (Factor Intensity), (j) Labour Productivity (Value Added/Labour), (k) Worker/Output, (l) Employment/Fixed Assets, (m) Fixed Assets/Employment, (n) Output/Unit, Input-Output Ratio. In this paper out of these aspects the aspect of localization has been used to study the structure of SSIs in Gujarat state. The purpose of this paper is to analyze the structure of SSIs in terms of location pattern in the Gujarat state.

Industrial localization is one of the important aspects to study the industrial structure. There are number of factors that influence industrial location. Some of these factors are; transport cost, labour cost, availability of capital, tax structure, availability of raw material, proximity of markets, power and fuel supply, water, labour laws, Government policy, nature and climate factors, socio-economic factors, personal factors etc. Alfred Weber and Sargent Florence (Cherunilam, 1989) considered labour cost as a major factor responsible for industrial localization. Florence gives two concepts- (1) Location Factor or Location Quotient (LQ) and (2) Coefficient of localization (CL) to analyze the location pattern and possibilities for industrial localization in the region. Alagh, Subrahmaniam and many other researchers have used these concepts to study the location pattern of industries. It is worth to find out as to which particular district has specialized in which type of industry. This can be done by working out the location quotient for different industrial groups of SSIs. LQ is a device to compare the percentage share of particular industry in a particular district to the percentage share of a particular industry in total SSIs of the state.

The location quotient indicates the degree of concentration of a particular industry in a region. The degree of concentration of industry I in Region J has been computed using following formula.

$$LQ = \frac{b_{ij}}{b_i} \dots\dots\dots (1)$$

b_{ij} was derived using the function; $b_{ij} = \frac{a_{ij} \times 100}{J_j}$ and

b_i was derived using the function $b_i = \frac{I_i \times 100}{T}$.

Where,

a_{ij} = numbers of SSIs in the i^{th} industry of j^{th} region,

J_j = total numbers of SSIs in the j^{th} region,

I_i = total numbers of SSIs in the j^{th} industry in all the regions and

T = total numbers of SSIs in all the industries in all the regions

If an industry is evenly distributed over the whole state, the location quotient for each region will be unity. If the LQ is not unity for all the regions, it means that there is uneven regional distribution of the industry. If a value of LQ is more than unity means that the region has a higher share of the industry.

To measure the propensity of industrial concentration in the region the Coefficient of Localization (CL) has been formulated. CL indicates the propensity of an industry to concentrate but it does not measure the industry's concentration in any particular region. The CL helps us to know the dispersability of different industries. On the basis of the CL, industries may be divided into two categories of high and low coefficients. Industries with high coefficient has very strong tendency to concentrate and industry with low coefficient can be widely dispersed as they have no tendency to concentrate. A following formula has been used to formulate the coefficient of Location.

$$CL = \frac{\sum \left(\frac{X_j}{N} - \frac{X_{ij}}{X_i} \right)}{100} \dots\dots\dots (2)$$

If $\frac{X_j}{N} - \frac{X_{ij}}{X_i}$

Where, X_j = total numbers of SSIs in the j^{th} region,

X_i = numbers of SSIs in the i^{th} industry

X_{ij} = numbers of SSIs in the i^{th} industry of j^{th} region

N = total numbers of SSIs in all the industries in all the regions

The location quotient and coefficient of localization have been worked out for the fourth MSME census for different SSIs groups across districts for Gujarat state. The statistics of location quotient and coefficient of localization obtained for various industry groups among different districts have been presented in table-1. The localization has been examined in to two parts (a) industry-wise location quotient and Coefficient of location and (b) District-wise location quotient. The important observations emerging from the table-1 are narrated below.

