

Planning for Minimization of Socioeconomic Inequalities within Vidarbha Region, Maharashtra, India

Amruta Khairnar and Joy Sen

Abstract—Disparity in India has been persisting since independence causing many socioeconomic problems and its removal has become the most prime objective of the planned development in India. Hence the paper attempts to study the disparity at State and Regional level and gives inclusive planning guidelines to achieve balanced regional development. At State level, the relative socioeconomic backwardness of Vidarbha Region based on Interregional analysis using selected indicators like Foreign Direct Investment, Human Development Index, Per Capita District Domestic Product has been assessed and broad guidelines have been proposed. In the later part at Regional level, the relative backwardness of districts based on Intra-regional analysis using socioeconomic indicators has been assessed within Nagpur sub region and factors responsible for backwardness & disparity have been indicated. The policy guidelines for Identified sub region have been proposed based on the most significant factor and their extent of relationship explaining backwardness Nagpur sub region.

Keywords—Balanced Growth, Foreign Direct Investment, Human Development Index, Per Capita District Domestic Product, Regional Disparity, Socioeconomic Inequality, Vidarbha Region.

I. INTRODUCTION

REGIONAL disparity in the level of economic development has become the vital problem for developed and developing countries. Disparity in India has been persisting since independence due to provincialism and sub provincialism causing many socioeconomic problems [1], [7] and its removal has become the most prime objective of the planned development in our country. So ideally the development should enhance the human capabilities, ensure the equitable distribution of benefits of the economic growth and give an equal chance to everyone to participate in the working society. Such disparities can be observed at various levels like national, state, and regional. One of such states with the interregional and intraregional disparity is Maharashtra. It has a reputation for progress and development in economic terms and is considered as the most developed state since the time of Independence due to higher percentage of urban population. But as per the Human Development Report (HDR) published in 2010 there are widespread inequalities in the

distribution of resources which have led to regional disparities, acute poverty and high level of unemployment.

Maharashtra state comprises three regions namely, Marathwada, Vidarbha and Rest of Maharashtra. Vidarbha region comprises Nagpur and Amravati sub region. To work out the study at the regional level, **Nagpur Sub region** has been selected instead of Amravati Sub region because of the better data availability.

Northern region of Marathwada and Vidarbha lag behind in the overall development. HDR (2010) showed that human development index (HDI) is the lowest for Nandurbar and Gadchiroli districts (0.21) and highest for Mumbai (1). The average HDI for the state of Maharashtra is 0.58 (Refer Fig. 1). In Maharashtra, 19 districts showed HDI less than the state average. Out of those districts most of the districts are belonged to the Vidarbha region. This region is completely neglected, unlike the Western and some of the South-Western districts, which get the Lion's share of State funding and attention. Recently Farmer's suicide has become the major concern in Vidarbha region [2]. From 1997 to 2006, the region has witnessed 36,428 cases of suicide among cotton farmers owing to debt. It indicates that disparity within the state of Maharashtra has risen sharply. Hence, the Paper attempts to analyze the socio-economic inequality, its causes, effects and the probable solutions to the problem. Aim of the study is to understand levels of Socio-economic backwardness for identified region and to form broad guidelines for minimization of inequality in identified region. Objective of the study is not to eradicate the socioeconomic inequality. Eradication of socioeconomic inequality is impossible. It is utopia. What best can be done is to work out on ways and means to minimize the inequality within practical limits. The present Paper is based on this premise and the secondary data from Directorate of Industries, Nagpur.

II. DATA AND METHODOLOGY

Present study attempts to examine the disparity at state and regional levels. At state level in order to assess the backwardness of the Vidarbha region disparity in terms of **HDI, Foreign direct investment (FDI), District wise Industrial development (DID), Per capita district domestic product (PCDDP)** has been studied. To understand the extent of inequality the gap between state average and regions has been calculated on the basis of above mentioned indicators.

