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Inter-Regional Imbalances in Human Development: Analysis of Punjab, Pakistan

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Abstract:

Present study investigates the current status of human development and human development disparities across the districts of Punjab. We have calculated Education Index (EI), Health index (HI), Income Index (INI), Human Development Index (HDI) and Non-Income Human Development Index (NIHDI) for thirty five districts of Punjab. One district Chiniot is excluded from our analysis due to some data constraints. Districts have been ranked on the basis of their values of EI, HI, INI, HDI and NIHDI. The results of our study indicate that huge human development disparities exist in terms of EI, HI, INI, HDI and NIHDI among the districts of Punjab. Some districts like Rawalpindi and Lahore have high human development status with high HDI and NIHDI values whereas some districts like Bahawalpur and Rajanpur are lagging behind in human development with low HDI and NIHDI values. Comparison of income index (INI) and NIHDI reveals that some districts like Narowal and Gujranwala have performed well in terms of NIHDI than INI. Similarly some other districts like Dera Gazi Khan, Muzaffar Garh and Rahim Yar Khan have performed better in terms of INI than their performance in NIHDI. The existing human development disparities among districts need to be reduced through effective public policy because such disparities can create a severe type of rivalry and distrust among the regions which can be harmful for social cohesion. The districts with poor human development especially the districts in the West and the South regions of Punjab are identified as target for special policy interventions.

Keywords: Human Development, Human Development Disparities, Punjab, Pakistan

JEL Classification Numbers: O15, O16

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1. Introduction

Human development is the primary objective of all developing economies of the world. It has great importance in social planning. Every individual, society and nation wants a prosperous life. Different instruments are used, investments are undertaken and different policy frameworks are designed to achieve this target. Development may mean different things to different people. Human development does not have any unanimous working definition.

Traditionally Gross Domestic Product, (GDP) per capita and GDP per capita growth have been used as an indicator to measure economic progress and human well-being of a society. Economic growth had been the primary focus of the economists and development planners. Growth in capital stock was considered as a mean and growth in GDP per capita was taken as an end. Per capita income and growth of per capita income were frequently used to compare the well-being of the people of the different countries and regions (UNDP, 1990).

However income per capita hides so many aspects of the socio-economic conditions of a society. Dasgupta and Weale (1992) describe that per capita income is not an appropriate measure to examine the well-being of a society because it does not necessarily tell about social condition of the society. Anand (1994) points out that income approach is a narrow approach to measure well-being of people and to examine the development of a society. According to him, people and their lives is the real end of all development policies. Income has instrumental importance to improve the quality of life of the people but it cannot be a direct measure of living standard.

According to Streeten (1995) three justifications can be given for the emphasis on economic growth as an indicator to measure the degree of development of an economy. First, through market forces it would automatically increase the labour demand, productivity and wages. So in that way, economic growth would spread its benefits broadly and with the passage of time income inequality would also decrease. Second justification is related to government especially democratic government. It is assumed that with increase in GDP per capita government will increase the tax collection from the rich people of the society and will distribute collected taxes among the poor people of the society through public provision of social services. As a result, both poverty and inequality in that society would automatically be decreased. Similarly through market interventions government can also reduce poverty directly where they feel that poor people are not getting benefits from market forces. The third justification is that addressing the problem of poverty is not compulsory at the early stage of development. Once economy succeeds to develop physical capital, infrastructure and productive potential of the economy then the benefits of economic growth will be transferred to the poor automatically. It means that some sort of inequality may be inevitable for economic growth. In the early stages of development inequality will increase. But after that, inequality will decrease with increase in income. This suggests an inverted U shaped relationship between economic growth and income inequality. This kind of relationship was initially investigated empirically by Simon Kuznets and is termed as Kuznets' inverted U hypothesis in literature (Kuznets, 1955).

But the literature shows that above mentioned three justifications have proved true only in those economies that focused on land reforms, education and health. Thus there may not be an automatic process by which GDP growth would have a reducing effect on poverty and

inequality. According to Sen (1988), growth and development are two distinct concepts. Economic growth is concerned only with improvement in GDP per capita and it does not explain about the distribution of GDP among the population. It is possible that a country or a society has greater expansion in GDP per capita but has unequal distribution of income. It is possible that the poor section of society gets little benefits of GDP per capita growth. According to him GDP is only a mean to achieve well-being but not an end in itself. Development is a very broad concept. It relates to “what people can actually do and be”. He argues that a basic distinction should be made between the means and the ends of development. Development focuses directly on the lives of people. Development process is more linked with elimination of different ills of a society such as hunger, under nutrition and child mortality.

Haq (1995) describes that people are the means as well as the end of economic development. Generally when economists talk about means of development they discuss about stock of physical capital which along with other factors of production plays an important role in production process. However evidence suggests that despite having abundant physical capital, many societies could not perform well in terms of various indicators of economic development.

Thus per capita income growth is not an appropriate measure of development. To address the shortcomings of income approach of development, different alternative approaches can be used to examine the development of a society. The Basic Needs Approach introduced by International Labour Organization (ILO, 1977) is one of such approaches. This approach suggested the use of different indicators related with basic needs such as food, water, clothing and shelter.

Physical Quality of Life Index (PQLI) introduced by Morris (1979) is another measure of the degree of development. This was the one of the pioneer attempt to measure the degree of development of a society with the help of combined index constructed by using three indicators of infant mortality, life expectancy and literacy. Nowadays, it has become an established wisdom among development economist that instead of using income as a sole indicator of development, some comprehensive and holistic measure of human development should be used for analyzing human development of a country or region. It is argued that income is only a mean to achieve a goal of development and some basic distinction is required between means and ends of development (Anand, 1994). Human Development Index (HDI) is one of such composite measure. HDI introduced by United Nations Development Program (UNDP) in its first human development report (UNDP, 1990) is a better measure of human development due to holistic approach used in its construction. It evaluates the average improvement of a nation in three basic aspects of human development: a long and healthy life, access to knowledge and decent standard of living. Prior to 2010, HDI was obtained by taking the arithmetic mean of three sub-indices of income index, education index and health index. Each of these sub-indices reflected the progress of a nation in three basic aspects of human development related with living standard, education and health. Methodology used for the construction of HDI has undergone several minor revisions since the publication of first human development report. Since 2010, UNDP has introduced a slightly new methodology for the measurement of HDI in which HDI is the geometric mean of normalized indices measuring the improvements in each aspect. UNDP (2010) also introduced some new indices to measure human development. Non Income Human Development Index (NIHDI) is one of such measures. It is constructed by using the indicators related with health and education. Unlike HDI, it does not use Gross National Product (GNP) in its construction. NIHDI

takes in to account only two aspects of a long and healthy life and access to knowledge. Thus NIHDI focuses only non-income dimensions of human development.

In this study, regional imbalances in human development have been investigated by calculating Education Index (EI), Health Index (HI), Income Index (INI), Human Development Index (HDI) and Non Income Human Development Index (NIHDI) for the districts of Punjab, Pakistan. It is important to study the development disparities among regions because such disparities may create a severe type of rivalry and distrust among the different regions which can be dangerous for social cohesion (Pervaiz and Chaudhary, 2010). This distrust and rivalry can be disastrous for development and wellbeing of the people through different ways.

2. Previous Studies Constructed HDI at District Level in Pakistan

United Nations Development Programme (UNDP) publishes annual reports on human development. These reports examine the status of human development across the countries and across the regions of the world. Occasionally, country-specific reports are also published by UNDP to study the regional differences of human development in a country. The reports indicate that still there are huge human development disparities across the countries and across the regions of the world. One such report by UNDP (2003) examined human development disparities among the provinces as well as among the districts of Pakistan. The report calculated HDI for the year 1998. HDI was calculated with the help of three sub-indices termed as income index, education index and health index. The results revealed that human development disparities existed among the provinces and within provinces. The report used agricultural crop value and manufacturing value added as proxy for GDP per capita at districts level to calculate income index. Literacy rate and primary enrollment rate was used for the construction of education index. The health index was constructed for provinces as well as for districts by using the indicators of infant survival rate and immunization rate. However, in the construction of health index for different districts, provincial level infant survival rates were used by implicitly assuming that such rates were same across all the districts of a province.

