

DEVELOPMENT RANK ORDERING OF DISTRICTS OF PAKISTAN: Revisited

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This paper quantifies the level of development of districts of Pakistan using 33 indicators and the latest published information. Three techniques viz; Z-SUM, Taxonomic Distance and Weighted Factor Score are employed to rank districts. The findings indicate significant inter district and intra-provincial differences in the level of development. We find pockets of developed and under developed regions in all the four provinces of Pakistan. The predominant share of the Punjab population lives in better conditions (top quartile). The share of Sindh, NWFP and Baluchistan in the backward districts (bottom quartile) is greater than their provincial population share.

I. Introduction

Research on the issues measuring territorial or regional levels of development is a popular but controversial subject in the development literature. The subject is controversial because of the choice of indicators that reflect a more representative level of development across countries and regions and the techniques that have been used for quantifying development. This subject has also received significant attention in Pakistan as earlier research shows significant inter district and intra provincial differences in the regional level of development. Review of the spatial policies pursued by various governments in Pakistan suggests that fiscal incentives

in the form of tax holidays and exemption of import duties on capital goods were popularly being used to influence the pattern of development in Pakistan. Besides, the government of NWFP (Rs.3.8 billions) and Baluchistan (Rs.4.8 billions), on the pretext of their relative backwardness level, were entitled to receive special grants since 1997 from the federal divisible pool of taxes in the NFC award. In addition, these two provinces are allocated additional funds (5 per cent each) in the Public Sector Development Programme (PSDP) from the federation on the basis of their backwardness. Despite these spatial policies, perhaps, there is now a greater realization that little has been achieved, relatively to influence the regional development pattern, given the current level of backwardness in various parts of the country.

The earlier research undertaken on the issue in Pakistan has attempted to quantify the level of regional development and identified significant inter-district and intra-provincial differences in the level of development. Helbok and Naqvi (1976) using 1960's data, measure the level of development of various districts in Pakistan. Similarly, Pasha and Hasan (1982) used 1970's data and with the help of 27 development indicators determined the development level of districts in Pakistan. They identified significant inter-district and intra-provincial variation in the level of development. Jamal and Malik (1988), and Pasha et.al., (1990) examined the shifting pattern in the development rank ordering in the Sindh province and Pakistan using the data sets of the 1970's and the 1980's, respectively. They found significant inter-temporal distortion in the development rank ordering, thereby implying that few districts which stood high in development ranking in the 1970's lagged behind due to poor performance or lower growth observed over a decade in some of the sectoral indicators. Wasti (1986) quantified level of rural and urban development at district levels in Pakistan. Zaidi (1989), also examined inter-provincial variation in the development level in Pakistan, using a number of individual indicators.

However, this study, utilizing the most recent census and published information in the late 1990's, attempts to quantify the level of development of districts in Pakistan. The study would not only help to trace the most backward districts of the country, but also help to identify the services and facilities that are lagging in these districts. This will attract immediate attention of the planners and policy makers in formulating appropriate policies for future (development) and target the planning of services to improve the quality of life in Pakistan.

The organization of the paper is as follows. Section II gives the description of various approaches used to study the development levels and provide details of the development indicators selected for this study. Section III throws light on the techniques used in construction of a composite indicator, whereas Section IV provides the description of the development process in Pakistan. Section V gives rank ordering of districts of Pakistan, followed by Section VI which provide a profile of backwardness along with the identification of the lagging sectors. Finally, in Section VII, the summary and concluding remarks have been recorded.

II. The Composite Index Approach and the Selection of Indicators

A) *Composite Index Approach*

Various approaches employed for measuring development inequality can be grouped into the following three categories:

- a) Single Indicators Approach.
- b) Multiple Indicators Approach.
- c) Composite Index Approach.

a) *Single Indicators Approach*

The traditional approach for studying the development level has been the use of GNP or GNP per capita as a sole representative of the development level. The simplicity of this approach led to its widespread use. It is, however, considered to be a poor measure of development as it ignores differences in access to and quality of goods and services, the extent of leisure and the share of non-marketed goods.

b) *Multiple Indicators Approach*

This approach utilizes more than one indicator but does not construct a single composite index. Thus, it concentrates on the multiple comparisons based on individual indicators. This approach also involves subjectivity in the choice of development indicators and no definite conclusions are drawn about the overall development level; given that, different indicators may point towards different directions as demonstrated by Zaidi (1989).

c) *Composite Index Approach*

This approach employs a large number of indicators, covering important sectors of the economy and lumping these into a single composite index. It accepts the conclusion [shared by Adelman and Morris (1967), Tobarrah (1972) Lee and Liu (1988), and Hicks and Streeten (1979)] that "Development is a multi-dimensional complex phenomenon that involves basic social and political changes in a society as well as growth in per capita income". However, the shortcomings are the subjectivity involved in the choice of development indicators and its weightage. This approach is superior to the single indicator approach given its wide sectoral coverage that essentially reflects various aspects of economic, social and institutional development.

B) Selection of Development Indicators

As highlighted earlier, broader consensus emerged on the definition that has seen development as a multidimensional phenomenon that involves basic social and political changes in a society along with growth in per capita income. Adelman and Morris (1967), Tobarrah (1972), Lee and Liu (1988), Hicks and Streeten (1979), Helbok and Naqvi (1976), Pasha and Hassan (1982), Pasha et.al (1990), use this definition for measuring development levels. This paper has also adopted a multidimensional view of development generated through an interaction of a large number of social, economic and institutional indicators.

The choice of indicators depends upon a few important considerations. First, an attempt has been made to cover as many sectors of the economy as possible given the availability of data at the district level. Second, given the data constraints, greater emphasis has been given to indicators that essentially relate to development inputs and could thus be used as an instrument of regional and development planning (Pasha and Hassan, 1982). Most of the selected indicators had earlier been used in different studies measuring district/territorial level of development in Pakistan. These selected indicators can be broadly categorized into the following seven sectors viz., Income and Wealth, Agriculture, Housing, Education, Health, Transport and Communications, Industrial Labour Force and Gender Equality. Altogether, 33 development indicators are used. The sector-wise list of indicators is given as under. The method of construction of these indicators is reported in Appendix Table A-1.

a) Income and Wealth

This sector is represented by the following five indicators.

1. Value of Crops (thousand rupees) per Capita Rural Population (VCROP).

This indicator stands as a proxy for rural income but ignores activities related to fishing, forestry, trade, etc. This indicator is constructed by using production and price data, which comprises of 42 fields (major and minor) crops and tree crops.

2. Industrial Value-Added per Capita Urban Population (MVA).

This indicator is taken as a proxy for urban income. Only large-scale manufacturing is included. Due to lack of information, it ignores small scale and informal sector activities at district levels. As such, it under-reports value added components for those districts which have a relatively higher share of small scale activities.

3. Number of Commercial Bank Branches per 100,000 Population (BNK).

This indicator is used as a crude proxy for income and wealth that may be linked with the level of economic and business activities.

