

Theme 5: Inclusive Cities: People and Place

**Growth without Inclusion:
Evidence from Khyber Pakhtunkhwa, Pakistan**

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Abstract

Cities are considered to be engine of growth. This view, however, limits the economic profiling of cities to variables such as GDP, wealth, and revenues that these cities possess or generate. Consequently, the outcome of growth in terms of distribution of economic benefits are usually ignored. Put differently, the inclusivity of growth in terms of socioeconomic characteristics are generally overlooked when ranking the cities for their economic performance. This paper explores the discrepancy between economic performance and inclusivity of the districts in the Khyber Pakhtunkhwa province of Pakistan. The Inclusion Coefficients are derived for each district using the method developed by Suryanarayana & Das (2014). However, this study utilizes HDI and its dimensional indices are utilized for analysis of inclusiveness of human development in Pakistan (Tauheed and Nasir, 2018). The district level GDPs are obtained from Hasan et al. (2021) who extracted these values using nightlight data. The comparison between ranking on these criteria shows sharp discrepancies between economic activity and economic inclusion in the province. For instance, Peshawar and Haripur districts rank one and four respectively in terms of economic activity. However, the Haripur is more inclusive (rank 1) than Peshawar (rank 4) using the inclusivity criteria. Similarly, Lakki Marwat ranks 14 in the province in term of GDP but has a much better ranking (# 6) using inclusion coefficient. These findings suggest that economic activity may not be a proper measure of inclusivity and may therefore not be used as a single criterion when assessing welfare of the cities.

1. INTRODUCTION

Cities are considered to be engine of growth. This view, however, limits the economic profiling of cities to variables such as GDP, wealth, and revenues that these cities possess or generate. Consequently, the outcome of growth in terms of distribution of economic benefits are usually ignored. Put differently, the inclusivity of growth in terms of socioeconomic characteristics are generally overlooked when ranking the cities for their economic performance. This paper explores the discrepancy between economic performance and inclusivity of the districts in the Khyber Pakhtunkhwa province of Pakistan.

Rising concerns about human security and sustainability in both developed and developing worlds gave rise to the slogan of 'Leaving no one behind'. Inclusive development is the only pathway that leads to the ideal society where everyone gets an opportunity to reap the fruits of development (Acemoglu & Robinson, 2012; McCartney & Naudé, 2012). It raises people's well-being by promoting the equality of opportunity for all members of the society, particularly the poor, the vulnerable, and the disadvantaged groups that are generally excluded from the process of development (Kozuka, 2014). Inclusive development is increasingly becoming a global demand and development agenda. Being a key requisite of human security and sustainability (Murotani, 2014), it is a prime concern of Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs) agenda. Widening disparities and non-decreasing multidimensional extreme poverty trends all around the world shifted the development paradigm from income growth to inclusive development (Ranieri & Ramos, 2013)^{8F}¹. The UNDP (2016) maintains that several sections of society are excluded from development due to gender, ethnicity, age, disability, or poverty. The poorest fifty percent of world's population own only one percent of all assets, whereas the richest ten percent own 85 percent. Almost one quarter of the world population (24%) is living in extreme poverty below \$1.25 a day (Kato, 2014). The World Bank Group (2016) projected that 700 million people in 2015 were living below poverty line of \$1.90 a day. A high proportion of those poor reside in Sub-Saharan Africa and South Asia.

The rising disparities and social and economic exclusion are a serious threat for peace and cohesion of the whole nation. Because of these exclusions Pakistan is facing massive losses in the form of human development, human lives, social harmony, peace, and massive security expenditures, to mention but a few. When HDI value is discounted for inequality, it falls to 0.377, a loss of 29.9 percent due to inequality in the distribution of the HDI dimensions indices. Average annual growth of HDI has declined from 1.62 in 2000-2010 to 0.79 in 2010-2014

¹ Sachs in a paper (Inclusive Development Strategy in an era of Globalization, 2004) elaborates this issue in detail.

(UNDP, 2015). In South Asian region Pakistan ranks below its counterparts Sri Lanka, India, and Bangladesh and its HDI is lower than regional HDI average of 0.621.

To properly address the problems of Pakistan caused by widening disparities and non-inclusive process of development serious efforts are required; otherwise, it will keep languishing in low-human development situation. Careful examination of the process of inclusive development is necessary to understand the state of the world today, and it is imperative to design a new development framework for the future. The foremost step in this regard is to formally and methodically assess the existing status of human development and level of its inclusion. The next step is to inspect the factors influencing inclusive development so that appropriate policies and action plans could be designed. A substantial research work for Pakistan covers the income dimension of development and inequality at national and sub-national levels. A few attempts have been launched to measure income and non-income dimensions of human development comprehensively specially at sub-national level^{16F}. Furthermore, a very few studies are carried out to capture the development inclusiveness in Pakistan using income and non-income dimensions separately^{17F}. All these studies are based on average measurement of human development which hides the intra-regional disparities. A comprehensive measurement of human development inclusiveness, at subnational levels and analysis of its determinants remains limited for Pakistan. Keeping in view the importance and practical application of the subject, and the existence of research gap, this study undertakes the task of a household-based analysis of human development to assess prevailing level of development, its inequalities, and its inclusiveness at the district level in the province of Khyber Pakhtunkhwa. These are, moreover, compared with the district level GDPs in the province to explore whether the economic growth is inclusive in the province.

2. INCLUSIVE DEVELOPMENT: A LITERATURE REVIEW

Inclusive development is a broad concept, there is no agreed and common definition of inclusive growth or inclusive development. Generally, it is referred to as growth or development coupled with equal distribution of opportunities and benefits, and consisting of economic, social, and institutional dimensions (Rauniyar & Kanbur, 2010).

