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Spatial Inequality: A Case-Study of Megacity Karachi

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Abstract

Inequality of income and wellbeing is not only unjust but also detrimental for social cohesion. Global and national inequalities have received considerable attention; however spatial inequalities, within cities are of equal concern. Spatial inequality reinforces social inequality because access to economic, social, and cultural capital is shaped by location. Such disparities within cities can be socially destabilizing, leading to political discontent and conflict. This paper examines the extent of inequality in Karachi, Pakistan's largest metropolitan city. It goes beyond income and takes a multidimensional approach to inequality while situating it in the spatial configuration of the city. Using a unique data set that enables neighborhood-level analysis, the paper constructs an index of wellbeing based on measures of income, living environment conditions, education, employment, and asset holdings. It maps these dimensions across Karachi's neighborhoods revealing how spatial inequalities contribute to the peripheralization of certain social groups. Peripheries not only face restricted access to opportunities and resources but also experience increased social unrest. The paper contributes to our understanding of peripheralization by demonstrating how hierarchies between urban centers and peripheries sustain urban inequality. Ultimately, it underscores the importance of analyzing spatial disparities to deepen our understanding of social inequality and inform policy interventions.

Key Words Urban Inequality, Spatial Inequality, Karachi, Megacity, Peripheralization

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1- Introduction

In 2007, for the first time in history more than half the world's population was living in cities. This proportion is expected to grow as projections indicate that 68% of the world's population will be urbanised by 2050 (DESA, 2018). Urbanization trends vary across countries and recent estimates show that large cities in the low-income and lower-middle-income countries had the highest urban population growth (Sun, Chen, Li, & Huang, 2020). The trend for ever increasing urbanization of the world's population poses many new and growing issues related to urban prosperity. Issues of increasing urban inequality, disparities in access to public services, and wellbeing of citizens remain strong challenges. These problems are of much higher concern in middle- and low-income countries of the Global South where the rapid internal migration to cities has not been matched with infrastructure development or increase in employment opportunities. Consequently, high slum populations are a distinct feature of megacities in the Global South (Davis, 2013).

Recent evidence shows that as cities grow, they become more unequal (Sarkar, 2019). Inequality in the city leads to social exclusion, limited access to opportunities, and increase in urban violence and crime (Routledge, 2010). Although there has been a shift towards understanding inequality as a multidimensional concept which incorporates the human capabilities approach, a spatial understanding of inequality remains underdeveloped. While it is well known that cities generate durable inequalities, how urban topographies contribute to sustaining these inequalities poses an important research agenda.

This paper examines urban inequality in Karachi, Pakistan's largest metropolitan city and 12th largest megacity in the world. Karachi plays a critical role in Pakistan's economy and politics but is marked by stark disparities in wealth, access to resources, and overall wellbeing. The paper adopts a multidimensional, spatial approach to urban inequality and uses unique dataset that allows for neighborhood-level analysis. First, the paper provides estimates of income inequality in Karachi using Gini Coefficient and Palma ratio. Second, it constructs a wellbeing index using dimensions such as income, living conditions, education, employment, and asset holdings. Third, it maps these different dimensions of wellbeing across cross different neighborhoods of Karachi.

The analysis shows that areas closer to the center show high levels of wellbeing compared to the urban periphery. A breakdown of different dimensions of inequality shows that income inequality is highest followed by employment and education. Inequality along dimensions of asset holdings such as possession of basic home appliances and living conditions such as access to tap water, electricity, toilet facility etc. are relatively low.

However, areas in the urban periphery demonstrate consistently low levels of income, education, and public services. Industrial towns like Korangi, Malir, and Landhi, despite low income and education levels, exhibit higher employment rates, whereas peripheral areas such as SITE and Baldia fare poorly across income, education, and employment. Middle-income areas such as North Nazimabad, Gulshan-e-Iqbal, Saddar, and Gulberg show high levels of education and yet employment rates in these areas are lower compared to low-income areas such as Malir, Landhi, and Baldia. However, it must be noted that these estimates may underreport inequality because of unavailability of data on people at the extremes such as the elite and those who live in slums. Nonetheless, the paper shows how proximity to the center mediates access to income, education, and job opportunities. It contributes to our understanding of peripheralization by illustrating how hierarchies between urban centre and periphery contribute to sustaining urban inequality (Kühn, 2015).

2- Urban Inequality: A Spatial Approach

While urbanization brings diversity, economies of scale, and capacities for innovation, it also generates negative externalities, such as ecological, economic, and social challenges. As cities expand to accommodate growing populations, the resulting concentration of people frequently comes at the expense of life quality. Overcrowding, coupled with unemployment and deprivation, often manifests in rising crime rates, particularly at the neighborhood level. Furthermore, urban concentration drives up housing and commuting costs while exacerbating pollution, disease exposure, and other social ills. These challenges are compounded by rapid economic development, which tends to intensify inequalities.

Scholars of intersectionality have stressed how inequality is linked to multiple, overlapping identities and experiences, which are spatially situated and reproduced (Mollett & Faria, 2018). A multidimensional approach to inequality must therefore account for how the city as a space of human activity generates, reproduces, or mitigates inequality. Neighborhoods within the cities often exhibit distinct characteristics, with poverty, demographic characteristics, educational attainment, skills and economic structure tend to cluster specific areas.

Spatially differentiated growth of a city can generate socio-economic segregation and disparities as witnessed in case of many European capital cities (Gentile, Tammaru, & van Kempen, 2012) as well as cities of Latin America (Mateos & Aguilar, 2013). Such spatial differentiation and residential segregation can further accentuate inequalities by limiting access to opportunities for education, employment, and health facilities and generate patterns of social exclusion (Nijman & Wei, 2020). While urban spatial topographies and physical infrastructure can contribute to material marginalization and exclusion, they also reinforce symbolic boundaries and restrict access to the "right to the city" (Harvey, 2020). Spatial disparities in economic activity, income and social, indicators when aligned

with ethnic and political tensions result in instability. Uneven material conditions within the city not only exacerbate socio-economic inequalities they also contribute to social stigmatization and create conditions of conflict (Baumann & Yacobi, 2022). When spatial inequalities go up, other things being equal, national inequality also goes up (Lens, 2022).

Inequality within cities have major sociopolitical implications as it can contribute to social polarization, political unrest, crime, and violence (Østby, 2016). Urban inequality stifles innovation, limits opportunity and is a barrier to social cohesion. These problems become politically sensitive if disparities are related to discrimination against ethnic groups, migrants in certain areas or religious groups in particular regions. In most cases the fault lines of urban exclusion are drawn by class, race ethnicity and religion (Gay et al., 2009). Spatial disparities within cities can further destabilize society, particularly when they spark conflicting political interests or dissatisfaction with economic welfare. Highly segregated cities, where rich and poor neighborhoods exist in stark contrast, are more likely to experience rising crime rates (Kang, 2016). These problems are particularly acute in the Global South cities where urbanization has remained decoupled from growth, and cities have become home to surplus population employed in low-wage and informal sectors (Mabin, 2014). Unlike the Global North where industrialization contributed to urbanization and economic growth, cities of the Global South have expanded because of neoliberal policies in the agriculture sector that pushed rural population to urban centers.

