© *The Pakistan Development Review*
62:2 (2023) pp. 199–222
DOI: 10.30541/v62i2pp.199-222

Is Economic Growth Inclusive in Punjab, Pakistan? A District Level Assessment Using the Composite Index

GHULAM MOHEY-UD-DIN and KHADIJA IKRAM

This paper aims to develop a composite Inclusive Growth Index (IGI) for 36 districts of Punjab, incorporating six overarching dimensions including (i) economic, (ii) amenities, (iii) gender equity and financial inclusion, (iv) human development (v) governance and (vi) sustainability. Following the OECD's Handbook of Composite Indices, the study uses a min-max approach for the normalisation of indicators followed by the weighted aggregation using Principal Component Analysis (PCA) for assigning weights to indicators in each dimension in the composite index. The study ranks the districts as out-performing, average-performing, and lagging districts in terms of social inclusion. According to the ranking, the central and northern districts of Punjab such as Lahore, Gujrat, and Rawalpindi, etc. are scoring high on IGI, while districts falling in South Punjab such as Rajanpur, Dera Ghazi Khan, and Muzaffargarh, etc. are lagging. The result of the study highlights the areas and dimensions of social inclusion where the districts are lacking and, consequently, the policymakers and planners need to focus on these.

JEL Classifications: D63; O11, O47.
Keywords: Inclusive Growth, Composite Index, Principal Component Analysis, Punjab–Pakistan

1. INTRODUCTION

Despite advancement in technological solutions and progress in industrial and agricultural sectors in Punjab, regional disparities and inequalities persist which hinders the process of poverty eradication. The variation in poverty level, Human Development Index (HDI) scores, and the variation in other social development indicators between districts are indicative of unequal growth and regional disparities. This has led to a call for a deeper understanding of the determinants of growth to ensure a higher degree of inclusiveness. Globally, Pakistan is positioned at 47th place, out of seventy-four

Ghulam Mohey-ud-din <dr.moheyuddin@gmail.com> is Urban Economist, The Urban Sector Planning and Management Services Unit (the Urban Unit), Lahore. Khadija Ikram <khadija.ib@gmail.com> is Research Associate, The Urban Sector Planning and Management Services Unit (the Urban Unit), Lahore.

Authors' Note: An earlier version of the paper was presented in the 35th AGM and Conference of PSDE/PIDE. Authors are thankful to the discussants and panellists of the technical session for their valuable comments/feedback on the draft version. Moreover, authors are grateful to the Team Lead (Economics) and the CEO, The Urban Sector Planning and Management Services Unit (the Urban Unit), Lahore Pakistan for their overall support and patronage of research work at the Urban Unit.

countries, which were ranked as per Inclusive Development Index 2018 (World Economic Forum, 2018). However, there is an absence of a comprehensive tool for tracking inequalities and social exclusion at provincial and/or sub-regional levels in Pakistan. Measuring inclusive growth at lower levels offers the potential for a holistic approach for addressing inequality challenges, by highlighting the links between economic and social policy. For instance, investing in employment policies will not only improve the living standard of an individual but will also help in increasing aggregate economic growth (Lee, 2018). Existing measures of economic growth including Gross Domestic Product (GDP) fail to recognise the contribution of other social factor which triggers the growth process (Prada & Sánchez-Fernández, 2019). In these circumstances, scholars have directed their attention towards the inclusive growth concept of development as it builds links across policy areas to reduce poverty and inequality.

The urban areas and metropolitan cities are driving growth in a country, however, most of the inequalities are visible in those areas. This has led the policymakers to deliberate on cities' inclusive growth, whether they are meeting the demand of the wider population or not. Focusing on lower levels offers the advantage of developing and testing new approaches for a specific local context, with the successful ones then scaled up to other areas (Lee & Sissons, 2016). Structural changes and devolution programs have led to the emergence of different tiers of provincial government, i.e., division, district, tehsil, and union council, as important economic actors who are given new powers and responsibilities to undertake the challenges of poverty alleviation at lower levels.

Although local policymakers often have limited powers to directly address growth, a country needs all its key political actors to contribute to the efforts of achieving the inclusive growth outcome. Globally, the Inclusive Growth (IG) agenda has already started to impact urban and regional policy areas. The most developed province of Pakistan, Punjab has also developed its Punjab Growth Strategy 2018 in line with the vision of inclusive growth (Planning & Development Board, 2015). However, the main challenge here is to make sure that Inclusive Growth does not become a buzzword, which implies that although many pre-existing policies have adopted the IG agenda, it is not translated into outcomes and does not have an impact (Lee , 2018). Thus, the creation of a statistical framework to measure inclusive growth is necessary at the Punjab district level to compare the extent of inclusive growth and to assess the impact of the measures undertaken for social inclusion.

With this background in mind, the paper aims to measure if the economic growth in Punjab is inclusive or not by constructing a composite Inclusive Growth Index (IGI) for its thirty-six districts. The study will be consistent with the definition and measurement approach of the Composite Index for Inclusive Growth adopted by Vellala & Chattopadhyay (2016), which integrates economic, amenities, gender equity and financial inclusion, human development governance and sustainability factors into one single measure. It also aims to conduct an inter-regional comparison between Punjab districts, by ranking them as out-performing, average-performing, and lagging districts, in order to determine which districts are high-priority areas for government intervention. The estimation of IGI will also demonstrate which particular dimension of inclusive growth is driving the index in any district.

The rest of the paper is arranged into four sections, where Section II will review the existing approaches to measure inclusive growth and show how this has informed the selection of dimensions of the inclusive growth index. Section III details the design of the inclusive growth index and outlines the selected indicators within the index. Section IV will present the results and discussion of this research, followed by concluding remarks and policy implications in Section V.

2. LITERATURE REVIEW

The initial debates on the concept of inclusive growth and its relationship with poverty and inequality have been dominated by the works of Kuznets (1995) who highlighted the inverted "U' function between inequality and growth. He argued that the trickle-down effect of development and growth can lead to poverty reduction. However, considering the prevalence situation, inequalities continue to persist in advanced countries despite their strong economic growth (Vellala & Chattopadhyay, 2016). As a result, another significant concept 'Pro-Poor Growth' appeared later on, which is defined as 'the difference between the poverty reduction associated with any particular growth spell and the poverty reduction.', and it focuses on the conditions under which the poorest benefit (Lee, 2018) However, from the beginning of the 1990s, countries around the world are facing increasing challenges of income inequality, poverty accumulation, and other intra-regional disparities, despite the increase in economic development and urbanisation. The critiques argued that the pro-growth concept was relatively narrow, and it focuses on the poor while ignoring the population just above the poverty line (Lee, 2018). As a result, there has been a shift in debates from 'pro-poor growth' to an alternative approach termed as the 'inclusive growth', where the former mainly focuses on poor segments of the population gaining from growth, while the latter incorporates greater equity concept across a broader segment of the population (Vellala & Chattopadhyay, 2016). The concept was incorporated into the globally recognised Sustainable Development Goals (UN, 2016). The Organisation for Economic Co-operation and Development (OECD) also launched an "Inclusive Growth in Cities" programme in 2016 for promoting a higher degree of inclusive economic growth. However, despite its popularity, this concept does not have a universal definition.

The Asian Development Bank (ADB) defines inclusive growth as the growth which ensures equal access to new economic opportunities for all segments of society, thus emphasising the social welfare component (Ali & Son, 2007). While IMF argues that inclusive growth promotes gender equality and sustainable development, along with reducing corruption, improving governance, and promoting the use of financial instruments by less wealthy households (Loungani, 2017). According to OECD, inclusive growth "creates opportunities for all segments of the population and distributes the dividends of this growing prosperity, in both monetary and non-monetary terms, fairly among the whole society" (Organisation for Economic Co-operation and Development (OECD), 2014). Different definitions of inclusive growth exist in the literature.

Numerous scholars have also tried to measure Inclusive Growth using various models, approaches, theories, and strategies for development. The major three main approaches are (1) the single indicator approach, (2) the dashboard indicators approach, and (3) the composite index approach. LSE Growth Commission uses a single indicator

approach, where median household income is taken as the indicator to explain GDP growth (Aghion, et al. 2013). On the other hand, ADB's Framework of Inclusive Growth follows the dashboard indicator approach, thus covering both income and non-income indicators (McKinley, 2010). The study includes 35 indicators that fall under five dimensions. These are (i) growth, productive employment, and economic infrastructure; (ii) income poverty and equity, including gender equity; (iii) human capabilities; and (iv) social protection. The study has also identified some of the indicators for the governance dimension such as the public expenditure-GDP ratio.

