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## IDENTIFICATION OF FACTORS AND SPATIAL VARIATION IN THE LEVEL OF DEVELOPMENT IN INDIA: AN EMPIRICAL ANALYSIS

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### ABSTRACT

*There is an adequate amount of proof to recommend that regional disparities within most developing countries are terrifyingly high and almost certainly ever-increasing. This disparity creates copious economic, social, cultural and environmental problems. The present study makes an attempt to inspect the interstate disparities in provisions of level of socio-demographic and economic development in India based on some selected variables by applying Principle Component Analysis (PCA) which is a technique of experimental factorial analysis and the level of development individually for the social, economic and inclusive socio-economic are acquired by computing the Composite Indices (CI). The indicators are chosen on the basis of straight impact and justified their implication of the investigation. From the result, it is exhibited that Kerala (indices 179.60) takes positioned first and Jammu and Kashmir (indices 149.08) takes last position in the socio-economic improvement. An extensive imbalance in the level of development is confirmed by the empirical result which prevails among the different state. For acquiring the balanced and uniform regional development and improving the value of life probable targets for various socio-economic amenities have been estimated for the low developed state. In addition the article advice to the diffident states for the instant attentiveness of the government to recover the various indicators at various dimensions for construct our country socially and economically developed in a complete manner. To eliminate such discrepancy a number of programme and procedures have to be invented.*

**KEY WORDS :** *Regional disparity, socio-demographic development, economic development, Principle Component Analysis, Composite Index, India.*

### INTRODUCTION

Regional disparities are terrifyingly high and almost certainly ever-increasing phenomenon experienced in all over the world which generates abundant socio-economic, socio-cultural and ecological issue. It refers to regional imbalances or regional dualism or expansion of differentiation in any territorial provision and happening at least in two individuals of the regional organization. According to Parveen (2016), Regional imbalances are multidimensional in nature and mentions to the coexistence of comparatively developed and economically miserable states and even regions within each state. Usually, it is the outcome of skewed regional development which varied from one region to another region depending upon socio-cultural, economic and demographic characteristics (Kundu and Mandal 2012; Dinesha 2015). The unfavorable impact of such inequality could either arrive throughout the natural resource exhaustion and critical health consequences of ecological degradation and the development on the other hand has been properly conceptualized as a process, which improves the quality of life of residents (Nizamuddin 2014) that typically concentrate only on some major territories of a nation and others do not entertain the benefits of such development due to several factors like market deficiency, geographical constraints, wrong government strategies, lack of law and order and other social, political and commercial motives. In addition,

the pattern of such disparities in the levels of development is dissimilar between the developed and underdeveloped countries. Hence, Unprejudiced regional development is necessary condition for the harmonious development of a nation, otherwise it cannot say to be developed in real sense (Chowdhury 2014; Mor and Devi 2017).

It becomes more significant for the diminution of space between the rich and the poor states of India as well as all developing countries. (Singh 2015). In terms of areal coverage, populations, climate, geography and culture, India facing the difficulties of regional differences which breed massive differences in the economic improvement. After 67 years of Independent, the peoples of India are unable to achieve the basic objective which required for gratifying the elementary desires of the individuals such as security of food, proper sanitation facilities, safe and clean water, better health facilities and even they cannot enjoy the fruits of education, employment, political and socio-cultural opportunities. As a result, they suffer from a different problem like poverty, inequality, malnutrition, unemployment. According to Ray and Rahaman (2017), India faces the challenge of improvement job in economic and social sectors, is one of bridging gigantic disparities among genders, social groups and across the region of a country. In the early 1990s, from the time of economic liberalization, India has been experiencing ever-increasing dissimilarity as well as persistent poverty which are the indication of the existence of regional differentiations in India. Although from pre-independence, economic planning of India has been worked for homogeneous development since the main goal of such development programs are the progressive decline in the regional disparity in the pace of development (Siddiqui and Hussain 2010).

From the early planning era in India, a large number of economists, planners, and politicians are engrossed by the problems of imbalanced regional development and they laid importance on the aim of the achieving in balanced regional development. Many individuals and agencies have also been completed their studies on inter-regional variations at state, district and block levels by using different methods and indicators. Young and Kathuria (2009) examined the trends in regional dissimilarity of income and consumption in between states and between rural and urban areas by emphasizing on education and health as development indicator. Similarly, Jahangir (2011) inspected the state wise disparities on the basis of variety of indicators, such as NSDP, Per capita NSDP and some social indicators like health and educations. Whereas, Ohlan (2012) analyzed the socio-economic dissimilarities in terms of development at the district level with the help of the Wroclow Taxonomic technique. The patterns of regional disparities in the levels of development in post-reform India utilizing Human Development Report technique has been analysed by Singh (2015), where he improved the deprivations score of all district into a development score. A recent study by Mor and Devi (2017) on regional disparity in post-reform era demonstrated that interstate disparities in literacy rate has been flagged due to increased investment in education sector and they also found that there is a convergence of GDP growth rates in successive plan periods after post-reform period by considering some fruitful indicator. The block level development inequality in socio-economic life within some districts of West Bengal has been examined by Sarkar and Roy (2011); Sheet and Roy (2013); Mistri (2016); Sam and Chakma (2016); Ray and Rahaman (2017). Additionally, inequality in social and economic development also prevailed at district level in other states of India which was scanned by some researcher and planners, such as Haan (2004); Chakraborty (2009); Tripathi et al., (2011); Raman and Kumari (2012); Kumari (2015); Pradhan and Kumar (2015); Ahuja and Nikam (2015).

Some research work has been evidenced that the problem of regional disparities in terms of socio-economic development and other sectors did not confine within the state of India. Czaban (2015) observe growing regional disparities in Hungary in order to afford a more inclusive impression of the phenomenon and create an emergent body of both Hungarian and global literature which is based on their implication for Hungary. Ionescu (2016) gave emphasized upon the thought of requirement of altering European Union's political goals while discussing regional disparity by using four indicators such as educational attainment level, hospital beds at 100000 population, employment rate and unemployment rate. Hence for superior understanding the present scenario and pattern of regional disparity, it is essential to study the various

socio-economic indicators of development and that's why social researchers become more interested about this topic.

