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Social Development Ranking of Districts of Pakistan

A. F. AISHA GHAUS, HAFIZ A. PASHA and RAFIA GHAUS

The paper has used eleven indicators relating to the education, health and water supply sectors to rank districts of Pakistan in terms of the level of social development. It also seeks to explain regional variation in the development of social infrastructure across districts. The paper demonstrates the importance of education indicators in determining the overall level of social development, especially in terms of female literacy and enrolment rates. Also, the ranking demonstrate a close correlation between levels of social and economic development spatially with Pakistan. Other important determinants of regional variations in the level of social development include the extent of urbanisation, the administrative development of the district (location of provincial headquarters), and the geographical/economic significance (indicated by the presence of the sea port). Overall, Punjab appears to have the highest level of social development followed by NWFP, Sindh and Balochistan. However, the results indicate substantial variation among districts within a province in the level of social development. Least developed districts within each province are identified as targets for special development allocations within SAP.

1. INTRODUCTION

International comparisons reveal the lack of correlation between the ranking of countries in terms of levels of economic and social development. Pakistan is an example of a developing country with relatively high per capita income but extremely poor social/human development indicators. The objectives of this paper are two fold: first, determine the extent of variation among districts in the level of social development and second to examine in the spatial context for Pakistan how strong the relationship is between levels of economic and social development and what explains regional differences in the level of social development. The former will help us in particular in identifying districts which have a low ranking within the country in terms of the level of social development. These districts can be targeted for special development allocations within the SAP to reduce the extent of regional disparity in terms of access to basic services like primary education, health, water supply, etc. If it emerges that the socially

A. F. Aisha Ghaus is Deputy/Acting Managing Director, Social Policy and Development Centre, Karachi. Hafiz A. Pasha is Deputy Chairman, The Planning Commission, Government of Pakistan, Islamabad. Rafia Ghaus is Economist at the Social Policy and Development Centre, Karachi.

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underdeveloped districts are also economically backward then the underlying reason may be the absence of a strong private sector or the absence of a local tax base or income affordability to finance the provision of these services. As case can then be made for transfer of resources to such regions.

Earlier research at the district level in Pakistan by Pasha, Malik and Jamal (1990) has, in fact, demonstrated that education and housing indicators are highly correlated with the overall level of development. Districts which have a relatively developed/underdeveloped education sector in terms of literacy and primary enrolment rates generally appear to have higher/lower ranking in terms of the composite level of development. Although it is difficult to come to any definitive conclusions about the direction of causality this finding tends to substantiate the view that regions of the country which have made greater progress are endowed with higher levels of human development.

The paper is organised as follows: Section 2 gives the choice of social development indicators. Section 3 gives the methodology for derivation of the composite indicator of social development while Section 4 gives the resultant ranking of districts, Section 5 presents the regression model and results of determinants of regional variations in the level of social development. Finally, in Section 6 are given the conclusions.

2. CHOICE OF INDICATORS

The choice of development indicators at the district level is governed by a number of considerations. First, an attempt has been made to achieve as wide a sectoral coverage as possible. As such indicators have been selected to highlight development of sectors like education, health, water supply. Second, two alternatives were available regarding the choice of indicators: we could concentrate on measuring the consequences of development or the level of development inputs. Greater reliance in this study is on the latter primarily because of the lack of district-wise data on the former. For example, if the output approach had been adopted to measure development of the education sector, the indicators used would have been, for example, school graduates as a percentage of the labour force both in stock and in flow. But since data is not available on this magnitude the alternative chosen is to quantify the level of inputs in the form of teachers, schools, hospitals, beds, etc. Therefore, while there may be some loss of precision in the quantification of the level of development, the results are perhaps more useful and operational in character from the planning view point.

The lack of data has not only constrained the approach to the construction of social development but it has limited the number of indicators. Nevertheless, it has been possible to identify 11 indicators relating to health, education and water supply. Diverse sources of data have been used for quantifying the indicators. Firstly, data has been

taken from the last census of population, housing survey by the FBS and development statistics of the provincial governments. Secondly, relevant data has also been collected from other published documents of the Federal, Provincial governments and FBS.

Described below are the social indicators chosen in each sector.

Education

Both stock and flow measures have been defined for the education sector. The stock measure is the literacy rate by gender which indicates the level of literacy among the population aged ten years and above in a district which has been taken from district census report of 1981. Measures of flow of output from the education sector relate to enrolment rates at the primary and secondary level (male and female separately). Information regarding enrolments at different levels has been taken from development statistics of the province. The relevant school age going population in each district have been projected on the basis of intercensal growth rates for purposes of deriving the enrolment rates. However, the distribution of census population has been adjusted according to newly formed districts which has been reported in the publication, Administrative Units of Pakistan, a publication of the Population Census organisation.