4. Number of Livestock Units per Capita Rural Population (LSTOCK).

This is an important indicator that represents income and wealth in rural areas. The indicator was constructed at the district level by aggregating livestock population and assigning different weights as used by Pasha et al., (1990), Jamal and Malik (1988).

5. Number of Cars per 1000 Urban Population (CAR)

This indicator was chosen to reflect the income and wealth status of urban households.

b) Agriculture

The value of field crops and trees has already been used as an indicator of income and wealth. The other indicators chosen to represent modernization of agriculture and intensity of agricultural activity include the following:

1. Number of Tractors per 1000 Hectares Cropped Area (TRC)
2. Fertilizer Usage (Nutrient Tons) per Hectare Cropped Area (FRT)
3. Proportion of Cropped Area Irrigated by Canals (IRIG)

c) Housing

This sector is represented by indicators that reflect consumption and quality of housing stock and basic services. The indicators included are:

1. Rooms per person (PROOMT) measure the availability of housing.
2. The quality of housing is reflected by the construction of housing stock reported as Pucca (PUCCA) including access to housing services like electricity (ELECTRICITY), gas (GAS) and piped water connection (WAT).

d) Transport and Communications

The lack of availability of data at the district level restricted the selection of indicators. However, three indicators that represented this sector include:

1. Metalled Road (km) per Geographic Area (MRD).

It ignores the quality of roads.

2. Passenger Load Carrying Capacity per Capita (PASN)

This indicator demonstrates the passenger load carrying capacity converted into equivalent passenger car units on roads at a district level by using the formula employed by Pasha et al., (1990)

3. Number of TV Sets per 1000 Population (TV)

The data on number of TV sets are based on the licenses issued by government agencies/departments. This indicator poorly reflects the actual situation as the bulk of the population does not procure licenses.

e) Health

Given the data limitation, this sector is represented by one indicator i.e. Number of Hospital Beds per 1000 Population (BED).

It represents the health-care available to public but is a poor indicator of measuring differences in access to or quality of health care. Due to lack of latest published information on the number of doctors for the districts located in Punjab, this indicator was not constructed. The statistics, however, is available for the remaining three provinces for the year 1998-99.

f) Education

The highest number of indicators (13) is chosen from the education sector. The selected indicators represent general access to education and include both stock and flow measures. Overall literacy rate (LTL) represented as an indicator of stock measure whereas enrollment ratios at the primary (PENR), middle (MENR), secondary (HENR) and college levels (IDENR) are weighted with respect to relevant age categories (see, Appendix Table A-1). The indicators capturing the quality of education are also included. These are student-teacher ratios at the primary (TSRP), middle (TSRM), secondary (TSRS) and college levels (TSRC), and teacher-school ratios at the primary (PSCT), middle (MSCT), secondary (SSCT) and college levels (CSCT).

g) Gender Equality

An important feature of development is women empowerment and their increased participation in decision making and social and economic activities. Two indicators are chosen to depict gender equality.

1. Female to Male Labour Force Participation Rate (LABFM), and
2. Female to Male Literacy Rate (LTFM).

h) Industrial Labour Force

1. Percentage of Labor Force in Industry (1998)

This indicator reflects the development of industrial base and depicts extent of employment absorption in both large and small-scale industry in a district.

The data on selected indicators is procured from a number of published sources. The major data set is taken from the Population Census Reports (1998), Provincial Development Statistics (1998-99), Livestock Census [(1996-97) Special Report], Banking Statistics of Pakistan (1997-98); for details please see, Appendix Table A-1.

III. Techniques for Construction of a Composite Index

The following three popular techniques for construction of a composite index have been discussed in the literature

1. Z-SUM Technique.
2. Taxonomic Distance Technique.
3. Weighted Factor Score Technique.

The Z-SUM technique for the district is given by

$$(z\text{-sum})_j = \sum_{i=1}^n Z_{ij}$$

where,

$$Z_{ij} = (X_{ij} - \bar{X}_i) / S_i,$$

n = Number of indicators,

X_{ij} = Value of the i th indicator in the j th district,

\bar{X}_i = Mean value of the i th indicator, and

S_i = Standard Deviation of the i th indicator.

The resulting distribution of Z-SUM also has a zero mean that provides a source point for comparing districts with the average. The higher the Z-SUM the more developed the district. The drawback of this technique is that it gives equal weightage to each indicator.

The Taxonomic Distance (TD) technique measures the difference in the level of development with respect to the highest standardized value of a particular indicator (ideal district) from a standardized value of the same indicator in the other observed districts.

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

where,

Z_{ij} = Standardized Value of the i th indicator of the j th district, and
 Z_i^* = Highest Standardized Value of the i th indicator among all the districts.

The lower the value of TD compared to the other districts, the higher will be the development rank. This technique is sensitive to the out-liers. It also assigned equal weight to each indicator.

The Factor Analysis technique is more sophisticated and commonly used multivariate method to index the level of socio economic development [Adelman and Dalton (1971)]. This technique forms clusters of highly correlated indicators into factors, such that the latter is a linear combination of the former.

$$X_i = a_{i1} F_1 + a_{i2} F_2 + \dots + a_{ij} F_j$$

where,

X_i represents the i th indicator,
 a_{ij} is the factor loading and represents the proportion of variation in X_i with respect to the j th factor,
 $\sum a_{ij}^2$ give the communality and it is equivalent to the multiple regression coefficients in regression analysis, and
 F_j represents the j th factor.

The method generates factors or component in decreasing magnitude of variation as explained by the data. Generally, the first few components called the principal component gives the maximum amount of explained variation. Subsequently, factor score of each unit is computed by using the factor loadings of the principal components.

$$(FS)_{kj} = \sum_k e_{ij} * Z_k$$

where,

FS_{kj} indicates factor score of the k th unit and the j th factor,
 Z_i is the standardized value of the i th indicator, and
 e_{ij} represent the factor loading of the j th factor and the i th indicator.

