Journal of Economic Sciences
Volume 4, Issue 2
https://www.jesciences.com

Spatial Analysis of Poverty Localization in Pakistan: Implications for Sustainable Development Policies

*Abdul Hameed[1, 2, *], Shahid Karim[3], Muhammad Hamza[4], Muhammad Shahid[1], Muhammad Rehan Khalid[1]*

Affiliations
1. Asian Development Bank Consultant, Policy Research Unit, Benazir Income Support Program, Islamabad, Pakistan
2. Postdoctoral Research Fellowship, Islamic Research Institute, International Islamic University, Islamabad, Pakistan
*Corresponding Author Email: hameedleghari@gmail.com
3. Government College University, Lahore, Pakistan
4. Benazir Income Support Program, Islamabad, Pakistan

Timeline
Received: Jul 31, 2025
Revised: Aug 22, 2025
Accepted: Aug 23, 2025
Published: Sep 09, 2025

DOI
https://doi.org/10.55603/jes.v4i2.a4

Abstract

Elimination of extreme poverty for all people everywhere by 2030 is the first goal of SDG. Poverty is the biggest problem in rural area of Pakistan and associated with health, education, and living standards. The study examines the multidimensional poverty in Pakistan, particularly in the provinces of Punjab, Sindh, KP and Balochistan by using PSLM 2019-20 data. The results of the study reveal that 33% of the population is multidimensionally poor, with 12% in urban areas and 42.7% in rural areas. It is estimated that 60% of the population of Balochistan is facing multidimensional poverty followed by 39% in Sindh, 38% in KP, and 23% in Punjab. It has been observed that poverty is particularly noticeable in the districts of South Punjab, rural areas of Sindh, the border and lower areas of the KP. While Balochistan is worst affected by poverty in Pakistan. Based on empirical evidence, the study recommends a multidimensional policy approach to reduce poverty in Pakistan at the provincial and district levels.

Keywords: *Sustainable Development, Poverty, Rural Pakistan, Socioeconomic, Multidimensional Deprivation, Education, Health, Living Standards*

JEL Classification: *I32, O18, Q01, R12*

1. Introduction

Pakistan was one of the first few nations to accept the Sustainable Development Goals (SDGs) 2030 development plan after a concerning performance for the achievement of millennium development goals in 2015 (Asadullah, Savoia, & Sen, 2020). The 18th Amendment to the Constitution of Pakistan devolved a number of powers from the federal government to the provinces. It transferred the responsibility for poverty, education and health from the federal government to the provincial governments. Provincial governments now have the authority to legislate and implement policies in these areas and are responsible for the welfare of citizens in their respective provinces. The 18th Amendment also transferred the power to levy and collect taxes in these areas to the provincial governments (Begum, Ashraf, & Ishaque, 2018). Poverty is defined as a lack of basic human needs such as food, clothing, shelter, education, health care and access to services (Wagle, 2002). More than 700 million people around the world still live in extreme poverty and are unable to meet their basic needs. The global extreme poverty rate reached 9.3%, up from 8.4% in 2019 (World Bank, 2022). Most of the poor are living in South Asia, including, India, Bangladesh and Pakistan. Poor people in South Asia face a range of challenges including limited access to basic services, extreme poverty, poor health, and limited educational opportunities (Islam, Newhouse, &Yanez-Pagans, 2021). In addition, many South Asian countries are highly vulnerable to natural disasters, such as floods and earthquakes, which can further exacerbate poverty and inequality (Li, Deng, & Zhang, 2021). Many of the region's poor live in rural areas and are dependent on subsistence agriculture including low wages and limited economic opportunities (Padda & Hameed, 2018).

The SDG-1 aim is to eradicate extreme poverty for all people everywhere by 2030, which is presently defined as someone making less than $1.25 per day. Most of the nations evaluated goal 1.1 effectiveness using their own national poverty thresholds. Headcount poverty in Pakistan has fallen from 57.9% in 1998-99 to

21.9% in 2018-19 over the previous two decades. During the same period, poverty reduced from 44.5% to 10.9% in urban areas and from 63.4% to 28.2% in rural regions. The rate of poverty reduction has been inconsistent over the time. Poverty is a transitory state, and in Pakistan, moving in and out of poverty is a typical occurrence (Farooq & Ahmad, 2020). Poverty is a barrier to accomplishing other long-term development goals (Cheng et al., 2019). Based on the Cost of Basic Need (CBN) methodology in 2013-14 for poverty estimation (GOP, 2018), the poverty line for 2013-14 was calculated at PKR. 3,030 per adult equivalent per month. The same poverty line was adjusted during 2015-16 while including Consumer Price Index (CPI) based inflation, in the estimation. Keeping in view this method, poverty line for 2015-16 was established at PKR. 3,250 per adult equivalent per month. While using HIES 2018-19 data, based on CPI inflation method, the poverty line is estimated at PKR. 3,776 per adult equivalent per month. It is clear from the data of poverty line obtained through various methods and approaches that poverty line is on the rise consistently. Looking at overall trend of absolute poverty, it is easy to conclude that urban poverty has declined at a substantially faster rate than rural poverty.

Now that poverty or the SDGs are local issues, it is up to the provincial governments to implement localization policies to meet the 2030 targets. However, localization policies must be prepared while considering the overall situation and context of poverty or SDGs at the local level. United Nations Development Programme (UNDP) defines localization as "the process of taking into account subnational contexts in the achievement of the 2030 Agenda, from the setting of goals and targets, to determining the means of implementation and using indicators to measure and monitor progress". Localization related to building and using the capacity of local and regional governments for achieving SDG targets and indicators, through implementation of local development policy. Localization of SDGs ensures tailoring the implementation of the global SDG targets in a manner which is conducive to local and regional governance mechanisms. This study uses updated data to determine the status of SDG-1 under local policy in order to analyze the performance of provinces at the local level (District). This study will be used in the future to localize policies to end poverty at the local and regional levels. This is the study's primary objective.

2. Literature Review

Many studies on Pakistan's multidimensional poverty have been done in the last ten years, using a variety of techniques to measure poverty at the local or national level. An alternate method for calculating multidimensional poverty and identifying impoverished households was put out by Naveed and Islam in 2010. They used data gathered in 2006–2007 by the Research Consortium on Educational Outcomes and Poverty, which was funded by the Department for International Development (DFID), to analyze household data from two provinces, Khyber Pakhtunkhwa (KP) and Punjab, and examine the relationship between household consumption and multidimensional poverty using the Alkire and Foster measure. The Alkire and Foster measure is recommended as an alternative to the Poverty Scorecard in the article, which calls for the adoption of a multifaceted method to gauging poverty in Pakistan. According to the findings, the Alkire and Foster measure would be more useful for identifying low-income households for social security programmes and for the official estimation of poverty in Pakistan (Naveed & Islam, 2010; khan et al., 2014: Khan et al., 2015).

Jamal in 2012, multidimensional poverty in Pakistan was examined using household data from the years 2010–2011, 2008–2009, and 2004–2005 as well as the well-known Foster–Greer–Thorbecke (FGT) indices. Jamal used measures of physical asset deficiency, substandard housing, and human poverty to generate a composite index of poverty. The multidimensional poverty threshold was established by constructing composite scores using statistical techniques like Principal Component Analysis and Cluster Analysis. According to the report, 48% of Pakistan's population suffered multiple deprivations in 2010–11, with a greater incidence of almost 65% in rural areas and 14% of urban residents living in extreme poverty. Provincially, Balochistan had the greatest rates of multidimensional poverty in both urban and rural areas, while Punjab had the lowest rates. Several factors, including those related to income, education, health, and housing options, were considered. The results showed that in all locations, including Karachi, Larkana, Hyderabad, Mirpur Khas, and Sukkur, multidimensional poverty was much higher than monetary poverty. Throughout a ten-year period, poverty levels at the provincial and regional levels both somewhat decreased, but the pattern was inconsistent. During the examined periods, Mirpur Khas was found to be the most destitute region, while Karachi was shown

to be the least impoverished. The study also revealed that rural areas were worse off than urban areas, with higher degrees of inequality in access to housing, healthcare, and educational opportunities. These results underline the need for a systematic and comprehensive strategy to combat poverty in Pakistan by enhancing the country's housing, healthcare, and educational systems. Improved infrastructure for primary and secondary education, higher enrolment rates, and incentives like scholarships for low-income groups are some specific recommendations (Jamal, 2012).

In a 2015 study in Pakistan by Saboor et al., regional variations in multidimensional poverty and changes over time in 26 regions were examined using a multidimensional poverty approach that used income, education, health, and housing resources as indicators. The study used 11 indicators and adhered to the methodology proposed by Alkire and Foster (2008). The results showed that multidimensional poverty was higher in rural regions, however between 1998–1999 and 2007–2008, rural areas had a 7% drop and urban areas only a one percent. Regions like Kalat, Makran, and Zhob continuously remained the poorest when considering both rural and urban areas, whereas Karachi and Rawalpindi divisions had the lowest rates of poverty in both urban and rural areas. According to the study, Pakistan's development trajectory has seen economic expansion without corresponding advancements in human development. In order to promote holistic development, the study proposes the necessity for an integrated strategy that addresses socioeconomic factors in accordance with worldwide well-being criteria (Saboor et al., 2015).

In 2016, Naveed conducted a study to update estimates of multidimensional poverty at different levels, including national, provincial, and district, using data from the Pakistan Social & Living Standards Measurement (PSLM) for the year 2014-15. The study analyzed deprivation experienced by households across 27 indicators related to four dimensions of wellbeing, including education, health, living conditions, and asset ownership. The findings revealed that although poverty reduction was slightly higher in rural areas compared to urban areas between 2012-13 and 2014-15, there was a significant disparity in poverty incidence between rural and urban populations, with rural populations being nearly five times poorer than urban populations. Balochistan had the highest poverty headcount ratio among the provinces, followed by Sindh and KP. The study further explored the main contributors to poverty, identifying education and assets as the primary drivers of poverty in the country, both in rural and urban areas. Urban poverty was mainly influenced by deprivation in education and living conditions, which together accounted for 75% of the adjusted headcount ratio. In contrast, the share of these two dimensions was relatively lower in rural poverty. The study highlighted the multidimensional nature of poverty in Pakistan and emphasized the significant disparities in poverty incidence between rural and urban areas (Naveed, 2016).

Idrees and Baig in 2017 conducted an empirical analysis of multidimensional poverty in Pakistan by incorporating six major dimensions of well-being, including education, health, house services, quality of house, additional facility, and women empowerment. Data from the latest available Pakistan Demographic Health Survey is used, and the Alkire-Foster methodology is employed to generate multidimensional poverty indices at three different poverty cutoffs. The study also examines the impact of assigning equal and unequal weights to each dimension of well-being in measuring poverty. The results show that approximately 10% of households are chronically poor and another 34% are substantially poor. The study suggests that future surveys should include information on important measures of well-being, such as physical safety, social security, and peace, to enable better comparison of trends and formulation of effective policies to address multidimensional poverty in Pakistan (Idrees & Baig, 2017).

GOP, UNDP and OPHDI (2016) conducted a study on multidimensional poverty in Pakistan, building upon the methodology developed by Alkire and Foster in 2008, which utilized 15 indicators. The report utilized data from the PSLM survey for the period of 1998-99 to 2014/15, revealing that Pakistan's MPI stands at 0.197, indicating that the poor population in Pakistan experiences 19.7% of the deprivations that would be experienced if all individuals were deprived in all indicators. The country's "headcount ratio" for multidimensional poverty is estimated to be 38.8% of the total population. Significant regional disparities in poverty are observed across Pakistan, with lower proportions of multidimensionally poor individuals in urban areas (9.4%) as compared to rural areas (54.6%). Further heterogeneities are observed at the provincial level, with MPI headcount ratios ranging from 31.4% in Punjab to 71.2% in Balochistan. Punjab accounted for the highest relative reduction in

MPI (40.2%), while Balochistan experienced the slowest progress in reducing multidimensional poverty, with a relative change of only 17.7% (GOP, UNDP, & OPHDI, 2016).