Big cities such as megacities – urban areas with a population of 10 million or more. (DESA, 2018) are more unequal than smaller cities. Megacities specifically have the political, economic and social dominance over their surrounding area, for example across urban centres and peripheries into outlying exurban locales. They concentrate, embed and reproduce disparities that occur at national level. Since megacities have large functional areas with multiple towns and diversity in their political geography, it is very difficult to achieve social and political cohesion over the whole functional region of the megacities (Storper, 2014). This makes their socio-political situation of utmost importance in relation to the regional as well as national settings.

It is estimated that by 2050, ten percent of world population will be living in megacities– Currently, 27 out of the 33 megacities in the world are in developing countries (Smit, 2021). Megacities have distinct spatial forms, and they expand into their hinterlands assimilating other areas as part of their geographic spread effects. They typically possess multiple centres and dominate their surrounding areas in terms of generating employment and nurturing innovation. Their powerful economies of scale are lucrative for business and also important for their rural surroundings as they provide large consumer markets and employment opportunities. However, megacities in the Global South, owing to their rapid growth, have not been able to match infrastructure requirements often resulting in high costs of service provision, as well as problems of exclusion and deprivation (Gay et al., 2009).

Since inequality within cities constitutes a significant challenge to urban prosperity, there is a need to develop concepts and measures that go beyond a narrow focus on income inequality and incorporate spatial disparities in living conditions, access to public services and socio-economic opportunities. Such a spatial analysis can explain the nature of spatial disparities and identify geographic sites that lag behind in relation to other areas. Since our individual wellbeing is not just about outcomes of one individual (neighborhood, town or district) but also about the relative position vis-à-vis other individuals in the distribution (Ferrer-i-Carbonell, 2005; Ravallion & Lokshin, 2010), a multidimensional and spatial approach can provide insights on who has the right to the city and who is excluded. How does urban infrastructure and geography provide prospects of prosperity for some while limiting those for others? And how can a place-based approach help devise policies which lead to prosperity for all residents of the city.

In the next section I take the case of mega-city Karachi, Pakistan to illustrate the concept and measurement of urban inequality from a multidimensional perspective. The analysis not only shows not how inequality is spatially distributed in Pakistan's megacity Karachi, but also how the different dimensions of inequality manifest in the urban landscape of Pakistan's megacity.

3- The Megacity of Karachi

Pakistan is the country with highest urbanization rate in South Asia and urban population is 37 percent of the total population (Pakistan, 2022-23). While these are estimates by the government, independent analysts claim that 55 percent of population in Pakistan is living in areas which have urban characteristics (Bajwa, 2013). Karachi is the largest city of Pakistan and currently the only port. It contributes 20 percent of Pakistan's gross domestic product (GDP) and 50 percent of the country's revenues (Arif Hasan, 2022). It has a 23 percent share of the urban population of the country but contributes as much as 46.75 percent to the national direct tax collection (SPDC, 2014-15). Beyond being an important city for the national economy, it is an important revenue base for the province of Sindh. Karachi contains 60 percent of Sindh urban population and 30 percent of Sindh's total population. The city's industrial sector employs 71.6 percent of the total industrial labour force in Sindh and produces 74.8 percent of the province's total industrial output. It also holds 78 percent of its formal private sector jobs (Hasan, 2016). Owing to its large population it is Pakistan's primate city.

Karachi has a unique position in the country as it is home to diverse ethnicities, and it represents Pakistani society in the most profound ways. It attracts migrants not only from other parts of Pakistan but also from Afghanistan, Bangladesh and Burma. The first wave of migrants arrived in the city at the time of partition in 1947. The city had 61.2 percent of Sindhis, but with an influx of over 600,000 refugees the city changed dramatically. By 1951 the Sindhi speaking population had shrunk to 8.6 percent while the Urdu speaking population was 50 percent. The city kept attracting migrants especially during the Afghan

war and also later during the Taliban crises and earthquake in the province of Khyber Pakhtunkhwa. According to 2018 census, Karachi's population increased to 16 million at an average of 2.59 percent (324,661.89 persons) per year. The intermittent waves of migration have had an overwhelming impact on the culture, politics and development of the city.

Like many megacities, Karachi faces problems of infrastructure, poor service delivery and housing shortages. The city's density is persistently increasing creating severe environmental problems (Arif Hasan, 2022). There is a severe shortage of housing, water and public transport. According to some estimates there are 702 informal settlements and slums in the city which are located within the inner city as well as in peripheral areas (Hasan et al., 2013). The city does not have a functional public transport system. The number of public transport registered buses has seen a persistent decline. Eighty percent of the registered vehicles in the city are private, which shows that the poor, who do not own personal vehicles have lowest access for commute (Hoor-Ul-Ain, 2019). Education and health facilities provided by the state are being rapidly replaced by the private sector and the quality of these public services is persistently low. This has resulted in deepening inequalities in access to quality education and health.

Karachi has frequently been a hotspot for political violence for three main reasons. First, its strategic location in the era of the Afghan war in the 1980s and for the national development projects like China-Pakistan Economic Corridor (CPEC) has made it a city where different regional interests converge. Second, its dominant economic role for Pakistan and specifically for Sindh make it a lucrative site for illicit activities such as extortion, kidnapping, and drug trade; and third, its ethnic composition that is much more diverse than any other city of the country makes it vulnerable to political mobilization. These factors make it an important city for the overall stability and economic growth of the country.

Infrastructural incapacities, high population density, and ethnic diversity have contributed to the spatial segregation and by extension political turf wars. The city has morphed into an archipelago of enclaves, and continues to be drawn into a vortex of violence (Kaker, 2014). The city has several unplanned neighbourhoods which severely lack access to public services, suffer from precarious incomes, and endure poor housing conditions. Although many residents have access to employment due to the presence of a large 'informal economy', but their income sources are not enduring or predictable in most cases. Research has shown that living in deprived neighborhoods imposes other disadvantages like poor services, reduced environmental quality (noise or atmospheric pollution), ill health, susceptibility to crime and lack of quality educational and economic opportunities (Lichter, Parisi, & Taquino, 2012; Sharkey & Faber, 2014). Material deprivation, poor infrastructure, poor access to services like water, sanitation, electricity etc. are strongly linked to violence in Karachi's poor neighborhoods. Concentration of low-income people in certain neighborhoods contributes to socio-spatial disparities,

exclusion and polarization. These exclusions are both gendered and ethnicity based and exacerbated by national and global level geopolitics (Mustafa, Anwar, & Sawas, 2019).