Describing the concept of inclusive development, generally two aspects are focused. First, the distinction between growth and development and second, the description of the term 'inclusiveness'. Rauniyar & Kanbur (2010) describe that in general, growth is a unidimensional concept of wellbeing i.e. income, while development refers to multi-dimensional well-being, which includes not only increases in income but also enhancements in other areas such as health and education. Inclusiveness is referred to equitable distribution of wellbeing. Thus, inclusive growth is related to the level and distribution of achievement in income; whereas, inclusive

development is associated with the distribution of achievements in multidimensions including, specifically, income, education and health. Kozuka (2014), Klasen (2010), and McKinley (2010) concur with this distinction between inclusive growth and inclusive development.

A substantial literature about inclusive development bring about the distinction among inequalities created by unequal opportunities (circumstances) and by unequal outcomes followed by modern egalitarian philosophers, like Ronald Dworkin and John E. Roemer which pursue for equal opportunity rather than equal outcome. Ali and Zhuang (2007), Zhuang and Ali (2009), African Development Bank (2012) , Flipe (2012), and Kozuka (2014) employ Roemer's distinction between inequalities arising from effort and those arising from circumstances, and maintain that Inclusive development strategy should address opportunity-related inequalities. However, UNDP report (2013) emphasized both equal access to opportunities and equality of outcomes as underlying concepts of inclusive development, "Equal outcomes cannot be achieved without equal opportunities, but equal opportunities cannot be achieved when households have unequal starting points". Teichman (2016) & World Bank ((2006) & (2009)) also describes inclusive Development on same lines.

Another issue describing inclusive development is its comparison with pro-poor development and two of its approaches absolute and relative. Klasen (2010) describes that the difference of targets is the main distinction between pro-poor growth and Inclusive Growth. Focus of pro-poor development is poor, whereas, Inclusive development focuses not only on the poor but on a broader segment of people including groups excluded from the process of development, such as the disabled, minorities and marginalized, to name but a few. World Bank (2009) and African Development Bank (2012) are concerned with the majority of the labor force, the poor and middle-class alike, and Klasen (2010) admits that Inclusive Growth could benefit all levels of society, including even the rich. World Bank (2009) relates Inclusive Growth with absolute pro-poor growth, in contrast, Klasen (2010) aligns inclusive growth to the relative pro-poor growth. According to Rauniyar & Kanbur (2010) inclusive development is necessarily pro-poor, but reverse is not true.

The measures of inclusive growth or development could be broadly categorized in two classes, absolute measures and relative measures. "Relative measures of inclusion are preferred over absolute measures as they consider excluded (deprived) ones as "social beings" whereas absolute measures consider them as "physical beings" (Townsend & Kennedy, 2004). Suryanarayana (2008) proposed a relative measure of inclusive growth. He suggested a methodology to calculate the coefficient of inclusiveness based on Foster-Greer-Thorebecke (1984) class of deprivation measures corresponding to 60% of the median. He employed this method to measure the mainstream and regional inclusiveness of growth in various Indian states

by using per capita nominal consumption in year 2004-05. Suryanarayana & Das (2014) extend the same study by adding few more states and extending the period from 1993-94 to 2011-12.

An absolute measure of inclusive growth is proposed by Ali & Son (2007). Their suggested methodology is based on social opportunity function and associated concentration curve to measure inclusive growth. This approach captures the inclusiveness of growth partially by means of opportunity curve which has a one-to-one relationship with social opportunity function. By using tools of opportunity curve and opportunity index this paper made an empirical dynamic analysis of access to and equity of educational and health services in Philippines. Its findings suggest that availability of education and health facilities is inequitable and is non-inclusive over time and across the regions in Philippine. By using the same approach at macro level, Anand et al. (2013) carried out research for a panel of emerging markets to assess the dynamics and determinants of inclusive growth. This study witnessed the exclusion in development process. McKinley (2010) also suggests absolute measure of inclusive growth, a composite inclusive growth index. In this index county wise appropriate indicators in the areas of growth, productive employment, economic infrastructure, income poverty and equity, human capabilities, and social protection; are combined based on scoring method and a weighting system. The effectiveness of this methodology is tested for cases of Bangladesh, Cambodia, India, Indonesia, the Philippines, and Uzbekistan. A similar approach is adopted by World Economic Forum (WEF) in Inclusive Growth and Development Report (2017). By assigning equal weight to the three pillars of inclusive development namely growth, inclusion, and intergenerational equity and to their 12 indicators, an inclusive development index at country level is calculated for 109 countries of the world. This approach of composite index also suffers from the limitation of suppressing sub-national disparities. The weighting system in this methodology implicitly encompasses value judgments (2010). Sen K. (2014) construct a compound variable for inclusive growth (POVINQ), the summation of the headcount ratio and the Gini coefficient. This simple measure captures both the poverty and inequality dimensions of inclusive growth. However, this method also inherits all the limitations of absolute measure of inclusiveness.