Most of the literature is based on the third approach i.e. construction of a composite index for measuring inclusive growth. Shearer et al (2016) created a composite index, based on three dimensions which are: (i) growth, (ii) prosperity, and iii) inclusion to monitor 100 US metropolitan cities' performance. Aggarwal (2021) examined the inclusive growth of various states in India, based on Inclusive Development Index (IDI), which is divided into two dimensions i.e. (i) process of growth, and (ii) outcome of growth. Similarly, another study measures the level of inclusive growth across 15 Indian states, based on six dimensions which are (i) economic, (ii) amenities, (iii) human development, (iv) gender equity and financial inclusion, (v) sustainability, and (vi) governance (Vellala & Chattopadhyay, 2016). Principal Component Analysis (PCA) was employed for the weighting and aggregation of all the indicators.

For Pakistan, there has been relatively little work done on developing frameworks to measure the Inclusive Growth Index (IGI) for the districts of Punjab, which gives enough scope for further investigation. Pakistan has been ranked at 47th position by World Economic Forum (World Economic Forum, 2018) against other countries to measure global progress in inclusive growth. The global dashboard monitors twelve indicators, based on three overarching dimensions i.e. (i) growth and development, (ii) inclusion, and (iii) intergenerational equity and sustainability. However, the dashboard includes a very broad range of factors, and the data for some of these factors are not measured at the regional or local level in Pakistan, which makes it difficult to be used for the purpose of this study. In addition to this, other studies also focused on measuring inclusive growth at the country level. Mushtaq and Zaman (2021) used the single indicator approach to measure the inclusive growth of Pakistan, where the poverty headcount ratio was used as a proxy and per capita Gross Domestic Product (GDP), Foreign Direct Investment (FDI) inflows, agriculture value added, health expenditures, income inequality, and education expenditures were used as explanatory variables which have an impact on inclusive growth. On the other hand, Kiani, et al. (2015) used a composite index approach to measure Pakistan's inclusive growth for a period of five years from 2008 to 2012. The limitation of this study is that it includes indicators that are not measured at the district level in Pakistan. However, the review of all the previous literature provides some guidance to a range of factors that can be included in the inclusive growth index in Punjab.

3. DATA AND METHODOLOGY

3.1. A Conceptual Framework

The concept of an inclusive growth index is understood as a measure of economic growth that considers the distribution of the benefits of growth across different segments

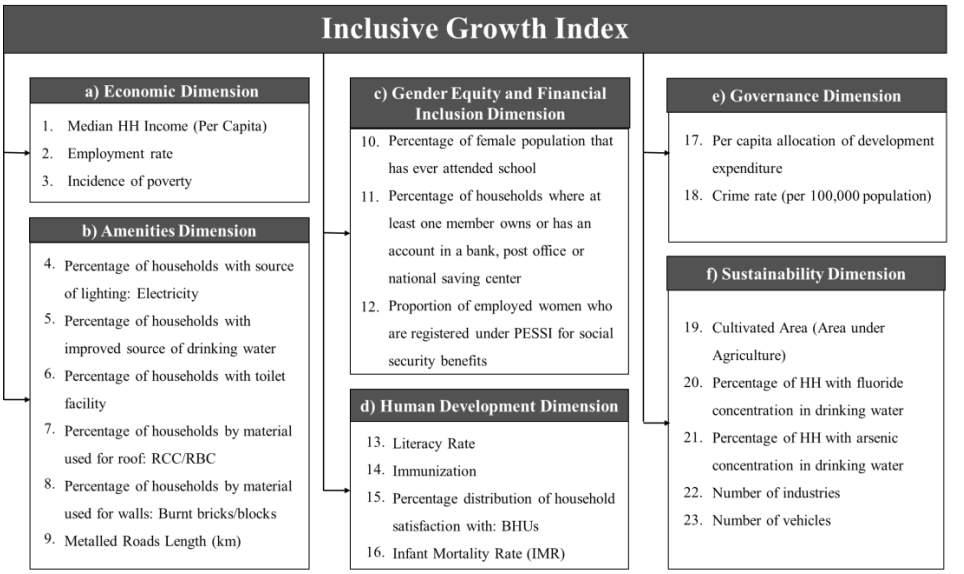
of society. The index is to ensure that the benefits of economic growth are widely shared and that growth is sustainable over the long term. It aims to provide a more comprehensive picture of economic performance than traditional measures such as GDP growth alone, and to inform policy-making that promotes inclusive and sustainable economic growth.

An inclusive growth framework is a set of policies and strategies aimed at promoting inclusive and sustainable economic growth. Based on the literature on inclusive growth index, the framework typically includes a range of policies areas aimed at addressing the key dimensions of inclusive growth, including economic growth, gender equity, environmental sustainability, promoting good governance and tackling corruption, investment in human capital, such as education and skills training, investment in infrastructure, such as transportation and energy, social protection and other programs to support the most vulnerable. This study has adopted the comprehensive framework used in Vellala & Chattopadhyay (2016), which is based on six dimensions including:

(i) Economic dimension: This dimension focuses on the overall level of economic activity and output, measured by indicators such as per capita median household income and employment, etc.
(ii) Amenities dimension: This dimension focuses on improving the living standards of society.
(iii) Gender equity and financial inclusion dimension: This dimension focuses on ensuring that all members of society can participate fully in economic and social life
(iv) Human development dimension: This dimension focuses on ensuring that all members of society have access to basic services such as education, healthcare, etc.
(v) Governance dimension: This dimension focuses on the role of good governance, effective institutions, and the rule of law in promoting inclusive growth.
(vi) Sustainability dimension: This dimension focuses on ensuring that economic growth is sustainable over the long term and does not come at the expense of the environment.

An inclusive growth framework also often involves a multi-sectorial and multi-stakeholder approach, bringing together different government agencies, private sector actors, civil society organisations, and international partners to work together to achieve inclusive and sustainable growth. It is important to note that the specific policies and strategies included in an inclusive growth framework will vary depending on the context and the specific needs and challenges of a country or region. In this study, these above-mentioned six dimensions consist of a list of 23 indicators, which were based on the requirement of the aforementioned framework, as well as the availability and reliability of local data sources, to ensure that the framework is suitable for measuring the level of inclusive growth within the context of this study. All these indicators together encompass different important aspects which lead to inclusive growth in Punjab. The conceptual framework of inclusive growth is depicted in Figure 1.

Fig. 1. Building Blocks of the Inclusive Growth Index (IGI)



The selected indicators had different connotations, meaning some have a positive relationship with IG and denotes a higher level of IG performance with a higher score and vice versa, while other display an opposite relationship where a higher value denotes a lower performance level in inclusive growth. Thus, a sign of positive and negative was given to each indicator to indicate hypothesised relation with inclusive growth. In the economic dimension of the index, medium HH Income and employment rate have a positive impact on inclusive growth as it increases the consumption capacity of the household. On the other hand, poverty negatively impacts inclusive growth, thus negative sign is associated with it.

3.2. Indicator Selection and Data Sources

The indicators for this dimension are slightly different from the indicators used in the original framework (2016) as they were suitably modified to incorporate those indicators which are collected at the district level in Punjab. Income-MPCE indicator in the original study (2016) was replaced by the estimated per capita Median HH Income indicator. Similarly, another variable i.e., GNI per capita is not reported at the district level in Pakistan. To cater to this problem, a proxy of the living standard dimension of the global Multidimensional Poverty Index (MPI) was used in the UNDP report (2017) for developing Pakistan Human Development Index. A similar proxy can be applied in this study. However, the indicators included in the living standard dimension of MPI are already being covered by the Amenities dimension of the selected framework, thus, this indicator has been dropped to avoid repetition. Lastly, the employment rate, which represents the participation of the labour force in the process of growth resulting in inclusive development (Aggarwal, 2021), is also added to the economic dimension.

