Geospatial Multidimensional Poverty Gap in India: A rural and urban decomposition analysis

Gupta, Pallavi

7 October 2023

Geospatial Multidimensional Poverty Gap in India: A rural and urban decomposition analysis

Dr Pallavi Gupta

Assistant Professor,

Sarla Anil Modi School of Economics,

SVKM's NMIMS, Mumbai.

Abstract

This paper examines the geographical distribution of multidimensional poverty in rural and urban India for the year 2021, utilising secondary data sourced from the NITI Aayog report 2021 based on the NFHS-4 dataset. The 2021 MPI, based on Alkire and Foster methodology, encompasses three dimensions—health, education, and standard of living—comprising twelve indicators. An in-depth analysis of interstate deprivation across diverse indicators within the rural and urban Multidimensional Poverty Index (MPI) highlights heightened levels of deprivation in economically challenged states like Madhya Pradesh, Bihar, Uttar Pradesh, and Jharkhand. A comprehensive decomposition analysis has been undertaken to identify the principal contributors to multidimensional poverty. The outcomes emphasise the critical role of health as a pivotal dimension, with nutrition emerging as the foremost factor influencing the overall MPI in both rural and urban contexts. These findings underscore the necessity for targeted policies aimed at poverty eradication, with a specific focus on strategic interventions in health and nutrition. The insights offer valuable perspectives for development planners and policymakers, contributing to a nuanced understanding of the intricate patterns of multidimensional poverty across Indian states.

Keywords: multidimensional poverty index (MPI), rural and urban poverty, spatial pattern of poverty, deprivation, decomposition of poverty, NFHS-4.

JEL Classification: I32, I38, J11

1. Introduction

The impact of reforms on inequality and poverty is a subject of intense debate in India. Owing to the scarcity of data, particularly income data across various temporal segments, a definitive elucidation or resolution to the debate remains elusive. Economic growth, while a principal objective of economic policy, must also ensure equitable distribution of its benefits across all social strata. The examination of whether growth has been inclusive necessitates a comprehensive assessment of poverty in its various manifestations. Moreover, the measurement of poverty is imperative for evaluating an economy's performance in affording a minimal standard of living to all its citizens. It is noteworthy that the measurement and

perception of poverty exhibit variations across countries, states, and temporal dimensions, thereby imparting profound policy implications.

Traditionally, 'Poverty' has been conventionally defined across nations as a deficiency in income, gauged through the financial standing of individuals, households, or communities. Sen, in his seminal work "Poverty: An Ordinal Approach to Measurement," initially described poverty as an income or unidimensional construct, although he acknowledged the impracticality of implementing this ordinal approach in everyday circumstances. The prevailing consensus since the mid-1970s has been that poverty is synonymous with low income. However, research has illuminated the inadequacy of income as a sole determinant of well-being, as it neglects nonmonetary deprivations like limited access to essential services. This limitation has prompted the exploration of alternative approaches such as the 'basic needs approach,' 'social exclusion,' and the 'capability approach.'

Researchers have increasingly adopted a combined approach, integrating monetary and nonmonetary indices to present a more nuanced understanding of poverty. Sen underscores the necessity to encompass diverse deprivations within a comprehensive framework, emphasising the superiority of multidimensional poverty measurement over unidimensional methods. This paradigm shift from unidimensional to multidimensional perspectives on poverty has gained momentum, notably reflected in the United Nations' Sustainable Development Goals (SDGs). SDG target 1.2 aims to "reduce at least half the proportion of men, women, and children of all ages living in poverty in all its dimensions according to national definitions" by 2030.

In the context of India, the traditional assessment of poverty has conventionally focused on measuring consumption and expenditure, offering a one-dimensional viewpoint that fails to encompass various facets of deprivation. Empirical research points to a significant number of individuals experiencing multidimensional poverty despite not being economically deprived, and vice versa (Alkire & Kumar, 2012). In a more widespread context, Alkire and Foster's (2011) methodology is favoured for measuring the multidimensional poverty index. This method efficiently consolidates diverse, not entirely overlapping deprivation domains into a coherent parametric category of multidimensional poverty indices, as highlighted by Pacifico and Poege (forthcoming).

