Socio-economic disparities in Balochistan, Pakistan – A multivariate analysis

Syed Nawaz-ul-Huda[1], Farkhunda Burke[2], Muhammad Azam[3]

[1]Population Census Organization, Statistics Division, Government of Pakistan, Karachi, Pakistan, [2]Department of Geography, University of Karachi, Karachi – 75270, Pakistan, [3]Department of Geography Federal Urdu University of Arts, Science and Technology, Karachi Campus, Karachi, Pakistan

Correspondence: Syed Nawaz-ul-Huda (email: nawaz_huda@hotmail.com)

Abstract

The causative agents of social and economic inequalities may be multivariate ranging from natural to man-made factors which have varying degrees of susceptibilities to reduction. Efforts of their dilution entail strenuous efforts starting from an understanding of the causative factors, to creating awareness especially among planners whose task is to henceforth channelize resources for its minimization. The present study is an analysis of the multivariate factors responsible for creating both social and economic inequality in Balochistan, considered as one of the most backward provinces of Pakistan. With the help of Multivariate Analysis, a highly advanced econometric method, the causes of disparity in Balochistan have been identified, presented in the form of factors, which have been used as a guideline for suggesting solutions for ameliorating the vicious prevalent condition. The results indicated that a well guided, integrated and sustainable planning prior to total implementation is imperative.

Keywords: income, infrastructure, multivariate analysis, urbanization, socio- economic inequalities, spatial disparities

Introduction

Geography plays a vital role in the study of socio-economic development of human beings (Bond, 1999; Haris & Arku, 2007; Coen, et al., 2008; Redding & Venables, 2004). Viewing society as a spatial structure it has been observed that social and economic processes vary from place to place, in addition to the varying natural phenomena, resulting in different and even contradictory spatial patterns of distribution and socio-economic disparities. The province of Balochistan has been selected for an inquiry into such spatial dimensions of social and economic inequalities.

The first question on which opinions differ is what is meant by `inequality`. Despite the possible variable elements implicated in its definition, it may be agreed that there are genuine causes rather than simply correlations of the phenomenon (Hedstrom, 2005). As standards of living increase (Kimura, 1993; Wu et al., 2007; Jacobs et al., 2007; Viljoen & Louw, 2007), the problems of social and economic disparity are progressively becoming acute and persist in spite of relentless efforts to close the glaring gasp between the 'haves' and 'have-nots'. In fact, the tendency of the rich to grow more wealthy at the expense of the less fortunate and backward seems to be unrelenting.

Socio-economic disparities between regions are a manifestation of factors which are predominantly structural in nature and embedded within the social, economic, cultural, historical, political, and environmental milieu of the area and form an inherent part of the society. The task of the social geographer therefore is not just to decipher spatial variations but also the threads of structural variations underlying them that differentiate them (Burke, 2004). The present study is an in-depth study through factor analysis, i.e., an explanatory dimension of social and economic inequality, based on assessment of variance for all 47 selected variables. Factor analysis is one of the best techniques for identification of cause and effect relations through data reduction based on

variance of variables (Weinbach & Grinnell, 2001) as it avoids the double counting of any attribute information (Griffith & Amrhein, 1997).

The study area

Balochistan or the country of Baloch is situated in the southwestern half of Pakistan and occupies nearly 44 percent of its land mass. It lies between 24° 53' and 32° 05' North latitudes and 60° 52' and 72° 18' East longitudes. It is bounded on the north by Afghanistan and FATA, on the northeast by FATA and Punjab province, on the east by Sindh province, on the south by the Arabian Sea and on the west by Iran covering 347,190 km² (Figure 1).
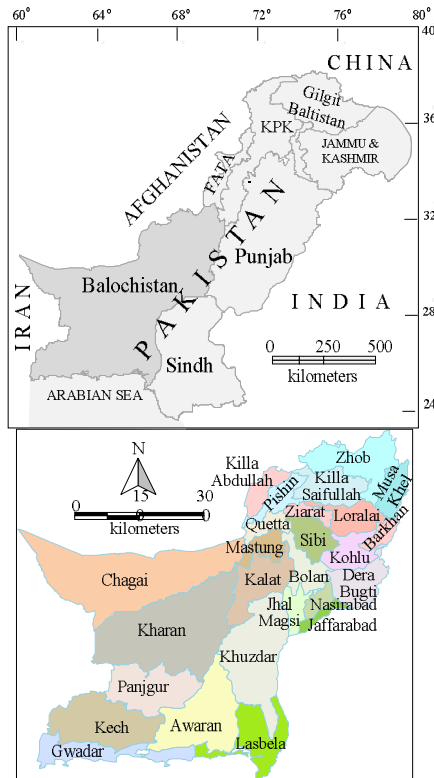

Figure 1. The s*tudy area*

Agriculture, animal husbandry and mining engage the largest segment of the population in the province (Mustafa & Qazi, 2007; Rodríguez & Mayer, 1995; Rodríguez, et al., 1993; Rees, et al., 1990) but the dynamo of economic activity in Balochistan is trade. Over 90 percent of it is undocumented and is in the informal sector, situated as it is on natural trade routes between South Asian sub-continent and Afghanistan, Iran and Central Asia on the one hand and the Arab Emirates on the other (Sharif, et al., 2000).