TABLE A-2

Summary Description of Development Indicators

Variables	Minimum	Maximum	Mean	Standard Deviation	Skewness	Coefficient of variation
BED	0.00	37.98	4.61	4.63	4.37	1.00
BNK	0.00	0.17	0.05	0.04	0.91	0.88
CAR	0.00	1242.45	87.42	181.49	3.78	2.08
CSCT	0.00	88.31	31.32	16.44	0.73	0.53
ELE	0.42	95.90	60.33	24.58	-0.62	0.41
FRT	0.00	2.54	0.12	0.28	7.23	2.32
GAS	0.07	80.89	9.21	13.78	2.90	1.50
HENR	0.03	0.57	0.25	0.11	0.36	0.42
IDENR	0.01	0.35	0.08	0.04	3.40	0.53
IRIG	0.00	173.33	70.93	37.46	-0.41	0.53
LABFM	0.00	0.30	0.04	0.04	4.27	1.09
LSTOCK	0.00	2.79	0.54	0.35	2.97	0.65
LTFM	0.13	0.76	0.38	0.15	0.67	0.39
LTL	10.37	70.40	33.65	13.72	0.43	0.41
MENR	0.06	0.85	0.42	0.18	0.10	0.42
MLABS	0.00	19.42	3.09	3.18	2.71	1.03
MRD	0.00	47.44	17.06	13.40	0.24	0.79
MSCT	1.77	18.17	9.11	2.96	-0.15	0.32
MVA	0.00	49905.06	3982.23	7622.09	3.21	1.91
PASN	0.00	646.59	36.53	83.29	5.16	2.28
PENR	0.04	0.75	0.33	0.17	0.60	0.52
POPU	33.00	9856.00	1270.53	1396.56	3.22	1.10
PROOMT	0.17	0.77	0.33	0.09	2.02	0.26
PSCT	0.23	8.95	2.77	1.30	1.96	0.47
PUCCA	1.50	96.71	43.43	28.97	0.23	0.67
SSCT	9.41	43.45	20.17	4.32	1.55	0.21
TRC	0.00	170.00	15.68	19.43	5.64	1.24
TSRC	0.00	0.31	0.05	0.05	2.93	0.90
TSRM	0.01	0.44	0.06	0.05	5.49	0.78
TSRP	0.00	0.08	0.04	0.01	0.56	0.26
TSRS	0.00	0.32	0.07	0.05	2.79	0.78
TV	0.00	725.68	103.33	150.84	2.26	1.46
VCROP	0.00	32422.64	5639.76	5149.93	2.23	0.91
WAT	7.94	97.40	59.97	27.68	-0.36	0.46

While undertaking the factor analysis Varimax rotation was used. Quatrimax rotation was also attempted but the result was not significantly altered.

Finally, the factor score generated by individual factors are added to compute the weighted factor score of each unit as follows:

$$(WFS)_k = \sum_j e_j (FS)_{kj}$$

In the above equation e_j represent the eigen value of the j th factor that represent the variation explained by the j th factor given the magnitude of the indicators. Finally, the weighted factor score of the k th unit is computed for the set of indicators. Higher the overall factor score of the district, the more developed the district would be compared to other districts.

IV. Results of the Weighted Factor Score

The first factor explains around 31 per cent variation in the data. Nearly 17 indicators load highly in this factor and largely include indicators from the education sector. It also contains indicators like water supply, electricity and gas, the provision of which is the responsibility of the public sector in Pakistan. This factor also includes indicators from the communication sector i.e., metalled road (MRD) and TV, indicator of income and wealth including banks (BNK) and manufacturing value added (MVA), industrial labour force (MLABS) and gender equality (LTFM). Based on the high loading cluster of indicators in this factor, it may be termed as reflecting the process of urbanization and modernization. This pattern was also obtained by Pasha and Hassan (1982).

The second factor explains 11 per cent of the total variation. It includes indicators of quality of education i.e., middle and secondary education (MSCT, SSCT). In addition, it also contains indicators representing modernization of agriculture i.e., IRIG, FRT.

The third factor explains 8 per cent of the variation and includes indicators of gender equality i.e. female to male labour force ratio (LABFM) showing an improvement in female labour force participation as compared to the findings of Pasha et. al., (1990), who observed its highest loading in the last factor in the process of development.

The fourth factor explains 7 per cent variation and includes two indicators from the agriculture sector i.e., tractors per cropped area (TRC) and livestock per rural population (LSTOCK). It further contains indicators that depicted quality of education such as primary and secondary student-teachers ratio (TSRP, TSRM).

The fifth and the sixth factors capture 6 per cent and 5 per cent, respectively, of the explained variation. The fifth factor includes two indicators i.e., persons per room (PROOMT) and teacher-student ratio at the college level (TSRC). The sixth

TABLE 1

Results of Principal Components Analysis

Variable	Fac- tor-1	Fac- tor-2	Fac- tor-3	Fac- tor-4	Fac- tor-5	Fac- tor-6	Commu- nalities
LTL	0.924	-0.049	-0.247	-0.025	0.007	-0.058	0.922
PENR	0.865	0.036	-0.300	0.000	0.175	0.118	0.885
MENR	0.853	-0.205	-0.114	-0.123	0.144	0.066	0.824
HENR	0.842	-0.250	0.145	-0.137	0.100	0.134	0.840
LTFM	0.826	0.206	-0.313	0.123	0.068	0.005	0.842
TV	0.789	0.171	-0.175	0.322	0.240	-0.135	0.861
GAS	0.767	0.266	0.273	0.272	-0.006	-0.113	0.820
ELE	0.730	-0.196	-0.068	-0.187	-0.189	0.055	0.649
PSCT	0.718	-0.128	-0.028	0.136	-0.154	-0.190	0.611
PUCCA	0.695	-0.327	-0.203	0.171	0.152	-0.223	0.734
WAT	0.679	0.106	-0.361	-0.191	-0.336	0.095	0.760
BNK	0.674	0.030	0.245	-0.091	0.029	-0.051	0.527
MRD	0.655	-0.078	-0.240	0.079	-0.461	0.039	0.713
MLABS	0.651	-0.006	-0.177	0.422	0.169	-0.087	0.669
IDENR	0.561	-0.123	0.564	-0.044	0.017	0.295	0.737
CSCT	0.479	0.414	-0.122	-0.200	-0.062	0.140	0.479
MVA	0.254	-0.224	0.080	0.132	-0.193	-0.057	0.179
SSCT	0.449	0.715	0.010	-0.218	-0.088	-0.119	0.783
FRT	0.263	0.478	0.383	-0.457	-0.092	-0.369	0.798
MSCT	0.223	0.548	-0.101	-0.270	0.499	-0.008	0.682
IRIG	-0.151	0.668	-0.122	-0.086	-0.352	0.330	0.725
BED	0.545	0.379	0.591	-0.144	-0.051	-0.223	0.863
PASN	0.473	-0.127	0.609	0.215	-0.048	0.297	0.748
CAR	0.406	-0.221	0.657	0.153	-0.048	0.381	0.816
LABFM	0.098	0.394	0.410	-0.063	-0.035	-0.570	0.664
TSRS	-0.219	-0.613	0.331	-0.090	0.091	-0.313	0.648
TRC	0.327	0.204	0.213	0.471	0.162	0.280	0.520
TSRP	-0.148	0.436	-0.103	0.550	-0.209	-0.134	0.587
LSTOCK	-0.328	0.432	0.118	0.550	-0.037	0.070	0.616
TSRM	-0.429	0.390	0.040	0.437	-0.131	-0.067	0.551
PROOMT	0.047	0.152	-0.066	-0.071	0.762	0.103	0.626
TSRC	-0.376	0.275	0.091	0.074	0.518	0.070	0.505
VCROP	-0.131	0.381	0.017	-0.330	-0.048	0.557	0.584
EIGEN VALUES	10.509	3.709	2.739	2.175	1.947	1.686	—
VARIATION EXPLAIN	31.846	11.240	8.301	6.590	5.900	5.110	—

factor includes cash crop value (VCROP) and depicts a link between the per capita crop value and the level of development.

