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MAPPING REGIONAL DISPARITIES IN KARNATAKA: A COMPREHENSIVE COMPOSITE DEVELOPMENT INDEX ANALYSIS

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----------ABSTRACT----------

This research paper presents an in-depth analysis of regional disparities in Karnataka, focusing on the construction of a Comprehensive Composite Development Index (CCDI) using data from 2020-21. By examining various socio-economic indicators such as literacy rates, per capita income, infrastructure development, and demographic factors, the study aims to identify the factors contributing to regional imbalances within the state. Through the categorization of districts into different development levels based on their relative progress, the research highlights the significant disparities that exist across various regions in Karnataka. The findings underscore the importance of targeted policy interventions and strategic measures to address these imbalances and promote inclusive growth and development across the state.----------

II. INTRODUCTION

Regional imbalances are a widespread issue affecting nations, states, and regions globally. These disparities stem from a combination of geographical, historical, and political factors. Geographical aspects such as natural resource distribution, terrain, and climate play a significant role in the economic development of regions. Political factors, including policies favouring certain areas, the allocation of public funds, and the presence of political patronage, can also influence regional development. In Karnataka, historical factors have been particularly influential, with the legacy of different ruling dynasties and the uneven establishment of administrative and educational institutions contributing to the uneven development across the state.

In Karnataka, inter-district disparities are evident, with some districts evolving into industrial and educational centres, while others remain predominantly agricultural and underdeveloped. These disparities can be traced back to historical events and decisions that have shaped the development trajectory of each district. For instance, colonial administrative practices and post-independence state policies have often favoured certain regions over others. By analysing these inter-district disparities, this paper aims to shed light on the persistent regional imbalances in Karnataka. Understanding these disparities is crucial for formulating strategies that promote balanced regional development and address the long-standing inequalities within the state.

III. REVIEW OF LITERATURE

The literature on regional disparities in India and Karnataka presents a detailed analysis of income inequalities, growth experiences, and socio-economic challenges across different regions. Dadibhavi (2019) highlights the divergent regional disparities in per capita district income in Karnataka between 1999-2000 and 2012-2013, emphasizing the importance of expanding physical infrastructure, urban agglomeration, and improving human and financial capital to spur economic growth in slower-growing regions. Suryanarayana (2009) examines economic disparities in Karnataka and Maharashtra, revealing pronounced inter-regional disparities despite the states being better off than the national average. Jose (2019) underscores the persistent regional disparities in India despite numerous policy initiatives, highlighting the need for balanced development across all regions. Chowdhury (2014) provides a historical analysis of inter-state disparities, identifying phases of low growth, post-liberalization, and high growth, and examining the economic performance and sectoral growth trajectories of different states.

Hanagodimath (2012) compares regional disparities within Karnataka and Gujarat, calling for strategic, target-oriented policy interventions to improve health, education, and employment-generating skills. Bhattacharya and

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Sakthivel (2004) investigate the widening regional disparity in India during the post-reform period, highlighting the faster growth of industrial states compared to backward states and the inverse relationship between population growth and SDP growth. The HPC FRRI (2002) report focuses on the backward taluks in North Karnataka, recommending a Special Development Program for the region and emphasizing the importance of the Comprehensive Composite Development Index (CCDI) in categorizing taluks into different development groups. Overall, the literature underscores the multifaceted nature of regional disparities in India and Karnataka, highlighting the need for targeted policy measures, investment in infrastructure and human capital, and inclusive growth strategies to bridge the development gaps across regions.

IV. OBJECTIVES

- To construct a composite development index (CDI) for districts of Karnataka
- To find out the factors which affects the regional imbalances
- To suggest policies and programmes for reduction of regional imbalances

V. HYPOTHESIS

- There is no association between CDI and other socio-economic indicators

VI. METHODOLOGY

The methodology for constructing the index will involve analysing key sectors such as agriculture and allied sectors, industry infrastructure, economic infrastructure, social infrastructure, and demography. The indicators for the agriculture and allied sector include metrics like the percentage of total cropped area to net area sown, percentage of area under food grains, horticultural crops, and commercial crops to the total cropped area, and the percentage of net area irrigated to net area sown. Additional indicators are fertilizer consumption in kg per hectare, number of tractors per 1000 hectares, number of units per lakh population, and per capita bank credit to agriculture. For the industry sector, indicators include the number of industrial units per lakh population, percentage of industrial workers to total workers, per capita development credit, number of branches per lakh population, and the total number of enterprises engaged in trade, hotels, and transport per lakh population.