The present work is an attempt to evaluate the imbalances in the level of development in the state of India excludes the union territory as these are all exceedingly developed on the basis of several preferred socio-economic indicators. Backward states have been identified by using the principal component analysis technique on the basis development parameters for fixing up the possible objective of various parameters for less development state.

### **MATERIALS AND METHODS:**

The present investigation is exclusively based on secondary data sources. The data is collected from statistical handbook, Statistical abstract 2015, Economic review 2015-16, Census 2011 etc. For this study, the state have been taken as the unit of analysis. Twentynine states of India have been included in the analysis.

### **Principle Component Analysis (PCA) Method:**

The Principal component analysis method is an empirical techniques of break down a correlation or covariance matrix in to set of orthogonal components or axes equal in number with that original varieties and H. Hotelling (1993) has been advanced this method. Here we used first principal component for a specific group simply because this happens to be the linear combination of varieties having the maximum sum of the square of the correlation co-efficient with variables. The first principal component is a linear combination (weight sum) of the standard scores of the given variables. The masses (weight) used in this circumstance are the elements of the Eigen vector consistent to the maximum Eigen value of correlation matrix R of the nominated variables. The Eigen vector is also normalized to the highest Eigen value used. After that, prediction of state level regional disparity of development would be highlighted and relative significance of alternative predictors will help in the identification of factors to be focused upon to bring about rapid control in the backward state in India.

In Principle component analysis method, first of all mean and standard deviation of every variable of 29 states of India are calculated and then a correlation matrix (R) is advanced taking in consideration 40 socio-demographic and 21 economic variables. Sum of correlation is acquired for every column and the vector of sums of column is referred as:

$$U_{a_1} = \sum a_1 + a_2 + a_3 + \dots + a_n$$

Where,  $a_1, a_2, a_3,$  and  $a_n$  are the coefficient value of every variable.

After the calculation, the normalization factor ( $NF_1$ ) is developed by the square root of the sum of squares of the total column sums of  $U_{a_1}$  i.e.

$$NF_1 = \sqrt{[(\sum \text{column } 1)^2 + (\sum \text{column } 2)^2 + \dots + (\sum \text{column } n)^2]}$$

After that, normalized vector  $V_{a_1}$  is acquired by using the following equation:

$$V_{a_1} = U_{a_1} / NF_1$$

First principle component is uprooted when various elements of  $V_{a_1}$  are multiplied by square root of  $NF_2$  and the products thus establish the elements of First Principle Component  $F_1$  and by using the First Principle Component Eigen value is computed which the summation of square of factor filling is relating to a factor.

By using the following equation the composite index (CI) have been calculated (Das 2018).

$$CI = \frac{X_1 * \bar{X}/\sigma + X_2 * \bar{X}/\sigma + X_3 * \bar{X}/\sigma + X_4 * \bar{X}/\sigma + X_5 * \bar{X}/\sigma + \dots \dots \dots X_n}{W_1 + W_2 + W_3 + W_4 + W_5 + \dots \dots \dots W_n}$$

Where,

CI= Composite Index

X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, X<sub>5</sub> ... .. X<sub>n</sub> are the selected indicators

$\bar{X}$ = Mean value of the state

$\sigma$ = Standard deviation of each indicator

W= Eigen vector

After calculating the Composite Index of all district except Kolkata, Composite Indices have been calculated taking the state average as 100. The composite indices have been calculated by the following equation-

$$\text{Composite Indices} = \frac{\text{Composite Index of any district}}{\text{Average Composite Index}} \times 100$$

The inter-district variations are grouped into four categories of less developed region, moderate developed region, developed region and highly developed region on the basis of natural break (Jenks) method.

**RESULTS AND DISCUSSION:**

**Detection of factors and relationship:**

On the basis of 40 socio-demographic and 21 economic interrelated variables, the present research work has been developed. According to the Kaiser’s criterion of Eigen principles more than unity the quantity of factors preserves in the analysis are four (Harman 1960). Table 1 & 2 represented the varimax rotated factor structure and majority of the variables under study have been appropriately focused on the structure exposes by this factor matrix. The social communalities value varied from .20 for the percentage of undergraduate student per 10000 populations to .88 for the percentage of secondary school with drinking water facility whereas economic communalities value varied from .38 for the number of branches of regional banks per 10000 populations to .84 for the percentage of gross cropped areas. Others remaining social and economic indicators are suitably represented in the form of four extracted factors. The extracted factors which are positively or inversely associated with development have been identified on the basis of the value of factor loading on variables ( $\geq 0.60$ ), are briefly discussed as follows.

**Table 1: Rotated component matrix of social indicators**

Variables	Factor loadings on variables				Communality
	F1	F2	F3	F4	
Total Primary Schools per 10000 population	-0.31	-0.80	-0.23	-0.12	0.80
Enrollment ratio in primary school	-0.01	-0.39	0.65	-0.08	0.58
Enrollment ratio in upper primary school	0.37	-0.32	0.27	0.36	0.44
Net Enrollment ratio in secondary school	0.77	-0.11	0.43	-0.27	0.86
Net Enrollment ratio in higher secondary school	0.76	0.10	0.16	-0.29	0.70
Total no of secondary school per 100000 population	0.16	-0.71	-0.5	-0.2	0.82
Student Teacher ratio in secondary school	-0.56	0.55	0.33	0.18	0.76
Percentage Single-Classroom in secondary Schools	0.01	-0.31	-0.39	-0.08	0.25
Percentage of Single-Teacher Schools in secondary section	-0.57	0.37	0.22	-0.13	0.53

