



PACE OF DEVELOPMENT IN RAJASTHAN IN THE ERA OF ECONOMIC REFORMS

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This paper is concerned with the construction of the composite development index for all districts taking agricultural, industrial and infrastructural indicators to assess the relative position and direction of change during the period of study. In the first part, indicators found significant for construction of Composite Index for overall development are discussed. Composite Indices for overall development for 1995-96 and 2007-08 were constructed and compared in the second part. Last part of this paper discusses the pattern of change in the era of economic reforms in terms of impact on different levels of development between districts and the pace of development in relatively under-developed districts. An attempt has been made to trace out correlates of development

Composite Indices for Development

Variables and the weights are obtained by using the factor analysis for constructing Composite Index for overall development. Ten variables were found significant in both the years for which indices are constructed i.e. 1995-96 and 2007-08 which are listed in table 1.1.

The procedure adopted for constructing the overall index of development taking indicators found significant for agricultural, industrial and infrastructural sector of districts shows that over-years relative importance of indicators have not changed significantly. Weights obtained

for 1995-96 and 2007-08 revealed that from agricultural sector productivity and per hectare use of fertilizers were found significant in explaining the variations in both the years while percentage of irrigated area was found significant in 1995-96 and net area sown was found significant in 2007-08. In industrial sector, for both the years the industrial area developed by RIICO was found significant for overall development depicting the importance of support system and infrastructural development for attracting investment in industries. The indicators from banking sector namely per capita deposits and per capita credit have remained significant in both the years establishing the importance of institutional credit in the process of growth.

Composite Index for overall development have been constructed for 1995-96 and 2007-08 and presented in table 1.2.

The table 1.2 shows that in the year 1995-96, the highest value of Composite Index for overall development was found the maximum for Kota with Composite Index 74.95 and the least for Jaisalmer with 7.41. In year 2007-08 it was observed the maximum in Jaipur with 76.19 and the minimum for Jaisalmer at 7.01. As noted earlier, due to change in the structural pattern of growth as reflected in the list of indicators found significant for explaining variations between districts, the composite indices of development for the year 1995-96 and 2007-08 are not comparable. But increasing importance of servicing sector has positively affected the growth in Alwar, Jaipur, Jodhpur, Sikar, Nagaur, Churu, and Barmer as their values of CDI's have gone up.

The impact of inter-district differentials in indices is assessed by way of change in the development gap among districts. The column 4 and 5 of the table 1.2 indicate difference level (gap) of i^{th} district from the highest score of index X in respective years. The change in the period of study in development gap is mentioned in the column 6 of the table cited above. Although the change in gap between most developed and least developed district is insignificant as the gap was found 67.53 in 1995-96 and 69.18 in 2007-08 respectively. The average gap between most developed district and other districts has risen from 39.17 to 49.72 indicating rise in developmental gap between districts.

The average difference of gap (in 2007-08 from 1995-96) is observed as 10.55. Only for 8 districts this difference of gap is observed as negative implying improvement in their relative position. Out of these 8 districts improvement in only 4 districts i.e. Jodhpur (-10.10), Jaipur (-5.56), Alwar (-4.38), Churu (-3.64) was found significant. The relative position of rest of the districts of Rajasthan has not improved in terms of the developmental covering. A large

decline was observed at Ganganagar (35.45), Bundi (35.78), Sirohi (31.39), Dausa (26.27), Baran (26.04), Rajsamand (24.91), Kota (24.88), Hanumangarh (18.96) and Pali (18.00) indicating declining importance of agriculture and increasing importance of service sector in income generation.

Between the years 1995-96 and 2007-08 difference in average gap between districts was found statistically significant as the results of tests are given below:

Statistics

Mean Difference of Gap = 10.55

Standard Deviation = 12.42

Std. error of Mean = 2.23

't' = 4.73

Results reject the null hypothesis that the average developmental gap between districts has remained the same during the period of study.

Measure of Inequality

Atkinson's measure of inequality has been calculated to reflect the impact on inequalities during the study period. The inequality coefficient marginally reduced from 0.1131 in the year 1995-96 to 0.1098 in the year 2007-08 indicating insufficient reduction in inequalities between districts over the period of study.