Economic infrastructure indicators encompass the number of post offices per lakh population, number of telephones per lakh population, road length per 100 sq. km area, percentage of habitations with access to all-weather roads, length of railway line per 1000 sq. km area, number of motor vehicles per lakh population, number of cooperative credit societies per lakh population, percentage of electrified villages including hamlets, and regulated markets per lakh population. Social infrastructure indicators include the total number of doctors per 10,000 population, number of beds per 10,000 population, literacy rate, pupil-teacher ratio for grades 1 to 10, percentage of children out of school in the 6-14 age group, number of students enrolled in aided and government degree colleges per lakh population, and percentage of habitations with drinking water facility of 50 or more LPCD. Demography indicators consist of the sex ratio (number of females per 1000 males as of 2011), percentage of urban population to total population (2011), percentage of SC and ST population, percentage of non-agricultural workers to total workers, and percentage of total agricultural labourers to total workers.

The relative index formula is used to construct the index. To create individual dimension indices, weightage is assigned using inverse standard deviation. Finally, to construct the Comprehensive Composite Development Index (CCDI), weightage is given according to the High-Powered Committee Report of Karnataka. Base for the categorisation is HPCFRRI (High Power Committee on Readdressed of Regional Imbalances in Karnataka).

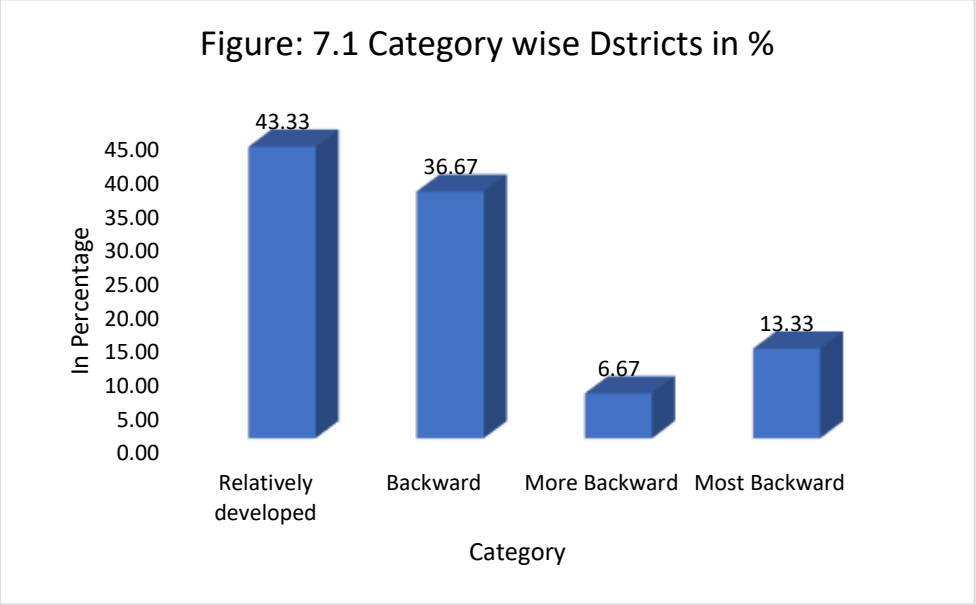
VII. INTER DISTRICT DISPARITY

The analysis of inter-district disparity in Karnataka reveals significant variations in development levels, as illustrated by Table 7.1, which categorizes districts into four groups: relatively developed, backward, more backward, and most backward. This categorization is further detailed in Table 7.2, providing a division-wise breakdown that highlights geographical disparities across the state. Figure 7.3 visually represents these regional disparities, emphasizing the urgent need for targeted policy interventions in areas with higher imbalances. Additionally, Figure 7.4 quantifies the disparities by showing the percentage distribution of districts across categories, while Thematic Map 7.1 offers a spatial visualization of this distribution, aiding in the identification of clusters requiring focused attention. Collectively, these analyses underscore the necessity for strategic measures to address the unique challenges faced by underdeveloped districts, promoting equitable growth throughout Karnataka.