Percentage of secondary Schools with Girls Toilet	0.40	0.67	-0.31	0.20	0.75
Percentage of secondary Schools with Boys Toilet	0.43	0.65	-0.33	0.15	0.74
Percentage of secondary Schools with Drinking Water	0.40	0.81	-0.18	0.17	0.88
Percentage of secondary Schools with Electricity	0.77	0.27	-0.28	-0.06	0.75
No of under graduate student per 10000population	0.04	-0.06	-0.18	-0.40	0.20
Student enrollment at post graduate per 10000 population	0.38	-0.16	-0.42	0.60	0.71
No of collage per 100000 population	0.46	0.19	0.48	-0.56	0.79
Student-Classroom Ratio	0.42	0.37	0.56	0.30	0.72
No of university	-0.23	0.72	-0.06	-0.39	0.73
Percentage of household by availability of Latrine facility within premises	0.70	-0.43	-0.06	0.11	0.69
Percentage of household by availability of Drinking water from treated source	0.64	0.10	-0.36	-0.39	0.70
Percentage of villages electrified	0.51	0.67	-0.09	0.16	0.74
Length of roads per square km	0.47	0.00	0.24	-0.38	0.42
Length of rural roads per square km	0.39	0.00	0.65	0.12	0.59
Electricity generation (MWh) per 10000 population	0.15	-0.07	-0.55	0.28	0.41
Percentage of Household Having Television	0.89	0.15	-0.17	-0.17	0.87
Percentage of Institutional deliveries	0.60	0.49	-0.05	0.06	0.61
Percentage of children fully immunized	0.57	0.11	0.13	0.42	0.53
Density of population	0.21	0.51	0.65	0.10	0.74
Percentage of Urban population	0.65	0.25	0.25	-0.07	0.55
Percentage of Female population	0.23	-0.21	0.69	-0.32	0.68
Literacy rate	0.82	-0.27	0.13	-0.05	0.76
Gender parity index	0.59	-0.36	0.10	0.10	0.50
Percentage of Female Teachers	0.72	-0.17	0.21	0.15	0.61
Percentage of Girls Enrolment	0.08	-0.55	0.46	0.34	0.64
Birth rates per 1000 population	-0.56	0.54	-0.09	-0.18	0.65
Death Rates per 1000 population	-0.06	0.51	0.62	-0.19	0.68
Infant mortality rate	-0.79	0.07	-0.05	-0.34	0.75
Sex ratio	0.34	-0.24	0.63	-0.34	0.69
Eigenvalue	9.92	6.71	5.37	2.78	

### Recognition of social factors structure and association:

The leading component of the first factor(F-1) are net enrolment ratio in secondary school, net enrolment ratio in higher secondary school, percentage of secondary school with electricity, percentage of household by availability of latrine facility within premises, percentage of household availability with drinking water from preserved source, percentage of household with T.V, percentage of urban population, percentage of institutional deliveries, literacy rate, percentage of female teacher and infant mortality rate. It is also mentioned that some of the principal elements have reliable associations with development where some elements have an inverse association. Except infant mortality rate all afore said variables are absolutely related with development.

Among the afore said component (table 1) of the second factor(F-2), some leading component like total primary school per 10000 population, the total number of secondary school per 10000 population is oppositely related to development .On the other hand the variable like percentage of secondary school with girls toilet, boy’s toilet ,and drinking water facility which are the indicators of infrastructural development in the educational institution as well as indicators of developed society which have the positive association with development. These mentioned component of the second factor analysed that overall development is closely associated with each other.

The principal or leading element of the third factor (F-3) which are the indicators of the level of development such as enrolment ratio in primary school, length of rural roads per square kilometre, the density of population, the percentage of the female population, death rates at 10000 population and sex ratio. However, these entire indicators are positively related to the development and are connected to each other.

The principal element of the fourth factor (F-4) shows that only one indicator e.g. student enrolment at post-graduate per 10000 populations is positively associated with development.

**Table 2: Rotated component matrix of economic indicators**

Variables	Factor loadings on variables				Communality
	F1	F2	F3	F4	
Per capita income	0.785	-0.14	-0.315	-0.237	0.79
Work force participation rate	-0.272	-0.409	-0.627	0.268	0.71
Labour force participation rate	-0.604	-0.373	-0.381	0.078	0.66
Estimated Employment in the public and private sector	-0.166	0.667	-0.542	-0.034	0.77
Number below poverty line	0.483	0.129	-0.096	0.384	0.41
Household availing banking services	0.692	-0.052	0.142	0.194	0.54
Population below poverty line	-0.605	0.384	0.386	-0.028	0.66
Percentage of cities or town reporting slums	0.019	0.21	-0.267	0.742	0.67
Percentage of net irrigated area to net shown area	0.721	0.329	0.21	0.072	0.68
cropping intensity percent	0.49	0.157	0.628	0.251	0.72
Office of commercial banks per 10000 population	0.758	-0.338	-0.049	-0.124	0.71
marginal workers to total working population	-0.439	-0.34	0.614	0.22	0.73
number of branches of regional banks per 10000 population	-0.32	-0.215	0.189	-0.443	0.38
no of factories per 10000 population	0.006	0.144	-0.179	-0.685	0.52
agricultural laborers as % to main workers	-0.612	0.436	-0.049	0.117	0.58
Real growth rates of states GSDP	0.535	-0.159	-0.532	0.01	0.59
Net cultivated area	0.264	0.549	-0.095	-0.2	0.42
Percentage of gross cropped area	-0.135	0.857	-0.238	0.179	0.84
Employees of Commercial Bank	-0.211	0.781	-0.159	-0.057	0.68
Number of storage per 10000 hectare of net shown	0.159	0.573	0.582	-0.033	0.69
Net shown area thousand in hectares to geographical area	0.257	0.797	-0.101	-0.141	0.73
Eigenvalue	4.674	4.235	2.792	1.78	

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**Recognition of economic factors structure and association:**

The leading economic component of the first factor (F-1) are per capita income, labour force participation rate, household availability, banking services, population under BPL, the office of commercial bank per 10000 population, the percentage of the net irrigated land to net shown land, percentage of agricultural labourers to the main workers. It is also mentioned that some principal element has reliable associations whereas some have the inverse association with development. Labour force participation rate, population below poverty line, agricultural labourers as the percentage to main workers have the inverse association with development and rest of the variables are positively connected with development.

Among the fundamental component of the second factor (F-2) estimated employment in the public and private sector, percentage of gross cropped area, employees of the commercial bank, net shown area thousand in hectares to the geographical area are very remarkable as these components are positively associated with economic development. Furthermore, these essential component considered that the overall development is closely associated with each other.