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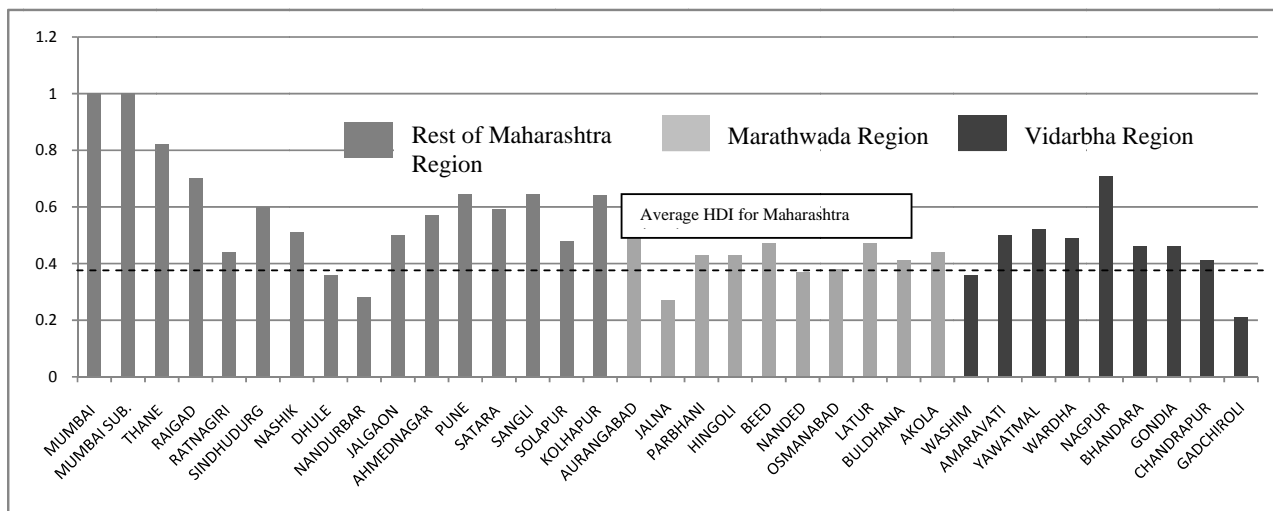


Fig. 1 District wise HDI for Maharashtra state (Source- Human Development Report, 2010)

Based on this study the broad guidelines have been proposed for Vidarbha region. In present paper district wise state level data for above mentioned selected indicators have been taken for the period of 2010. At Regional level, to assess the backwardness of Gadchiroli district a Maxima Minima analysis has been done. It gives the overall level of development of districts within Nagpur sub region. In order to find out the most affecting factor in overall development of the district Regression between Sectoral development indices and Composite development indices have been performed. This has been done through the data available on socioeconomic indicators for the period of 2010.

III. RESULTS AND INTERPRETATIONS AT STATE LEVEL

The gap between Maharashtra state average and Vidarbha region with respect to HDI, FDI, DIDI, and PCDDP has been calculated in percentage. The range of the gap adapted for the analysis is 0-25%, 25-50%, 50-75%, 75-100%. Severity of the problem increases with the range.

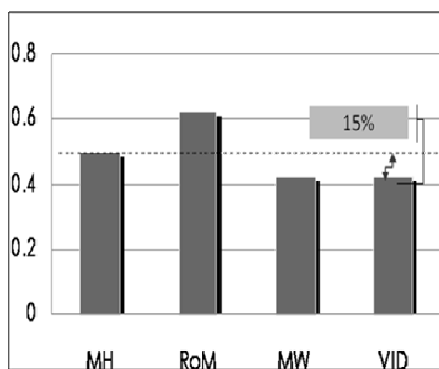


Fig. 2 Gap between average Maharashtra state level and Vidarbha region for HDI

Inequality Based on HDI, FDI, DIDI (investment), DIDI (Labor), PCDDP.

Firstly, HDI is relatively higher for western part than the eastern part of Maharashtra state except for Nagpur district from the eastern part (Refer Fig.3). It is higher for Thane, Mumbai and Pune and lower for Gadchiroli, Yawatmal, Beed, Solapur, and Dhule. The gap between average HDI of Maharashtra State and HDI of Vidarbha is 15% which is fairly low (Refer Fig. 2). However Nagpur district has the highest HDI of 7 which is responsible for increment in the average HDI for Vidarbha region.

Secondly, FDI is highly concentrated in the Mumbai, Thane and Pune District which constitute the western part of the Maharashtra (Refer Fig. 4). It is well connected to the other part of nation through various transportation linkages which boosts the development in that region. Like Konkan railway project has attracted huge foreign direct investment. This has not only brought in innovative technologies in the industrial units in the state but also raised the competitiveness of the business units in western part of Maharashtra [3]. Hence the high gap of 75 % could be seen (Refer Fig.8, Chart 1).

Thirdly, DID in terms of Investment is high in the western zone except Raigad and Dhule. (Refer Fig.5)It is also lower in the eastern zone except Nagpur and Chandrapur. However the gap is 5 % which is very less than 25 %. (Refer Fig.8, Chart 2)

Fourthly, DID in terms of labor is higher in the western zone mainly Thane, Pune, Mumbai, Kolhapur, except Raigad and Dhule. (Refer Fig.6) It's lower in the eastern zone except Nagpur and Chandrapur. It is least in the Gadchiroli and Gondia from the western zone. The Gap of 60.53 % has been observed which is higher than 50 %. (Refer Fig. 8, Chart 3). Fifthly, PCDDP is very high for Thane, Mumbai, Raigad, Nagpur and Pune District. It is lowest for Dhule and Jalna. (Refer Fig.7) Southern eastern part of the Maharashtra state shows low values for all indicators. The gap of 12.83% is lower than 25%. (Refer Fig. 8, Chart 4)

Gini's coefficient for inequality within Maharashtra state is 0.41 which clearly shows that there is a widespread inequality. Empirical study revealed that major unevenly distributed

factors as per above analyses are FDI and Industrial Investment. Hence inequality has risen sharply.