The social and economic development and its inequality (a partial analysis of inclusive development) in Pakistan has been analyzed over time and across regions in several studies by utilizing various techniques and measures. Social development across districts of Pakistan is analyzed by Aisha, Pasha, & Ghaus (1996) by applying the techniques of Principal Component Analysis (PCA) and Z-Sum. To measure the level of social development this study uses indicators relating to the education, health and housing sectors. Most of the indicators used in this study belongs to input for development, a few are from output side. Haq (1998) analyzes welfare in Pakistan by using welfare index proposed by Sen (1974). It carries out a

decomposition analysis of consumption expenditure from 1979 to 1993 to measure inequality in urban rural sectors and in overall Pakistan. Baluch & Razi (2007) utilizes ordinal approaches of Lorenz Dominance and Generalized Lorenz Dominance; and cardinal approach of Sen's Social Welfare Function; to measure social welfare in Pakistan. The multidimensional inequality trends in Pakistan are captured by Burki, Memon, & Mir (2015) by employing Gini coefficient, Palma index and consumption share by quintiles across regions using household data from 1990 to 2013. They analyze distribution of income, wealth, educational attainment, investment in human capital, road infrastructure. They also examine the intergenerational mobility and the inequalities generated by regressive taxation, inflation tax and gender bias. The findings of these studies witness the presence of income and non-income inequality traps and widening polarization levels in Pakistan. Siddiqui (2008) carries out a district wise analysis of human development and its inequality by using micro survey data for the year 1998-99. The study calculates head count ratio of poverty, Gini coefficient for inequality, literacy rates and several indices as proxies for public investment in provision of social services at the district level. By developing and estimating a basic need policy model for various indicators of human capability, this study analyzes the role of poverty and inequality in determining level of human capabilities. Haq et al. (2010) analyzes empirically intra-district variations in Punjab at tehsil-level in quality of life measured by constructing indices for quality of persons and quality of conditions using principle component analysis. This study utilizes Multiple Indicator Cluster Survey (MICS) Punjab 2007-08 data for analysis.

There are few studies that are focused to measure status of inclusive growth in various economic and social dimensions individually in the context of Pakistan. However, there is barely any study which address comprehensively the issue of inclusive development in Pakistan. Asghar & Javed (2011) based on social opportunity function approach estimates the level of inclusive growth using education and employment opportunities available to the population. By constructing Opportunity Index (OI) and Equity Index of Opportunities (EIO) for PSLM data of 1998-99 and 2007-08, it measures the extent of growth and distribution in these two socio-economic components of development. It concludes that growth in both dimensions is inclusive however is unequal. The same approach is adopted by Tirmazee & Haroon (2014) to measure inclusive growth in Pakistan using income per capita and a household asset index during the period 2008-09 to 2010-11. This study witnesses the non-inclusive nature of growth in Pakistan. By employing the methodology developed by Asian Development Bank (McKinley, 2010); Khan, Khan, Safdar, Munir, & Andleeb (2016) estimated the inclusive growth indices of Pakistan for the years 1990 to 2012. This study concludes that Pakistan exhibits satisfactory inclusive growth. The limitations of these studies are to employ absolute measure of inclusion and to use aggregated data at national level. Absolute measure of inclusion accounts only for

physical aspect of development and ignores its social aspect (Townsend & Kennedy, 2004). The distributional feature of inclusive growth could not be appropriately analyzed by using aggregated data.

3. DATA AND RESEARCH METHODOLOGY

3.1 Data

The data for district-wise GDP for Khyber Pakhtunkhwa province have taken from Hasan et al. (2021) who extracted these values using nightlight data. The study used harmonized nightlight data to estimate non-farm economic activity. At the first stage, cross-country data was utilized to estimate the elasticity between GDP and nightlights growth in order to establish the strength of nightlights data in estimating GDP. The second step involved a similar exercise at the national level for South Asian countries and the subnational (province/state) level for urban areas in Pakistan and India. At the third stage, the estimated coefficients from the sub-national model were used to estimate the non-agricultural component of GDP for the KP province of Pakistan. At the fourth stage, to arrive at the GDP of the districts and cities of KP, official provincial GDP is distributed using nightlights to determine the share of non-agricultural GDP in each district and city, and the share of rural population to distribute the share of agricultural GDP. Finally, the distribution of nightlights at the district level along with the daytime satellite imagery is used to identify urban growth trends.

The data utilized for analysis exploring various aspects of inclusive development at household and subnational level is taken from PSLM 2014-15. Data for households' assets, housing, literacy, years of schooling, and demographic features is compiled from this survey. However, data on child mortality (health indicator in this study) is not available in this survey. PSLM-HIES 2013-14 is utilized to collect information on child death and survival period for estimation of household's child mortality rate. Then by using data fusion technique households' child mortality rates are predicted for PSLM (2014-15).

Most of the district-level controls for exploring the associative relationship between GDP and inclusive development is collected from various publications of Pakistan Bureau of Statistics for the years 2014 and 2015. The data about education and health institutions, total area, forest area, cultivated area, tube wells, tractors, threshers, harvesters, road length, registered factories, police stations, and reported crimes is collected from provincial development statistics. Few missing observations about some districts of Sindh are collected from district profiles published by USAID. The data of doctors and paramedics in government hospitals of Punjab is taken from District Health Information System (DHIS) annual report (2014). Data about population and sex ratio is collected from Pakistan Census 2017 as these figures are close approximates for year 2014-15.

3.2 Methodology

The general methodology utilized here to construct household based HDI is taken from Alkire and Foster (2010). For issues, specific to household-based study this research consults mainly Lopez-Calva & Ortiz-Juarez (2011) and Harttgen & Klasen (2012). Technical notes for human development reports (2014; 2015) are consulted for technical details of index construction, inequality measurement, and loss due to inequality. The first step of calculating the household's HDI is to create three separate indices for each of the three dimensions: standard of living, education, and health. These dimension indices are then used to calculate the household's HDI and IHDI. In each dimension index, a household's achievements are normalized to a score between 0 and 1 using extreme values across country, called domestic goal posts. HDI and, hence, IHDI are contextualized regarding domestic goalposts to consider the provincial realities and priorities. Domestic goalposts provide a realistic assessment of the relative progress made by different districts in KPK.