The principal element of the third factor (F-3) are workforce participation rate, the percentage of cropping intensity and marginal worker to the total working population. Workforce participation rate, the percentage of cropping intensity is inversely related with development whereas marginal worker to the total working population have the positive association with development.

Between underlying elements of the fourth factor (F-4) percentage of cities or town reporting slum is positively associated and the number of factories per 10000 populations is oppositely related to the development.

**Regional disparities in the level of development in India:**

By using the method of the composite index (CI) the level of development in terms of socio-demographic, economic and overall development in India has been evaluated. The relation between the value of composite score and the level of development is direct for instance states with the greater value of composite score have the advanced level of development and the state having lesser value recognize the lower level of improvement.

**Level of social development in India:**

There are numerous powerful societal element in the society whose spatial variation creates social disparities in the level of development. Based on 40 socio-demographic indicators the level of social development has been computed. Among these educational infrastructure, literacy rate, health facilities, family welfare, electricity availability, accessibility of water from treated source, availability of road network, some demographic indicators such as density of population, percentage of urban population, death rates, sex ratio and some other amenities of social life are the more significant. However, according to the level of social development, India has been classified into five groups.

**Highly developed region:**

The states with composite index more than 171.63 have been belonging to this zone. According to the socio-demographic indicators, Kerala is only one state that grouped to this zone. The status and infrastructure of education and health are exceedingly developed in Kerala. However, the number of total primary school is low but enrolment ratio in that section is too high. Kerala is also experienced the highest proportion of enrolled student in the higher secondary sector in spite of having the moderate number of higher secondary school per 10000 populations. The presence of developed educational infrastructure like the secondary school with the girl's toilet, boy's toilet, drinking water facilities, and the school with electricity has also the tremendous indication of enhancement. The quantity of graduate student is also high in this state. Kerala has great advantages in highly developed amenities of social life like latrine facilities, availability of television, good connectivity of rural roads. The inhabitants of Kerala including both of male



and female population are exceedingly literate that they are extremely conscious about health, as a result, the state recorded high proportion of institutional deliveries, low level of infant mortality rates. The uppermost position in literacy rate and also the peak position in female literacy rate, the highest number of female population and also the female teacher, large proportion of the urban population and some other facilities available in social life raise Kerala highly developed. The states of Haryana, Maharashtra, Tamil Nadu, Karnataka, Punjab and Kerala have a good score with respect to the first and second components (Fig. 2 A).

#### Developed Region:

Eleven states e.g. Tripura, Chhattisgarh, Mizoram, Telangana, Manipur, Karnataka, West Bengal, Himachal Pradesh, Andhra Pradesh, Goa, and Tamilnadu are included in this region, having the composite index between 162.91 and 171.63. These states experienced a high proportion of enrolled students in the primary, upper primary, secondary and higher secondary level with the developed educational infrastructure. However, several diverse pictures is observed in some selected states of this zone. For illustration, except the state of Himachal Pradesh and Mizoram, all the included state of this region is served by less no of primary school. At the same time the Andhra Pradesh, Chhattisgarh, Telangana, and West Bengal have the lower level of enrolled student in secondary school. Likewise, the enrolment ratio in the higher secondary section is fewer in Andhra Pradesh, Karnataka, Chhattisgarh, and Telangana. With the blunder of Andhra Pradesh, and Chhattisgarh rest of the state of this group have the evidence of large proportion of graduate student. The populace of Andhra Pradesh and Goa are enjoying the availability of drinking water facilities from treated source but contradictory images are found in the state of Tripura, Chhattisgarh, Manipur, and West Bengal. Excluding the state of Chhattisgarh entire state of this zone has the substantiation of latrine facilities within the premise. The scenario of others indicators of the developed society is almost equal in all state of this region. A lesser amount of the number of television is used by the population of only two state i.e. Chhattisgarh, and West Bengal. Mizoram, West Bengal, and Chhattisgarh are well connected by rural road network. Universal electrification in villages, high literacy rate, and a huge proportion of the female population, and urban population, favourable sex ratio has resulted in this zone. Additionally, the large proportion of institutional deliveries, the lower amount of infant mortality rate, and less amount of death rate is the indicators of developed medical services, are observed in this regions. Whereas some varied circumstances are found in some state like 25% of delivery does not occur institutionally in Chhattisgarh, Himachal Pradesh, Tripura, and West Bengal. Infant mortality rate is also moderate in Chhattisgarh, Manipur, and Andhra Pradesh. These states are bestowed with the facilities like encouraging the number of all level of school such as primary, upper primary, secondary, higher secondary school, optimistic educational infrastructural amenities like the secondary school with girl's toilet, boy's toilet, drinking water facilities, and the school with electricity.

**Table 3: Composite index value matrix of social indicators**

Composite Z score	Level of development	Name of the states
153.20 - 156.10	Very low	Jammu & Kashmir (153.20), (Nagaland 155.82) Arunachal Pradesh (155.54), Sikkim (156.10)
156.10 - 158.54	Low	Bihar (156.50), Haryana (156.83), Meghalaya (156.93), Madhya Pradesh (157.56), Rajasthan (157.65), Jharkhand (157.94), Assam (158.39), Uttar Pradesh (158.54)
158.54 - 162.91	Moderate	Punjab (159.41), Gujarat (159.48), Odisha (161.32), Maharashtra (161.47), Uttarakhand (162.91)
162.91 - 171.63	High	Tripura (164.35), Chhattisgarh (164.46), Mizoram (164.64), Telangana (165.12), Manipur (165.40), Karnata (165.83), West



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		Bengal (165.86), Himachal Pradesh (166.13), Andhra Pradesh (167.06), Goa (169.33), Tamilnadu (171.63)
171.63 - 184.14	Very high	Kerala (184.14)

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#### **Moderately developed Region:**