Similarly, indicators of amenities and gender equity and financial inclusion dimensions have negative and positive impacts on inclusive growth. In the gender equity

and financial inclusion dimension, to replace the percentage of women in LWF used in the original study (2016), another suitable indicator was used which is calculated in Pakistan at the district level i.e. the proportion of employed women who are registered under Punjab Employees Social Security Institution (PESSI) for social security benefits. Moreover, health and education expenditures have a positive impact on inclusive growth (Mushtaq & Zaman, 2021). Thus, literacy rate, immunisation rate, and household satisfaction level with healthcare facilities (BHUs) are positively associated with inclusive growth, while the infant mortality rate indicator has a negative hypnotised relationship with inclusive growth. In this dimension, the life expectancy indicator was replaced by two indicators, which are 'child immunisation rates (aged 12 to 23 months)' and 'self-reported satisfaction with healthcare facility (BHUs)'. These were also used in the UNDP Report 2017 for Pakistan Human Development Index as a proxy for the life expectancy indicator, which is not measured in Pakistan at the district level. In addition to this, the crime rate indicator included in the sustainability dimension of the original framework was shifted to the Governance dimension, where it seemed more suitable. The incidence of major crimes is also identified as a major Pakistan-specific governance indicator (Pasha & Ghaus-Pasha, 2010).

District-level public sector 'per capita allocation of development expenditure' is another indicator added to measure the governance dimension, which is an indicator of the non-inclusive and inequitable distribution of development budget among districts (Naveed & Khan, 2018).

The former negatively affects inclusive growth. While the latter has a positive association with inclusive growth (Naveed & Khan, 2018). Lastly, for the sustainability dimension, the 'air quality' indicator is not measured regularly at the district level in Punjab. Thus, six proxy indicators are used in its place which were also used in a recent study for constructing an urban sustainability index for Punjab (Ghalib, Qadir, & Ahmad, 2017). These indicators are 'cultivated area (area under agriculture)', 'number of industries', and 'number of registered vehicles' to identify the negative impact of air quality on inclusive growth, as well as 'percentage of households with fluoride concentration in drinking water' and 'percentage of household with fluoride concentration in drinking water' to identify the negative impact on human health, which in turn affect the overall inclusive growth.

All the selected indicators contribute to inclusive growth in one way or another. More government expenditure on education, health, and social security, improving the access of amenities to households, improved law and order situation, better environment would reduce inequalities and boost the growth and welfare of the people (Aggarwal, 2021). Moreover, all the proxies used in the study are already in use for the construction of global and regional indexes, thus ensuring the robustness to use these indicators. Data against the indicators was retrieved from secondary sources including national and provincial reports such as Pakistan Social and Living Standards Measurement (Pakistan Bureau of Statistics (PBS), 2019-20), Punjab Multiple Indicator Clusters Survey (Bureau of Statistics (BOS), 2017-18), Population Census 2017 and the Urban Unit database (The Urban Unit, 2015). A complete list of indicators along with their associated hypothesised relationship, data sources, and descriptions are listed in the Appendix (Table A1).

3.2. Methodology for Construction of Composite Index

Following the OECD's Handbook of Composite Indices (OECD, 2008), the study uses min-max approach for normalisations of indicators. This approach offers the advantage of using indicators with different metrics (e.g., mortality rates and length of roads) and with values of huge variation, to be put on the same scale for comparison purposes. For standardisation of data, the following formula was applied to obtain the normalised values of indicators lying between 0 and 1:

$$\text{Normalised Indicator} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}} \quad \ldots \quad \ldots \quad (1)$$

$$\text{Normalised Indicator} = \frac{\text{Actual Value} - \text{Maximum Value}}{\text{Minimum Value} - \text{Maximum Value}} \quad \ldots \quad \ldots \quad (2)$$

The variables, which were hypothesised to contribute positively to inclusive growth, were normalised using Equation 1 whereas those indicators which were on a negative scale, were normalised using Equation 2.

This step was followed by weighted aggregation using Principal Component Analysis (PCA), for assigning of weights to indicators and their corresponding dimensions in the composite index. While Kaiser-Meyer-Olkin (KMO) and Bartlett tests were applied to validate the factor analysis for statistical accuracy, using the following formulas:

$$\text{KMO} = \frac{\sum_{i \neq j} r_{ij}^2}{\sum_{i \neq j} r_{ij}^2 + \sum_{i \neq j} u_{ij}^2} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

where r_{ij} is simple correlation and u_{ij} is a partial correlation.

$$\text{Barlett test} = \frac{(\text{N}-\text{k}) \ln(\text{S}_\text{p}^2) - \sum_\text{i}^\text{k} (\text{n}_\text{i}-1) \ln(\text{S}_\text{i}^2)}{1 + \frac{1}{3(\text{k}-1)} \left(\sum_{\text{i}=1}^\text{k} \frac{1}{(\text{n}_\text{i}-1)} - \frac{1}{\text{N}-\text{k}} \right)} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

where s is the variance, N is the total sample size, k is the number of groups, and Sp is pooled variance.

Weighted aggregation using multi-stage PCA was used in the study where the weights for both the six dimensions, as well as the indicators or sub-indices of each dimension, was determined. In the first stage, the PCA was employed to develop sub-indices or dimensions, using the following formula:

$$\text{Dimension} = \sum(\text{w}_\text{i} \times \text{indicator}_\text{i}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

Where w_i= weight of *ith* indicator, i = 1 … n and n = No. of Indicator in each (*i*th) dimension

For the second stage of PCA, the resulting scores of each dimension were aggregated and subsequently normalised using Equation 1, to derive the final composite Inclusive Growth Index (IGI). Normalisation was done to transform the final composite scores into a comparable index score, which ranges from zero to one, and where values closer to zero denote less inclusive growth whereas values closer to one represent high inclusive growth. Thereafter, data was processed in Geographical Information Systems (GIS) to prepare a map of the Punjab district to spatially highlight the level of inclusive growth.

4. RESULTS AND DISCUSSION

This section reports the main findings of the study and the resultant ranking of each district of Punjab as per the Inclusive Growth Index (IGI). Before employing the Principal Component Analysis (PCA), a correlation test was conducted and a high correlation was found between two indicators of the Amenities Dimension, which are the 'percentage of household with a source of lighting: Electricity' and 'percentage of household with materials used for the wall: Burnt bricks/blocks. Thus, the latter was dropped, and the remaining 22 indicators were finalised for the composite score. The matrix for the correlation test for each dimension is given in the Appendix.

Table 1 highlights the descriptive statistics including mean, median, standard deviation, and number of observations. The table shows that the 'number of vehicles' indicator has the highest mean value, while the 'per capita allocation of development expenditure' indicator has the lowest. The mean and median are almost the same. Moreover, almost all the variables have low standard deviation, with low variation and consistency in the data.

Table 1

Descriptive Statistics

	Dimensions and Sub-indices	Hypothesised Relationship	Obser-vations	Mean	Median	Standard Deviation
	Economic Dimension					
1	Median HH Income (Per Capita)	positive	36	0.49	0.56	0.28
2	Employment rate	positive	36	0.57	0.63	0.26
3	Multi-dimensional poverty index (MPI)	negative	36	0.63	0.63	0.25
	Amenities Dimension					
4	Percentage of households with source of lighting: Electricity	positive	36	0.29	0.15	0.31
5	Percentage of households with improved source of drinking water	positive	36	0.83	0.90	0.22
6	Percentage of households with toilet facility	positive	36	0.88	0.96	0.20
7	Percentage of HH by material used for roof: RCC/RBC	positive	36	0.82	0.92	0.25
8	Metalled Roads Length (kilometres)	positive	36	0.29	0.24	0.21
	Gender Equity & Financial Inclusion Dimension					
9	Percentage of female population that has ever attended school	positive	36	0.53	0.51	0.26
10	Percentage of households where at least one member owns or has an account in a bank, post office or national saving center	positive	36	0.39	0.35	0.22
11	Proportion of employed women who are registered under PESSI for social security benefits	positive	36	0.22	0.11	0.24
	Human Development Dimension					
12	Literacy Ratio	positive	36	0.51	0.49	0.27
13	Immunisation	positive	36	0.53	0.56	0.27
14	Percentage distribution of household satisfaction with: health facilities (BHUs)	positive	36	0.65	0.72	0.28
15	Infant Mortality Rate (IMR)	negative	36	0.55	0.57	0.24
	Governance Dimension					
16	Per capita allocation of development expenditure	positive	36	0.09	0.06	0.16
17	Crime rate (per 100,000 population)	negative	36	0.78	0.79	0.17
	Sustainability Dimension					
18	Cultivated Area (Area under Agriculture)	positive	36	0.40	0.33	0.28
19	Percentage of HH with fluoride concentration in drinking water	negative	36	0.76	0.84	0.22
20	Percentage of HH with arsenic concentration in drinking water	negative	36	0.78	0.90	0.27
21	Number of industries	negative	36	0.91	0.97	0.19
22	Number of vehicles	negative	36	0.92	0.97	0.17