Geometric mean as measure of composite index

As an alternate method to the above presented method of constructing composite indices of over-all development geometric mean of the composite indices_{agri}, composite indices_{ind} and composite indices_{infra} for the year 2007-08 is calculated and presented in table 1.3.

To observe the implications of the two methods of constructing composite indices rank correlation was carried between ranks obtained for geometric means and composite development indices and results are summarized below:

			Geo Mean	CDI
Spearman's rho	Geo Mean	Correlation Coefficient	1.000	.818
		Sig. (2-tailed)		.000
		N	31	31
	CDI	Correlation Coefficient	.818	1.000
		Sig. (2-tailed)	.000	
		N	31	31

The high correlation coefficient of 0.818 signifies high association between indices generated by selected variables from all sectors and indices computed by taking Geometric mean of sectoral indices.

Change in Relative position of Districts

To see the temporal changes in relative positions of districts between the period from 1995-96 to 2007-08 the Composite Indices for overall development for both the years has been classified in different ranges and presented in table 1.4

The change in development level could easily be visualized from the fact that in 1995-96 only for four districts Composite Index for overall development was observed below 20 and in 2007-08 the number of such districts increased to 13. Further there were 11 districts in the developing category i.e. Composite Index for overall development between 30 and 40 in 1995-96 which fell to 6 in 2007-08. Five districts in intermediate levels of development were observed in 1995-96 while none of the districts have fallen in this category in 2007-08 meaning there by that economic inequalities have increased in the state. The changing pattern of development has remained beneficial for a few districts.

Ranking of the Districts

The districts were ranked according to their Composite Index for overall development and presented in table 1.5

The first rank was attained by Kota in 1995-96 and Jaipur in 2007-08. Alwar was at second position in 2007-08 while Jaipur ranked second in 1995-96. The relative position of Jodhpur (22 to 4), Alwar (6 to 2), Nagaur (28 to 18), Sikar (26 to 10), Bharatpur (13 to 5), Ajmer (14 to 7), Udaipur (12 to 8), Jhunjhunu (25 to 15), Bikaner (20 to 13) have improved significantly indicating positive impact of developmental efforts in these districts, whereas shifts in relative position of Sirohi (5 to 22), Dausa (10 to 29), Bundi (4 to 19), Baran (7 to 21), Rajsamand (11 to 26), Hanumangarh (8 to 14), Pali (17 to 25) and Ganganagar (3 to 9) indicate

worsening position implying insufficient development efforts leading to widening of gap between developing and under-developed districts.

Correlates of Development Efforts are made to determine the correlates of development in this section. Resource base of districts, and per capita plan expenditure are correlated with development indices of districts.

Relationship between Resource base and Development

To enquire whether there is any relation between resources available in the district and levels of development a correlation is carried between Composite Index of resource base and overall Composite Index of development. Summarized results are listed below

Correlation between Index Resource Base and CDI

		Composite Index of Resource base	Composite Development Index
Spearman's rho	Composite Index of Resource base	1.000	0.643**
	Correlation Coefficient		.000
	N	31	31
Spearman's rho	Composite Development Index	.643**	1.000
	Correlation Coefficient	.000	
	N	31	31

** Correlation is significant at the .01 level (2-tailed)

It is well ascertained from the table that resource base of a district plays major role in development of district. Rank correlation coefficient 0.643 depicts that upto 64% of development is explained by resource based structure of the district. In other words inequalities in resources are the main cause of disparities in the levels of economic development.

