

TAXONOMY OF SOCIO-ECONOMIC DEVELOPMENT ACROSS INDIAN STATES

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The socio-economic development of each individual State is crucial for the overall development of a developing economy like India. It is vital for poverty alleviation and for improvements in the quality of life of people. In this context, this paper examines the pattern of socio-economic development across twenty Indian States over last three decades. The empirical evidence is found in favour of the existence of spatial as well as temporal disparity in the levels of socio-economic development across States of India. This finding is critical for the policy makers targeting to achieve balanced regional development. Appropriate infrastructural developments along with good governance system can be considered vital in the direction of accelerating the process of socio-economic developments in lagging States.

Keywords: *Socio-economic development, Indian States, Composite Index, Inequality*

INTRODUCTION

Since a long time socio-economic development of a region has been considered as the primary process of human progress, and as important system to promote the quality of life of people (Narain *et al.* 2007; Mishra, 2017). This socio-economic development has been argued to minimize the disparities between rich and poor, rural and urban, and male and female in a society (Balakrishna, 1987; Dreze & Sen, 1999; Iravani, 2011). Improper socio-economic development limits the growth and utilization of human resources and their capabilities which has serious implications for the overall progress of the society (Kesarwani & Yadav, 2014). Thus, the development literature has constantly been enriched by the studies concerning the identification of indicators which can measure the socio-economic development of a region. Although increase in per capita output/income has long been considered as an important indicators of economic growth (Bhattacharya & Sakthivel, 2004), it is only a facilitator of social development, and by no means sufficient (Porter, Stern & Loria, 2013; Gill & Taylor, 2013). Socio-economic progress is more than just economic growth. It is rather a multi-dimensional process (Ohlan, 2013) which requires raising living standards of people, and improving their education, health and equality of opportunity (World Bank, 1992; Sen, 2003; Alkire, 2008; Herguner, 2012; Dreze & Sen, 2013; Mishra, 2017). The major components of socio-economic development include per capita income, level of agricultural development, level of industrial development, degree of urbanization, occupational structure, and level of educational development, health status, population characteristics, and infrastructure. Thus, the pattern of socio-economic development can better be studied in terms of a composite index that embraces the important dimensions of socio-economic progress and also articulates regional disparity (Kundu & Varghese, 2010; Mishra, 2017).

India is a land of diversity in almost all aspects of human well-being. It is a country of socio-economic, political, cultural, demographic and environmental diversities. The diversity is also seen in the socio-economic progress of its States. Dreze & Sen (2013) aptly observed that the States like

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Tamil Nadu and Himachal Pradesh have stepped up in the ladders of socio-economic development to be among the top performers in socio-economic progress while the traditionally backward States (like Bihar, Uttar Pradesh, Madhya Pradesh, etc) have retained their positions among the worst performing States. The attainment of balanced regional development has remained one of the objectives of the economic planning process in India since 1951 (Kurian, 2007). In spite of such efforts at the policy circle, substantial inter-state disparities in socio-economic development still persist. The research outcomes of Bhattacharya & Sakthivel (2004), Jha (2004), Pal & Ghosh (2006), Ghosh (2008), Kalra & Sodsriwiboon (2010), Bandyopadhyay (2011), Mishra *et al.* (2016), and Mishra (2017) reveal the persistence of socio-economic development disparity across Indian States in the pre- and post-reform periods.

The presence of such disparity across Indian States is arguably the biggest development challenge, the country is facing in all its development moves. It has serious implications for the Indian economy, society and polity (Kurian, 2007). In order to address the issue, it is critical to understand the degree of disparity, its pattern and taxonomy. It is with this backdrop, this paper is an attempt to measure the socio-economic development of Indian States in a multi-dimensional framework, and to analyse the taxonomy of its pattern since 1980s. The rest of the paper is organised as follows: Section 2 highlights the data and methodology of the study; Section 3 discusses the findings; and Section 4 concludes.

Data and Methodology

In line with the objective of the study, first the trends in economic inequality across Indian States is analysed in terms of per capita net state domestic product at constant prices. Then the regional development disparity is examined by constructing the composite index of socio-economic development applying Wroclaw Taxonomic method developed by Florek *et al.* (1952) and Narain *et al.* (1991, 2007). Also, the taxonomy of socio-economic development of States is prepared by following fractile classification technique as suggested by Narain *et al.* (2007).