Then Principal Component Analysis (PCA) was conducted to determine the weights of indicators, followed by KMO and Bartlett's Test. KMO measures a value greater than 0.5 i.e. 0.75 for the composite index, ensuring sampling adequacy for PCA. Similarly, Bartlett's Test of Sphericity for composite index is significant at 0.00 level of significance showing that PCA can be applied to this dataset. Since the stated objective of the current analysis is to use the extracted factors to determine the weights of the indicators and not to reduce the choice of the indicators, and these indicators are important from a policy perspective, thus the study has applied both the tests and ensured that either the KMO is more than 0.5 or the Bartlett statistics is significant. The results of these tests satisfy the prerequisites which are considered acceptable within statistical literature (Sian Hoon Teoh, 2010; Fransena, 2019; Abraham Y. Owinoa, 2014).

Table 2

Results of KMO and Bartlett's test

	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	Bartlett's Test of Sphericity	
Test		Approx. Chi-Square	Sig.
Dimensional Sub-indices			
Economic Dimension	0.6	36.7	0.0
Amenities Dimension	0.6	107.3	0.0
Gender Equity and Financial Inclusion Dimension	0.6	26.6	0.0
Human Development Dimension	0.6	23.4	0.0
Governance Dimension	0.5	34.7	0.0
Sustainability Dimension	0.5	19.3	0.0
Composite Index	0.75	98.6	0.0

Source: Authors' calculation using PCA.

Stata 16.0, which is the standard statistical software, was used to run the PCA, which gives an option to the user to define the number of principal components which are to be extracted. As per the OECD handbook for composite index (OECD, 2008), all factors with eigenvalues below 1.0 (Kaiser criterion) were dropped to extract the components for assigning weights. The eigenvalue for each principal component indicates the percentage of variation in the total data explained. The Kaiser criterion was utilised for both stages of the PCA process. The table below shows the selection of eigen value for the weighting of dimensions or sub-indices to calculate the final composite score.

Table 3

Selection of Eigen Values

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3.20479	2.16043	0.5341	0.5341
Comp2	1.04436	.216121	0.1741	0.7082
Comp3	.828237	.265358	0.1380	0.8462
Comp4	.562879	.333354	0.0938	0.9400
Comp5	.229525	.0993172	0.0383	0.9783
Comp6	.130208		0.0217	1.0000

Table 3 lists the finalised indicators and their respective weights calculated from the factor score generated through PCA analysis. Different weights to different dimensions highlight varying impacts on inclusive growth. It can be concluded that median HH income (per capita), employment rate, the incidence of poverty, per capita allocation of development expenditure, and crime rate (per 100,000 population) included in the Economic and Governance dimension will bring a greater change in inclusive growth of a district, as compared to other indicators. Apart from economic factors, other factors such as health and education which are represented in the human development dimension in this study, also contribute to improvement in living standards and inclusive growth of a region.

Table 4

Weightage as per Principal Component Analysis (PCA)

	Dimensions/Indicators	Weights
	Economic Dimension	20%
1.	Median HH Income (Per Capita)	7.2%
2.	Employment rate	4.9%
3.	Incidence of poverty	8.0%
	Amenities Dimension	19%
4.	Percentage of households with source of lighting: Electricity	3.3%
5.	Percentage of households with improved source of drinking water	3.1%
6.	Percentage of households with toilet facility	4.7%
7.	Percentage of HH by material used for roof: RCC/RBC	3.9%
8.	Metalled Roads Length (kilometers)	3.0%
	Gender Equity & Financial Inclusion Dimension	18%
9.	Percentage of female population. that has ever attended school	8.8%
10.	Percentage of households where at least one member owns or has an account in a bank, post office or national saving center	8.7%
11.	Proportion of employed women who are registered under PESSI for social security benefits	0.4%
	Human Development Dimension	8%
12	Literacy Rate	1.2%
13	Immunisation	1.1%
14	Percentage distribution of household satisfaction with BHUs	4.7%
15	Infant Mortality Rate (IMR)	0.9%
	Governance Dimension	27%
16	Per capita allocation of development expenditure	13.7%
17	Crime rate (per 100,000 population)	13.7%
	Sustainability Dimension	8%
18	Cultivated Area (Area under Agriculture)	1.2%
19	Percentage of HH with fluoride concentration in drinking water	2.2%
20	Percentage of HH with arsenic concentration in drinking water	1.4%
21	Number of industries	1.1%
22	Number of vehicles	1.9%

After assigning weights, a composite index was constructed and the resultant ranking of each district of Punjab was established as per the Index. The study classified all 36 districts of Punjab into three quintiles to highlight different levels of inclusive growth, based on descending order of weighted factor scores. According to the ranking, the top 12 districts are rated as out-performing districts for inclusive growth, the middle 12 districts as average-performing districts and the last 12 as lagging districts. The ranking of districts as per the Inclusive Growth Index (IGI) is given in the table below. Rajanpur district having the least inclusive growth is assigned the score of 0.00, while the top performing district for inclusive growth, i.e. Lahore has been assigned the value of 1.00.

