

CHAPTER -- II

LOCATION QUOTIENTS AND LOCALISATION CO-EFFICIENTS

OF WEST BENGAL'S INDUSTRIES. A STUDY OF

CONCENTRATION AND DISPERSAL.

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CONCENTRATION AND DISPERSAL.

2.0: It is the characteristic of developing countries that their industrial development renders centralisation of capital with concentration of output and employment in some specific regions where off them others remain industrially backward. Their atypical development, the product of urban-bised strategy of development, crops up inter-regional and intra-regional disparities over and above the problem of divergence in backward regions where chronic unemployment and underemployment are overwhelmed with other crisis process. For sakvation of depressed regions, the task of industrial development through package of policies needs knowledge about 'propensity of industries for dispersal'. There are three measures which determine the 'propensity for dispersal'.

i) Localisation Co-efficient.

ii) Location Quotient.

iii) Intra-Industry Linkage.

A close examination of these three aspects would reveal the existing nature and pattern of industrialisation in the state and would help in finding the way the planners should move through.

2.1: Localisation Co-efficient: It gives a general picture of the degree of local concentration of a particular industry compared with the distribution of the working population as a whole. Through the Co-efficient of localisation for a particular industry we study the nature of propensity for dispersal. The industries which show low co-efficient of location, have a propensity for dispersal since they can flourish in widely different environments. Bread making, brick making and such other market controlled industries fall in this category. On the other hand iron and steel and various metallurgical industries are raw-materials control and hence have high co-efficient of localisation and one cannot be capable of considerable dispersal. Between these two extremes are industries like Cotton, Jute, Paper, Match and general engineering which have a wide choice of location. In case of these industries, transport, labour and agglomeration decide the location.

The localisation co-efficient in the present study, has been computed with Florence's formula<sup>(1)</sup>

$$C.L = \frac{1}{2} \sum_{j=1}^n (W_{ij} / \sum_{j=1}^n W_{1j} - \sum_{i=1}^m W_{1j} / \sum_{i=1}^m \sum_{j=1}^n W_{ij}) \dots (1.1)$$

Where,  $W_{ij}$  = Employment of the  $i$ th industry in the  $j$ th region.

$i = 1, 2, \dots, m =$  number of industry sectors.

$j = 1, 2, \dots, n =$  number of regions.

The values of co-efficient of localisation (C.L) vary in the intervals of ( 0, 1 ) and the relative magnitude of C.L. characterises the dispersal or localized nature of the industry concerned.

## 2.2: Location Quotient:

It measures the degree of concentration of a particular industry in a particular region. If an industry is evenly scattered over the whole region, the location quotient will be more than unity for that particular region or so far others. The location quotient has been calculated by following formula:

$$L.Q = \frac{(W_{ij} / \sum_{j=1}^n W_{ij})}{(\sum_{i=1}^m W_{ij} / \sum_{i=1}^m \sum_{j=1}^n W_{ij})} \dots\dots (2.2)$$

The notations are identical with the notations used in the formula for localisation co-efficient. Prof. D.T. Lakdawala, Atul Sharma and Y.K. Alagh had worked with this procedure on Indian industries. (2).

## 2.3: Intra-Industry Linkage:

It measures by the Leontief inverse Matrix, (3)  
Constructing the Leontief Inverse Matrix the structure

can be stated in the following form which is more useful for calculating the backward and forward linkage:

$$AX + F = X \quad \text{or} \quad (I - A) X = F \dots\dots\dots (2.3)$$

$$\text{or} \quad X = (I - A)^{-1} F. \dots\dots\dots (2.4)$$

where  $X$  = Gross output Vector.

$F$  = Final demand Vector.

$A$  = Technology Matrix.

If  $(I - A)^{-1}$  be designated by 'B' then forward and backward linkage will be :

$$\text{Forward linkage} = \sum_{j=1}^n B_{ij} \dots\dots\dots (2.5)$$

= Total increase in output of  $j$  th sector for a unit increase of output in all the sectors.

$$\text{Backward linkage} = \sum_{i=1}^n B_{ij}$$

= Total input requirement for a unit increase in the output of the  $j$  th sector.

$$\text{Thus, the total linkage} = \sum_{j=1}^n B_{ij} + \sum_{i=1}^n B_{ij} \dots\dots (2.6)$$

Higher forward linkage of a particular industry group refers to more potential for other industries based on the

product of that industry group and vice versa; thus, a lower value refers to direct consumption without boosting up other industrial activities.

The Higher the value of backward linkage of an industry, more is the scope of ancillary units to feed that particular industry ( high diffusion effect ) and vice versa; thus, a lower value refers to those industries which are principally based on the raw material inputs rather than input produced by ancillaries. The Leontief Inverse Matrix  $( I - A )^{-1}$  has been prepared by the Directorate of Bureau of Applied Economics and Statistics, Govt. of West Bengal. But availability of other information limit this analysis. A full view of this type of work has done by M.K. Chowdhury for Assam<sup>(4)</sup>.