A study on multidimensional poverty in Pakistan was done in 2016 by the GOP, UNDP, and OPHDI, building on the approach created by Alkire and Foster in 2008, which made use of 15 indicators. The report used data from the PSLM survey for the years 1998–1999 through 2014–2015, and it showed that Pakistan's MPI is 0.197, meaning that the country's impoverished population suffers 19.7% of the deprivations that would be felt if everyone were deprived in every indication. The "headcount ratio" of multidimensional poverty in the nation is thought to be 38.8% of the entire populace. In Pakistan, there are notable geographical differences in poverty, with urban regions having a smaller percentage of multidimensionally poor people (9.4%) than rural areas (54.6%). At the province level, further heterogeneities may be seen, with MPI headcount ratios varying from 31.4% in Punjab to 71.2% in Balochistan. While Balochistan saw the slowest progress in eliminating multidimensional poverty, with a relative shift of only 17.7%, Punjab had the biggest relative drop in MPI (40.2%).

Based on primary data gathered from the Pakistan Rural Household Survey 2013 in the provinces of Punjab, Sindh, and KP, Padda and Hameed performed research in 2018 that used the Principal Component Analysis approach to analyse multidimensional poverty in rural Pakistan. The study looked at things like agricultural and non-agricultural assets, housing, education, energy, sanitation, and access to clean drinking water to identify different aspects of deprivation. According to the study's findings, 44% of rural Pakistani households fall into the poorest and most vulnerable categories, meaning they struggle with issues like a lack of access to clean drinking water, inadequate sanitation, subpar housing, tainted energy sources, and a lack of financial resources. The poorest rural populations are found in Hyderabad, Thatta, and Sangher. In order to achieve sustainable development and poverty reduction, the study emphasizes the need for additional funding from the federal, provincial, and local governments to be allocated towards social welfare, education, sanitation, water supply, and agriculture development in rural areas of Pakistan (Padda & Hameed, 2018).

The study conducted by Saleem, Shabbir, and Khan in 2019 focuses on poverty and its various forms, considering regional variations including the four provinces, as well as rural and urban areas of Pakistan. Data for the study were used from the PSLM survey for multiple periods, ranging from 2004/2005 to 2014/2015. The main indicators used to assess the socio-economic aspects of the economy were health facilities, education, and housing, consisting of 10 variables. Applying the Alkire-Foster methodology. The results reveal an increasing trend between the periods of 2010/2011 and 2012/2013. The provincial-level analysis indicates that Balochistan has a higher incidence of poverty across all dimensions, while Punjab has the lowest. This empirical analysis highlights the importance of adopting an integrating technique for multidimensional poverty transition in order to address socio-economic issues rapidly in Pakistan (Saleem, Shabbir, & Khan, 2019).

Over time, numerous studies have been conducted on multidimensional poverty in Pakistan. However, there is a lack of consistency in the domains and indicators used for multidimensional poverty assessment in the country. These studies have revealed that establishing and implementing a consistent set of domains and indicators for measuring multidimensional poverty would enable more accurate and comparable measurements of poverty over time. This would include identifying patterns and trends, understanding the drivers of changes in poverty levels in different regions and populations, as well as comprehending the interactions and synergies among these dimensions. Such an approach would provide valuable insights for designing targeted poverty reduction interventions. Some studies have employed the Alkire and Foster measure to analyze household data from specific provinces and have advocated for its adoption as an alternative to the monetary poverty measurement, with different indicators. Other studies have used FGT indices and composite indices of poverty to analyze data from different years and regions in Pakistan. The findings of these studies emphasize the need for an integrated approach to address poverty in Pakistan, with a focus on improving education, health, living conditions, and asset ownership. Suggestions include enhancing education infrastructure, increasing enrolment rates, and providing incentives for low-income groups. Furthermore, these studies highlight the disparity in poverty incidence between rural and urban populations, with rural populations being much poorer. Balochistan was identified as having the highest poverty headcount ratio among the provinces, followed by Sindh and KP.

In the last decade, from 2010 to 2020, several studies have been published on multidimensional poverty. These studies have utilized different techniques to assess national or regional level poverty, using various domains and indicators. The MPI analysis has been found to be particularly sensitive to the choice of indicators and weights. In 2014, the Government of Pakistan officially estimated MPI analysis in collaboration with international institutions. However, after 2014, no author has used the same domains and indicators to assess MPI progress over the years. In this study, updated data from 2019-20 was used, along with the same domains, indicators, and weights, to assess the updated multidimensional poverty and compare the progress of poverty over time. The results of this study and other MPI-based techniques are somewhat sensitive to both low and high-progress indicators.

3. Materials and Methods

3.1 Data

This study used PSLM 2019-20 most recent survey, which is conducted by the Pakistan Bureau of Statistics (PBS). PSLM district level survey is a survey used to determine the socio-economic conditions of the people living in a particular district. The survey collects data on various topics such as household size, employment status, income, health, education, housing and other related socio-economic characteristics. The survey results are used to guide development strategies and policies at the district level. It helps to identify the most vulnerable populations and guide the allocation of resources and services to the people who need them most.

Table 1: Covered Study Sample

Province	Percent	Freq.
Punjab	49.6	79,674
Sindh	23.1	37,106
KP	17.8	28,632
Balochistan	9.5	15,241
Total	100	160,653

Source: PBS, 2021

3.2 Methodological Approach

There are many different ways to measure poverty, and they can be broken down into two main groups: absolute poverty and relative poverty (Fry, Firestone & Chakraborty, 2014). Absolute poverty is characterized by a person's inability to afford basic essentials for survival. The relative poverty is the difference between one's standard of living and the economic standards of the same region (Alkire & Foster, 2011; Chambers, 2006). These unidimensional poverty approaches do not provide an explanation about underlying cause of poverty. However, to provide a more thorough assessment of poverty and deprivation, multidimensional poverty assessments seek to quantify the non-income-based components of poverty. In earlier studies in Pakistan, several multidimensional poverty techniques were employed. This approach is widely used to ascertain the performance of SDGs in many countries and MPI was used as a primary approach to analyses the performance of SDG-1 across the many countries. This study also used MPI (Alkire & Foster, 2011), with modified indicators for living standards, health, and education based on the Pakistan Planning Commission's multidimensional poverty report (2018). This study applied the same weights as those used by the Planning Commission of Pakistan in its 2018 report for comparison of results and interpretation.

The MPI for Pakistan was introduced in 2016 and is based on three main dimensions: living standards, health, and education. Table 2 lists the indicators and their weights for each dimension. The national MPI index for Pakistan has a total of 15 indicators. Years of education, attendance, and school quality were used as education indicators. The healthcare facilities, vaccinations, prenatal care, and assisted birth for the health sector.

Improved walls, overcrowding, electricity, sanitation, water, cooking fuel, assets, and land and animals (rural areas) used for living standards.

Table 2: MPI Domains, Indicators and Weights

Domain	Indicators	Weights
Health	Access to health facilities/clinics/basic health units	0.17
	Immunisation	0.06
	Antenatal care	0.06
	Assisted delivery	0.06
Education	Years of schooling	0.17
	Child school attendance	0.13
	Educational quality	0.04
Living Standard	Water	0.05
	Sanitation	0.02
	Walls	0.02
	Overcrowding	0.05
	Electricity	0.05
	Cooking Fuel	0.05
	Assets	0.05
	Land and Livestock (only for rural areas)	0.05
Total	15	1.00

Cut-Off Criteria

- Step 1: Each household is evaluated based on their household level indicator position. The household who is below the cut-off in any indicator are classified as deprived in that area.
- Step 2: The extent of deprivation experienced by a household is measured through the weighting of the pertinent indicators. If the total weighted deprivations equate to 33% or more of the possible deprivations, then the household is classed as multidimensionally poor.

Computing MPI

MPI is the sum of two pieces of data: (1) the percentage or incidence of households (within a given population) that experience multiple deprivations, and (2) the severity of their deprivation, or the average percentage of (weighted) deprivations they experience. The multidimensional headcount ratio (H) is the name given to the first component in formal terms:

$$H=\frac{q}{n}----------(1)$$

Here, the whole population is denoted by n, while the number of multidimensionally deprived household is denoted by q. The intensity (A) (or breadth) of poverty is the second most crucial factor. It is the multidimensionally poor people's average deprivation score and stated as:

$$A=\frac{\sum_{i=1}^{n} C_i(k)}{q}----------(2)$$

Where $C_i(k)$ is the censored deprivation score of households i and q is the number of households who are multidimensionally poor? The MPI is the product of both:

$$MPI=H*A----------(3)$$

4. Results

To comprehend the sustainable development progress at the national, provincial, and regional levels, this study adopted a three-level MPI analysis. This study's main goal was to determine how Pakistani family well-

being and human development are grew by health, education, and living standards. The MPI used a number of indicators, such as years of education, educational quality, child attendance at school, health facilities at basic health units, immunization, antenatal care, assisted delivery, access to clean drinking water, sanitation, and quality of walls, as well as indicators of overcrowding, access to electricity, access to clean cooking fuel, household durable assets, agricultural land, and livestock.

4.1 Country Level Analysis

The country level analysis presented MPI, incidence or headcount ratio and intensity of the poverty in Table 3. The MPI is a gauge of acute poverty that accounts for the aforementioned various deprivations faced by individuals, households, and communities. The MPI creates a single indicator of overall poverty by combining many measures of poverty, such as health, education, and living standard. According to this index, a person facing deprivations in one-third or 33% of the indicators is a multidimensional poor. The proportion of persons or families classified as multidimensionally poor, as measured by the incidence or headcount of poverty (H) (that is those that face multiple deprivations). What a severe poverty or intensity (A) is reflecting the average share of deprivations each poor person or household experiences). The results show that the MPI was adjusted for the level of deprivation, which was estimated at 0.16 nationally, 0.05 in urban areas and 0.21 in rural areas. Similarly, nationally, 33% of people were multidimensionally poor according to the 1/3 cutoff, while in urban areas it was 12% and in rural areas it was 42.7% in as per PSLM data 2019-20. Compared to the Pakistan Plaining Commission's previous estimate from the PSLM 2014-15, the MPI size decreased by 0.3 points at the country level and by 0.7 in rural areas, but increased by 0.01 in urban areas. Compared to urban areas, rural areas of Pakistan are generally more deprived. The depth of multidimensional poverty, which represents the average level of deprivation among the poor decreased from 50.9% to 48.8% in Pakistan, 43% to 42.5% in urban areas and 51.6% to 49.4% in rural areas. The intensity of poverty is greater in rural areas than in urban areas, but the severity of poverty is not much better for the poor in urban areas. The uncensored headcount ratios represent the proportion of people who are disadvantaged in each of the MPI's 15 indicators, regardless of their poverty status. These are calculated without applying the 1/3 cut-off criterion. At the national level, the percentage of people living in poverty decreased from 38.8% to 33.1% and good news for those living in rural areas is that the headcount dropped from 54.6% to 42.7%. The headcount increased from 9.4% to 12.0% in urban areas.