The above results indicate the importance of modernization and urbanization in determining the overall regional development level in comparison to agricultural development. It further emphasizes the role that the public sector can play in the context of regional development in Pakistan.

V. Ranking of the Districts

Development ranking has been obtained by employing all the three techniques viz., Z-SUM, Taxonomic Distance and Weighted Factor Score. The ranking of districts obtained by these techniques points to robustness in results as the rank correlation between the ranking procured by Z-Score and Taxonomic Distance is as high as 0.9640. The rank correlation between ranking of WFS and Z-Sum is 0.9516 and between the former and Taxonomic Distance is 0.9483. Robustness in rank ordering are further confirmed by examining the development ranking in case of top and bottom ten to fifteen districts in Pakistan, which more or less, identify similar district rankings.

However, as highlighted earlier given the superiority of the WFS technique, development ranking obtained through this technique has been used to spot relatively developed and backward districts of Pakistan, and districts with intermediate level of development. The results obtained from other techniques are also reported for the purpose of comparison. The most developed districts are considered to be those where top quartile of the national population resides and the most backward districts are identified as those where its bottom quartile lives. The districts in the remaining two quartiles are considered at an intermediate stage of development.

The results based on WFS techniques (see Table 2) indicate that top 25 per cent of the country's population resides in 9 districts, including the four provincial capitals i.e., Karachi, Lahore, Peshawer and Quetta. The remaining 5 districts are from the Punjab province, viz., Rawalpindi, Jhelum, Sialkot, Gujrat and Gujranwala. The reasons for a predominantly higher concentration of the Punjab districts in the most developed region is due largely to better progress in the indicators of education, transport and communication, housing and gender equality sectors. This seems to suggest that over time the province of Punjab focuses more on developing its social and economic infrastructure base. The progress is thereby reflected in considerable improvement in transport and communication network and housing quality and services. Besides, its focus on enhancement in enrollment rates at various levels of education, including its greater focus on reducing gender inequality in education, literacy and in labor force participation.¹ This rank ordering reflects that

¹ For reference, the table can be provided by the authors, on request.

TABLE 2

Development Rank Ordering of Districts of Pakistan

District*	Province	Weighted Factor Score	Rank	Z-Sum	Rank	Taxonomic Distance	Rank
<u>Top Quartile (Developed Districts)</u>							
Karachi	Sindh	2.34	1	48.470	2	23.009	1
Lahore	Punjab	1.72	2	49.370	1	23.935	2
Peshawar	NWFP	1.65	3	36.451	4	24.987	4
Quetta	Baluchistan	1.41	4	45.524	3	24.074	3
Rawalpindi	Punjab	1.27	5	30.213	5	26.573	5
Sialkot	Punjab	0.92	6	27.298	6	27.208	7
Jhelum	Punjab	0.82	7	23.551	7	27.346	8
Gujrat	Punjab	0.75	8	20.683	9	27.915	13
Gujranwala	Punjab	0.68	9	20.805	8	27.550	10
<u>Second Quartile</u>							
Faisalabad	Punjab	0.63	10	18.859	10	27.557	11
Ziarat	Baluchistan	0.55	11	9.812	18	27.753	12
Multan	Punjab	0.53	12	14.081	12	27.532	9
Hyderabad	Sindh	0.48	13	14.176	11	27.194	6
Chakwal	Punjab	0.44	14	11.292	16	28.595	23
Attock	Punjab	0.42	15	9.236	19	28.435	19
Sahiwal	Punjab	0.38	16	12.447	14	28.029	14
T. Tek Singh	Punjab	0.30	17	10.360	17	28.455	20
Abbotabad	NWFP	0.29	18	12.488	13	28.529	21
Sheikhupura	Punjab	0.28	19	12.071	15	28.117	15
Sargodha	Punjab	0.28	20	7.105	23	28.658	24
Upper Dir	NWFP	0.25	21	-1.043	44	29.472	48
Kohat	NWFP	0.25	22	7.758	22	28.321	16
M.Bahauddin	Punjab	0.19	23	7.879	21	29.115	31
Sukkur	Sindh	0.18	24	6.125	24	28.363	18
Bahawalpur	Punjab	0.17	25	3.742	27	28.565	22
Sibi	Baluchistan	0.16	26	2.160	32	28.340	17

(continued)

TABLE 2
(continued)

Norowal	Punjab	0.14	27	8.040	20	29.011	28
Hafizabad	Punjab	0.11	28	5.522	26	29.093	29
Haripur	NWFP	0.07	29	2.327	31	29.705	55
<u>Third Quartile</u>							
Kasur	Punjab	0.06	30	6.109	25	28.778	25
Vehari	Punjab	0.04	31	3.232	29	29.207	36
Khanewal	Punjab	0.04	32	2.692	30	29.178	35
Mianwali	Punjab	0.03	33	1.427	33	29.259	39
Jhang	Punjab	0.02	34	1.280	35	29.261	40
Okara	Punjab	0.02	35	3.526	28	29.164	33
Larkana	Sindh	0.01	36	0.480	40	28.978	26
Nawabshah	Sindh	0.01	37	0.611	38	29.005	27
Khushab	Punjab	-0.02	38	0.664	36	29.422	46
Mardan	NWFP	-0.04	39	1.408	34	29.214	37
R. Yar Khan	Punjab	-0.05	40	0.655	37	29.169	34
Pishin	Baluchistan	-0.05	41	-2.279	52	29.422	45
Gwader	Baluchistan	-0.05	42	-7.446	74	30.582	78
Bahawalnagar	Punjab	-0.05	43	0.229	41	29.328	44
Mirpurkhas	Sindh	-0.05	44	0.576	39	29.102	30
Mastung	Baluchistan	-0.05	45	-2.771	55	29.561	50
Panjgur	Baluchistan	-0.06	46	-5.636	69	30.438	75
Loralai	Baluchistan	-0.08	47	-4.056	60	29.449	47
Chaghai	Baluchistan	-0.08	48	-3.927	59	29.124	32
Mansehra	NWFP	-0.08	49	-1.918	48	29.563	51
Jafarabad	Baluchistan	-0.10	50	-3.512	57	29.734	56
Killa Saifullah	Baluchistan	-0.11	51	-4.648	67	29.573	52
Pakpattan	Punjab	-0.11	52	-2.002	50	29.806	61
Kech (Turbat)	Baluchistan	-0.12	53	-6.911	71	30.389	73
Sanghar	Sindh	-0.13	54	-1.773	47	29.244	38
Musakhal	Baluchistan	-0.13	55	-9.522	78	30.416	74

(continued)