Karachi's ethnically driven enclavization has contributed to increasing socio-political tensions. It is dominated by Muhajirs- immigrants from India post-partition - in a province that is Sindhi dominated. Moreover, it has had a huge influx of people from Khyber Pakhtunkhwa and the Punjab provinces. The three ethnicities' Muhajir, Sindhi, and Pashtuns are predominantly represented by Muttahida Quami Movement (MQM), Pakistan People's Party (PPP), and Awami National Party (ANP) respectively. There have been many turf wars between these parties, mostly in the form of criminal gangs and militant groups staging proxy wars in certain neighbourhoods of the city (Kalia, 2016). Amid these conflicts the city has been facing an urban crisis. There is a severe lack of infrastructure and public utilities. Power shortages, unstable political situation and criminal activities are a major constraint to the economic growth. Although the city is still Pakistan's manufacturing powerhouse, productivity is fast declining. For the citizens too, the city has not been able to provide a good quality of life. Karachi ranks much lower in living conditions compared to its counterpart cities in the world.

The economic growth of Pakistan has resulted in rising income; however, the distribution is uneven, a problem that is more pronounced in the case of Karachi. A spatial analysis of socio-economic disparities will help target areas that lag in development and may also identify underlying socio-economic causes of instability. The next part of the paper measures inequality and socioeconomic disparities in Karachi from a spatial perspective.

4- Measuring Urban Inequality

Inequality can be manifested in various ways, including inequalities of income, assets, access to jobs, public services, and opportunities. Inequality is also demonstrated through disparities in socioeconomic wellbeing, which are related to spatial segregations. In this paper I am using a multidimensional approach which takes into account the spatial distribution of inequality in the city. First, I calculate inequality in Karachi using household income. Next, I outline different dimensions of welfare – level of education, employment, living conditions, assets holdings, and income showing they differ across different parts of the city. These dimensions are combined in an index of wellbeing to show a comparison and compare the levels of wellbeing in towns and districts of Karachi.

The data used for this study, is unique because it is on the city level and allows disaggregation down to the level of towns. Most household sample surveys do not allow a disaggregation below the province level. In the case of Pakistan, the household survey compiled under the 'PSLM (Pakistan Social and Living Standards Measurement) and HIES (Household Integrated Economic Survey) are not disaggregated below the level of districts. The availability of data at the district level enables the comparison of the city with other cities and districts in the country. This means that while we can get detailed

information for each district, finer granularity below this level is generally not available in these data.

The data used for this study provides information down to the town level. It was collected by the Pakistan Bureau of Statistics between November 2015 and March 2016 under a project funded by the US State Department and carried out under a partnership between the George Mason University and University of Karachi². At the first sampling stage the city was classified into strata according to 18 administrative towns and 6 cantonment areas which were further divided in blocks. Based on the estimates of 1998 census there are 13,233 blocks in Karachi, but the sizes of these blocks vary. A 1% sample of blocks was taken from each stratum through systematic random sampling. At the second stage it was decided that 15 households would be selected through systematic random sampling. A total sample of 1980 ($13,233 \times 10\% = 132 \times 15$) was therefore obtained for this survey. Eleven additional households were selected to make the survey representative of all towns and cantonments. This resulted in a total sample of 1991 households.

The availability of the data based primarily in Karachi thus made it possible to measure inequality and disparities of wellbeing within the city. However, since this is cross sectional data, it cannot be used to explore trends and changes in inequality.

4.1- Estimates of Income Inequality in Karachi

Income inequality can be measured through various measures which assess the extent to which incomes are unequally distributed. Household data have become the primary source for the empirical analysis of inequality (Foster, Seth, Lokshin, & Sajaia, 2013). In most developing countries consumption data is used for the measurement of inequality. Previous studies that measure inequality in Pakistan have used both income and consumption. The most recent measurement of inequality in Pakistan is done by UNDP (2020) which provides multiple measures of inequality at the country level. The report notes that the *“poorest one percent of the population, who hold only 0.15 percent of the national income, compared to the richest 1 percent, whose share of national income exceeded 9 percent in 2018–2019”* (UNDP, 2020, p. 13).

While immensely useful, this study does not offer an analysis of inequality from a spatial perspective. This is because most studies of inequality are constrained by the availability of reliable data. Household surveys tend to have smaller representation of the upper income strata which leads to under representation of higher income groups. This problem is aggravated by a high level of non-response of income information especially among not only the high-income but also the low-income groups. There are problems of under reporting or over reporting which also complicate the task of measuring income inequality. Usually, household incomes are used as a proxy for wellbeing of a particular

² Megacity Survey 2015–2016: The survey is available on the following website: <https://cssr.gmu.edu/research-projects/university-of-karachi-partnership/megacities2016-karachimegacitiesdata>

family (or household), and they are equalized by household size to get household income per capita. This method assumes equal sharing of income and associated benefits among household members, which may not be the case. Unfortunately, information about the patterns of income distribution within households is also not available in most surveys. These limitations are also associated with the data used in this study; however, it has the advantage of offering town level details.

The Gini coefficient is the most widely used measure of inequality. It measures the average difference between pairs of income relative to the mean. The Gini Coefficient ranges from 0 (perfect equality) to 1 (perfect inequality). It is considered to be more sensitive to changes in the middle of the distribution. A second measure of inequality is Palma Ratio that reveals income disparities among the rich and the poor. It is the ratio of national income shares of the top 10% of households to the bottom 40%. A third way to measure inequality is income share by quintiles. It divides the population into fifths (quintiles) from poorest to richest and reports the levels or proportions of income that accrue to each level. It is a crude measure and is a way of summarizing inequality in terms of the shares of total income that are held by different groups.

The table below reports the three indices of inequality in Karachi based on per capita household income.

Table -1: Estimates of Income Inequality in Karachi

Gini Coefficient	0.456
Palma Ratio	2.83
Income share by Quintile %	
Q1	3.7
Q2	8.6
Q3	13.8
Q4	21.9
Q5	52

Source: Author's calculation from the household data

These estimates show that income inequality in Karachi is higher than that of the whole country which stands at 0.309 according to UNDP (2020) report. An earlier study by Abid Burki (2015) noted that urban inequality using Gini is higher at 0.346 compared to rural inequality which is 0.247. Karachi's level of inequality at 0.456 as calculated above is relatively much higher. This is shown by other indices as well. The quintile indices show that the richest 20 percent hold more than 50 percent share of total income, while the poorest 20 percent have only 3.7 percent of total income. The Palma index of 2.83 is less compared to the whole country's Palma ratio of 4.61 in 2018-19 as reported by the UNDP (2020). This may be because of underreporting among the top 1 to 2 percent of

income earners. Intuitively, Palma shows that richest ten percent earn 2.8 times the income of the poorest 40 percent people of Karachi.

4.2- Estimates of Spatial Disparities of Well Being in Karachi

There is a consensus among policy makers and academics that wellbeing is a multidimensional concept. Human wellbeing cannot be solely viewed from an income perspective and variables like educational attainment, health, housing characteristics and human capabilities need to be taken into account (Nussbaum, 2011; Rawls, 2017; Sen, 1999). Material conditions combined with human, social, and cultural capital enable people to achieve socio-economic well-being. Distribution of these forms of capital is important for several policy outcomes. Disparities in attainment and levels of these forms of capital can have strong implications for policy.

