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Spatial Distribution of Industrial Development in India: A Geographical Analysis

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Abstract-

The industry denotes a systematic and organized activity in which a new (product) is manufactured on the basis of the transformation of basic resource after processing (Chauhan P.R. and Singh S.K (2009). Industry means the habitual employment in useful work in the branch of trade or manufacture (Encyclopedia Dictionary,(1964). A small scale and large scale agro based industries play important role in rural economy and they also create employment opportunities in rural sector altimetry they play a vital role in rural development. Large scale agro based industries play role of growth pole center in rural development. (Prithewish Roy (2004). Geographer's concept of regional development offers the combination of physical, social and economic development.

The geographic analysis of development begins with identification and analysis of regional disparities in the level of development. Analysis of such regional disparities is the core of geographic analysis. It may be followed by the analysis of diffusion of development from one area to another. One activity or element, how it spread to the other area is very important matter in geography. How these activities are affecting the ecology of concerned region also fall within the scope of geographic analysis of the development process. The present research paper is concern with the spatial distribution of industrial development in India.

Key wards- Industry, Development, Economy

Introduction:

The industry denotes a systematic and organized activity in which a new (product) is manufactured on the basis of the transformation of basic resource after processing (Chauhan P.R.)An economy may be conceptualized as a collection of economic, social, institutional, legal and technological arrangements through which individuals in society seek to increase their material and spiritual well-being. The two elementary

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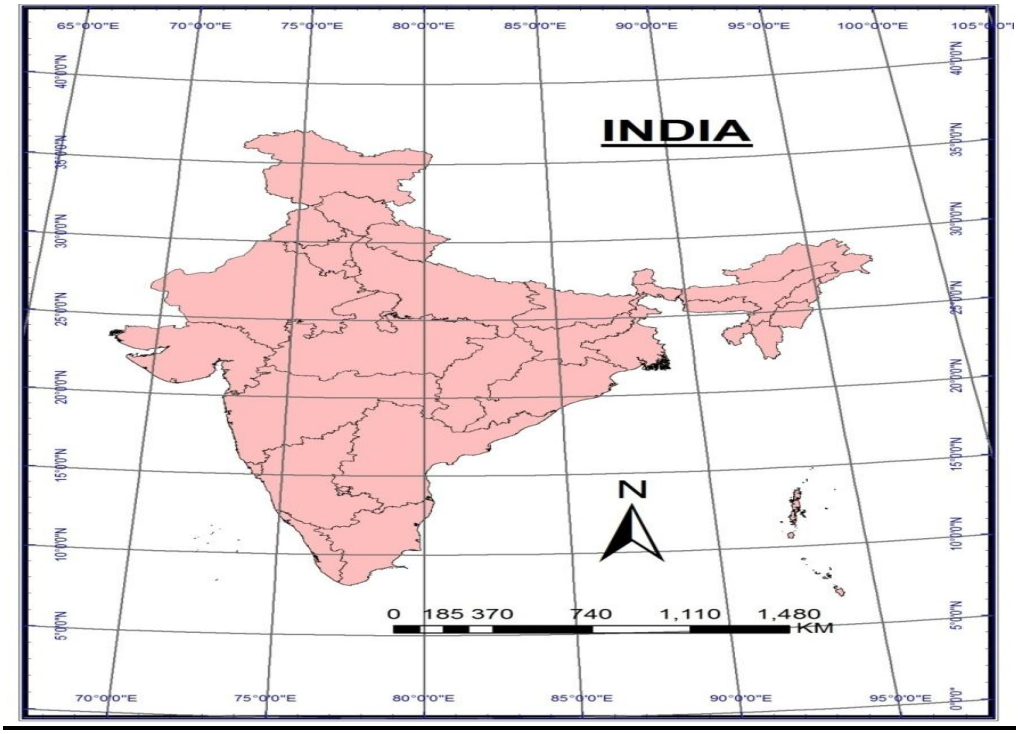
functions of an economy are consumption and production. Consumption is considered as the prime pump of an economy (Katar Singh-2009).

Indian economy can comprise two main sectors, namely, rural sector and the non-rural sector. The rural sector is, in turn, composed of two main subsectors, that is, agricultural and non-agricultural subsector. The non-agricultural subsector consists of economic activities relating to small scale village industries, rural crafts, business and services. Industry here refers to cottage and village industries like Khadi, handlooms and handcrafts, so on. The industry denotes a systematic and organized activity in which a new (product) is manufactured on the basis of the transformation of basic resource after processing (Chauhan P.R. and Singh S.K(2009).