Health

Three types of indicators of development of the health sector have been defined. The first relates to health personnel i.e. doctors and nurses per 10,000 population, second, to hospital and rural health centre beds per 1,000 population while the third to number of patients treated in relation to total population. The last indicator is essentially an output measure. However, as the information regarding the number of district-wise doctors and nurses for the year 1991-92 was not available for Punjab. Therefore, it has been estimated on the basis of extrapolation of figures given in Health Statistics, a publication of provincial governments.

Housing

Only one indicator has been used to measure the level of social development, that is, access to water supply. The particular indicator use is percentages of households with inside water connections. As the data on water supply was not available for the latest year, the analysis has been done on the information reported in the Housing Survey of 1989 carried out by the FBS.

Ninety-four districts (as of 1991-92) and eleven indicators have been included in the analysis. This includes 34 districts from Punjab, 15 from Sindh, 20 from NWFP and 25 from Balochistan. Out of the eleven indicators, 6 relate to education, 4 to health and 1 to water supply.

Three summary measures, the mean, variance and the coefficient of variation, have been calculated to describe and compare the distributions of the indicators (see Table 1). By doing so we derive the extent of regional variation in social development. It needs to be pointed out that the means of the various indicators do not correspond to the national values of these indicators. This is because they are simple averages and not averages weighted by the population or area of the district depending on the indicator.

Table 1

Summary Statistics of Indicators

Indicators	Mean	Variance	Coefficient of Variation
Doctors per 1000 Population	2.03	4.25	0.98
Nurses per 1000 Population	0.87	2.69	0.53
Patients Treated per Population	0.43	0.15	1.10
Primary Enrolment—Boys (%)	73	0.08	2.55
Primary Enrolment—Girls (%)	33	0.07	1.29
Secondary Enrolment—Boys (%)	29	0.04	1.53
Secondary Enrolment—Girls (%)	10	0.01	1.05
Literacy Rate—Male (%)	24.52	190.70	1.78
Literacy Rate—Female (%)	10.50	76.57	1.20
Households with Access to Water (%)	16.77	187.31	1.23
Hospital Beds per 1000 Population	0.50	0.30	0.92

3. METHODOLOGY OF MEASUREMENT

In the literature on regional development, a number of techniques have been used to reduce the dimensions of the complex multivariate problem associated with the construction of composite development indicator. The first is the Z-sum technique which sums for a particular district its Z-score on each indicator. The Z-score is the standardised score, which has zero mean and unit variance. The higher the Z-sum[1] the more developed the region.

[1]The Z-sum can be computed as follows:

$$(Z\ sum)_j = \Sigma_{i=1}^{n} Z_{ij}$$

where $Zij = Xij\text{-}Xi / Si$, n= numbers of indicators, Xi= mean value of the ith indicator, Si= Standard deviation of the ith indicator, Xij= value of the ith indicator in the jth district.

The second technique computes the taxonomic distance [Khan and Iqbal (1982)], which is the Euclidean distance from the highest (standardised) values observed for different indicators.[2] The lower the taxonomic distance of a region or district, the more developed it is. Both the techniques have the problem of assigning equal importance to all development indicators. Further, the taxonomic distance technique is very sensitive to the presence of outliers.

The third and the most sophisticated method for indexing a multidimensional phenomenon is Factor Analysis (FA) technique [Adelman and Dalton (1971)]. This technique reduces the number of relationships by grouping together all those variables which are most highly correlated with each other into one factor or component. Thus the FA model can be described as follows:

$$X_i = a_{i1} F_1 + a_{i12} F_2 \ldots + a_{ij} F_j \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

where,

X_i is the ith indicator.

a_{ij} is called the factor loading and represents the proportion of the variation in X_i which is accounted for by the jth factor.

Σa_{ij} is called the communality and it is equivalent to the multiple regression coefficient in regression analysis.

F_j represents jth factor or component.

Principal Components Analysis (PCA) produces components in descending order of importance, that is, the first component explains the maximum amount of variation in the data, and the last component the minimum. It is often found that the first few components, called principal components, account for a sizeable part of the variation and subsequent components contribute very little. Using factor loadings of these principal components, factor score for each region or unit is computed as follows:

$$(FS)_{kj} = \Sigma_k e_{ij} * Z_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

where,

[2]The taxonomic distance can be derived as follows:

$$(TD)_j = [\Sigma_{i=1}^{n} (Z_{ij} - Z_i^*)^2]^{1/2}$$

where Zij=standardised (as described in the previous footnote) value of the ith indicator in the jth region, Zi*=highest standardised value of the ith indicator in all regions. The taxonomic distance is an Euclidean measure of the distance of a district from a hypothetical district which has the highest value for all the development indicators.

FS_{kj} represents factor score of the kth region and the jth factor,
Z_i is the standardised value of the ith indicator,
Σe_{ij} is the factor loading of the jth factor and the ith indicator.