Per Capita Public Expenditure and Composite Development

As public expenditure plays important role in deciding the pace of growth, attempt has been made to analyse the impact of public expenditure on development levels of districts. The ordinal regression method was applied but no significant result was obtained. The rank

correlation between ranks of districts in terms of growth level and ranks in terms of per capita public expenditure is calculated to assess relationship between these two factors. The results are summarized below:

Correlation between PCPE and CDI -1995-96

		CDI Rank	PCPR Rank
Spearman's rho	CDI Rank	1.000	0.116
	Correlation Coefficient		
	Sig (2-tailed)		0.534
	N	31	31
	PCPE Rank	0.116	1.000
	Correlation Coefficient		
	Sig (2-tailed)	0.534	
	N	31	31

Correlation between PCPE and CDI 2007-08

		CDI Rank	PCPR Rank
Spearman's rho	CDI Rank	1.000	-0.119
	Correlation Coefficient		
	Sig (2-tailed)		0.524
	N	31	31
	PCPE Rank	-0.119	1.000
	Correlation Coefficient		
	Sig (2-tailed)	0.524	
	N	31	31

The results show very low correlation between development level of the district and PCPE implying there is no systematic allocation of public expenditure keeping in view the developmental stage of district. In other words, this shows PCPE was found not significant determinant of development of districts in the state of Rajasthan. This result shows that despite of stated policy of inclusive growth per capita plan expenditure is not fulfilling the goal of balanced development.

Thus the hypothesis that per Capita public expenditure and level of development are not correlated significantly is accepted on empirical evidences.

Appendix:

Table 1.1: Variables used in Indices

Variable	Year 1995-96	Year 2007-08
1	Productivity (AD1)	Productivity (AD1)
2	Percentage of Irrigated Area to Gross sown area (AD2)	Per hectare use of fertilizers (AD3)
3	Per hectare use of fertilizers (AD3)	Net area sown as percentage of Reporting area (AD7)
4	Area developed by RIICO per lakh sq.k.m.(ID4)	Area developed by RIICO per lakh sq.k.m.(ID4)
5	Student-Teacher ratio in colleges (SD6)	Average population per school (SD1)
6	Population served per Government Medical Institute (SD8)	Percentage of villages Electrified (SD11)
7	Population served per bed (SD9)	Per capita deposits (SD13)
8	Per capita deposits (SD13)	Per capita credit (SD14)
9	Per Capita Credit (SD14)	Road length per 100 square kilometer of area (SD15)
10	Population served per post office (SD16)	Population served per telegraph office (SD17)

Source: Calculated

Table 1.2: Composite Index for Overall Development

District	CDI 1995-96	CDI 2007-08	Change in value of CDI	Gap 1995-96	Gap 2007-08	difference of gap
AJMER	37.12	35.77	↓	37.82	40.42	2.59
ALWAR	47.77	53.39	↑	27.18	22.80	-4.38
BANSWARA	31.14	22.38	↓	43.80	53.80	10.00
BARAN	44.36	19.56	↓	30.59	56.63	26.04
BARMER	7.72	11.34	↑	67.23	64.85	-2.38
BHARATPUR	37.38	38.85	↑	37.57	37.34	-0.23
BHILWARA	41.11	33.34	↓	33.84	42.84	9.00
BIKANER	31.06	23.69	↓	43.88	52.50	8.61
BUNDI	53.99	19.85	↓	20.95	56.34	35.38
CHITTORE	34.18	25.00	↓	40.76	51.19	10.42
CHURU	10.27	15.16	↑	64.67	61.03	-3.64
DAUSA	39.65	14.63	↓	35.29	61.56	26.27
DHOLPUR	36.35	22.20	↓	38.60	53.98	15.39
DUNGARPUR	21.71	15.58	↓	53.24	60.61	7.37
GANGANAGAR	66.38	32.18	↓	8.56	44.01	35.45
HANUMANGARH	41.35	23.63	↓	33.60	52.56	18.96
JAIPUR	69.39	76.19	↑	5.56	0.00	-5.56
JAISALMER	7.41	7.01	↓	67.53	69.18	1.64
JALORE	28.08	18.20	↓	46.86	57.99	11.13
JHALAWAR	28.92	18.10	↓	46.02	58.09	12.07
JHUNJHUNU	26.49	22.79	↓	48.46	53.40	4.94
JODHPUR	28.35	39.69	↑	46.60	36.50	-10.10
KOTA	74.95	51.31	↓	0.00	24.88	24.88
NAGAU	17.87	20.49	↑	57.08	55.70	-1.38
PALI	32.84	16.08	↓	42.11	60.10	18.00
RAJSAMAND	39.44	15.78	↓	35.50	60.41	24.91
SAWAI MADHOPUR	32.20	25.04	↓	42.75	51.15	8.40
SIKAR	26.40	28.59	↑	48.54	47.59	-0.95
SIROHI	49.26	19.11	↓	25.69	57.08	31.39
TONK	26.65	19.58	↓	48.29	56.61	8.32
UDAIPUR	39.21	35.98	↓	35.74	40.20	4.47
Average	37.12	35.77	↓	37.82	40.42	2.59