The moderately developed states are Punjab, Gujarat, Odisha, Maharashtra, and Uttarakhand (Fig. 1). These including state have less number of primary school but recorded a higher proportion of enrolled student in primary section. At the different level of education such as upper primary, secondary, higher secondary section the proportion of enrolled student underlying in a decreasing manner. But the number of undergraduate students is comparatively less in comparison to developed states. After all, in general, the literacy rate is higher in all state. These state recorded the developed educational infrastructure like the secondary school with the girl's toilet, boy's toilet, drinking water facilities, and the school with electricity which are the indicators of upgrading the state. All the included state has the evidence of the moderate proportion of latrine facilities and the drinking water facilities from the treated source except the state of Odisha. On the other hand, the network of rural roads is limited in the state of Uttarakhand and Gujarat but remaining states are moderately connected with the rural network. The number of television, used by the different household is very low in Odisha, moderate in Gujarat and Maharashtra whereas rest of the states have enjoyed the fruit of television. The status of institutional deliveries is too good in all the aforesaid states but in case of infant mortality rate Punjab and Maharashtra experienced inferior whereas remaining states experienced the moderate of such mortality rate. The density of population in the underlying state of this zone is moderate to high. Till now above 50 percent of the population live in the rural sector and also the states have less proportion of the female population are the causes behind the moderate development of this zone.

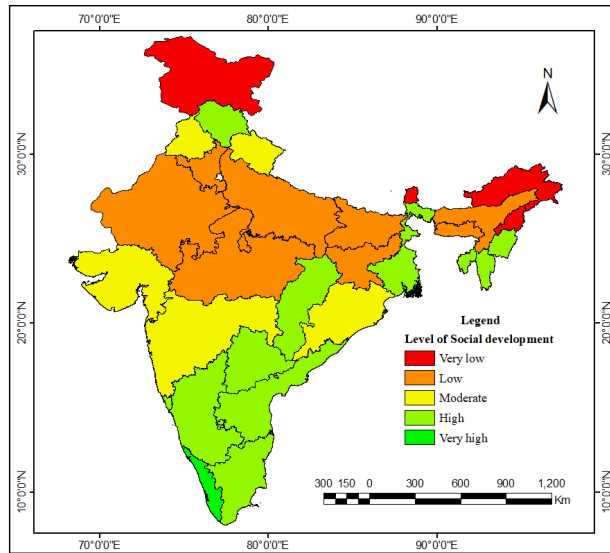
#### **low developed region:**

The fundamental state of this zone is Bihar, Haryana, Meghalaya, Madhya Pradesh, Rajasthan, Jharkhand, Assam, and Uttar Pradesh (Fig. 1). These states recorded moderate enrolment ratio in the upper primary section whereas very low in secondary, higher secondary and undergraduate level. Except Haryana, Meghalaya, and Assam remaining state of this group have the low level of latrine facilities. In addition, the facility of drinking water from the treated source is also not adequate in all state except the state of Haryana. That's why these states are considered as socially backward. On the other hand in Meghalaya near about 20 percent villages is far from electrification and the numbers of television users are incredibly stumpy in these states except Haryana. However, the report of institutional deliveries is moderate in all states except Meghalaya where it is very low. In Bihar literacy rate and percentage of the urban population are least among the state of India while infant mortality rate is highest in the state of Madhya Pradesh. The lower proportion of the female population, female teacher and also high death rates give the chance to stay in this zone.

#### **Very low developed Region:**

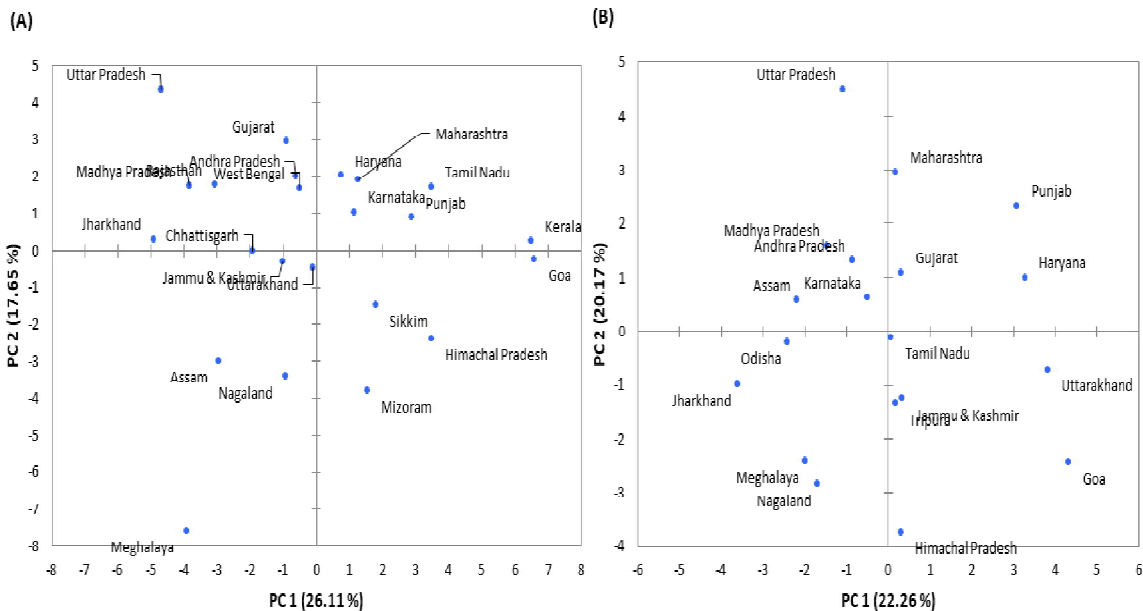
In order to social indicators Jammu and Kashmir, Nagaland, Arunachal Pradesh, and Sikkim belong to this group (Fig. 1). Being a mountainous region these states have the low communication facilities, as a result, they cannot achieve all the services of education, health, and other social facilities which are responsible for very low development. All these states experienced a very low proportion of enrolled student in the primary, upper primary, secondary and higher secondary level. Till now 30% household of these included state of these zones has experienced unfavourable latrine facilities within the premise. At the same time, drinking water facilities are very dreadful in Nagaland, even rest of the state recorded moderate level in that manner. In terms of health status near about 50 % deliveries do not occur institutionally. Though Sikkim and Nagaland experienced the moderate level of literacy rate and infant mortality rate rest of

the state recorded very less proportion in such manner. Different social indicators such as educational amenities, health facilities, drinking water availability from the treated source and some other facilities of the high quality of life are limited in these states which are the main constraint of the development.