A. Industry-wise Location Quotient

The value of location quotient for food & food product industries is found to be greater than unity in 16 districts out of total 26 district of the state. These districts are Banaskantha, Patan, Mahesana, Sabarkantha, Rajkot, Jamnagar, Porbandar, Junagadh, Amreli, Kheda, Dahod, Narmada, Bharuch, Dang, Navsari and Tapi. The highest LQ is found 2.54 for Porbandar and lowest for Surat (0.21). For the beverages, tobacco and tobacco product SSIs, it is found to be greater than unity in 11 districts viz.; Banaskantha, Patan, Mahesana, Surendranagar, Rajkot, Jamnagar, Porbandar, Anand, Kheda, Dahod and Vadodara in the state. The highest LQ for beverages, tobacco and tobacco product industries is found for Anand district and lowest for Dang & Navsari (0.00).

The location quotient for textile industries is found to be greater than unity in only five districts of the state. These districts are Surat, Surendranagar, Navsari, Ahmadabad , and Amreli. Among these districts the highest LQ is found 3.74 for Surat and lowest for Narmada (0.03). Comparing the location quotient for hosiery and garment industry, it is found that in 19 districts out of 26 districts the location quotient is found to be greater than unity. These districts are Kachchh, Banaskantha, Patan, Mahesana, Gandhinagar, Sabarkantha, Rajkot, Jamnagar, Porbandar, Junagadh, Amreli, Kheda, Narmada, Bharuch, Surat, Dang, Navsari and Tapi. Among these 19 districts LQ for Dang district is found highest of 3.59 and lowest for Ahmadabad (0.33).

The LQ for wood products industry is found to be greater than unity in 9 districts viz.; Kachchh, Banaskantha, Patan, Sabarkantha, Ahmadabad, Amreli, Bhavnagar, Kheda, Navsari and Tapi. The highest LQ for wood products industry is found to have 1.76 for Amreli district and lowest for Dahod (0.36) in the state. For the paper product and printing SSIs the location quotient is found to be greater than unity in only six districts. These districts are Kachchh, Mahesana, Gandhinagar, Ahmadabad, Amreli and Valsad. The highest LQ is found 3.09 for paper product and printing SSIs in Valsad district and lowest in two districts Jamnagar and Surat (0.21). The leather & leather product SSIs in the state is found more dispersed than paper product industries in Gujarat. The location quotient for this type of industrial group is found to be greater than unity in 11 districts viz.; Patan, Gandhinagar, Ahmadabad , Amreli, Bhavnagar, Bhavnagar, Kheda, Panchmahal, Dahod, Vadodara, Bharuch and Navsari. The highest LQ is found 2.91 for Bhavnagar district and lowest in Dang (0.00) in the state. Rubber & Plastic product industry can be considered as one of the polluting industries. The location quotient for this type of industrial group is found to be greater in 11 districts viz.; Mahesana, Gandhinagar Ahmadabad, Junagadh, Bhavnagar, Anand, Kheda, Panchmahal, Dahod, Vadodara and Valsad. The highest LQ is found 1.97 for Valsad district and lowest for Dang district (0.05) in the state. The chemical and chemical product industries are found to have more concentrated in compare with other polluting industries in the state. The LQ for chemical & chemical product SSIs is found to be greater than unity in seven districts in Gujarat. These districts are Kachchh, Gandhinagar, Ahmadabad , Surendranagar, Bhavnagar, Bharuch and Valsad. The highest LQ is found 2.72 for Valsad district and lowest in Dang district (0.08). Chemical industry is considered as

highly polluting industry these districts may be facing the problem of various types of pollution also or it may increase in future.

The location quotient for non-metallic mineral product industrial units is found to be greater than unity in 8 districts viz.; Mahesana, Sabarkantha, Gandhinagar, Surendranagar, Rajkot, Porbandar, Amreli and Dahod. The highest LQ is found 2.89 for Sabarkantha and lowest for two districts Surat and Tapi (0.07). It is observed from the table that the LQ for basic metal product SSIs is found greater than unity in 6 districts. These districts are Gandhinagar, Ahmadabad, Rajkot, Jamnagar, Amreli and Bhavnagar. The highest LQ is observed for basic metal industry is in Jamnagar district which is 3.62 and lowest in Dang (0.00). The table shows that the LQ for metal product SSIs is greater than unity in only 4 districts viz.; Surendranagar, Rajkot, Porbandar and Bhavnagar. It indicates that these types of SSIs are highly concentrated. The highest LQ is found 3.29 for Bhavnagar and lowest for Dang (0.09) in Gujarat.