To compute weighted factor score (WFS), these individual factor scores are derived from the following equation:

$$(WFS)_k = \Sigma_k \; e_j \; (FS)_{kj} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

where ej is the eigen value of the factor j and depicts the proportion of variation in the data set explained by the factor j. This WFS is used as an index for ranking regions on the basis of the general characteristics of the variable-set.

In this study, PCA is preferred to explain the grouping of variables, with WFS being used to rank the district due to its more appealing characteristics. However, Z-sum technique is also used to observe the sensitiveness of the results with respect to the choice of technique for deriving the composite indicators. Pasha and Hasan (1982); Pasha *et al.* (1990) also used these two techniques.

Table 2 presents the loading of each indicator on different factors. In addition, it gives the eigen values of each factor. Four factors emerge from the principal components analysis. These factors are described below:

Factor 1

Five out of 11 indicators load highly on this factor. It is by far the most important factor and includes most of the indicators from the education sector. As such education can be interpreted the most important service capturing variation in the level of social development.

Factor 2

This factor includes three indicators. It essentially comprises of health and water supply and sanitation.

Factor 3

The two indicators in this factor also relate to health. It is essentially a continuation of Factor 2 and reflects the same underlying phenomena.

Factor 4

This factor includes only one indicator, primary boys enrolment rate. This indicator represents the most basic level of education and, therefore, variation in its magnitude is not strongly correlated with the overall level of social development.

Table 2

Factor Loading Matrix

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Communality
Secondary Enrolment—Girls (%)	0.88133	0.14516	0.30654	0.1646	0.919
Literacy Rate—Female (%)	0.82926	0.27829	0.24511	-0.07239	0.847
Literacy Rate—Male (%)	0.80951	0.11763	0.30996	0.27688	0.842
Primary Enrolment—Girls (%)	0.79726	0.10043	0.20128	0.40248	0.848
Secondary Enrolment—Boys (%)	0.71632	0.15801	0.20314	0.47522	0.805
Households with Access to Water (%)	0.40003	0.84549	0.06185	–0.10853	0.890
Patients Treated per Population	0.07031	0.80268	0.21396	0.22458	0.745
Hospital Beds per 1000 Population	0.0549	0.75256	0.3051	0.35518	0.789
Doctors per 1000 Population	0.25292	0.24332	0.86359	0.0883	0.937
Nurses per 1000 Population	0.37494	0.24848	0.85231	–0.02692	0.929
Primary Enrolment—Boys (%)	0.37031	0.26334	–0.03524	0.8318	0.900
Eigenvalues	6.19901	1.49286	1.14938	0.61098	

4. RANKING OF DISTRICTS

The rank ordering of districts in 1990-91 is presented in Table 3. The table gives rankings generated by the principal components analysis (weighted factor score) and the *Z*-sum technique respectively. The correlation between the two rankings is 0.988. This indicates the robustness of the results which is also highlighted by the fact that except for Gujranwala, the top ten districts in WFS are also in the list of top 10 districts indicated by the *Z*-score.

Karachi and Rawalpindi are the most developed districts in Pakistan in terms of social indicators according to the *WFS* while in *Z*-score ranking Lahore and Quetta displace Karachi and Rawalpindi as the most developed districts. Besides these the list of top 10 districts include Chakwal, Jhelum, Gujrat, Faisalabad, and Sialkot. Gujranwala and Peshawar rank 10th in the *WFS* and *z*-score rankings respectively. These top ten districts account for almost 25 percent of the country's population. It may be noted that according to both the techniques most of the top districts are located in the province of Punjab with one each in the other three provinces. This tends to indicate that Punjab is ahead of the other provinces in terms of social development.

At the lower end of the distribution, seven out of ten districts are the same in both the rankings. According to *WFS*, Dera Bugti and Jalmagsi are the least developed districts while Kohistan and Nasirabad emerge as the lowest two districts in Z-score ranking. The other least developed districts according to both the rankings include Zhob, Khuzdar, Kalat, Kharan, Turbat, Bolan, Panjgur, Awaran and Killa Saifullah, all districts of Balochistan. Estimates are that about 5 percent of the national population resides in these districts. Nine of these districts are in Balochistan. This implies that Balochistan is least socially developed province in the country.

Table 3 also classifies the 94 districts according to the level of development. Relatively developed districts are those in which the top quartile of population lives. Districts at the intermediate level are those in which the second and the third quartile lives while the relatively under developed districts account for the bottom 25 percent of the population.

According to Z-score ranking, the top quartile consists of 10 districts. All the provincial capitals are in this category. Besides, Faisalabad, Rawalpindi, Gujrat, Sailkot and Jhelum are districts with high rate of urbanisation and buoyant industrial activity. Except of one district each in Sindh, NWFP and Balochistan all the other districts in this quartile are from Punjab.