Jamal and Khan (2007) calculated HDI for the provinces as well as for the districts of the provinces of Pakistan. The study used different variables for the construction of three sub-indices of income index, education index and health index which were further used to develop HDI. Adult literacy rate and combined (primary, secondary and tertiary) enrollment rate was used for developing education index whereas age and sex specific death rates and immunization rates were used for the construction of health index. The income index for districts was constructed by using agricultural crop value and manufacturing value added. However, in the construction of health index for different districts, provincial level age and sex specific death rates and immunization rates were used by implicitly assuming that such rates were same across all the districts of a province. This seems to be an unrealistic assumption. The study analyzed inter-temporal change in human development across the provinces and districts of Pakistan by calculating HDI for the years 1998 and 2005. The findings of the study reveal that HDI values of provinces and districts improved significantly but some provinces and districts improved more as compared to other provinces and districts. Punjab had high HDI value as compared to other provinces but growth in HDI from 1998 to 2005 of Khyber Pakhtunkhwa (KPK) was the highest. There was no significant reduction in human development disparities across the provinces as well as across the districts of Pakistan from 1998 to 2005.

Studies by UNDP (2003) and Jamal and Khan (2007) that examine human development disparities across the districts of Pakistan share a common flaw in the construction of district level HDI. Provincial level health indicators have been used by these studies to reflect district specific health outcomes. The use of provincial level health indicators for the construction of district level HDI seems to be based upon an implicit assumption that health indicators remain same across the districts. But this assumption seems to be unrealistic.

3. Construction of Indices

This study uses Education Index (EI), Health Index (HI), Income Index (INI), Human Development Index (HDI) and Non Income Human Development Index (NIHDI) to investigate the human development disparities among the districts of Punjab, Pakistan. A brief description of the data sources, the variables and methodology used for the construction of these indices is given in the following section.

3.1. Human Development Index

Human development index (HDI) constructed in this study covers three dimensions. These dimensions include average achievements by the districts in health, education and income. The average achievements are measured through three indices i.e. health index, education index and income index. HDI is a composite index which combines these three indices with equal weightage. UNDP has been reporting HDI for a large numbers of countries since 1990 at annual basis. After 1990, UNDP has revised the formulation of the index at several times. In 2010, UNDP made a few changes in the construction of education index. Mean years of schooling and expected years of schooling were used instead of adult literacy rate and combined enrollment rate.

The studies which calculated HDI across the districts of Pakistan were conducted by UNDP (2003) and Jamal and Khan (2007). UNDP (2003) calculated HDI for the year 1998. The report used adult literacy rate and primary enrollment rates for education index. The health index was constructed by using infant survival rate and immunization rate. The report proxied provincial infant survival rate for each district due to unavailability of district data. District GDP per capita was used as income index which was calculated by using agricultural crop value and manufacturing value added.

Jamal and Khan (2007) calculated HDI for the years 1998 and 2005 and analyzed the inter-temporal change in human development across the districts of Pakistan. They used adult literacy rates and combined (primary, secondary and tertiary) enrollment rates for education index whereas life expectancy at birth and immunization rates for the construction of health index. The study proxied provincial estimates of life expectancy at birth for each district within the province. Income index consisted of district GDP per capita which was calculated with the help of agricultural crop value and manufacturing value added.

Both UNDP (2003) and Jamal and Khan (2007) have the deficiency in measurement of district specific health outcomes by using the value of provincial health indicators for each district. This study has constructed HDI by using district specific health indicators instead of

provincial indicators as a proxy for district health achievements. We have used adult literacy rate and combined enrollment rate for construction of district education index. Child survival rate and immunization rates have been used for the construction of health index. Income index is constructed by calculating district GDP per capita. Districts share of agricultural crop value and manufacturing value added have been used for estimating district GDP per capita. These three indices are combined with equal weightage in order to calculate a composite HDI for thirty-five districts of Pakistani Punjab using 2011 data. Equation 3.1 and Figure 3.1 explain the methodology of constructing HDI.

$$HDI = (1/3 Health + 1/3 Education + 1/3 Income) \quad (3.1)$$

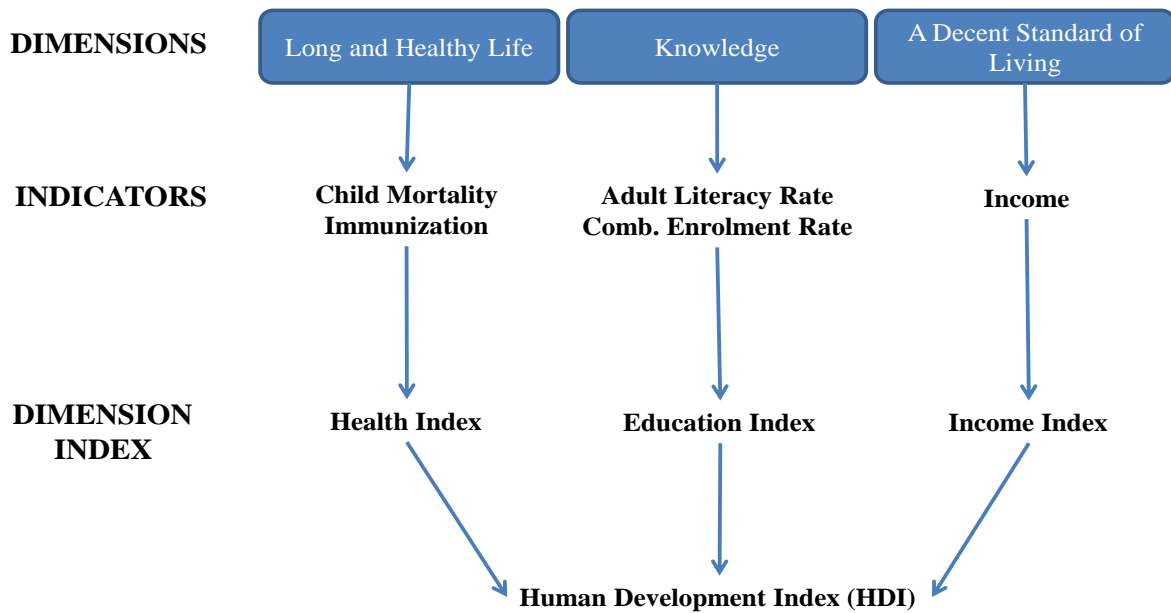


Figure 3.1: Construction of HDI

3.2. Education Index

Education index is constructed using combined (primary, secondary and tertiary) enrollment rate of age cohort 5 to 24 years and literacy rate of 10 years and above population. Both variables are normalized by using their actual, maximum and minimum values. 100 percent is considered as maximum and 0 percent as minimum for educational attainments. Composite education index combines these two normalized variables by assigning two-third weightage to literacy rate of ten years and above population and one-third weightage to combine enrollment. Equation 3.2, 3.3 and 3.4 explain the methodology of calculating education index.

$$\text{Literacy Index (LI)} = \frac{\text{actual} - \text{minimum}}{\text{maximum} - \text{minimum}} \quad (3.2)$$

$$\text{Combined Enrollment Index (EI)} = \frac{\text{actual} - \text{minimum}}{\text{maximum} - \text{minimum}} \quad (3.3)$$

$$\text{Education Index (EDI)} = 2/3 (\text{LI}) + 1/3 (\text{EI}) \quad (3.4)$$

3.3. Health Index

Anand and Sen (1994) suggest that child mortality (i.e. additive inverse of child survival rate) and life expectancy are more suitable proxies for health because both present more comprehensive picture of health. Due to unavailability of district specific data for life expectancy, we used under five survival rate and immunization rate in construction of health index. Both variables are normalized by using their actual, maximum and minimum values. 100 percent is considered as maximum and 0 percent as minimum for health outcomes. The child survival rate is a consistent and more comprehensive representative measure of health condition of a society as compared to immunization rates. It is an outcome of different health relates activities and facilities. That's why we gave a higher weight to child survival rate in the calculation of health index. Composite health index combines these two variables by assigning 70 percent weight to child survival rate and gives 30 percent weight to immunization rate. Equation 3.5, 3.6 and 3.7 explain the methodology of calculating health index.

$$\text{Child Survival Index (CSI)} = \frac{\text{actual} - \text{minimum}}{\text{maximum} - \text{minimum}} \quad (3.5)$$

$$\text{Immunization Index (IMI)} = \frac{\text{actual} - \text{minimum}}{\text{maximum} - \text{minimum}} \quad (3.6)$$

$$\text{Health Index (HI)} = 0.7 (\text{CSI}) + 0.3 (\text{IMI}) \quad (3.7)$$

3.4. Income Index

To calculate real GDP per capita in terms of purchasing power parity (PPP\$), we have used method proposed by UNDP (2003) at district level in Pakistan. We have calculated real GDP per capita for Punjab and its thirty-five districts. First we have estimated the real GDP (PPP\$) per capita of Punjab by using data from Pakistan Household Integrated Economic Survey (PHIES, 2011). The average monthly household's income of Pakistan and all provinces has been given in (PHIES, 2011). We calculated the ratio of the average household's income of Punjab to the average household's income of Pakistan. Then this ratio is multiplied to real GDP (PPP\$) per capita of Pakistan, which is collected from World Development Indicators (WDI, 2011), to attain real GDP (PPP\$) per capita of Punjab.