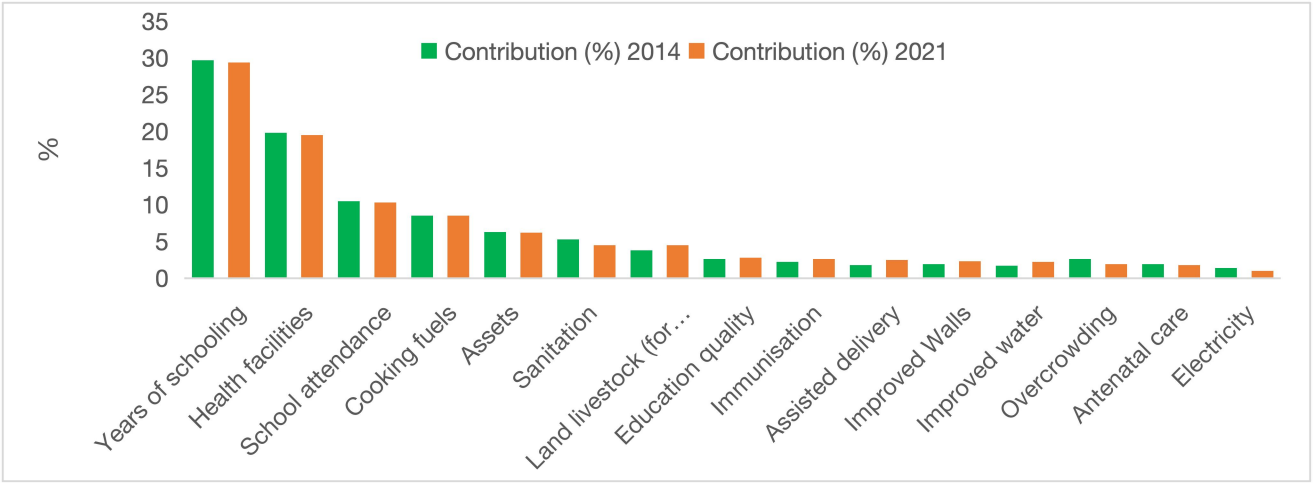
Table 3: Multidimensional Poverty in Pakistan

	Pakistan		Urban		Rural	
	2014	2021	2014	2021	2014	2021
MPI	0.19	0.16	0.04	0.05	0.28	0.21
Incidence (H)	38.8	33.1	9.4	12.0	54.6	42.7
Intensity (A)	50.9	48.8	43.1	42.5	51.6	49.4

Source: Author's Calculations (2021) & Pakistan Planning Commission (2016)

Figure 1 shows contribution (%) of each indicator to overall poverty. Years of education had the greatest impact in both years, declining slightly from 29.7% in 2014 to 29.4% in 2021. At the same time, the participation rate of health facilities has also declined slightly, falling from 19.8% to 19.5%. The proportion of students enrolled fell slightly during this period, from 10.5% to 10.3%, which is another important factor. Over the course of the two years, the proportion of fuel used for cooking remained constant at 8.5%. However, the assets contribution has hardly changed from 6.3% in 2014 to 6.2% in 2021.

Figure 1: Contribution (%) of Each Indicator to Overall Poverty



Source: Author's Calculations (2021) & Pakistan Planning Commission (2016)

Sanitation continued to contribute 5.3% in both years. However, the proportion of land used for livestock farming by rural families fell from 40.5% in 2014 to 30.8% in 2021, indicating a shift in the impact of livestock farming on overall poverty. The contribution of educational quality increased from 3.8% in 2014 to 4.5% in 2021, indicating an improvement in its impact. In addition, there was a slight increase in vaccinations from 2.6 to 2.8%. The proportion of assisted delivery increased from 2.2% in 2014 to 2.6% in 2021, a significant increase. Likewise, the impact of improved walls and water increased significantly from 1.9% to 2.3% and from 1.8% to 2.5%, respectively. The rate of overcrowding increased from 2.2% in 2014 to 2.6% in 2021, showing how serious this problem has become over time. On the other hand, the contribution of prenatal care fell slightly from 1.9 to 1.8%. The share of electricity fell from 1.4 to 1.0%.

Table 4: Contribution of Each Domain (%)

Contribution of each domain (%)	**MPI**	
	2014	2021
Health	26%	26%
Education	43%	43%
Living Standard	32%	31%

Source: Author's Calculations (2021) & Pakistan Planning Commission (2016)

MPI is a composite index that measures the level of multidimensional poverty in a given population. It is composed of three domains: education, health, and living standards. Education indicators contribute the most to the overall MPI, accounting for 43%. Health indicators account for 26%, while living standards contribute for 31%. The difference between 2014 and 2021 is that the contribution to living standards fell by 1%, otherwise all areas contributed equally to poverty from 2014 to 2021. This is the biggest question about the progress of the Sustainable Development Goals at the aggregate level from 2014 to 2021 (Table 4).

4.2. Provincial Level Analysis

By looking at MPI in the different provinces in Pakistan in Table 5, it is possible to identify the areas that are most vulnerable in human development well-being. According to the 2019-20 data, the MPI estimated in Punjab is 0.11, 0.20 in Sindh, 0.19 in KP and 0.32 in Balochistan. The provinces Sindh and Balochistan have more deprivation than Punjab. The MPI in KP is almost equal to Sindh. It is estimated that 23% of the population in Punjab are facing multidimensional poverty, 39% in Sindh, 38% in KP, and 60% in Balochistan. Except for Punjab, more than one third of the population in the other three provinces are facing multidimensional poverty. The intensity of poverty is almost equal across the provinces but Punjab and KP are slightly better than Sindh and Balochistan.

Table 5: Multidimensional Poverty by Province

	Punjab	Sindh	KP	Balochistan
MPI	0.11	0.20	0.19	0.32
Incidence (H)	23%	39%	38%	60%
Intensity (A)	45%	51%	49%	52%

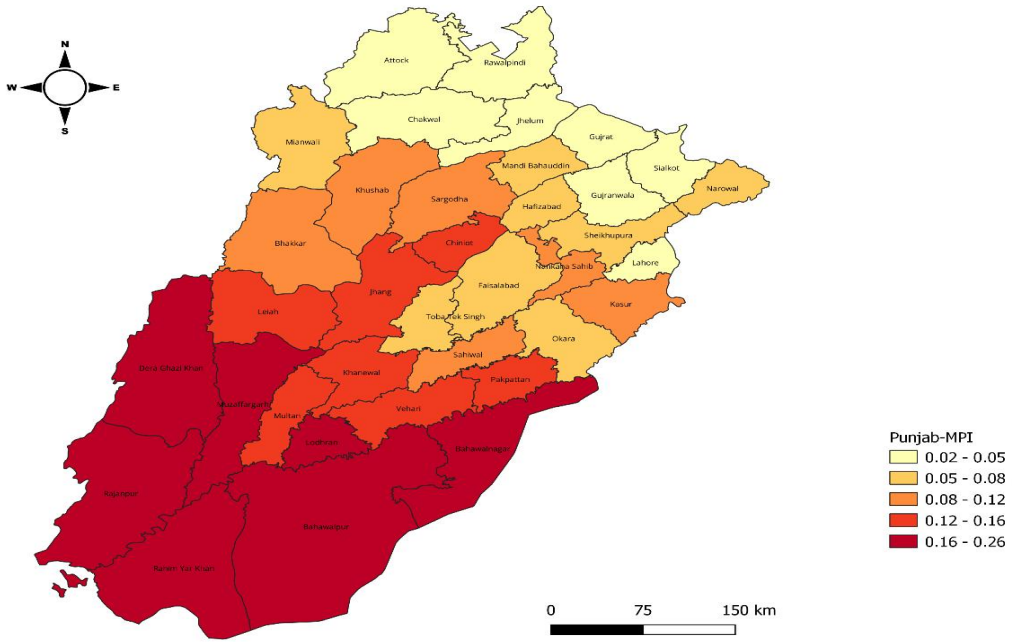
Source: Author's Calculations

4.3. Regional Level Analysis

Punjab

An overview of the MPI in provinces' districts is given in this section. In Punjab, one of Pakistan's most populated provinces, there are many different cities and districts, each of which has distinct socio-economic traits. The MPI poverty rate in each of Punjab's major cities and districts is summarized in this research as of 2019–20 data, and it shows that Rajanpur has the highest MPI (0.26) in top ten districts, followed by Bahawalpur, Rahim Yar Khan, D. G. Khan, Muzaffargarh, Lodhran, Layyah, Jhang, and Chiniot (0.24, 0.23, 0.23, 0.21, 0.19, 0.16, 0.15 and 0.15, respectively). The districts Vehari, Khanewal, Multan, Pakpattan, Khushab, Bhakhar and Sahiwal have MPI ranging from 0.13 to 0.11. However, districts Kasur, Nankana Sahib, Sargodha, Hafizabad, Toba Tek Singh, Mianwali, Faisalabad, Okara, Mandi Bahauddin, Narowal, and Sheikhupura have the medium MPI in the province, ranging from 0.10 to 0.06. The province's lowest districts, with ranging from 0.05 to 0.01, include Gujranwala, Sialkot, Gujrat, Attock, Jehlum, Lahore, Chakwal, Rawalpindi, and Islamabad (Fig.2 and S1).

Figure 2: MPI in Punjab

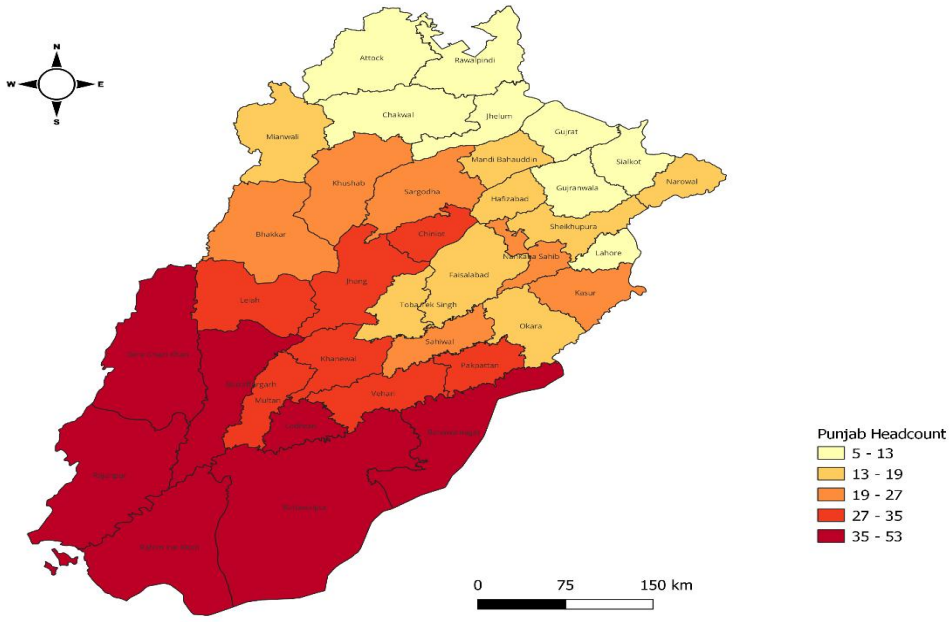


Source: Author's Calculations

According to the MPI headcount, nine districts in Punjab are facing extreme poverty levels, namely Rajanpur, Bahawalpur, D. G. Khan, Rahim Yar Khan, Muzaffargarh, Bahawalnagar, Lodhran, Layyah, and Jhang. These districts have poverty rates varying from 53% to 34% of the population being multidimensionally poor. This has led to a number of social, economic, and political issues in these districts, exacerbating the poverty situation. In the districts of Chiniot, Vehari, Pakpatten Khenewal, Multan, and Bhakher, 31% to 27% of

the people live in multidimensional poverty, which ranges from extreme to moderate. The multidimensional poverty rate is between 26% and 13% in the districts of Khushab, Sahiwal, Kasur, Nankana Sahib, Sargodha, Hafizabad, T.T. Singh, Mianwali, Faisalabad, Mandi Bahauddin, Okara, Narowal, Sheikhupura, and Gujranwala. Nevertheless, the multidimensional poverty rate in the districts of Sialkot, Gujrat, Attock, Jehlum, Lahore, Chakwal, Rawalpindi, and Islamabad ranges from 12% to 3% of the population (Fig.3 and S2).