#### 2.4: The Nature of Dispersal in Registered Manufacturing Sector of West Bengal:

We study the localisation co-efficients and location quotients for industries in Registered Manufacturing Sector of West Bengal where all units are registered under sec. 2m(i) and 2m(ii) of Indian Factory Act, 1948.<sup>(5)</sup> In Registered Manufacturing sector for A.S.I. we have two frames, one for census<sup>(6)</sup> and another for Non-census

factories, <sup>(7)</sup> which enlisted units in pursuance of National Industrial Classification, 1970. The Classification covers major items produced by each 3-digit industry group belonging NIC Division '2' and '3' relating to manufacturing. <sup>(8)</sup>

The first 2 digits of the Code indicate the NIC of industry group under which the 3 - digit industry groups are classified. The 4th digit of a 3 - digit industry indicates a specific product under the industry group <sup>(9)</sup> Through the classification of product we find the following industries in Registered Manufacturing Sector of West Bengal <sup>(10)</sup>

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
20 - 21		<u>Manufacture of Food Products</u>
	201	Manufacture of dairy Products.
	202	Canning and preservation of fruits and veg.
	203	Canning and preservation and processing of fish, crustacean and similar foods.
	204.1	Flour Milling ( by power Machine).
	204.2	Rice Milling (by power machine).
	204.3	Dal Milling (by power machine).
	204.4	Processing and grinding of cereals and grain manually.

<u>Major Group</u> <u>(1)</u>	<u>Group / Sub-Group</u> <u>(2)</u>	<u>DESCRIPTION</u> <u>(3)</u>
	204.9	Other Grain Milling and Processing activities.
	205	Manufacture of Bakery Products.
	207.4	Manufacture of other bakery products.
	208	Product of Common Salt.
	209	Manufacture of Cocoa, Chocolate and Sugar confectionery (Including Sweetmeats)
	210	Manufacture of hydronated Oils Vanaspati Ghee etc.
	211	Manufacture of other edible Oil and fats, for example Mustered Oil, Ground nut oil and Til oil etc.
	212	Tea Processing.
	215	Manufacture of Ice.
	216	Manufacture of prepared animal feeds.
	217	Manufacture of strach.
	219.9	Other food processing activities.
22.		<u>Manufacture of Beverages, Tobacco &amp; Tobacco Products:</u>
	222.0	Malt liquors and Malt
	224	Soft drink and carbonated water industries.



<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	228.2	Manufacture of Garba.
23.		<u>Manufacture of Cotton Textiles.</u>
	230	Cotton ginning, cleaning and bailing.
	231	Cotton spinning, Weaving, Shrinking, Sanforzing, mercersing and finishing of cotton textiles in Mills.
	232	Printing, dyeing and bleaching or cotton textiles.
	235	Weaving and finishing of cotton textiles in hand loom other than khadi.
	236	Weaving and finishing of cotton textiles in Power-looms.
	235	Cotton tixtiles not elsewhere classified (n.e.c.).
24.		<u>Manufacture of wool, silk and Synthetic Fibre Textiles.</u>
	241	Wool cleaning, bailing and pressing.
	243	Dyeing and bleaching of Woollen textiles.
	244	Manufacture of Wool (n.e.c.)
	246	Printing, dying and bleaching of silk textiles.

<u>Major Group</u> (1)	<u>Group /</u> (2)	<u>Sub-Group</u> (3)	<u>DESCRIPTION</u>
	247		Spinning Weaving and finishing of other textiles as Synthetic fibres, rayons and nylons etc.
	249		Silk and synthetic fibre textiles (n.e.c.).
25			<u>Manufacture of Jute, Hemp and Mesta Textiles.</u>
	250		Jute and Mesta Pressing and bailing.
	251		Jute and Mesta spinning and weaving.
	259		Manufacture of Jute bags and other Jute textiles (n.e.c.).
26			<u>Manufacture of Textile Products Including Weaving appared other than foot-wear.</u>
	260		Knitting Mills.
		261.1	Thread and Thread ball making.
		261.3	Manufacture of other rope and cordage.
		261.9	Manufacture of other.
	262		Embroidery and making of carpats laces and fringes.
	263		Weaving carpets rugs and other similar textile products.