Industrialization plays a vital role in the overall economic development of a region by contributing to increased industrial production, providing immediate large scale employment, offering a method of incurring a more equitable distribution of regional income, facilitating an effective mobilization of resources of capital and skill and preventing the migration of rural population to urban areas.

Study Region-

Map No-1.1 Location of India:



The map 1.1 reveals the absolute location of India. India lies in Southern part of Asia. Absolute location of country is 8^0 42’ 08” to 37^0 65’

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03" North latitude and 68^0 73' 33" to 97^0 25' 47" East longitudes. The geographical area of the country is 3287540 square kilometer and population is 1189172906 as per census 2011.India is second largest nation in population and seventh largest in area. The country has Monsoonal type of climate, with an average annual rainfall 110cm. The average monthly minimum and maximum temperature is 14^0c (January) and 35^0c (June) respectively.

Geographically, the high altitude and younger landscape of Himalaya lies in Northern part of Country, Which present snow-clad peaks, deep gorges, waterfall, along with dense forest and mountainous soil. There are flat topped summits,

Residual ranges and broad valleys with regur soil on Deccan plateau.

There are flat topped summits, residual ranges and broad valleys with regur soil on Deccan plateau. The plain region with alluvial soils lies in between Himalaya and Deccan plateau. It has 56.6 per cent of total workers engaged in agriculture and allied activity and 13.4 per cent in manufacturing.

Objectives:

The main objective of this paper is

1) To study the spatial distribution of Industrial development in study region
2) To analyses the density of industries in study region.

Data collection and Methodology:

In order to meet these objectives the relevant information and data regarding number of industries, industrial workers, output per workers geographical area in each state of India is collected from the Secondary Sources. Information and Data was collected from census of India 2011. Collected rough data are processed. Kendals Ranking Coefficient of co-relation has been calculated.

1.Spatial Distribution of Industries in Study Region-

Nation as whole has 149.31 industries per state but the spatial distribution is varies from state to state. Low industrial distribution i.e. < 30 is found in Arunachal Pradesh, Nagaland and Chandigarh state. It is low in

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Arunachal Pradesh and Nagaland due to Himalaya Mountain, steep slope, dense forest leads low transport and communication. The spatial distribution is moderate ranging from 30 to 60 industries is found in Andhra Pradesh, Assam, Bihar, Chattisgarh, Himachal Pradesh, Gujrat, Punjab, Rajastan, Jammu Kashmir, Jharkhand, Maharashtra, Manipur and Tamil nadu state. High industrial development i.e. 60 to 90 industries found in Goa, Hariyana, Meghalaya, Orissa and Sikkim state in India. Very high i.e. >90 industries is recorded in Kerala, Madya Pradesh and W. Bengal State. The western coast a continuous industrial zone. Alappuzha, Guruvayur, iddukku, Kannur, Kochi, Kollam, Kattayam, Kozikode, Tiruanantpurum these are theindustrial centers in Kerala. It is very high in Madya Pradesh due to cottage, sugar, Mining and food processing industries in Bhopal, Gwaler, Indore, Jabalpur, kanho and Ujjain. In west Bengal it is very high in Assansol, Darjilling, Durgapur, Hawrah, Kolkata and Silligudi.

2. Spatial distribution of Industrial Density in Study Region-

Nation as a whole has 359.3 sq km industrial density. But the spatial distribution is varies from state to state. Low industrial density i.e. < 30 Sq Km. is recorded in Manipur, Mizoram, Nagaland, Tripura, Arunachal Pradesh, Himachal Pradesh, Zarkand, Jammu Kashmir, Sikkim and Rajastan. High altitude, Steep slope, undulating surface, dense forest on mountain slope, low communication adversely effect on the development of industries. The density is moderate ranging from 30-60 km is found in Gujrat, Uttarakhand and Maharashtra state. The density is high i.e. 60-90 km is found in Goa, Hariyana and West Bengal.Very high i.e.>90 Sq km per city is found in Kerala, Chandigarh, Madya Pradesh, Andhra Pradesh, Punjab and Tamil nadu. In Andhra Pradesh it is high due to building product, Asian Paint and Refractories in coastal region. Bhatinda in Panjab due to largest food grain and cottage market. Punjab-Cottage, Muchin industry and transport equipment. Ludhiyana, Jalandhar, Amritsar, Mandi, Gobindgarh, and Mahali.