Figure 3: MPI Headcount in Punjab



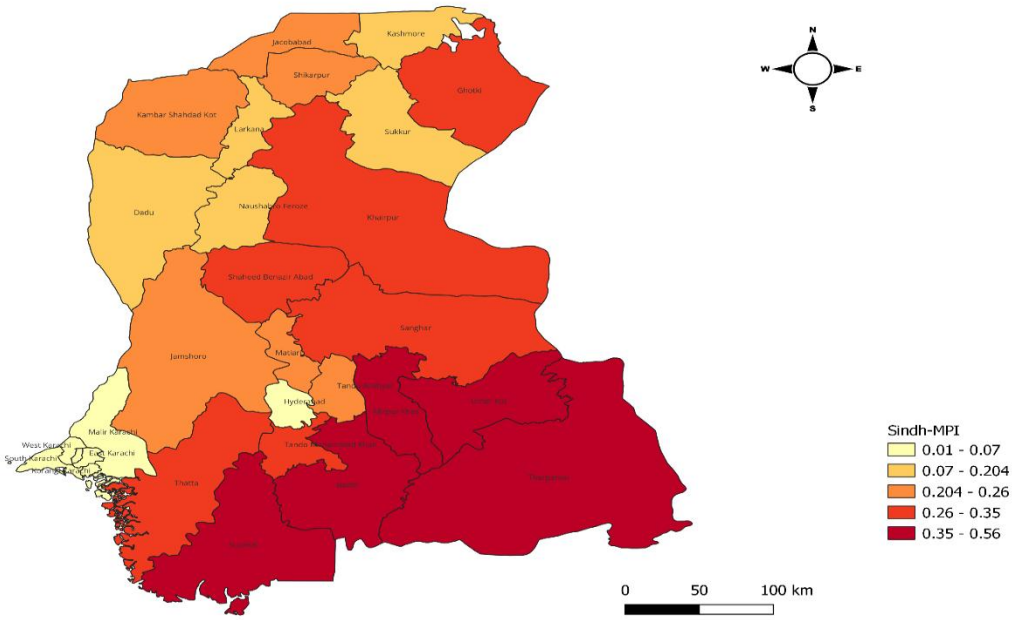
Source: Author's Calculations

The intensity of MPI among the poor population varied from 50% to 39% in Punjab. It shows that the districts Rahim Yar Khan, Bahawalpur, Rajanpur, Bahawalnagar, D. G. Khan, Muzaffargarh and Lodhran varied from 50% to 46% and the districts Khanewal, Khushab, Jhang, Faisalabad, Layyah, Chiniot and Mianwali varied from 46% to 45%. The districts Sahiwal, Sargodha, Pakpattan, Hafizabad, Bhakhar, Kasur, T.T. Singh, Vehari, Nankana Sahib, Okara, Narowal, Gujranwala, Jehlum, Chakwal and Mandi Bahauddin varied from 44% to 42%. However, districts Islamabad, Sialkot, Attock, Rawalpindi, Gujrat and Lahore are lowest and varied from 41% to 39% (S3).

Sindh

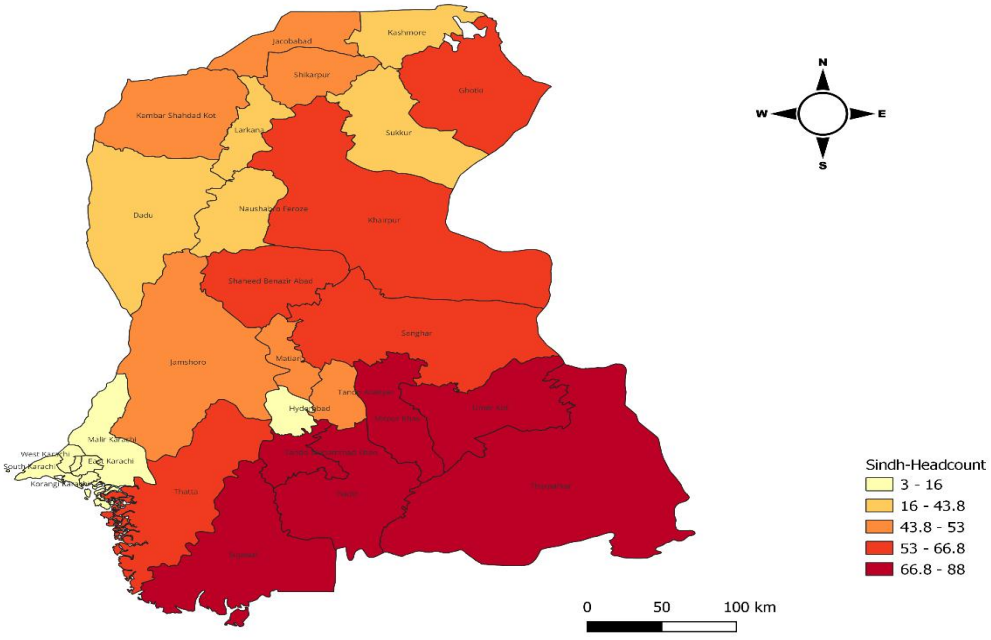
The province Sindh has second largest populous region of Pakistan. The MPI estimates show that Tharparker has the highest MPI (0.56) in top ten districts, followed by Umer Kot (0.42), Sujawal (0.41), MirPur Khas (0.40), Badin (0.37), Tando Muhammad Khan (0.35), Thatta (0.35), Khairpur (0.30), Shaheed Banazir Abad (0.29) and Ghotki (0.28). The districts Sanghar, Tando Allah Yar, Shikarpur, Jacobabad, Jamshoro, Matiari, Shahdadkot, Nowshero Feroze and Kashmore have MPI ranging from 0.28 to 0.20. However, districts Sukkur, Larkana and Dadu, have the medium MPI in the province, ranging from 0.19 to 0.17. The province's lowest districts, with ranging from 0.07 to 0.01, include Hyderabad and Karachi (Fig.4 and S4).

Figure 4: MPI in Sindh



Source: Author's Calculations

Figure 5: MPI Headcount in Sindh



Source: Author's Calculations

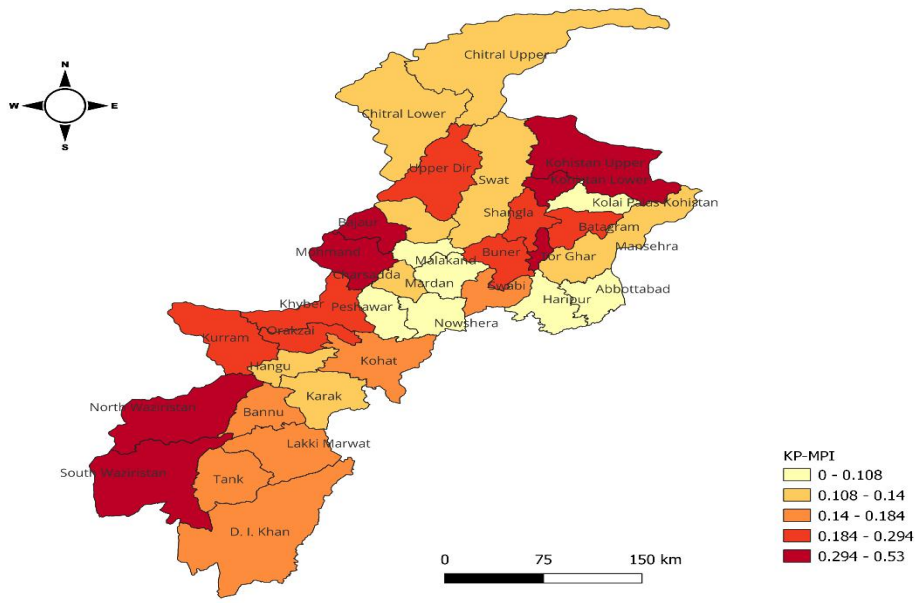
According to the MPI headcount out of 29 districts, 15 districts of Sindh are facing extreme poverty levels, namely Tharparkar, Umer Kot, Sujawal, Badin, Tando Muhammad Khan, Mir Pur Khas, Thatta, Khairpur, Shaheed Banazir Abad, Ghotki Sanghar, Tando Allah Yar, Shikarpur, Jacobabad and Jamshoro. These districts have poverty rates varying from 88% to 50% of the population being multidimensionally poor. This has led to a

number of social, economic, and political issues in these districts, exacerbating the poverty situation. In the districts of Shahdadkot, Matiari, Nowshero Feroze, Kashmore, Larkana, Sukkur and Dadu, 48% to 37% of the people live in multidimensional poverty, which ranges from extreme to moderate. Nevertheless, the multidimensional poverty rate in the districts of Karachi and Hyderabad ranges from 16% to 3% of the population (Fig.5 and S5). The intensity of MPI among the poor population varied from 63% to 36% in Sindh. It shows that the districts Tharparkar, Mir Pur Khas, Umer Kot, Sujawal, Thatta, Badin, Sukkur, Tando Muhammad Khan, Khairpur and Sanghar varied from 63% to 51% and the districts Jamshoro, Ghotki, Shaheed Banazir Abad, Tando Allah Yar, Jacobabad, Matiari, Shikarpur, Nowshero Feroze, Dadu, Shahdadkot and Kashmore varied from 51% to 46%. The districts Hyderabad, Larkana, Karachi Malir, Karachi West, Karachi East, Karachi Central, Korangi and Karachi South varied from 44% to 36% (S6).

Khyber Pakhtunkhwa

The province KP has third largest populous region of Pakistan. The MPI estimates show that Kohistan has the highest MPI (0.53) in top ten districts, followed by Mohmand (0.46), Bajur (0.41), North Waziristan (0.38), Tor Garh (0.35), South Waziristan (0.31), Kurram (0.29), Shangla (0.28), Batagram (0.25) and Orakzai (0.25). The districts Bunair, Khyber, Bannu, Kohat, Lakki Marwat, D. I. Khan, Tank and Swabi have MPI ranging from 0.24 to 0.15. However, districts Mansehra, Swat, Charsada, Hangu, Lower Dir, Karak, Chitral, Peshawar and Abbottabad, have the medium MPI in the province, ranging from 0.14 to 0.10. The province's lowest districts, with ranging from 0.09 to 0.06, include Mardan, Nowshera, Haripur and Malakand (Fig.6 and S7).