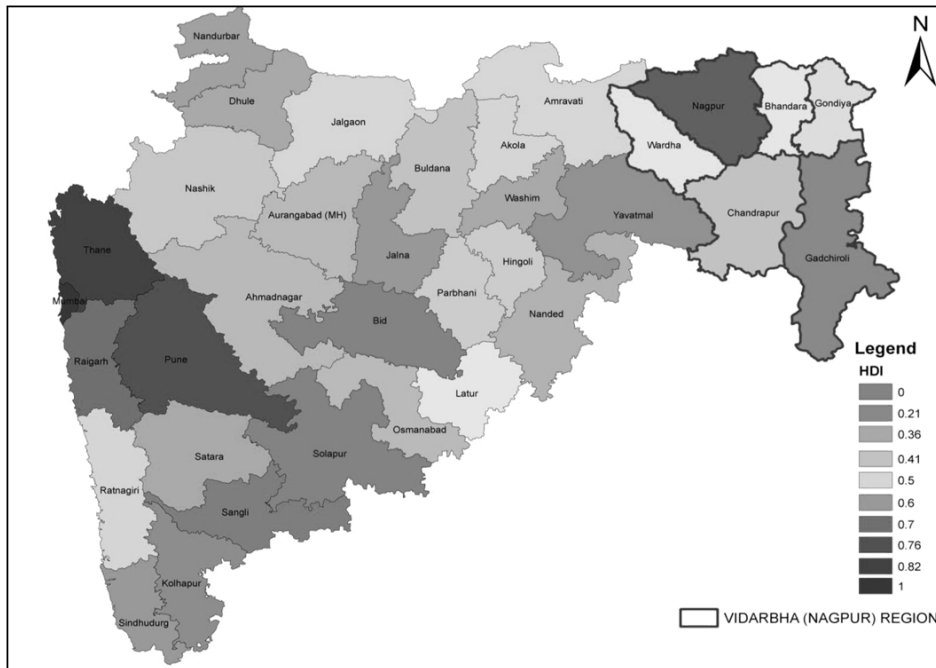


Fig. 3 Inter Regional Inequality based on **HDI** (Source- Primary data on HDI: Human Development Report, 2010)

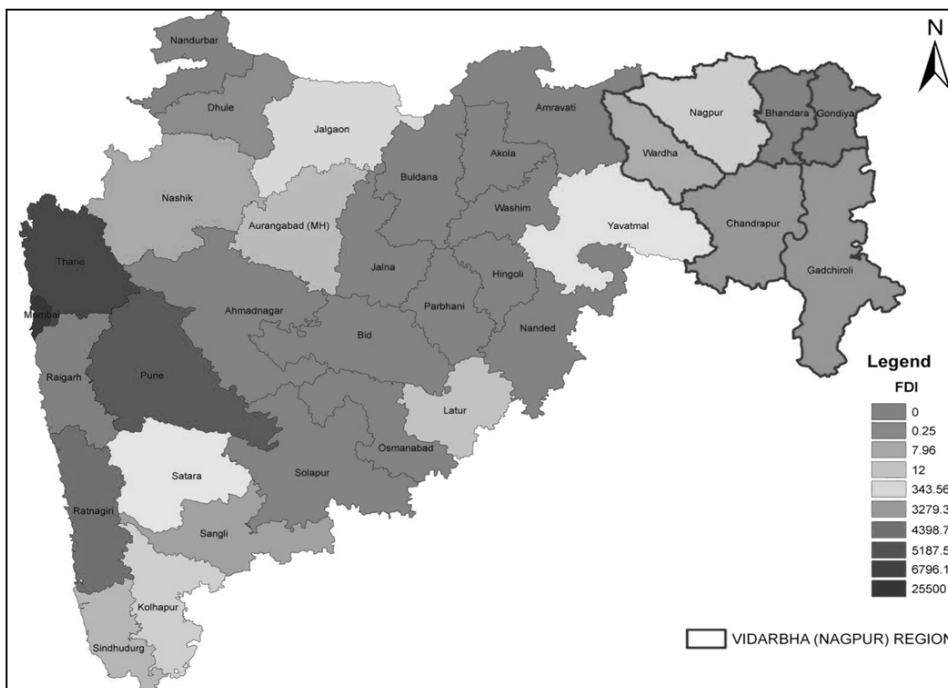


Fig. 4 Inequality based on **FDI** (Source- Primary data on FDI : Directorate of Industries, Nagpur)