TABLE 2
continued

Kohlu	Baluchistan	-0.14	56	-2.306	53	29.295	42
Bannu	NWFP	-0.14	57	-0.871	43	29.309	43
Chitral	NWFP	-0.14	58	-4.193	63	29.932	63
<u>Bottom Quartile (Backward Districts)</u>							
Layyah	Punjab	-0.14	59	-2.777	56	29.766	58
Ghotki	Sindh	-0.14	60	-1.919	49	29.536	49
Bhakkar	Punjab	-0.16	61	-4.129	61	29.949	65
N. Feroze	Sindh	-0.16	62	-0.591	42	29.767	59
D G. Khan	Punjab	-0.16	63	-4.153	62	29.742	57
Nowshera	NWFP	-0.16	64	-1.258	45	29.939	64
Khairpur	Sindh	-0.17	65	-4.470	66	29.827	62
Dadu	Sindh	-0.17	66	-1.696	46	29.273	41
Kalat	Baluchistan	-0.20	67	-9.242	76	30.206	71
Lasbela	Baluchistan	-0.21	68	-7.221	73	29.597	53
Lodhran	Punjab	-0.21	69	-4.368	65	30.036	66
D.I. Khan	NWFP	-0.22	70	-4.241	64	29.771	60
Muzaffar Garh	Punjab	-0.23	71	-4.993	68	30.042	67
Charsadda	NWFP	-0.24	72	-3.886	58	30.066	68
Malakand	NWFP	-0.25	73	-2.165	51	30.096	70
Zhob	Baluchistan	-0.27	74	-10.389	80	30.490	76
Shikarpur	Sindh	-0.27	75	-2.401	54	29.661	54
Kharan	Baluchistan	-0.28	76	-13.758	89	30.507	77
Swat	NWFP	-0.28	77	-7.032	72	30.361	72
Karak	NWFP	-0.29	78	-10.115	79	31.056	89
Bolan	Baluchistan	-0.30	79	-11.971	82	30.635	81
Barkan	Baluchistan	-0.31	80	-13.827	90	30.615	80
Jacobabad	Sindh	-0.31	81	-7.473	75	30.072	69
Khuzdar	Baluchistan	-0.32	82	-12.238	83	30.867	87
Swabi	NWFP	-0.33	83	-6.328	70	30.760	85
Rajanpur	Punjab	-0.34	84	-10.588	81	30.612	79

(continued)

TABLE 2
(continued)

Dera Bugti	Baluchistan	-0.37	85	-14.114	91	30.695	82
Jhal Magsi	Baluchistan	-0.44	86	-13.527	88	31.054	88
Umerkot	Sindh	-0.48	87	-15.301	94	31.365	91
Tank	NWFP	-0.49	88	-9.391	77	30.709	83
Badin	Sindh	-0.50	89	-12.919	85	30.806	86
Lakki	NWFP	-0.51	90	-13.111	86	31.343	90
Thatta	Sindh	-0.52	91	-12.692	84	30.731	84
Tharparkar	Sindh	-0.55	92	-21.591	100	31.988	96
Killa Abdullah	Baluchistan	-0.57	93	-20.388	99	32.289	100
Nasirabad	Baluchistan	-0.58	94	-18.069	97	31.781	94
Buner	NWFP	-0.61	95	-14.860	92	31.528	93
Hangu	NWFP	-0.64	96	-15.063	93	32.269	99
Kohistan	NWFP	-0.65	97	-17.817	96	31.890	95
Awaran	Baluchistan	-0.67	98	-25.554	101	32.530	101
Shangla	NWFP	-0.75	99	-18.972	98	32.098	97
Lower Dir	NWFP	-0.80	100	-15.927	95	32.164	98
Battagram	NWFP	-0.89	101	-13.393	87	31.492	92

*Given in descending order of ranking according to WFS.

predominantly higher proportions of the Punjab population, in comparison to the other provinces, reside in the most developed districts of the country and hence, enjoy relatively better standards/quality of life.

The second quartile of the national population includes 20 districts. Punjab again has the highest number of (12) district in this quartile, followed by 4 districts of NWFP (i.e., Abbotabad, Kohat, Upper Dir and Haripur), and 2 districts each from Sindh (Hyderabad and Sukkur) and Baluchistan (Ziarat and Sibi). A concentration of relatively higher proportion of districts from Punjab in the second quartile demonstrate a phenomenon of broad-based character of regional development in this province. These districts characterized as rapidly developing districts, given their potentially higher backward and forward economic linkages. It is interesting to note that earlier study by Pasha and Hassan (1982) identified six districts of Punjab in the second quartile, of which, three districts (viz., Sialkot, Gujrat, and Gujranwala) have now moved up and occupied the positions in the most developed areas of

Pakistan. The development profile of the four districts of NWFP may be seen as potential growth centres demonstrating relatively higher enrollment rates in education and better access to water supply facilities. Surprisingly, however, Hyderabad in Sindh occupied 5th position and was categorized among the most developed areas in the national ranking in the 1980's [Pasha et al., (1990)] has now slipped to 14th position in the 2nd quartile. Similarly, Faisalabad in Punjab has fallen back and occupies 10th position in the recent ranking as compared to 8th position in the 1980's [Pasha et.al., (1990)]. The sectoral development ranking shows that Hyderabad development indicators performed poorly, particularly with regard to agriculture and education sectors (with sectoral ranking 45), income and wealth sector (ranking 31) and housing sector (ranking 20). Moreover, two district of Baluchistan (Ziarat and Sibi) have occupied positions in this quartile. Relatively high ranking of Ziarat and Sibi is attributable to its better performance in the indicators of income and wealth (VCROP, BNK), agriculture (TRC, IRIG) and ownership of CAR, etc.

The third quartile of the national population resided in 29 districts. These include 11 districts from Baluchistan, 10 from Punjab and 4 each from Sindh and NWFP. A relatively higher share of districts from Baluchistan i.e., Pishin, Gawadar, Mastung, Punjgur, Loralai, Chaghai, Jaffarabad, Kila Saifullah Kech (Turbat), Musakhil and Kohlu depict the phenomenon that significant disparity existed in the level of development in Baluchistan with respect to their most developed region, Quetta.

Nearly 43 districts are considered to be backward as they fall in the bottom quartile of the national population. These are 15 districts from NWFP, 12 from Baluchistan, 10 from Sindh and 6 from the Punjab province. Barring few exception, bulk of the backward districts of NWFP concentrated in the northern parts of the province where communication network and provision of services are really lacking. The districts of NWFP included in the bottom quartile are Battagram, Lower Dir, Shangla, Kohistan, Hangu, Buner, Lakki, Tank, Swabi, Karak, Swat, Malakand, Charsadda, D.I. Khan and Nowshera. Similarly, in the Sindh province ten districts are considered backward. These are: Tharparkar, Thatta, Badin, Umerkot, Jacobabad, Shikarpur, Dadu, Khairpur, Nowshero Feroze and Ghotki. Underdeveloped districts of Baluchistan comprise of Awaran, Nasirabad, Kila Abdullah, Jhal Magsi, Dera Bugti, Khuzdar, Barkan, Bolan, Kharan, Zhob, Lasbela and Kalat. Majority of these backward districts are located in southern Baluchistan. Finally, out of the seven backward districts from Punjab, six are located in the southern Saraiki belt of Punjab i.e., Rajanpur, Muzaffargarh, Lodhran, D.G.Khan and Layyah, excluding Bhakkar.