Figure 6: MPI in KP

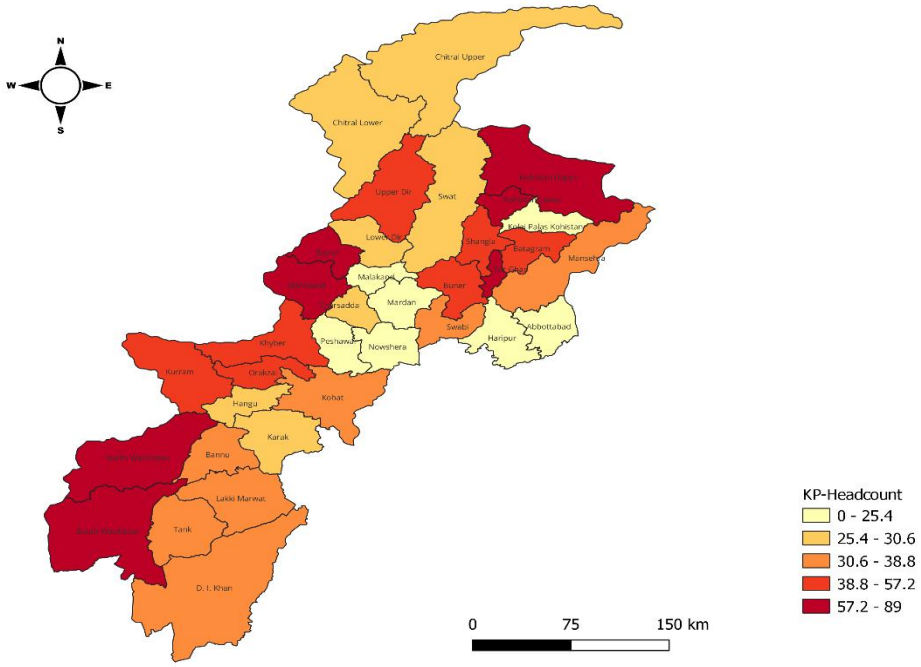


Source: Author's Calculations

According to the MPI headcount out of 32 districts, 10 districts of KP are facing extreme poverty levels, namely Kohistan, Mohmand, Bajur, North Waziristan, Tor Garh, South Waziristan, Shangla, Kurram, Orakzai and Batagram. These districts have poverty rates varying from 89% to 50% of the population being multidimensionally poor. In the districts of Upper Dir, Bunair, Khyber, Bannu, Kohat, D. I. Khan and Lakki Marwat, 49% to 35% of the people live in multidimensional poverty, which ranges from extreme to moderate.

However, the multidimensional poverty rate in the districts of Tank, Swabi, Mansehra, Charsada, Swat, Hangu, Lower Dir, Karak, Chitral, Abbottabad, Peshawar, Mardan and Nowshera ranges from 34% to 20% of the population. The only two districts-Haripur and Malakand in KP have less than 20% of the population being multidimensionally poor (Fig.7 and S8). The intensity of MPI among the poor population varied from 59% to 43% in KP. It shows that the districts Kohistan, Mohmand, Kurram, Bajur, Batagram, South Waziristan and North Waziristan varied from 59% to 50% and the districts Shangla, Bunair, Tor Garh, Orakzai, Upper Dir, Lakki Marwat, Bannu, Mansehra, Swabi, Kohat, Khyber, Swat, Charsada, Lower Dir, Hangu, Tank and Peshawar varied from 49% to 45%. The districts D. I. Khan, Haripur, Mardan, Malakand, Abbottabad, Karak, Nowshera and Chitral varied from 44% to 43% (S9).

Figure 7: MPI Headcount in KP

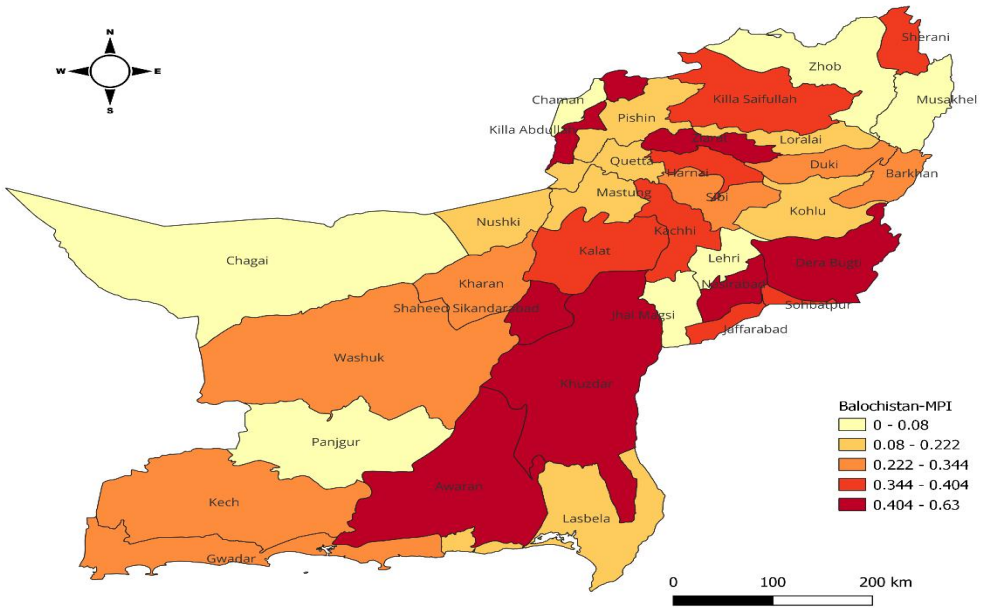


Source: Author's Calculations

Balochistan

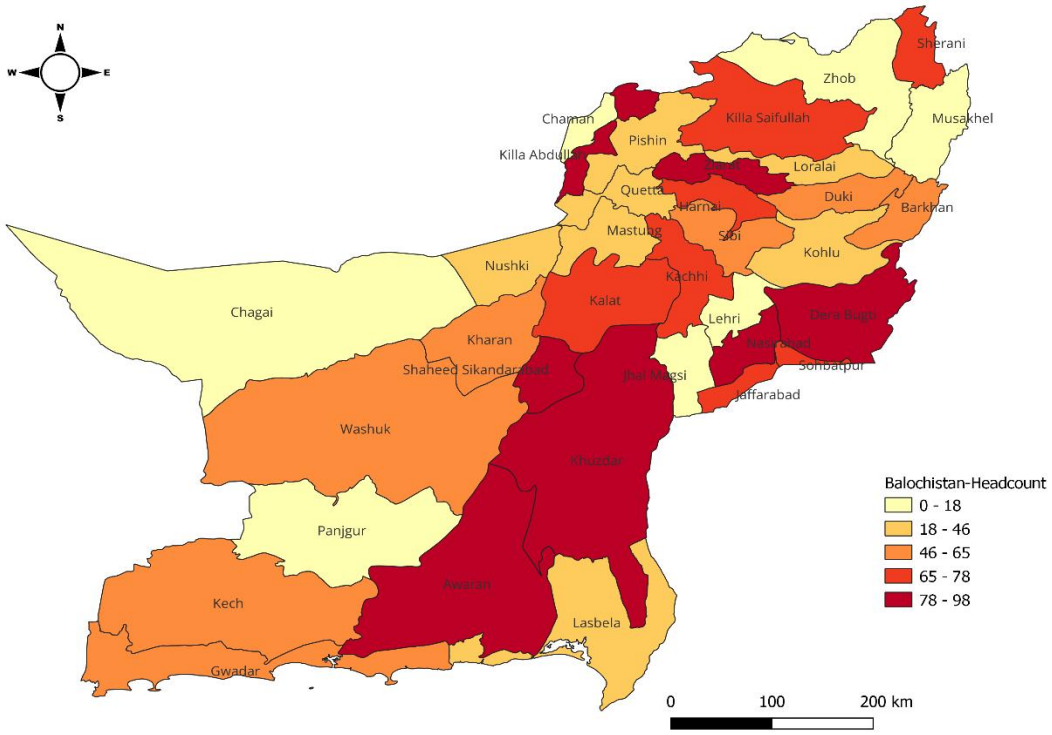
The province of Balochistan is facing an extreme level of multidimensional poverty compared to the other provinces and regions of Pakistan. The MPI estimates show that Khuzdar has the highest MPI (0.63) in top ten districts, followed by Awaran (0.62), Dera Bugti (0.48), Shaheed Sikandar Abad (0.47), Qilla Abdullah (0.45), Nasirabad/ Tamboo (0.43), Ziarat (0.42), Harnai (0.40), Qilla Saifullah (0.39) and Sherani (0.39). The districts Kachhi/ Bolan, Jaffarabad, Sohbatpur, Kalat, Washuk, Gwadar, Kech/Turbat, Sibbi and Kharan have MPI ranging from 0.39 to 0.25. However, districts Barkhan, Duki, Lasbela, Mastung and Loralai, have MPI in the province, ranging from 0.24 to 0.20. The province's lowest districts, with ranging from 0.18 to 0.10, include Pishin, Nushki, Quetta and Kohlu (Fig.8 and S10).

Figure 8: MPI in Balochistan



Source: Author's Calculations

Figure 9: MPI Headcount in Balochistan



Source: Author's Calculations

According to the MPI headcount out of 28 districts, 20 districts of Balochistan are facing extreme poverty levels, namely Awaran, Khuzdar, Shaheed Sikandar Abad, Dera Bugti, Ziarat, Qilla Abdullah, Nasirabad/ Tamboo, Sherani, Qilla Saifullah, Harnai, Sohbatpur, Kachhi/ Bolan, Jaffarabad, Kalat, Washuk,

Kech/Turbat, Kharan, Sibbi, Gwadar and Barkhan. These districts have poverty rates varying from 98% to 50% of the population being multidimensionally poor. In the districts of Duki, Mastung, Lasbela, Loralai, Pishin, Nushki, Quetta and Kohlu, 46% to 23% of the people live in multidimensional poverty, which ranges from extreme to moderate (Fig.9 and S11). The intensity of MPI among the poor population varied from 64% to 43% in Balochistan. It shows that the districts Khuzdar, Awaran, Washuk, Qilla Abdullah, Dera Bugti, Nasirabad/ Tamboo, Gwadar, Harnai, Kachhi/ Bolan, Jaffarabad, Qilla Saifullah, Ziarat, Shaheed Sikandar Abad, Sherani, Kalat, Sohbatpur and Duki varied from 64% to 50%. The districts Loralai, Kech/Turbat, Lasbela, Sibbi, Pishin, Barkhan, Quetta and Kharan varied from 49% to 45% (S12).

5. Discussion

In 2010, Pakistan's constitution underwent its 18th amendment, which was a significant turning point for the nation. It resulted in a significant change in the balance of power by transferring some authority from the federal government to the provinces (Zaman et al., 2018). Health, education, and poverty reduction are three of the most significant of these ceded competences and are now all under the purview of the province administrations (Rana, 2020). The provincial governments have been granted additional authority to create and carry out policies that would enhance the quality of life for people living in their individual provinces (Nasrullah., Amin, & Soomro, 2021), as well as more control over the funding of these programmes. Also, the 18th Amendment gave provincial governments additional freedom to devise their own poverty-reduction plans (Khan, Chaudhry, & Saif, 2022). This has allowed them to focus on certain requirements. Now, mostly SDGs targets, performance and progress are the provincial concept in accordance to the 18th amendment and the provincial governments have been developed many programs and initiates related to the SDGs progress, particularly SGD-1. The SDG-1 is significantly correlated all other SDGs. However, it is directly or indirectly effected with SDGs initiates and programs (Pradhan et al., 2017). This study is a snapshot of national and provincial progress on SDG-1 from the updated PSLM 2019-20 data using the MPI. The MPI is a human development performance index which is a combination of other SDGs, including health, education, and living standards, without capturing the employment, income, inequalities, food and nutrition insecurity, climate change, Natural disasters and so on. The countries that are signatories to the United Nations have frequently employed these tools to monitor and assess progress in the localization of the Sustainable Development Goals (SDGs).