Table 1. Indicator of Industrial Development in Study Region-

Sr. No	State Name	Per factory worker	Density of Industries	Gross output per worker
1	Andhra Pradesh	34.32	100.00	7.53
2	Arunachal Pradesh	28.93	3.82	2.63

3	Assam	42.69	17.98	3.53
4	Bihar	30.19	10.73	5.14
5	Chandigarh	29.29	6929.82	6.8
6	Chhttisgarh	34.87	10.21	7.5
7	Goa	61.98	100.00	9.82
8	Gujrat	46.13	53.10	10.72
9	Hariyana	69.93	97.49	6.45
10	Himachal Pradesh	50.49	24.07	7.15
11	J&k	51.31	2.20	5.01
12	Jharkhand	48.94	16.56	8.16
13	Karnatka	1000.00	612.81	6
14	Kerala	1000.00	1835.01	4.04
15	MP	1000.00	136.45	7.32
16	Maharashtra	42.59	40.07	8.26
17	Manipur	39.06	2.24	6.7
18	Meghalaya	77.59	4.01	3.52
19	Mizoram	49.02	2.37	2.8
20	Nagaland	28.30	1.81	2.2
21	Orissa	74.63	13.68	5.28
22	Punjab	37.66	92.93	3.65
23	Rajastan	38.72	9.93	5.86
24	Sikkim	123.08	9.70	7.84
25	Tamil Nadu	43.45	123.17	3.88
26	Tripura	48.69	24.79	0.52
27	UP	44.04	26.40	5.7
28	Uttarakhand	91.72	49.93	6.22
29	W Bengal	62.39	60.51	4.62
		149.31	359.03	5.68

3. Industrial Gross Out Put Per Worker In Study Region-

State as a whole has 5.68 gross output. But the spatial distribution is varies from state to state. Low output per worker i.e. <4 is found in Arunachal Pradesh, Assam, Mizoram, Nagaland, Tamilnadu and Tripura. It is moderate ranging from 4-6 output is recorded in Bihar, J&k, Karnatka, Kerala, Orissa, Rajastan, Uttar Pradesh, West Bengal and Rajastan state. The gross output is high ranging from 6-8 is found in Andhra Pradesh, Chandugarh, Chattisgarh, Hariyana, Himachal Pradesh, Madya Pradesh, Manipur and Uttarakhand state. While it is very high i.e.

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>8 gross output is found in Goa, Gujrat, Zarkhand, Maharashtra and Sikkim state. In Zarkhandmining industry in Budaburu, Noamundi, Gua, Ranchi, Hajaribag and Aditypura. While in Gujarat it is very high in eastern plane region Kattcha, Surat as a capital city, Ahmadbad and Vadodara located in Gujarat plane region.

*Spatial Distribution of Industrial Development in India:

Kendals Ranking coefficient method is used for the spatial distribution of industrial development in study region.

Table.2 Ranking Index of Industrial Development in India:

Sr. No	State Name	Per factory worker	Density of Industries	Gross output per worker	Ranking Index
1	Andhra Pradesh	5	27	23	18.33
2	Arunachal Pradesh	2	5	3	3.33
3	Assam	10	12	5	9.00
4	Bihar	4	9	12	8.33
5	Chandigarh	3	28	20	17.00
6	Chhttisgarh	6	8	23	12.33
7	Goa	18	22	27	22.33
8	Gujrat	12	17	28	19.00
9	Hariyana	20	20	19	19.67
10	Himachal Pradesh	16	15	21	17.33
11	J&k	17	2	11	10.00
12	Jharkhand	13	11	26	16.67
13	Karnatka	25	25	16	22.00
14	Kerala	26	26	29	27.00
15	MP	27	24	28	26.33
16	Maharashtra	9	16	25	16.67
17	Manipur	8	3	18	9.67
18	Meghalaya	21	6	6	11.00
19	Mizoram	14	4	5	7.67
20	Nagaland	1	1	2	1.33
21	Orissa	22	10	13	15.00
22	Punjab	6	21	7	11.33
23	Rajastan	7	7	15	9.67
24	Sikkim	24	7	24	18.33
25	Tamil Nadu	11	23	8	14.00

26	Tripura	12	13	1	8.67
27	UP	15	14	14	14.33
28	Uttarakhand	23	18	17	19.33
29	W Bengal	19	19	10	16.00

Source: census of India-2011

Low industrial development i.e. < 3.33 is recorded in Arunachal Pradesh and Nagaland. Due to high altitude, steep slope dense forest and remote area resulted low transportation and communication facilities.