For this purpose, twenty six socio-economic indicators including share of agriculture, share of manufacturing, share of services, gross fiscal deficit, credit-deposit ratio, population growth, population density, percentage of urban population, percentage of SC&ST population, sex ratio, percentage of population below poverty line, work participation rate, female literacy rate, gross primary enrolment ratio, primary dropout rate, primary pupil-teacher ratio, crude birth rate, crude death rate, infant mortality rate, effective couple protection rate, percentage of households having access to electricity, percentage of households having access to safe drinking water, percentage of households having toilet facilities in the premises, per capita electricity consumption, average population per bank and road density have been considered. The data on above mentioned socio-economic indicators have been compiled from various sources including CSO, Census of India, Economic Survey, EPW Research Foundation database, CMIE database on States of India, and the Handbook of Statistics on India States of RBI for the time points 1981, 1991, 2001 and 2011.

Since the chosen development indicators are taken from different population distributions, and are measured in different units, first these are standardized by using the formula:

$$Z_{ij} = \frac{X_{ij} - \bar{X}_j}{\sigma_j}$$

where Z_{ij} is the standardized indicator of the i^{th} State, X_{ij} is the given value of the j^{th} indicator for i^{th} State, \bar{X}_j is the mean of the j^{th} indicator, and σ_j is the standard deviation of the j^{th} indicator. Then the pattern of development (C_i) of the i^{th} State is computed by the formula:

$$C_i = \left[\sum_{j=1}^k \frac{P_{ij}}{CV_j} \right]^{1/2}$$

where $P_{ij} = (Z_{ij} - Z_{oj})^2$, Z_{oj} is the best value of each indicator, maximum value or minimum value depending on the direction of its impact on economic growth, and CV_j is the coefficient of variation in X_{ij} for the j^{th} indicator. The composite index of socio-economic development of i^{th} State is given by:

$$SEDI_i = \frac{C_i}{C}$$

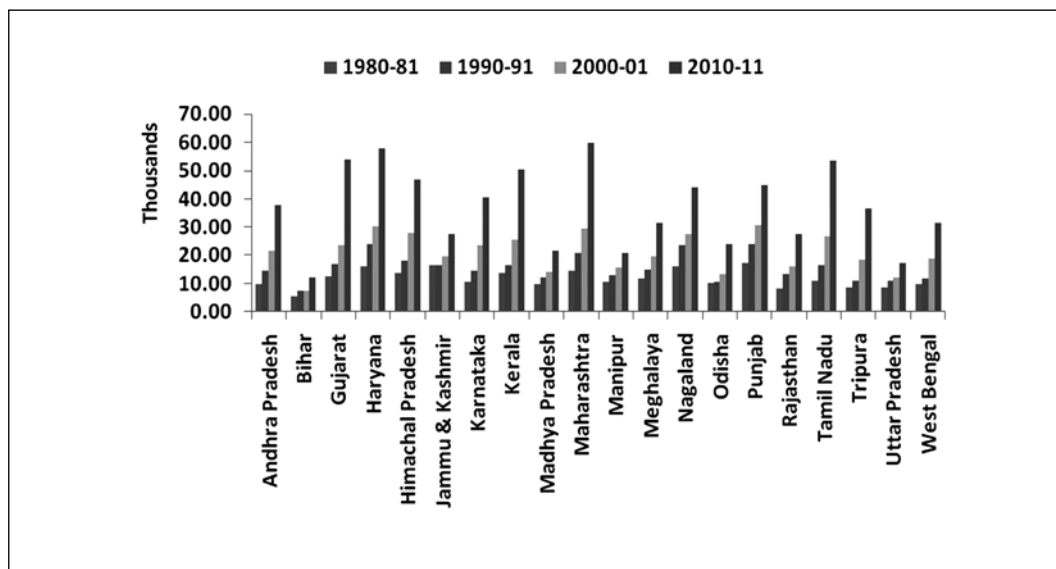
where $C = \bar{C} + 3\sigma_{C_i}$, \bar{C} is the mean of C_i and σ_{C_i} is the standard deviation of C_i . Smaller value of SEDI indicates high level of socio-economic development and higher value of SEDI indicates low level of development. Next, the following taxonomy of States is created on the basis of their socio-economic development in terms of a fractile classification from the assumed distribution of the mean of SEDI.