The LQ for machinery & parts (except electrical) SSIs is found to be greater than unity in seven districts. These districts are Mahesana, Sabarkantha, Ahmadabad, Surendranagar, Rajkot, Amreli and Narmada. The highest LQ for Machinery & parts industry is found 1.9 for Ahmadabad and lowest for Dang (0.09). The LQ for electrical machinery and apparatus industrial units is found to be greater than unity in 8 districts viz.; Sabarkantha, Gandhinagar, Anand, Vadodara, Surat, Navsari, Valsad and Tapi. The observed highest value of LQ for electrical machinery and apparatus SSIs is 2.62 for Valsad district and lowest for Jamnagar (0.43) in the state. The highest location quotient for transport equipment & parts industries is found to be greater than unity in districts. These districts are Rajkot, Amreli, Anand, Kheda, Panchmahal, Dahod, Vadodara, Narmada, Surat, Dang, Navsari, Valsad and Tapi. The highest LQ in the state for transport equipment & parts SSIs is found 8.75 for Dang and lowest for Patan district (0.23). The location quotient for miscellaneous manufacturing industries in the state of Gujarat is found to be greater than unity in 6 districts viz.; Kachchh, Porbandar, Dahod, Vadodara, Valsad and Tapi. Vadodara district shows very high rate of concentration with has very high value of LQ (9.21) and lowest concentration by Dang (0.0).

The location quotient for repair services is found to be greater than unity in 14 districts in Gujarat. These districts are Kachchh, Patan, Mahesana, Sabarkantha, Gandhinagar, Rajkot, Jamnagar, Porbandar, Junagadh, Anand, Kheda, Panchmahal, Narmada and Bharuch. The highest LQ for repair service SSIs is found 2.33 for Narmada and lowest for Dang district (0.0). The location quotient for other services is found to be greater than unity in 16 districts viz.; Banaskantha, Patan, Mahesana, Sabarkantha, Surendranagar, Jamnagar, Porbandar, Junagadh, Anand, Kheda, Dahod, Vadodara, Narmada, Bharuch, Dang and Valsad. The highest LQ is found 2.3 for Dang district and lowest for Amreli (0.42) in the state. Location quotient for the group of all other SSIs is found to be greater than unity in 9 districts viz.; Kachchh, Banaskantha, Jamnagar, Panchmahal, Dahod, Vadodara, Surat and Tapi. The highest location quotient for this group of industries is found 6.41 for Panchmahal and lowest for dang (0.04) in the state of Gujarat.

Table 1: Location Quotient and Coefficient of Localization for SSIs among Various Districts by Industry Groups in Gujarat