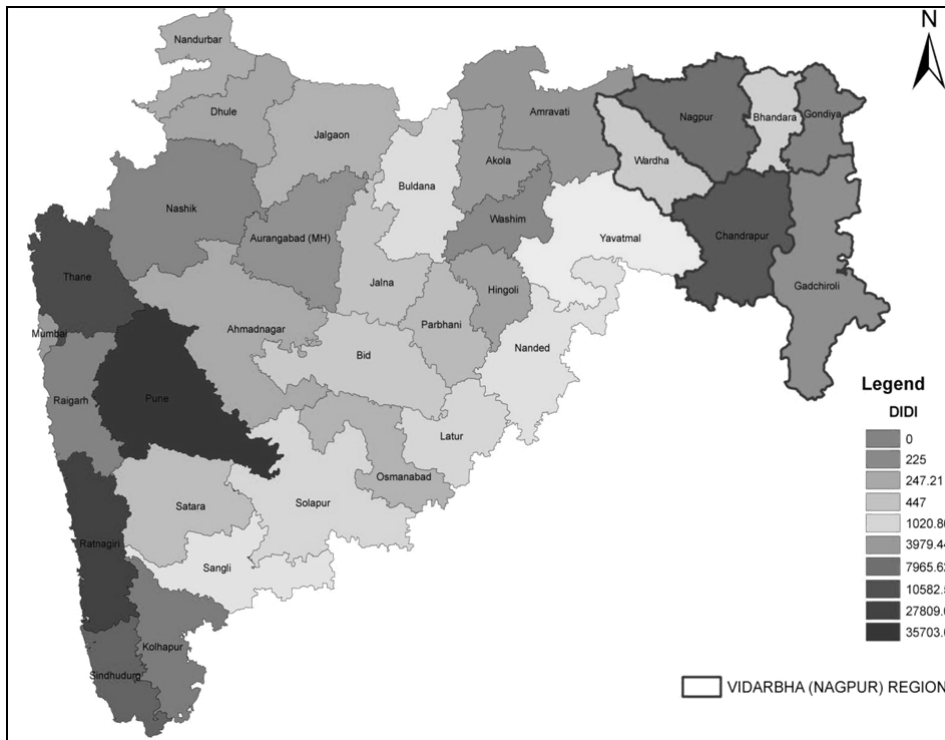


Fig. 5 Inequality based on **DID- Investment** (Source- Primary data on DIDI : Economical and Statistical Department, Mumbai)

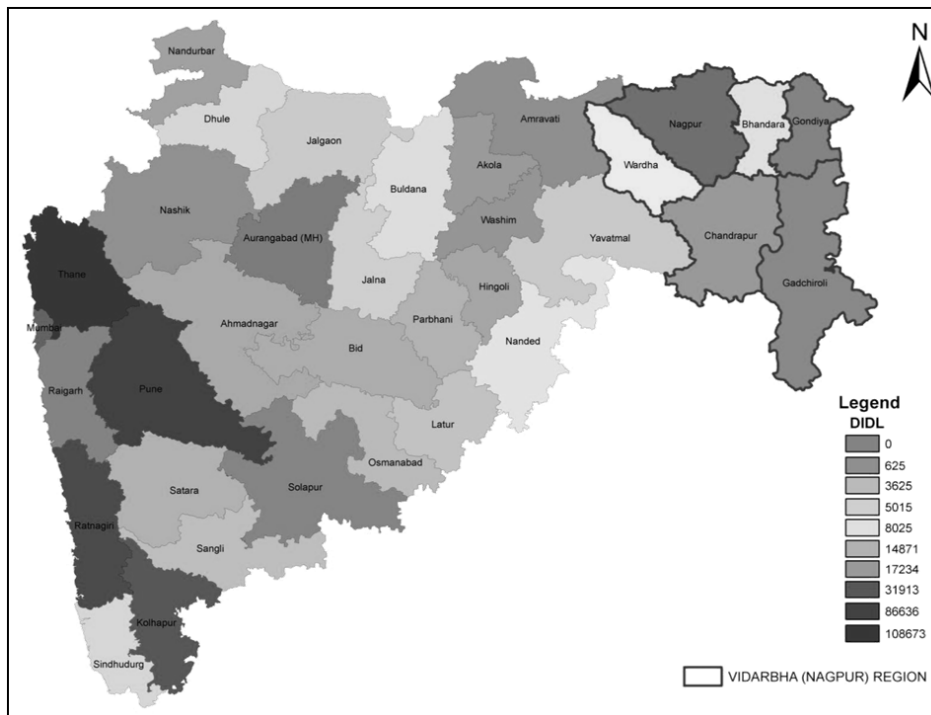


Fig. 6 Inequality based on **DID-Labor** (Source- Primary data on DID-Labor: Economical and Statistical Department, Mumbai)