3.2.1 Household's Standard of Living Index

Considering the merits of asset-based index approach, issue of availability of reliable households' income data, and unavailability of households' expenditure data at district level for KPK, this research utilizes assets-based indices to evaluate households' living standard. By combining observed measures of a household's physical living conditions, the assets-based index captures a dimension of economic standing (Filmer & Scott, 2012). The main idea of asset index approach is to construct an aggregated uni-dimensional index over the range of different dichotomous variables of household assets capturing housing durables (ownership of cheap utensil and expensive utensil, car, motorcycle, bicycle, TV, refrigerator, phone etc.); information on the housing quality (number of sleeping rooms, quality of roof material, floor material, wall material, and toilet facility etc.); and access to public facilities (water, electricity, natural gas, telephone etc.), that indicate the material status (living standard) of the household². Assets index as a proxy for Standard of SOL index is obtained by normalizing asset scores. A general formula for estimating the asset scores is:

$$AS_i = \gamma_1 a_{i1} + \gamma_2 a_{i2} + \dots + \gamma_k a_{iK} \text{-----(1)}$$

where AS_i refers to the asset scores for $i = 1, \dots, N$ households and $k = 1, \dots, K$ household assets, the a_{ik} is the respective asset of the household i recorded as discrete variables in the data sets and the γ represent the respective weights or scores for each asset that would be estimated. AS_i is

² These indicators are used to construct asset index in a number of studies including Filmer & Pritchett ((1999), (2001)), Sahn & Stifel ((2000), (2003)), Kolenikov & Angeles ((2004), (2009)), Howe, Hargreaves, & Huttly (2008), Harttgen & Klasen (2012), Smits & Steendijk (2013), Habyarimana, Zewotir, & Ramroop (2015), and Wittenberg & Leibbrandt (2017).

normalized between zero and one using goal posts to obtain SOL index: it equals one when household ‘i’ possesses all assets in the list and zero when it possesses none. Asset index or SOL index (S_i) is obtained by normalizing asset scores as (Keho, 2012):

$$S_i = \frac{AS_i - AS_{min}}{AS_{max} - AS_{min}} \text{-----}(2)$$

where AS_{max} and AS_{min} are the maximum and minimum values (domestic goal posts) of the asset scores AS_i .

Based on the standard of living index, households are ranked into quintiles; with first quintile corresponds to the poorest 20 percent of households, second quintile corresponds to the lower middle 20 percent, third quintile corresponds to the middle 20 percent, forth quintile corresponds to the upper middle 20 percent, and the fifth quintile corresponds to the richest 20 percent. A descriptive analysis of these quintile provides an overview of inclusive development in standard of living dimension. Classification of households in standard of living quintiles would be utilized to test the reliability of SOL index.

The PPCA is utilized in this research to construct household’s asset index, as it is the most comprehensive technique to measure relative wellbeing of a household for the type of asset indicators used in this study (Ward, 2014; Kolenikov & Angeles, 2009).

3.2.2 Household’s Education Index

The education index for household i (E_i) is computed as weighted average of household’s adult literacy index and schooling index. The weights proposed and used by UNDP in human development reports 1991-1994 are 2/3 for literacy and 1/3 for schooling. Using these weights education index is calculated as:

$$E_i = \frac{2}{3}L_i + \frac{1}{3}Sc_i \text{-----}(3)$$

3.2.3 Household’s Health Index

In traditional HDI, health component uses data on life expectancy at birth. This indicator cannot be estimated at the household level with available data in PSLM. Some other indicators of household health used in previous studies to construct regional level HDI’s health component for Pakistan are children immunization rate, pre-natal and mother’s tetanus vaccination and infant survival rate³. The child immunization rate cannot be used to construct household health index as more than 48% households surveyed in PSLM 2014-15 do not have any under-five child. For pre-natal care and tetanus vaccination approximately 60% of the data is missing, therefore, this also cannot be employed. Keeping in view all these limitations and technical issues, the child survival rate (one minus child mortality rate) is employed as a proxy for life expectancy to construct household’s health index. This choice is justified particularly for Pakistan as high child mortality is one of the most frightening health challenges faced by Pakistan.

³ Hussain D. A., (2003); Jamal, (2016).

Data fusion technique with survival analysis is utilized to calculate mortality rates at the household level. Survival analysis would be beneficial to overcome the problem of households without children that results in a loss of data and to obtain higher variation in the data. In this study survival analysis is executed by employing discrete-time model with a complementary log-log (cloglog) link to estimate the households under five mortality rates. The child survival time is intrinsically a continuous random variable; however, it is mostly observed in discrete intervals of time e.g. in days, months or years (interval censoring). The child survival data used in this study is observed retrospectively in a cross-sectional survey, where dates are recorded to the closest month or year. The survival time is therefore measured discretely also called interval-censored because the only information is that an event happened at some point during an interval of time. Accordingly, the appropriate choice for modeling child mortality rate is discrete time model. Discrete-time model are commonly estimated by maximum likelihood using logit link for logistic hazard and cloglog link for proportional hazards. Keeping in view the nature of mortality data, very low probability of child death (6.46 % in PSLM 2013-14), and data limitations, a cloglog link is utilized to estimate household's child mortality rates in this study.

Since, the focus of this study is the district level representative survey PSLM 2014-15 which do not contain information on child mortality, PSLM 2013-14 is utilized for survival analysis using household level covariates which are common in PSLM 2013-14 and 2014-15. As a first step of data fusion, child mortality is regressed on a set of household's basic socioeconomic characteristics using Complementary log-log model (discrete-time proportional hazard model). Subsequently, coefficients of survival model obtained in previous step are used to predict the child mortality rates for all households in PSLM 2014-15.