<u>Major Group</u> (1)	<u>Group /</u> (2)	<u>Sub-Group</u> (3)	<u>DESCRIPTION</u>
	264		Manufacture of all types of textiles, Garments including weaving apparel.
		265.1	Manufacture of umbrellas.
	266		Manufacture of made up textile goods (except garments) such as curtains mosquito nets.
		267.2	Manufacture of Rubbarised cloth
		267.3	Manufacture of Tarpaulin.
		267.4	Manufacture of artifiical leather.
		267.9	Manufacture of others.
		269.2	Manufacture of gas mantles.
		269.3	Manufacture made up cade of canvas goods (tents sails etc.).
		269.9	Manufacture of others(n.e.c.)
27			<u>Manufacture of Wood and Wood Products, Furniture and Fixtures.</u>
	270		Manufacture of Veneer Plywood and other products.
	271.		Sowing and Planning of wood (other than Plywood ).
	272		Manufacture of wooden and cane boxes, crates, drums, barrels, bamboo reeds etc.
	273.		Manufacture of structural wooden goods such as beams posts, doors and windows etc.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	274	Manufacture of wooden industrial goods, such as bobbins, blocks sadelling and simi equipment and fixtures.
	275	Manufacture of cork and cork products.
	276	Manufacture of wood, bamboo and cane products not elsewhere classified.
28		<u>Manufacture of paper and paper products and printing and allied industries.</u>
	280.4	Manufacture of Packing paper (Machine made ).
	280.5	Manufacture of paper Boards and straw boards (machine made)
	280.7	Manufacture of hand made pulps, paper boards etc.
	280.9	Manufacture of others.
	281	Manufacture of container and boxes of paper and paper board.
	283	Manufacture of Paper and Paper board articles not elsewhere classified.
	284	Printing and Publishing of News Papers.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	285	Printing and Publishing of Periodicals, books, Journals, articles, maps and sheet, music directories etc.
	286	Printing of bank notes, currency notes, Postages Stamps.
	287	Engraving, etching, block making etc.
	288	Bookbinding.
	289	Printing, Publishing and allied activities not elsewhere classified like envelope printing, picture, Post card Printing embossing etc.
29		<u>Manufacture of Leather and Leather and For Products (except Repair).</u>
	290	Tanning, Curcine, finishing embossing and japanning of leather.
	291	Manufacture of footwear except vulcanized or mould rubber or plastic footwear.
	293	Manufacture of leather consumer goods.
	299	Manufacture of leather and for products not elsewhere classified.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
30		<u>Manufacture of Rubber, Plastic Petroleum and Coal Products.</u>
	300	Tyre and Tube industries.
	301.1	Manufacture of Rubber footwear.
	301.2	Manufacture of Plastic and PVC footwear.
	301.3	Manufacture of canvas cum rubber/ plastic footwear.
	302.2	Prophylastics (Rubber contra- ceptives.
	302.9	Others n.e.c.
	300	Manufacture of Plastic products n.e.c.
	305	Manufacture of products of Petroleum n.e.c.
	307	Manufacture of other cote tar products.
31.		<u>Manufacture of Chemicals and Chemical Products except Petroleum and Coal.</u>
	310.1	Manufacture of Basic heavy inorganic chemicals.
	310.2	Manufacture of Basic heavy organic chemicals.
	311.1	Manufacture of Inorganic Fertilizers.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	311.2	Manufacture of Organic Fertilizers.
	311.3	Manufacture of Mixed Fertilizers.
	311.4	Manufacture of Pesticides (insecticides, fungicides and Weedicides.
	311.5	Manufacture of Pesticides fasonulations.
	312.1	Manufacture of paints, varnishes Lacquers, etc.
	312.2	Manufacture of Dye-stuffs.
	312.3	Manufacture of indigo.
	312.4	Manufacture of waxes and polishes.
	312.9	Manufacture of others
	313.1	Manufacture of allopathic medicines.
	313.2	Manufacture of Ayurvedic and Unani medicines.
	313.3	Manufacture of Homeopathic medicines.
	313.9	Manufacture of other medicines.
	314.8	Manufacture of Detergent.
	314.9	Manufacture of others.
	315.1	Manufacture of vegetable oils including solvent extracted oils.
	316.2	Manufacture of Turpentine and Resin.

<u>Major Group</u> <u>(1)</u>	<u>Group / Sub-Group</u> <u>(2)</u>	<u>DESCRIPTION</u> <u>(3)</u>
	316.4	Manufacture of Plastic materials.
	316.9	Manufacture of others.
	318	Manufacture of explosives and annunities and fire works.
	319.4	Manufacture of Drug inter- mediaries.
	319.7	Manufacture of shellac.
	319.9	Manufacture of others.
32		<u>Manufacture of Non-Metallic mineral products.</u>
	320.1	Manufacture of Fire Bricks.
	320.2	Manufacture of Refractories.
	320.4	Manufacture of Tiles.
	320.9	Manufacture of others.
	321.1	Manufacture of Hollow Glassware (bottles jars etc.)
	321.4	Manufacture of Labrotary Glass-ware.
	321.9	Manufacture of other Glassware.
	323.1	Manufacture of Chinaware.
	323.3	Manufacture of Insulators.
	323.9	Manufacture of others.



<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	324.2	Manufacture of lime.
	324.9	Manufacture of others.
	326.1	Manufacture stone dressing and stone crushing.
	326.9	Manufacture of others.
	328	Manufacture of asbestos, cement and other cement products.
	329.1	Manufacture of Hume pipes and others concrete products, slabs, Poles Pillers.
	329.2	Manufacture of R.C.C. Bricks and Tiles.
	329.5	Manufacture of Grinding Wheels and Abrasives.
	329.9	Manufacture of others.
33		<u>Basic Metal and Alloys Industries.</u>
	330.1	Manufacture of Iron and Steal.
	330.9	Manufacture of Special Steal.
	331.1	Manufacture of castings and forgings.
	331.2	Manufacture of structure.
	331.3	Manufacture of pipes.
	331.9	Manufacture of others.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	332	Manufacture of ferrous alloys
	333	Copper Manufacturing.
	334	Brass Manufacturing.
	335.	Aluminium Manufacturing.
	336	Zinc Manufacturing.
	339	Other non-ferrous metal industries.
34		<u>Manufacture of Metal Products and Parts except Machinery and Transport Equipments.</u>
	340.1	Manufacture of safes and vaults and Almirahs.
	340.2	Manufacture of steel Trunks.
	340.3	Manufacture of Drums, Tanks Rail and metal Containers n.e.c.
	340.4	Manufacture of sanitary Plumbing fixtures and of metal fittings
	340.5	Manufacture of stoves.
	340.6	Manufacture of Haricane Lanterns & Oil Pressure Lamps.
	340.7	Manufacture of Welding n.e.c.
	340.9	Manufacture of structural Metal products.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	341	Manufacture of structural Metal products.
	342	Manufacture of furniture and fixtures primarily of metal.
	343	Manufacture of hand tools and general hardware
	343.5	Manufacture of agricultural handtools and implements.
	343.9	Manufacture of others.
	344	Enamelling ,Japanning, Lacquering Galvanizing plating and polishing of metal products.
	345	Manufacture of metal utensils, Cutlery and Kitchenware.
	349	Manufacture of metal products like type, Razer, blades, spring.
35		<u>Manufacture of agricultural machinery and equipments and parts.</u>
	350	Manufacture of agriculture machinery and equipments.
	351	Manufacture of Earth moving, drills coal cutting machines, lift, hoisting machinery, cranes, conveyors and road rollars and other heavy Machinery and equipments used by construction and mining industries.