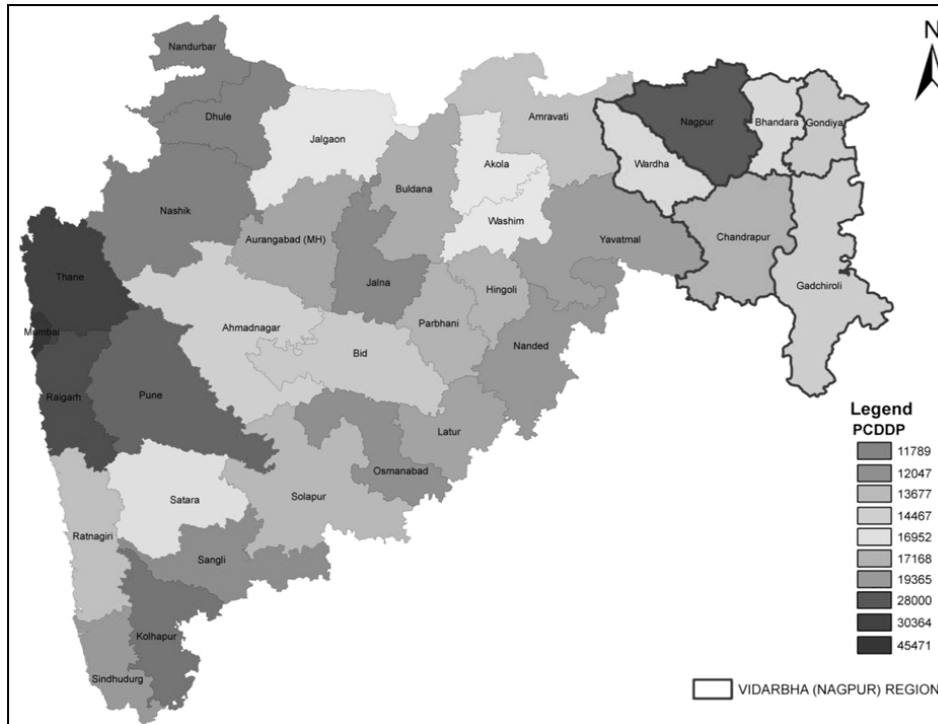


Fig. 7 Inequality based on **PCDDP** (Source: Primary data on PCDDP: Directorate of Economics and Statistics, 2001, District Domestic Product of Maharashtra 1993-94 to 1998-99, Government of Maharashtra, Mumbai)

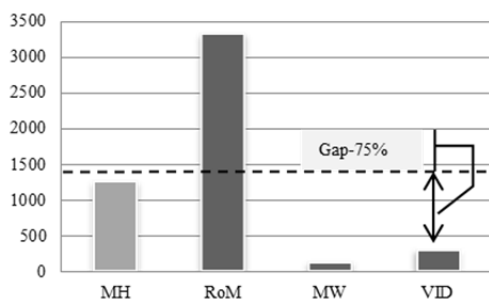


Chart 1- Gap between Average Maharashtra state level and Vidarbha region based on **FDI**

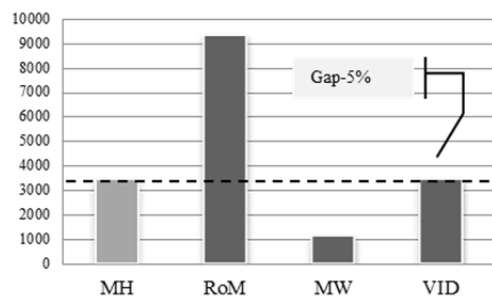


Chart 2- Gap between Average Maharashtra state level and Vidarbha region based on **DID (Investment)**

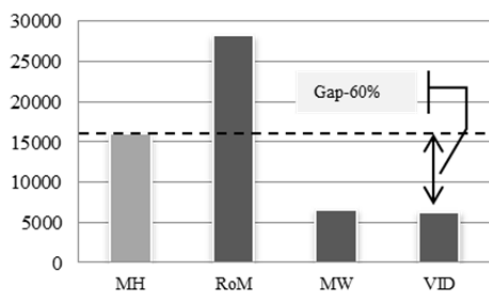


Chart 3- Gap between Average Maharashtra state level and Vidarbha region based on **DID (Labor)**

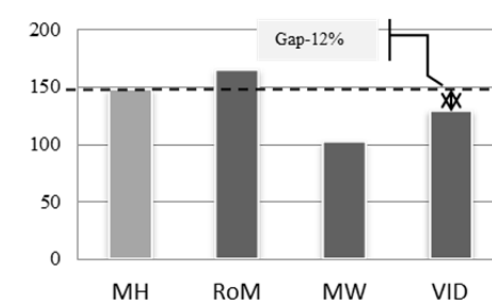


Chart 4- Gap between Average Maharashtra state level and Vidarbha region based on **PCDDP**

Fig. 8 Estimated Gap between Average Maharashtra level and Vidarbha region for FDI, DIDI-Investment, Labor and PCDDP (Source- Economical and Statistical Department, Mumbai)

