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Poverty, Income Distribution and Social Development in Lahore

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Abstract

In this paper we present a comparative analysis of poverty and income inequality prevalent in the seven towns of Lahore. Further, an analysis of the gender inequality and overall social development by considering education, health, and labor market conditions is presented. For a deeper insight, we have computed the statistics of income distribution such as poverty, Herfindahl Index, Gini Coefficient, ratio of share of income of bottom 20% to top 20% and SEN index in this study. Finally, composite index of social development is estimated and on the basis of this, index ranking of each town is outlined. Nishter Town is the least socially developed town where as Aziz Bhatti, Shalimar, and Allama Iqbal towns are less socially developed as compared to Ravi, Cantt and Gunj Buksh towns.

Key Words: Poverty, Income distribution, *Gini, Lorenz curve, Gender inequality, Social Development*, Lahore, Pakistan
JEL Classification: I0, I3

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I   Introduction

Emergence of trading blocks, formation of monetary unions, and integration of external policies are the main outcomes of globalization during the last decade. However, during the same era, fiscal management has gone through the process of decentralization. It is widely believed that effectiveness of fiscal policies in delivering social service can be enhanced in a decentralized unit. Level of deprivation in the society is considered to be a threat to the integration of global system, therefore, poverty, income inequality and social development has gained priority in the agenda of fiscal policies. Development strategies in Pakistan are also focusing upon poverty alleviation, equity in income distribution among the masses, and social development. These three areas have become the major concerns for the policy makers at national as well as at local levels since the introduction of devolution in Pakistan. These are the core issues taken in to account while formulating effective development strategies for the province of Punjab. Hence, In order to bring any significant change, there is an acute need of profound analysis of poverty, prevailing income inequalities, and social development.

Poverty and income inequality represent the level of absolute and relative deprivation respectively (Sen 1984). Poverty measures help in identifying the number of households that are below the minimum welfare threshold (minimum required food and non food expenditures), while, income inequality represents the relative positioning of the households according to the distribution of overall income. Overall income deprivation is the outcome of several types of deprivations arising from lower education, illness prevalence, unemployment and lack of earning opportunities. Jamal *et al* (2003) provided district-wise poverty or deprivation indices in Pakistan, based on the Population and Housing Census data of 1998. They considered deprivation in the sectors of housing, education, health, residential services, and employment. Pasha *et al* (1990) identified the development level of districts in Pakistan and highlighted changes in development ranking of a number of districts from the early 1970s to the early

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1980s, especially among districts at the intermediate level of development. Jamal and Khan (2003) performed a development ranking of the districts of Pakistan. They also identified regional clusters and described the sectoral inequality levels in the country. These studies provide an insight into the policy making process so as to outline the type of social service demand of each district according to the position of the district in social development. Therefore, investigation of income and social deprivation in the towns[2] of Lahore is important for the formulation of better policy regarding poverty alleviation, equitable income distribution and social service delivery by Punjab government and district management of Lahore.

Analysis of income distribution relies on accurate and reliable estimates of distributional parameters that encompass measures of central tendency, dispersion, skewness, percentile, and other summary statistics. Exploring these measures and differences among them over towns of Lahore provide useful insight into behavior of the income distribution and effect of different policy measures.

Section II gives the description of data and outlines the methodological framework. Section III discusses the results and finally section IV concludes the paper along with policy recommendations.

II   Data and Methodology

Multiple Indicators Cluster Survey

The Bureau of Statistics, Government of Punjab collected and compiled primary data set of all the districts of Punjab as well as of seven towns of Lahore for the Multiple Indicators Cluster Survey (MICS) study. For this study the primary data of the seven towns (Gunj Bakhsh Town, Shalimar Town, Allama Iqbal Town, Aziz Bhatti Town, Nishter Town, Ravi Town, Cantt Area) has been

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[2] This paper utilized the micro data of MICS-2004, therefore six towns along with the Cantt Area is explored.

separated and analyzed. Basic properties of the data can be reflected by the descriptive statistics such as mean, median, maximum, minimum, standard deviation, and skewness.