**Fig .1 Level of social Development in India**

To analysis the level of economic development of India irrigation facility, agriculture, industry, working population, per capita income etc. have been consideration. The computed composite indices of all indicators are presented in table 4. However, according to the level of economic development, India has also been classified into five groups.



**Fig.2 Score plot of first PC and second PC of (A) Social development and (B) Economic development Level of Economic development in India:**

### Very high developed Region

This zone consist of only one state namely Maharashtra. The state occupies fourth position in India in terms of per capita income. Besides , highest number of employee worked in private and public sector in this state and is often characterized by positive level of worked and labour force participation rate, availability of banking services, lower proportion of population who live in below poverty line. At the same time, Maharashtra recorded high level of agricultural characteristics such as large proportion of net irrigated area, gross cropped area, net shown area, higher level of cropping intensity. Also with the fewer number of marginal worker, large number of factories, a less number of agricultural labourers, a smaller amount of slum population and people who live below the poverty line resulted in high development in economic sector. The states of Haryana, Maharashtra, Punjab and Gujarat have a good score with respect to the first and second components (Fig. 2 B).

### High Developed region:

Himachal Pradesh (179.17), Gujarat (181.29), West Bengal (182.30), Uttar Pradesh (183.29), Jharkhand (188.07), Karnataka (194.75), Tamilnadu (201.36), and Andhra Pradesh (206.35) are included in this region, having composite index between 173.49 and 206.36 (Table 4). The entire states of this zone stands for high per capita income, high labour force participation rate, high workforce participation rate, high banking services, and higher level of cropping intensity. On the other hand two state of this zone i.e. Uttar Pradesh and West Bengal experienced greater number of population who live in below poverty line and also experienced high proportion of cities reporting slum. However, the number of marginal worker is increasing in Himachal Pradesh, West Bengal, Uttar Pradesh, and Jharkhand whereas remaining states have the evidenced of lesser amount of marginal workers. At the same time, Karnataka and Gujarat practiced high percentage of gross cropped area and number of employees in commercial bank. In Gujarat quantity of factories is excessively high. The entire favourable factor resulted in high development of this state. Uttar Pradesh, West Bengal is based on agricultural activities where percentage of net irrigated area and net shown area, cropping intensity, are very high, reasons for such development.

**Table 4: Composite index value matrix of economic indicators**

Composite Z score	Level of development	Name of the state
128.03 - 137.72	Very low	Jammu & Kashmir (128.03), Nagaland (130.92), Goa (131.63), Telangana (135.56), Bihar (137.72).
137.72 - 151.33	Low	Uttarakhand (140.76), Manipur (141.38), Haryana (144.09), Punjab (144.89), Tripura (146.86), Odisha (151.33), Arunachal Pradesh (156.1),Meghalaya (157.75), Mizoram (160.35),Chhattisgarh(163.12),Rajasthan (169.36), Assam (170.79), Sikkim (173.49)
151.33 - 173.49	Moderate	Himachal Pradesh (179.17), Gujarat (181.29), West Bengal (182.30), Uttar Pradesh (183.29), Jharkhand (188.07), Karnataka (194.75), Tamilnadu (201.36), Andhra Pradesh (206.35),
206.36 - 260.37	Very high	Maharashtra (260.37)

### Moderately Developed zone:

The moderately economic developed states of India are Arunachal Pradesh, Meghalaya, Mizoram, Chhattisgarh, Rajasthan, Assam, and Sikkim (Fig. 3). With high per capita income, the all states recorded large workforce participation rate and large labour force participation rate. Although employee in organised sector is less in Meghalaya and Mizoram, high in Assam and Rajasthan and rest of the state recorded

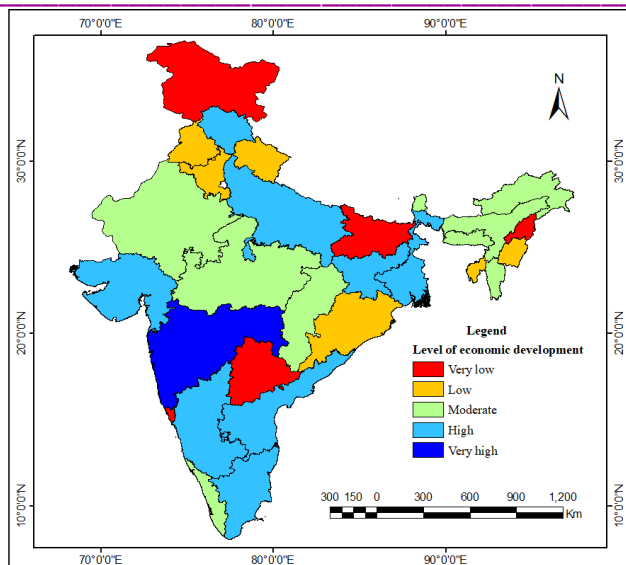
moderate share of employee in organised sector. Sikkim, Rajasthan, Meghalaya, and Mizoram comprise poorer quantity of BPL population whereas Arunachal Pradesh, Chhattisgarh, Assam recorded high proportion. On the other hand slum reporting town is not as much of in Assam, sensible in Arunachal Pradesh, Meghalaya, and Rajasthan. Due to inauspicious physical condition such as undulating nature of land, mountainous region, dense forest, Meghalaya, Assam, Sikkim has insignificant proportion of net shown area, net irrigated area, and low level of gross cropped area. Similarly at that time the occupation in commercial bank is extremely low in these states. So it is concluded that Chhattisgarh, Rajasthan, and Mizoram recorded moderate level of development on basis of selected economic indicators. But Rajasthan practiced highest proportion of grossed cropped area; though the agricultural characteristics are not greater due to arid condition. Similarly, the number of factories is moreover high in state of Chhattisgarh and Assam. Entire state recorded large proportion of marginal worker. This discoursed factor give chance to stay in this group.