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Table 7.1: Categorisation of Districts		
Category	**No of Districts**	**In %**
Relatively developed	13	43.33
Backward	11	36.67
More Backward	2	6.67
Most Backward	4	13.33

Source: Appendix 1.1

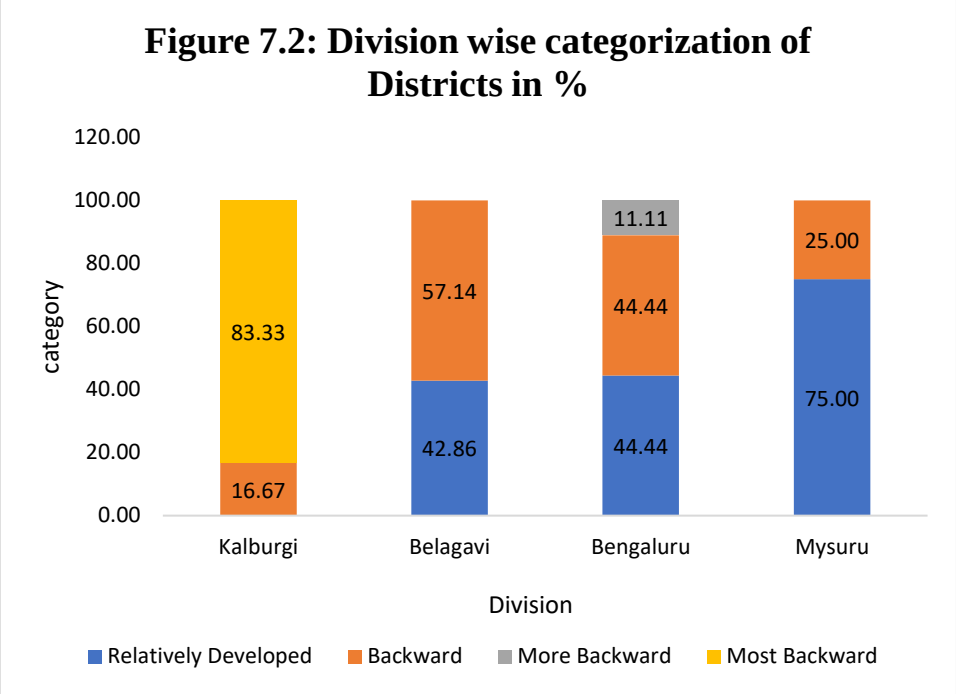


Source: Appendix

The table 7.1 categorizes districts into four development levels based on their relative progress. Out of the total districts, 43.33% (13 districts) are classified as relatively developed, indicating a higher level of infrastructure, industry, and social services. A significant portion, 36.67% (11 districts), are considered backward, showing moderate development with room for improvement. The more backward category comprises 6.67% (2 districts), suggesting significant developmental challenges. Lastly, 13.33% (4 districts) fall into the most backward category, indicating the least development and likely requiring the most attention and resources for improvement.