The child survival rate is obtained from child mortality rate as:

$$csr_i = 1 - cmr_i \text{-----(4)}$$

where cmr_i and csr_i are the child mortality rate and child survival rate respectively for household i. The health index for household i is then calculated by following expression:

$$H_i = \frac{csr_i - csr_{min}}{csr_{max} - csr_{min}} \text{-----(5)}$$

where csr_{min} and csr_{max} are the minimum and maximum values respectively for households' child survival rates. For maximum, the maximum household's child survival rate obtained for PSLM 2014-15 is used. To calculate minimum value, the formula is:

$$le_{nat} = \frac{csr_{nat} - csr_{min}}{csr_{max} - csr_{min}} \text{-----(6)}$$

where csr_{nat} is the national child survival rate, calculated as the population weighted average (geometric mean) of the predicted households' child survival rates from PSLM 2014-15 ; csr_{max} is the households' maximum child survival rate predicted from the same survey ; and le_{nat} (UNDP, 2016) is the national life expectancy index for year 2015.

To calculate HDI for a household i , its indices in three dimensions are aggregated by arithmetic mean and is given as:

$$HDI_i = (S_i + E_i + H_i)/3 \text{ -----(7)}$$

The use of the arithmetic mean guarantees that there is no concern for inequality (Alkire & Foster, 2010)⁴. For Inequality-Adjusted HDI for a household i , its indices in three dimensions are aggregated by using geometric mean and is given as:

$$IHDI_i = \sqrt[3]{S_i \times E_i \times H_i} \text{ -----(8)}$$

This index accounts for inequality across the dimensions in a household's development level.

3.2.4 Methodology to Estimate Coefficient of Inclusion

To compute unified measure of inclusive development at district and provincial level a method proposed by Suryanarayana (2008) is adopted in this study. Suryanarayana(2008) and Suryanarayana & Das (2014) uses nominal consumption expenditure to measure the inclusiveness of growth in Indian States. In the present study HDI and its dimensional indices are utilized for analysis of inclusiveness of human development in Pakistan.

Suryanarayana (2008) proposes a methodology to measure inclusive growth in terms of median consumption. Choice of this approach for present research is mainly due to its two distinguishing features. First, it is a relative measure; and second, it is based on median, an order-based average. Relative measure of inclusion is chosen over absolute measure as it considers excluded (deprived) ones as “social beings” whereas absolute measures consider them as “physical beings”. Relativity implies that exclusion must be from a specific society, in a specific place and time (Townsend & Kennedy, 2004). The median is preferred over mean, because mean as an average is not a robust measure for skewed distributions of variables related to human wellbeing⁵.

Suryanarayana (2008) assesses the economic standing of relatively deprived regarding a threshold, specified as a function of the median. The underlying idea is that the growth process under review will be inclusive if it is beneficial for deprived sections of the society. To identify the deprived, this approach compares the economic achievement of individual units of the society (individuals/ households/ regions) relative to the average economic achievement of the society. The population having economic achievement below sixty percent of median economic achievement of the society is considered as deprived. The same approach is adopted to measure inclusiveness of development in this study. The phenomenon of development cannot be captured

⁴ For detailed discussion see (Foster, Seth, Lokshin, & Sajaia, 2013).

⁵For detail discussion see (Birdsall & Meyer, 2014; Townsend & Kennedy, 2004).

by economic achievement alone; it requires an assessment of socio-economic achievement. Hence, IHDI as an indicator of socio-economic achievement is utilized to assess the deprivation and hence inclusion in the mainstream of development. Thus, the segment of population which is deprived of development is defined regarding a threshold of Inequality-Adjusted human development, specified as a function of median IHDI. The population (households) having IHDI below sixty percent of median IHDI is considered as deprived. The 60% of median, and 50% of the mean are two commonly used thresholds for relative income deprivation; the former measure is probably the most extensively used measure nowadays (Townsend & Kennedy, 2004). In this study the application of this threshold is extended to development and its dimensions including economic well-being (SOL), education, and health. The deprived proportion of population is given as:

$$\theta = F(\delta\xi_{0.5}) = \int_0^{\delta\xi_{0.5}} f(x)dx \text{-----(9)}$$

where θ = incidence of the deprived (ID), $0 < \delta < 1$, and ‘ x ’ is the variable to be analyzed for inclusion. The $\xi_{0.5}$ represents the median such that:

$$\int_0^{\xi_{0.5}} f(x)dx = \frac{1}{2} = \int_{\xi_{0.5}}^{\infty} f(x)dx \text{-----(10)}$$

The value of δ is kept 0.6. The variable (x) to be analyzed for inclusion in this study is development which is represented by HDI and its dimensions. F is the cumulative distribution function and $f(x)$ is the density function of ‘ x ’. Some important features and implications are as follows:

The value of θ lies in the open interval (0, 0.5).

(i) θ tends to 0 implies bottom half of the distribution concentrates in the “inclusion zone”, given by $[\delta\xi_{0.50}, \xi_{0.50}]$

(ii) θ approaches to 0.5 implies bottom half of the distribution concentrates in the “exclusion zone”, given by $[0, \delta \xi_{0.50}]$.

Hence, whether the development process being analyzed is inclusive or exclusive could be demarcated and evaluated regarding the concentration of the distribution in/out of the “inclusion zone” given by the interval $[\delta\xi_{0.50}, \xi_{0.50}]$. The value of θ represents the exclusion.