Over time, MPI in Pakistan has steadily declined since 2014. Still, the headcount rate is estimated at 33%, and the rate of improvement will need to accelerate for the regional programs to achieve its target of 19%. Based on the data analysis conducted by the UNDP and Pakistan Planning Commission in 2014/15, the headcount rate was estimated to be 38.8%. However, due to the combined efforts of provincial authorities and donors, the headcount rate has decreased by 5.8% since 2014/15. The MPI is highly dependent on the domain indicators. In Pakistan, a decline has mostly been observed in health and living standard related indicators. These all indicators are derived from private income sources and donor-related programs such as immunization, antenatal care, assisted delivery, and living standards. It shows that 42.1% of the population is deprived in terms of the school indicator, 15.6% of the population is deprived in school attendance, 12.7% in quality education, 32.5% in basic health facilities, 20.7% in housing walls, 22.3% in overcrowding, 19.1% in sanitation, 12.3% in access to improved drinking water, 57.5% in access to clean cooking fuel, 33.9% in households' durable assets, and 34.3% in agriculture and livestock. In 2014/15, education-related deprivations were the largest contributor to poverty in Pakistan, accounting for 42.8% of the MPI. This means that a significant proportion of the population in Pakistan lacked access to education or faced other barriers that prevented them from fully participating in educational opportunities. The living standards, such as access to basic services like clean water and electricity, contributed to 31.5% of the MPI, while health-related factors, including access to healthcare, contributed to 25.7% of the MPI. This indicates that poverty in Pakistan is not only caused by lack of income, but also by the lack of access to basic services and social safety nets. The MPI indicators have decreased over time, indicating

that poverty in Pakistan has improved to some extent. This could be attributed to the various efforts made by the government, NGOs, and other stakeholders to address poverty and improve access to basic services. However, despite the progress made, poverty remains a major challenge in Pakistan (GOP, UNDP, & OPHDI, 2016).

However, non-MPI indicators, Pakistan's Gini Coefficient Index is 68.4, and the country's unemployment rate increased to 6.50% in 2021 from 4.40% in 2020, 40.2% of households reported food insecurity in daily caloric intake in 2018–19, and the annual economic growth steadily declining (Hameed et al., 2021). Despite of these limitation with MPI, the contribution in MPI shows that years of schooling contributing the most at 29.4%, followed by housing walls at 20.7%, overcrowding at 22.3%, and basic health facilities at 19.5%, school attendance (10.3%), access to clean cooking fuel (8.5%), households' durable assets (6.2%), agriculture and livestock (4.5%) and sanitation (4.5%) are the most important. These all indicators are highly corrected with poverty and deprivation level (Padda &Hameed, 2018). Rural regions experience 47.7% headcount ratio greater levels of poverty deprivation than urban areas (12%), yet the severity of poverty is almost equal in both areas. In 2014/15, 56% of the population in rural areas and 10.5% in urban areas were living in poverty. The headcount decreased by 8.5% in rural areas and increased by 1.5% in urban areas of Pakistan. This increase can be attributed to the high rate of urbanization in Pakistan, which is the highest in South Asia. However, recent research has shown that urbanization does not always lead to growth, jobs, and productivity. In many developing countries, unplanned and unmanaged urbanization has resulted in urban slums, environmental degradation, poverty, and inequality. Pakistan is also facing numerous urban challenges. (UNDP, 2019).

In Pakistan, rural areas are particularly vulnerable to economic conditions of agriculture, livestock, and climate change. The majority of rural households are dependent on agriculture and livestock as their main sources of income (Azam & Shafique, 2017). Recent research has found that agricultural production in the country has decreased due to climate change and the increased frequency of extreme weather events (Khan et al., 2022). Lumpy skin disease is considered one of the most economically important viral diseases of cattle in Pakistan. The disease has been reported in many parts of the country, including Punjab, Sindh, KP, Balochistan, Gilgit-Baltistan and Azad Jammu and Kashmir and over 100,000 animals (mostly cattle) were affected with lumpy skin disease (Imran et al., 2022). The provincial analysis along with districts level shows that except for Punjab, more than one third of the population in the other three provinces are facing multidimensional poverty. The intensity of poverty is almost equal across the provinces but Punjab and KP are slightly better than Sindh and Balochistan. It is estimated that 23% of the population in Punjab are facing multidimensional poverty, 39% in Sindh, 38% in KP, and 60% in Balochistan During the period of 2014/15, the percentage of people living in multidimensional poverty was 31.4% in Punjab, 43.1% in Sindh, 49.2% in KP, and 71.2% in Balochistan. Since then, there has been a decrease in poverty rates in all provinces, with Punjab experiencing an 8.4% decrease, Sindh experiencing a 4.1% decrease, and KP and Balochistan experiencing an 11.2% decrease. However, multidimensional poverty rates are still quite high at both the provincial and district levels despite these reductions. There are big problems with district level examinations nationwide, such as bad management, a lack of resources, and unequal wealth distribution. People in rural areas, who are usually living under the Sardar, Wadera, and Chaudry cultures administration, do not have access to good healthcare, jobs, income generating activities, and other benefits. This is because of these influencers and their corruption; the urban and influencers areas usually get more of the local resources available (Rehman, 1997; Arif & Farooq, 2014).

The Punjab province is the largest province of Pakistan by population and resource. It is divided into three parts-South Punjab, Central Punjab and North Punjab. The South Punjab, including districts Rajanpur, Bahawalpur, D. G. Khan, Rahim Yar Khan, Muzaffargarh, Bahawalnagar, Lodhran, Layyah, and Multan Jhang. Most people of South Punjab are engaged in agriculture; main crops are sugarcane, cotton, wheat and maize.

Fruits and vegetables are also being increasingly grown in these areas (Padda & Hameed, 2018). Unfortunately, South Punjab districts are more deprived in basic health, education, access to clean drinking water and sanitation as compared to Central and Northern Punjab. The top ten extremely deprived districts of Punjab Province belong to this region. This has led to a number of social, economic, and political issues in these districts, exacerbating the poverty situation. In the Central Punjab Region, districts of Chiniot, Vehari, Pakpatten Khenewal, Multan, and Bhakher, 31% to 27% of the people live in multidimensional poverty, which ranges from extreme to moderate. The Northern Punjab region has less population fewer people living in poverty as compared to than the Central and Southern Punjab regions. This shows that there is an unequal distribution of resources and policies are not helping people in the South Punjab districts of South Punjab. Local political leaders have a lot of influence in these areas. Also, the level of administration by the government is appalling. The percentage of people aged 10 and older who have ever attended school at the national level has increased from 65% in 2014–15 to 66% in 2019–20. In 2019–20, 24% of children aged 5 to 16 who have never attended school and 28% of those who have done so in rural regions are classified as being out of school. The living standards of the households reveal that 84% own their home, 96% have access to electricity, 50% use gas as a cooking fuel, and 18% utilize the municipal waste management system. The filtered water is available to the 18% of households. From 2014–15 to 2019–20, the percentage of households with toilet facilities increased from 79% to 89% (GOP, 2021).

The situation in rural Sindh is similar to that of South Punjab. Sindh is divided into three parts; Karachi, metro cities and rural areas. The rural areas are the poorest with poverty rates ranging from 50%-88%, including districts Tharparkar, Umer Kot, Sujawal, Badin, Tando Muhammad Khan, Mir Pur Khas, Thatta, Khairpur, Shaheed Banazir Abad, Ghotki Sanghar, Tando Allah Yar, Shikarpur, Jacobabad and Jamshoro. The metro cities including Hydrabad, Sukkur, Larkana and Dadu are less poor than the rural areas. Karachi is made up of 6 districts including Malir, West, East, South, Central and Korangi and they are less multidimensionally poor due to the employment opportunities and urban development. In rural areas, local political leaders have a lot of influence and the government's administration is poor. Nearly, 48% of Sindh's population lives in rural areas and the main sources of rural households' income are based on agriculture and its allied activities. A large number of the rural population faces social development deprivation and well-being issues (Padda & Hameed, 2018). Availability and access to basic services such as water, sanitation, cooking fuel and electricity make up an important determinant for analyzing poverty. There have been marginal improvements in access to basic services from the baseline in 2014-15 to 2019-2020 in Sindh province. The access to improved water sources and the gas improved by 1% and 1.3% respectively. However, access to flush toilet improved by 9% in 2019-20 versus the baseline period i.e., 2014-15 (GOP, 2021). Despite the reduction in MPI in Sindh province from 2014-15 to 2019-20, there is still need for discussion on economic development, agricultural production, income disparity, and small business opportunities. From 2015-16 to 2018-19, the household employment ratio in Sindh varies by just 2%, remaining unchanged in urban areas and changing by 3% in rural regions (GOP, 2019). Over 43.9% of Sindh families were food insecure. Food insecurity was assessed to be 38.4% in urban Sindh compared to 44.4% in rural Sindh (Hameed et al, 2022). Climate change has a significant impact on agricultural crop and livestock productivity in Sindh. Crop insurance is provided on a very modest basis via a public-private partnership, while animal insurance is not provided.

KP province is divided into three regions: upper areas, central areas, and border areas near Afghanistan. Out of 32 districts, 10 districts face extreme poverty levels, with poverty rates ranging from 89% to 50%, namely Kohistan, Mohmand, Bajur, North Waziristan, Tor Garh, South Waziristan, Shangla, Kurram, Orakzai and Batagram. The Upper Dir, Bunair, Khyber, Bannu, Kohat, D. I. Khan and Lakki Marwat have poverty rates ranging from 49% to 35%, while the central areas such as Malakand, Mardan, Nowshera, and Pheshawar are less deprived. The upper areas of KP are the least deprived due to economic opportunities. The border and lower

areas are more deprived due to insurgency. Pakhtun communities are more affected due to limited economic resources, low education levels, poor health, and lack of access to clean drinking water and sanitation. These problems lead to terrorism, street crime, violence, and social exclusion in the region (Hameed & Qaiser, 2019). In 2019-20, 54% of children aged 5-16 had attended school and 32% were out of school. 34% of children were in rural areas and 20% in urban areas. Government spending on essential services like education, health and social protection decreased from 2014-15 to 2018-19, while access to toilet facilities increased from 76% to 84% and 6% more households had access to improved water sources. In 2019-20, 27% of households reported that their economic situation had worsened, after Sindh (GOP, 2021). Food and nutrition insecurity show that 49.5% of households were deprived of enough food to meet their daily needs, affecting 19.8 million people. The prevalence of unbalanced food intake was estimated at 35.6%, with 45.4% in urban areas and 41.9% in rural areas (Hameed et al., 2022).

Nutrition, health, child development, housing and sanitation domains indicators are the key role of intra-household and regional level in Balochistan. The province observed high level of MPI deprivation. The respective province of Pakistan is completely directly controlled by the political and land lord influencers. According to the MPI headcount out of 28 districts, 20 districts of Balochistan are facing extreme poverty levels, namely Awaran, Khuzdar, Shaheed Sikandar Abad, Dera Bugti, Ziarat, Qilla Abdullah, Nasirabad/ Tamboo, Sherani, Qilla Saifullah, Harnai, Sohbatpur, Kachhi/ Bolan, Jaffarabad, Kalat, Washuk, Kech/Turbat, Kharan, Sibbi, Gwadar and Barkhan. These districts have poverty rates varying from 98% to 50% of the population being multidimensionally poor. The remaining districts varied from 46% to 23% of the people live in multidimensional poverty. In 2019-20, 44% of children aged 5-16 had attended school and 47% were out of school, 51% of children were in rural areas and 35% in urban areas. Interestedly, the children had attended school ratio was same in 2014-15 data. On the other side, Government spending on essential services like education, health and social protection increased from 2014-15 to 2018-19, while access to toilet facilities increased from 31% to 44% and 7% more households had access to improved water sources. In 2019-20, 22% of households reported that their economic situation had worsened and 47% reported same as 2014-15 (GOP, 2021). Food and nutrition insecurity show that 53.3% of households were deprived of enough food to meet their daily needs, affecting 1.7 million people in urban and 5.3 million in rural areas. The prevalence of unbalanced food intake was estimated at 44.4%, with 45.8% in urban areas and 43.8% in rural areas (Hameed et al., 2022).