Source: Calculated

Table 1.3: Comparison of two methods

Districts	Geometric Mean-2007-08	CDI 2007-08
Ajmer	30.99	35.77
Alwar	59.87	53.39
Banswara	22.61	22.38
Baran	20.47	19.56
Barmer	11.83	11.34
Bharatpur	30.08	38.85
Bhilwara	31.48	33.34
Bikaner	17.41	23.69
Bundi	23.91	19.85
Chittore	28.25	25.00
Churu	13.39	15.16
Dausa	20.54	14.63
Dholpur	22.30	22.20
Dungarpur	17.07	15.58
Ganganagar	31.52	32.18
Hanumangarh	25.54	23.63
Jaipur	62.15	76.19
Jaisalmer	7.04	7.01
Jalore	17.15	18.20
Jhalawar	21.52	18.10
Jhunjhunu	18.49	22.79
Jodhpur	27.67	39.69
Kota	53.58	51.31
Nagaur	17.07	20.49
Pali	20.29	16.08
Rajsamand	26.25	15.78
Sawai madhopur	27.88	25.04
Sikar	21.63	28.59
Sirohi	24.68	19.11
Tonk	20.16	19.58
Udaipur	30.77	35.98

Source: Calculated

Table 1.4: Comparative Position of Districts

Value of Composite index	No. of Districts	Name of the Districts	No. of Districts	Name of the Districts
		1995-96		2007-08
Less than 10	2	Jaisalmer, Barmer	1	Jaisalmer
10 - 20	2	Churu, Nagaur	12	Barmer, Dausa, Churu, Dungarpur, Rajsamand, Pali, Jhalawar, Jalore, Sirohi, Baran, Tonk, Bundi
20 - 30	7	Dungarpur, Sikar, Jhunjhunu, Tonk Jalore, Jodhpur, Jhalawar,	9	Nagaur, Dholpur, Banswara, Jhunjhunu, Hanumangarh, Bikaner, Chittorgarh, Sawai madhopur, Sikar
30 - 40	11	Bikaner, Banswara, Sawai madhopur, Pali, Chittorgarh, Dholpur, Ajmer, Bharatpur, Udaipur, Rajsamand, Dausa	6	Ganganagar, Bhilwara, Ajmer, Udaipur, Bharatpur, Jodhpur
40 - 50	5	Bhilwara, Hanumangarh, Baran, Alwar, Sirohi	0	
More than 50	4	Bundi, Ganganagar, Jaipur, Kota	3	Kota, Alwar, Jaipur

Source: Calculated



Table 1.5: Ranks of districts based on CDI

District	1995-96	2007-08
Ajmer	14	7
Alwar	6	2
Banswara	19	16
Baran	7	21
Barmer	30	30
Bharatpur	13	5
Bhilwara	9	8
Bikaner	20	13
Bundi	4	19
Chittorgarh	16	12
Churu	29	28
Dausa	10	29
Dholpur	15	17
Dungarpur	27	27
Ganganagar	3	9
Hanumangarh	8	14
Jaipur	2	1
Jaisalmer	31	31
Jalore	23	23
Jhalawar	21	24
Jhunjhunu	25	15
Jodhpur	22	4
Kota	1	3
Nagaur	28	18
Pali	17	25
Rajsamand	11	26
Sawai Madhopur	18	11
Sikar	26	10
Sirohi	5	22
Tonk	24	20
Udaipur	12	6

Source: Calculated

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