To attain real GDP (PPP\$) per capita for thirty-five districts of Punjab, we added agriculture-crop value and manufacturing value added of each district. Then this sum has been divided on the same at national level to obtain ratio of district income to the national income. This ratio is then multiplied to real GDP (PPP\$) of Pakistan in order to attain district real GDP (PPP\$). In last round, real GDP (PPP\$) per capita for each district is obtained by dividing each district real GDP to the size of their respective population. Formulas to calculate real GDP (PPP\$) per capita of Punjab and its thirty five-districts are given below;

Real GDP (PPP\$) Per Capita of Punjab from (PHIES, 2010-11).

$$\frac{\text{R.GDP(PPP\$)} \\ \text{P.C(Punjab)}}{\text{P.C(Punjab)}} = \frac{\text{Average Household's Monthly} \\ \text{Income (Punjab)}}{\text{Average Households} \\ \text{Monthly Income (Pakistan)}} \times \frac{\text{Real GDP} \\ \text{(PPP\$)P.C (Pak)}}{\text{P.C (Pak)}}$$

Real GDP Per Capita of each district of Punjab from agricultural crop value (ACV) plus manufacturing value added (MVA) method.

$$\frac{\text{Real GDP (PPP\$)} \\ \text{(District)}}{\text{(District)}} = \frac{\text{ACV + MVA (District)}}{\text{ACV + MVA (Pak)}} \times \frac{\text{R.GDP (PPP\$)} \\ \text{(Pak)}}{\text{(Pak)}}$$

$$\frac{\text{Real GDP (PPP\$)} \\ \text{Per Capita (District)}}{\text{Per Capita (District)}} = \frac{\text{Real GDP (PPP\$) (District)}}{\text{Population (District)}}$$

The limitation of the calculated district income is the assumption of equal percentage share of services in district GDP which is equal to the share of services in national GDP. This limitation is due to unavailability of district data for services sector. To calculate normalized values of income index we have set 100 \$ (PPP) as a minimum value for income index which is suggested by UNDP as subsistence level internationally and world real GDP per capita (PPP\$), which is 9814 \$ (PPP), is taken as maximum value for income index.

$$\text{Income Index (INI)} = (\text{actual} - 100 \text{ \$ (PPP)}) / (9814 \text{ \$ (PPP)} - \text{minimum}) \quad (3.8)$$

3.5. Non Income Human Development Index

In its human development report published in 2010 UNDP has introduced some new indices to measure human development. Non Income Human Development Index (NIHDI) is one of such measures. It is constructed by using the indicators related with health and education. Unlike HDI, it does not use Gross National Product (GNP) in its construction. HDI measures the improvements in three aspects which are a long and healthy life, access to knowledge and decent standard of living. But NIHDI takes into account only two aspects which include a long and healthy life and access to knowledge. Thus NIHDI focuses only on non-income dimensions of human development. The construction of NIHDI is given below:

$$\text{NIHDI} = (1/2 \text{ Health} + 1/2 \text{ Education}) \quad (3.9)$$

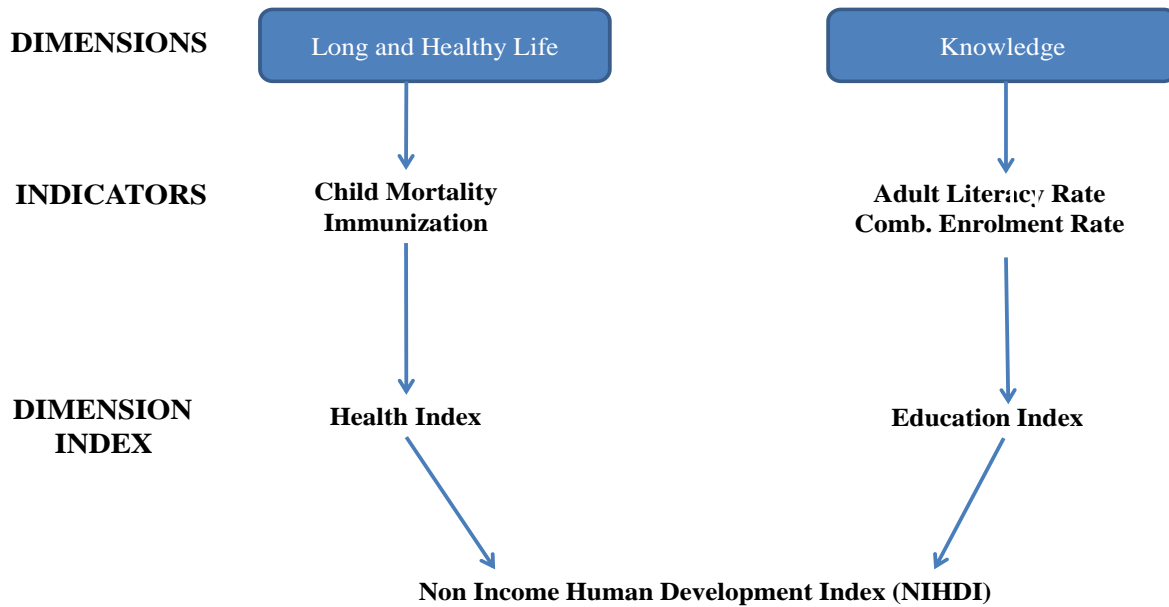


Figure 3.2: Construction of NIHDI

3.6. Data Source

We have used cross sectional data for thirty-five districts of Punjab for the year of 2010-11 for present study. The data for HDI, NIHDI and determinants of human development disparities have collected from different kind of sources. The data of adult literacy rate, immunization rate and combined enrollment rate for thirty-five districts has taken from Pakistan Social and Living Standard Measurements Survey (PSLM, 2011). PSLM (2011) survey is conducted by Pakistan Bureau of Statistics (PBS) at district level with 76546 households sample from entire country to achieve Millennium Development Goals. This survey covered 14,549 enumeration blocks and 25,875 villages from Punjab. Data of child survival rate for the districts of Punjab is collected from Multiple Indicator Cluster Survey (MICS, 2011), which is conducted by Punjab Bureau of Statistics with the collaboration of UNDP and United Nations International Children's Emergency Fund (UNICEF). The survey covered 6,368 clusters and 91,280 households in urban and rural areas throughout the province.

Agriculture crops production data at district level, Punjab level and national level is taken from Crops Area Production by Districts (2011) published by Ministry of Food Pakistan and from Agriculture Marketing Information Services (AMIS, 2011) conducted by Government of Punjab. The prices data of agriculture crops is collected from Pakistan Statistical Year Book (2011), Pakistan Economic Survey (2011) and AMIS. The data of manufacturing value-added at districts level is collected (with this assumption that districts shares remained constant for the year of 2011) from Census of Manufacturing Industries (CMI, 2006). The data of World real GDP and Pakistan real GDP in PPP\$ for 2010-11 is collected from World Development Indicators (WDI, 2011), districts population data is collected from (Punjab Development Statistics, 2012). Punjab Development Statistics (2012) is annually published by Punjab Bureau of Statistics.