<u>Major Group</u> (1)	<u>Group/ Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	342.1	Manufacture of Boilers and steam Generating plants.
	352.9	Manufacture of others.
	353.1	Manufacture of Rice, Dal and flour Mills machinery.
	353.2	Manufacture of Oil Mill machinery.
	353.3	Manufacture of Sugar machinery.
	353.4	Manufacture of Tea machinery.
	353.5	Manufacture of textiles machinery. Spinning, Carding Power looms. and textiles accessories.
	353.6	Manufacture of Jute machinery.
	353.9	Manufacture of others.
	354.1	Manufacture of Pharmaceutical machinery.
	354.4	Manufacture of mining machinery.
	354.9	Manufacture of others.
	355.1	Manufacture of Refrigerator air-conditioning plants for Industrial & Commercial use.
	355.4	Manufacture of fire lighting equipment and engines.
	355.9	Manufacture of others.

<u>Major Group</u> <u>(1)</u>	<u>Group / Sub-Group</u> <u>(2)</u>	<u>DESCRIPTION</u> <u>(3)</u>
	356.1	Manufacture of size Reduction equipment crushers and conveying equipment bucket elevators, ship-hoist, cranes, derricks, etc.
	356.2	Manufacture of Mixers and Reactors (turbo-mixers etc.)
	356.3	Manufacture of centrifugal machines driers.
	356.4	Manufacture of power driven pumps reciprocating centrifugal etc.
	356.5	Manufacture of Air, Gas compressors and vacuum pumps (excluding electrical furnaes).
	356.6	Manufacture of Ball, Roller tapered bearings.
	356.9	Manufacture of others.
357		Manufacture of machines tools part and accessories.
	358.1	Manufacture of Type-writers.
	358.6	Manufacture of weighting machines.
	358.9	Manufacture of others.
	359.1	Manufacture of sawing machines.
	359.2	Manufacture of knitting.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	359.4	Manufacture of Arms & Armaments.
	359.6	Manufacture of Filtration and distillation equipments.
	359.9	Manufacture of others including sobbery engineering.
36		<u>Manufacture of electrical machinery apparatus, appliances supplies and parts.</u>
	360.1	Manufacture of Generators.
	360.2	Manufacture of transformers.
	360.3	Manufacture of switch gears.
	360.4	Manufacture of electric motors.
	360.9	Manufacture of others.
361		Manufacture of insulated wire, cables, dry and wet batteries.
	362.9	Manufacture of others.
	363.3	Manufacture of ordinary electric lamps.
	363.4	Manufacture of Miniature lamps.
	363.7	Manufacture of House hold appliances (like electric irons and heaters etc.
	363.9	Manufacture of others.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	364.2	Manufacture of radios.
	364.3	Manufacture of Television sets.
	364.9	Manufacture of others. (including public address equipments).
365		Manufacture and repair of radiographic, X-Ray apparatus and tubes and parts.
367		Manufacture of electric components and accessories n.e.c.
369		Manufacture of electrical Machinery apparatus appliances and supplies and parts n.e.c.
37		<u>Manufacture of transport equipments and parts.</u>
	370.1	Making of ships and other vessels drawn by power.
	370.8	Parts and accessories.
371		Manufacture of Locomotives and parts.
372		Manufacture of Railway Wagons and Coaches and parts.
373		Manufacture of Rail-Road equipments.
374		Manufacture of Motor Vehicles and parts.

<u>Major Group</u>	<u>Group /</u>	<u>Sub-Group</u>	<u>DESCRIPTION</u>
	375		Manufacture of Motor-cycles and Scooter and parts.
	376		Manufacture of bicycles cycle-rickshaw and parts.
	379		Manufacture of transport equipments and parts n.e.c.
38.			<u>Other Manufacturing Industries.</u>
	380.1		Manufacture of surgical and medical instruments.
	380.2		Manufacture of laboratory and Scientific instruments.
	380.3		Manufacture of mathematical instruments.
	380.4		Manufacture of Water-meters, steam meters and electricity meters.
	380.5		Manufacture of instruments indicating recording and regulating devices of pressure, temperature, rate of flow weights and levels etc.
	380.6		Manufacture of industrial instruments.
	380.9		Manufacture of others.
	381		Manufacture of Photographic and optical goods (excluding photo-chemicals, sensitised paper and film.