Measurement of Indicators

Poverty

In Pakistan, the National Poverty Line on the basis of 2350 calories per adult equivalent per day for the year 2004 is estimated to be Rs 848.798 per adult equivalent per month. Therefore, this threshold is utilized for the computation of poverty line.

Table: 1	Classification of Population According to Income Quintiles
Divisions of Poverty	The entire population of each town is divided into the consumption-expenditure based quartiles or poverty band around the poverty line of Rs 848.798/-.
The Absolute Poor	If the per capita consumption expenditure per month of the household is less than 75 % of the poverty line, it is categorized as a chronically poor household. This group is further subdivided into two sub-sections - the extremely poor (less than 50 per cent of the poverty line) and chronically poor (between 50 and 75% of the poverty line).
The Transitory Poor	If the per capita consumption expenditure per month of a household is less than 125 % of the poverty line and more than 75 % of the Poverty Line, it is categorized as transitory Poor Household. This group is further sub-divided into two sub-sections – the transitory poor (between 75 and 100% of the poverty line and transitory vulnerable (between 100 and 125% of the poverty line.
The Non-Poor	If the per capita per month consumption expenditure of the household is more than or equal to the 1.25 % of the poverty line, it is categorized as non-poor household. As with the other categories, this group is divided into two sections- transitory non-poor (between 125 and 150% of the poverty line) and the non-poor (more than 150% of the poverty line).

Income inequality

Herfindahl
$$H = \sum_{i=1}^{n} P_i^2 \qquad Where \qquad \sum_{i=1}^{n} P_i^2 = \sum_{i=1}^{n} \frac{x_i^2}{\sum_{i=1}^{n} x_i^2}$$

and x_i =Household expenditures of ith ordered observations

Normalized Herfindahl $H^* = \dfrac{H - \dfrac{1}{n}}{1 - \dfrac{1}{n}}$

Gini Coefficient $\quad G = \left[\dfrac{2}{n^2 \bar{x}}\right] \sum\limits_{i=1}^{n}\left(\left(i - \dfrac{n+1}{2}\right)x_i\right)$ $\qquad$ Where $\quad \bar{x} = \dfrac{1}{n}\sum\limits_{i=1}^{n} x_1$

and x_i =Household expenditures of ith ordered observations

Concentration Coefficient $C = \left(\dfrac{n}{n-1}\right)G$

Income Share of Quintiles

Let's suppose for ordered observations $x_n \geq x_{n-1} \geq x_{n-2} \geq x_{n-3}................x_{n-(n-2)} \geq x_{n-(n-1)}$

x_i =Household expenditures of ith ordered observations

Share of bottom 20% $= \dfrac{\sum\limits_{n=1}^{n/5} x_i}{X}$ $\qquad$ Where $\quad X = \sum\limits_{i=1}^{n} x_i$

Second $\quad = \dfrac{\sum\limits_{\frac{n}{5}+1}^{2n/5} x_i}{X}$ $\qquad$ Where $\qquad X = \sum\limits_{i=1}^{n} x_i$

Third $\quad = \dfrac{\sum\limits_{\frac{2n}{5}+1}^{3n/5} x_i}{X}$ $\qquad$ Where $\qquad X = \sum\limits_{i=1}^{n} x_i$

Fourth $\quad = \dfrac{\sum\limits_{\frac{3n}{5}+1}^{4n/5} x_i}{X}$ $\qquad$ Where $\qquad X = \sum\limits_{i=1}^{n} x_i$