4. Empirical Results and Discussion

This section presents the empirical results of calculated Human Development Index (HDI), Non Income Human Development Index (NIHDI), Education Index (EI), Health Index (HI), Income Index (INI) and determinants of HDI and NIHDI. Thirty five districts of Punjab are ranked on the basis of current values of HDI, NIHDI, EI, HI, and INI. These ranks indicate the disparities of human development.

Table 4.1
Ranking of the Districts based on HDI

| Districts | HDI | | Districts | HDI | |
|-------------|--------|------|-----------------|--------|------|
| | Value | Rank | | Value | Rank |
| Rawalpindi | 0.6731 | 1 | Nankana Sahib | 0.5505 | 19 |
| Lahore | 0.6667 | 2 | Mandi Bahuddin | 0.5470 | 20 |
| Sheikhupura | 0.6487 | 3 | Narowal | 0.5452 | 21 |
| Faisalabad | 0.6267 | 4 | Toba Take Singh | 0.5411 | 22 |
| Sialkot | 0.6198 | 5 | Okara | 0.5408 | 23 |
| Kasur | 0.6171 | 6 | Hafizabad | 0.5359 | 24 |
| Multan | 0.6071 | 7 | Rahim Yar Khan | 0.5302 | 25 |
| Jhelum | 0.5985 | 8 | Layyah | 0.5299 | 26 |
| Chakwal | 0.5983 | 9 | Vehari | 0.5064 | 27 |
| Khushab | 0.5776 | 10 | Muzaffar Garh | 0.5047 | 28 |
| Jhang | 0.5770 | 11 | Sargodha | 0.5006 | 29 |
| Attock | 0.5690 | 12 | Dera Gazi Khan | 0.4992 | 30 |
| Mianwali | 0.5665 | 13 | Pakpatten | 0.4787 | 31 |
| Bhakhar | 0.5643 | 14 | Bahawalnager | 0.4769 | 32 |
| Gujrat | 0.5642 | 15 | Lodhran | 0.4753 | 33 |
| Gujranwala | 0.5630 | 16 | Bahawalpur | 0.4521 | 34 |
| Khanewal | 0.5567 | 17 | Rajanpur | 0.4515 | 35 |
| Sahiwal | 0.5559 | 18 | PUNJAB | 0.5567 | |

Source: Author's Calculation

The results of HDI have been reported in Table 4.1 and Fig 4.1. The results indicate that overall Punjab is not at better position in human development. The HDI value of Punjab is 0.5567 which is not comparable with HDI developed nations. UNDP (2011) has categorized those nations in medium human development category which have the values of HDI in the range of 0.5220 to 0.6980. Keeping in view UNDP criteria, twenty-six districts and overall Punjab fall in medium human development category. Whereas nine districts of Punjab fall in low human development category. Results of the districts presented in Table 4.1 and Fig 4.1 reveal that some districts have high HDI values but some districts are lagging behind with low HDI values.

To discuss the results in detail, we have divided thirty-five districts in three categories A, B and C. The districts having HDI values in the range of 0.61 and above are fall in category A. The districts having HDI values in the range of 0.51 to 0.60 are listed in category B. The districts which have HDI value 0.50 and below are fall in category C.

The Rawalpindi has first rank in terms of human development and the value of HDI is 0.6731 whereas Rajanpur stands on last position with HDI value 0.4515. Table 4.1 and Fig 4.1 show that category A is performing well as compare to other districts. The results indicate high human development disparities are existed across the districts. HDI value of Rawalpindi is 0.6731, Lahore 0.6667, Multan 0.6071, Vehari 0.5064 and Bahawalpur is 0.4521. The performance of category B districts in terms of human development is low as compare to category A and the performance of B category is high as compare to category C. Overall results indicate that category C has lower performance regarding human development. Moreover the results of the Table 4.1 clarify that southern districts like Rajanpur, Lodhran, Muzaffar Garh, D.G Khan, Vehari, Bahawalpur, Bahawalnager, Layyah and Rahim Yar Khan are lagging behind in human development.

To examine the difference in income and non-income human development among the districts of Punjab we have calculated NIHDI and compared it with INI. The results of INI and NIHDI for the districts have been given in Table 4.2 and Fig 4.2.

Table 4.2
Ranking and Comparison of Districts based on NIHDI with INI

| NIHDI | | Districts | INI | |
|--------|------|----------------|--------|------|
| Value | RANK | | Value | Rank |
| 0.7046 | | PUNJAB | 0.2608 | |
| 0.7003 | 18 | Sheikhupura | 0.5455 | 1 |
| 0.6936 | 21 | Kasur | 0.4640 | 2 |
| 0.7715 | 5 | Lahore | 0.4571 | 3 |
| 0.7133 | 15 | Faisalabad | 0.4536 | 4 |
| 0.7885 | 2 | Rawalpindi | 0.4422 | 5 |
| 0.6980 | 19 | Multan | 0.4252 | 6 |
| 0.6652 | 26 | Bhakhar | 0.3626 | 7 |
| 0.7516 | 7 | Sialkot | 0.3562 | 8 |
| 0.6437 | 29 | Okara | 0.3352 | 9 |
| 0.6282 | 31 | Rahim Yar Khan | 0.3342 | 10 |
| 0.7073 | 16 | Khushab | 0.3183 | 11 |
| 0.7393 | 10 | Jhelum | 0.3169 | 12 |
| 0.6823 | 24 | Sahiwal | 0.3033 | 13 |
| 0.6850 | 23 | Khanewal | 0.3002 | 14 |
| 0.7141 | 14 | Mianwali | 0.2713 | 15 |
| 0.6132 | 32 | Dera Gazi Khan | 0.2712 | 16 |
| 0.6286 | 30 | Muzaffar Garh | 0.2569 | 17 |
| 0.7395 | 9 | Jhang | 0.2519 | 18 |
| 0.7298 | 13 | Attock | 0.2475 | 19 |
| 0.6937 | 20 | Hafizabad | 0.2202 | 20 |
| 0.6085 | 33 | Pakpatten | 0.2191 | 21 |
| 0.7979 | 1 | Chakwal | 0.1991 | 22 |
| 0.7341 | 12 | Nankana Sahib | 0.1837 | 23 |
| 0.7034 | 17 | Layyah | 0.1829 | 24 |

| | | | | |
|--------|----|-----------------|--------|----|
| 0.6818 | 25 | Vehari | 0.1558 | 25 |
| 0.6019 | 35 | Bahawalpur | 0.1524 | 26 |
| 0.7371 | 11 | Toba Take Singh | 0.1475 | 27 |
| 0.6036 | 34 | Rajanpur | 0.1472 | 28 |
| 0.7731 | 4 | Gujranwala | 0.1432 | 29 |
| 0.7752 | 3 | Gujrat | 0.1422 | 30 |
| 0.7512 | 8 | Mandi Bahuddin | 0.1386 | 31 |
| 0.6487 | 27 | Bahawalnager | 0.1333 | 32 |
| 0.6486 | 28 | Lodhran | 0.1288 | 33 |
| 0.6875 | 22 | Sargodha | 0.1268 | 34 |
| 0.7562 | 6 | Narowal | 0.1237 | 35 |