The sectoral profile of backwardness indicates that Sindh districts are generally backward due to the poor social and economic infrastructure provision. Majority of the backward districts of Sindh portray a dismal performance on education sector indicators, equally in housing, transport and communication, and agriculture

sector growth. Besides, indicators of gender equality has also shown a significant disparity between males and females. The backward districts of Baluchistan have typically reflected a poor social and economic infrastructure and services lagging behind the rest of the country's districts. The backward districts of NWFP and Punjab also does not show a better picture than Baluchistan.

Using the results of WFS, the profile of development and backwardness is constructed at three levels (see Table 3). First, an estimate by taking the provincial

TABLE 3

Profile of Development by Province
(Weighted Factor Score Technique)

Province	Top Quartile	Second Quartile	Third Quartile	Bottom Quartile	Total
<u>Population Share with Respect to Quartile Population</u>					
Punjab	59.7 (6)	81.2 (12)	61.8 (10)	27.0 (6)	57.4 (34)
Sindh	31.3 (1)	11.8 (2)	16.5 (4)	35.2 (10)	23.7 (17)
NWFP	6.4 (1)	6.3 (4)	13.3 (4)	29.0 (14)	13.8 (23)
Baluchistan	2.4 (1)	0.7 (2)	8.4 (11)	8.8 (12)	5.1 (26)
Total	100.0 (9)	100.0 (20)	100.0 (29)	100.0 (42)	100.0 (100)
<u>Population Share with Respect to Province own Population</u>					
Punjab	25.6	35.4	27.2	11.8	100.00
Sindh	32.4	12.5	17.6	37.5	100.00
NWFP	11.4	11.3	24.3	53.0	100.00
Baluchistan	11.6	3.3	41.5	43.6	100.00
Total	24.5	25.0	25.3	25.2	100.00
<u>Population Share with Respect to National* Population</u>					
Punjab	14.7	20.3	15.6	6.8	57.4
Sindh	7.6	2.0	4.2	8.9	24.7
NWFP	1.5	1.6	3.4	7.3	13.8
Baluchistan	0.6	0.2	2.1	2.2	5.1
Total	24.4	25.1	25.3	25.2	100.00

* Include figures for Baluchistan, NWFP, Punjab (excluding Islamabad) and Sindh.
Figures in the parenthesis show the number of districts.

share in each quartile of the population is derived. Second, by computing the provincial share in each quartile, with respect to provinces' own total population the result is drawn. Lastly, sectoral profile is computed through provincial share given in each quartile cell with respect to the total national population.

It is clearly identified that the province of Punjab has the highest population share at the top and intermediate quartiles. Their proportion in each top three quartiles is greater than their share in the national population reflecting therefore, relatively better overall level of development in this province. Our analysis further shows that 27 per cent of the Punjab population is still living in the least developed region of the country. However, the situation seems to have improved for Punjab, over time. This is indicated by the fact that in the 1970's, 45 per cent population resided in the backward region [Pasha and Hassan, (1982)] and 41 per cent in the 1980's [Pasha et al., (1990) see Table 4].

In the context of Sindh, not only the extent of disparity between the most (Karachi) and the least developed regions have increased, but the overall incidence of backwardness has also increased over time. This is indicated by the fact that Karachi² is the most developed area of Sindh as well as Pakistan and now 10 districts of Sindh out of total 17 fall in the category of least developed districts (bottom quartile) of the country. The share of Sindh population in the bottom quartile is the highest i.e., 35 per cent, more than their share in the national population, which was 23 per cent both in the 1970's and 1980's (see Table 4). This seems to suggest that the relative backwardness in Sindh has increased over time. Altogether, population residing in the backward region of Sindh accounts for 9 per cent of the national population (highest in the country) and 37 per cent of province's own population (see Table 3). The backward region of Sindh may be characterized by lower literacy and enrollment rates, lower provision of civic services, poor communication network and economic opportunities.

A significantly higher share of NWFP population (29 per cent) is living in the most backward areas of the country. Over time, the situation seems to have worsened for NWFP, as their share was 19 per cent in the 1970's. Similarly, a disproportionately higher share of Baluchistan population, about 8 per cent each, resided in the two bottom quartiles (more than their share in the national population). However, comparing with the share obtained in the earlier period [Pasha et.al., (1990)], the position for Baluchistan appears to have improved in the ranking procured in the recent years. This has been reflected by their share in the least developed districts that is now 8 per cent as compared to the share of 11.7 per cent in the 1970's and 18.4 per cent in the 1980's (see Table 4). Though few of their districts slightly move upward in the recent development ranking (from bottom quartile to the third quartile)

² if Karachi is considered as one district.

TABLE 4

Changing Regional Development Levels under various Periods

(Figures in the brackets are no. of Districts)

	Punjab	Sindh	NWFP	Baluchistan
<u>Latest (Population Share %)*</u>				
Top Quartile	59.8 (6)	31.3 (1)	6.4 (1)	2.4 (1)
Second Quartile	81.2 (12)	11.8 (2)	6.3 (4)	0.7 (2)
Third Quartile	61.8 (10)	16.5 (4)	13.3 (4)	8.4 (11)
Bottom Quartile	27.0 (6)	35.1 (10)	29.0 (14)	8.9 (12)
Total	57.4 (34)	23.7 (17)	13.8 (23)	5.1 (26)
<u>Early 1980's (Population Share %)**</u>				
Top Quartile	53.2 (4)	34.6 (2)	10.5 (1)	1.8 (1)
Second Quartile	76.6 (6)	5.5 (1)	17.2 (3)	0.7 (1)
Third Quartile	62.1 (6)	29.7 (5)	8.3 (3)	0.0 (0)
Bottom Quartile	40.8 (5)	22.6 (5)	18.1 (5)	18.4 (14)
Total	56.1 (21)	22.6 (13)	13.1 (12)	5.1 (16)
<u>Early 1970's (Population Share %)***</u>				
Top Quartile	41.8 (2)	42.1 (2)	12.4 (1)	3.6 (1)
Second Quartile	96.8 (5)	0.0 (0)	3.2 (1)	0.0 (0)
Third Quartile	64.9 (6)	27.6 (4)	7.5 (1)	0.0 (0)
Bottom Quartile	45.4 (6)	23.5 (5)	19.4 (3)	11.7 (9)
Total	57.9 (19)	21.2 (11)	12.8 (6)	3.7 (10)

*present study. **Based on Pasha et al., (1990). ***Based on Pasha and Hassan (1982).
The figures in parenthesis show the number of districts.

but most of these districts still fall in the lower ebb of the third quartile and thus demonstrate relatively backward positions.

If profile of backwardness is seen with respect to the number of districts in the bottom quartile, then relative backwardness of NWFP seems to be more pronounced. A significantly higher proportion of its districts (63 per cent) have fallen in this category, followed by 53 per cent from Sindh, 46 per cent from Baluchistan and 14 per cent from Punjab.