Notably, an improvement in household economic well-being doesn't always correspond to a reduction in multidimensional poverty (Klasen, 2000). Moreover, the correlation between income poverty levels and key determinants like child mortality, primary school completion rates, and undernourishment is inconsistently strong (Bourguignon et al., 2010). Addressing the limitations of traditional poverty assessment, recent years have seen a shift in perspective, viewing poverty as a multifaceted issue that includes health, nutrition, education, skills, livelihood, and living conditions. Alkire & Foster (2007) have introduced a comprehensive methodology for measuring multidimensional poverty, proven beneficial in various studies for regional and national poverty reduction planning (UNDP, 2010). The Multidimensional Poverty Index (MPI) surpasses conventional measures by considering both the occurrence

and intensity of deprivation, offering a more precise evaluation compared to income and consumption alone. Additionally, MPI holds advantages over the Human Development Index (HDI) by evaluating well-being at the household level rather than the country level (Tripathi & Yenneti, 2020).

With this backdrop, the main objective of this paper is to measure the Multi-dimensional poverty index for India. For this purpose Alkire and Foster (2011) method has been used. This analysis employs three primary indicator categories—standard of living, education, and income—to gauge the Multidimensional Poverty Index (MPI) in India. What sets this study apart is the utilisation of NFHS - 4 data for MPI computation. It is noteworthy that the Indian government relies heavily on NITI Aayog and NFHS data for crucial decisions, such as establishing poverty lines based on consumption expenditure. Consequently, employing a dataset to measure MPI introduces a novel contribution to poverty literature in India. Given the government's distinct calculation of poverty lines for rural and urban areas, this study also separately computes MPI for each, revealing disparate scenarios crucial for tailored policy prescriptions. This separation facilitates the development of distinct rural and urban policies to address multidimensional poverty effectively. Additionally, I calculate state-level Multidimensional Poverty indices for rural and urban areas independently, facilitating the formulation of targeted state-level policies.

The paper's contributions encompass several facets. To begin, the primary objective is to evaluate the spatial pattern of rural and urban multidimensional poverty across the states of India in 2021. I also delve into depicting the spatial differentiation in the absolute gap of rural and urban poverty among the Indian states. Furthermore, the study explores the relationship between MPI, Headcount ratio (H), and Intensity (A) of poverty in both rural and urban contexts. Lastly, the investigation focuses on the indicator-wise rural and urban deprivation of MPI across the states of India in 2021, examining the contribution of each indicator to rural and urban MPI in India. This comprehensive study aims to enhance understanding regarding the current status of multidimensional poverty, intensity, and deprivation in rural and urban India, as well as across states. Such insights will prove valuable in shaping state-level policies.

Rest of the paper is organised as follows. Section 2 provides a brief review of literature. Section 3 explains methodology and data and details of indicators used. Section 4 presents results of spatial pattern of MPI in rural and urban areas. Decomposition analysis of MPI in rural and urban regions is Section 5. Section 6 concludes.

2. Literature Review

Several studies have explored the dimensions of multidimensional poverty in India. In an analysis by Mohanty (2011), poverty in multidimensional space and its connection to child survival were quantified using NFHS-3 unit data. Sarkar (2012) developed the MPI, examining rural poverty in India with eight indicators sourced from NSSO data. Chaudhuri et al. (2014) conducted a study utilising three rounds of National Family and Health Survey

(NFHS) data spanning 1992-93, 1998-99, and 2005-06 to compute the Multidimensional Poverty Index (MPI) in India. The examination incorporated various variables related to Standard of Living, Health, and Education to gauge state-level MPI. Emphasising intra-urban imbalances and female multidimensional deprivation, the study showed the persistent imbalances in development across the country, with economically disadvantaged states remaining in impoverished conditions. Bihar, for instance, maintained its status as the most deprived state throughout the three NFHS data rounds. In contrast to income poverty trends that depict a systematic decline across all Indian states, MPI calculations revealed an increase in poverty in certain states like Arunachal Pradesh, Tripura, and Manipur by 4.7%, 5%, and 0.7%, respectively, from 1992-93 to 2005-06.