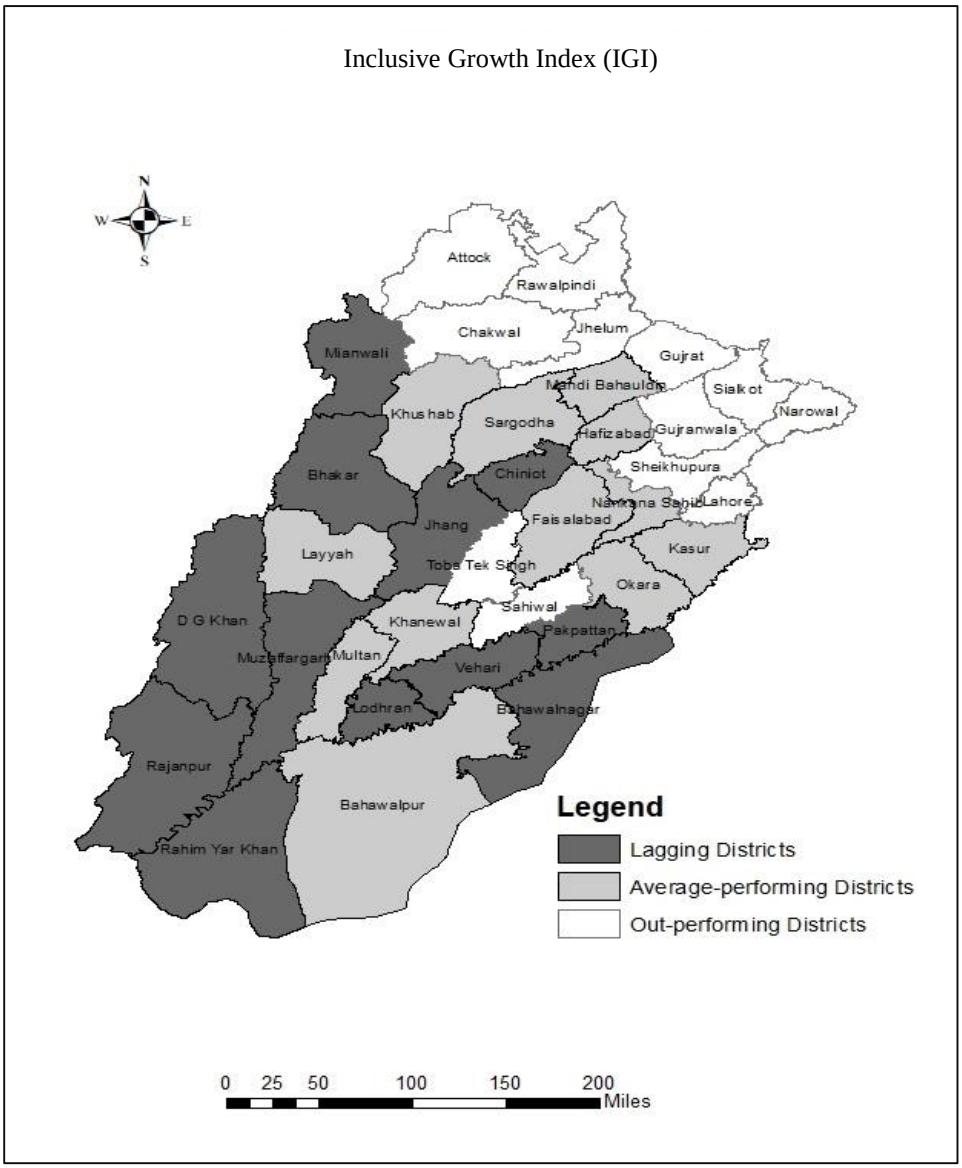
Table 5

District Ranking based on Inclusive Growth Index (IGI)

Districts	Composite Index Score	District Rank
Top quartile including out-performing districts		
Lahore	1.00	1
Rawalpindi	0.96	2
Chakwal	0.95	3
Gujrat	0.92	4
Attock	0.92	5
Gujranwala	0.85	6
Jhelum	0.81	7
Narowal	0.79	8
Sialkot	0.76	9
Toba Tek Singh	0.70	10
Sahiwal	0.69	11
Sheikhupura	0.66	12
Middle Quartile Including Average Performing Districts		
Sargodha	0.65	13
Mandi Bahauddin	0.64	14
Okara	0.62	15
Bahawalpur	0.61	16
Khanewal	0.58	17
Kasur	0.57	18
Khushab	0.56	19
Faisalabad	0.56	20
Multan	0.54	21
Nankana Sahib	0.53	22
Layyah	0.52	23
Hafizabad	0.51	24
Bottom Quartile Including Lagging Districts		
Jhang	0.49	25
Pakpattan	0.49	26
Rahim Yar Khan	0.46	27
Vehari	0.45	28
Bahawalnagar	0.45	29
Lodhran	0.42	30
Mianwali	0.41	31
Dera Ghazi Khan	0.39	32
Bhakkar	0.38	33
Chiniot	0.36	34
Muzaffargarh	0.23	35
Rajanpur	0.00	36

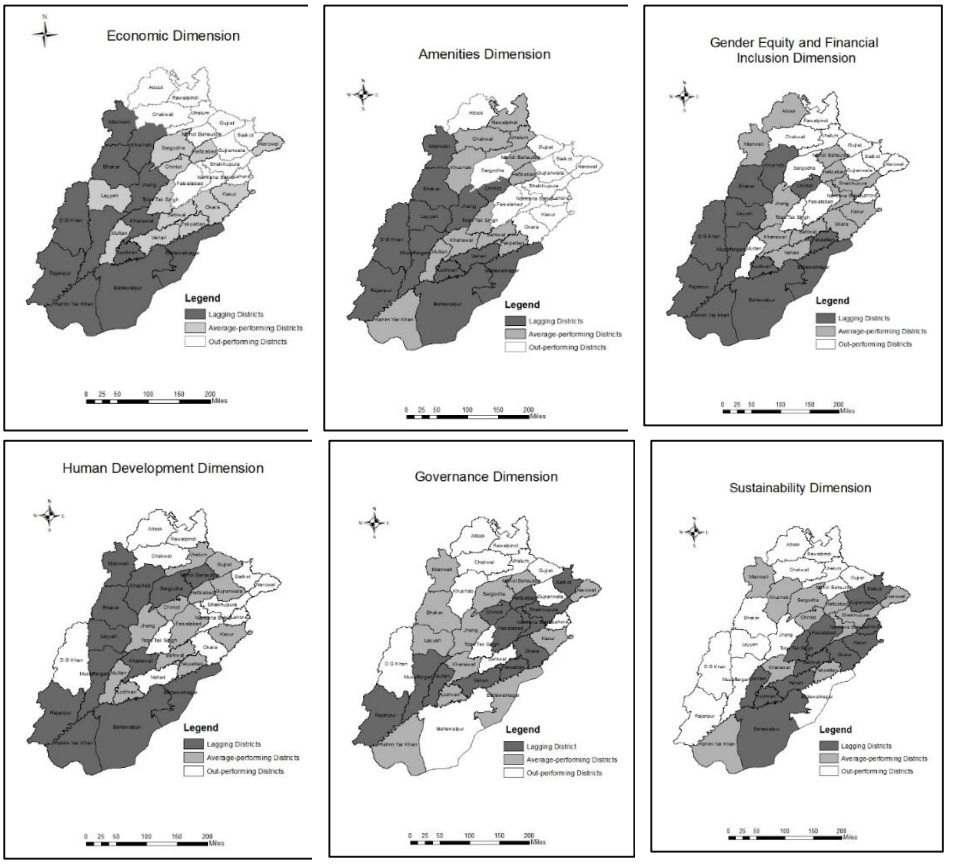
While the spatial dispersion of inclusive growth across 36 districts of Punjab is displayed in Figure 2. It can be observed that central and northern districts of Punjab such as Lahore, Gujrat, Rawalpindi, Attock, Chakwal, Sialkot, Jhelum, Sheikhupura, Narowal, Gujranwala, Gujrat, Toba Tek Singh and Sahiwal are scoring high on Inclusive Growth Index. Major determinants leading to a high level of inclusive growth in these districts are high median HH income (per capita), higher employment rate, lower incidence of poverty, and higher per capita allocation of development expenditure. The study also underpins the districts which lagging in terms of social inclusion such as Muzaffargarh, Bhakker, Mianwali, DG Khan, Rajanpur etc.

Fig. 2. Inclusive Growth Index and District Ranking



For a deeper analysis of districts' performances, separate maps of each dimension are also included to explain regional variations in inclusive growth in lower levels in Punjab (see Figure 3). According to the rankings established by the composite index, higher inclusive economic growth is generally observed in more advanced districts with a high level of literacy rate and participation of women in the labour force such as in Rawalpindi and Gujrat. On the other hand, a high incidence of poverty and a lower employment rate is causing less inclusive growth in lagging districts like Rajanpur and Muzaffargarh.

Fig. 3. District Performance in Each Dimension



The economic dimension of the index shows that there is a combination of higher employment rates, lower incidence of poverty, and higher medium HH income in the districts of Lahore, Attock, Rawalpindi, Chakwal, Jhelum, Mandi Bahauddin, Gujrat, Sialkot, Gujranwala, Sheikhupura, Nankana Sahib and Faisalabad, which are leading to higher inclusive growth. Similarly, the Amenities dimension shows that there is a combination of higher percentages of households with electricity, water and toilet, strong housing material, and metalled roads in Lahore, Gujrat, Sialkot, Gujranwala, Sheikhupura, Narowal, Sargodha, Kasur, Gujrat and Okara, which are leading to higher inclusive growth. The Gender Equity and Financial Inclusion Dimension identifies that there is a combination of a large number of literate women, a large number of women in the labour working force, and a higher number of