6. Conclusion and Policy Recommendations

Nationwide, 33% of people in Pakistan are multidimensionally poor, with 12% in urban areas and 42.7% in rural areas. Poverty is closely linked to a lack of health services, sanitation, overcrowding, poor housing, limited clean cooking fuel, few household assets, and low agricultural and livestock resources. Major deprivations include schooling (42.1%), school attendance (15.6%), quality education (12.7%), health facilities (32.5%), housing walls (20.7%), overcrowding (22.3%), sanitation (19.1%), drinking water (12.3%), clean cooking fuel (57.5%), household assets (33.9%), and agriculture and livestock (34.3%). The provincial situation shows wide disparities. Sindh and Balochistan record higher deprivation than Punjab, while KP stands close to Sindh. Rural Sindh faces severe poverty, but cities such as Hyderabad, Sukkur, Larkana, and Dadu are relatively better off. In Punjab, South Punjab is more deprived than Central and North Punjab, particularly in education, healthcare, clean water, and sanitation. In KP, poverty varies across regions. Out of the 32 districts, 10 face extreme deprivation. The upper areas enjoy better economic opportunities, while the border and lower areas are deeply affected by insurgency and poor access to essential services. Communities in these regions, face serious challenges in education, health, drinking water, and sanitation. Balochistan remains the most deprived province. Out of its 28 districts, 20 suffer from extreme poverty. Key issues include poor nutrition, weak health services, limited child development, inadequate housing, and sanitation problems. Poverty in Balochistan is worsened by

political and feudal influence, which restricts people's access to basic services and resources. To eradicate poverty or deprivation in Pakistan, the following solemn actions will be taken for achieving the SDGs goals 2030.

- Prioritize universal access to education, health, water, and sanitation as a foundation for poverty reduction across the Pakistan instead of developed areas like metro cities of provinces.
- Provide incentives for decentralized level livelihoods to generate employment and promote local economic growth. Empower women through access to education, skills, and jobs. Gender-focused policies can strengthen households and reduce poverty faster.
- Modernize agriculture and diversify livelihoods through value addition, agro-processing, and climate-resilient practices. Support farmers with training, infrastructure, credit, and institutional backing. Introduce crop and livestock insurance schemes to safeguard farmers against natural disasters, disease, and other risks.
- Provide income-generating activities for the skilled population to safeguard against future slum poverty, which is projected to increase, although not directly analyzed in this study.

Limitations of the Study

The Pakistan Bureau of Statistics conducted the PSLM 2019-20. Comparison with the 2014-15 MPI is limited due to slight questionnaire changes and missing cut-off details.

- School Quality: In 2019-20, deprivation included children aged 6–11 not attending school due to quality issues or dissatisfaction. The 2014-15 survey did not specify an age range.
- Immunization: The 2019-20 survey covered 14 vaccines, compared to 12 in 2014-15. A child under five is deprived if not fully vaccinated, but earlier criteria for "full immunization" were unclear.
- Drinking Water: In 2014-15, only access and time to source were asked. In 2019-20, questions included source inside/outside the home and round-trip time.
- Electricity & Housing: The 2019-20 survey added solar energy as a lighting source and included plywood/cardboard as wall material, unlike 2014-15.

Funding:

Not applicable.

Data availability:

All relevant data are within the paper.

Conflict of interest:

The authors declare that there is no competing interest among them for the publication of this research. There are no patents, products in development or marketed products to declare.

References

Alkire, S., & Foster, J. (2011). Counting and multidimensional poverty measurement. *Journal of public economics*, *95*(7-8), 476-487.

Arif, G., & Farooq, S. (2014). Rural poverty dynamics in Pakistan: Evidence from three waves of the panel survey. The Pakistan Development Review, 53(2), 71-98

Asadullah, M. N., Savoia, A., & Sen, K. (2020). Will South Asia achieve the sustainable development goals by 2030? Learning from the MDGs experience. Social Indicators Research, 152, 165-189.

Azam, A., & Shafique, M. (2017). Agriculture in Pakistan and its Impact on Economy. *A Review. Inter. J. Adv. Sci. Technol*, *103*, 47-60.

Begum, S., Ashraf, M. I., & Ishaque, W. (2018). National Plan for Devolution of Power under 18th Amendment: Challenges for Government in the New Pakistan. Global Social Sciences Review (GSSR), 71-88.

Chambers, R. (2006). What is poverty? Who asks? Who answers?.

Cheng, H., Dong, S., Li, F., Yang, Y., Li, Y., & Li, Z. (2019). A circular economy system for breaking the development dilemma of 'ecological Fragility–Economic poverty'vicious circle: A CEEPS-SD analysis. *Journal of Cleaner Production*, *212*, 381-392.

Farooq, S., & Ahmad, U. (2020). Economic growth and rural poverty in Pakistan: A panel dataset analysis. *The European Journal of Development Research*, *32*(4), 1128-1150.

Fry, K., Firestone, R., & Chakraborty, N. M. (2014). Measuring equity with nationally representative wealth quintiles. *Washington, DC: PSI*.

GOP, (2018), National Poverty Report 2015-16. Ministry of Planning and Development Reform, Islamabad.

GOP, UNDP and OPHDI, (2016). Multidimensional Poverty in Pakistan. 2016. The Planning Commission of Pakistan, UNDP, & Oxford Poverty & Human Development Initiatives, University of Oxford

GOP. (2019). Pakistan Household Integrated Economic Survey 2018-19. Government of Pakistan, Pakistan Bureau of Statistics, Ministry of Planning Development & Special Initiatives.

GOP. (2021). Pakistan Social and Living Standards Measurement Survey 2019-20. Government of Pakistan, Pakistan Bureau of Statistics, Ministry of Planning Development & Special Initiatives.

Hameed, A., & Qaiser, Z. (2019). Estimating social exclusion in rural Pakistan: A contribution to social development policies. *Business & Economic Review*, *11*(1), 103-122.

Hameed, A., Padda, I. U. H., & Karim, S. (2022). Spatial analysis of food and nutrition security in Pakistan: a holistic pathway towards zero hunger policies. GeoJournal, 1-23.

https://tradingeconomics.com/pakistan/unemployment-rate

Idrees, M., & Baig, M. (2017). An Empirical Analysis of Multidimensional Poverty in Pakistan. FWU Journal of Social Sciences, 11(1).

Imran, M., Hashmi, A. H., Khalique, F., & Iqbal, M. Z. (2022). Lumpy Skin Disease Emerging Problem in Pakistan.

Islam, T. T., Newhouse, D., & Yanez-Pagans, M. (2021). International comparisons of poverty in South Asia. *Asian Development Review*, *38*(1), 142-175.

Jamal, H. (2012). An Exploratory Analysis of Inter-Temporal Multidimensional Poverty. Social Policy and Development Centre (SPDC) http://spdc.org.pk/Data/Publication/PDF/RR83.pdf

Khan, A. U., Saboor, A., Hussain, A., Sadiq, S., & Mohsin, A. Q. (2014). Investigating multidimensional poverty across the regions in the Sindh province of Pakistan. Social indicators research, 119, 515-532.

Khan, A. U., Saboor, A., Hussain, A., Karim, S., & Hussain, S. (2015). Spatial and temporal investigation of multidimensional poverty in rural Pakistan. *Poverty & Public Policy*, *7*(2), 158-175.

Khan, M., Chaudhry, M. N., & Saif, S. (2022). Benefits and drawbacks of EIA decentralisation in Pakistan. *Environmental Impact Assessment Review*, *97*, 106882.

Khan, N., Ma, J., Kassem, H. S., Kazim, R., Ray, R. L., Ihtisham, M., & Zhang, S. (2022). Rural Farmers' Cognition and Climate Change Adaptation Impact on Cash Crop Productivity: Evidence from a Recent Study. International Journal of Environmental Research and Public Health, 19(19), 12556.

Li, Z., Deng, X., & Zhang, Y. (2021). Evaluation and convergence analysis of socio-economic vulnerability to natural hazards of Belt and Road Initiative countries. *Journal of Cleaner Production*, *282*, 125406

Nasrullah., Amin, R. U., & Soomro, K. A. (2021). Decentralization of Education: The Affective Role of Fiscal Decentralization in Pakistani Education System (s). *FWU Journal of Social Sciences*, *15*(1), 41-51.

Naveed, A. (2016). Geography of Poverty in Pakistan; Multidimensional Poverty in Pakistan at the National, Provincial and District levels 2014-15 Pakistan Poverty Alleviation Fund (PPAF)

Naveed, A., & Ul-Islam, T. (2010). Estimating multidimensional poverty and identifying the poor in Pakistan: An alternative approach.

Padda, I. U. H., & Hameed, A. (2018). Estimating multidimensional poverty levels in rural Pakistan: A contribution to sustainable development policies. Journal of cleaner production, 197, 435-442.

Pradhan, P., Costa, L., Rybski, D., Lucht, W., & Kropp, J. P. (2017). A systematic study of sustainable development goal (SDG) interactions. *Earth's Future*, *5*(11), 1169-1179.

Rahman, T. (1997). Language and ethnicity in Pakistan. Asian Survey, 9, 833-839.

Rana, M. A. (2020). Decentralization experience in Pakistan: the 18th constitutional amendment. Asian Journal of Management Cases, 17(1), 61-84.

Saboor, A., Khan, A. U., Hussain, A., Ali, I., & Mahmood, K. (2015). Multidimensional deprivations in Pakistan: Regional variations and temporal shifts. The Quarterly Review of Economics and Finance, 56, 57-67.

UNDP. (2019). Urbanisation in Pakistan. https://www.undp.org/pakistan/urbanisation-pakistan

Wagle, U. (2002). Rethinking poverty: definition and measurement. *International Social Science Journal*, *54*(171), 155-165.

World Bank, (2022) Understanding of Poverty: https://www.worldbank.org/en/topic/poverty/overview

Zaman, A., Subhan, F., Mumtaz, A., & Khan, A. Q. (2018). 18th amendment & provincial autonomy: challenges for political parties. Bi-Annual Res J, Balochistan Study Centre, University of Balochistan.