Materials and methods

The 26 districts of Balochistan was made the basis of analyzing the factors of social and economic disparities in the study area. A wide selection of data relating to social and economic characteristics was collected from publications of Federal and Provincial Statistical Departments, Population Census Organization, United Nations Development Reports and other research journals. The variables used in the computer analysis are listed in Table 1. In all cases, original

data have been transformed into percentages, proportions and ratios depending on the general patterns on which the specific variables involved.

Table 1. The selected variables

CBR	Crude Birth Rate
PHC	% of Public Health Centers to Total Population
H	% of Hospitals Total Population
BAPHC&H	% of Beds available in Public Health Centers and Hospitals to Total Population
D	% of Doctors to Total Population
LHW	% of Lady Health Workers to Total Female Population
PCIV	% of Children Immunized and Vaccinated (Less than 10 years)
SNU	Standard Nutrition Units
PHP	% of Houses to Population Age 18 and above
NOH	% of Non-Ownership of Households to Total Housing Units
ARC	Average Room Congestion
PH	% of Pacca Houses to Total Houses
HUE	% of Housing Units Electrified to Total Houses
HUPW	% of Housing Units with inside Potable Water to Total Houses
HUG	% of Housing Units with fuel Gas connection to Total Houses
PO	% of Post Offices to Population Density
HTRA	% of High Type Road to total Area of the District
HTRP	Ratio of High Type Road Per Thousand Population
HTRTRN	% of High Type Road to Total Road Network
L	Literacy Rate
PE	% of Primary Educated to Literates
M	% of Matriculate to Literates
G+	% of Graduates and above to Literates
S:	% of Schools to School Going Age Population (4-16 years)
SE	% of Student Enrollment to School Going Age Population (4-16 years)
STR	Student Teacher Ratio
SCCH	% of Seating Capacity in Cinema Halls to Population Age 10 and Above
UP	% of Urban Population to Total Population
PD	Population Density
S&TW	% of Secondary and Tertiary Workers to Total Workers
PCC	% of Cognizable Crimes to Population Age 14 and Above
PS	% of Police Station to Population Age 14 and Above
NM	% of Never Married to Population Age 18 Above
GDP	Gross Domestic Product (PPP in PKR)
CLAE	Ratio of Cultivable Land to Agricultural Workers
TRH	% of Three Roomed Houses
IS	% of Information Services availed Houses to Total Houses
DAP	Dependent to Economically Active Population Age 10 and Above
W	% of Workers to Economically Active Population Age 10 and Above
PW	% of Primary Workers to Total Workers
SW	% of Secondary Workers to Total Workers
TW	% of Tertiary Workers to Total Workers
UE	Unemployment Rate
P_H	Productivity per Hectare (PKR)
P_W	Productivity per Worker (PKR)
PIW_W	% of Industrial Workers to Total Workers
PVA_IW	Proportion of Value Added to Industrial Workers

The factor analysis conducted for this study is based on 47 variables pertaining to spatial dimensions of social and economic inequality as reflected in the social, economic, demographic, production and consumption characteristics of the population of the study area's 26 districts. Computation for this analysis was carried on Statistical Computing System using the SPSS version 13.

Results and discussion

The percentage of rotated loadings of factor variables extracted through principle component method has been shown in Table 2, where data has shown 73.00 percent variance among all the

Table 2. Rotated sums of squared loadings

Total	% of Variance	Cumulative %
9.48	20.17	20.17
6.73	14.32	34.49
5.88	12.52	47.01
4.35	9.26	56.26
4.16	8.85	65.12
3.71	7.89	73.00

Extraction method: Principal component analysis.

districts of Balochistan. This is presented in Table 3, where 17 out of 47 variables showing spatial inequality have emerged as significant in Factor I, 12 in Factor II, 10 in Factor III , 7 in Factor IV, 9 in Factor V and 9 in Factor VI. The scores of all the factors are classified into five categories based on the equal range technique i.e., highest, high, moderate, low and lowest.

Factor I-Urbanization
Fig. 2 shows the spatial dimensions of Factor I in Balochistan for 1998. The factor scores, which are the standardized measures, of the districts on each factor, have been divided into 5 classes, ranging from very high positive to very high negative.

The first factor, which accounts for 20.17 percent of the total variance, is of paramount importance in explaining social and economic inequality in Balochistan. The nature of the factor is clearly identified by very high positive loadings for beds in hospitals and PHCs (0.93), gas connections (0.89), graduates and above (0.78), hospitals (0.78), urban population (0.77), seating capacity in cinema halls (0.77), and housing units with potable water (0.70). High loadings have been recorded for literates (0.69), *pacca* (A house which has walls made mainly of burnt bricks, G.I. sheets or other metal sheets, stone, cement, concrete, RBC and RCC, etc) houses (0.67), secondary and tertiary workers (0.67), tertiary workers (0.66), doctors (0.63), population density (0.63), never married population (0.48), non-ownership households (0.45) and value added to industrial workers (0.42). High negative loadings have been recorded for primary workers (-0.68) and moderate for houses to population above 18 (-0.46).

A closer look into the variables for Factor I reveals that in addition to the variable on urban population, most of the other variables point towards urbanization with all variables recording positive loading revealing that they behave in a certain consistent fashion. Positive loadings were recorded for all the attributes responsible for a positive urbanization, while negative loadings showed just the reverse. The process of urbanization was highly dependent on the pull factors of migration or motivation due to availability of basic human needs and opportunities through employment in greener pastures, hence the positive socio-economic effects.