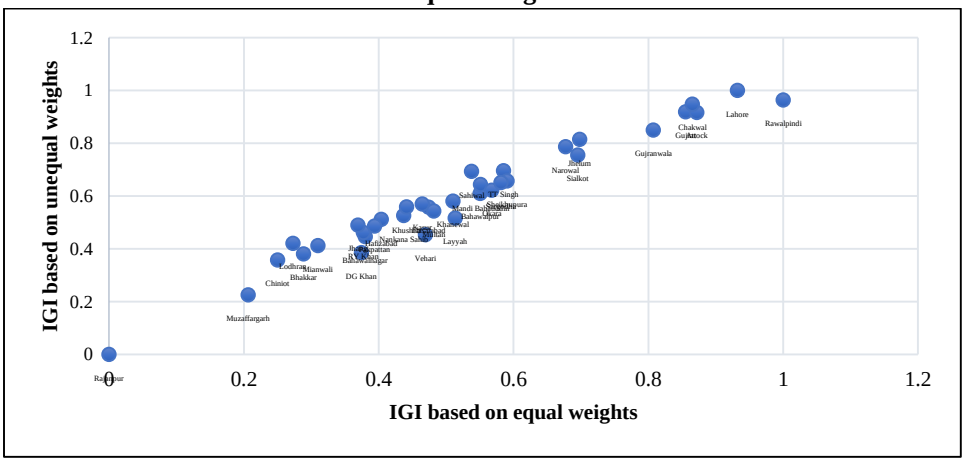
households with an account in a bank in Lahore, Rawalpindi, Chakwal, Jhelum, Gujrat, Gujranwala, Toba Tek Singh, Multan, Narowal, Sialkot, Sargodha and Faisalabad which are leading to higher inclusive growth. Similarly, the human development dimension shows that there is a combination of high literacy rate, immunisation, HH satisfied with Basic Health Units (BHUs), and low levels of infant mortality rates in the districts of Lahore, Attock, Rawalpindi, Chakwal, Sialkot, Narowal, Sheikhupura, Nankana Sahib, Okara, Pakpattan, Toba Tek Singh, Vehari and Dera Ghazi Khan, which are leading to higher inclusive growth. The governance dimension highlights that there is a combination of high per capita allocation of development budget and low crime rate in the districts of Lahore, Attock, Rawalpindi, Chakwal, Jhelum, Khushab, Gujrat, Gujranwala, Toba Tek Singh, Sahiwal, Bahawalpur, and Dera Ghazi Khan.

For the sustainability dimension, it can be seen that major districts, which include the largest cities of Punjab, such as Lahore, Faisalabad, Gujranwala, Multan, Bahawalpur, and Sialkot have lower performance. The rapid expansion of cities and the development of industries, communication, networks, and markets in these major economic hubs can lead to higher levels of air and water pollution. Since 'the air quality' indicator is not measured regularly at the district level in Punjab, 'number of industries', 'cultivated areas' and 'number of registered vehicles' are used to identify the impact of air quality on inclusive growth, as well as the 'percentage of household with fluoride concentration in drinking water' and 'percentage of household with fluoride concentration in drinking water' are used to identify the impact on of water pollution. The sustainability dimension can have a significant impact on inclusive growth; thus these indicators are included. This dimension will be especially useful in emphasising that there should be a control of the growth of industries inside and outside of the urban areas, urbanisation and expansion of cities should be planned, reduction in vegetation cover surrounding the areas should be controlled and pollution from cars should be regulated to reduce air pollution. Efficient distribution of the development budget can play an important role in increasing inclusive growth in Punjab.

It is significant to point out that a high ranking of districts does not mean that there is no need for them to advance further in achieving a higher level of inclusive growth. The exercise of disaggregating the composite score shows that high-ranking districts do not necessarily indicate good performances in all the dimensions. For instance, Lahore is a top-ranked district for inclusive growth, however, it is performing poorly in the sustainability dimension, and thus targeted interventions should be introduced for improving the overall score of Lahore. Similarly, Multan is an economic center of Punjab, yet it is ranking relatively low on the index because of its governance and sustainability dimension.

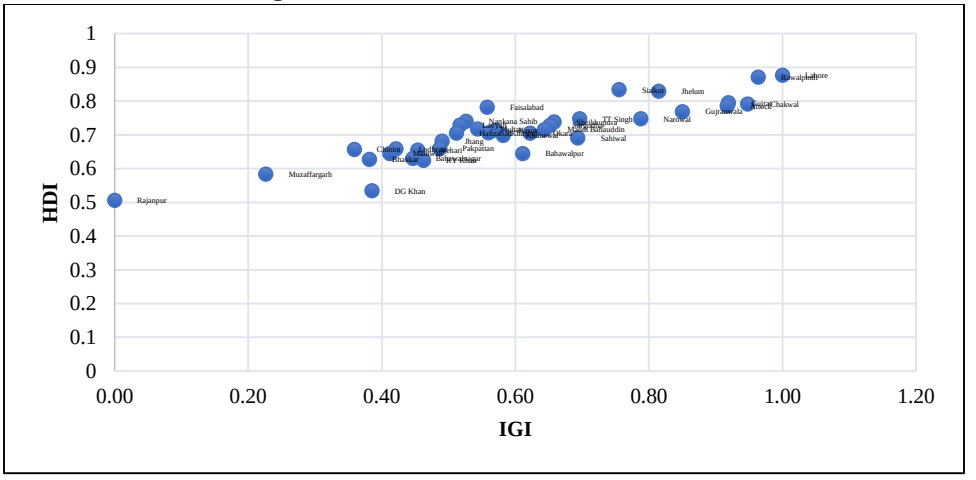
The robustness of the Inclusive Growth Index (IGI) has been tested using different weighting schemes, which is a common approach mentioned in the OECD handbook. For this purpose, an equal weightage scheme was used to construct the IGI, using 0.22 weights for each of the indicators and then comparing both indexes. From Figure 4 it can be seen that the composite index based on equal weights is strongly and positively correlated with the composite index based on unequal weights having a spearman's rank correlation coefficient of 0.98. The results indicate that IGI is not sensitive to the change in weighting pattern.

Fig. 4. Correlation Between IGI Based on Equal Weights and IGI Based on Unequal Weights



The findings of the composite index for inclusive growth have also been validated by the findings of other major studies conducted by the United Nations. As per the OECD handbook, the composite indicators can be linked to other well-known phenomenon to test the explanatory power of the composite index. For instance, the district with Inclusive Growth (IG) might have a good score on Human Development Index (HDI), thus correlating IGI and HDI. From Figure 5, it can be seen that the composite index for inclusive growth is strongly and positively correlated with Human Development Index (HDI) (United Nations, 2017) having a Spearman's rank correlation coefficient of 0.89. Most of the districts are close to the trend line while Dera Ghazi Khan district is an outlier. The best-performing and the worst-performing districts of Punjab districts in the Inclusive Growth Index (IGI) are also listed as the best and worst-performing districts in Human Development Index (United Nations, 2017), thus further validating the robustness of the composite index.

Fig. 5. Correlation between IGI and HDI



This correlation test indicates that the variation in the two data sets is similar, not necessarily casual. It should be emphasised here that the inclusive growth index is closely related to but still is distinct from HDI. Based on only three dimensions, the HDI does not capture the inequality dimension, environmental quality, poverty, human safety, empowerment, and other factors hence, it does not capture inclusive development in its full scope (Dörffel & Schuhmann, 2020). Thus, each index differs significantly and presents different policy recommendations.

Finally, the limitation of the study should be considered when generalising the validity of the scale. Since the study is limited to constructing an Inclusive Growth Index (IGI) for Punjab province, those variables are selected which are publicly available at the district level. Thus, to scale it up to other provinces of Pakistan, the selection of indicators might require adjustments as it will depend on the availability of data in other provinces. However, the index provides a comprehensive framework to identify major thematic areas contributing to inclusive growth.

5. CONCLUSION AND POLICY IMPLICATION

The study has developed a composite Inclusive Growth Index (IGI) for the thirty-six districts of Punjab, to measure the degree of inclusiveness of growth and to examine the main factors contributing to it. Out-performing districts are Lahore, Rawalpindi, Gujrat, Attock, Chakwal, Sialkot, Jhelum, Sheikhupura, Narowal, Gujranwala, Sahiwal, and Toba Tek Singh. Major determinants leading to a high level of inclusive growth in these districts are high median HH income (per capita), higher employment rate, lower incidence of poverty, and higher per capita allocation of development expenditure. The study also underpins various socioeconomic disparities among the districts which are keeping the districts lagging in terms of social inclusion. Thus, it helps identify the areas and indicators responsible for the lower position of a district in social inclusive raking.