Supplementary Information (SI)

S1: MPI Rank in Punjab

District	MPI	Rank	District	MPI	Rank	District	MPI	Rank
Rajanpur	0.26	1	Pakpattan	0.13	14	Narowal	0.07	27
Bahawalpur	0.24	2	Khushab	0.12	15	Sheikhupura	0.06	28
Rahim Yar Khan	0.23	3	Bhakhar	0.12	16	Gujranwala	0.05	29
D. G. Khan	0.23	4	Sahiwal	0.11	17	Sialkot	0.05	30
Muzaffargarh	0.21	5	Kasur	0.10	18	Gujrat	0.04	31
Bahawalnagar	0.21	6	Nankana Sahib	0.10	19	Attock	0.04	32
Lodhran	0.19	7	Sargodha	0.09	20	Jehlum	0.04	33
Layyah	0.16	8	Hafizabad	0.08	21	Lahore	0.03	34
Jhang	0.15	9	T.T. Singh	0.08	22	Chakwal	0.02	35
Chiniot	0.15	10	Mianwali	0.08	23	Rawalpindi	0.02	36
Vehari	0.13	11	Faisalabad	0.08	24	Islamabad	0.01	37
Khanewal	0.13	12	Okara	0.07	25			
Multan	0.13	13	Mandi Bahauddin	0.07	26			

S2: MPI Headcount Rank in Punjab

District	H	Rank	District	H	Rank	District	H	Rank
Rajanpur	53%	1	Multan	29%	14	Narowal	16%	27
Bahawalpur	49%	2	Bhakhar	27%	15	Sheikhupura	15%	28
D. G. Khan	48%	3	Khushab	26%	16	Gujranwala	13%	29
Rahim Yar Khan	46%	4	Sahiwal	25%	17	Sialkot	12%	30
Muzaffar Garh	45%	5	Kasur	24%	18	Gujrat	10%	31
Bahawalnagar	44%	6	Nankana Sahib	24%	19	Attock	10%	32
Lodhran	41%	7	Sargodha	21%	20	Jehlum	8%	33
Layyah	35%	8	Hafizabad	19%	21	Lahore	7%	34
Jhang	34%	9	T.T. Singh	19%	22	Chakwal	6%	35
Chiniot	33%	10	Mianwali	17%	23	Rawalpindi	5%	36
Vehari	31%	11	Faisalabad	17%	24	Islamabad	3%	37
Pakpattan	29%	12	Mandi Bahauddin	17%	25			
Khanewal	29%	13	Okara	17%	26			

S3: MPI Intensity in Punjab

District	A	Rank	District	A	Rank	District	A	Rank

Rahim Yar Khan	50%	1	Chiniot	45%	14	Narowal	42%	27
Bahawalpur	49%	2	Mianwali	45%	15	Gujranwala	42%	28
Rajanpur	48%	3	Sahiwal	44%	16	Jehlum	42%	29
Bahawalnagar	47%	4	Sargodha	44%	17	Chakwal	42%	30
D. G. Khan	47%	5	Pakpattan	44%	18	Mandi Bahauddin	42%	31
Muzaffar Garh	47%	6	Hafizabad	44%	19	Islamabad	41%	32
Lodhran	46%	7	Bhakhar	43%	20	Sialkot	41%	33
Khanewal	46%	8	Kasur	43%	21	Attock	41%	34
Khushab	45%	9	T.T. Singh	43%	22	Rawalpindi	41%	35
Jhang	45%	10	Vehari	43%	23	Gujrat	40%	36
Faisalabad	45%	11	Nankana Sahib	43%	24	Lahore	39%	37
Layyah	45%	12	Okara	43%	25			
Multan	45%	13	Sheikhupura	42%	26			

S4: MPI Rank in Sindh

District	MPI	Rank	District	MPI	Rank	District	MPI	Rank
Tharparkar	0.56	1	Sanghar	0.28	11	Larkana	0.17	21
Umer Kot	0.42	2	Tando Allah Yar	0.26	12	Dadu	0.17	22
Sujawal	0.41	3	Shikarpur	0.26	13	Hyderabad	0.07	23
Mir Pur Khas	0.40	4	Jacobabad	0.25	14	Karachi Malir	0.07	24
Badin	0.37	5	Jamshoro	0.25	15	Karachi West	0.05	25
Tando Muhammad Khan	0.35	6	Matiari	0.23	16	Karachi East	0.03	26
Thatta	0.35	7	Shahdadkot	0.22	17	Karachi South	0.02	27
Khairpur	0.30	8	Nowshero Feroze	0.20	18	Karachi Central	0.02	28
Shaheed Banazir Abad	0.29	9	Kashmore	0.20	19	Korangi	0.01	29
Ghotki	0.28	10	Sukkur	0.19	20			

S5: MPI Headcount Rank in Sindh

District	H	Rank	District	H	Rank	District	H	Rank
Tharparkar	88%	1	Sanghar	54%	11	Sukkur	37%	21
Umer Kot	73%	2	Tando Allah Yar	53%	12	Dadu	37%	22
Sujawal	72%	3	Shikarpur	53%	13	Karachi Malir	16%	23
Badin	71%	4	Jacobabad	52%	14	Hyderabad	16%	24
Tando Muhammad Khan	69%	5	Jamshoro	50%	15	Karachi West	12%	25
Mir Pur Khas	68%	6	Shahdadkot	48%	16	Karachi East	9%	26
Thatta	66%	7	Matiari	47%	17	Karachi South	6%	27
Khairpur	58%	8	Nowshero Feroze	43%	18	Karachi Central	5%	28
Shaheed Banazir Abad	58%	9	Kashmore	43%	19	Korangi	3%	29
Ghotki	55%	10	Larkana	40%	20			

S6: MPI Intensity Rank in Sindh

District	A	Rank	District	A	Rank	District	A	Rank
Tharparkar	63%	1	Jamshoro	51%	11	Kashmore	46%	21
Mir Pur Khas	59%	2	Ghotki	51%	12	Hyderabad	44%	22
Umer Kot	58%	3	Shaheed Banazir Abad	50%	13	Larkana	44%	23
Sujawal	57%	4	Tando Allah Yar	50%	14	Karachi Malir	42%	24
Thatta	52%	5	Jacobabad	49%	15	Karachi West	42%	25
Badin	52%	6	Matiari	48%	16	Karachi East	40%	26
Sukkur	51%	7	Shikarpur	48%	17	Karachi Central	38%	27
Tando Muhammad Khan	51%	8	Nowshero Feroze	47%	18	Korangi	37%	28
Khairpur	51%	9	Dadu	46%	19	Karachi South	36%	29
Sanghar	51%	10	Shahdadkot	46%	20			

S7: MPI Rank in KP

District	MPI	Rank	District	MPI	Rank	District	MPI	Rank
Kohistan	0.53	1	Bunair	0.23	12	Hangu	0.13	23
Mohmand	0.46	2	Khyber	0.19	13	Lower Dir	0.13	24
Bajur	0.41	3	Bannu	0.18	14	Karak	0.11	25

North Waziristan	0.38	4	Kohat	0.17	15	Chitral	0.11	26
Tor Garh	0.35	5	Lakki Marwat	0.17	16	Peshawar	0.10	27
South Waziristan	0.31	6	D. I. Khan	0.16	17	Abbottabad	0.10	28
Kurram	0.29	7	Tank	0.15	18	Mardan	0.09	29
Shangla	0.28	8	Swabi	0.15	19	Nowshera	0.09	30
Batagram	0.25	9	Mansehra	0.14	20	Haripur	0.07	31
Orakzai	0.25	10	Swat	0.14	21	Malakand	0.06	32
Upper Dir	0.24	11	Charsada	0.13	22			

S8: MPI Headcount Rank in KP

District	H	Rank	District	H	Rank	District	H	Rank
Kohistan	89%	1	Bunair	46%	12	Hangu	29%	23
Mohmand	80%	2	Khyber	40%	13	Lower Dir	28%	24
Bajur	79%	3	Bannu	38%	14	Karak	26%	25
North Waziristan	76%	4	Kohat	37%	15	Chitral	26%	26
Tor Garh	72%	5	D. I. Khan	37%	16	Abbottabad	23%	27
South Waziristan	62%	6	Lakki Marwat	35%	17	Peshawar	23%	28
Shangla	56%	7	Tank	34%	18	Mardan	20%	29
Kurram	54%	8	Swabi	31%	19	Nowshera	20%	30
Orakzai	51%	9	Mansehra	31%	20	Haripur	17%	31
Batagram	50%	10	Charsada	30%	21	Malakand	14%	32
Upper Dir	49%	11	Swat	30%	22			

S9: MPI Intensity Rank in KP

District	A	Rank	District	A	Rank	District	A	Rank
Kohistan	59%	1	Upper Dir	48%	12	Tank	45%	23
Mohmand	57%	2	Lakki Marwat	48%	13	Peshawar	45%	24
Kurram	54%	3	Bannu	47%	14	D. I. Khan	44%	25
Bajur	53%	4	Mansehra	47%	15	Haripur	43%	26
Batagram	50%	5	Swabi	46%	16	Mardan	43%	27
South Waziristan	50%	6	Kohat	46%	17	Malakand	43%	28
North Waziristan	50%	7	Khyber	46%	18	Abbottabad	43%	29
Shangla	49%	8	Swat	46%	19	Karak	43%	30
Bunair	49%	9	Charsada	45%	20	Nowshera	43%	31
Tor Garh	49%	10	Lower Dir	45%	21	Chitral	43%	32
Orakzai	48%	11	Hangu	45%	22			

S10: MPI Rank in Balochistan

District	MPI	Rank	District	MPI	Rank	District	MPI	Rank
Khuzdar	0.63	1	Kachhi/ Bolan	0.39	11	Duki	0.23	21
Awaran	0.62	2	Jaffarabad	0.37	12	Lasbela	0.21	22
Dera Bugti	0.48	3	Sohbatpur	0.37	13	Mastung	0.20	23
Shaheed Sikandar Abad	0.47	4	Kalat	0.35	14	Loralai	0.20	24
Qilla Abdullah	0.45	5	Washuk	0.34	15	Pishin	0.18	25
Nasirabad/ Tamboo	0.43	6	Gwadar	0.27	16	Nushki	0.14	26
Ziarat	0.42	7	Kech/Turbat	0.26	17	Quetta	0.14	27
Harnai	0.40	8	Sibbi	0.25	18	Kohlu	0.10	28
Qilla Saifullah	0.39	9	Kharan	0.25	19			
Sherani	0.39	10	Barkhan	0.24	20			

S11: MPI Headcount Rank in Balochistan

District	H	Rank	District	H	Rank	District	H	Rank
Awaran	98%	1	Sohbatpur	73%	11	Duki	46%	21
Khuzdar	98%	2	Kachhi/ Bolan	73%	12	Mastung	45%	22
Shaheed Sikandar Abad	93%	3	Jaffarabad	71%	13	Lasbela	44%	23
Dera Bugti	89%	4	Kalat	70%	14	Loralai	41%	24
Ziarat	82%	5	Washuk	61%	15	Pishin	37%	25
Qilla Abdullah	82%	6	Kech/Turbat	54%	16	Nushki	33%	26

Nasirabad/ Tamboo	80%	7	Kharan	54%	17	Quetta	29%	27
Sherani	77%	8	Sibbi	53%	18	Kohlu	23%	28
Qilla Saifullah	76%	9	Gwadar	51%	19			
Harnai	75%	10	Barkhan	50%	20			

S12: MPI Intensity Rank in Balochistan

District	A	Rank	District	A	Rank	District	A	Rank
Khuzdar	64%	1	Qilla Saifullah	52%	11	Sibbi	48%	21
Awaran	64%	2	Ziarat	51%	12	Pishin	48%	22
Washuk	55%	3	Shaheed Sikandar Abad	50%	13	Barkhan	47%	23
Qilla Abdullah	55%	4	Sherani	50%	14	Quetta	47%	24
Dera Bugti	54%	5	Kalat	50%	15	Kharan	46%	25
Nasirabad/ Tamboo	54%	6	Sohbatpur	50%	16	Mastung	45%	26
Gwadar	53%	7	Duki	50%	17	Nushki	43%	27
Harnai	53%	8	Loralai	49%	18	Kohlu	43%	28
Kachhi/ Bolan	53%	9	Kech/Turbat	49%	19			
Jaffarabad	52%	10	Lasbela	48%	20			