Whereas is moderate ranging from mean to 1 SD i.e. 3.33 – 12.33 is recorded in Assam, Manipur, Mizoram, Meghalaya, Jammu Kashmir, Punjab, Rajastan, Chattisgarh and Bihar state. It is moderate in Assam, Manipur, Mizoram, Meghalaya, Jammu Kashmir due to Himalayan ranges leads high altitude, steep slope, heavy rainfall leads dense forest which resulted low communication. Due to very low rainfall high temperature leads high drought and desert in the state of Rajastan.

The industrial development is high ranging i.e. 12.33 to 19.67 recorded in

Andhra Pradesh, Gujarat, Haryana, Panjab, West Bangal, Maharashtra, Zarkhand, Orissa and Sikkim state. It is high to Andhra Pradesh due to the due to the coastal region resulted Chittod, Guntur, Mandal, Handipur, Hydrabad, Sikandrabad, Tirupati, Vijaywada and Vishakhapatnm district development.

While in Gujrat eastern part of plane region develop the industrial linkage. Ahmadbad, Ankleyshwar, Bharuch, Bhavnagar, Gandhinagar, Navsavi, Porbandar, Rajkot, Surat and Vadodara. Surat and Ahmadbad due to cottage industry, Porbndar due to costal region leads trade and transport. Ankalayshwar due to oil mining. In Hariyana it is high due to Ambala, Balaghat, Chanigarh, Jalandhar and Panchkula.Panipat, Rohtak and Rewari these are urban centers.

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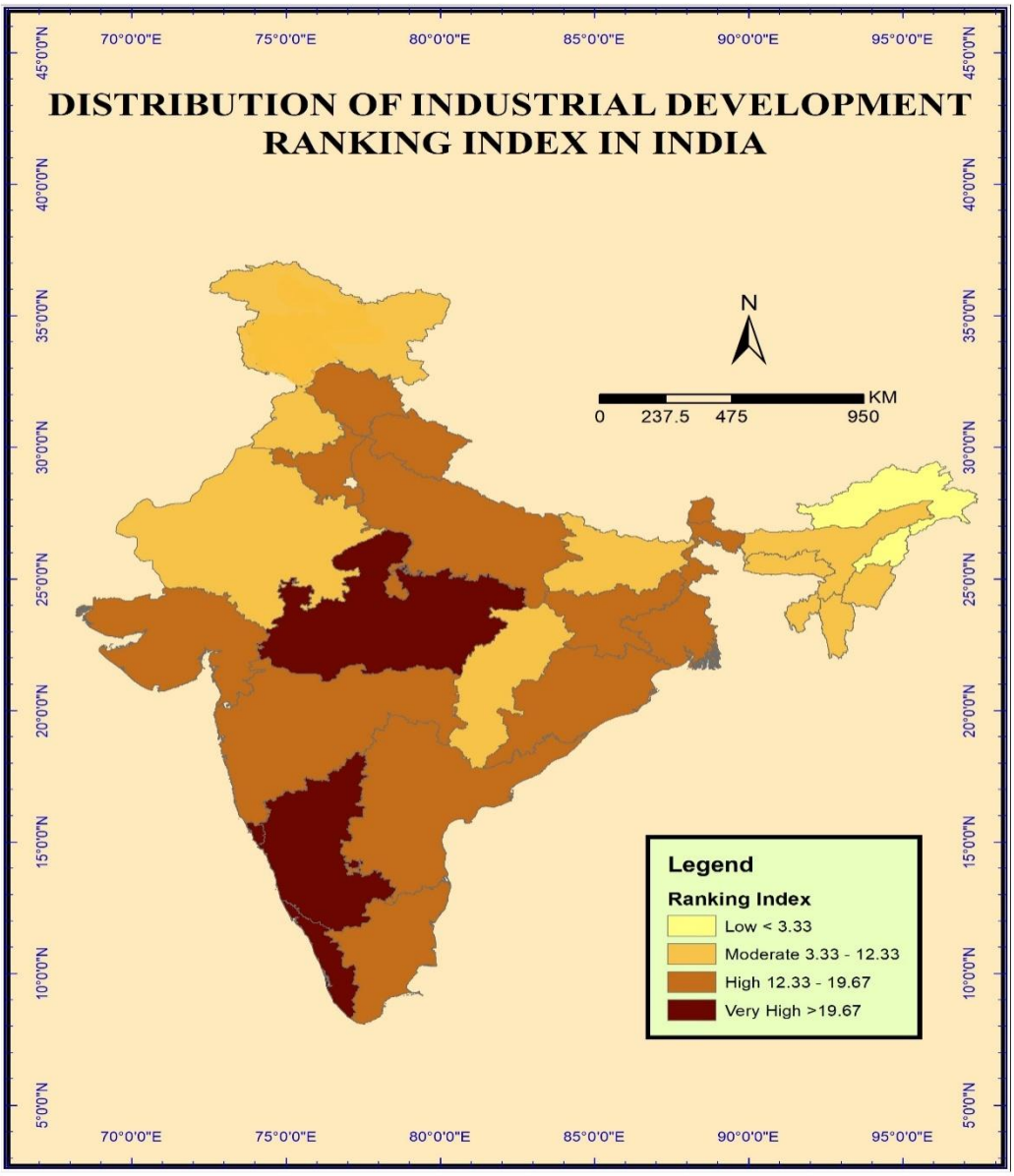
Map-2.