Share of top 20% $= \dfrac{\sum\limits_{\frac{4n}{5}+1}^{n} x_i}{X}$ $\qquad$ Where $\qquad X = \sum\limits_{i=1}^{n} x_i$

x_i =Household expenditures of ith ordered observations

SEN Index

$S = RY(1 - G)$ $\qquad$ *Where $G = Gini\ coefficient$*

and

RY = Average real income calculated by per capita real GDP or GNP

Gender Inequality

Three dimensions of gender inequality such as education, health and labor market are used to construct the composite index of gender inequality. Three indicators such as primary enrollment, secondary enrollment, and adult literacy rate are utilized to compute the gender inequality in education sector. Five indicators such as malnutrition, diarrhea, child mortality, adult mortality, and incidence of TB are utilized to compute the gender inequality in health sector. Labor force participation and unemployment are utilized to compute the gender inequality in labor market. For a particular indicator i, the index is constructed as follows:

$$I_i = \left[\frac{S_W}{100} + \frac{S_M}{R_i} \right]^{-1}$$

Where S_W = share in the relevant population of women and S_M = share in the relevant population of men ($S_W + S_M = 1$), R_i is the ratio of the magnitude of the indicator for men to the magnitude for women. The ratio is expressed as a percentage. In the case of perfect equality $I_i = 100$. If $R_i > 100$ percent then $I_i > 100$. Alternatively, if $R_i < 100$ percent then $I_i < 100$. The higher the magnitude of I_i, the greater will be the gender inequality. However, the index is relatively insensitive to large values of R_i and, therefore, reflects moderate aversion to inequality. Equal weighting scheme is used for the construction of overall gender inequality index as well as gender inequality indices of education, health and labor market.

Social Development

Social development index is also computed by using the equal weighting scheme. Four dimensions such as education, health, labor market, and income distribution are utilized for the construction of social development index. Indicators considered in each dimension along with their weights are given below in the table.

Education (0.25)	Health (0.25)	Labor Market (0.25)	SEN Index (0.25)
Adult Literacy Rate (0.08)	Malnutrition (0.05)	Labor Force Participation (0.125)	Poverty
Primary Enrollment (0.08)	Diarrhea (0.05)	Unemployment (0.125)	Income Inequality
Secondary Enrollment (0.08)	Child Mortality (0.05)		
	Adult Mortality (0.05)		
	Incidence Of TB (0.05)		

Weight of each indicator is given in parenthesis
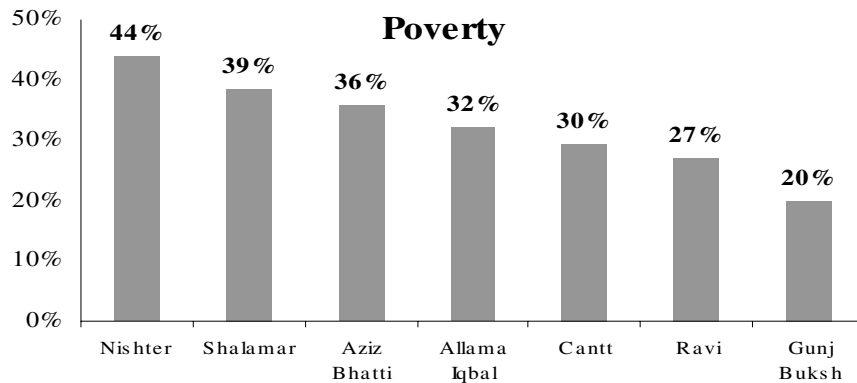
III   Results

Exact assessment of social development is nearly an impossible task. However, for the sake of comparison, indicators can be computed in order to estimate the social conditions prevailing in several localities. Therefore, poverty, income inequality, and gender inequality is estimated for the seven towns of Lahore. Further, overall gender inequality along with its three dimensions such as labour market, education and health are computed. Finally, overall indices of social development are computed for each town. These indices are utilized to rank the towns of Lahore according to the level of their social development.

Poverty

Poverty incidence is estimated for the seven towns of Lahore and is reported in the Chart below. Poverty measures are based on the threshold of 850/-Rs per month per adult expenditures. The poverty measures vary across towns in a manner that Nishter town has the highest poverty and Gunj Buksh town is characterized with the lowest poverty incidence of 20%. Therefore, absolute deprivation measured by poverty incidence is the highest in Nishter Town.