Another study by Alkire and Suman (2008) employed the Below the Poverty Line (BPL) 2002 methodology and NFHS data to calculate MPI for India. This study discovered that up to 12% of the poor sample population and 33% of the extremely poor could be inaccurately classified as non-poor using the pseudo-BPL method. Mohanty (2011) utilised unit data from the National Family and Health Survey 3 to assess poverty in multidimensional space and investigate the connections between multidimensional poverty and child survival. The findings indicated significantly lower child survival rates among the abject poor compared to the moderately poor and non-poor groups.

Alkire & Seth (2013), utilising the NFHS dataset, scrutinised the variation in multidimensional poverty in India from 1999 to 2006. Dehury & Mohanty (2015) assessed multidimensional poverty dynamics across 84 natural regions using IHDS 2004-05. Kumar et al. (2015) identified states in varying stages of vulnerability and excellence in MPI. Alkire & Seth (2015), based on NFHS data from 1996 to 2006, revealed non-uniform reduction in poverty across social parameters in India. Strotmann & Volkert (2018) investigated rural Karnataka, noting associations between multidimensional poverty and happiness. Roy et al. (2018) measured rural multidimensional poverty in West Bengal, analysing disparities among socioeconomic groups.

However, Tripathi & Yenneti (2020) found a decrease in multidimensional poverty headcount from 62.2% in 2004–2005 to 38.4% in 2011–2012, with a sharper decline in rural areas. Alkire et al. (2021) explored poverty reduction among social categories in India from 2005-06 to 2015-16. Das et al. (2021) studied consumption-based deprivation and multidimensional poverty, showing regional concentrations in Central and Eastern India. Mothkoor & Badgaiyan (2021) analysed the trend of multidimensional poverty, finding a faster decline in rural areas. Mohanty & Vasishtha (2021) estimated urban multidimensional poverty, highlighting probabilities among specific urban demographics.

Despite the wealth of studies, no comparative analysis of rural and urban multidimensional poverty across Indian states has been conducted. This study aims to fill this gap using the latest NITI Aayog data on India's MPI in 2021.

3. Data Sources and Methodology

This paper uses secondary data. To examine the spatial disparities in the landscape of multidimensional poverty in both rural and urban India, information from the foundational report of the Multidimensional Poverty Index, established by NITI Aayog (National Institution for Transforming India) in 2021 is extracted. The 2021 Multidimensional Poverty Index (MPI) is grounded in the Alkire and Foster (AF) methodology, encompassing three dimensions: health, education, and standard of living. It incorporates twelve indicators, with three from the health dimension, three related to education, and the remaining seven pertaining to the standard of living. (See Table 1). Representative samples from rural and urban areas were collected, and estimations were carried out.

Table 1. Dimension, indicator, weights and deprivation of multidimensional poverty

Dimension	Indicator (Weight)	Deprivation cut-off
Standard of Living (1/3)	Cooking Fuel (1/21)	A household cooks with dung, agricultural crops, shrubs, wood, charcoal or coal.
	Sanitation (1/21)	The household has unimproved or no sanitation facility or it is improved but shared with other households.
	Drinking Water (1/21)	The household does not have access to improved drinking water or safe drinking water is at least a 30-minute walk from home (as a round trip).
	Electricity (1/21)	The household has no electricity.
	Housing (1/21)	The household has inadequate housing: the floor is made of natural materials, or the roof or wall are made of rudimentary materials.
	Assets (1/21)	The household does not own more than one of these assets: radio, TV, telephone, computer, animal cart, bicycle, motorbike, or refrigerator; and does not own a car or truck.
	Bank Account (1/21)	No household member has a bank account or a post office account.
Health (1/3)	Nutrition (1/6)	A household is considered deprived if any child between the ages of 0 to 59 months, or woman between the ages of 15 to 49 years, or man between the ages of 15 to 54 years -for whom nutritional information is available - is found to be undernourished.
	Child & Adolescent Mortality (1/12)	A child/adolescent under 18 years of age has died in the family in the five-year period preceding the survey.
	Antenatal Care (1/12)	A household is deprived if any woman in the household who has given birth in the 5 years preceding the survey, has not received at least 4 antenatal care visits for the most recent birth, or has not received assistance from trained skilled medical personnel during the most recent childbirth.
Education (1/3)	Years of Schooling (1/6)	Not even one member of the household aged 10 years or older has completed six years of schooling
	School Attendance (1/6)	Any school-aged child is not attending school up to the age at which he/she would complete class 8.