The second quartile of population, according to the WFS, resides in 20 districts. Here again we observe the dominance of Punjab, with eleven out of these districts belonging to this province, like Gujranwala, Toba Tek Singh, Sahiwal, and

Table 3

Districts-wise Ranking of Social Sector of Pakistan

	District	Province	WFS		District	Province	Z–Score
				Top Quartile			
1	Karachi	[S]	26.0147	1	Lahore	[P]	33.7790
2	Rawalpindi	[P]	16.9032	2	Quetta	[B]	27.1702
3	Chakwal	[P]	16.2396	3	Rawalpindi	[P]	21.7602
4	Lahore	[P]	15.8617	4	Jhelum	[P]	15.1961
5	Jhelum	[P]	13.8476	5	Karachi	[S]	15.0423
6	Quetta	[B]	11.4693	6	Faisalabad	[P]	12.4723
7	Gujrat	[P]	10.6669	7	Chakwal	[P]	11.6895
8	Faisalabad	[P]	10.2559	8	Sailkot	[P]	10.4392
9	Sailkot	[P]	9.5103	9	Gujrat	[P]	10.2695
10	Gujranwala	[P]	9.0223	10	Peshawar	[N]	9.6742
				Second Quartile			
11	T.T. Singh	[P]	8.7161	11	Gujranwala	[P]	8.3997
12	M. Baha Uddin	[P]	7.8838	12	T.T. Singh	[P]	7.6672
13	Narowal	[P]	7.4406	13	Haripur	[N]	7.1679
14	Haripur	[N]	6.3132	14	Shaiwal	[P]	6.8214
15	Attock	[P]	5.4162	15	Attock	[P]	6.6496
16	Sargodha	[P]	5.0561	16	Multan	[P]	5.7214
17	Hyderabad	[S]	4.8612	17	Abbottabad	[N]	5.5262
18	Shaiwal	[P]	4.3784	18	Sibi	[B]	5.2867
19	Nawshera	[N]	4.0355	19	Nawshera	[N]	4.9870
20	Khanewal	[P]	3.5312	20	Sargodha	[P]	4.7876
21	Multan	[P]	3.3155	21	Narowal	[P]	4.5065
22	Naushero F.	[S]	3.3003	22	M. Baha Uddin	[P]	4.1047
23	Okara	[P]	2.8373	23	Kohat	[N]	4.0671
24	Sheikhupura	[P]	2.7449	24	Hyderabad	[S]	4.0355
25	Abbottabad	[N]	2.7280	25	Charsadda	[N]	3.8821
26	Charsadda	[N]	2.3308	26	Rahim Yar Khan	[P]	3.3607
27	Tank	[N]	2.2013	27	Mainwalai	[P]	3.3278
28	Bahawalnagar	[P]	2.1264	28	Bhawalpur	[P]	3.1852
29	Malakand	[N]	1.6083	29	Tank	[N]	2.8443
30	Peshawar	[N]	1.3097	30	D.I. Khan	[N]	2.7729
				31	Larkana	[S]	2.4750

Continued—

Table 3—(*Continued*)

District		Province	WFS	District		Province	Z–Score
				Third Quartile			
31	Mirpurkhas	[S]	1.0353	32	Chitral	[N]	2.4402
32	Mainwalai	[P]	1.0231	33	Karak	[N]	2.2741
33	Hafizabad	[P]	0.8930	34	Khushab	[P]	2.2490
34	Karak	[N]	0.7639	35	Bannu	[N]	1.5821
35	Sukkar	[S]	0.6430	36	Nawabshah	[S]	1.5610
36	D.I. Khan	[N]	0.6428	37	Naushero F.	[S]	1.3569
37	Swabi	[N]	0.5445	38	Malakand	[N]	1.3358
38	Vehari	[P]	0.3224	39	Sheikhupura	[P]	1.2868
39	Rahim Yar Khan	[P]	0.2881	40	Lakki	[N]	0.6170
40	Khushab	[P]	0.2413	41	Mirpurkhas	[S]	0.4713
41	Kasur	[P]	0.2153	42	Swat	[N]	0.4668
42	Kohat	[N]	0.1457	43	Khairpur	[S]	0.2289
43	Khairpur	[S]	–0.1975	44	Khanewal	[P]	–0.1656
44	Nawabshah	[S]	–0.1986	45	Sukkar	[S]	–0.4690
45	Layyah	[P]	–0.2253	46	Bahawalnagar	[P]	–0.7517
46	Jhang	[P]	–0.6348	47	Bhakkar	[P]	–0.7959
47	D.G. Khan	[P]	–0.9605	48	Okara	[P]	–0.9460
48	Buner	[N]	–1.3008	49	Jhang	[P]	–1.1024
49	Bhawalpur	[P]	–1.4317	50	Buner	[N]	–1.2584
50	Pakpattan	[P]	–1.4499	51	Swabi	[N]	–1.6588
51	Chitral	[N]	–1.5092	52	Hafizabad	[P]	–1.8140
52	Mardan	[N]	–1.5608	53	Shikarpur	[S]	–1.8390
53	Lodhran	[P]	–1.7701	54	Kasur	[P]	–2.0419
54	Dadu	[S]	–2.1306	55	Mardan	[N]	–2.1385
				56	Ziarat	[B]	–2.2424
				Bottom Quartile			
55	Shikarpur	[S]	–2.2492	57	Layyah	[P]	–2.3279
56	Muzaffarghar	[P]	–2.5598	58	Vehari	[P]	–2.3336
57	Bannu	[N]	–2.9875	59	D.G. Khan	[P]	–2.6532
58	Larkana	[S]	–3.0215	60	Dadu	[S]	–3.0322
59	Sanghar	[S]	–3.1303	61	Thatta	[S]	–3.0647