Chart 1   **Poverty incidence by towns of Lahore**

Poverty

Town	Poverty
Nishter	44%
Shalamar	39%
Aziz Bhatti	36%
Allama Iqbal	32%
Cantt	30%
Ravi	27%
Gunj Buksh	20%

Poverty dynamics can better be understood with the help of further classification of household according to positioning. Therefore, an in depth analysis of poverty incidence is presented below by their classification into six quintiles (Extremely Poor, Chronically Poor, Transitory Poor, Transitory Vulnerable, Transitory Non-Poor, and Non Poor).

The population of extremely and chronically poor households is highest in Nishter town that is 24.8% and then 18.1% in Allama Iqbal Town. However, Gunj Buksh Town has only 7.6% households in this category. Shalimar Town ranks highest in the category of transitory poor and vulnerable (41.3%) and Nishter town has 33.9% households in this category. However, 67% population of Gunj Buksh town, 57.7% population of Ravi town, and 54.3% population of Allama Iqbal town are in the category of non poor.

Chart 2: **Classification of Population According to Income Quintiles**
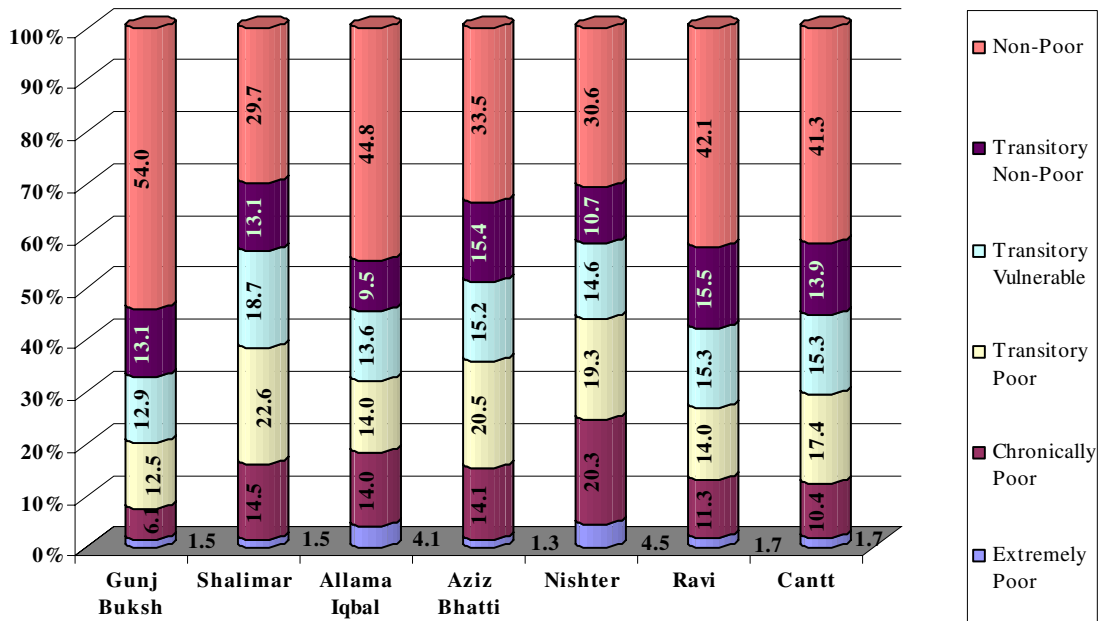
Income Inequality

Categorical analysis of poor raises the question of income distribution in each town. Measure of central tendency and dispersion are the better tools to analyze income distribution. Gini coefficient that represents income inequality is computed for each town. These statistics are presented in the table below in a manner that first column of Shalimar town is characterized with highest inequality and the last column of Allama Iqbal Town has the lowest income inequality according to the Gini Coefficients.