Moreover, by disaggregating composite scores into its seven thematic dimensions, policymakers can learn about the differential performances of districts in different sectors. For instance, Rawalpindi has greater success in the human development dimension, hence the pattern of its education and health sectors should be investigated and applied to other districts. Differing experiences of each district can facilitate policymakers for spatial policy learning and can lead to the identification of factors leading to higher inequality so that targeted policies could be designed for the efficient allocation of resources. Furthermore, the best district like Lahore, despite being on top in the overall ranking, is among the worst districts in terms of sustainability. Thus, during the inter-district allocation of the development budget for the environment sector, Lahore must be given priority. It can be seen that districts including the largest cities of Punjab, such as Lahore, Faisalabad, Gujranwala, Multan, Bahawalpur, and Sialkot have lower performance in the sustainability dimension. The rapid expansion of cities and development of industries, communication, networks, and markets in these major economic hubs can lead to higher levels of air and water pollution, thus it can have a significant impact on inclusive growth. This dimension will be especially useful in emphasising that there should be a control of the growth of industries inside and outside of the urban

areas, urbanisation and expansion of cities should be planned, reduction in vegetation cover surrounding the areas should be controlled and pollution from cars should be regulated to reduce air pollution. Efficient distribution of the development budget can play an important role in increasing inclusive growth in Punjab

Globally, the Inclusive Growth (IG) agenda has already started to impact urban and regional policy areas. Although Inclusive Growth Agenda has been included in the Punjab Growth Strategy, there's a need for continuous economic reforms for a higher level of inclusive growth and integration of poverty strategies into the existing policy framework with measurable outcomes, so that the IG agenda does not become a buzzword. However, due to the limited availability of data at lower levels, it is difficult to monitor the inclusivity of growth at the local or district level. The framework for the Inclusive Growth Index (IGI) developed in this study can be replicated and updated every second year (after the release of updated PSLM/HIES) and can be used for the annual assessment of Punjab districts, that can measure the progress of districts against indicators of social inclusions and SDGs. It will help the policymakers and planners to work on those areas and dimensions, which are lacking, to make the districts and regions more socially inclusive. The development expenditures must be targeted towards the district lagging in ranking and on the sectors/dimensions which are poor in the particular region or district. For instance, those districts that are at the bottom in terms of social inclusion such as Bhakkar, Muzaffargarh, Mianwali, DG Khan, and Rajanpur, etc. need to be targeted for social sector expenditures.

Inclusive growth is achievable in Punjab, however efficient public policies would be required to push the country toward achieving a higher level of inclusive growth to mitigate poverty and inequality. Some of the major policy areas can be as below:

- Increasing focus on policies that deliver both economic and social benefits such as the provision of municipal services, improvement of existing health and educational facilities, etc. Investment in infrastructure and human capital will positively impact the level of inclusive growth in the region.
- Improving the social welfare system or introducing new and innovative forms of social protection interventions is an important measure for achieving inclusive growth, as it will mitigate the income and wealth inequalities in the region.
- Employment and literacy rate are important tools for inclusive growth for labour productivity and poverty alleviation. Reforms in the education system and efforts towards employment generation, especially promoting women empowerment, will surely benefit in helping inclusive growth.

Lastly, this paper contributes to the empirical literature on inclusive growth. For future research, the study can be scaled up to cover all districts of Pakistan, for developing a common framework and to align the outcomes with the measurable provincial targets for SDGs. Given the multidimensional nature of this phenomenon, other thematic areas contributing to inclusive growth should also be explored such as the impact of fiscal redistribution, inflation, technological advancement, and informal employment on inclusive growth. The indicator framework may require adjustments in the future as new research and indicators in the field of inclusiveness become available.

APPENDIX

Table A1
Indicator Description and Data Source

Dimension/ Indicators	Hypothesised Relationship	Data Source	Description and Justification of the Selected Variable
Economic Dimension			
Median HH Income (Per Capita)	positive	Est. from PSLM 2019-20	Income-MPCE indicator, used in the IGI framework adopted by Vellala & Chattopadhyay (2016), is replaced by the estimated per capita Median HH Income indicator in this study. The district level data was extracted from the micro data available at the Pakistan Bureau of Statistics (PBS) website using the given processing code and weightages. It is the weighted median of average monthly HH income of each district.
Employment rate	positive	LFS 2020-21	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available. (SDG indicator 1.2.2)
Multi-dimensional poverty index (MPI)	negative	MICS 2017-18	In the latest MICS report, Multi-dimensional Poverty Index (MPI) for each district is given, which represents deprivation in health, education and amenities. MPI complements household-level consumption-based poverty.
Amenities Dimension			
Percentage of households with source of lighting: Electricity	positive	PSLM 2019-20	Per capita consumption of electricity indicator used in the IGI framework adopted by Vellala & Chattopadhyay (2016), is replaced by the percentage of households with the source of lighting: Electricity indicator in this study. District level data is available.
Percentage of households with improved source of drinking water	positive	MICS 2017-18	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Percentage of households with toilet facility	positive	PSLM 2019-20	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Percentage of HH by material used for roof: RCC/RBC	positive	PSLM 2019-20	Pucca Houses indicator used in the IGI framework adopted by Vellala & Chattopadhyay (2016), is replaced by these two indciators in this study. District level data is available
Percentage of HH by material used for walls: Burnt bricks/blocks		PSLM 2019-20	
Metalled Roads Length (kilometres)	positive	Punjab PDS 2021	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available.

Continued—

Table A1—(*Continued*)

Gender Equity & Financial Inclusion Dimension			
Percentage of female population that has ever attended school	positive	MICS 2017-18	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Percentage of households where at least one member owns or has an account in a bank, post office or national saving center	positive	PSLM 2019-20	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Proportion of employed women who are registered under PESSI for social security benefits	positive	Women Economic and Social Wellbeing Survey Punjab 2018-19	% of women in LWF indicator used in the IGI framework adopted by Vellala & Chattopadhyay (2016), was replaced by Proportion of employed women who are registered under PESSI for social security benefits which is more suitable. District level data is available.
Human Development Dimension			
Literacy Ratio	positive	PDS 2021	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Immunisation	positive	PSLM 2019-20	Life expectancy indicator was used in the IGI framework adopted by Vellala & Chattopadhyay (2016). Since it is not measured in Pakistan at district level, UNDP report 2017 for Pakistan Human Development Index used 'child immunisation rates (aged 12 to 23 months)' and 'self-reported satisfaction with healthcare facility (BHUs)' as a proxy for life expectancy indicator. Thus, same proxy is used in this study. District level data is available.
Percentage distribution of household satisfaction with: health facilities (BHUs)	positive	PSLM 2019-20	
Infant Mortality Rate (IMR)	negative	MICS 2017-18	Consistent with the IGI framework adopted by Vellala & Chattopadhyay (2016). District level data is available
Governance Dimension			
Per capita allocation of development expenditure	positive	Punjab ADP 2018	Percentage of development expenditure to total expenditure and percentage of tax revenue to GSDP use in the IGI framework adopted by Vellala & Chattopadhyay (2016), was replaced by estimated per capita allocation of the development expenditure. It is an indicator of non-inclusive and inequitable distribution of development budget among districts (Naveed & Khan, 2018). It was calculated by dividing the proportion of allocated development expenditure of each district by its population.

Continued—

Table A1—(*Continued*)

Crime rate (per 100,000 population)	negative	Est. from Punjab Provincial Development Statistics 2021	Crime rate indicator was included in sustainability dimension of the IGI framework adopted by Vellala & Chattopadhyay (2016), but it was shifted to Governance dimension in this study, where it seemed more suitable. The incidence of major crimes is also identified as a major Pakistan-specific governance indicator (Pasha & Ghaus-Pasha, 2010).
Sustainability Dimension			
Cultivated Area (Area under Agriculture)	positive	Punjab Provincial Development Statistics 2021	For sustainability dimension, 'air quality' indicator was used in the IGI framework adopted by Vellala & Chattopadhyay (2016). However, it is not measured regularly at district level in Punjab. Thus, six proxy indicators are used in its place which were also used in a recent study for constructing an urban sustainability index for Punjab (Ghalib, Qadir, & Ahmad, 2017). These indicators are 'cultivated area (area under agriculture)', 'number of industries' and 'number of registered vehicles' to identify the negative impact of air quality on inclusive growth, as well as 'percentage of household with fluoride concentration in drinking water' and 'percentage of household with fluoride concentration in drinking water' to identify the negative impact on human health, which in turn have an effect on the overall inclusive growth. District level data is available for all these indicators.
Percentage of HH with fluoride concentration in drinking water	negative	National Nutrition Survey (2018)	
Percentage of HH with arsenic concentration in drinking water	negative	National Nutrition Survey (2018)	
Number of industries	negative	Census of Manufacturing Industries (2015-16)	
Number of vehicles	negative	Punjab Provincial Development Statistics 2021	

Inequalities (GNI coefficient) used in the economic dimension of the IGI framework adopted by Vellala & Chattopadhyay (2016), was dropped in this study. As GNI per capita indicator is not reported at the district level in Pakistan. To cater to this problem, a UNDP report (2017) has used a proxy of living standard dimension of the global Multidimensional Poverty Index (MPI) to construct Pakistan Human Development Index. Similar proxy can be applied in this study. However, the indicators included in living standard dimension of MPI are already being covered by the Amenities dimension of the selected framework, thus, this indicator has been dropped to avoid repetition.