IV. RESULTS AND INTERPRETATIONS AT STATE LEVEL

Vidarbha region is comprised of Amravati sub region and Nagpur sub region. In order to do analysis at regional level, the focus is on Nagpur Sub region because of the better data availability. It comprises 6 districts namely; Wardha, Nagpur, Gadchiroli, Gondia, Chandrapur, and Bhandara. Maxima Minima Analysis has been worked out to understand the relative backwardness of the district within Nagpur Sub Region. In order to this socioeconomic Indicators have been selected (Refer Table IV, Appendix). Secondly, based on those Indicators district wise Sectoral Development Indices (SDIs) have been calculated for each kind of indicator. Thirdly, Composite Development indices (CDIs) have been calculated which gave overall level of development of the Districts within Nagpur Sub Region. Finally, the Regression between each SDI and CDI has been performed to understand the most affecting factor in the overall development of the District. For this analysis particularly Demographic, Industrial, Transportation, Agriculture, Livestock and Health & Education Indicators have been chosen as per expert opinion and industrial report published by Directorate of Industries in Nagpur.

a) Maxima Minima Analyses

In order to calculate SDIs for Industrialization; Initially the sub indicators (Refer Table I) have been multiplied by the weightages as per expert opinion and factor analysis. Summations of such resultant products give the SDI for Industrial Development. Once the SDIs has been calculated; CDI for a particular district could be calculated by adding all the weighted SDIs.¹ CDIs for each district give the idea of the overall development of the districts.

TABLE I
CALCULATION OF THE COMPOSITE DEVELOPMENT INDEX

Indicators	Calculation of Sectoral & Composite Development Index
Demographic Indictors	$(1 * G_1) + (0.337 * G_2) + (0.602 * G_3) + (0.72 * G_4) + (0.649 * G_5)$
Industrial Indicator	$(0.99 * I_1) + (0.992 * I_2) + (1 * I_3)$
Transportation	$(1 * T_1) + (0.1 * T_2)$
Agriculture	$(0.503 * A_1) + (0.447 * A_2) + (0.995 * A_3) + (0.995 * A_4) + (0.545 * A_5) + (0.915 * A_6)$
Livestock	$(0.94 * L_1) + (0.996 * L_2) + (0.148 * L_3)$
Health & Education	$(0.115 * E_1) + (1 * E_2) + (0.1 * E_3)$
Composite Development Index	$(0.87 * G) + (0.9 * I) + (0.964 * T) + (0.72 * A) + (0.87 * L) + (0.99 * E)$

¹ Let's say for calculating Sectoral Development Index for Industrial Development formula of $(0.99 * I_1) + (0.992 * I_2) + (1 * I_3)$ has been used where I1 (NO. OF INDUSTRIES), I2 (INVESTMENT IN PLANT AND MACINERY), I3 (EMPLOYMENT) are sub indicators. I1, I2 & I3 have been given the weightages of 0.99, 0.992 & 1 respectively as per the Factor Analysis.

b) Regionalization Based on Sectoral Development Indices

The empirical study based on the six socioeconomic indicators gave sectoral development indices for each district (Refer Fig.10). Firstly, in the case of SDI of General Indicators Nagpur (SDI-834.0) and Bhandara (SDI-678.7) are districts with higher percentage of urban population, women literates, and literacy rate. Whereas it is comparatively low for Gondia, Wardha and Chandrapur and least for Gadchiroli district (SDI-455.8). Secondly, Nagpur shows highest SDI of 172.5 due to high Industrial concentration. Followed by Nagpur it is highly concentrated in Chandrapur district (SDI-12.1) due to the coal mines natural resource. Moreover, All electrical and machinery industries are highly concentrated in Chandrapur district. Least Industrial Development has been shown by Gadchiroli District (SDI-1.5). Thirdly, In case of Transportation Bhandara (SDI-104.3) and Gondia (SDI-92.17) districts are highly developed due to major railway junction resulting in industrially better developed areas. The Districts like Gadchiroli, Bhandara, Gondia, and Wardha having fewer roads network concentration also industrially least developed. Fourthly, Wardha (SDI-2664.8) and Bhandara (SDI-2688.62) districts are agriculturally relatively highly developed. On contrary Nagpur and Chandrapur are least developed as they are mainly Industrial districts. Gadchiroli is less developed agriculturally as well as industrially due to the poor irrigation facilities. In Gadchiroli the agricultural policies are not modernized. Fifthly, Gadchiroli has largest number of cattle. However as per the local survey, this livestock is not incomes generating. Wardha (SDI- 394.37) is highly developed in terms of Health and Education as they have extensive no. of health institutes. Nagpur, Bhandara, Gadchiroli are moderately developed.

The composite development index shows that Nagpur (CDI- 14905.74) is developed in almost all the aspects. Chandrapur and Bhandara are moderately developed whereas Wardha and Gondia are proved to be less moderately developed. Gadchiroli has shown least values for almost all indicators (Refer Fig. 9 & Table II).