Based on the fact that the majority (almost 73.00 percent), with slight spatial variations, of the population of Balochistan is engaged in primary occupations, the high negative loading for this variable (-0.68) coupled with the high positive loadings for secondary and tertiary workers (0.67), tertiary workers (0.66) and value added industries (0.42), indicate that areas which have high percentage of population engaged in secondary and tertiary sectors were more developed. These sectors were more predominant in urban areas as indicated by the high loading for urban population (0.77) and population density (0.63). Thus, the fact is established that rural areas and its residents were considerably economically worse off as compared to their urban counterparts.

Table 3. Rotated component matrix

SOCIAL INDICATORS	Components					
Health and Nutrition	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
CBR	0.159	0.764	-0.351	-0.057	0.152	0.171
PHC	-0.087	-0.050	0.089	0.787	-0.050	0.094
H	0.775	-0.205	0.238	0.125	0.069	-0.035
BAHPHC	0.930	0.156	0.160	-0.010	0.072	-0.023
D	0.633	0.590	0.052	0.126	0.105	0.176
LHW	0.123	0.283	0.093	0.621	0.281	-0.020
PCIV	0.280	0.805	-0.071	-0.225	0.036	-0.064
SNU	-0.044	0.452	0.415	0.360	0.332	0.197
Housing and Environment						
HP	-0.456	0.081	-0.238	-0.126	-0.605	0.388
NOH	0.451	0.026	0.654	-0.235	0.399	-0.145
AC	-0.054	-0.061	-0.074	0.154	0.054	0.585
PH	0.668	0.050	-0.020	0.014	-0.049	-0.038
HUE	0.328	0.503	0.223	-0.222	0.566	-0.274
HUW	0.701	0.239	-0.080	-0.412	0.228	-0.051
HUG	0.889	0.131	0.197	-0.174	0.020	-0.082
PO	-0.099	0.015	-0.376	0.045	0.041	0.563
HTR_Area	0.045	0.265	0.689	-0.331	0.425	-0.078
HTR_POP	-0.110	0.313	0.098	0.352	0.638	0.434
HTR_TRN	0.094	0.219	0.388	-0.195	0.753	0.214
Education and Culture						
L	0.685	0.607	-0.036	-0.101	0.126	0.074
PE	-0.245	0.321	-0.552	-0.344	0.071	0.053
M	0.115	-0.341	0.386	0.374	-0.335	-0.358
G+	0.779	-0.137	0.294	0.065	0.062	-0.159
SI	-0.239	0.149	0.203	0.737	-0.020	-0.206
SII	0.330	0.653	0.089	0.454	0.060	-0.069
S_T	0.351	0.235	-0.231	-0.614	-0.209	0.050
SCCH	0.770	0.198	0.221	-0.209	-0.131	0.251
Crime and Social Welfare						
PCC	0.138	0.302	0.670	0.243	-0.108	-0.041
PS	0.138	0.302	0.670	0.243	-0.108	-0.041
NM	0.478	0.473	-0.396	0.052	0.427	-0.001
Urbanization						
UP	0.773	0.060	0.191	-0.339	0.008	0.321
PD	0.629	0.127	0.424	-0.454	0.155	-0.224
S&TW	0.667	0.226	-0.437	0.042	0.242	0.388
ECONOMIC INDICATORS						
Income, Consumption, and Wealth						
GDP (PPP)	-0.161	0.639	0.220	0.266	0.442	0.077
CL_AW	0.096	-0.085	-0.155	0.141	0.754	0.001
TR	0.348	0.207	-0.219	0.120	0.479	-0.530
IS	0.233	0.667	-0.123	-0.376	-0.031	-0.145
Occupational Structure						
D_AP	-0.372	0.193	-0.522	-0.238	-0.246	-0.233
W	0.002	-0.345	0.733	0.103	0.049	0.162
PW	-0.675	-0.237	0.403	-0.024	-0.221	-0.424
SW	0.095	-0.242	0.099	-0.033	-0.248	0.512
TW	0.661	0.250	-0.449	0.045	0.268	0.340
UE	-0.114	-0.210	-0.724	-0.438	-0.159	-0.089
Agricultural Development						
P_H	-0.020	0.810	0.178	0.091	-0.186	-0.077
P_W	-0.025	0.817	0.243	0.188	0.253	-0.105
Industrial Development						
PERIE	0.163	0.026	0.169	-0.089	0.056	0.678
VA_IW	0.421	0.107	0.063	-0.253	0.094	0.650

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 8 iterations.

Affluence and improvement of social and economic status were highly positively correlated with educational achievement as manifested in the positive loading for graduates and the highly educated (0.78), literates (0.69), doctors (0.63) and low loading for student teacher ratio (0.35).

Urban areas provide brighter prospects for better education and hence, enhanced job opportunities. The very high positive loading for available beds in hospitals and PHCs (0.93), coupled with that of gas connections (0.89), hospitals (0.78), seating capacity of cinema halls (0.77), potable water in houses (0.70) and *pacca* houses (0.67) indicates that areas which record a high level of urbanization were dynamic areas, though they must also show a concurrent improvement in the availability of urban facilities. Never married (0.48) and non-ownership households (0.45) signify urbanization, as male youth who migrated from rural to urban areas in search of livelihood, in order to improve their level of living, very often experienced housing problems.