Source: National Multidimensional Poverty Index, 2021 based on Niti Aayog NFHS-4 (2015-16).

Methodology

Headcount ratio (H): is the proportion of the multidimensionally poor to the total population and is calculated as

$$H = \frac{q}{n} * 100$$

Here, q is the number of people who are multidimensionally poor and n is the total population.

Intensity of poverty (A): is the weighted average count of deprivation experienced by the multidimensionally poor and is calculated as

$$A = \sum_{i=1}^{q} C_i(k)$$

Here, $C_i(k)$ is the deprivation score of multidimensionally poor individuals up to the ith individual and k is the number of multidimensionally poor individuals.

The Multidimensional Poverty Index (MPI) is the product of both the headcount ratio and the intensity of poverty. MPI is computed as

$$MPI = H * A$$

Where, H is the headcount ratio, and A is the intensity of poverty.

Decomposition of MPI by dimensions and indicators was conducted to examine the contribution of the various dimensions or indicators to overall poverty. The contribution of a particular indicator *(i)* to overall multidimensional poverty is calculated as

$$MPI_i = \frac{w_i CH_i}{MPI_c} * 100$$

Where w_i is the weight of the ith indicator (See Table 1), CH_i is the censored headcount ratio of the ith indicator and MPI_c denotes India's national multidimensional poverty index.

4.a. Geospatial Multidimensional Poverty: Pattern of MPI in Rural Regions

The interstate disparities in Rural Multidimensional Poverty Index (MPI) in India are illustrated by categorizing the country into three groups: high (MPI>0.192), moderate (MPI 0.098-0.192), and low (MPI<0.098). The national MPI for rural India, according to the NITI Aayog's 2021 report, stands at 0.155. High rural MPI (>0.192) is notably present in four states—Bihar (0.286), Jharkhand (0.246), Madhya Pradesh (0.219), and Uttar Pradesh (0.211). Conversely, states with a low level of MPI (<0.098) include Kerala (0.004), Goa (0.017), Sikkim (0.018), Punjab (0.028), Tamil Nadu (0.029), Himachal Pradesh (0.032), Haryana (0.066), Andhra Pradesh (0.067), Jammu & Kashmir (0.073), Karnataka (0.081), Telangana (0.088), Tripura (0.095), Uttarakhand (0.096), and Mizoram (0.098). The remaining states exhibit a moderate level of MPI in 2021. Notably, eight states surpass the national MPI score of 0.155.

The geographic dispersion of rural poverty intensity highlights a concerning scenario, with over 45.39 percent experiencing high poverty levels in 11 Indian states. The study discerns a concentration of high multidimensional rural poverty in the central region, with moderate levels prevalent in the western and northeastern parts. Conversely, the northern and southern states exhibit a lower incidence of poverty in the rural context in India for the year 2021. However, a more accurate portrayal of the poverty scenario emerges when examining the spatial patterns of intensity and severity of poverty. The decreased intensity of poverty in states such as Kerala and Himachal Pradesh can be attributed to more effective implementation of social schemes, including MGNREGA, the mid-day meal scheme, and the public distribution system.