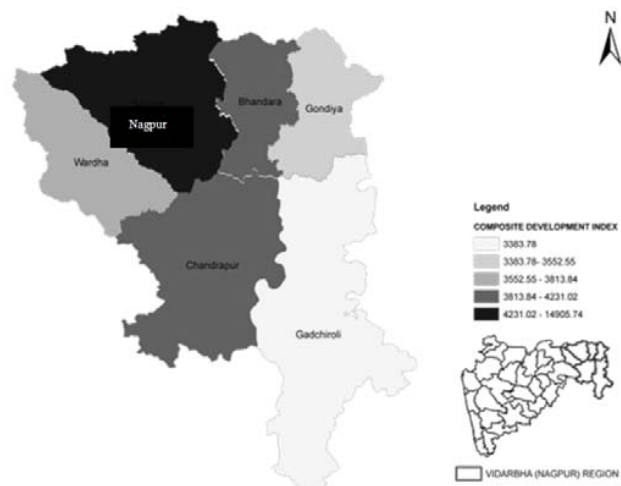


Fig. 9 Regionalization based on Composite Development

TABLE II
CALCULATION OF COMPOSITE DEVELOPMENT INDEX

Composite Development Index	Ranking	Districts
14905.74	FIRST	NAGPUR
4231.02	SECOND	CHANDRAPUR
4086.35	THIRD	BHANDARA
3813.84	FOURTH	WARDHA
3552.55	FIFTH	GONDIA
3383.78	SIXTH	GADCHIROLI

The value of the Gini's coefficient is 0.24 which shows that there could be the case of Primacy rather than inequality. In case of Nagpur sun region, Nagpur district is the primate city and these kinds of cities contribute to an imbalanced therefore undesirable urban system. The developments of primate cities often contribute to low levels of socioeconomic development and urbanization [4].

c) Regression Analysis

It can be observed from analysis that CDIs have shown strong correlation with indices of Industrial Development ($R^2 = 0.998$) & Education and Health ($R^2 = 0.57$). It implies that higher CDIs of the developed regions are mainly due to the development in the Industries and advancement in Education & Health.

V. PROPOSALS

The relative socioeconomic backwardness of the Vidarbha Region has already been established in the previous part. In particular, this Section addresses the broad guidelines for Vidarbha region on the basis of Human Development Index, Foreign Direct Investment, District wise Industrial Development, Per Capita District Domestic Product (Refer Table III). Similarly in the later part it forwards the policy guidelines at broad level for Nagpur sub region.

Initially at regional level, empirical results showed that Gap between State average and Vidarbha region is almost 76.17% in case of FDI. This is mainly due to the Industrial policies. Industrial policies do give the incentives but those incentives are not the area specific. Hence only western belt of Maharashtra is getting benefited by the industrial policies. As a result high priority attention should be given to the eastern belt mainly to attract Industries. Same applies for the District wise industrial Development.

Finally, at Nagpur sub regional level, the empirical results pertaining to inter district analysis gives the overview of relative development of the districts which are ranked based on CDI (Refer Table II).

As per the development, the Nagpur sub region has been delineated into four sub regions namely; relatively developed area, relatively moderate area, relatively less moderate, relatively less developed (Refer Fig. 9). Broad policy

guidelines have been proposed for each sub region on the basis of SDIs and primary observation of the districts.

TABLE III
BROAD POLICY GUIDELINES BASED ON SELECTED INDICATORS

Indicators	Gap	Broad policy guidelines
FDI	76.17%	High priority planning for redistributing FDI within Vidarbha
PCDDP	12.83%	Moderate attention
DID	60.53%	High priority planning for DIDI
HDI	15%	Over all low priority attention.

Relatively Developed Nagpur District has shown high development index almost in all the sectors. Relatively Moderate Chandrapur and Bhandara Districts have shown high development index in Industrial agricultural development respectively. Relatively less backward includes Wardha and Gondia districts. Finally, Relatively Backward, Gadchiroli has shown low development indices in almost all the sectors.

Firstly, Gadchiroli has been proved as the most backward district. It is less developed in agriculture due to poor irrigation facilities available [5]. Most of the irrigation is rain dependent & ground water. Moreover, agricultural practices are not modernized. Despite of its development in livestock it's not income generating. It's also backward in terms of industries because of Primacy of nearby districts like Nagpur. Hence Gadchiroli district needs special attention as it has shown least values for almost all indicators. It can be observed that this district suffers primarily due to inadequate irrigation facility, low productivity, and traditional farming methods so requires high attention for advancement in agricultural technologies. Also Livestock should be developed extensively which would provide alternate economy in drought condition. Friedman & Alonso called relatively less moderately developed regions as Frontier regions [6]. Wardha and Gondia districts have shown marginally higher values in indices of development but problems in these districts are similar to those in the backward region. Due to the poor irrigation facility policies should aim at the development of agriculture & irrigation facility. At the same time industrialization can be promoted by integrating both of them in the regional economy. Bhandara and Chandrapur are observed to be developed due to Industries and it's bordering to Nagpur. Bhandara and Chandrapur are highly developed in Agriculture and industries respectively. Although Bhandara fall under the category of agriculturally developed region, the dependency on tube wells & other wells is higher for irrigation. Since the productivity of food grains is comparatively higher development should mainly focus on development of irrigation facilities. Policies should aim at promoting industries in Bhandara through development of Infrastructure facilities & Transportation network. There is an excessive