Table 1: Taxonomy of Pattern of Socio-economic Development

Criteria of Taxonomy	Category of Socio-economic development
SEDI less than or equal to Mean – S.D.	High level developed States
SEDI in between Mean – S.D. and Mean	High middle level developed States
SEDI in between Mean and Mean + S.D.	Low middle level developed States
SEDI greater than or equal to Mean + S.D.	Low level developed States

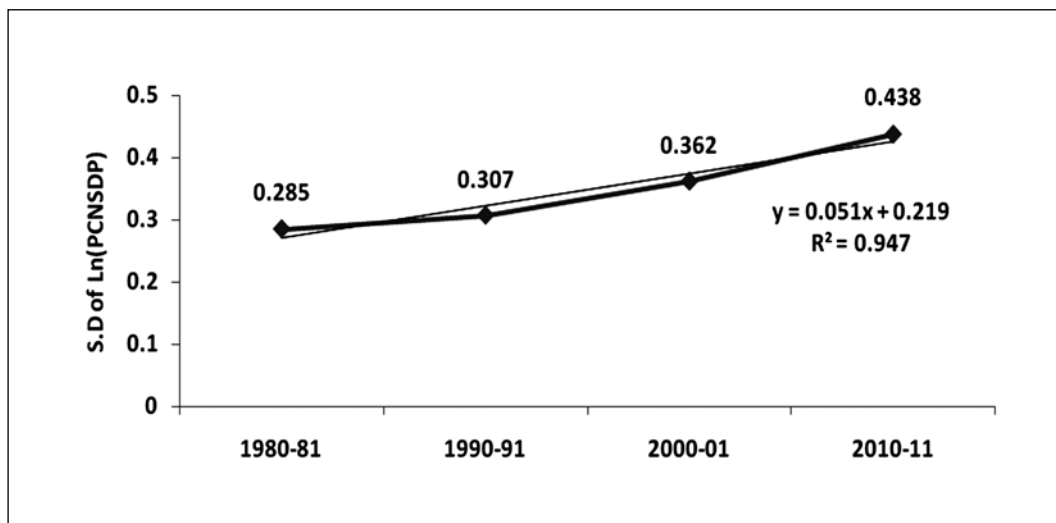
FINDINGS AND DISCUSSION

At the outset, the time series plot of per capita net state domestic product at factor cost and at constant prices of 2004-05 for 20 Indian States at 4-time points is created to visualize the presence of income inequality over space and time (see fig.1). It is revealed from fig.1 that the real per capita output/income has increased in each individual State over the last three decades. But this increase is not uniform spatially. In some States like Bihar, MP and UP, the real per capita output is substantially low thereby indicating the lowest levels of economic growth. On the contrary, for Gujarat, Haryana, Maharashtra and Tamil Nadu, it is at a higher level thereby indicating highest levels of economic growth. A visible income disparity is clearly reflected when σ -convergence test of Barro & Sala-i-Martin (1992) is employed. The σ -convergence takes place if the standard deviation of the natural logarithm of real per capita income across States declines over time (see fig.2). But our case is different. The trend line shows an upward move which is sufficient to conclude about the persistence of spatial-temporal income inequality in India.

Figure 1 : TS Plot of Per Capita NSDP, Indian States

Source: Author's Own Plot

In the development literature, it is argued through empirical supports that the income inequality leads to socio-economic disparities. But this income inequality does not clearly reveal any sort of socio-economic disparity across regions (Porter, Stern & Loria 2013) though it is not the sufficient condition of such divergence. The reason is that socio-economic development is a complex multi-dimensional process which is difficult to capture through a single income indicator.