Urbanization adds to the socio-economic status of an area by providing employment opportunities and earnings even to people who move out of rural areas in distress. The nature of loading of the variables indicates that mere accretion of population in urban areas was not a sufficient empirical test of urbanization. Urbanized areas should have 'a few pronounced urban characteristics' and should be served by 'civic amenities'. The rest of the variables quoted lend support to the fact that recreational, medical and communication facilities, etc. are essential for adequate urban development of any area. The spatial pattern of variation in terms of urbanization for Balochistan reveals that all the districts pertain only to three groups i.e., highest, low and lowest categories (Fig. 2). Quetta, the capital of the province, by virtue of being the administrative headquarters, having better quality of life, was in the highest category. Being a prominent class 2 city in 1998, it tooak pride of place in provincial urbanization with its facilities for enhancement of social and economic standards of living. Quetta also witnessed the impact of British colonialism, having become a cantonment in 1876. Thus, the historical inertia of urbanization had had far-reaching effects in Quetta.

The urban assets of Quetta included several industrial establishments related to pharmaceutical, manufacturing, horticulture processing industries as well as mining. Cottage and small-scale industries improved the economy through export and national consumption. A very interesting feature for Balochistan revealed by the spatial pattern evolved for Factor I is that only the district of Quetta emerged in the most prominent category. No entries existed in the second and third categories while ten and fifteen districts occupied the low and lowest categories respectively.

The nature of the highly positively loaded variables along with the highly negatively loaded variables reveals the fact that urbanization was quite slow and lopsided in the province, one of the prime reasons for its social and economic inequality. Industrialization is generally a forerunner of urbanization, but for Balochistan the wheel of progress seems to be lying at a standstill in spite of having enormous mineral reserves to spur the growth of its primary sector.

The districts falling in the low category are Gwadar, Sibi, Kohlu, Zhob, Chagai, Dera Bugti, Mastung, Loralai, Musa Khel and Bolan (Fig. 2). Gwadar is a district along the seaboard, presently it is the second most important deep-sea port after Karachi. It was recognised as a District in 1977 and its economy was based on fishing and allied industries, employment in government and social services followed by agriculture and livestock rearing. The rest of the above named districts in this category were accorded this status in the years, 1981, 1983, 1890, 1899, 1983, 1991, 1970, 1992 and 1991, respectively. Among these districts, Kohlu had few manufacturing units and routine commercial activities shape its economic life. Some small-scale coal mines operated here. Zhob had some agro-based industries, Chagai being rich in mineral resources like copper, onyx, marble, sulphur, iron and granite, was called the 'museum of minerals' (GoP, 2001; Barrick, 2010). Gun making was the traditional industry at Lehri in Bolan. With about a dozen coal mining bases, it contributed a valuable share in the district`s economy. Apart from this the rest of the districts had no mining or industrial activities but only small-scale enterprises like flourmills, ice factories, furniture and cottage industries comprising those related to carpet weaving, woodwork, shoe making, black smith, embroidery and other consumer items.

Factor II-Income and benefits

The second most important factor explaining 14.32 percent of the total variance of social and economic inequality was Income and Benefits. The rotated factor matrix shows that the highest positive loading was recorded for productivity per worker to agricultural workers in PKR (0.82),

productivity per hectare to agricultural workers in PKR (0.81), children immunized and vaccinated (0.81). High positive loadings were recorded for CBR (0.76), electronic and print media services (0.67), schools (0.65), real GDP per capita (0.64) and literates (0.61). Moderate positive loadings were observed for doctors (0.59), electrified housing units (0.53), never married population (0.47), and SNUs (0.45). The very high positive loading for productivity per worker to agricultural workers, (0.82), productivity per hectare to agriculture workers, (0.81), were indications of the fact that agriculture was one of the most significant contributors to the stability of the economy of Balochistan. However, the high positive loading for productivity per hectare is an indication of the heavy input in the form of irrigation, fertilizers and high yielding variety of seeds, intensive cropping, mechanization, etc.

The four significant variables of positive loadings relating to health and nutrition were children immunized and vaccinated (0.81), CBR (0.76), doctors (0.59) and SNUs (0.45) signifying the significance of these variables as contributors to economic stability. In the educational perspective, enrolled students (0.65) and literacy (0.61) also indicated that school enrollment was responsible for the prevalent literacy level, which was the result of the availability of educational facilities such as schools and the income level supporting them. The latter subsequently provided households with other facilities like information, etc.

Fig. 3 shows the spatial pattern of Income and Benefits in the province. Ziarat was the top scorer. Here, agriculture was the major source of income and employment. Almost all the available land of 3,500 hectares had been brought under orchards, producing valuable export fruits like apples,cherries, almonds, apricots and peaches . Horticulture and livestock rearing were also an important source of livelihood for the rural population. With respect to occupation, the population of the district can be roughly divided into the following classes, zamindars, cattle owners, laborers, traders and government servants. The district, however, earned little from tourism. Killa Abdullah had emerged as the second highest income district in the Province. Horticulture, trade and commerce constituted the major occupations. In Chaman *tehsil*, the smuggling of goods to and from Afghanistan was a lucrative occupation providing an important source of earnings to a large number of people (Sharif, et al., 2000).