Composite indices such as Human Development Index, Gender Empowerment Measure, Economic Freedom of the World index and Worldwide Governance Indicators have gained considerable attention among academics. They combine multiple social and economic indicators and provide a ranking of units based on the measure. Although the use of these indices is widespread, there are several trade-offs involved in the construction of these indices. Most important are the selection of the indicators and the weights attached to these indicators. The selection of the variables is used in an effort to link to the purpose of the measure, which can then be used to track development, to monitor poverty, or to target gender disparities (Booyesen, 2002). The weights assigned to the dimensions may be driven by theoretical considerations, determined by policy relevance or assumed to be even if no reasons for differential weights are defensible. It must be noted that for computation of multidimensional indices, all data should ideally come from the same source.

As Maasoumi (1986) suggests that social welfare analysis is better when a greater number of attributes are considered as the assumptions of 'anonymity' and 'impartiality' are better satisfied. So, a single attribute cannot be expected to provide a complete representation of welfare. However, in most cases, the analysts are only constrained by the availability of data in defining and choosing which variables to include and their weights (Ravallion, 2010).

In this study I have used five dimensions to assess well-being in various parts of Karachi. All dimensions have been given equal weights following the Human Development Index methodology. Weights reflect an important aspect of the trade-off between the dimensions and hence need to be used cautiously. Ideally, I should be weighting these dimensions on the basis of their importance for policy purposes, but the literature does not argue for any reliable basis for this. Therefore, I use, equal weights assuming that each dimension is equally important for wellbeing.

The table below shows the dimensions, and the indicators used to construct these

dimensions. This is followed by an explanation of methods used for calculating the composite index

Table-2: Indicators selected for the analysis of disparities

<p>Income: Monthly Income (per capita) of Household (Income of all members aggregated and equalised by household size)</p>
<p>Employment Measured by employment status (unemployed, employed (including self-employed))</p>
<p>Education Attainment Measured by years of schooling, of all members of the household, aggregated for each household</p>
<p>Living Environment Conditions Construction type of the house Number of Rooms in the house per household member Type of toilet facility Fuel used for cooking Main source of Water supply to the house Electricity</p>
<p>Asset holdings: An aggregate of the assets; (all assets carry equal weights) Home ownership Type of House (Big Bungalow, Town house, large apartment, small apartment, hut etc.) Mobile phones (smart phones) Television Washing Machine Computer, Laptop, Tablet Refrigerator Motorcycle Car or Van</p>

Income:

The economic dimension to development must not be ignored as monetary resources contribute greatly to the lifestyle and wellbeing. Income or consumption are the appropriate measures to evaluate the standard of living of an individual, household or a region. In developing countries, consumption data is preferred over income, due to high non-response rate of income-based measures and under reporting. However, in this

study I have used household income as a relative measure of wellbeing because consumption data that can be disaggregated to the town level is not available. Income here is measured as the monthly income of the household. This monthly income has been equalised using the per capita scale. This makes this income information comparable by considering larger economies of scale and difference in needs based on household size.

Employment

This indicator is measured as the number of employed and unemployed members in the household. The housewives, children and elderly who do not make the part of the labour force have been excluded from the analysis. Employment status is an important determinant of the development of any region. In Karachi specifically access to jobs is a major issue and it tends to be unequally dispersed across different neighbourhoods.

Education

According to Sen's theory of 'capabilities' education forms an important component of development outcomes (Sen, 1999). Differences in education lead to differences in earnings. Policy makers are interested in the stock and distribution of human capital, and education forms a crucial part of human capital. I measure education by the years of schooling of the members of the household, aggregated for each household.

Living Conditions

Measured by house type, access to services such as electricity, water, toilet this indicator reflects the life conditions of the residents of the city. Unplanned areas are prone to greater deprivation and hence poor living environment. These influence the health of the residents and foster hopelessness, despair and antisocial behaviour. As shown by Anwar, Mustafa, Sawas, and Malik (2016) life conditions, have a major influence on patterns of violence in Karachi. Public services, like electricity, water, housing facilities contribute to living conditions and must have an equal distribution. Hence, it is of interest to analyse disparities in public service provision as well as living conditions to understand neighbourhood disparities. The variables were aggregated into one indicator with equal weights assigned to each variable.

Asset Holdings

Asset based indicators are nonmonetary methods of measuring socioeconomic wellbeing of the households. This is another dimension of economic development that attempts to measure the overall financial situation of a household. This method uses data of monetary value of household assets such as durable and semi-durable goods to evaluate household welfare. This is measured using variables that measure ownership of assets like house, mobile phone, refrigerator, washing machine etc. Linear aggregation has been used to combine the variables in an indicator to retain objectivity.

A two-step method was used to construct the composite index of socioeconomic development. At the first stage the indicators in each dimension are normalized using the Min-Max technique into an identical range (0,1) in line with the HDI (HDI 2014). The formula is given below:

$$\text{Dimension Indicator} = \frac{\text{actual value} - \text{minimum value}}{\text{maximum value} - \text{minimum value}}$$

This helps to transform the variables measured in different units into indices between zero and one. This range makes goalposts which act as ‘natural zeroes’ and ‘aspirational goals’. The higher score reflects a more desirable situation in terms of welfare.

Once the five indicators are calculated they are combined into an Index of Well Being. Here again the method used by UNDP for aggregation of HDI is employed. The resultant index of well-being is the geometric mean of the five indicators.

$$\text{Index of Well Being} = (I_{\text{income}} \cdot I_{\text{employment}} \cdot I_{\text{education}} \cdot I_{\text{living conditions}} \cdot I_{\text{asset holdings}})^{1/5}$$

Table 3 presents the town and district rankings for the Index of Well Being in Karachi, where 0 represents low wellbeing and 1 represents high wellbeing. These composite indices are relative measures and are used to compare different units, in this case towns.