3.2.4.1 Coefficient of inclusion in a homogeneous society

Assuming society consisting of a homogeneous group with heterogeneity in development across households, a “Coefficient of Inclusion” is defined by suitable standardization regarding its limits. Inclusion Coefficient (IC) denoted by ‘ Ψ ’ is given as:

$$\Psi = 1 - 2 \int_0^{\delta\xi_{0.5}} f(x)dx \text{-----(11)}$$

where $0 < \Psi < 1$. It has the following relevant properties:

(i) The value of Ψ tends to the value 0, when no relatively poor is participating and hence, benefiting from the mainstream development process; it approaches to unity, as the all relatively poor falls in the inclusion zone.

(ii) A value of Ψ greater than $\frac{1}{2}$, indicates a situation where the proportion of the bottom half of the population falling in the inclusion zone is greater than the proportion in the relative deprivation-zone, implying a state of inclusion.

(iii) Positive improvement in Ψ and its positive covariance with median level of development indicates inclusive development; a constant Ψ implies continuation of status quo and a deterioration in Ψ with negative covariance with median level of development indicates the state of exclusion.

3.2.4.2 Coefficient of Inclusion in a Non-Homogeneous Society

The economic and social welfare is not evenly distributed across regions in Pakistan (Jamal, 2016; UNDP Pakistan, 2016), exhibiting a scenario of non-homogeneous society. Consequently, inclusiveness of development is analyzed in two ways i.e. across the regions (inter-regions) and within the regions (intra-region).

Inter-regional inclusion

Inter-regional inclusion is examined with reference to disparities in median levels of human development across regions. It is measured by closeness of regional median ($\xi_{0.5}^R$) to national median $\xi_{0.5}^M$ (of the national/mainstream population). For a given δ such that $0 < \delta < 1$, there can be two scenarios:

(i) $\xi_{0.5}^R < \delta \xi_{0.5}^M$ implies exclusion of the specific region.

(ii) $\xi_{0.5}^R \geq \delta \xi_{0.5}^M$ implies inclusion of the specific region.

Intra-regional inclusion

Intra-regional inclusion is examined in terms of inclusion coefficients (ICs) defined with respect to regional as well as national median. Intra-regional inclusion for any given region 'i' is measured with respect to either own median ($\xi_{0.5}^R$) providing a measure of Ψ_i^R (IC Regional) or overall national median ($\xi_{0.5}^M$) providing a measure of Ψ_i^M (IC Mainstream). These two measures are distinct and different for situations when there is inter-regional exclusion; and converge with progressive inter-regional inclusion.

IC Regional (Ψ_i^R) measures the extent of inclusion of the bottom half population of the region under review in its own progress. Its limits and properties are the same as discussed for the inclusion coefficient of a homogeneous society. IC Mainstream (Ψ_i^M) measures the extent of inclusion of the population (laying below national median) of concerned region in the progress of the country/ society. The limits for IC Mainstream (Ψ_i^M) are as follows:

$\Psi_i^M = -1$ implies exclusion of the entire region

$\Psi_i^M = 1$ implies inclusion of the entire region

4. RESULTS AND DISCUSSION

4.1 GDP Based Economic Ranking of KP Districts

This section begins with the analysis of economic ranking of the KP's districts based on the economic activity (GDP) in the districts obtaining by utilizing the nightlight data. These rankings are provided in Table 1. The table shows that Peshawar, being the capital city, ranks top in terms of overall economic activity. This is followed by Nowshera and Mardan, respectively. This may not be surprising given the fact that main political family resides in the these districts and whenever they came into power, they spent majority of the resources in these districts. The fact that Kohistan and Torgarh are at the lowest indicates that absence of major political/civil power in these provinces and hence they are under-represented in the parliament and other policy decisions forums.

Table 1: Ranking of KP Districts based on GDP obtain using NTL

District	GDP	Rank
Peshawar	228583	1
Nowshera	142301	2
Mardan	113350	3
Haripur	104021	4
Abbotabad	81088	5
Swabi	74478	6
D.i.Khan	72156	7
Charsadda	56273	8
Kohat	52264	9
Mansehra	51039	10
Bannu	45886	11
Swat	40085	12
Malakand	33430	13
Lakki Marwat	28166	14
Lower Dir	23418	15
Karak	14650	16
Tank	8617	17
Hangu	8301	18
Buner	8107	19
Upper Dir	6665	20
Shanggla	6403	21
Batagram	4932	22
Chitral	4632	23

Kohistan	1544	24
Tor Ghar	811	25

Source: Hasan et al. (2021)

However, it is important to if expansion of economic activity (GDP growth) has been inclusive in terms of the economic as well as social dimensions (education and health). For this purpose, we next present the results for inclusivity (overall) as well as separately for standard of living, education, and health indices.

4.2 Inclusive Development Based Ranking of KP Districts

This section discusses the coefficient of inclusion for KP districts using overall inclusion as well as separately for asset-based standard of living, education, and health. Figure 1 exhibits that majority districts in KP portray a state of inclusion in terms of regional inclusion as their regional inclusion index is above 0.5. It shows its bottom half of the households concentrates in the regional inclusion zone. Kohat, Swabi and Shangla exhibits the state of regional exclusion. It is important to highlight that despite its relatively better scenario of regional inclusion, in each district of KP at least one fourth of the households in bottom half are excluded from regional development stream. In KP nearly half of the district is in state of inclusion with respect to mainstream development as their mainstream ICs are greater than 0.5. The state of mainstream inclusion is quite alarming in some of KP districts. The districts of Kohistan and Tor Ghar with negative mainstream IC, are leading towards perfect exclusion. The district with highest level of inclusive human development in KP is Haripur. Almost 75 percent of households in lower half of the population falls in regional inclusion zone of development and 85 percent of bottom half of households lie in mainstream inclusion zone. The districts with the lowest level of inclusion with respect to mainstream human development is Kohistan. None of its households in bottom half falls in mainstream inclusion zone. Shangla is the district with lowest regional inclusion in KP whereby 49 percent of households in bottom half of the population lies in regional inclusion zone. Like the human development status, most of the districts at lowest end of inclusion in KP belong to the north of the province.