VI. Profile of Relatively Backward Districts

Earlier, we identified the relatively backward districts of the country, it is now useful to determine the indicators in which these districts are backward. It can be seen by examining the correlation coefficient between the individual indicators and the group indicators with that of the overall composite indicator using the weighted factor score.

The highest correlation is observed between the group indicators in the education sector (0.871) with the overall composite index of development (see Table 5). Within the education sector the highest correlation is observed in the literacy rate (0.729), enrollment rate at the primary, middle, and secondary levels (between 0.70 to 0.75). Correlation between the overall composite index and the group indicators of housing (especially access to gas) is also high 0.796, followed by the group indicators of transport and communication (0.768), particularly T.V. and the gender equality (0.756) i.e., female to male literacy rate. Group indicators of income and wealth and health sectors are not strongly related to overall development, which was also reported by Pasha et al., (1990). Given this analysis, the backward districts of Pakistan have typically low literacy rates and education levels i.e., enrollment rates at the primary, middle and secondary school levels and lower provision of gas. It also reflects lower female literacy rate (i.e., female to male literacy).

Given a relatively lower provision of services coupled with low concentration of economic activities in the backward regions, it would require special attention of planners and policy makers for devising appropriate development strategy for future targeting and adequate planning to cover the backlog and improve the quantity and quality in the provision of services.

VII. Summary and Conclusions

This paper quantifies the level of development of districts of Pakistan and identifies relatively developed and backward districts, using the latest published information. Multidimensional view of development has been adopted to measure the development levels. Three techniques viz., Z-SUM, Taxonomic Distance and Weighted Factor Score are employed to measure development levels. Thirty-three development indicators were chosen to rank districts.

The most developed and most backward districts of the country are identified where top and bottom quartile of the national population resides. The districts in the remaining two quartiles are considered as being in the intermediate stage of development. Ranking obtained from different techniques appears to be quite robust as they depict high rank correlation among their ranks and identified more or less similar top and bottom 10 districts with few exceptions. The findings show significant variation in the level of development among districts in all the four provinces of

TABLE 5

Correlation Coefficients of Overall Ranking
With Sectoral and Individual Indicators

Variables		Sectors	
BED	0.666**	Income and Wealth	0.633**
BNK	0.639**	Housing	0.796**
CAR	0.512**	Health	0.666**
CSCT	0.494**	Education	0.871**
ELE	0.508**	Agriculture	0.341**
FRT	0.317**	Transport & Communication	0.768**
GAS	0.851**	Gender In-equality	0.756**
HENR	0.706**	Labour Force	0.621**
IDENR	0.620**		
IRIG	0.020**		
LABFM	0.205*		
LSTOCK	-0.024		
LTFM	0.752**		
LTL	0.729**		
MENR	0.670**		
MLABS	0.621**		
MRD	0.442**		
MSCT	0.374**		
MVA	0.157*		
PASN	0.589**		
PENR	0.748**		
PROOMT	0.199*		
PSCT	0.557**		
PUCCA	0.487**		
SSCT	0.548**		
TRC	0.551**		
TSRC	-0.117		
TSRM	-0.198*		
TSRP	0.029		
TSRS	-0.353**		
TV	0.784**		
VCROP	0.017		
WAT	0.470**		

*Correlation is significant at 0.05 level. **Correlation is significant at 0.01 level.

Pakistan. We find pockets of developed and under developed regions in each province. The pre-dominant share of the Punjab population lives in better conditions as their share in the top three quartile is more than its share in the national population.

Nearly, 43 districts are considered as backward as they fall in the bottom quartile of the national population. These include 15 districts from NWFP, 12 from Baluchistan, 10 from Sindh and 6 from the Punjab province. Based on these results, we conclude that nearly 27 per cent of the Punjab population is still living in the least developed region but the situation seems to have improved as this share was 45 per cent in the 1970's. Out of the six backward districts from Punjab five are located in the southern Saraiki belt.

The vast majority of the population of the province of Baluchistan is still living in the backward regions of the province. Under-developed districts are located in southern Baluchistan. A significantly higher share of the NWFP population (29 per cent) is living in the most backward areas of the country. Over time, the situation seems to have worsened for NWFP, as its share was about 19 per cent in the 1970's. Bulk of the backward districts of the NWFP are concentrated in the northern parts of the province.

Out of the 17 districts, ten districts of the Sindh province are considered as backward. Due to the extent of disparity between the most (Karachi) and the least developed regions, the overall incidence of backwardness has increased over time in Sindh. The share of Sindh population in the bottom quartile is highest i.e., 35 per cent (equivalent to 9 per cent of the national share), which has risen from 23 per cent in the 1970's and 1980's. Thus, it confirms that the relative backwardness in Sindh has increased over time.

Similarly, a disproportionately higher share of Baluchistan population (8 per cent) resided in the bottom quartile (more than their share in national population). Its position improved over time from a share of 18.4 per cent in the early 1980's. If profile of backwardness is seen with respect to number of districts in the bottom quartile, then the relative backwardness of NWFP seems to be more pronounced. A significantly higher proportion of its districts (63 per cent) have fallen in this category, followed by 53 per cent from Sindh, 46 per cent from Baluchistan and 14 per cent from Punjab. The backward districts of Pakistan have typically low literacy and education levels, i.e., enrollment rates at school and low female literacy rate, as compared with the male literacy rate.

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APPENDIX

TABLE A-1

Construction of Development Indicators by Source

S. No.	Indicators	Description/Methods of Construction	Sources
I. Income and Wealth			
1.	BNK	Bank Branches per thousands Population of District.	Banking Statistics of Pakistan 1997-98.
2.	CAR	Numbers of Cars per thousand Urban Population (includes numbers of motor cars / jeeps and station wagons).	Development Statistics Punjab (1999), NWFP (1999) Sindh (1999), Baluchistan (1998).
3.	LSTOCK	Variable Computed using weights as assign by Pasha et. al., (1990) = $[0.8 \times \text{CAT} + \text{BUF} + 0.1 \times \text{GOA} + 0.1 \times \text{SHE} + 0.01 \times \text{POU}] / \text{RUR}$; where, CAT = number of cattles, BUF = number of buffalo, GOA = number of goats, SHE = number of sheeps, POU = numbers of poultry, and RUR = rural population of a district..	Livestock Census (Special Report) 1996-97.
4.	MVA ¹	Manufacturing Value Added per Urban Population of District.	Census of Manufacturing Industries 1995-96.
5.	VCROP ²	Cash Crop Value of 42 Crops per Rural Population of District, derived by multiplying production figures with applicable prices. In the absence of information of prices at the district level, nearest districts prices are used.	Agriculture Statistics of Pakistan 1998-99, Government of Pakistan. Pakistan Journal of Agricultural Economics, No.4, July, 2000, Agricultural Prices Commission.