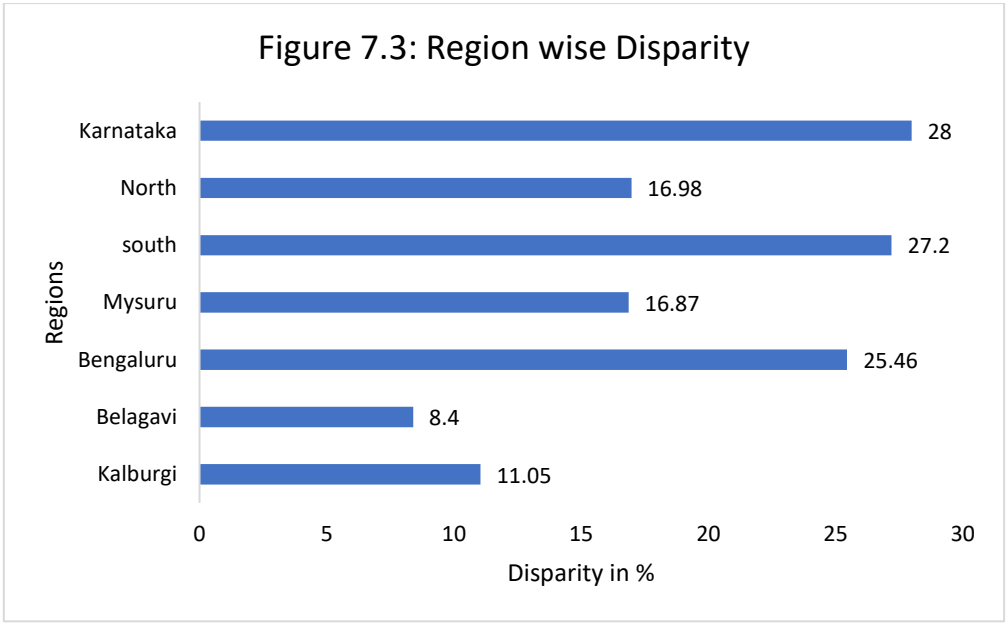
Table 7.2 Division wise categorisation of districts				
Division	**Relatively Developed**	**Backward**	**More Backward**	**Most Backward**
Kalburgi	0.00	16.67	0.00	83.33
Belagavi	42.86	57.14	0.00	0.00
Bengaluru	44.44	44.44	11.11	0.00
Mysuru	75.00	25.00	0.00	0.00
Source: Appendix				

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Source: Appendix

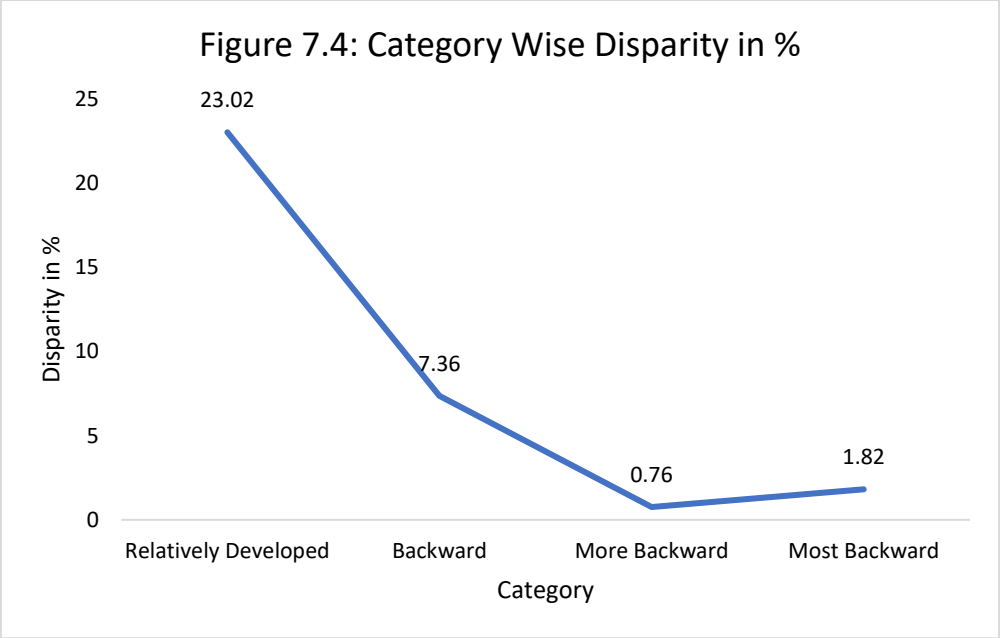
The table 7.2 categorizes districts within four divisions based on their level of development. In the Kalburgi division, none of the districts are relatively developed, 16.67% are backward, and a significant 83.33% are most backward, indicating severe developmental challenges. In contrast, the Belagavi division shows a moderate level of development with 42.86% of districts being relatively developed and 57.14% being backward, with no districts in the more or most backward categories. The Bengaluru division has an equal proportion of relatively developed and backward districts, each at 44.44%, and a small percentage (11.11%) classified as more backward, reflecting a generally balanced development with some areas needing improvement. The Mysuru division stands out as the most developed, with 75.00% of its districts being relatively developed and 25.00% being backward, showing a high level of overall development. Overall, the Kalburgi division faces the most significant developmental challenges, whereas the Mysuru division is the most advanced. Belagavi and Bengaluru divisions exhibit a mix of development levels, with no districts in the most backward category.