Figure 1: District-wise IHDI's Regional and Mainstream Inclusion Coefficients

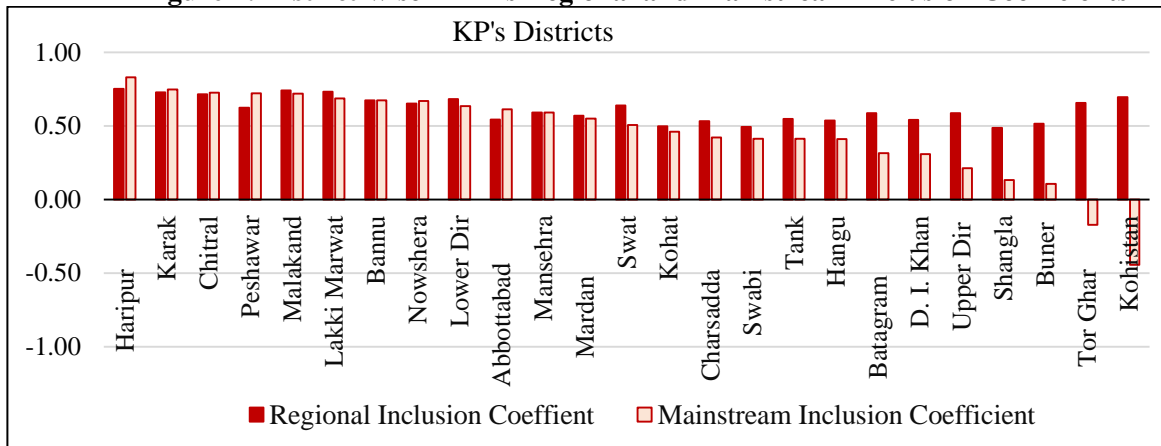
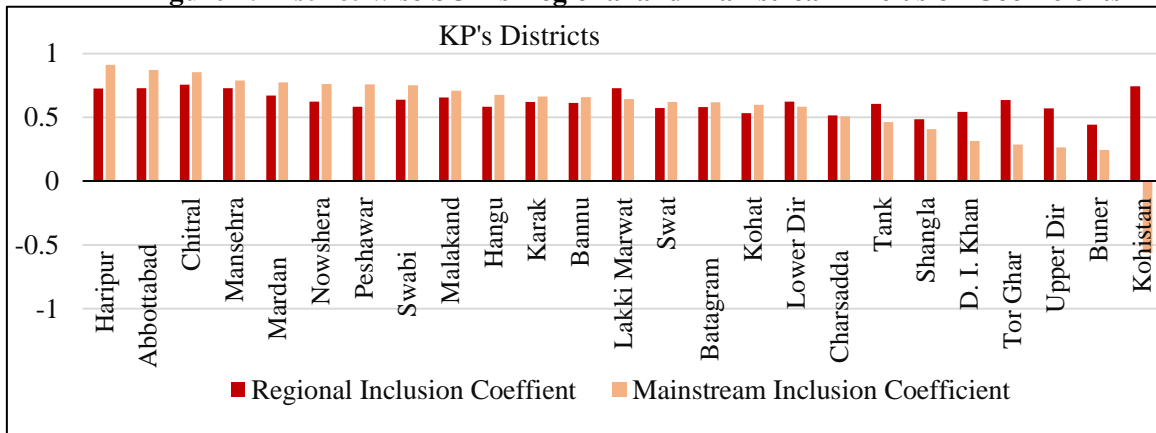


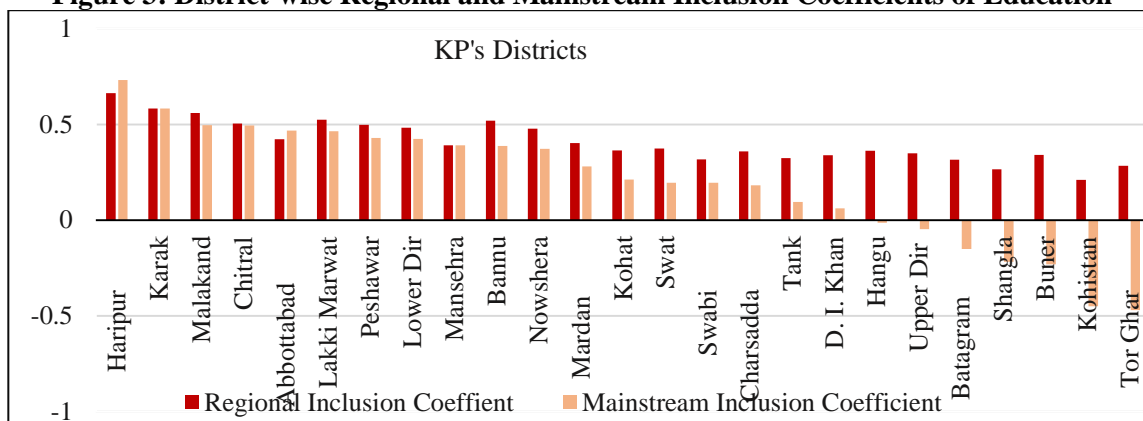
Figure 2 exhibits that majority districts in KP portray a state of inclusion in terms of regional inclusion as their regional ICs are above 0.5. It shows its bottom half of the households concentrates in the regional inclusion zone. Shangla and Buner exhibit the state of regional exclusion. It is worth noticing that despite of its relatively better situation of regional inclusion, in each district of KP at least 24 percent of the households in bottom half are excluded from regional development stream. In KP, 18 out of 25 districts are in state of inclusion with respect to mainstream SOL. The mainstream IC for districts of Kohistan is negative that exhibits perfect exclusion. In KP, the district with highest level of mainstream inclusion and regional inclusion of SOL are Haripur and Chitral respectively. Almost 91 percent of the households in bottom half Haripur's population falls in regional inclusion zone of SOL. In Chitral the percentage of households exhibiting regional inclusion is 76. The districts with the lowest level of inclusion with respect to mainstream SOL is Kohistan leading towards perfect exclusion with negative IC. Buner is the district with lowest regional inclusion in KP whereby 44 percent of households in bottom half of the population lies in regional inclusion zone.