Table-3: Town Rankings of Well Being in Karachi

	Towns	N	Index of Well Being (Mean)
1	Jamshed Town	111	0.345
2	Cantonments	186	0.342
3	Gulshan e Iqbal Town	187	0.310
4	North Nazimabad Town	99	0.302
5	Shah Faisal Town	62	0.299
6	Gulberg Town	103	0.292
7	Saddar Town	108	0.291
8	Liaquatabad Town	140	0.285
9	Malir Town	24	0.272
10	Kemari Town	32	0.271
11	Gadap Town	97	0.267
12	New Karachi Town	91	0.263
13	Lyari Town	190	0.259
14	Landhi Town	130	0.242
15	Orangi Town	126	0.231
16	Korangi Town	134	0.214

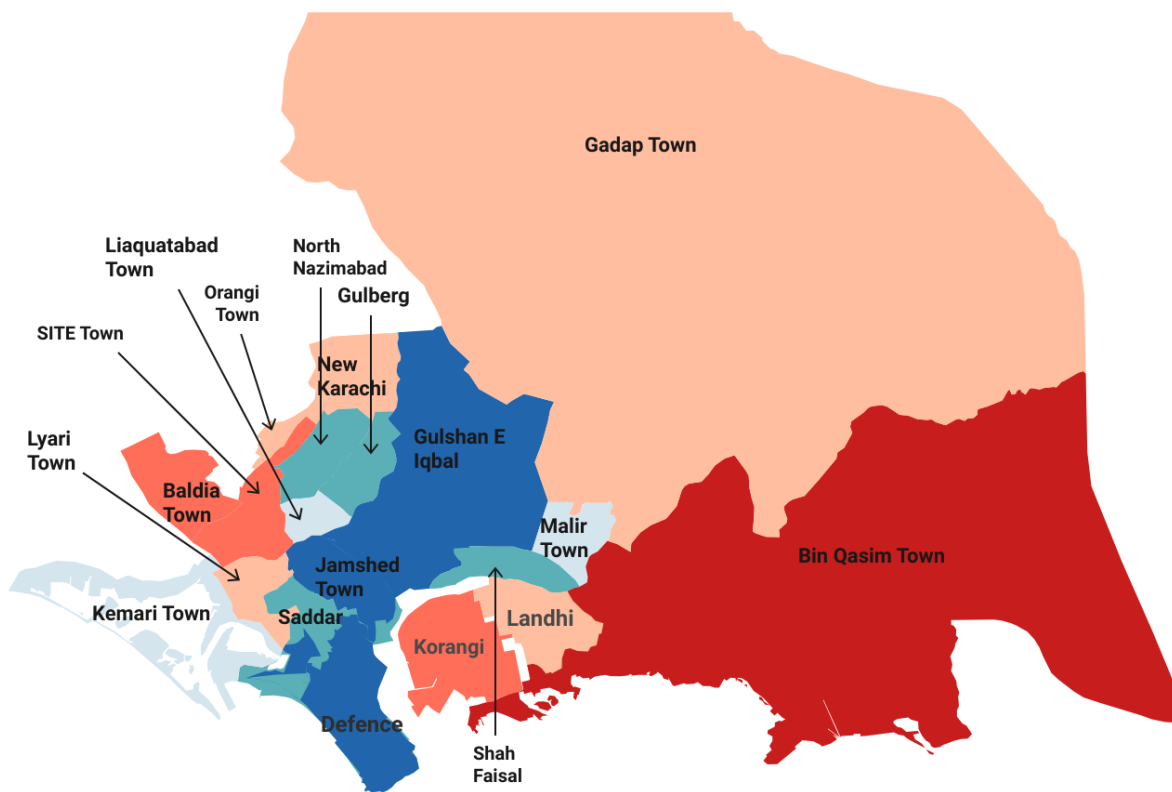
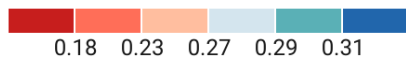
17	Baldia Town	104	0.197
18	Site Town	51	0.183
19	Bin Qasim Town	16	0.135
	Total	1991	0.271

Source: Author's calculation from the household data

These estimates are reflected in the image 1 below.

Image-1: Spatial Disparities of Well Being in Karachi

Composite Score

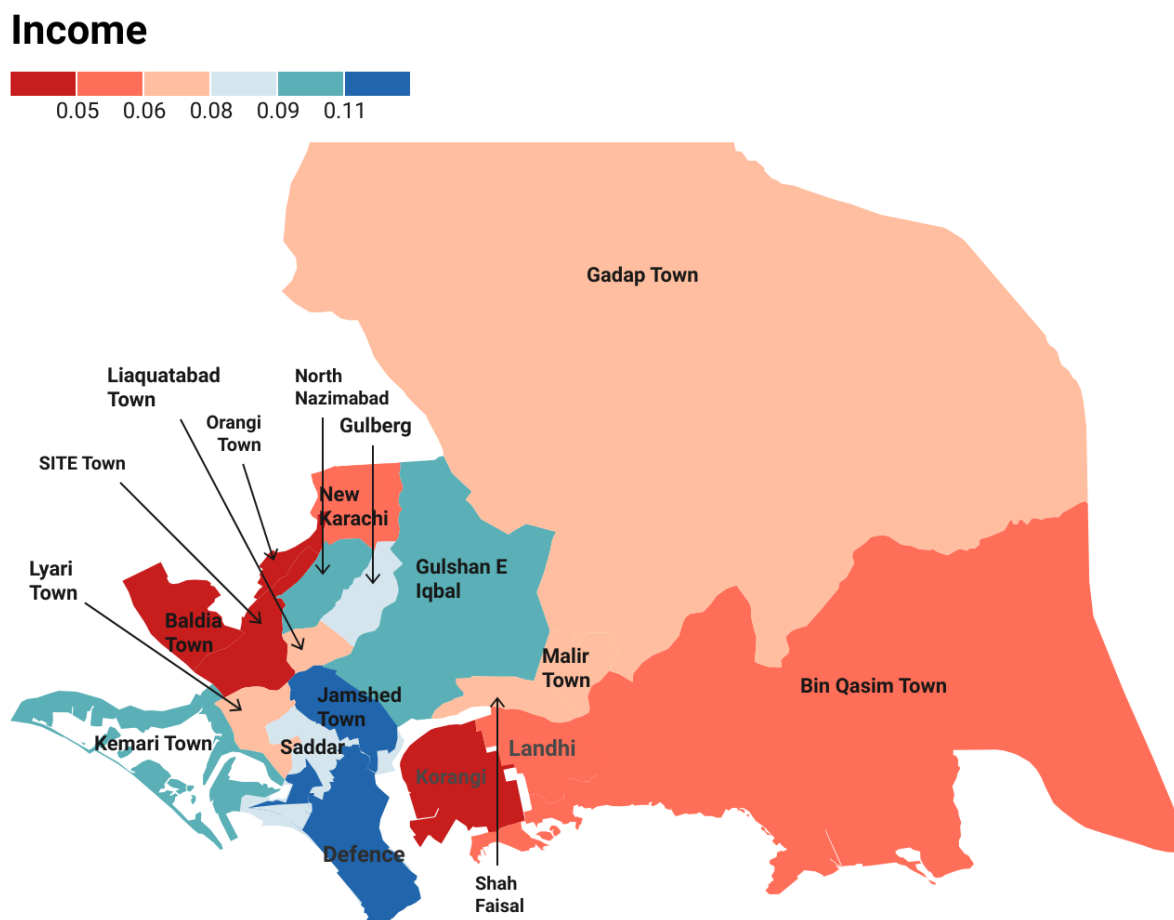


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As we can see Jamshed town, Gulshan-e-Iqbal, and Cantonments have the highest level of wellbeing. The cantonment areas included in the sample were Clifton Cantt, Faisal Cantt, Korangi Creek, Malir Cantt, Karachi Cantt and Manora Cantt. Areas like Baldia Town, Site Town, Korangi, and Bin Qasim Town lie at the very bottom of the ranking displaying very low levels of wellbeing. Orangi, Landhi, Lyari, New Karachi, Gadap also show relatively low levels, whereas Liaquatabad, Malir, and Kemari have low to medium levels of wellbeing. Further areas like Saddar, Gulberg, North Nazimabad, and Shah Faisal are in medium to high range.