Source: Appendix

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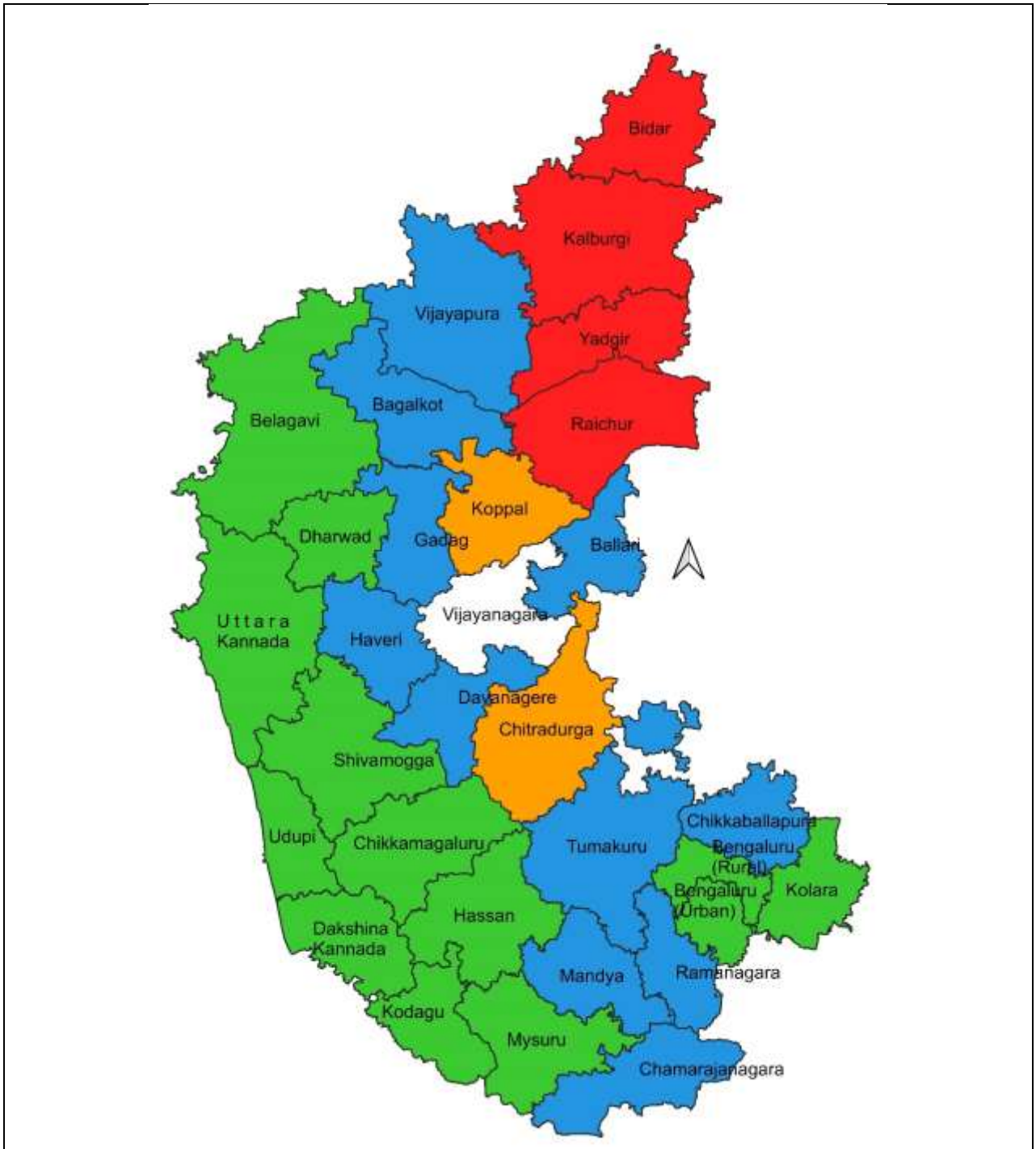
Figure 7.3 presents disparity percentages across various divisions and regions within Karnataka. The Kalburgi division has a moderate disparity of 11.05%, indicating some inequality within the division. Belagavi division shows the lowest disparity at 8.4%, suggesting relatively uniform development. In contrast, the Bengaluru division has a significant disparity of 25.46%, reflecting notable inequality likely due to the mix of highly developed urban areas and less developed rural regions. Mysuru division exhibits a disparity of 16.87%, indicating moderate inequality. The South region has a high disparity of 27.2%, highlighting substantial development differences within this area, while the North region shows a moderate disparity of 16.98%. Overall, Karnataka state has the highest disparity at 28%, suggesting considerable developmental differences across the state. This analysis indicates that while some regions like Belagavi are relatively uniform in development, others, particularly the South and Bengaluru divisions, have significant disparities, underscoring the need for targeted interventions to address these inequalities