Districts with moderate features of Income and Benefits were Kech, Panjgur, Quetta, Gwadar and Nasirabad. The economy of Kech depended on agriculture with dates being the major agricultural produce both for domestic and export markets. Other economically supportive crops were wheat and rice. A considerable proportion of population was engaged in the livestock rearing economy. Most of the people of Panjgur district served in the Middle East, thus contributing substantially to the provincial economy in the form of overseas remittances. Quetta, by virtue of being the provincial headquarters, had its income mainly based on trade, government services and a variety of professions. Marine fisheries were the main source of Gwadar's earnings and supplied one fourth of the total fish of the province. Other economically viable activities were power generation and manufacturing of boats and furniture In terms of contribution to economic stability, Nasirabad was the most developed district in the province, employing the majority of the people in agricultural activities. Livestock provided the backbone of the villagers' livelihoods.

Factor III-Rural-Infrastructural nexus

The third most important factor explaining 12.52 percent of the total variance was Rural-Infrastructural Nexus. The high positive loadings for workers (0.73), high type road to total area of the district (0.69), cognizable crimes (0.67), police stations (0.67), houses (0.65) and moderate positive loadings for population density (0.42), SNUs (0.42), primary workers (0.40) and negative loadings for un-employment (-0.72), primary educated (-0.55) and dependent (-0.52), all point strongly towards the prevalence of infrastructural stress typical of Third World rural areas . The demographic parameter of employment was closely correlated with the availability of road networks, security services, houses, schools, telecommunication, etc. which were sorely inadequate in rural Balochistan.

Social well-being is not solely a matter of monetary income but also a function of access to other critical variables such as education, health, housing, nutrition, recreation and status (Koch, et al., 2010; Gennetian, et al., 2010; Ourti, et al., 2009; Rojas, 2008; Murasko, 2008). Rural areas are places of hard living where the relative absence or lacking of such social amenities and

facilities is a fact of life. Indeed, 'rustication' - the term coined to banish people from the town to the countryside as a punishment- conjures the image of hardships of rural living (Raza and Burke, 1986).

However, the simple people of Balochistan seemed in to find in the trivial beauties of rural living a compensation for the hardships. The spatial pattern of this factor (Fig. 4) reveals that Nasirabad and Jaffarabad scored the highest. In Nasirabad, the agricultural sector was well established where out of a total cultivated area of 336,700 hectares 11196.84 hectares were under irrigation. Jaffarabad, the second most important district was also quite fertile. Both benefit from the Sindh irrigation system being contiguous to it. Quetta, though the Provincial capital, engaged only 24.73 percent of the total work force with the primary sector accounting for only 7.21 percent. The northern districts of Killa Abdullah, Pishin and Chagai exhibitrd an extreme lack of development with reference to infrastructural facilities and were therefore characterised by immense rural stress.

All the values of variables with positive and negative loadings were validated spatially and correlated with each other. Employment was not a real problem in the rural areas as any one could find some type of employment on the farms. Disguised unemployment or under employment was also prevalent depicted by the close spatial correlation between taangible crimes and police stations. Districts with no recorded police stations recorded no crimes. The law and order there was maintained with the help of *jirga* and the Frontier Constabulary.

Housing infrastructure in the rural areas of Balochistan posed no problem as they were mainly *kaccha* (a house with walls made of grass, leaves, reeds or bamboos, etc) houses constructed from locally available material. The local agricultural products provided just sufficient sustenance and SNU for the local people (Burke, et al., 2005). The population density was commensurate with the availability of infrastructural facilities.

Factor IV - Demographic stability and services
The fourth factor which explained 9.26 percent of the total variance was Demographic Stability and Services. It was composed of three high positively loaded variables of PHCs (0.79), schools (0.74), and LHWs (0.62), moderate loadings for enrolled students (0.45), average positive loadings for matriculates (0.37), SNUs (0.36) and road access to population (0.35). The negative loadings were for student teacher ratio (-0.61), population density (-0.45) unemployment (-0.44) and potable water (-0.41) which all served to indicate that demographic stability was essential for equitable provision and distribution of essential services and that population explosion could prove to be highly detrimental. It is noteworthy that almost all the significant variables pertaining to this factor had population as their denominator, hence the justification of the factor.

Figure 5 depicts the spatial inequalities in the health and education service sectors which emerged prominently in the province for this factor. Ziarat and Kohlu recorded the highest positive scores followed by Barkhan and Sibi. Rural population with low density featured in both Ziarat and Kohlu where it positively correlated with the availability of services. In Ziarat, a district hospital, seven Basic Health Units, two Rural Health Centers and seven Civil Dispensaries functioned in the health sector, while 103 boys' and 47 girls' schools facilitated the education of 56.01 percent boys and 26.03 percent of girls of school-going age. Kohlu was one of the most well endowed districts in terms of the health sector with one District Hospital, two Civil Hospitals, twenty-one Basic Health Units, two Mother and Child Health Centers, thirty-four Dispensaries, four Health Auxiliaries and one Tuberculosis (TB) Clinic. In the education sector also, Kohlu has a leading position, with 267 boys' and 49 girls' schools providing enrollment to 8,772 boys and 1,990 girls in 1998. These facilities highly benefited the sparse population of both the above mentioned low inequality districts which have densities of 0.02 and 0.01, respectively, much below the provincial average of 0.04 persons per square kilometer. Pishin, Jaffarabad and Quetta recorded negative scores on this factor i.e., 0.05, 0.18 and 0.29 respectively, because their high population densities diminishes the benefits of the services provided.