Sr. No.	District	NIC-1987																		
		20	22	23+24+25	26	27	28	29	30	31	32	33	34	35	36	37	38	97	99	OT
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Kachchh	0.61	0.17	0.18	1.39	1.40	1.30	0.63	0.42	2.26	0.70	0.20	0.92	0.33	0.80	0.48	2.15	1.91	0.74	1.22
2	Banaskantha	2.35	1.12	0.70	1.30	1.33	0.59	0.37	0.79	0.30	0.75	0.17	0.60	0.88	0.67	0.57	0.07	0.84	1.55	1.96
3	Patan	1.70	5.25	0.37	2.12	1.66	0.51	1.48	0.94	0.71	0.39	0.19	0.66	0.54	0.66	0.23	0.04	1.73	1.09	0.10
4	Mahesana	1.72	3.45	0.70	1.15	0.91	1.21	0.73	1.46	0.96	1.01	0.78	0.78	1.07	0.92	0.57	0.26	1.39	1.04	0.14
5	Sabarkantha	1.51	0.94	0.33	0.42	1.56	0.98	0.97	0.95	0.49	2.89	0.34	0.86	1.26	1.04	0.36	0.14	1.38	1.19	0.73
6	Gandhinagar	0.99	0.62	0.41	1.34	0.98	1.21	1.26	1.80	1.57	1.94	1.04	0.62	0.94	1.25	0.70	0.74	1.26	0.84	0.28
7	Ahmadabad	0.71	0.26	1.09	0.33	1.35	1.65	1.08	1.19	1.55	0.87	1.74	0.99	1.90	0.75	0.39	0.58	0.97	0.85	0.21
8	Surendranagar	0.81	1.05	1.55	1.00	0.55	0.75	0.63	0.80	1.80	2.75	0.71	1.15	1.12	0.49	0.31	0.27	0.56	1.11	0.53
9	Rajkot	1.47	1.63	0.28	1.28	0.80	0.88	0.80	0.82	0.85	2.41	1.56	1.12	1.65	0.75	1.08	0.19	1.20	0.65	0.41
10	Jamnagar	1.33	2.19	0.09	1.09	0.52	0.21	0.33	0.35	0.19	0.45	3.62	0.90	0.30	0.43	0.24	0.07	1.42	1.20	4.48
11	Porbandar	2.54	1.85	0.19	1.25	0.59	0.47	0.87	0.97	0.65	1.41	0.18	1.01	0.90	0.90	0.73	1.03	1.31	1.83	0.51
12	Junagadh	2.18	0.71	0.30	1.10	0.71	0.74	0.47	1.17	0.54	0.66	0.26	0.86	0.87	0.95	0.50	0.25	1.88	1.88	0.14
13	Amreli	1.41	0.28	1.07	1.95	1.76	1.05	1.07	0.92	0.91	1.33	1.45	0.90	1.11	0.46	1.04	0.12	0.50	0.42	0.30
14	Bhavnagar	0.82	0.30	0.63	0.89	1.35	0.77	2.91	1.14	1.26	0.65	1.26	3.29	0.77	0.64	0.57	0.68	0.51	0.45	0.51
15	Anand	0.82	8.09	0.80	0.39	0.63	0.52	0.83	1.23	0.16	0.73	0.22	0.46	0.25	1.05	2.54	0.27	1.52	1.68	2.95
16	Kheda	1.27	1.86	0.05	1.72	1.44	0.70	2.76	1.16	0.38	0.58	0.26	0.82	0.68	0.69	1.72	0.64	1.81	1.26	0.40
17	Panchmahal	0.84	0.53	0.40	0.39	0.68	0.35	1.69	1.23	0.29	0.78	0.23	0.48	0.22	0.50	2.43	0.11	1.50	0.43	6.41
18	Dahod	1.02	1.07	0.74	1.28	0.36	0.37	1.30	1.03	0.35	1.71	0.92	0.40	0.38	0.67	2.85	5.04	0.89	1.06	3.11
19	Vadodara	0.59	1.37	0.51	0.75	0.52	0.94	1.10	1.34	0.49	0.88	0.73	0.98	0.81	1.16	1.14	9.21	0.76	1.03	3.17
20	Narmada	1.60	0.29	0.03	1.29	0.95	0.71	0.41	0.59	0.61	0.50	0.16	0.79	1.20	0.89	1.22	0.83	2.33	1.03	0.69
21	Bharuch	1.00	0.06	0.10	1.53	0.67	0.77	1.17	0.98	1.62	0.52	0.85	0.91	0.50	0.67	0.94	0.24	1.55	2.13	0.83
22	Surat	0.21	0.01	3.74	1.34	0.73	0.21	0.47	0.37	0.21	0.07	0.08	0.87	0.18	1.58	1.19	0.59	0.26	0.69	1.24
23	Dang	1.15	0.00	0.93	3.59	0.72	0.23	0.00	0.05	0.08	0.90	0.00	0.09	0.09	0.84	8.75	0.00	0.00	2.30	0.04
24	Navsari	1.25	0.00	1.31	1.79	1.60	0.25	2.11	0.87	0.54	0.35	0.34	0.57	0.45	1.89	5.31	0.89	0.42	0.78	0.07
25	Valsad	0.92	0.18	0.42	0.79	0.85	3.09	0.32	1.97	2.72	0.39	0.43	0.92	0.59	2.62	1.61	1.52	0.43	1.53	0.08
26	Tapi	2.27	0.00	0.44	2.77	1.22	0.34	0.82	0.65	0.19	0.07	0.07	0.34	0.19	2.46	3.68	1.22	0.45	0.75	1.73
Coefficient of Localisation		0.28	0.45	0.36	0.31	0.14	0.17	0.21	0.11	0.22	0.41	0.25	0.16	0.24	0.20	0.48	0.40	0.21	0.16	0.50