Continued—

Table 3—(*Continued*)

60	Bhakkar	[P]	–3.1602	62	Sanghar	[S]	–3.7943
61	Manshera	[N]	–3.1704	63	Manshera	[N]	–3.8104
62	Swat	[N]	–3.1779	64	Kohlu	[B]	–4.1405
63	Barkhan	[B]	–3.6361	65	Dir	[N]	–4.7799
64	Thatta	[S]	–3.7789	66	Lodhran	[P]	–4.8434
65	Tharparkar	[S]	–3.9269	67	Chagai	[B]	–4.9470
66	Musa Khail	[B]	–3.9667	68	Muzaffarghar	[P]	–4.9657
67	Dir	[N]	–4.1152	69	Barkhan	[B]	–5.2614
68	Sibi	[B]	–4.3073	70	Badin	[S]	–5.3758
69	Ziarat	[B]	–4.3808	71	Pishin	[B]	–5.4476
70	Lakki	[N]	–4.4524	72	Jhalmagsi	[B]	–5.6175
71	Loralai	[B]	–4.6029	73	Rajanpur	[P]	–5.9379
72	Rajanpur	[P]	–4.7602	74	Pakpattan	[P]	–6.1570
73	Mastung	[B]	–4.7734	75	Gawader	[B]	–6.1616
74	Badin	[S]	–4.8466	76	Jacobabad	[S]	–6.1918
75	Pishin	[B]	–5.0904	77	Lasbela	[B]	–6.7740
76	Chagai	[B]	–5.1677	78	Loralai	[B]	–7.7837
77	Panjgur	[B]	–6.0387	79	Mastung	[B]	–7.9594
78	Kohlu	[B]	–6.0408	80	Tharparkar	[S]	–8.9178
79	Gawader	[B]	–6.3226	81	Jaffarabad	[B]	–9.1419
80	Lasbela	[B]	–6.5395	82	Musa Khail	[B]	–9.2995
81	Jacobabad	[S]	–6.5698	83	Bolan	[B]	–9.3237
82	Killa Saifullaha	[B]	–6.7825	84	Dera Bugti	[B]	–9.4643
83	Jaffarabad	[B]	–6.8593	85	Kharan	[B]	–9.6348
84	Awaran	[B]	–7.1243	86	Khuzdar	[B]	–10.1718
85	Kalat	[B]	–7.1316	87	Killa Saifullaha	[B]	–10.2935
86	Turbat	[B]	–7.2116	88	Awaran	[B]	–10.5132
87	Kharan	[B]	–7.2608	89	Kalat	[B]	–10.8131
88	Kohistan	[N]	–7.3670	90	Panjgur	[B]	–10.8265
89	Khuzdar	[B]	–7.4268	91	Zhob	[B]	–11.0581
90	Bolan	[B]	–7.5248	92	Turbat	[B]	–11.0819
91	Nasirabad	[B]	–7.7698	93	Nasirabad	[B]	–11.1989
92	Zhob	[B]	–7.8430	94	Kohistan	[N]	–12.6158
93	Jhalmagsi	[B]	–8.7686				
94	Dera Bugti	[B]	–9.4706				

[P]=Punjab, [S]=Sindh, [N]=NWFP, [B]=Balochistan.

Multan. Out of the remaining districts, seven are from NWFP, including Haripur, Abbotabad, Nowshera, Kohat, Charsadda, D. I. Khan, and Tank. The relatively high enrolment rates at primary level alongwith access to water supply facilities are the prime reason for the relatively high ranking of districts in the province.

Nine each out of 25 districts in the third quartile are from NWFP and Punjab respectively while six are from Sindh. The last quartile which consists of 38 districts is dominated by Balochistan, with 22 districts belonging to this province, followed by Punjab with seven districts and Sindh with six districts.