Source: Author's Calculation

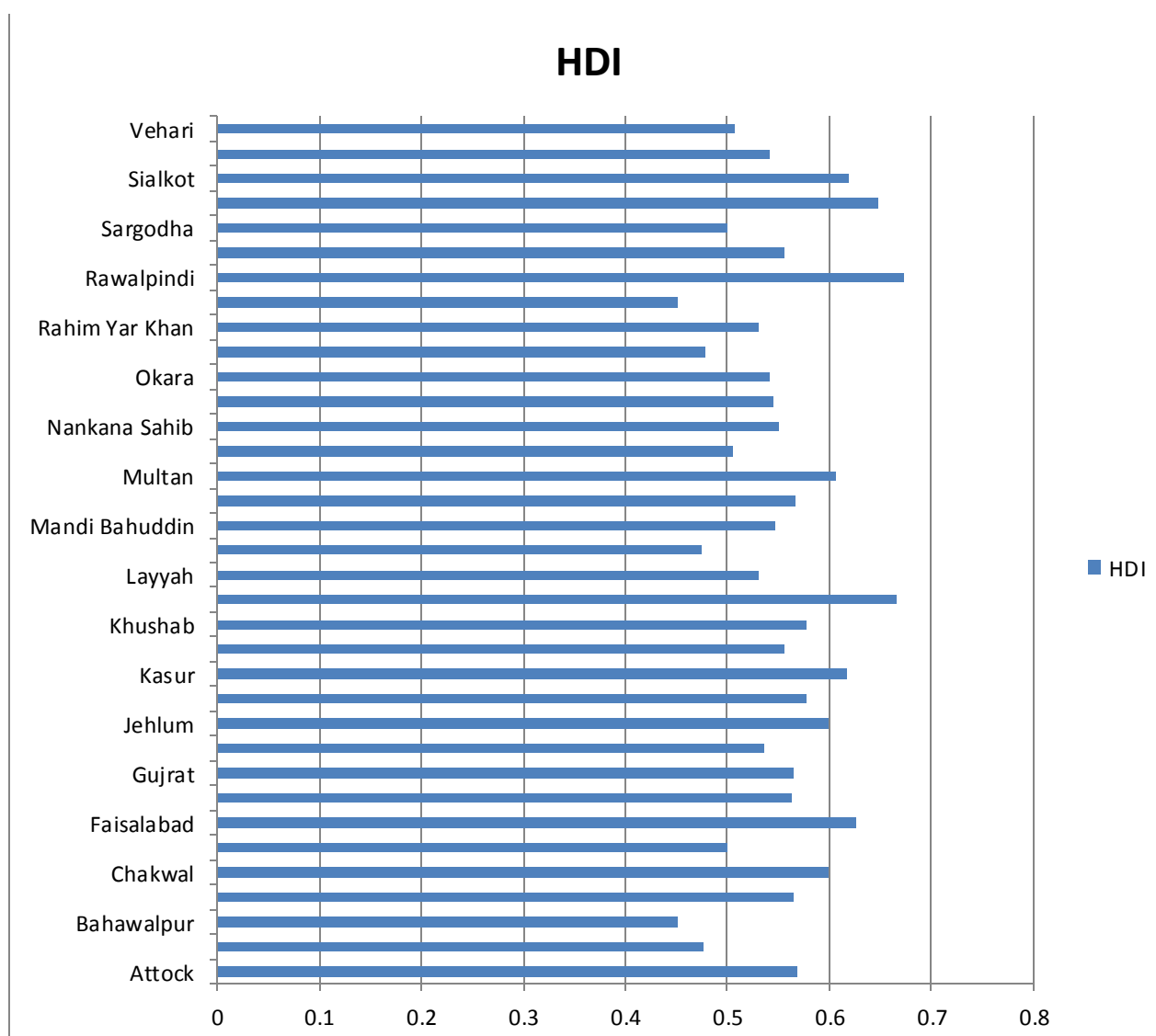


Fig: 4.1

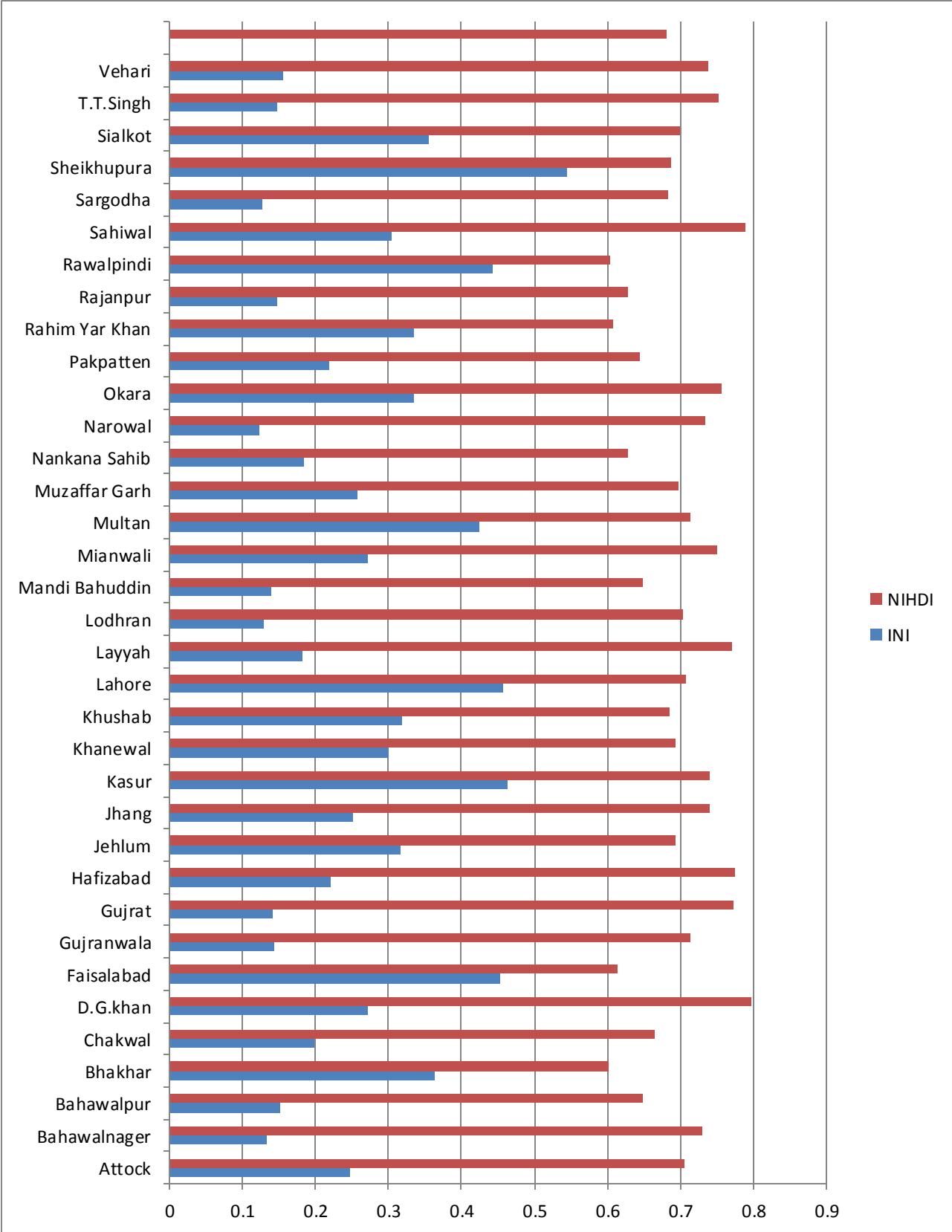


Fig: 4.2

The results of Table 4.2 and Fig 4.2 reveal that Rahim Yar Khan, D.G Khan, Muzaffar Garh, Layyah, Vehari, Bahawalpur and Rajanpur are performing well in income as compare to Narowal, Gujranwala, Gujrat and Mandi Bahuddin but these districts have low ranking in NIHDI. The high values of INI and lower NIHDI values of southern districts show that southern districts are neglecting in public provision of social services related to education and health (education infrastructure, health infrastructure, sanitation facilities and clean drinking water etc.). The results of Table 4.2 also highlight that the districts which have more distance from capital cities (Islamabad and Lahore) have low NIHDI. On the other hand, the public provision of social services increase the value of NIHDI and that is in favor of those districts which have less distance to capital cities.