Factor V- Connectivity - Capability nexus
Factor V which explained 8.85 percent of the total variation in the province was the Connectivity-Capability Nexus. This consisted of high positive loadings for the ratio of cultivable land per

agricultural worker (0.75), high grade roads to total network (0.75), and total population (0.64); and moderate loadings for electrified housing units (0.57), three roomed houses (0.48), never married population (0.43), real GDP (PPP) per capita (0.44), high grade road to total area of the district (0.43) and non-ownership households (0.40).

Connectivity is a crucial issue in the development strategy of any region. Higher connectivity reflects a higher degree of development and vice-versa. It is essential for the smooth working of any economy, not only for production but also distribution of economic gains and for harnessing the integration process. In the case of Balochistan , three variables pertaining to roads have emerged as positively significant related to agriculture, income, and housing facilities. Transport helped in collapsing spatial differentials and in enhancing movement, migration, urbanization, and economic and social transformation in the urban areas of Balochistan. Here, there were greater housing problems with the coming in of many unmarried people in search of greener pastures.

The factor clearly indicates that agriculture was the mainstay of the economy of Balochistan (Figure 6) with horticulture being the most significant except in Killa Abdullah and Awaran. The district of Mastung, Sibi and Chagai occupied the top ranks in this factor as they had good road connectivity and better agricultural economy in particular horticulture and livestock herding. As Munby (1968) rightly stated there is no escape from transport for the economic and social reshaping of a region's capabilities is made possible only by interaction. Even in the most remote and least developed of inhabited regions transport in some form is the fundamental part of the daily rhythm of life (Hoyle and Knowles, 1998). This has been vividly portrayed in Balochistan.

Although agriculture here is of the traditional type, it is an essential part and parcel of their life. Horticultural products and livestock which were their economic mainstay were transported both provincially and nationally by roads. Transportation also permitted the division of labour and the economically driven migration of unmarried males to urban centers in the provincial capital of Quetta.

The most backward districts in terms of factor V were Gwadar and Panjgur which until 1998 had a very poor transport network. Recently, with the construction of the Coastal Highway and the development of the Gwadar Deep Sea Port, the economic and social capabilities of the districts had been considerably enhanced. For the realisation of a region's potential to be possible there has to be a focus on the basic needs of people and on reducing the poverty level of the masses by ensuring that a bigger share of the country's income is invested in meeting their basic needs (Carr, 1997). This is made possible by connectivity as shown by the spatial variation of the real GDP (PPP) in Balochistan which was moderate in the top ranking districts and lowest in bottom ranking districts.

Factor VI-Industrialization

This factor which accounted for 7.88 per cent of the total variance reveals positive loadings for workers employed in industrial estates (0.68), value added to industrial workers (0.65), room congestion (0.59), post offices (0.56), secondary workers (0.51), high grade road to population (0.43), houses and secondary & tertiary workers (0.39 each), lending reasonable support to the state of industrial development in the study area.

The level of industrialization is a paramount factor that globally distinguishes societies from each other. Following the theory of industrialization, countries become much more similar over time, thus diminishing the stratification process. Technological change and modernization of society that come with industrialization drive the societal division of labor in a similar direction, as a result of which the occupational structures, and associated differences in power, privilege and prestige, become more similar although granted that social differences and class structures could also be attributed to historical, political and political economy factors as well as (Erikson and Goldthorpe, 1992).

The factor having close affinity to industrial development in Balochistan is displayed in Figure 7, with Lasbela having a prime position. Other variables such as high room congestion and low percentage of houses, however, indicated that industrialization here was not sufficient enough to create jobs for the people of this district. Most of the people serve in low-income jobs, due to low literacy levels and insufficient skills. The low income of the people engaged in