Source: All India MSME Census, 2006-07

The overall observation is that out of total 19 industrial groups only 8 industrial groups - Food & food products, Beverages, tobacco and tobacco products, Hosiery and garments, Leather & leather products, Rubber & plastic products, Transport equipment & parts, Repair services and Other services are found to have more than unity LQ in more than 10 districts in Gujarat. This shows that these types of industries have developed in all these districts and contributing more than their fair share in the state in comparison with the remaining 16 districts in Gujarat. This shows that 8 industrial groups have occupied an important place among SSIs in more than 10 districts of the state which offer real strength to its structure in the state. Thus, these 8 industrial groups which have obtained an important place need to be given special attention whereas the remaining 11 industrial groups as well as industrial less developed districts also need to be given a separate attention while framing development policy for SSIs in the state of Gujarat.

Coefficient of Location

The high coefficient of location indicates high possibility of centralization whereas its low value indicates low possibility of centralization. Here the coefficients of location for all the industrial groups of SSIs are found 0.5 or lower. It indicates that all types of industrial groups have high possibilities to get established in any district of the state. Among these industrial groups only seven industry groups viz.; beverages, tobacco & tobacco products, textile industry, hosiery & garments, non-metallic mineral products, transport equipment & parts, miscellaneous manufacturing and other SSIs have CL above 0.3 and all other 12 industrial groups have less than 0.3. This means that these seven industrial groups have more possibility to centralization than other 12 groups of SSIs. The highest CL of 0.5 is found for the group of other SSIs which are not included at any group of remaining 18 industries. This is followed by transport equipment & parts (0.48) which shows highest possibility for agglomeration. The lowest CL is found for the group of rubber & plastic products (0.11). This means that this type of SSIs have highest possibility for de-agglomeration of SSIs among various districts in the state.

B. District-wise Location Quotient

The Location Quotient of SSIs for major industry groups viz.; Agro & Forest Based SSIs, Chemical & Chemical Products, Mineral Based SSIs, Machinery & Parts Producing SSIs, Service SSIs and Other Services & Products for various districts in Gujarat for fourth census data are presented in the table -2. In the table various types of SSIs are classified according to the concentration (High and Low concentration) on the basis of Location Quotient for each district. High concentration refers to the value of LQ greater than unity and low concentration refers to the value of LQ less than unity. On the basis of these criteria all the six industry groups have been classified into high concentrated industry and low concentrated industry across 26 districts in the state. This is clearly presented in table-2. According to the table Kachchh district had high concentration of chemical, service and other industry group while agro & forest, mining & minerals and machinery & miscellaneous manufacturing were found to have lower concentration. Banaskantha is found to have higher concentration of other industries, agro & forest and service sector SSIs whereas Machinery & miscellaneous manufacturing, mining & minerals and chemical were found to be in lower concentration. Patan had service and agro & forest industries were highly concentrated, while chemical, mining & minerals and machinery & miscellaneous manufacturing were in lowest concentration. Service and Agro & forest SSIs industries were highly concentrated in Mahesana district and chemical, machinery & Miscellaneous manufacturing and mining & minerals were in lowest concentration. In Sabarkantha district, service and mining & minerals were highly concentrated SSIs while machinery & miscellaneous manufacturing, agro & forest and other industries were in lower concentration.