The picture gets more interesting when we look at the specific dimensions of wellbeing in the city. For instance, image 2 below shows that income disparities are higher compared to the composite index of wellbeing. Cantonments have the highest income whereas Baldia, Bin Qasim, Orangi, Landhi , New Karachi, and Korangi towns have very low levels of income. Similarly, the income of middle-class areas such as North Nazimabad, Gulshan-e-Iqbal, Saddar and Gulberg is also much less in comparison to Cantonment areas and Jamshed Town. Income inequality in a city is often a reflection of spatial differences in returns to skills and work. Living in one area of the city can lead to higher incomes despite similar skill set and work type. Segregation based on income can perpetuate inequality because it erects spatial barriers in terms of access to education, healthcare, jobs, and networks (Chetty, Friedman, Saez, Turner, & Yagan, 2020).

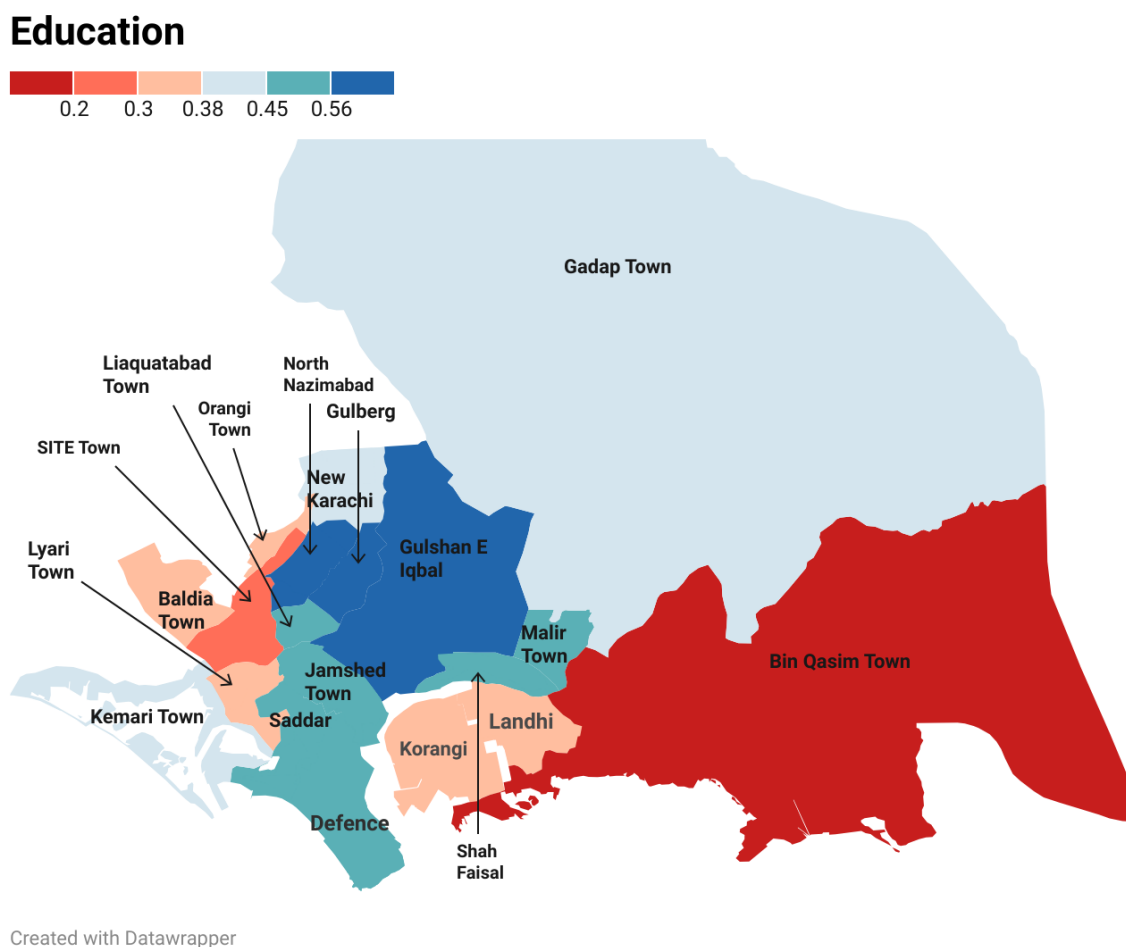
Image-2: Spatial Disparities of Income in Karachi



Created with Datawrapper

Income segregation may be a consequence of high and low skilled people living separately in particular areas. Thus, one would expect similar patterns in education and income inequality. While this is true for areas such as Bin Qasim, Baldia, Orangi, Landhi and Korangi where both education and income levels are low, the situation in the centre is slightly different. Image 3 below shows that middle class areas such as Gulshan-e-Iqbal, Gulberg, and North Nazimabad have highest levels of education, but their income levels are lower than Cantonments and Jamshed town.