#### **Low developed region:**

Uttarakhand, Manipur, Haryana, Punjab, Tripura, and Odisha are categorized in this group. Though the per capita income is high in the state of Uttarakhand and Tripura but the agricultural status is very low due to mountainous region of undulating plane of surface. These states have fewer number of commercial bank. The percentage of cities reporting slum population is high in Uttarakhand that is the indicators of lower development. Manipur and Odisha have the proof of less amount of per capita income. Beside Manipur, Tripura, and Haryana also have experienced high percentage of population with BPL. Tripura face the problem of less number of employees in commercial bank. Cropping intensity and the household availing banking services is very low in Odisha. But there is another reason behind the low level of economic development in the state of Punjab and Haryana. These two enjoy the high per capita income, high proportion of irrigated area, gross cropped area, net shown area but low level of workforce participation rate, labour force participation rate and also the lower number of commercial bank has resulted in this zone. Except the state of Haryana, and Odisha employee in organised sector is too low in the entire state. With this large number of marginal workers has restraint the development.

#### **Very low developed region:**

Jammu Kashmir, Nagaland, Goa, Telangana, and Bihar belong to this very low developed region. All the selected economic indicators experienced lower development in Jammu & Kashmir, Nagaland like per capita income, labour force participation rate, workforce participation rate, grossed cropped area, net shown area, irrigated area, employees in commercial bank etc. But banking services is advanced in Jammu & Kashmir. In Goa per capita income, labour force participation rate, workforce participation rate, number of commercial bank is high but agriculturally Goa remain in very low developed. On the other hand in Bihar, good indicators of agriculture is prevailed like large proportion of gross cropped area, net shown area, net irrigated area, and large amount of agricultural labour. But less per capita income, lowest bank services has present constrained in the development. Massive amount of BPL population, agricultural worker, marginal workers, and less no of factories are the reason behind to this very low development.



**Fig .3 Level of Economic Development in India**

**Level of overall development in India:**

To evaluate the overall socio economic development the composite indices of social, demographic, economic indicators have been combined jointly to work out composite indices for over all development at state level.

**Table 5: Composite index value matrix of overall indicators**

Composite Z score	Level of development	Name of the state
149.08 - 155.64	Very low	Jammu & Kashmir (149.08), Nagaland (151.75), Bihar (153.43), Haryana (154.75), Arunachal Pradesh (155.64), Punjab (157.03), Meghalaya (157.07), Sikkim (158.95), Odisha (159.68), Assam (160.42), Uttarakhand (159.29), Rajasthan (159.57),
155.64 - 160.42	Low	Madhya Pradesh (159.88), Telangana (160.29), Manipur (161.47), Tripura (161.49), Uttar Pradesh (162.59), Jharkhand (162.87), Gujarat (163.05), Goa (163.16), Mizoram (163.94), Chhattisgarh (164.24)
160.42 - 164.24	Moderate	Himachal Pradesh (168.26), West Bengal (168.55), Karnataka (170.57), Andhra Pradesh (173.49),
164.24 - 173.49	High	
173.49 - 179.60	Very high	Tamilnadu (176.50), Maharashtra (177.66), Kerala (179.60)

**Very high developed Region:**

The state having the composite index between 173.49 and 179.60 have been included in this category. They are Tamilnadu, Maharashtra, and Kerala. Per capita income and other economic indicators like workforce participation rate, labour force participation rate, the percentage of slum population, percentage of the population live below the poverty line, banking services, gross cropped area, and so on is experienced very high level of development in these states. With the high level of agricultural characteristics, excellent banking services, less number of slum population, the lower proportion of BPL population, and the increasing amount of per capita income, Maharashtra measured as economically developed state. However in terms of certain social factors like literacy rate, different educational infrastructure, transport network,

the percentage of the household having drinking water from the treated source and other facilities. Maharashtra has justified as a moderate state. It accomplished with the good health services. Tamilnadu has the superior circumstance in terms of per capita income, high level of labour force participation, high rate of workforce participation, high level of banking services, and a high level of cropping intensity. These state also experienced the lower number of the population who live below the poverty line. Entire states are bestowed with the facilities like encouraging the number of all level of school such as primary, upper primary, secondary, higher secondary school, optimistic educational infrastructural amenities. Due to the high literacy rate and also have the high female literacy rate Kerala have experienced excellent health condition like low infant mortality rate, low death rate etc. Due to the developed economic condition, the residences of these states are able to provide outstanding educational facilities, and also the dreadfully well health facilities which are a prime motivation of socio-economic development.

#### **High Developed Region:**

High developed regions are Himachal Pradesh, West Bengal, Karnataka, and Andhra Pradesh(Fig.4). On the basis of some selected indicators these all state considered as socially developed and also as an economically developed state. The entire states of this zone stands for high per capita income, high labour force participation rate, high workforce participation rate, high banking services, high level of cropping intensity, lower share of the population live below poverty line and fewer percentages of cities reporting slum population. Employment in public and private sector is too high in the state of Jharkhand. At the same time, Karnataka and Gujarat also practiced high percentage of gross cropped area and number of employees in the commercial bank. In Gujarat, the amount of factories is excessively high. The entire favorable factor resulted in the high development of this state. On the other hand Uttar Pradesh, West Bengal is based on agricultural activities where the percentage of net irrigated area and net shown area, cropping intensity, is very high that help in the economic development of the state. Along with the exceedingly economic development, these states of this zone are also bestowed with some social facilities like encouraging the number of all level of schools such as primary, upper primary, secondary, higher secondary school, optimistic educational infrastructural amenities, favorable health services and better health condition. These are the causes behind the socio-economic development of the state.