Source: Appendix

The data on category-wise disparity highlights significant variations in development across different groups. The "Relatively Developed" category exhibits the highest disparity at 23.02%, indicating substantial inequality within this group. This suggests that while some members of this category are well-off, a considerable portion still faces significant disadvantages. The "Backward" category shows a disparity of 7.36%, reflecting moderate inequality, but not as pronounced as in the relatively developed group. The "More Backward" category has a much lower disparity at 0.76%, suggesting that this group experiences more uniform levels of disadvantage, although overall they are more deprived. Lastly, the "Most Backward" category has a disparity of 1.82%, indicating some level of inequality but still relatively low. This might imply a more homogeneous level of deprivation among its members. Overall, the analysis underscores that inequality is most pronounced in the relatively developed groups, while the more backward groups, though uniformly disadvantaged, show less internal disparity.

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Category	Relatively Developed	Backward	More Backward	Most Backward	Data not available

Thematic Map 7.1: Category Wise Distribution of Districts

Source:Appendix

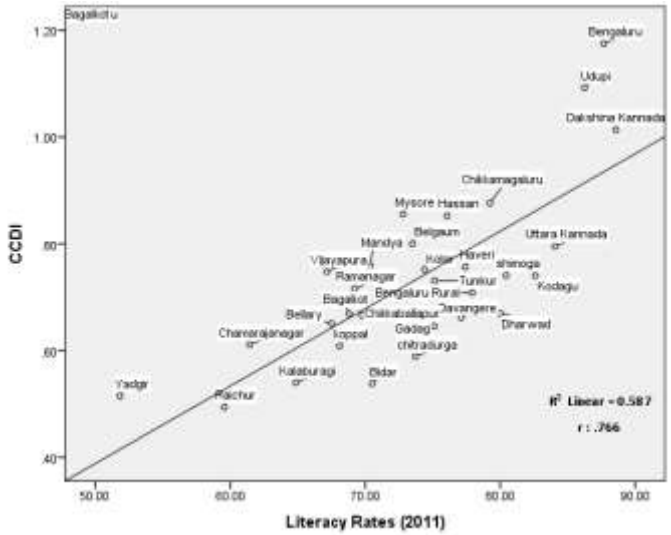
Map 7.1 illustrates the category-wise identification of districts, revealing distinct regional development patterns. Notably, all districts classified as "Most Backward" are located within the Kalburgi division, indicating significant developmental challenges in this area. In contrast, the Mysore division shows a higher level of development, with all its districts categorized as "Relatively Developed" except for Mandya and Chamarajanagar. Additionally, all coastal districts fall under the "Relatively Developed" category, suggesting that these regions benefit from factors such as tourism, trade, and better infrastructure.