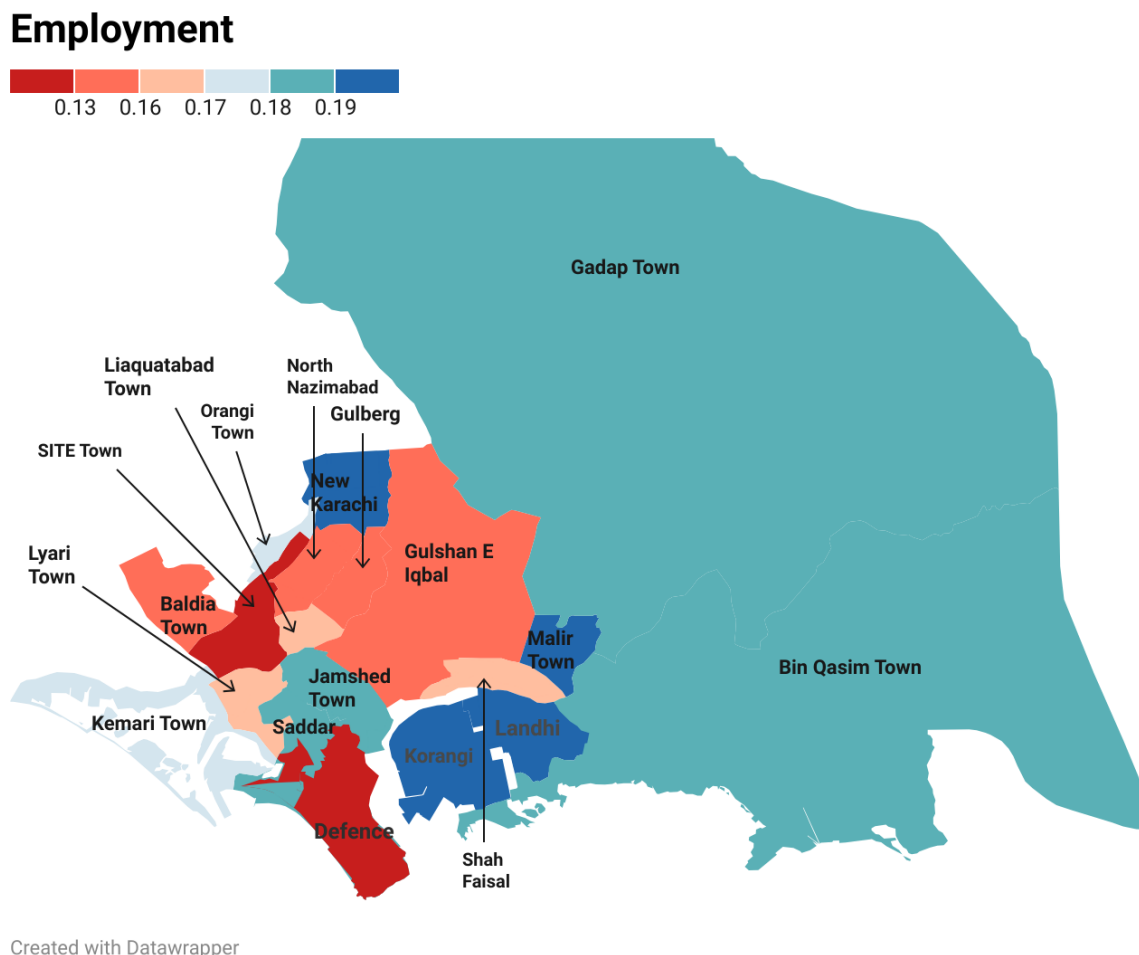
Image-3: Spatial Disparities of Education in Karachi



One explanation of low income despite high education in case of Gulshan-e-Iqbal, North Nazimabad and Gulberg may be that they have relatively lower levels of employment as seen in the image 4. Overall disparity in employment across the towns is low compared to income and education, as areas such as Korangi, Malir, and Landhi which are industrial towns and despite being low in both income and education, show relatively higher levels of employment. Bin Qasim town which is lowest in income and education does relatively better in employment. The lowest level of employment is seen in cantonments despite

being highest on income. The SITE and Baldia towns show very low levels of employment, as well as income.

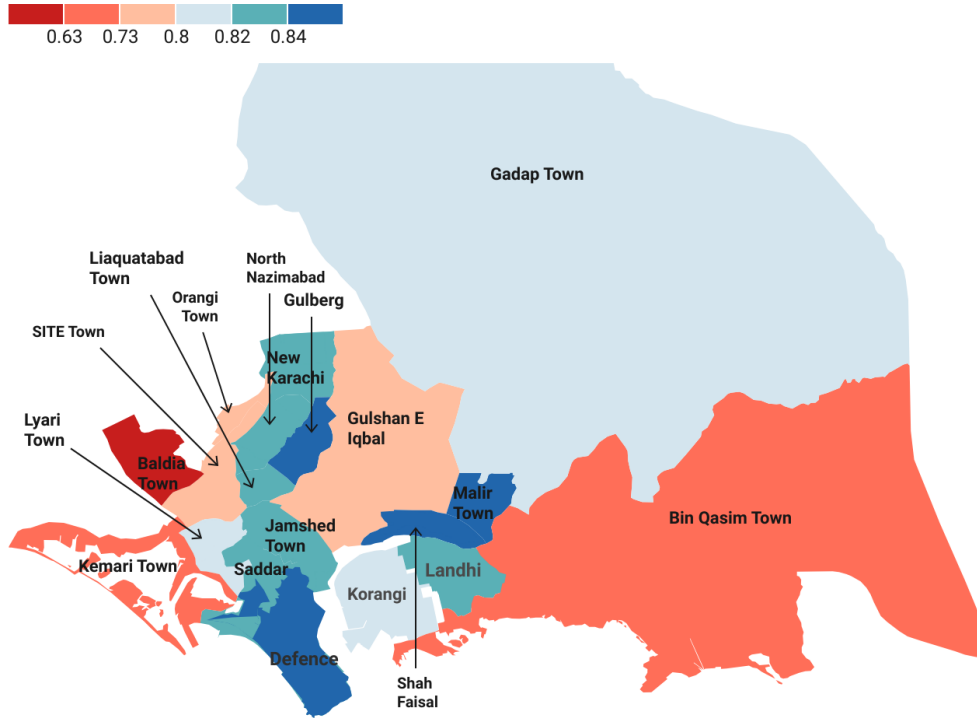
Image-4: Spatial Disparities of Employment in Karachi



In terms of living conditions, the data shows relatively higher levels of disparity across town as seen in the image 5 below. Even though most houses have access to water, electricity and toilet facilities, areas such as Kemari, SITE, and Bin Qasim town remain at very low levels of access to public services. However, this picture may not capture the overall extent of inequality in terms of living conditions because the data does not include households at the extreme ends such as those of the elite and the slums. Asset holdings in terms of possession of television, refrigerator, washing machine, motorcycle, car or computers in Baldia, SITE, and Korangi towns are very low. Other towns such as Malir and Shah Faisal have a better score in terms of asset ownership despite very low levels of income. Compared to living conditions asset holdings in the home show a lower level of inequality across towns as seen in the image 6 below.

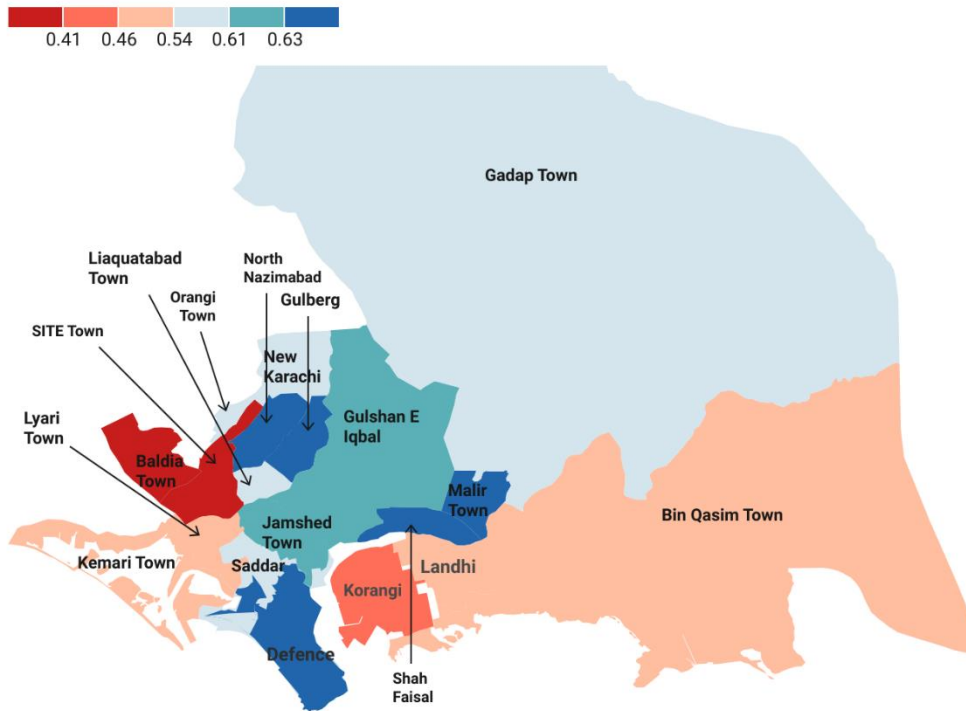
Image-5: Spatial Disparities of Living Conditions in Karachi