Table 4.3
Ranking of the Districts based on EI

| Districts | EI | | Districts | EI | |
|-----------------|--------|------|----------------|--------|------|
| | Value | RANK | | Value | RANK |
| PUNJAB | 0.5241 | | Khushab | 0.5206 | 18 |
| Chakwal | 0.6507 | 1 | Sargodha | 0.5108 | 19 |
| Gujranwala | 0.6505 | 2 | Hafizabad | 0.5103 | 20 |
| Rawalpindi | 0.6401 | 3 | Layyah | 0.5013 | 21 |
| Lahore | 0.6315 | 4 | Multan | 0.4931 | 22 |
| Gujrat | 0.6101 | 5 | Khanewal | 0.4819 | 23 |
| Sialkot | 0.6023 | 6 | Vehari | 0.4811 | 24 |
| Toba Take Singh | 0.6017 | 7 | Sahiwal | 0.4809 | 25 |
| Jhang | 0.5914 | 8 | Bhakhar | 0.4603 | 26 |
| Narowal | 0.5732 | 9 | Bahawalnager | 0.4412 | 27 |
| Mandi Bahuddin | 0.5717 | 10 | Okara | 0.4311 | 28 |
| Jhelum | 0.5711 | 11 | Rahim Yar Khan | 0.4143 | 29 |
| Nankana Sahib | 0.5605 | 12 | Pakpatten | 0.4012 | 30 |
| Attock | 0.5602 | 13 | Lodhran | 0.4011 | 31 |
| Mianwali | 0.5421 | 14 | Muzaffar Garh | 0.3921 | 32 |
| Sheikhupura | 0.5405 | 15 | Dera Gazi Khan | 0.3913 | 33 |
| Faisalabad | 0.5317 | 16 | Bahawalpur | 0.3909 | 34 |
| Kasur | 0.5304 | 17 | Rajanpur | 0.3011 | 35 |

Source: Author's Calculation

The results of Education Index are presented in Table 4.3 and Fig 4.3. The EI value of Chakwal is 0.6507, Lahore 0.6315, Rawalpindi 0.6401, Lodhran 0.4011, Muzaffar Garh 0.3921, Dera Gazi Khan 0.3913 and Rajanpur 0.3011. The results reveal that there is huge difference between Chakwal and Rajanpur in status of education. Chakwal, Gujranwala, Rawalpindi, Lahore, Gujrat and Sialkot have high education status on the other hand Bahawalnagar, Okara, Rahim Yar Khan, Pakpatten, Lodhran, Muzaffar Garh, Dera Gazi Khan, Bahawalpur and Rajanpur have low education status. The value of EI shows that the southern districts have lower ranking positions than others. The overall results of Table 4.3 and Fig 4.3 indicate that there are education inequalities across the districts.

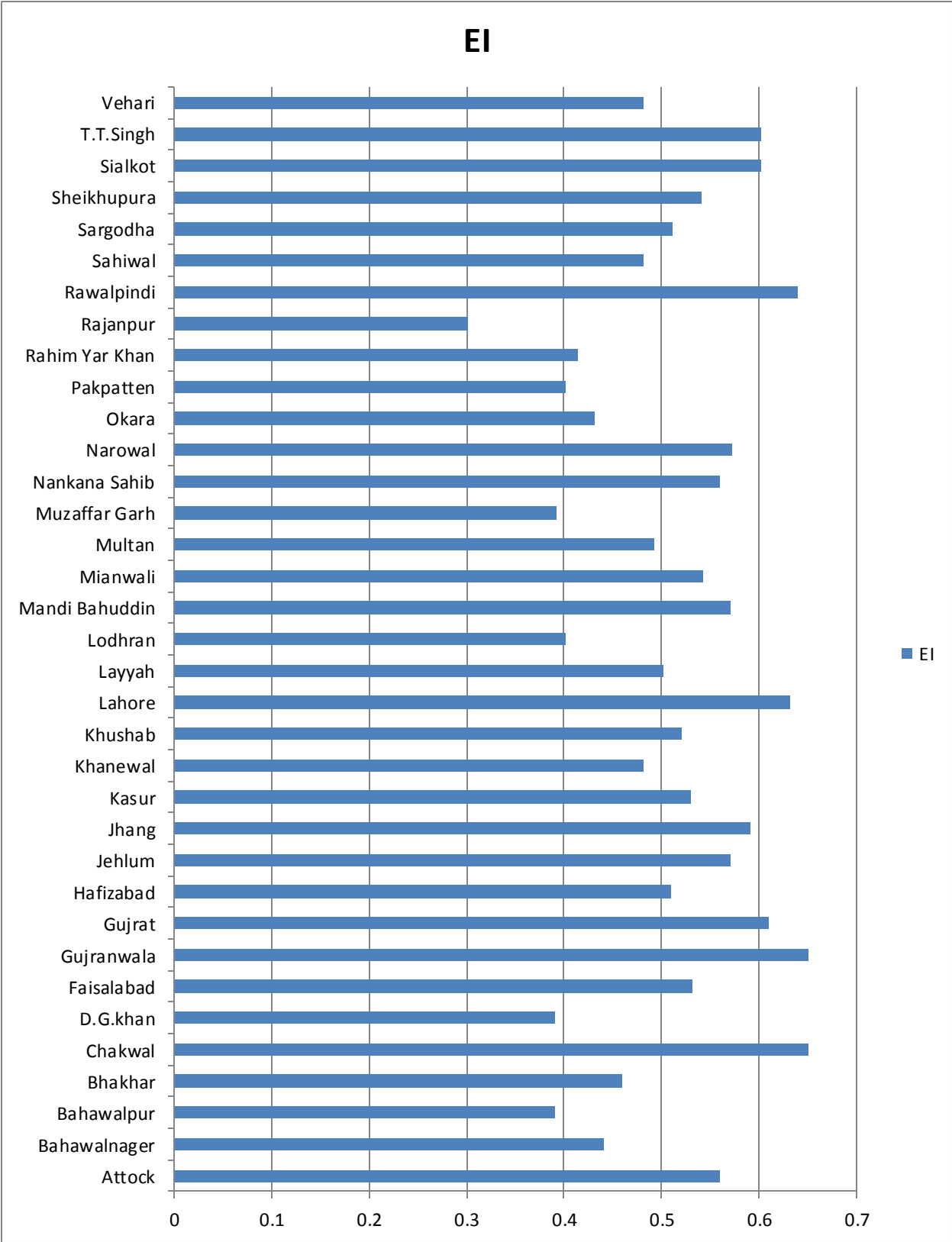


Fig: 4.3

The results of Table 4.4 and Fig 4.4 indicate that there is inequality in health outcomes across the districts. Chakwal is on first position and its HI value is 0.9452 whereas Bahawalpur stands on last rank and HI is 0.8131. The performance of Chakwal, Gujrat, Narowal, Rawalpindi and Lahore is high in term of HI value whereas Muzaffar Garh, Sheikhpura, Kasur, Okara, Bahawalnager, Rahim Yar Khan, Dera Gazi Khan, Pakpatten and Bahawalpur have low health performance.

Table 4.4
Ranking of the Districts based on HI

| Districts | HI | | Districts | HI | |
|----------------|--------|------|-----------------|--------|------|
| | Value | RANK | | Value | RANK |
| PUNJAB | 0.8852 | | Khanewal | 0.8882 | 18 |
| Chakwal | 0.9452 | 1 | Jhang | 0.8877 | 19 |
| Gujrat | 0.9404 | 2 | Mianwali | 0.8861 | 20 |
| Narowal | 0.9388 | 3 | Sahiwal | 0.8837 | 21 |
| Rawalpindi | 0.937 | 4 | Vehari | 0.8825 | 22 |
| Mandi Bahuddin | 0.9307 | 5 | Hafizabad | 0.8772 | 23 |
| Lahore | 0.9116 | 6 | Toba Take Singh | 0.8741 | 24 |
| Jhelum | 0.9076 | 7 | Bhakhar | 0.8701 | 25 |
| Nankana Sahib | 0.9075 | 8 | Muzaffar Garh | 0.8652 | 26 |
| Rajanpur | 0.9062 | 9 | Sargodha | 0.8643 | 27 |
| Layyah | 0.9056 | 10 | Sheikhpura | 0.8601 | 28 |
| Multan | 0.903 | 11 | Kasur | 0.8569 | 29 |
| Sialkot | 0.901 | 12 | Okara | 0.8563 | 30 |
| Attock | 0.8994 | 13 | Bahawalnager | 0.8562 | 31 |
| Lodhran | 0.8961 | 14 | Rahim Yar Khan | 0.8421 | 32 |
| Gujranwala | 0.8955 | 15 | Dera Gazi Khan | 0.8352 | 33 |
| Faisalabad | 0.8949 | 16 | Pakpatten | 0.8159 | 34 |
| Khushab | 0.894 | 17 | Bahawalpur | 0.8131 | 35 |