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VIII. ASSOCIATION BETWEEN CDI AND DIFFERENT SOCIO-ECONOMIC INDICATORS

In this section, an analysis is conducted to explore the relationship between the Composite District Development Index (CCDI) and various socio-economic indicators, including the literacy rate, percentage of the rural population, and per capita income across different districts.

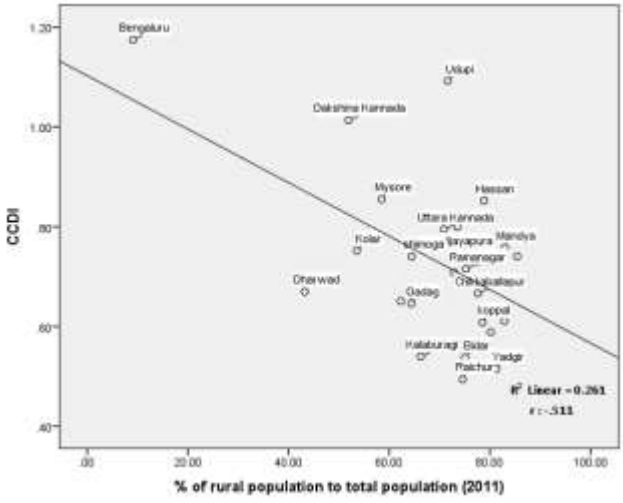
Figure 8.1: Association between CCDI and Literacy Rate



Source: Appendix and 2011 Census

The analysis of the association between the Comprehensive Composite Development Index (CCDI) and the literacy rate reveals a strong positive correlation, with a correlation coefficient (r) of .766. This indicates a robust positive relationship between these variables. Moreover, the coefficient of determination (R^2) is 0.587, meaning that about 58.7% of the variability in the literacy rate can be attributed to changes in the CCDI. This finding suggests that as the level of comprehensive development increases, there is a significant tendency for literacy rates to rise. The high explanatory power of this relationship highlights the considerable impact that comprehensive development has on improving literacy rates.

Figure 8.2: Association between CCDI and % Rural Population



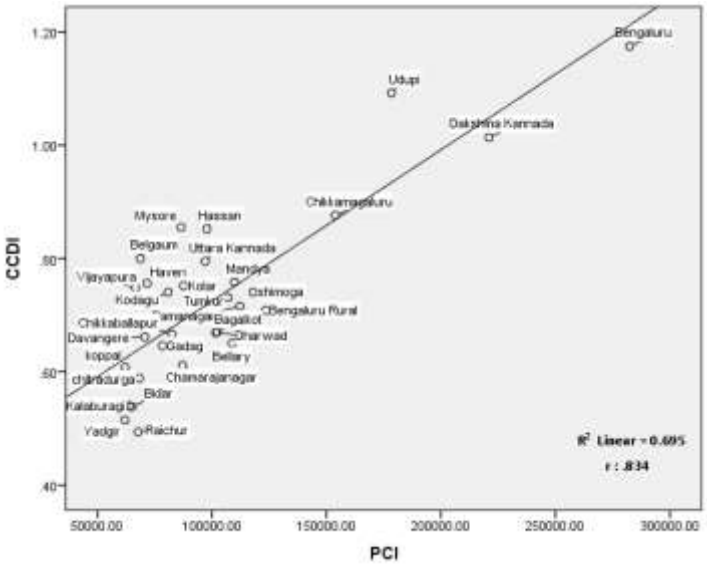
Source: Appendix and 2011 Census

The examination of the relationship between the Comprehensive Composite Development Index (CCDI) and the percentage of the rural population relative to the total population reveals a moderate negative correlation. With a correlation coefficient (r) of -.511, there is a noticeable negative association between these variables. Furthermore, the coefficient of determination (R^2) is 0.261, indicating that about 26.1% of the variability in the rural population

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percentage can be attributed to changes in the CCDI. This suggests that as comprehensive development increases, the proportion of people living in rural areas tends to decrease.