Gandhinagar had chemical, service and mining & minerals were concentrated highest as per Location Quotient. Machinery & miscellaneous manufacturing, agro & forest SSIs were lowest in concentration in Gandhinagar. Chemical, machinery & miscellaneous manufacturing, mining & minerals were major SSIs concentrated in Ahmadabad while agro & forest, service and other SSIs were in lower concentration in the district. Surendranagar district had high concentration of chemical, mining & mineral and agro & forest SSIs and service, machinery & miscellaneous manufacturing and other SSIs were in lower concentration. Mining & minerals and machinery & miscellaneous manufacturing were highly concentrated in Rajkot district while service, agro & forest and chemical SSIs were in low concentration in the district. Jamnagar had other, service and mining and mineral SSIs were highly concentrated and agro & forest, machinery & miscellaneous manufacturing and chemical SSIs were in lower concentration. Service SSIs were highly concentrated in Junagadh district while agro & forest, machinery & miscellaneous manufacturing, mining & minerals were in lowest concentration in the district. Amreli district had high concentration of agro & forest, mining & mineral SSIs. Chemical, machinery & miscellaneous manufacturing and service SSIs were in lower concentration. While in Bhavnagar, mining & minerals and

Table 2 Location Quotient for Number of SSIs among Various Districts by Major Industry Groups in Gujarat

Sr. No.	Concentration of Industry	Kachchh		Banaskantha		Patan		Mahesana	
		Industry Group	LQ	Industry Group	LQ	Industry Group	LQ	Industry Group	LQ
1	High Concentration	Chemical	2.26	Others	1.96	Service	1.48	Service	1.26
		Service	1.46	Agro & Forest	1.15	Agro & Forest	1.27	Agro & Forest	1.09
		Others	1.22	Service	1.11				
2	Low Concentration	Agro & Forest	0.82	Machinery & Misc. Manu.	0.72	Chemical	0.71	Chemical	0.96
		Mining & Minerals	0.74	Mining & Minerals	0.56	Mining & Minerals	0.51	Machinery & Misc. Manu.	0.90
		Machinery & Misc. Manu.	0.61	Chemical	0.30	Machinery & Misc. Manu.	0.50	Mining & Minerals	0.84
						Others	0.10	Others	0.14
		Sabarkantha		Gandhinagar		Ahmadabad		Surendranagar	
1	High Concentration	Service	1.30	Chemical	1.57	Chemical	1.55	Chemical	1.80
		Mining & Minerals	1.27	Service	1.10	Machinery & Misc. Manu.	1.22	Mining & Minerals	1.47
				Mining & Minerals	1.02	Mining & Minerals	1.09	Agro & Forest	1.01
2	Low Concentration	Machinery & Misc. Manu.	0.99	Machinery & Misc. Manu.	0.99	Agro & Forest	0.97	Service	0.77
		Agro & Forest	0.84	Agro & Forest	0.98	Service	0.92	Machinery & Misc. Manu.	0.75
		Others	0.73	Others	0.28	Others	0.21	Others	0.53
		Chemical	0.49						
		Rajkot		Jamnagar		Porbandar		Junagadh	
1	High Concentration	Mining & Minerals	1.51	Others	4.48	Service	1.51	Service	1.88
		Machinery & Misc. Manu.	1.19	Service	1.33	Mining & Minerals	0.96		
				Mining & Minerals	1.26				
2	Low Concentration	Service	0.98	Agro & Forest	0.59	Agro & Forest	0.90	Agro & Forest	0.89
		Agro & Forest	0.85	Machinery & Misc. Manu.	0.32	Machinery & Misc. Manu.	0.88	Machinery & Misc. Manu.	0.80
		Chemical	0.85	Chemical	0.19	Chemical	0.65	Mining & Minerals	0.71
		Others	0.41			Others	0.51	Chemical	0.54
						Others	0.14		
		Amreli		Bhavnagar		Anand		Kheda	
1	High Concentration	Agro & Forest	1.41	Mining & Minerals	2.28	Others	2.95	Service	1.60
		Mining & Minerals	1.10	Chemical	1.26	Service	1.58	Agro & Forest	1.02
2	Low Concentration	Chemical	0.91	Agro & Forest	0.94	Machinery & Misc. Manu.	0.85	Machinery & Misc. Manu.	0.84
		Machinery & Misc. Manu.	0.83	Machinery & Misc. Manu.	0.69	Agro & Forest	0.77	Mining & Minerals	0.67
		Service	0.47	Others	0.51	Mining & Minerals	0.48	Others	0.40
		Others	0.30	Service	0.49	Chemical	0.16	Chemical	0.38
		Panchmahal		Dahod		Vadodara		Narmada	