Figure 2 : σ -Convergence Test of Income Inequality across Indian States

Source: Author's Own Plot

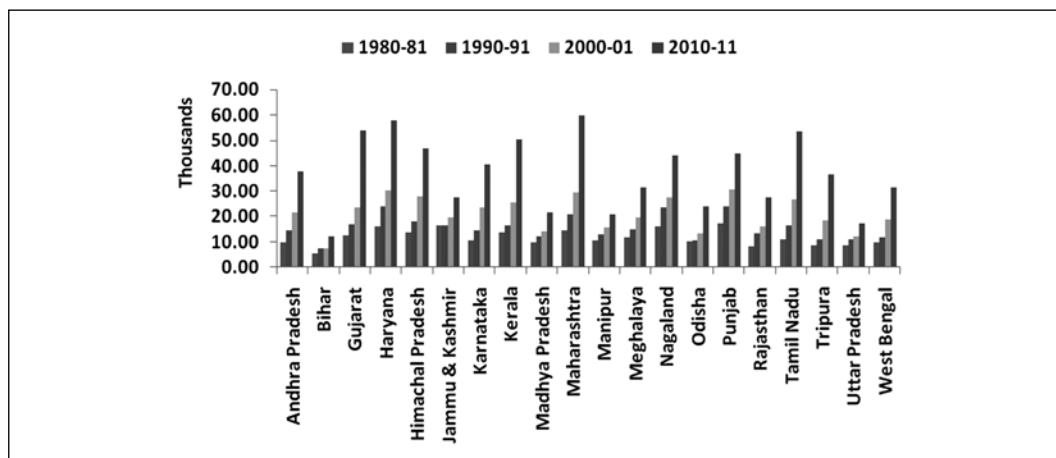
Table 2: Socio-economic Development Index

States of India	1981	Rank	1991	Rank	2001	Rank	2011	Rank
Andhra Pradesh	0.7293	12	0.7334	11	0.6790	11	0.7146	13
Bihar	0.8675	19	0.8885	20	0.8985	20	0.9144	20
Gujarat	0.6304	5	0.6149	4	0.5485	2	0.6455	6
Haryana	0.6570	7	0.6842	9	0.6380	7	0.6480	7
Himachal Pradesh	0.6858	10	0.7076	10	0.6504	9	0.6384	5
Jammu & Kashmir	0.6355	6	0.6519	6	0.6371	6	0.6916	10
Karnataka	0.6764	9	0.6668	8	0.5936	4	0.6573	8
Kerala	0.7503	13	0.7842	15	0.8361	18	0.8426	18
Madhya Pradesh	0.7800	16	0.7761	13	0.6918	13	0.7775	14
Maharashtra	0.5323	1	0.5471	1	0.4937	1	0.5417	1
Manipur	0.8173	18	0.7767	14	0.7349	15	0.7019	11
Meghalaya	0.7576	15	0.8110	17	0.7383	16	0.7920	15
Nagaland	0.6983	11	0.6665	7	0.6686	10	0.7035	12
Odisha	0.8900	20	0.8557	19	0.7988	17	0.7921	16
Punjab	0.5426	2	0.6298	5	0.6424	8	0.6689	9
Rajasthan	0.7513	14	0.7919	16	0.6956	14	0.8036	17
Tamil Nadu	0.6219	4	0.5943	2	0.5865	3	0.6141	2
Tripura	0.6742	8	0.7365	12	0.6815	12	0.6246	4
Uttar Pradesh	0.7815	17	0.8144	18	0.8756	19	0.8465	19
West Bengal	0.5774	3	0.6079	3	0.6147	5	0.6244	3
Mean	0.7028		0.7170		0.6852		0.7122	
S.D.	0.0990		0.0943		0.1049		0.0959	
Mean – S.D.	0.6038		0.6226		0.5802		0.6162	
Mean + S.D.	0.8019		0.8113		0.7901		0.8081	
C.V.(%)	14.0865		13.1520		15.3094		13.4653	

Source: Author's Own Calculation

In addition, it is also difficult to capture the complex process of socio-economic development in terms of a number of indicators when examined individually. Thus, a composite Socio-Economic Development Index (SEDI) is constructed for each State and for each time point under consideration by employing the Taxonomic method elaborated earlier. The values of SEDI are presented in Table-2. The higher the SEDI, the lower is the level of socio-economic development (see fig.3. The ranking of States over years indicate that the State of Maharashtra occupies the first position and Bihar occupies the last position. It is further observed that the relative variation as indicated by C.V. of socio-economic development indices is higher for the time point 2001. The level of variation declined from 1981 to 1991, then increased in 2001 and further declined to 2011.