Figure 8.3: Association between CCDI and PCI:



Source: Appendix and 2011 Census

The analysis of the relationship between the Comprehensive Composite Development Index (CCDI) and Per Capita Income (PCI) reveals a strong positive correlation, with a correlation coefficient (r) of . 834. This high value indicates a robust positive association between the two variables. Additionally, the coefficient of determination (R^2) is calculated at 0.695, which implies that approximately 69.5% of the variability in PCI is explained by variations in the CCDI. This finding highlights that regions with higher comprehensive development scores tend to experience significantly higher per capita income levels. The strong correlation underscores the substantial impact that comprehensive development has on economic prosperity, demonstrating that improvements in CCDI are closely linked to increases in PCI.

IX. FINDINGS, SUGGESTION AND CONCLUSION

Findings

Significant regional disparities exist across divisions and districts in Karnataka based on the Comprehensive Composite Development Index (CCDI) analysis for 2020-21.

Disparities range from moderate to high levels, with the Kalburgi division showing a moderate disparity of 11.05% and the South region exhibiting a high disparity of 27.2%.

There is a correlation between CCDI and per capita income levels, indicating that regions with higher comprehensive development scores tend to have higher economic prosperity.

Suggestions

To address regional disparities effectively, it is essential to implement targeted interventions that focus on regions with the most significant developmental gaps, promoting balanced growth across all areas. A key strategy involves improving infrastructure, encompassing physical, economic, and social aspects, to support comprehensive development. Alongside these efforts, policy reforms should be implemented to foster inclusive growth, addressing the historical and political factors that have contributed to these disparities. Moreover, investing in human capital development through education and skill-building initiatives is crucial for enhancing the overall development potential of underdeveloped regions. To ensure the success of these initiatives, a robust monitoring and evaluation framework must be established to track progress and guarantee the effective implementation of strategies aimed at reducing regional disparities.

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Conclusion

The analysis of the Comprehensive Composite Development Index (CCDI) in Karnataka for 2020-21 underscores the presence of significant regional disparities across divisions and districts. These disparities, ranging from moderate to high levels, are influenced by a combination of historical legacies, geographical aspects, and political factors, shaping the development trajectories within the state. The correlation between CCDI and per capita income levels highlights the importance of comprehensive development in driving economic prosperity in regions. Addressing these regional disparities requires targeted interventions, infrastructure development, policy reforms, and investments in human capital. By understanding and acknowledging these disparities, policymakers can formulate strategies to promote balanced regional development and reduce inequalities within Karnataka.

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Appendix

District	CCDI	RANK	CATEGORY
Bangaluru (Urban)	2.006111	1	Developed
Udupi	1.504058	2	Developed
Bangaluru (Rural)	1.394755	3	Developed
D Kannada	1.37315	4	Developed
Mysuru	1.191998	5	Developed
Chikmagalur	1.130892	6	Developed
Hassan	1.122869	7	Developed
Kodagu	1.070008	8	Developed
Belagavi	1.051637	9	Developed
U Kannada	1.043404	10	Developed
Dharwad	1.036546	11	Developed
Shimoga	1.026371	12	Developed
Kolar	1.025994	13	Developed
Tumkur	0.997397	14	Backward
Mandya	0.98913	15	Backward
Ramanagar	0.976689	16	Backward
Vijayapur	0.952031	17	Backward
Ballari	0.900359	18	Backward
Haveri	0.892937	19	Backward
Davangere	0.892152	20	Backward
Gadag	0.859751	21	Backward
Chamarajanagara	0.828537	22	Backward
Bagalkot	0.825633	23	Backward
Chikballapur	0.8225	24	Backward
Koppal	0.778833	25	More Backward
Chitradurga	0.770456	26	More Backward

Kalburgi	0.692652	27	Most Backward
Bidar	0.685786	28	Most Backward
Raichur	0.673894	29	Most Backward
Yadgir	0.664827	30	Most Backward

Source: Authors construction using various District at a Glance of 2020