Source: Author's Calculation

Table 4.5
Ranking of the Districts based on INI

| Districts | INI | | Districts | INI | |
|------------|--------|------|-----------------|--------|------|
| | Value | RANK | | Value | RANK |
| PUNJAB | 0.2608 | | Jhang | 0.2519 | 18 |
| Sheikhpura | 0.5455 | 1 | Attock | 0.2475 | 19 |
| Kasur | 0.4641 | 2 | Hafizabad | 0.2202 | 20 |
| Lahore | 0.4571 | 3 | Pakpatten | 0.2191 | 21 |
| Faisalabad | 0.4536 | 4 | Chakwal | 0.1991 | 22 |
| Rawalpindi | 0.4422 | 5 | Nankana Sahib | 0.1837 | 23 |
| Multan | 0.4252 | 6 | Layyah | 0.1829 | 24 |
| Bhakhar | 0.3626 | 7 | Vehari | 0.1558 | 25 |
| Sialkot | 0.3562 | 8 | Bahawalpur | 0.1524 | 26 |
| Okara | 0.3352 | 9 | Toba Take Singh | 0.1475 | 27 |

| | | | | | |
|----------------|--------|----|----------------|--------|----|
| Rahim Yar Khan | 0.3342 | 10 | Rajanpur | 0.1472 | 28 |
| Khushab | 0.3183 | 11 | Gujranwala | 0.1432 | 29 |
| Jhelum | 0.3169 | 12 | Gujrat | 0.1422 | 30 |
| Sahiwal | 0.3033 | 13 | Mandi Bahuddin | 0.1386 | 31 |
| Khanewal | 0.3002 | 14 | Bahawalnager | 0.1333 | 32 |
| Mianwali | 0.2713 | 15 | Lodhran | 0.1288 | 33 |
| Dera Gazi Khan | 0.2712 | 16 | Sargodha | 0.1268 | 34 |
| Muzaffar Garh | 0.2569 | 17 | Narowal | 0.1237 | 35 |