<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
6	382	Manufacture of watches and Clocks.
	383	Manufacture of Jewellery and related articles.
	385	Manufacture of sports and athelatic goods and play equipments.
	386	Manufacture of musical Instruments.
	387.1	Manufacture of fountain pens and Ball pens.
	387.9	Manufacture of others.
	389.4	Manufacture of Non-Mechanical Toys.
	389.5	Manufacture of Bones, ivory, Hornes and similar products
	389.7	Manufacture of Wigs.
41		<u>Gas and Steam.</u>
	410	Manufacture of Gas works of electricity and distribution of electric energy to households industrial and commercial and other users.
42		<u>Water Works and Supply.</u>
	420.0	<u>Water supply i.e. Collection Purification and distribution of water.</u>

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
74		<u>Storage and Wire-House.</u>
	741	Cold storage.
91		<u>Sanitary services.</u>
	910	Sanitation and similar services such as Garbage and Sewage disposal works collected with p Public Health.
95		<u>Recreational and Cultural Services.</u>
	950	Motion Picture production.
96		<u>Personal Services.</u>
	961	Laundries, laundry services & cleaning, dying plants.
97		<u>Repair services.</u>
	971	Repair of footwear and other leather goods
	972	Electrical repairs
	973	Repair of motor vehicles. and Motor Cycles.
	974	Repair of Watches, Clocks and Jewellery.
	979	Repair of enterprises not elsewhere classified.

The above enumeration bears the evidence of industry-gap in the census and non-census sector as in every major industry-group there is a break in continuity failed to form the pyramidal picture. Other little worth industrial works have been carried by few units which were not entered in the frames. We count them from the source of Inspector of Factories, West Bengal and see that the growth of industrial units in these industries is uneven in character as shown in table 2.1<sup>(11)</sup>

From the year 1980 to 1987 there were growth of new units in the industries like Leather, Chemical, Basic, Metal and alloy products, Electrical Machineries and Parts, storage and Ware Housing and Repair services. Except Ware Housing and Repair services the growth were mainly in Calcutta, 24 Parganas, Howrah and Hooghly industrial belt. As in the year 1987 for Leather products there were 171 units of which 162 units were in 24 -Parganas and 9 units in Calcutta; for Chemical products there were 509 units of which 319, 47, 31 and 33 units were in 24 Parganas, Howrah, Calcutta and Hooghly respectively; for manufacture of electrical machineries and parts there were 401 units of which 96% units were in same belt<sup>(12)</sup> And there is nothing worthy of re-mark at growth rate for other industries in Registered Manufacturing Sector of West Bengal. This information makes step for a study about regional inter-industry as well as intra-industry disparity in the state.

Table : 2.1

Enumeration of Working Factories.  
Progress of Manufacturing Industries in West Bengal.

Code No.	Industry	Total working factories.									
		1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total West Bengal.	5967	6144	6421	6548	6954	7324	7629	7864	8064	8348
20.	Manufacture of Food Products	483	473	478	490	484	464	500	516	534	546
21.	Manufacture of Food Products.	434	432	439	446	449	462	472	477	482	490
22.	Manufacture of Beverages, Tobacco and Tobacco products.	36	37	32	33	32	32	32	34	33	33
23.	Manufacture of Cotton Textiles.	245	253	262	260	260	264	270	268	270	273
24.	Manufacture of Wool, Silk and Synthetic Fibre Textiles.	25	25	26	26	26	26	27	26	28	30
25.	Manufacture of Jute, Hemp and Mesta Textiles.	113	122	125	130	136	139	140	145	146	140
26.	Manufacture of Textiles products (Including Weaving Apparel other than Footwear).	133	137	149	151	152	155	158	158	166	170
27.	Manufacture of wood and wood products, Furniture and Fixtures:	284	286	288	296	304	309	328	331	341	352
28.	Manufacture of paper and paper products and Printing, Publishing and allied Industries.	407	418	436	434	447	459	467	477	483	494
29.	Manufacture of Leather and Leather for products ( except repair).	129	136	147	150	153	156	160	163	164	171
30.	Manufacture of Rubber, Plastic, Petroleum and coal products.	261	279	3061	318	489	641	703	745	769	836

contd...2

Table : 2.1 (contd....2)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
31.	Manufacture of chemicals and chemicals products (except petroleum and coal products)	352	362	379	386	408	426	450	664	481	509
32.	Manufacture of Non-Metallic Mineral products	185	192	205	212	225	235	244	252	262	273
33.	Basic Metal and Alloys Industries	706	734	783	801	828	853	877	899	916	939
34.	Manufacture of Metal Products and parts.	728	749	787	801	822	843	865	883	910	925
35.	Manufacture of Machinery	548	552	574	579	600	612	630	643	654	669
36.	Manufacture of Electric Machinery	238	243	259	281	297	311	331	357	367	401
37.	Manufacture of transport equipments.	194	200	207	204	210	212	217	225	228	228
38.	Other Manufacturing industries	88	89	92	91	103	106	107	109	114	122
40.	Electricity	70	69	72	72	72	72	73	75	75	76
41.	Gas and Steam	4	4	4	4	4	4	4	5	6	6
42.	Water Works and supply.	13	15	16	16	18	19	19	20	20	20
50.	Construction	1	1	1	1	1	1	1	1	1	1
70.	Land Transport	4	4	4	4	4	4	4	4	5	6
71.	Water Transport	5	5	5	5	5	5	5	5	5	5
73.	Service incidental to Transport	12	12	13	13	13	17	16	16	16	15
74.	Storage and Ware housing	60	101	118	127	131	140	144	160	164	171
82.	Real Estate and Business Services	6	5	8	8	10	11	19	21	25	26
91.	Sanitary services	8	8	8	8	8	8	8	8	8	8
92.	Edn., Scientific and Research services	10	10	10	10	10	10	11	11	10	11
95.	Recreational & Cultural Service	6	6	5	5	5	5	5	5	5	5
96.	Personal Services	14	14	16	16	16	16	18	18	21	22
97.	Repair services	167	168	169	170	232	307	322	342	354	372