(continued)

TABLE A-1
(continued)

S. No.	Indicators	Description/Methods of Construction	Sources
II. Agriculture			
6.	FRT	Fertilizer Consumption as proportion of Cropped Area.	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
7.	IRIG	Irrigated Area as proportion of Cropped Area.	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
8.	TRC	Tractors per thousand hector Cropped Area.	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
III. Housing			
9.	ELE	Percentage of Housing Units with Electricity Connection (Directly Available)	District Census Report 1998.
10.	GAS	Percentage of Housing Units with Gas Connections (Directly Available).	District Census Report 1998.
11.	WAT	Percentage of Housing units with Inside Pipe Water Connection (Directly Available).	District Census Report 1998.
12.	PUCCA	Percentage of Housing Units with Pucca Dwelling (Directly Available).	District Census Report 1998.
13.	PROOMT	Rooms per Person (Reciprocal of Persons per Room).	District Census Report 1998.
IV. Communication			
14.	MRD	Length of Mettled and Unmettled Road per Hundred Square Kilometer Area of District.	Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).

(continued)

TABLE A-1
(continued)

S. No.	Indicators	Description/Methods of Construction	Sources
15.	PASN	Passenger Load Carrying Capacity per thousand population, derived using weights as assigned by Pasha and Hassan, (1982) = $[(3 \times \text{TAX} + 2 \times \text{AUT} + 55 \times \text{BUS})/\text{TOTPOP}] \times 1000$; where, TAX = number of taxies, AUT = auto rickshaws, BUS = buses and TOTPOP = district population.	Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
16.	TV	Number of Television Sets with Licenses per ten thousand population of district.	Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
V. Health			
17.	BED	Numbers of Hospital Beds (include hospitals, dispensaries and R. H. centres beds) per 10 thousand population	Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998). District Census Reports (1998).
VI. Education			
18.	LTL	Percentage of Literate to total population (directly available).	District Census Report 1998.
19.	PENR	Primary Enrollment Ratio as percentage of 5-9 years age bracket.	District Census Report 1998.
20.	MENR	Middle Enrollment Ratio as percentage of 10 - 14 years age bracket.	District Census Report 1998.
21.	HENR	Matric/Intermediate Enrollment Ratio as percentage 15-19 years age bracket.	District Census Report 1998.
22.	IDENR	College Enrollment Ratio as percentage of 20 - 24 years age bracket.	District Census Report 1998.

(continued)

TABLE A-1
(continued)

S. No.	Indicators	Description/Methods of Construction	Sources
23.	TSRP	Teacher per Student at the Primary Level.	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
24.	TSRM	Teacher per Student at the Middle Level.	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
25.	TSRS	Teacher per Student at the Secondary Level.	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
26.	TSRC	Teacher per Student at the College Level (Intermediate and Degree Colleges).	Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
27.	PSCT	Number of Teachers per Primary School.	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
28.	MSCT	Number of Teachers per Middle School.	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
29.	SSCT	Number of Teachers per Secondary School.	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
30.	CSCT	Number of College Teachers per College (Intermediate and Degree Colleges).	Source: Development Statistics Punjab, NWFP & Sindh (1999), Baluchistan (1998).
VII. Gender Equality			
31.	LABFM	Ratio of Female to Male Labour Force 10 years and above population.	District Census Report 1998.

(continued)

TABLE A-1
(continued)

S. No.	Indicators	Description/Methods of Construction	Sources
32.	LTFM	Ratio of Female to Male Literate Population of 10 years and above.	District Census Report 1998.

VIII. Industrial Labour Force

33.	MLABS	Share of Manufacturing Workers Employed (Division 3, DCR) with respect to Total Employed Labour Force of a District.	District Census Report 1998.
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¹ MVA for Districts of Punjab and Sindh is available for the year 1995-96. In case of NWFP and Baluchistan due to non-availability of district MVA, over all provincial MVA figures for 1995-96 is distributed among districts using their shares in 1990-91.

² Minor, major and tree crops include the following: wheat, rice basmati, rice, maize, bajra, jawar, barley, sugarcane, cotton, tobacco, gram, mung, mash, masoor, mator, rapeseed or mustard, ground nut, sesamum, linseed, castor seed, soya bean, sunflower, safflower, onion, garlic, chilies, coriander, turmeric, potato, citrus, mango, banana, apple, guava, apricot, peach, pears, plums, grapes, pomegranate, dates, almond.

TABLE A-2

Summary Description of Development Indicators

Variables	Mini- mum	Maxi- mum	Mean	Standard Deviat- ion	Skew- ness	Coeffic- ient of variation
BED	0.00	37.98	4.61	4.63	4.37	1.00
BNK	0.00	0.17	0.05	0.04	0.91	0.88
CAR	0.00	1242.45	87.42	181.49	3.78	2.08
CSCCT	0.00	88.31	31.32	16.44	0.73	0.53
ELE	0.42	95.90	60.33	24.58	-0.62	0.41
FRT	0.00	2.54	0.12	0.28	7.23	2.32
GAS	0.07	80.89	9.21	13.78	2.90	1.50
HENR	0.03	0.57	0.25	0.11	0.36	0.42
IDENR	0.01	0.35	0.08	0.04	3.40	0.53
IRIG	0.00	173.33	70.93	37.46	-0.41	0.53
LABFM	0.00	0.30	0.04	0.04	4.27	1.09
LSTOCK	0.00	2.79	0.54	0.35	2.97	0.65
LTFM	0.13	0.76	0.38	0.15	0.67	0.39
LTL	10.37	70.40	33.65	13.72	0.43	0.41
MENR	0.06	0.85	0.42	0.18	0.10	0.42
MLABS	0.00	19.42	3.09	3.18	2.71	1.03
MRD	0.00	47.44	17.06	13.40	0.24	0.79
MSCT	1.77	18.17	9.11	2.96	-0.15	0.32
MVA	0.00	49905.06	3982.23	7622.09	3.21	1.91
PASN	0.00	646.59	36.53	83.29	5.16	2.28
PENR	0.04	0.75	0.33	0.17	0.60	0.52
POPU	33.00	9856.00	1270.53	1396.56	3.22	1.10
PROOMT	0.17	0.77	0.33	0.09	2.02	0.26
PSCT	0.23	8.95	2.77	1.30	1.96	0.47
PUCCA	1.50	96.71	43.43	28.97	0.23	0.67
SSCT	9.41	43.45	20.17	4.32	1.55	0.21
TRC	0.00	170.00	15.68	19.43	5.64	1.24
TSRC	0.00	0.31	0.05	0.05	2.93	0.90
TSRM	0.01	0.44	0.06	0.05	5.49	0.78
TSRP	0.00	0.08	0.04	0.01	0.56	0.26
TSRS	0.00	0.32	0.07	0.05	2.79	0.78
TV	0.00	725.68	103.33	150.84	2.26	1.46
VCROP	0.00	32422.64	5639.76	5149.93	2.23	0.91
WAT	7.94	97.40	59.97	27.68	-0.36	0.46