Figure 3: Socio-economic Development Index of Indian States



Source: Author's Own Plot

Table 3: Taxonomy of Socio-economic Development across Indian States

Criteria of Taxonomy	States in Different Time Periods
High Level Development $SEDI \leq Mean - SD$	1981 -Maharashtra, Punjab, West Bengal 1991 -Gujarat, Maharashtra, Tamil Nadu, West Bengal 2001 -Gujarat, Maharashtra 2011 -Maharashtra, Tamil Nadu
High Middle Level Development $Mean - SD < SEDI < Mean$	1981 -Gujarat, Haryana, Himachal Pradesh, J&K, Karnataka, Nagaland, Tamil Nadu, Tripura 1991 -Haryana, Himachal Pradesh, J&K, Karnataka, Nagaland, Punjab 2001 -Andhra Pradesh, Haryana, Himachal Pradesh, J&K, Karnataka, Nagaland, Punjab, Tamil Nadu, Tripura, West Bengal 2011 -Gujarat, Haryana, Himachal Pradesh, J&K, Karnataka, Manipur, Nagaland, Punjab, Tripura, West Bengal
Low Middle Level Development $Mean < SEDI < Mean + SD$	1981 -Andhra Pradesh, Kerala, Madhya Pradesh, Meghalaya, Rajasthan, Uttar Pradesh 1991 -Andhra Pradesh, Kerala, Madhya Pradesh, Manipur, Meghalaya, Rajasthan, Tripura 2001 -Madhya Pradesh, Manipur, Meghalaya, Rajasthan 2011 - Andhra Pradesh, Madhya Pradesh, Meghalaya, Odisha, Rajasthan
Low Level Development $SEDI \geq Mean + SD$	1981 -Bihar, Manipur, Odisha 1991 -Bihar, Odisha, Uttar Pradesh 2001 -Bihar, Kerala, Odisha, Uttar Pradesh 2011 -Bihar, Kerala, Uttar Pradesh

Source: Author's Own Classification

This indicates the presence of regional disparity in the socio-economic development across Indian States over years. Although the ranking method is simple to interpret, it does not infer the taxonomy of the States according to their levels of socio-economic development. Thus, the literature suggests using a fractile classification of States (Narain *et al.* 2007). According to this, there can be four levels of socio-economic development, viz., high, high middle, low middle, and low. This is presented in Table-3. It is revealed that Maharashtra is the only State which is in high developed category in all the four time points, and Bihar is the only State in low developed category in all these time points.

It follows that the high performing States remained at the high levels of socio-economic development and the low performing States remained at the low levels of socio-economic development. The States of Gujarat, Maharashtra, and Tamil Nadu are found to be better performing as compared to other States. The low performing States include Bihar, Odisha, and Uttar Pradesh which needs special attention for further development. In addition, Kerala appeared in the low development category in last two time points. This may be due to the underperformance of certain indicators which needs to be identified. In this respect, this paper is limited and it is left for further research. However, this study identifies Bihar, Odisha and Uttar Pradesh as most lagging or backward States of India. Special policy attention should be given for their development. Better policy framework for infrastructural development to attract private capital from within and outside the country may be recommended for the socio-economic progress of these States. Efficient governance system is also warranted to maintain law and order, and attract industrial investment in these States. The necessity is also to provide for better human capital formation through improvements in health, education, housing and sanitation. In short, a comprehensive development strategy which combines infrastructure, basic amenities and social development may be coined, and implemented in collaboration with major private partners for the socio-economic progress of the lagging States.

CONCLUSION

In developing countries like India, focusing on socio-economic development keeps a wide relevance in the context of reduction of regional imbalances, poverty alleviation and improving the quality of life of people. Thus, this paper examines the pattern of socio-economic development across Indian States over the last three decades. The empirical evidence is found for the persistence of socio-economic disparity across States over the years. The pattern of this inequality is such that Bihar, Odisha, and Uttar Pradesh remained as the low performing States whereas Gujarat, Maharashtra, and Tamil Nadu leveled as the better performing States. The development challenge in the country is to make the lagging States upward moving in the ladders of socio-economic progress. In light of the present scenario of political economy of these States, it is suggested to improve the governance system such that current laws and regulations create favourable environment to attract new growth opportunities and enhance the living standards of people. Congenial laws and regulations can make it easier for the private investment to create employment opportunities at equitable wages. Furthermore, if right types of infrastructure facilities are provided, then new industries would come up along with better opportunities for human capital formation. All these would certainly go a long way in reducing socio-economic disparities across Indian States thereby making the economic and social development of the nation robust.

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