So, with the identification of industry-gap the inter-industry disparity in terms of localisation co-efficients and location quotients has been an interesting view of this analysis. For this, the nature of spread of these industries has been observed in 16 districts which are by following codes:-

- |                    |                 |                 |
|--------------------|-----------------|-----------------|
| (1) Darjeeling.    | (2) Jalpaiguri. | (3) Coochbehar. |
| (4) West Dinajpur. | (5) Malda.      | (6) Nadia.      |
| (7) Murshdabad.    | (8) Calcutta    | (9) Howrah.     |
| *10) 24-Parganas.  | (11) Hooghly,   | (12) Burdwan.   |
| (13) Birbhum       | (14) Bankura.   | (15) Midnapore. |
| (16) Purulia.      |                 |                 |

By the Frames of 1977-78 for census and Non-census factories, the distribution of workers under different industry groups and 'sub-groups',<sup>(13)</sup> among districts of West Bengal are summed up to the major industry group and arranged in tables 2.2 and 2.3. Then we calculate the localisation co-efficient and location quotients for the industries as presenting in the tables 2.2, 2.3, 2.4 and 2.5. Through localisation co-efficients the highly dispersal.

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\* 24 Parganas is divided into two districts viz. Uttar 24 Parganas and Dakshin 24 Parganas. By Frames few factories under Calcutta entered under district 24- Parganas.

Table : 2.2

Localisation Co-efficient based on the  
Distribution of Workers Under Different Major Industry Groups  
among Districts of West Bengal. (For Census Factories )

Industry Code	District Code																Column Total	Localisation Co-efficient
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
20-21	6203	24302	102	1281		181	1182	6461	1019	616	647	1216	3480	604	2429		49723	0.001
22							122	2241			392	461		50			3266	0.130
23						921	3910	23997	8660		13196	591	412				51687	0.040
24					180			4870			2875			321	482		8728	0.179
25								150458	59710		43747						253915	0.101
26								1279	1092	251	601						3223	0.096
27	319	445	57				64	2074		103		74					3136	0.165
28	179		101				64	11078	3161	5660	1148	2068			562		23957	0.026
29								11014									11014	0.250
30							59	8038	1581		5664	1033			467	341	16783	0.245
31	146							14471	1228	464	2070	1929			184	910	22002	0.294
32					217		193	8731	777		1773	5369	229		85	59	17433	0.031
33							554	15084	17044	100	3754	46388			388		83312	0.030
34							178	10726	5760	189	793	432		135	72		18285	0.029
35							686	23283	4911	125	1829	4474		100			35408	0.037
36					78			18117	32011	318	135	1831					23690	0.043
37							553	29898	18757		11057	9307			6556	571	76699	0.034
38	59							6199									6258	0.245
41								140									140	0.250
42								590			65	149					804	0.136
24												195					195	0.447
91								161									161	0.250
96								156		59							215	0.245
97	136		335	93		605		15109	495	430		1057				867	19127	0.096
Column Total	7042	24747	595	1374	475	1707	7501	364175	127406	9315	89946	76574	4121	1210	12092	1881	729161	

Source: ASI PRAMB, 1977-78

Table : 2.3.

Location Quotients based on the Distribution of Workers under Different Major Industry Groups among Districts of West Bengal (For Census Factories).

Industry Code	District by Code															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20-21	12.90	14.40	2.51	13.67	-	1.55	2.31	0.26	0.12	1.09	0.11	0.23	12.38	7.32	2.95	-
22							3.63	1.37			0.97	1.34		9.23		
23						7.61	7.35	0.93	0.96		2.07	0.11	1.41			
24					31.66			1.12			2.67			22.16	3.33	
25								1.19	1.35		1.40					
26								0.79	1.94	6.83	1.51					
27	10.53	4.18	22.27				1.98	1.32		2.88		0.22				
28	0.77		5.17				0.26	0.93	0.76	20.72	0.39	0.82			1.41	
29								2.00								
30							0.34	0.96	0.54		2.74	0.59			1.68	7.88
31	0.61							1.32	0.32	1.85	0.76	0.83			0.50	16.03
32					19.10		1.08	1.00	0.26		0.82	2.93	2.32		0.29	1.31
33							0.65	0.36	1.17	0.11	0.37	5.30			0.28	
34							0.95	1.17	1.80	0.91	0.35	0.22		4.45	0.24	
35							1.88	1.31	0.79	0.31	0.42	1.20		1.70		
36					5.05			1.53	0.78	1.18	0.05	0.74			5.15	2.89
37							0.70	0.78	1.40		1.17	1.16				
38	0.98							1.98								
41								2.00								
42								1.47			0.66	1.76				
74												9.52				
91								2.00								
96								1.45		24.06						
97	0.74		21.46	2.58		13.51		1.58	0.15	1.97		0.53				17.57

Source : ASI FRAME - 1977-78.



Table : 2.4

Localisation Co-efficients based on the Distribution of Workers under Different Major Industry Groups among Districts of West Bengal. ( For Non-Census Factories).