Spatial Distribution of Industrial Development in India



In Maharashtra it is high due to historical plece in Aurangabad,in Kolhapur it is high due to education and tourism development. While as in Mahabaleshwar, Matheran due to the development of tourism industry. Mumbai, Nagpur, Navi Mumbai is capital city, Wai and Pachgani in satara

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so many natural beauty and historical places Thane Ulahasnagar these are the urban centers.

Very high industrial development i.e. >19.67 composite index is found in Goa, Karnatka, Kerala and Madhya Pradesh. In Kerala Kochi is fast growing second tier metro in the country and industrial capital of Kerala. It increasing number of industrial park. Variety of sector that include IT, Tourism, engineering, garment production, Food processing, rubber production. SIDICO has major industrial estate. Mini industrial estate spread all over Kerala.

Mankulangara industries in Errakulum, Edapally-Velankanni industries in Kallor, LEBRA industries in Ernakulu. Cement Industry,Thermal power, coal mining, ACS, Ceramik, Hydrated lmtd, clay product these are the major industries in Madhya Pradesh. Cement industry in Rera, Satnah, Domah, Katni and Sidji, Thermal power in Sahdol, Sidhi, Satna, Betul and Domah. Narsingpur, Annuppur, and Chandiware these are the coal mining centers, Hydraled lime in Katni and Satna, clay product in Ujjin, Roftnig tiles in Houshangabad and Balagat, Marble cutting in Katni, Flag stone industy in Shirpuri Gwoler and Panna.In Karnatka it is high due to western costal region. Beguluru is capital city largely expanded. Manglur, Kurge, Dharwar, Hubli, Mysor and Udipi these are insutrial centers In Karnatka.

Conclusion-

Low industries is found in Arunachal Pradesh, Nagaland and Chandigarh state. It is low in Arunachal Pradesh and Nagaland due to Himalaya Mountain, steep slope, dense forest leads low transport and communication. High number of industries are found in Goa, Hariyana,

Meghalaya, Orissa and Sikkim state in India. Whereas it is Very high in Kerala, Madya Pradesh and W. Bengal State.

Low industrial density is recorded in Manipur, Mizoram, Nagaland, Tripura, Arunachal Pradesh, Himachal Pradesh, Zarkand, Jammu Kashmir, Sikkim and Rajastan due to physiography and climatic condition of india. The density of industries is high in Goa, Hariyana and West Bengal. Whereas it is Very high in Kerala, Chandigarh, Madya Pradesh, Andhra Pradesh, Punjab and Tamilnadu.

Low output per worker is found in Arunachal Pradesh, Assam, Mizoram, Nagaland, Tamilnadu and Tripura. The gross output is high found in Andhra Pradesh, Chandugarh, Chattisgarh, Hariyana, Himachal Pradesh, Madya Pradesh, Manipur and Uttarakhand state. While it is very highin Goa, Gujrat, Zarkhand, Maharashtra and Sikkim state.

Very high industrial development is recorded in Kerala, Madya Pradesh and W. Bengal State due to multiple sectors are developed.Whereas high industrial development is found in Goa, Haryana, Meghalaya, Orissa and Sikkim state in India and Low industrial development is found in Arunachal Pradesh, Nagaland,, Jammu Kashmir, Rajasthan, Bihar, Assam, Meghalaya, Tripura, Manipur and Mizoram state in India.

Due to the growth of urban centers and growth of urbanization is the major cause of industrial development in India.

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