Table 2: **Comparative Analysis of Income Inequality in Towns of Lahore**

Towns	Shalimar	Aziz Bhatti	Ravi	Nishter	Gunj Buksh	Cantt Area	Allama Iqbal
Sample size	482	376	522	513	543	287	558
Mean	6995	6777	7681	7797	10439	9981	9828
Median	5849	5516.5	6437	5125	7220	6405	6634
Herfindahl	0.0036	0.0038	0.0032	0.0037	0.0039	0.0083	0.0067
Gini Coefficient	0.3048	0.3113	0.3251	0.4093	0.4160	0.4408	0.4499
Share of bottom 20%	0.0898	0.0848	0.0787	0.0703	0.0664	0.0658	0.0561
Second	0.1322	0.1262	0.1272	0.1036	0.1034	0.1006	0.0949
Third	0.1656	0.1635	0.1673	0.1360	0.1397	0.1283	0.1349
Fourth	0.2145	0.2304	0.2213	0.1916	0.1914	0.1754	0.2036
Share of Top 20%	0.3979	0.3951	0.4054	0.4986	0.4991	0.5299	0.5105

Computation of the number of poor below poverty threshold, and income inequality provide information regarding the existence of absolute and relative deprivation in the towns. However, there is a need for an in depth analysis of income dispersion within the lower income households. Therefore, the extent of poverty and income distribution is investigated at three arbitrary levels (500, 750, and 1000 Rs/month) of income threshold. The Gini Ratio, income short falls from the threshold, and poverty and SEN Indexes are computed to present a comprehensive picture of the households living below given the threshold level. Higher values of SEN index reflect worse conditions regarding poverty and inequality. The results are presented in tables below.

Almost half the population of Nishter and Shalimar town is spending below 1000 Rs/month per adult and nearly one third of the population has the purchasing power of below 750Rs/month per adult. The third town in this ranking is the Aziz Bhatti town where 45% and 27% of the population is below the thresholds of 1000 Rs/Month and 750Rs/month per adult respectively. Almost 40% of the population of Allama Iqbal town, Cantt areas and Ravi town and 30% of the population of Gunj Buksh town is below the threshold of 1000 Rs/month per adult.

Table 3:   Statistics of Poverty and Inequality with Threshold of 500 RS/Month

Towns	SEN Index (%)	Head Count Poverty Ratio (%)	Ratio of Short fall (%)	Gini Ratio Poor (%)
Gunj Buksh	2.7	3.1	85.3	6.4
Shalimar	4.3	4.8	88.8	6.3
Allama Iqbal	7.6	9.0	84.0	8.1
Aziz Bhatti	4.0	4.5	88.0	5.6
Nishter	8.0	9.6	82.9	7.1
Ravi	3.9	4.6	83.2	8.9
Cantt	3.9	4.5	85.3	8.2

Table 4: **Statistics of Poverty and Inequality with Threshold of 750 RS/Month**

Towns	SEN Index (%)	Head Count Poverty Ratio (%)	Ratio of Short fall (%)	Gini Ratio Poor (%)
Gunj Buksh	11.5	14.2	79.3	10.4
Shalimar	24.4	29.3	81.6	9.1
Allama Iqbal	20.0	25.8	74.3	12.2
Aziz Bhatti	22.3	27.1	80.6	9.2
Nishter	27.2	35.1	74.8	11.4
Ravi	16.9	20.9	78.5	11.2
Cantt	17.3	21.2	79.3	11.1

Table 5: **Statistics of Poverty and Inequality with Threshold of 1000 RS/Month**

Statistics of Poverty and Inequality with Income threshold of 1000 RS/Month				
Towns	SEN Index (%)	Head Count Poverty Ratio (%)	Ratio of Short fall (%)	Gini Ratio Poor (%)
Gunj Buksh	23.5	30.0	74.9	13.1
Shalimar	39.9	52.5	72.7	12.4
Allama Iqbal	30.5	41.9	67.8	15.6
Aziz Bhatti	34.1	45.7	70.9	12.5
Nishter	39.1	54.4	66.9	15.1
Ravi	29.8	39.1	72.4	13.8
Cantt	30.3	39.9	72.3	13.0