Fig. A2. Correlation Test for All Indicators

a) Economic Dimension

```
. corr INC EMP MPI
(obs=36)
```

	INC	EMP	MPI
INC	1.0000		
EMP	-0.3823	1.0000	
MPI	-0.7455	0.5050	1.0000

b) Amenities Dimension

```
. corr ROOF WALL ELEC WAT TOI ROAD
(obs=36)
```

	ROOF	WALL	ELEC	WAT	TOI	ROAD
ROOF	1.0000					
WALL	0.5142	1.0000				
ELEC	0.4409	0.8809	1.0000			
WAT	-0.0072	0.4970	0.3387	1.0000		
TOI	0.7008	0.6587	0.5535	0.1144	1.0000	
ROAD	-0.0393	0.0638	0.0529	0.0488	-0.1117	1.0000

c) Gender Equity and Financial Inclusion Dimension

```
. corr SCH BANK SEC
(obs=36)
```

	SCH	BANK	SEC
SCH	1.0000		
BANK	0.7374	1.0000	
SEC	0.1101	0.0523	1.0000

d) Human Development Dimension

```
. global xlist LIT IMM SAT IMR

. corr $xlist
(obs=36)
```

	LIT	IMM	SAT	IMR
LIT	1.0000			
IMM	0.5401	1.0000		
SAT	0.1257	-0.1525	1.0000	
IMR	-0.4809	-0.3554	-0.0127	1.0000

e) Governance Dimension

```
. corr DEV CRI
(obs=36)
```

	DEV	CRI
DEV	1.0000	
CRI	-0.8029	1.0000

f) Sustainability Dimension

	CUL	FLO	ARS	IND	VEH
CUL	1.0000				
FLO	0.1407	1.0000			
ARS	-0.2409	-0.1854	1.0000		
IND	-0.1424	0.0173	0.0935	1.0000	
VEH	-0.1909	0.2135	0.3284	0.4589	1.0000

Where INC = Median HH Income (Per Capita), EMP = Employment rate, POV = Incidence of poverty, ROOF = Percentage of HH by material used for roof: RCC/RBC, WALL = Percentage of HH by material used for walls: Burnt bricks/blocks, ELEC = Percentage of households with source of lighting: Electricity, WAT: Percentage of households with improved source of drinking water, TOI: Percentage of households with toilet facility, ROAD: Metalled Roads Length (km), SCH: Percentage of female population that has ever attended school and BANK: Percentage of households where at least one member owns or has an account in a bank, post office or national saving center, SEC: Proportion of employed women who are registered under PESSI for social security benefits, LIT: Literacy Rate, IMM: Immunisation, SAT: Percentage distribution of household satisfaction with: BHUs and IMR: Infant Mortality Rate, DEV: Per capita allocation of development expenditure, CRI: Crime rate (per 100,000 population), CUL: Cultivated area (area under agriculture), FLO: Percentage of HH with fluoride concentration in drinking water, ARC: Percentage of Arsenic concentration in drinking water, IND: number of industries, VEH: number of registered vehicles.

REFERENCES

Aggarwal, S. C. (2021). Inclusiveness and the progress of Indian states: Evidence from inclusive development index between 2011 and 2018. *Indian Journal of Human Development*.

Aghion, P., Besley, T., Browne, J., Caselli, F., Lambert, R., Lomax, R., Reenen, J. V. (2013). *Investing for prosperity: Skills, infrastructure and innovation.* LSE Growth Commission, Institute for Government.

Ali, I. & Son, H. H. (2007). Measuring inclusive growth . Asian Development Bank.

Bureau of Statistics. (2018). Multiple indicator clustor survey (MICS) 2017-18. Bureau of Statistics (BOS), Government of Punjab.

Dorosh, A., & Malik, S. (2006). *Transitions out of poverty: Drivers of real income growth for the poor in rural Pakistan.* International Association of Agricultural Economists Conference.

Forum, W. E. (2017). The inclusive growth and development report .

Ghalib, A., Qadir, A., & Ahmad, S. R. (2017). Evaluation of developmental progress in some cities of Punjab, Pakistan, using urban sustainability indicators. Multidisciplinary Digital Publishing Institute (MDPI) Sustainability.

Government of Pakistan (2015). *Pakistan multidimensional poverty index.* Planning Commision. Government of Pakistan.

Igbatayo, S. A., & Awoyemi, B. O. (2014). Exploring inclusive growth and poverty reduction strategies in the BRICS economies: A multi-country study of Brazil, China and South Africa. *Journal of Economics and Finance.*

Kuznets, S. (1995). Economic growth and income inequality. *American Economic Review.*

Lee, N. (2018). *Inclusive growth in Cities: a sympathetic critique.* LSE International Inequalities Institute (III) .

Lee, N. & Sissons, P. (2016). *Inclusive growth? The relationship between economic growth and poverty in British cities.* Environment and Planning A: Economy and Space.

Loungani, P. (2017). *The power of two: Inclusive growth and the IMF.* Leibniz Information Centre for Economics.

McKinley, T. (2010). Inclusive growth criteria and indicators: An inclusive growth index for diagnosis of country progress. ADB Sustainable Development Working Paper Series.

Mushtaq, H. & Zaman, K. (2021). In search of Pakistan's inclusive growth: Evidence from income and non-income dimensions. *Social Change*.

Naveed, A. & Khan, S. A. (2018). Widening disparities: Public sector spending and poverty across districts in Punjab. Pakistan Poverty Alleviation Fund (PPAF*)*.

OECD. (2008). *Handbook on constructing composite indciators: methodology and user guide.* Joint Research Center-European Commision, Organisation for Economic Co-operation (OECD).

Organisation for Economic Co-operation and Development (OECD). (2014). *All on board: Making inclusive growth happen.* Paris: OECD: All on board: Making inclusive growth happen.

Pakistan Bureau of Statistics (PBS). (2017). *Population census.* Bureau of Statistics (BOS), Government of Pakistan.

Pakistan Bureau of Statistics (PBS). (2019-20). *Pakistan social and living standards measurement (PSLM).* Government of Punjab.

Pasha, D. H., & Ghaus-Pasha, D. A. (2010). Baseline research on governance indicators in Pakistan. Institue of Public Policy. Beaconhouse National University.

Planning & Development Board (2015). Punjab growth strategy 2018: Accelerating economic growth and improving social outcomes. P&D Board. Government of Punjab.

Prada, A. & Sánchez-Fernández, P. (2019). Transforming economic growth into inclusive development: An international analysis. *Social Indicators Research*.

Shearer, R., John NG, A. B., & Friedhoff, A. (2016). Metro monitor. Tracking growth, propperity and inclusion in the 100 largest U.S. Metropolitan Areas. The Brookings Institution. Mrtropolitan Policy Programme.

The Urban Unit (2015). Punjab spatial strategy (PSS) 2047. The Urban Unit, Planning and Development Department Board, Government of Punjab.

UN (2016). *New urban agenda*. New York: United Nations.

United Nations (2017). *Pakistan Human Development Index*. United Nations Development Programme (UNDP).

Vellala, P. S., & Chattopadhyay, U. (2016). *The development of composite index for exclusive economic growth: An Indian perspective.* International Journal of Economic Perspectives.

World Economic Forum (2018). *The inclusive growth and development report.* The Insight Report.