Source: Author's Calculation

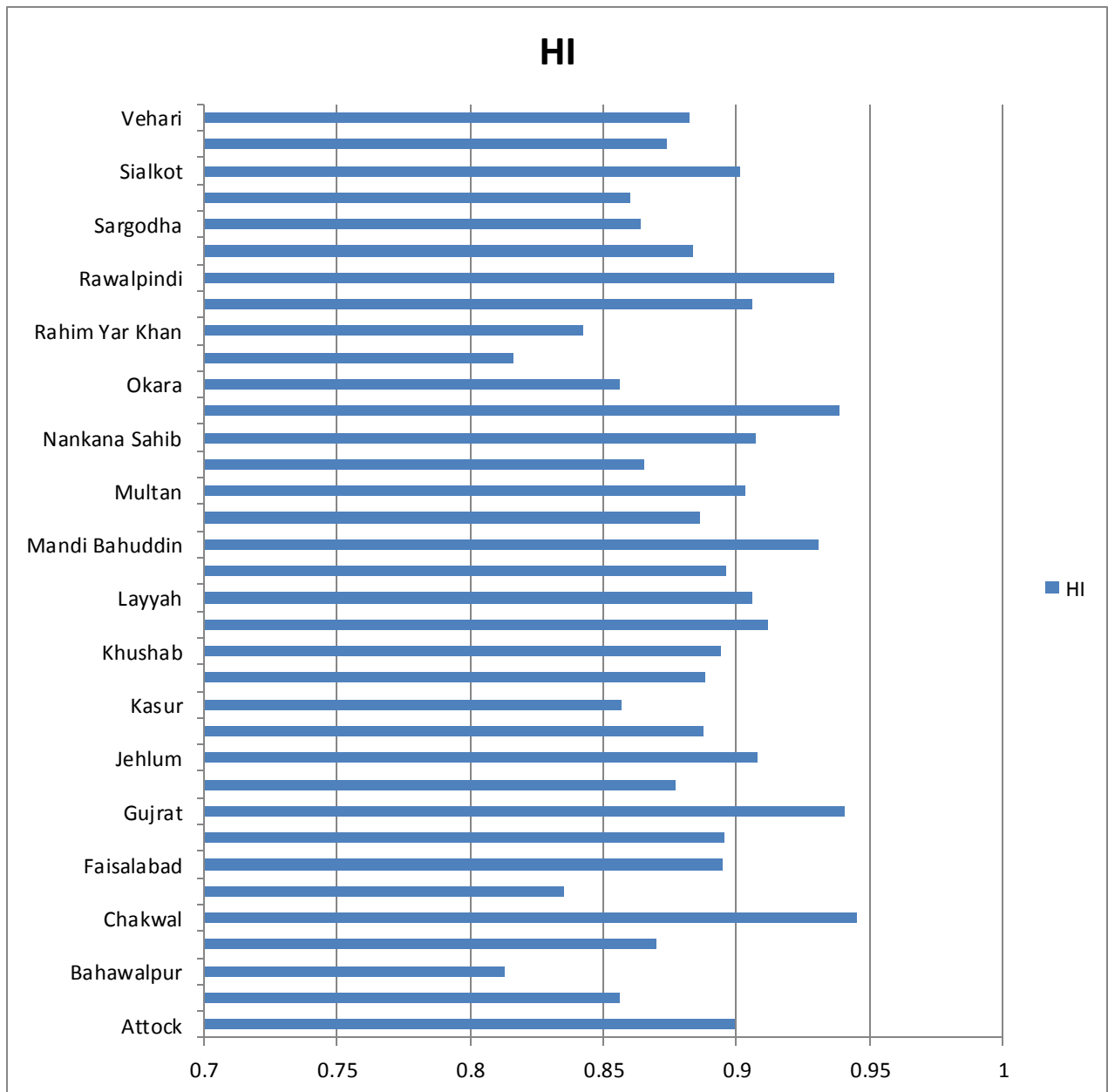


Fig: 4.4

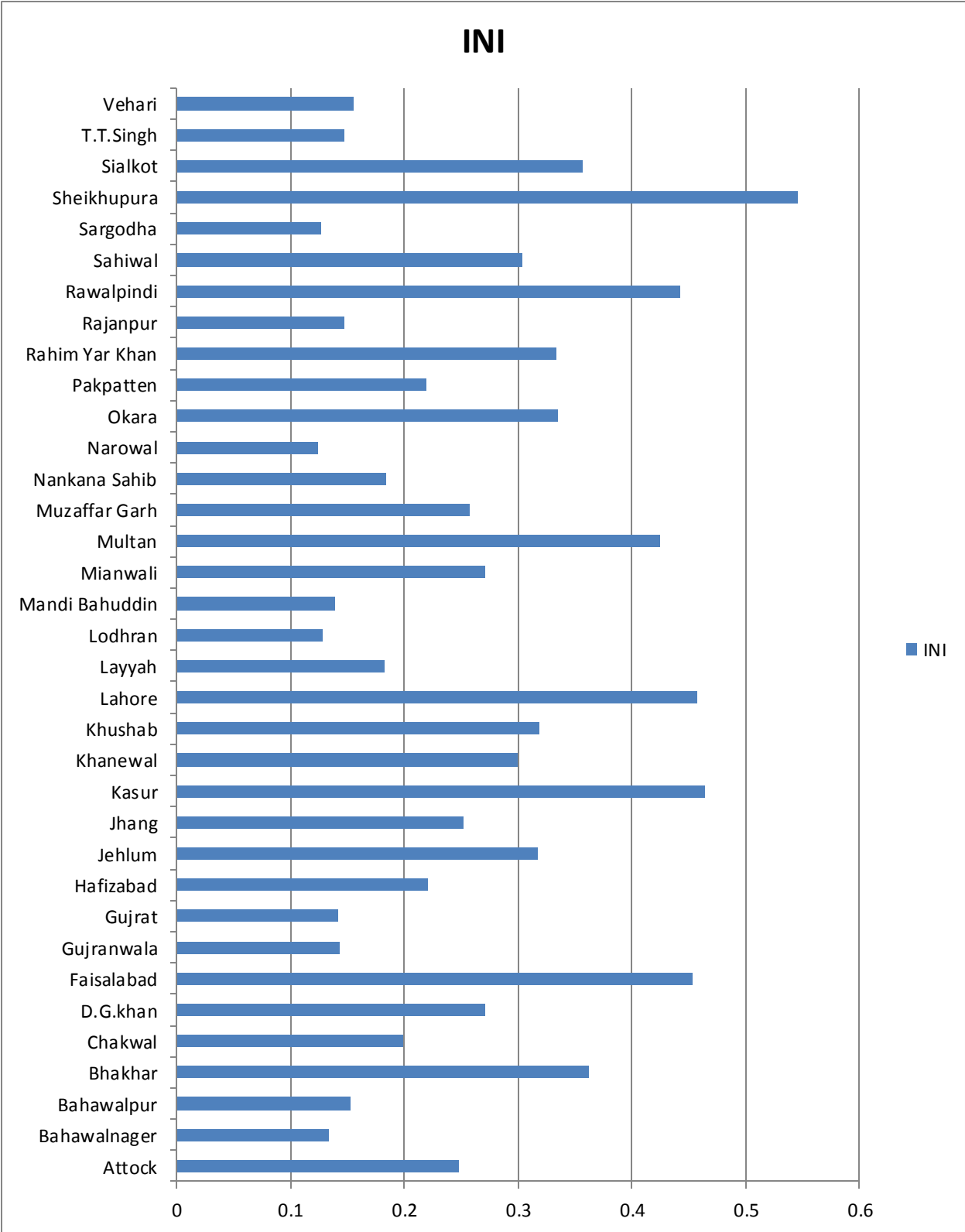


Fig: 4.5

The results of Table 4.5 and Fig 4.5 indicate that there are high income inequalities across the districts. There is high difference between the INI value of first rank position district and last rank position district. The INI value of Sheikhupura is 0.5455 on the other hand the value of Narowal is 0.1237. There some southern districts like Rahim Yar Khan, Muzaffar Garh and Dera Gazi Khan have high INI values as compare to some other districts like Gujranwala, Gujrat and Narowal but due to having low values of EI and HI these districts have low overall HDI ranking. The INI values of the districts are Sheikhupura is 0.5455, Kasur 0.4641, Bhakkar 0.3626, Muzaffar Garh 0.2569, Chakwal 0.1991, Gujranwala 0.1432 and Narowal is 0.1237.

5. Conclusion and Policy Suggestion

This study calculated HDI, NIHDI, EI, HI and INI and examined the current status of human development and human development disparities across the districts of Punjab. Thirty-five districts were considered for this purpose and cross section data was used.

The results of HDI indicated that there were high human development disparities in terms of HDI. The results of HDI revealed that the performance of Punjab in terms of HDI was not comparable with high HDI ranked nations. According to UNDP categorization twenty six districts had medium and nine districts had low human development status and also there were massive human development disparities among the districts. The analysis revealed that some districts achieved high level of human development with high literacy rate, high combined enrollment rate, high immunization rate, high child survival rate and high level of real GDP per capita such as Rawalpindi and Lahore. On the other hand some other districts were lagging behind in human development with low literacy rate, low combined enrollment rate, low immunization rate, low child survival rate and low level of real GDP per capita such as Layyah, Vehari, Muzaffar Garh, Sargodha, D.G Khan, Pakpattan, Bahawalnager, Lodhran, Bahawalpur and Rajanpur, most of that districts belonged to the south region of Punjab.

The results of NIHDI concluded that non-income human development disparities were also existed among the districts of Punjab. The comparison of NIHDI and INI revealed that the public provision of social services had not been remained in favored of south region districts. The four districts (Narowal, Gujranwala, Gujrat and Mandi Bahuddin) had low ranked positions in terms of INI but they had high ranked positions in terms of NIHDI. Similarly some south region districts like Layyah, Vehari, Muzaffar Garh, D.G Khan, Bahawalpur and Rajanpur had high ranked positions in terms of INI but they shifted in low ranked positions in terms of NIHDI. The upward shifting of Narowal, Gujranwala, Gujrat and Mandi Bahuddin in HDI ranking was due to high ranked positions NIHDI and downward shifting of (Layyah, Vehari, Muzaffar Garh, D.G Khan, Bahawalpur and Rajanpur) in HDI ranking was due to low ranked positions in NIHDI. Education disparities had observed across the districts from the values of EI and there were health inequalities among the districts in terms of HI. There were also high income inequalities among the districts in terms of INI.

The results of HDI, NIHDI, EI, HI and INI revealed that there was high variation in human development across the districts. The differences in these indices indicate that may there is need to take some suitable steps at district level in Punjab. The improvement can be in terms of education facilities, health facilities and tap water or sanitation facilities to improve the human

development status of the districts especially in the districts of south region in Punjab. Out of nine districts which were categorized in low human development category, 7 districts belonged to the south region of Punjab. The government of Punjab can enhance the empowerment of the people among the districts with the improvement in income, education, health and other social services. There are different criteria for the allocation of development budget among the regions. Underdevelopment may also be considered as a criterion for the allocation of development budget among the different regions. The government of Punjab may increase the development budget of those districts which have a low level of human development like Layyah, Vehari, Muzaffargarh, Sargodha, D.G Khan, Pakpattan, Bahawalnager, Lodhran, Bahawalpur and Rajanpur.

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APPENDIX

Table A-1: Data

| Districts | Immunization Rate | Child Survival Rate | Literacy Rate | Combined Enrollment Rate | Real GDP (PPP\$) Per Capita |
|------------------|--------------------------|----------------------------|----------------------|---------------------------------|------------------------------------|
| PUNJAB | 86 | 89.6 | 60 | 38 | 2634.1808 |
| Attock | 87 | 91.2 | 64 | 41 | 2504.4565 |
| Bahawalnager | 81 | 87.6 | 49 | 36 | 1395.4506 |
| Bahawalpur | 68 | 87.0 | 47 | 24 | 1580.7853 |
| Bhakhar | 84 | 88.3 | 49 | 42 | 3623.2667 |
| Chakwal | 99 | 92.6 | 78 | 42 | 2034.3803 |
| Dera Gazi Khan | 74 | 87.6 | 43 | 34 | 2734.9187 |
| Faisalabad | 89 | 89.7 | 66 | 30 | 4506.9670 |
| Gujranwala | 85 | 91.5 | 74 | 56 | 1492.0792 |
| Gujrat | 96 | 93.2 | 71 | 50 | 1482.0789 |
| Hafizabad | 95 | 84.6 | 58 | 35 | 2239.8282 |
| Jhelum | 86 | 92.8 | 75 | 23 | 3178.9586 |
| Jhang | 88 | 89.1 | 52 | 78 | 2547.9992 |
| Kasur | 81 | 87.7 | 58 | 41 | 4608.0488 |
| Khanewal | 87 | 89.6 | 53 | 40 | 3016.3937 |
| Khushab | 88 | 90.0 | 60 | 38 | 3192.5411 |
| Lahore | 85 | 93.8 | 77 | 40 | 4541.4353 |
| Layyah | 90 | 90.8 | 55 | 42 | 1876.9645 |
| Lodhran | 88 | 90.3 | 47 | 27 | 1351.7571 |
| Mandi Bahuddin | 93 | 93.1 | 65 | 40 | 1446.8828 |
| Mianwali | 80 | 92.3 | 61 | 42 | 2736.4777 |

| | | | | | |
|----------------|----|------|----|----|-----------|
| Multan | 91 | 90.0 | 58 | 35 | 4231.5118 |
| Muzaffar Garh | 84 | 87.6 | 43 | 31 | 2595.8221 |
| Nankana Sahib | 96 | 88.5 | 60 | 56 | 1885.4200 |
| Narowal | 95 | 93.4 | 58 | 60 | 1302.5808 |
| Okara | 85 | 85.9 | 50 | 33 | 3356.5617 |
| Pakpatten | 79 | 82.7 | 45 | 31 | 2228.5104 |
| Rahim Yar Khan | 77 | 87.3 | 46 | 33 | 3347.5697 |
| Rajanpur | 93 | 89.6 | 34 | 21 | 1530.3877 |
| Rawalpindi | 93 | 94.0 | 79 | 38 | 4396.4713 |
| Sahiwal | 89 | 88.1 | 56 | 35 | 3046.8556 |
| Sargodha | 83 | 87.9 | 59 | 38 | 1332.5607 |
| Sheikhupura | 76 | 90.3 | 63 | 41 | 5399.6462 |
| Sialkot | 88 | 91.0 | 66 | 52 | 3561.1758 |
| Toba Tek Singh | 83 | 89.3 | 69 | 43 | 1533.0491 |
| Vehari | 90 | 87.5 | 55 | 39 | 1613.8639 |