#### **Moderately developed Region:**

The underlying state of this zone is Manipur, Tripura, Uttar Pradesh, Jharkhand, Gujarat, Goa, Mizoram, and Chhattisgarh. The high literacy rate, high level of the educational infrastructural facility, good health condition, and services, accessibility by rural road network and other facilities of social life provide development of Tripura, Goa, Mizoram, and Chhattisgarh but the reverse stipulation is found in the economic development of these state. Economically Tripura, Goa, Mizoram and Chhattisgarh stand for the low developed zone, very low developed region, and the moderately developed region respectively. Beside this Gujarat is remarkably developed in the economic sector having encouraging characteristics of agricultural, high banking services. The modest level of literacy rate, educational infrastructural facilities, and the sensible condition of health services, latrine facilities, drinking water facilities, and the moderate number of urban population hamper the state to acquire vastly development. Economically Jharkhand presented as highly developed state whereas fewer literacy rate, less proportion of urban population, poorer health services and lower level of latrine facilities, drinking water facilities assist the state to stay in this category. Uttar Pradesh is based on agricultural productivity where the percentage of the net irrigated area and net shown area, cropping intensity, is quite high that are the causes behind the development of this state but minor literacy rate, subordinate level of drinking water facilities from the treated source causes the smaller level of health condition. That is the motivation for the moderate development of these states in overall socio-economic development.



### Low Developed Region:

The state having the composite index between 155.64 and 160.42 have been included in this region. These states are Punjab, Meghalaya, Sikkim, Odisha, Assam, Uttarakhand, Rajasthan, Madhya Pradesh, and Telangana. From the entire state, Punjab, Uttarakhand, and Odisha considered as economically low developed. A huge number of marginal workers were restraint these states to achieve the economic development. However, these three states considered as moderately developed in the social sector. Above 50 percent of the population live in the rural sector and also the states have less proportion of the female population are the causes behind the moderate development of the social section. On the other hand, Meghalaya, Sikkim, Assam, and Rajasthan experienced economically moderate developed as the states are recorded huge percentage of marginal worker and smaller quantity of factories. But Meghalaya, Assam, Rajasthan and Andhra Pradesh are socially low developed. Enrolment ratio in the upper primary section in these states are moderate and low in secondary, higher secondary and undergraduate level. In addition, the states were experiencing the low level of latrine amenities. With these unfavorable circumstances, the facility of drinking water from the treated source is not adequate in all state. That's why these states are considered as socially backward. The numbers of television users are incredibly stumpy in these included states. The density of population and urban population prevails with a very low proportion. The lower proportion of the female population, female teacher and also high death rates give the chance to stay in this zone. Till now 30% household of these included state of this zone has experienced unfavorable latrine facilities within the premise. In terms of health status near about 50 % deliveries of these states do not occur institutionally.

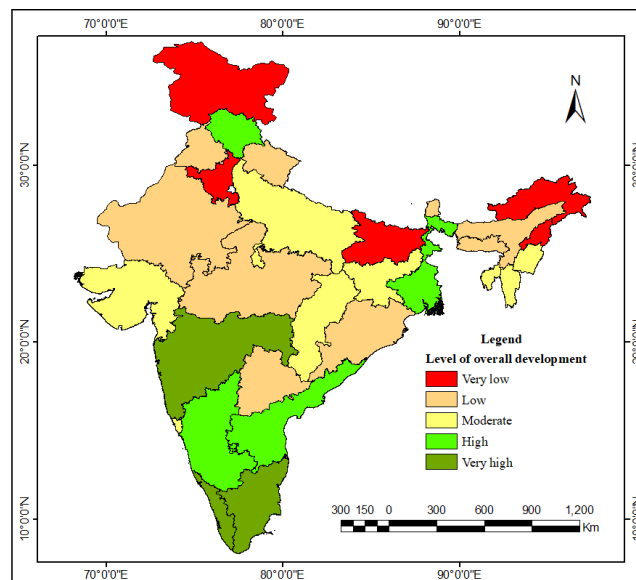


Fig .4 Level of Overall Development in India

### Very Low Developed Region:

The lowest level of development was reported from Jammu Kashmir, Nagaland, Bihar, Haryana, and Arunachal Pradesh. The entire states of this zone have affirmation of low level of social development in terms of different social indicators. Due to illiteracy, the residents of this zone are very unaware about their health as they countenance the problems of high infant mortality rate, high death rates, and small quantity of institutional deliveries. Beside this poorer quantity of female population, the female teacher gives the chance to stay in this zone. At the same time, the integrated state of this zone is documented as economically backward zones. But the state of Arunachal Pradesh Jammu and Kashmir and Nagaland

experienced the moderate level of development in the economic sector. Due to the mountainous region of the undulating plan of Jammu Kashmir, Arunachal Pradesh and Nagaland experienced little share of the net irrigated area, gross cropped area, and net shown area. However, the per capita income of Jammu Kashmir is modest due to tourism services and also due to the availability of different kind of flower, fruits, and masala. But it faces the difficulties of political turmoil so as to obstruct the regular life of residences and also blocked the possibility of tourist to move toward Jammu Kashmir. The lack of adequate health facilities, educational infrastructure, the limited number of bank, low level of basic amenities is the chief hindrance of overall development.

## CONCLUSION

The previous examination reveals that the stratum of social development and economic life of the populace within the state of India recorded the difficulties of extensive discrimination, which is undeniably a reason for considerable apprehension (Ray and Rahaman 2017). Jammu Kashmir, Nagaland, Bihar, Haryana, and Arunachal Pradesh considered as comparatively diffident state whereas Tamilnadu, Maharashtra, and Kerala measured as socio-economically developed state. As a result, the residents of these states survive with dissatisfaction and it will be the causes of making a conception of crumbling in the society. Contemporary regional policies ought to be formulated to conquer such a problem. The earlier study divulge that in comparison to other methods like deprivation index, average deprivation index, composite development index, ranking method, Gini coefficient method, simple composite index method without Eigenvector, Wroclow method, level of development is appropriately analyzed by the principal component analysis method as principal composite index with Eigenvector is relatively significant for the appreciation of level of development as it is protected with the help of standardized value. And Eigenvector is the far better in comparison to other methods. By using this technique, the existing regional disparities in India presented properly. Amalgamated and overall progress in India, such spatial discerning appreciative facilitates to formulate the suitable policy. And this paper also evaluates that the relative position of the state did not experience to a great extent of transformation from the period of study. As development has acquired no significance if there is only social and economic development so it is obligatory to diminish the regional disparities and achieve the evenhanded regional development both in socio-economic sector and transform India from developing country to developed country.

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