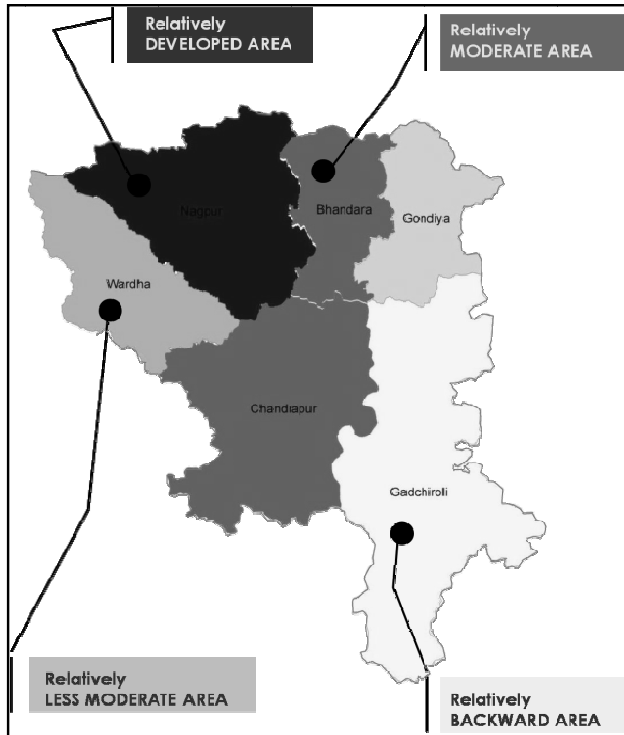


Fig. 9 Delineation of the Nagpur Sub region

immigration in Nagpur district because of the high concentration of Industries & Economic activities. Since all surrounded districts depend upon Nagpur district it exerts Additional pressure on infrastructure of Nagpur. Development in this region is possible only by the policies by decentralization which could be achieved through Growth Pole theory. This would not only solve the problems of region but also would lead to balanced development of adjacent region.

VI. CONCLUSIONS

The empirical results pertaining to inter regional disparity at state level and inter district disparity at regional level are alarming. The inequality indices have risen sharply and the gap has widened. Hence aim of the proposal is to help poorer regions or districts to grow faster. So that there will be less migration from poorer regions or districts. This will help to keep equal population density. Also due to the district wise Industrial development there will be same level of economic activity in each region or district. Ultimately there will be equality of opportunity in each region which will help to minimize the socioeconomic inequality and will induce the balance development.

APPENDIX

TABLE IV

SOCIOECONOMIC INDICATORS FOR ANALYSIS AT REGIONAL LEVEL
(Source: GoM. (2002). Maharashtra State Development report. Mumbai.)

Indicators	Sub Indicators
Demographic Indicators	I. Density
	II. Literacy Rate
	III. % Of Urban Population
	IV. % Of Women Literates
	V. % Of SC-ST Population
Industrial Indicator	I. No. Of Industries
	II. Investment In Plant And Machinery
	III. Employment
Transportation	I. Road Length Per100 Sq.km. Of Geographical Area
	II. Railway Route Length Per100 Sq.km. Of Geographical Area
Agriculture	I. % Of Net Area Sown
	II. % Of Area Irrigated More Than Once
	III. Average Yield Per Hectare Of Cereals
	IV. Average Yield Per Hectare Of Pulses
	V. Average Yield Per Hectare Of Cotton
	VI. Per Capita Food Grain Production
Livestock	I. No. Of Cows & Buffaloes In Milk Per 1000 Population
	II. No. Of Livestock Per 100 Population
	III. Livestock per Sq.km. Of Total Geographical Area
Health & Education	I. No. Of Hospital Per Lakh Of Population
	II. No. Of Beds In Public Aided Medical
	III. Institutions Per Lakh Population

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REFERENCES

- [1] Prof. (Dr.) Vilas Aghav, A Study of Regional imbalance development and the demand of separate Vidarbha state, Shodh, Samiksha aur Mulyankan (International Research Journal)—ISSN-0974-2832 Vol. II, Issue-7 (August 2009)
- [2] S. Mishra, R. Duggal, L. Lingam, A. Pitre, A Report on Health Inequities in Maharashtra, Jan-2008, pg23
- [3] Business maps of India- "Impact of FDI Maharashtra economy."
- [4] R.P. Mishra, Regional Development Planning in India
- [5] Annual Report on Vidarbha Vikas, 2009
- [6] Friedmann, J., & William, A. (1988). Regional Planning and Development, A Reader. Cambridge: The MIT Press.
- [7] (2002). Human development Report.