The population shares of each province in each quartile are presented in Table 4. The share of Punjab in the top three quartiles is larger than its share in national population (excluding FATA etc.) implying that Punjab, by and large, has a high to intermediate level of social development. Sindh has a high share in the first and the fourth quartile, indicating the dualistic pattern of development in the province with Karachi representing one polar extreme. NWFP has an intermediate level of development while Balochistan is the most backward province in terms of social development in the country. It is, however, important to note that even the relatively developed provinces have pockets of low development like the districts in the south of Punjab. Alternatively, even a relatively backward province has some areas with high level of social development. The best example of this is Quetta district in Balochistan.

Table 4

Percentage Share of Provinces in Population Quartile, by Level of Development

(%)

Quartile	Punjab	Sindh	NWFP	Balochistan	Total
Top Quartile	61.1	31.5	5.6	1.8	100.0
Second Quartile	55.8	23.6	20.4	0.2	100.0
Third Quartile	55.8	23.6	20.4	0.2	100.0
Bottom Quartile	33.4	31.5	8.7	26.3	100.0
Overall Population Share	55.2	24.1	13.9	6.8	100.0

Table 5 gives the zero-order correlation matrix between different indicators. High correlation is observed between doctors and nurses, primary and secondary enrolments, literacy rates and enrolment rates. In particular, girls primary and secondary enrolment rates are strongly related to the male and female literacy rates. There also appears to be a degree of correlation between different sectors. Linkage

Table 5

Correlation Between Social Indicators

Indicators	Doctors per Thousand Population	Nurses per Thousand Population	Patients Treated per Thousand Population	Primary Enrolment Rate (Boys) 1991-92	Primary Enrolment Rate (Girls) 1991-92	Secondary Enrolment Rate (Boys) 1991-92	Secondary Enrolment Rate (Girls) 1991-92	Literacy Ratio (Male) 1981	Literacy Ratio (Female) 1981	Percent of Households with Inside Piped Water	Hospital Beds (Hospitals+ RHCs)
Doctors per Thousand Population	1.00000										
Nurses per Thousand Population	0.88090	1.00000									
Patients Treated per Thousand Population	0.40591	0.40132	1.00000								
Primary Enrolment Rate (Boys) 1991-92	0.27303	0.16642	0.38080	1.00000							
Primary Enrolment Rate (Girls) 1991-92	0.47133	0.51504	0.24912	0.59583	1.00000						
Secondary Enrolment Rate (Boys) 1991-92	0.49811	0.48307	0.38916	0.64211	0.77362	1.00000					
Secondary Enrolment Rate (Girls) 1991-92	0.61623	0.61686	0.28043	0.48885	0.86746	0.73185	1.00000				
Literacy Rate (Male) 1981	0.61825	0.54877	0.28096	0.52766	0.79438	0.75025	0.85712	1.00000			
Literacy Rate (Female) 1981	0.58983	0.56980	0.34780	0.35702	0.64480	0.66845	0.81675	0.72088	1.00000		
Percent of Household with Inside Piped Water	0.41134	0.44265	0.59216	0.31705	0.38558	0.37318	0.46214	0.41752	0.51800	1.00000	
Hospital Beds (Hospital + RHCs)	0.47711	0.42465	0.59562	0.45330	0.37197	0.33016	0.33867	0.34572	0.30970	0.62680	1.00000

exists between water supply and health services and education and health services, specifically health personnel. This correlation is a reflection of the spillover and externalities generated by different social services and highlights the presence of synergies between sectors. On the whole, in the profile of development, the key sector appears to be education, in particular, female primary and secondary enrolment rates.

5. DETERMINANTS OF SOCIAL DEVELOPMENT OF DISTRICTS

The key question that arises is what determines regional variations in the level of social development in Pakistan. From the above discussion it appears that provincial headquarters rank high in terms of development. Also, to the extent the provision of services is characterised by economies of scale and is more efficient and cost effective in larger cities, there may exist a high degree of correlation between urbanisation and regional social development. Moreover, regions with buoyant industrial bases and high level of economic development may have a high demand and a higher ability to pay for social services. Therefore, as recognised generally in international literature, there may exist a close link between urbanisation, industrialisation, economic development and social development in Pakistan also.

Besides, there appear to be substantial interprovincial differences in the level of social development in Pakistan. The previous section indicates that Punjab is further ahead of the other provinces in terms of social development. In addition, the presence of special features, like the existence of sea port, may also have an impact on the spatial ranking of district in terms of social development.

To analyse the determinants of social development in Pakistan we have developed the following regression model:

$$SOCIAL_i = f(PU_i, PCVA_i, ROAD_i, PHQ, DUM, PORT) \quad \ldots \quad \ldots \quad (4)$$
$$\qquad\qquad +\quad +\quad +\quad +\quad +/-\quad +$$

Where:

$SOCIAL_i$ = Weighted Factor Score of the 'ith' district.
PU_i = Percentage of urban population in the 'ith' district.
$PCVA_i$ = Per capita industrial value-added of the 'ith' district.
$ROAD_i$ = Road network in the 'ith' district.
PHQ = Dummy for provincial headquarters.
DUM = Provincial dummies.
$PORT$ = Dummy for Karachi port.