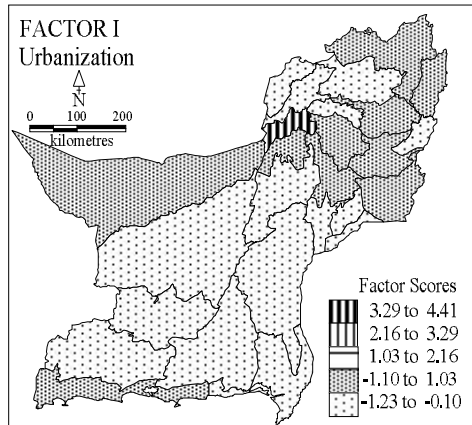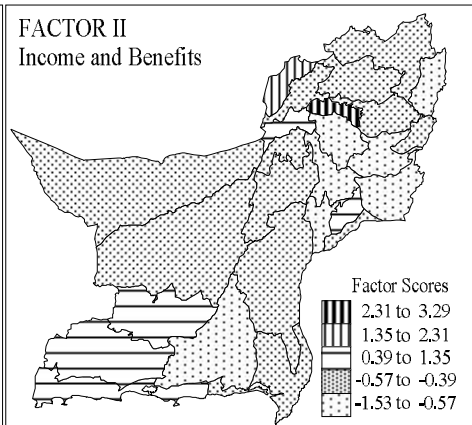industrial jobs was reflected in the 25th and 14th ranks of the respective variables on room congestion and percentage of houses.
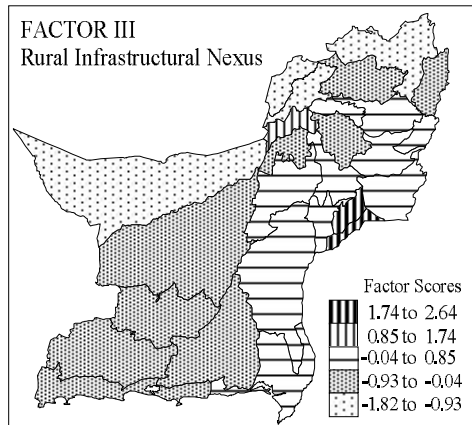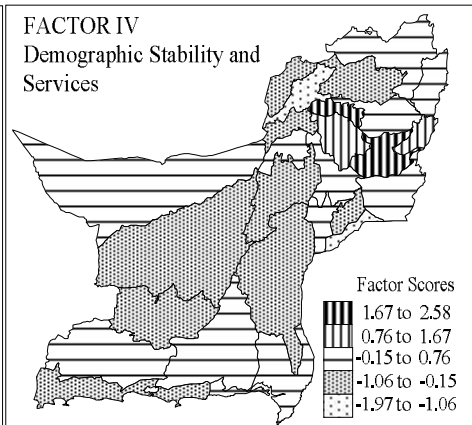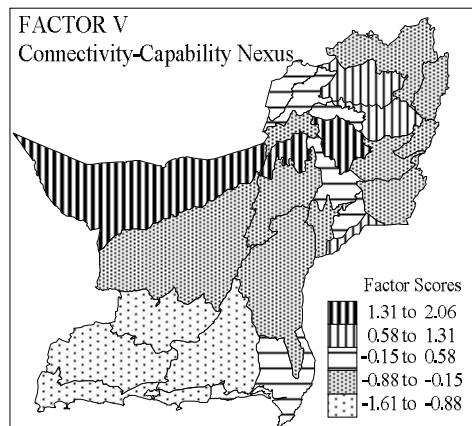

Fig. 2
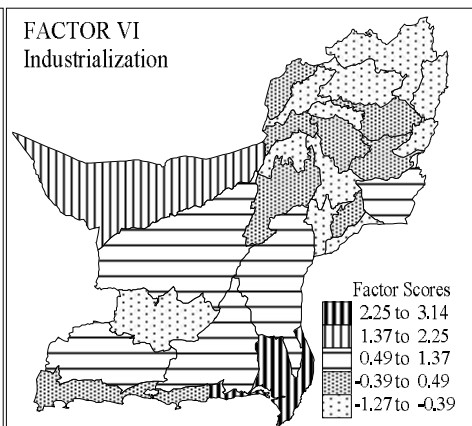
Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

The major industrial estates in Lasbela were Hab, Winder and Uthal where more than 166 industrial units were functioning. The main industries were textiles, auto parts, electronics, chemicals, ghee and plastic the surplus production of which was for exports. The Lasbela Industrial Estate Development Authority (LIEDA) provided attention, technical know-how and new sites to investors. LIEDA also maintains the Marble City, the newly allocated area for this

rock and its allied industries. Ship breaking industries were in Gaddani. Small enterprises included the Balochi embroidery, manufacturing of caps, carpets etc.

The spatial variation of industrialization portrayed in Figure 7 depicts Chagai as having second rank. The only industry worth mentioning was the Saindak project, one of the big projects that have been established with the collaboration of the Chinese Metallurgical Construction Corporation. Although completed, it was not fully functional for unknown reasons. The project could considerably benefit the district both economically and socially. There were supplementary industries for cutting and polishing of marbles and granites to enhance exports.

The multivariate study has highlighted that overall the districts of the Balochistan were less developed than the provincial capital Quetta. The process of urbanization was quite restricted for the rest of the province as compared to Quetta which possessed better facilities by virtue of being the provincial capital. As a whole Balochistan was predominantly a backward, rural province where infrastructural development was relatively better only where income generating activities through resource exploitation was present. Demographic stability was important for reducing inequalities, as it relieves the pressure on access to resources. Industrialisation provided employment opportunities based on capabilities, thus encouraging people to improve their knowledge and skills. Balochistan might have better prospects subsequent to improvement in industrialization. Yet, ultimately, education is an effective socio-economic equaliser and its development in the province was an urgent need.

Conclusion

The contribution of the factors of urbanisation, income and benefits, rural-infrastructural nexus, demographic stability and services, connectivity-capability nexus and industrialisation to fostering inequality in Balochistan was intricately linked to each other. Lack of urbanisation was the main cause of disparity in Balochistan, Quetta being the only Class I city. The other cities were ill-equipped and suffered from lack of planning, unauthorised settlements, shortages of housing, and poor services as testified by the problems of sanitation, air pollution, inadequate access to safe drinking water, overcrowding and socio-economic problems. The agricultural economy and the income levels of the province would have been much enhanced by factor III, the rural-infrastructural nexus. Yet, the rugged topography made even more difficult by extensive deserts and highly infertile soils, did not encourage massive capital investment in infrastructural development. At the same time, population growth put not only pressure on the available resources and services but also led to disguised and under-employment and ultimately social problems. Industrialisation was also lacking in the province although it could have been the catalyst for economic growth and development in Balochistan as it had enormous mineral reserves. The development of connectivity could definitely accelerate the development pace and reduce inequality. Finally, the development of education as an instrument of equitable progress for the people of the province could not be over-emphasised.