Living Conditions



Created with Datawrapper

Asset Holdings



Created with Datawrapper

Image-6: Spatial Disparities of Asset Holding in Karachi

Spatial disparities tend to limit access of specific groups to opportunities. Karachi is a Muhajir dominated city, who are scattered in all parts of the city, however other ethnic groups such as Pashtuns from the northern part of Pakistan, Punjabis from the biggest province, Balochs from the western province, and Sindhis who are indigenous to the city also call Karachi home. As the table 4 below shows some of these ethnic groups are concentrated in certain parts of the city such as Lyari is a Baloch dominated town, whereas Kemari has majority of Pashtuns. Both these towns remain at a low level of wellbeing, particularly in terms of income and education. Bin Qasim Town which is lowest in almost all measures of wellbeing has higher proportion of Sindhis and Balochs.

Table 4- Spatial distribution of major ethnic groups in the city

Town	Urdu	Punjabi	Sindhi	Pushto	Baloch	Other (Saraiki, Hindko, Gujrati etc.)
Jamshed Town	73.9	3.49	7.26	4.96	0	10.38
Cantonments	49.81	16.72	13.27	5.09	1.63	13.45
Gulshan e Iqbal Town	67.78	2.14	2.51	9.1	0	18.47
North Nazimabad Town	82.65	2.73	5.26	0.39	0	9
Shah Faisal Town	71.51	9.5	1.48	0	9.2	8.3
Gulberg Town	85.33	0	0	0	0	14.67
Saddar Town	75.25	3.13	1.85	1.42	0	18.35
Liaquatabad Town	87.92	2.23	3.16	0.56	0	6.13
Malir Town	61.34	4.65	8.55	2.6	1.67	21.18
Kemari Town	17.36	3.31	2.48	60.33	0	16.5
Gadap Town	66	13	9.5	0	2.5	9
New Karachi Town	73.27	1.45	4.45	1.55	0	19.27
Lyari Town	7.38	13.89	10.63	2.4	47.17	18.52
Landhi Town	63.45	3.42	1.59	10.02	0.61	21
Orangi Town	69.85	1.88	0	18.17	0	10
Korangi Town	70.25	8.4	1.11	1.6	0	18.61

Baldia Town	43.88	19.59	0	20.9	2.64	13
Site Town	50.18	4.66	0	33.33	0.36	11.46
Bin Qasim Town	6.25	2.5	50	8.75	28.75	3.75

5- Conclusion

The analysis above shows that Karachi is a highly unequal and spatially segregated city. Where you live in the city is a good indicator of how rich and poor you are. Income inequality is the highest with high income concentrated in the centre and towns in the periphery with very low incomes. This is also reflected in employment trends where peripheral areas have less access to employment than those in the centre. However, both education and employment do not determine income. For instances towns with high levels of education such as North Nazimabad, Gulshan-e-Iqbal, Gulberg do not show high employment, although their living conditions and asset ownerships situation is much better than the towns in the periphery. The inequalities in Karachi are also visible in the form of the built city. Richer areas have better infrastructure and housing facilities in comparison to low-income areas where people are in highly vulnerable life conditions. The data shows relatively low levels of disparity in living conditions across towns near the centre, however peripheral towns such as Baldia and Bin Qasim have poor living conditions. These peripheral towns are also dominated by specific ethnic groups such as Pashtuns and Baloch.

There are social, political and economic costs of these inequalities. Areas in the city with low wellbeing have higher conflict and crime rates. Analysis of homicide incidents in Karachi from 2013 to 2017 by Khan (2018) shows that SITE, Baldia, and Lyari have remained flashpoints of crime and violence in Karachi. Areas like Kati Pahari and Qasba Colony in Orangi town have also been flashpoints of violence. Militant outfits like TTP (Tehrik e Taleban Pakistan) and LeJ (Lashkar e Jhangvi) have also found safe havens in poor and less developed areas like Sohrab goth in Gadap Town, Banaras in Orangi Town and Maghopur area in Site Town. Karachi, being the most ethnically diverse city, has a potential of destabilization if the disparities grow to the extent that they transform into discontent. As disparities deepen, distrust grows, as crime and the fear of crime increases, and as spatial segregations become cruder there are higher costs of private security and policing.

Through the case study of Karachi, this chapter demonstrates how any efforts to understand and improve urban prosperity must include an analysis of spatial disparities and how those disparities contribute to peripheralization of specific social groups. Cities attract people because of employment and economic opportunities. They are places where ambitions and aspirations are realised. However, when these opportunities are

enjoyed by a few, or the prosperity is restricted to certain groups or areas; cities become sites of conflict where the right to collective wellbeing is demanded and fought for. Disparities produced through peripheralization of certain social groups have strong implications for the city's stability. The city has exclusive elite spaces where the rich are distanced from the poor. The less privileged are concentrated in areas that are farther from the centre. These disparities are deepening the lines of segregation, separation and are causing exclusion and social polarization. The excluded lose opportunities, the means, and finally the ability to participate in socio-economic processes. They have weak position in the housing market, limited political participation, constrained social mobility and restricted socio-cultural integration.

Investments in infrastructure like roads and public supported housing will help improve life conditions in peripheral areas. Provision of mass transit facilities, non-motorized alternatives will increase the labor market participation of people from low-income areas. Redistributive policies must be redesigned to ensure equitable delivery of public services and resources. If sound policies are devised, the costs incurred on security arrangements can instead be used for developmental purposes.

Finally, inequality is more of a political than economic problem. Widespread political orthodoxy reinforces widening of income inequality. Karachi specifically has been a victim of political rifts. Despite being the largest city of the country, its government does not have any functional or financial authority. The city is being run by the provincial government, and this centralized governance mechanism has limited people's participation in decision making. Karachi can only become a prosperous and more inclusive city if the citizen and common rights are protected and promoted. These include the freedom of information, movement and assembly.

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