Results

The above model has been estimated for the 94 districts in Pakistan. The results are as follows:

$$SOCIAL_i = \underset{(-2.055)}{-0.3157} + \underset{(3.686)}{1.3433}\, PU_i + \underset{(1.162)}{4.26 \times 10^{-5}}\, PCVA_i + \underset{(4.414)}{2.6461}\, ROAD_i + \underset{(2.515)}{1.0842}\, PHQ$$

$$\underset{(-6.743)}{-1.0084}\, BDUM - \underset{(-5.201)}{0.8082}\, SDUM - \underset{(-3.030)}{0.4378}\, NDUM + \underset{(3.697)}{2.2333}\, POR \quad \ldots \quad (5)$$

Figures in brackets are t-statistics $\overline{R}^2 = 0.7530$ No. of Observations = 94.

Where:

$BDUM$ = Dummy for Balochistan province.
$SDUM$ = Dummy for Sindh province.
$NDUM$ = Dummy for NWFP province.

Equation (5) indicates a high positive correlation between the level of social development of a strict and the extent of its urbanisation and economic development. The latter is proxied by road network. Pasha and Hasan (1982), and Pasha *et al.* (1990) highlight the close link between the level of economic development and road network in the context of Pakistan. As such, our results substantiate the existence of a close relationship between the level of social development, urbanisation and economic development.

The results, however, do not demonstrate a high positive correlation between industrialisation and social development. This is not surprising because according to Pasha *et al.* (1990), the process of industrialisation does not possess a high degree of correlation with the overall process of economic development also. This is in conflict with the perception that large-scale manufacturing generally acts as the leading sector stimulating economic growth. The small share of this sector in the national economy, limited employment creation and its dependence on imported material have reduced its linkages with the rest of the economy. Consequently, districts with higher manufacturing value-added are not necessarily the most economically and/or socially developed.

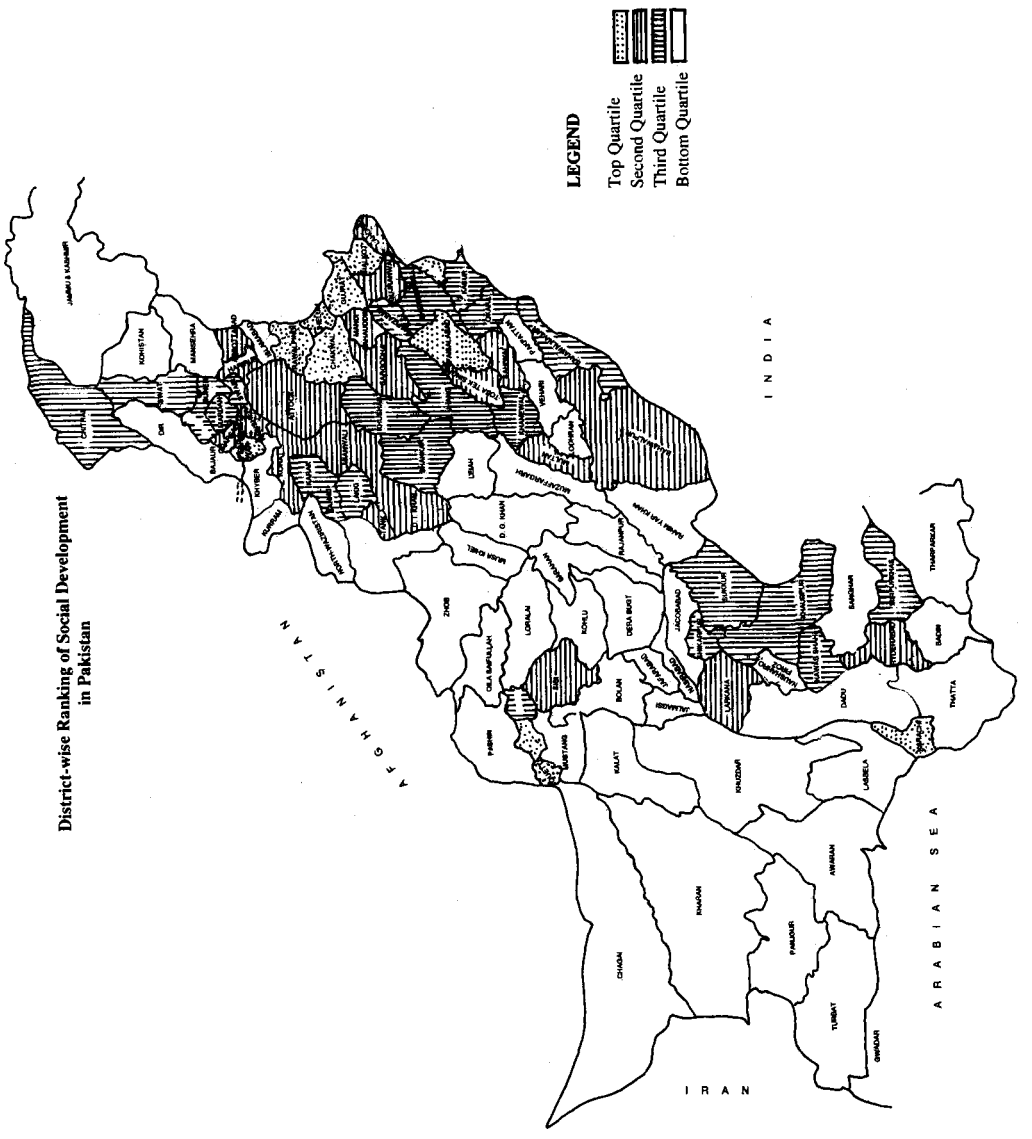
As expected, provincial capitals have a highly developed network of social infrastructure as does the port city of Karachi. The negative provincial dummies substantiate our earlier conclusion that Punjab is the most highly developed province in social indicators followed by NWFP, Sindh and Balochistan. As such, there are clear inter-provincial differences in regional development in Pakistan. This may reflect historical differences in the level of public allocations per capita to the social sectors.