References

Barrick (2010) Building value in everything we do. Annual Report 2010. Barrick Gold Corporation, Toronto, Canada.

Bond P (1999) Basic infrastructure for socio-economic development, environmental protection and geographical desegregation: South Africa's unmet Challenge. *Geoforum* **30,** 43-59.

Burke F (2004) *Quality of life – Uttar Pradesh, India*, Karachi. Madraswala Infotenment.

Burke F, Huda SN, Hamza S, Azam M (2005) Disparities in agricultural productivity in Balochistan - A GIS perspective. *Pakistan Geographical Review* **60** (1), 27-34.

Carr M (1997) *New patterns: Process and change in Human Geography*. Surrey, Thomas Nelson and Sons Ltd, UK.

Cattell BC (2006) The life and work of Charles Spearman. *Journal of personality* **14** (2), 85-92.

Coen ES, Ross AN, Turner S (2008) Without tiendas it's a dead neighbourhood: The socio-economic importance of small trade stores in Cochabamba, Bolivia. *Cities* **25**, 327–339.

Erikson R, Goldthorpe JH (1992) *The constant flux: A study of class mobility in industrial societies*. Clarendon Press, Oxford.

Gennetian AL, Castells N, Morris AP (2010) Meeting the basic needs of children: Does income matter? *Children and Youth Services Review* **32**, 1138-1148.

Government of Pakistan (GoP) (2001) Provincial census report 1998 - Balochistan, Statistics Division, Population Census Organization, Islamabad.

Griffith AD, Amrhein GC (1997) *Multivariate statistical analysis for geographers*. Prentice Hall, New Jersey, USA.

Harris R, Arku G (2007) The rise of housing in international development: The effects of economic discourse. *Habitat International* **31**, 1-11.

Hedstrom P (2005) *Dissecting the social. On the principles of analytical sociology*. Cambridge University Press, Cambridge.

Hoyle B, Knowles R (1998) *Modern transport geography*, Edition 2. Wiley, New York.

Jacobs ED, Kelly T, Sobolewski J (2007) Linking public health, housing, and indoor environmental policy: Successes and challenges at local and federal agencies in the United States. *Environmental Health Perspectives* **115** (6), 976-982.

Kimura M (1993) Standards of living in Colonial Korea: Did the masses become worse off or better off under Japanese rule? *The Journal of Economic History* **53** (3), 629-652.

Koch E, Romero T, Romero CX, Akel C, Manríquez L, Paredes M, Román C, Taylor A, Vargas M, Kirschbaum A (2010) Impact of education, income and chronic disease risk factors on mortality of adults: Does 'a pauper-rich paradox' exist in Latin American societies? *Public Health* **124** (1), 39-48.

Munby DL (1968) *Transport: Selected readings*. Penguin, Harmondsworth.

Murasko EJ (2008) An evaluation of the age-profile in the relationship between household income and the health of children in the United States. *Journal of Health Economics* **27** (6), 1489-1502.

Mustafa D, Qazi UM (2007) Transition from Karez to Tubewell irrigation: Development, modernization, and social capital in Balochistan, Pakistan. *World Development* **35** (10), 1796-1813.

Ourti TV, Doorslaer E, Koolman X (2009) The effect of income growth and inequality on health inequality: Theory and empirical evidence from the European Panel. *Journal of Health Economics* **28** (3), 525-539.

Raza M, Burke F (1986) Regional dimensions of income disparities: A case study of Uttar Pradesh-India. In: Shafi M, Raza M (eds) *Spectrum of modern geography: Essays in memory of Prof. Mohammad Anas,* 227-241. Concept Pub, New Delhi, Aligarh, India.

Redding S, Venables JA (2004) Economic geography and international inequality. *Journal of International Economics* **62**, 53-82.

Rees DJ, Samiullah A, Rehman F, Kidd CHR, Keatinge JDH, Raza SH (1990) Precipitation and temperature regimes in upland Balochistan: Their influence on rain-fed crop production. *Agricultural and Forest Meteorology* **52** (3-4), 381-396.

Rodríguez A, Mayer L (1995) Development of sheep fattening schemes in highland Balochistan, Pakistan. *Small Ruminant Research* **18** (3), 193-200.

Rodríguez A, Ali I, Afzal M, Shah NA (1993) Marketing of goat and sheep skins in highland Balochistan, Pakistan. *Small Ruminant Research* **12** (3), 259-270.

Rojas M (2008) X-inefficiency in the use of income to attain economic satisfaction. The *Journal of Socio-Economic* **37**, 2278-2290.

Sharif M, Farooq U, Bashir A (2000) Illegal trade of Pakistan with Afghanistan and Iran through Balochistan: Size, balance and loss to the public exchequer. *Int. J. Agri. Biol.* **2** (3), 199-203.

Viljoen F, Louw (2007) State compliance with the recommendations of the African Commission on Human and Peoples' Rights, 1994-2004. *The American Journal of International Law* **101** (1), 1-34.

Weinbach WR, Grinnell MRJR (20010 Statistics for social workers, 5th Edn. Allyn and Bacon, USA.

Wu F, Jacobs D, Mitchell C, Miller D, Karol HD (2007) Improving indoor environmental quality for public health: Impediments and policy recommendations. *Environmental Health Perspectives* **115** (6), 953-957.