Figure 2: District-wise SOL's Regional and Mainstream Inclusion Coefficients



The province-wise analysis of intra district inclusion in terms of Education in KP is exhibited graphically in Figure 3. The figure reveals that in KP only 2 out of 25 districts are in state of inclusion with respect to IC-mainstream and seven districts with negative IC-mainstream exhibit nearly perfect exclusion. In KP, Haripur district has highest level of mainstream inclusion and regional inclusion of 73 percent and 66 percent respectively. The second highest level of mainstream and regional inclusion is exhibited by district Karak for which both measures have the same value of 0.58. Provincial capital Peshawar also exhibits mainstream exclusion with IC-mainstream 0.43 and its IC-regional is 0.50. The districts with the lowest level of inclusion with respect to mainstream education and regional education are Tor Ghar (-47 %) and Kohistan (21 %) respectively.

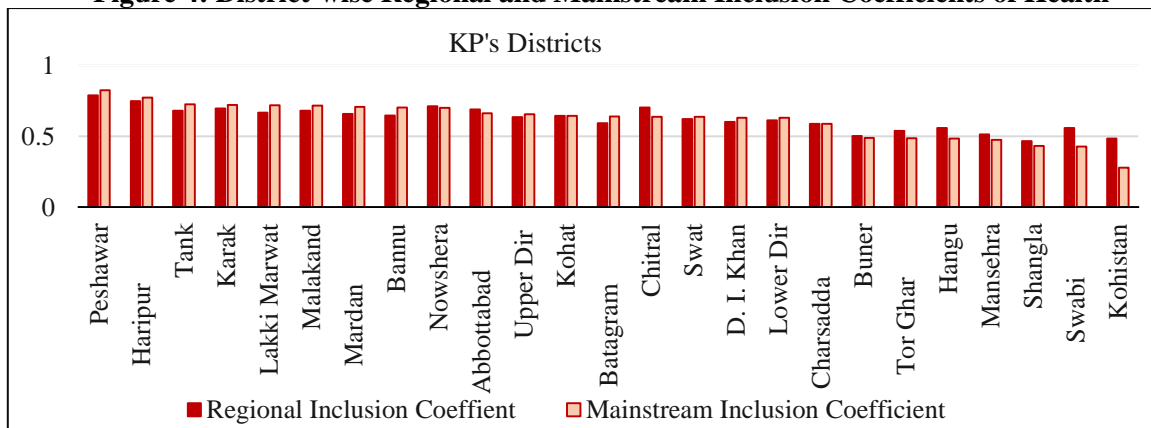
Figure 3: District-wise Regional and Mainstream Inclusion Coefficients of Education



The province-wise analysis of intra-district inclusion in terms of health is illustrated graphically in Figure 4. It exhibits that majority districts in KP depict a state of inclusion in terms of both regional and mainstream inclusion as their ICs are above 0.5. It shows their bottom half of the

households concentrates in the regional and mainstream inclusion zones. The two districts of KP Kohistan and Shangla exhibit the state of regional exclusion. Including these two, seven districts in KP show exclusion from mainstream. It is worth noticing that despite of its relatively better situation of inclusion, in each district of KP at least 21 percent and 17 of the households in bottom half are excluded respectively from regional and mainstream development. Peshawar has the highest level of both mainstream and regional inclusion followed by Haripur. The districts with the lowest level of inclusion with respect to mainstream is Kohistan with IC 0.28. Shangla is the district with lowest regional inclusion in the province whereby 47 percent of households in bottom half of the population lies in regional inclusion zone.

Figure 4: District-wise Regional and Mainstream Inclusion Coefficients of Health



Moreover, the association between GDP and coefficient of inclusion is found to be statistically insignificant. This results, in addition to the discussion in this section, suggest that growth in the economic activity has failed to have a trickle-down effect in terms economic and social benefit for households across the province.

5. CONCLUDING REMARKS

Judging the regional economic performances simply based on the expansion in economic activities could be misleading in ranking cities for development. This study confirms this notion. The paper explores the discrepancy between economic performance and inclusivity of the districts in the Khyber Pakhtunkhwa province of Pakistan. The Inclusion Coefficients are derived for each district using the method developed by Suryanarayana & Das (2014) by utilizing HDI and its dimensional indices for analysis of inclusiveness of human development in Pakistan. The district level GDPs are obtained from Hasan et al. (2021) who extracted these values using nightlight data. The comparison between ranking on these criteria shows sharp discrepancies between economic activity and economic inclusion in the province. For instance, Peshawar and

Haripur districts rank one and four respectively in terms of economic activity. However, the Haripur is more inclusive (rank 1) than Peshawar (rank 4) using the inclusivity criteria. Similarly, Lakki Marwat ranks 14 in the province in term of GDP but has a much better ranking (# 6) using inclusion coefficient. These findings suggest that economic activity may not be a proper measure of inclusivity and may therefore not be used as a single criterion when assessing welfare of the cities.

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