6. CONCLUSIONS

The paper has used eleven indicators relating to the education, health and water supply sectors to rank districts of Pakistan in terms of the level of social development. It also seeks to explain regional variation in the development of social infrastructure across districts. The paper demonstrates the importance of education indicators in determining the overall level of social development, especially in terms of female literacy and enrolment rates. Also, the ranking demonstrate a close correlation between levels of social and economic development spatially with Pakistan. Other important determinants of regional variations in the level of social development include the extent of urbanisation, the administrative development of the districts (location of provincial headquarters), and the geographical/economic significance (indicated by the presence of the sea port). Overall, Punjab appears to have the highest level of social development followed by NWFP, Sindh and Balochistan. However, the results indicate substantial variation among districts within a province in the level of social development. Least developed districts within each province are identified as targets for special development allocations within SAP.

Table A1

Table A1


District-wise Ranking of Social Development in Pakistan
LEGEND
Top Quartile
Second Quartile
Third Quartile
Bottom Quartile
AFGHANISTAN
INDIA
IRAN
ARABIAN SEA

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Comments

The study is focused on very important issues of development i.e. identification of most underdeveloped areas. The authors have used Social Development Indicators to rank the districts of Pakistan. The objective of the study is to highlight the variation in the development of social infrastructure across the country. The main focus has been placed on the education and health variables. It has been claimed that a close correlation exists between social and economic development. Punjab appears to have the highest level of social development followed by the NWFP, Sindh, and Balochistan. The least developed districts are also identified for special development allocation (through SAP) so that such underdeveloped areas could be brought into the mainstream.

The authors have picked an important topic for research, particularly focusing at district-level research which has so far been lacking. Therefore, the paper also opens up an avenue to carry out research at micro level. The research work pertaining to the ranking of districts is a valuable contribution which could be used for policy direction; particularly, the 9th Plan may focus on the underdeveloped areas, which are neglected. The 6th Plan had a special development programme for such areas but it was hardly implemented. Thus, the information contained is valuable and timely and could be used for development policy direction. The study may be improved and made more meaningful by including the following points.

(i) The authors have focused mainly on education and health variables. Other variables of social development are ignored. Even important variables pertaining to health and education are not analysed. For example, sanitation facilities in rural areas, rural roads, health units, informal education programmes, etc. Moreover, there is a need to split the information on rural-urban basis. Most of the facilities are provided in urban areas whether the whole district appears to be top/bottom ranking. Thus, there is a need to broaden the scope of variables and regional areas within districts.

(ii) Primary involvement does not provide a good picture of the situation. I would not include *kachi* class; and dropouts are so high that such enrolment may not convey the desired message. Thus, the quality of data is as important as the results of the study.

(iii) Table 4, which provides percentage share of province in population quartile by level of development. Such percentage figures are misleading for policy direction. It might be better if the absolute number of persons in each province (by quartile) were also provided and a conclusion drawn based upon both percentage and absolute figures. The objective of development policies may

not be the number of districts but the maximum the number of people, who should be the target of development policy. Therefore, the cluster of population needs to be identified, not in percentage term. By doing so, it could provide a better guideline for policy-makers. By doing so, the claims and ranking may not be the same as argued by the authors.

In brief, the study is a significant contribution to the literature which provides the bases for a development policy. However, it could be more useful if the point cited above were incorporated.

M. Aslam Chaudhary

Department of Economics,
Quaid-i-Azam University,
Islamabad.