Industry Code	District Code.																Column Total	Localisation Co-efficient.	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
20-21	1678	638				379		2247	842	596	179	426	242	343	160	65	7795	0.006	
22								86	25	10							121	0.068	
23		47					468	2202	1275		155	139			19		4305	0.079	
24								191	6					30			227	0.119	
25								465	190		35						690	0.113	
26		14						1031	512	613	35	12			46		2263	0.032	
27	83	605	35				4	2311	260	132	27	146		12	21	10	3646	0.007	
28	59	16					32	2322	150	3096	53	30					5758	0.016	
29								2153									2153	0.249	
30								2576	521	867	75	53			27		4119	0.042	
31	45							2974	687	154	245	107	135	12	45	211	4615	0.020	
32		41			29	15	150	1201	287	83	111	57	128	37	14	60	2213	0.013	
33		17						47	3027	6144	95	169	131	7		39	26	9702	0.020
34	40	6			30		10	4886	3536	388	64	245				34		9239	0.012
35	48	112				40	46	3974	2783	331	36	162						7532	0.014
36							89	2192	578	329	51	17						3256	0.040
37							55	1187	1026	69					18			2355	0.059
38								856	50	563	31	40						1540	0.046
41									16		14							30	0.363
42								78		26	11	58						173	0.173
74								59	30	33	110	103			40			375	0.168
91								64			11	40						115	0.227
95								142										142	0.249
96										110		36			16			162	0.429
97								1015	10	456		157	49		125			1812	0.048
Column Total	1953	1496	35	-	59	434	901	37239	18928	7951	1412	1959	561	434	604	372		74338	

Source: ASI FRAME, 1977-78.

Table : 2.5.

Location Quotients based on the Distribution of Workers under Different Major Industry Groups among Districts of West Bengal. (For Non-Census Factories.)

Industry Code.	District By Code.															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20-21	8.19	4.07				8.33		0.58	0.42	0.71	1.20	2.07	4.11	7.53	2.53	1.67
22								1.42	0.81	0.77						
23		0.54					8.97	1.02	1.38		1.90	1.23			0.54	
24								1.68	0.10					22.64		
25								1.35	1.08		2.67					
26		0.30						0.91	0.89	2.53	0.81	0.20			2.50	
27	0.86	8.25	20.39				0.09	1.27	0.28	0.34	0.39	1.52		0.56	0.71	0.55
28	0.39	0.14					0.46	0.81	0.10	5.02	0.49	0.20				
29								2.00								
30								1.25	0.50	1.97	0.96	0.49			0.81	
31	0.37							1.29	0.58	0.31	2.79	0.88	3.88	0.45	1.20	9.14
32		0.92			16.51	0.07	5.59	1.08	0.51	0.35	2.64	0.98	7.66	2.86	0.78	5.42
33		0.09					0.40	0.62	2.49	0.09	0.91	0.51	0.10		0.49	0.54
34	0.16	0.03			4.09		0.09	1.06	1.50	0.39	0.36	1.01			0.45	
35	0.24	0.74				0.91	0.50	1.05	1.45	0.41	0.25	0.82				
36							2.26	1.34	0.70	0.94	0.82	0.20				
37							1.93	1.01	1.71	0.27					0.94	
38								1.11	0.13	3.42	1.06	0.99				
41									2.09		24.57					
42								0.90		1.41	3.35	12.72				
74								0.31	0.31	0.82	15.44	10.42				
91								1.11			5.04	13.20				
95								2.00								
96										6.35		8.43			12.16	
97								1.12	0.02	2.35		3.29			8.50	

Source: ASI FRAME, 1977-78

Industries are 20-21, 23, 28, 32, 33, 34, 35, and 38 for census sector. For Non-census sector they are 20-21, 28, 27, 34, 32, 33, 34, 35 and 36. We observe that the following industries under census and non-census sector were less dispersal compare to other industries in major groups:

High Localisation Co-efficient for  
Major Industry Groups for  
Census Factories.

Manor Industry Group.	Description
29	Manufacture of Leather and Leather Products.
30	Manufacture of Rubber, Plastic and Coal Products.
31	Manufacture of Chemical and Chemical Products.
36	Manufacture of Electric Machinery and Parts.
37	Manufacture of Transport equipments and Parts.
74	Storage and Wire-house.

(For Non-census factories)

29	Manufacture of Lather and Leather Products.
41	Manufacture of electricity and gas.
91	Sanitary Services.
95	Recreational Cultural services.
96	Repair Services.

In the year 1978 almost all of them were concentrated in the districts like Howrah, Hooghly, Calcutta and 24-Parganas and gradually they became dispersal as in the year 1987 the distribution of total units among district shows that there were slight growth of new units in these industries in other districts of West Bengal. We see that in the year 1987 except for manufacturing of leather and leather products most of them showed inclination of dispersal as it will appear in table ( 2.6), where few specific industries (added) bear high degree of concentration.