1	High Concentration	Others Service	6.41 1.08	Others Machinery & Misc. Manu.	3.11 1.12	Others Machinery & Misc. Manu.	3.17 1.46	Service Machinery & Misc. Manu.	1.83 1.08
2	Low Concentration	Machinery & Misc. Manu. Agro & Forest Mining & Minerals Chemical	0.64 0.60 0.51 0.29	Service Agro & Forest Mining & Minerals Chemical	0.96 0.83 0.81 0.35	Mining & Minerals Service Agro & Forest Chemical	0.91 0.86 0.69 0.49	Agro & Forest Others Chemical Mining & Minerals	0.77 0.69 0.61 0.61
		Bharuch		Surat		Dang		Navsari	
1	High Concentration	Service Chemical	1.77 1.62	Agro & Forest Others	1.60 1.24	Machinery & Misc. Manu. Agro & Forest	1.65 1.33	Machinery & Misc. Manu. Agro & Forest	1.68 1.36
2	Low Concentration	Others Mining & Minerals Agro & Forest Machinery & Misc. Manu.	0.83 0.81 0.76 0.61	Machinery & Misc. Manu. Mining & Minerals Service Chemical	0.80 0.53 0.43 0.21	Service Mining & Minerals Chemical Others	0.90 0.28 0.08 0.04	Service Chemical Mining & Minerals Others	0.56 0.54 0.48 0.07
		Valsad		Tapi					
1	High Concentration	Chemical Machinery & Misc. Manu.	2.72 1.45	Others Machinery & Misc. Manu. Agro & Forest	1.73 1.51 1.32				
2	Low Concentration	Agro & Forest Service Mining & Minerals Others	0.95 0.86 0.70 0.08	Service Mining & Minerals Chemical	0.57 0.23 0.19				

Source: All India MSME Census, 2006-07

chemical SSIs were highly concentrated. Agro & forest, machinery & miscellaneous manufacturing, and other SSIs were in lower concentration in the district. In Anand district SSIs related to others and service were highly concentrated while machinery & miscellaneous manufacturing, agro & forest and mining & mineral were in lower concentration. SSIs of service and agro & forest were highly concentrated in Kheda district while machinery & miscellaneous manufacturing, mining & mineral and other were found in lower concentration in this district.