Gender Inequality

Gender inequality in Lahore is mainly driven from the labor market and there is no visible existence of gender inequality in the sectors of education and health. Two indicators of labor market such as labor force participation and unemployment level are considered for the construction of gender inequality in labor market. Labor force participation considers supply of labor whereas employment refers to the utilization of existing labor force. The highest gender inequality of labor market is in the town of Aziz Bhatti and that is due to lower female labor force participation. In a similar manner, lower female labor force participation rate is the main cause of gender inequality in the towns of Ravi, Cantt and Gunj Buksh. Gender inequality of labor market in the towns of Nishter and Allama Iqbal are driven from higher female unemployment.

Table 6:   Gender Inequality in the Towns of Lahore

Towns	Gender Inequality Indices			
	Overall	Education	Health	Labor market
Gunj Buksh	114.5	101.2	100.1	142.2
Shalimar	111.6	96.5	100.0	138.1
Allama Iqbal	113.5	99.4	101.5	139.6
Aziz Bhatti	115.1	99.9	99.1	146.2
Nishter	114.8	102.2	100.4	141.8
Ravi	114.7	102.5	99.0	142.6
Cantt Area	111.5	98.6	96.8	139.2
If index=100 then perfect equality and if index>100 then bias is in favor of male				

Social Development

The social development of each town is explored with the help of the indicators mentioned in methodology. Towns are ranked according to the social development level measured by overall index. Nishter town is the most deprived town of the district as it has the highest poverty incidence when compared with the other towns of Lahore. Highest fraction of population (4.5%) of Nishter town is in the category of extremely poor. Around 9% of the population of this town is spending less than or equal to 500 rupees per month per adult. The highest fraction of females (11%) participating in the labor market have not yet done any reasonable work.

Table 7:   Social Development in the Towns of Lahore

Towns	Social Development indices				Adjusted SEN Index
	Overall	Education	Health	Labor Market	
Nishter	69.9 (1)	53.5 (1)	89.8 (4)	63.6 (4)	72.8 (1)
Aziz Bhatti	71.7 (2)	56.1 (2)	89.4 (3)	63.8 (6)	77.7 (3)
Shalimar	71.9 (3)	56.9 (3)	89.3 (2)	65.7 (7)	75.6 (2)
Allama Iqbal	73.2 (4)	61.5 (5)	89.0 (1)	62.5 (2)	80.0 (4)
Ravi	74.2 (5)	60.4 (4)	90.0 (5)	63.4 (3)	83.1 (6)
Cantt Area	74.8 (6)	63.5 (6)	91.2 (6)	61.6 (1)	82.7 (5)
Gunj Buksh	77.2 (7)	64.3 (7)	92.5 (7)	63.7 (5)	88.5 (7)
If index=0 then worse case and if index =100 then best case					
Rank of each town is presented in parenthesis					

Conclusions and Policy Recommendations

This paper summarizes the social development level prevailing in several areas of Lahore. Nishter Town has the maximum incidence of poverty that is 44% of which 4.5% can be termed as extremely poor. 10% population of this town is spending less than 500 Rs/month per adult. This town is also endowed with least human capital when considering primary enrollments, secondary enrollments and literacy rate in a composite education indicator. Shalimar and Aziz Bhatti towns are not in the category of least deprived but can be termed as deprived towns. Allama Iqbal and Ravi town having moderate level of social development, however, Cantt and Gunj Buksh towns are relatively better off towns of Lahore regarding social development.

Philanthropic activities should concentrate on Nishter town so that a major fraction of population should have access to relief for basic needs. Public policies should also consider the problem of higher female unemployment in Nishter and Allama Iqbal towns. Overall employment opportunities should be created in Shalimar and Aziz Bhatti town so that a majority of transitory population facing risk of falling below poverty line should be saved.

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