To highlight spatial cluster of industries we have calculated localisation quotients. Higher values are observed for major industry group 20-21, 27, 28, 31 and 34 for North Bengal. Low values are observed for every major industry groups for Calcutta, Howrah, Hooghly, 24-Parganas and Burdwan districts. In terms of location quotients the disparity between North and South is evident as crisis process of concentration of employment. It leads concentration of capital and output. For census and Non-census factories higher employment is observed in Howrah, Calcutta, 24-Parganas, Hooghly and Burdwan district. For North Bengal significant employment is observed in Darjeeling and Jalpaiguri districts. It is only because of tea gardens. But in the tea gardens of Darjeeling and Jalpaiguri districts hectorage under tea has been stagnating or slowly decaying between 1950 and 1974. Again employment in tea industries has remained static over last twenty five years<sup>(14)</sup>

Table: 2.6

Localisation Co-efficients based on Factory Workers Classified by Industry at 2-digit Level by District in West Bengal, 1987.

Industry Code	District Code																Column Total	Localisation Co-efficients
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
20	756	508	128	1381	200	1013	151	897	1433	7331	1057	3721	2600	844	1211	138	23369	0.000
21	6913	16962	81	54		159		330	675	4705	993	247	182	378	580	63	32331	0.002
22	97	20	50			203		71	25	3122	501	336		33			4458	0.327
23		27		677		3501	872		11029	24344	11038	1092		28	97		52705	0.022
24					147				41	5240	6621				770		12819	0.106
25				425					53471	130017	43701	5					227315	0.057
26		12						1114	3682	4180	465	19			44		9516	0.023
27	533	1603	118	86	14	147		215	773	3643	42	202		10	7	9	7402	0.004
28	341	17	50	125		1213	12	7965	3319	10753	1433	3038			1349		29615	0.001
29								236		13539							13775	0.257
30	86	25				913		751	3452	12776	5602	817	90	15	1582	441	26550	0.004
31	226	49			45	256		1167	2874	21775	4018	2248	269	16	767	795	35475	0.004
32	80	143	9	8		353	25	147	2137	10958	2532	6752	291	76	134	667	24312	0.002
33		276				1150		153	29446	18618	6304	55260	176	38	328	630	112379	0.009
34	79	25			34	683		1169	13021	22980	2836	902			335	104	42168	0.007
35	60	161				1177		613	6236	22688	765	7303		48	3152	19	42222	0.006
36	34	16				270		572	5464	28457	139	2999			356		38307	0.008
37		8				599		195	8103	31480	10554	14391			174		65504	0.016
38	132						78	417	148	5150	177	54	12				6168	0.039
40	313	184	92		40		1603	135	92	4688	2018	3275			1909	1582	15931	0.014
41									63	137	16	1181					1397	0.059
42								165		1078	73	915					2231	0.136
50										383							383	0.268
68	50									16							66	0.262
70		33								17			114			35	139	0.324
71								16		210							266	0.257
73								34	115	681			300				1130	0.107
74		207		35		142		32	262	1102	1643	1468	83	119	642		5735	0.003
82								503		131		46					680	0.125
91										365	7	81					453	0.147
92	19	23							108	64	543	68	16	19	18		878	0.024
95										154							154	0.268
96								160		204		29					393	0.125
97	471	237	245	242	15		523	1177	8858	17932	11	912	58	75	11867	488	43111	0.006
99						20											20	0.493
Column Total	10190	20536	773	2733	495	12069	3264	18234	154848	408901	103089	108475	3782	1699	25357	4936	879381	

Own Calculation.

Source: Economic Review West Bengal, 1992. P. 517- 520.

However, the over all picture of West Bengal does not speak favourably of industrial development. As here during the period from 1978 to 1987 the average daily number of workers employed in registered working factories did increase from 839316 to 879381. It is only at the rate of 0.5% per year.<sup>(15)</sup> For the same period average daily number of workers employed in manufacture of beverage, tobacco and tobacco products has been reduced from 4789 to 4458, for Cotton textiles reduced from 54343 to 52705, for jute textiles reduced from 235286 to 227319 and for Manufacture of paper and paper products and printing, publishing and allied industries reduced from 32237 to 29615. For other industries the employment had increased at a very insignificant rate as for wood products 1.8%, for leather products 0.5%, for rubber and plastic 2.7%, for Chemical 0.8%, for basic metal and alloys industries 1.4%, for manufacture of electric Machinery and parts 2% only. And only a significant rate of increase of employment had found in storage and wire housing for which average daily number of workers increased at the rate of 12% per year. The generation of employment in old units either in public sector or in private sector had practically been stopped since 1978 and only a few new units come out through public funds at the interest of new employment. As Govt. made a promise for industrial development in backward areas, Govt. allowed public funds for new and old units even made them hard to carry through.

But swelling industrialisation of an area needs power and rapid infrastructural development which are decisive indicators to meet the interest of the entrepreneurs. With this, available raw materials and markets follow ideological preference for manufacturing units to have a start. If industrialisation programme does not follow this connotation, within short period the new venture will enter into deep crisis for capacity utilisation. Following under utilisation of capacity every unit incurs loss, runs into debt and dries up through debt servicing burden. Then sickness and closure of units overthrow the industrialisation programme. The programme for industrialisation in backward areas of West Bengal have come at this juncture.

Through the change of localisation co-efficients we observe that industrialisation in West Bengal had followed the nature of dispersal in compliance with Govt. policy and measures. From the year 1978 to 1987 there had come of a few industrial units in different districts which are industrially backward in the state. As studies have been made <sup>through</sup> co-efficient of variation for different years that the degree of variability in industrial development among the districts has already been decreasing which may partly be attributed to Govt's effort in mitigating disparities among the regions. (16)

Alive to the consequences the regional intra-industry disparity has become an interesting view for which we project an analysis in next chapter.

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