Panchmahal district had other SSIs and service SSIs as highly concentrated and machinery & miscellaneous manufacturing, agro & forest and mining & mineral were in lower concentration. Dahod had other and machinery & misc. manu SSIs were in high concentration while service, agro & forest and mining & mineral were in lower concentration. Vadodara district has high concentration of machinery & miscellaneous manufacturing and other SSIs. Mining & minerals, service and agro & forest were in lower concentration in the district. Service and machinery & miscellaneous manufacturing were highly concentrated in Narmada district while agro & forest, other and chemical SSIs were in lower concentration. Bahruch had high concentration in Service and chemical SSIs while it had other, mining & mineral and agro & forest SSIs in lower concentration. Surat had high concentration of agro & forest and other SSIs while it had lower concentration in machinery & miscellaneous manufacturing, mining & mineral and service SSIs. Machinery & miscellaneous manufacturing and agro & forest SSIs were highly concentrated in Dang district. Service, mining & mineral and chemical SSIs were in lower concentration in Dang.

Machinery & miscellaneous manufacturing and agro & forest SSIs were highly concentrated in Navsari district while service, chemical and mining & mineral were in lower concentration in the district. Valsad had chemical and machinery & miscellaneous manufacturing SSIs were highly concentrated and agro & forest, service and mining & mineral were in lower concentration in the district. Tapi had other, machinery & miscellaneous manufacturing and agro & forest SSIs were highly concentrated. Service, mining & mineral and chemical SSIs were in lowest concentration in the district.

Major Conclusion

The overall observation is that there is high concentration of service sector, agro & forest based SSIs, machinery & miscellaneous manufacturing industry, mining industry, chemical industries and other SSIs (excepting the 18 industrial groups) in 13 districts, 10 districts, 9 districts, 9 districts, 7 districts and 8 districts respectively. In the same six major SSI groups the corresponding low concentration is found in 13 districts, 16 districts, 17 districts, 17 districts, 19 districts and 18 districts respectively in the state of Gujarat. The chemical industries which are usually referred to as highly polluting group of industries is found to have high concentration only in 7 districts out of 26 districts in the state. LQ of these industrial groups are found to be greater than unity in these districts. It shows that the share of a particular major industrial group in the concern district is found to be greater than the proportionate share when compared with the remaining industrial groups in the particular district. Chemical industry being a leading group of SSIs in seven districts, people in these districts need more environmental awareness and protective measure to save the environment and public health in these districts from pollution. Contrarily, high concentration of industrial group in some districts shows the uneven development of SSIs across the districts as well as unbalanced development of the districts in the state. The observations bring forth certain further research areas such as (1) how far the growth of various types of SSIs among districts of Gujarat is compatible to optimality?, (2) which factors have been determining the emerging growth pattern of SSIs in the state?, (3) which policy measures need to be initiated for development of different type of SSIs across districts in the state? etc.

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Annexure -1: NIC Code and Industrial Group of SSIs

Sr. No.	Major Group / NIC	Industrial Group of SSIs
	A	Agro & Forest Based SSIs (Total 1 to 8)
1	20	Food & Food Products
2	22	Beverages, Tobacco & Tobacco Products
3	23+24+25	Cotton, Wool Silk & Synthetic Fiber, Jute, Hemp & Mesta Textiles
4	26	Hosiery & Garments
5	27	Wood Products
6	28	Paper Products & Printing
7	29	Leather & Leather Products
8	30	Rubber & Plastic Products
9	B / 31	Chemical & Chemical Products
	C	Mineral Based SSIs (Total 10 to 12)
10	32	Non-Metallic Mineral Products(Glass & Ceramic)
11	33	Basic Metal Products
12	34	Metal Products
	D	Machinery & Parts Producing SSIs (Total 13 to 16)
13	35	Machinery & Parts Except Electrical
14	36	Electrical Machinery/Apparatus
15	37	Transport Equipment & Part
16	38	Misc Manufacturing Industries

	E	Service SSIs (Total 17 & 18)
17	97	Repair Services
18	99	Services not Elsewhere Cited
19	F / OT	Other Services & Products
	Total	A + B + C + D + E + F