Figure 1. Spatial pattern of rural and urban MPI
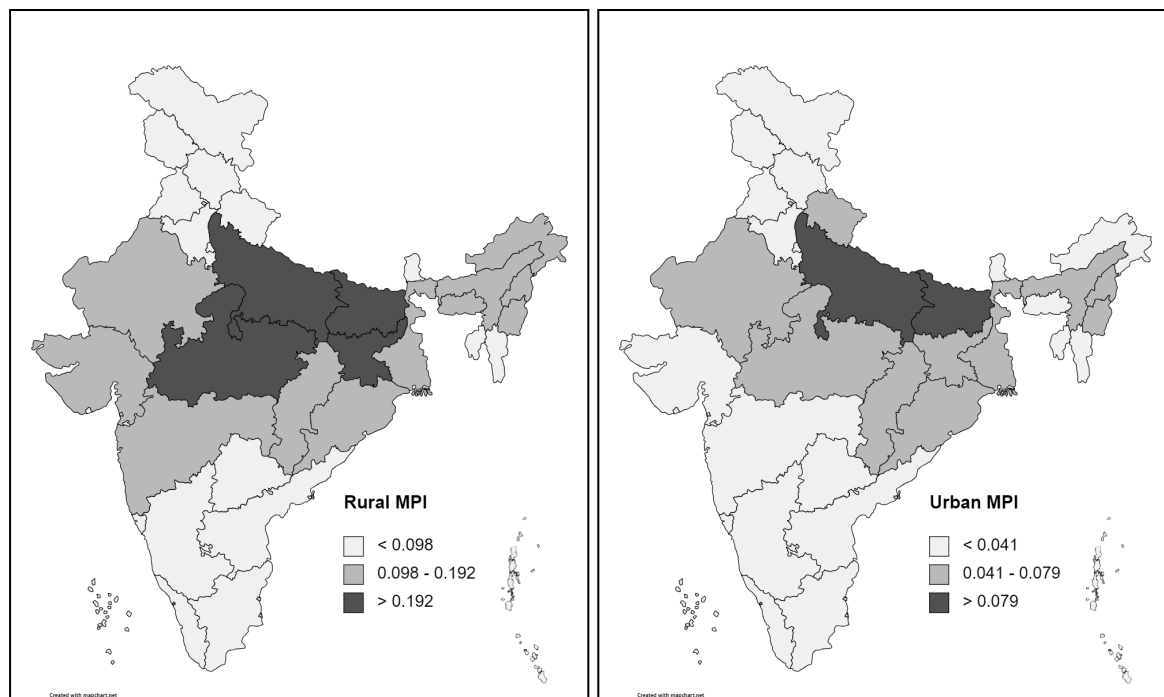
Source: Authors own compilation from Niti Ayog NFHS -4 dataset

4.b. Geospatial Multidimensional Poverty: Pattern of MPI in Urban Regions

To discern interstate disparities in urban multidimensional poverty, I categorised India into high (>0.079), moderate (0.041-0.079), and low (< 0.041) categories. The national urban MPI in India for 2021 is 0.040. Fig. 1 visually represents the spatial distribution of urban MPI across Indian states, showcasing Bihar with the highest score (0.117) and Kerala with the lowest score (0.002). Except for Bihar, other states with high MPI include Uttar Pradesh (0.085), while several states fall into the moderate MPI range (0.041 to 0.079), such as Jharkhand, Madhya Pradesh, Odisha, West Bengal, Rajasthan, Nagaland, Uttarakhand, Assam, Chhattisgarh, and Manipur.

The remaining states exhibit low urban MPI (less than 0.041), with the central and eastern states showing persistent moderate to high urban MPI, while the rest of India displays low

urban MPI. Examining the spatial distribution of urban headcount ratio, I observe a similar trend to urban MPI. In India, the urban headcount ratio for 2021 is 8.81%, and Bihar has the highest concentration of multidimensionally urban poor (23.91%), followed by Uttar Pradesh (18.07%). The lowest concentration is observed in Kerala (0.43%), Mizoram (1.42%), and Himachal Pradesh (1.46%). Six states have surpassed the national intensity of urban poverty (45.25%), while Kerala and Tamil Nadu persist with low intensity (less than 41%). Despite high MPI and headcount ratio in India, the extent of moderate to high intensity of urban poverty is substantial, warranting further exploration by experts.

5. Decomposition of Rural and Urban Multidimensional Poverty Index

While all selected indicators play a pivotal role in determining the overall MPI score, further elucidation is needed to discern which indicators significantly contribute to the final MPI score in rural and urban contexts. Therefore, a decomposition of multidimensional poverty in both rural and urban perspectives has been conducted to understand the contribution of each dimension and indicator. This analysis, reveals that in the overall rural MPI score in India, nutrition has the most significant contribution at 27.94 percent, with additional substantial contributions from indicators such as years of schooling (14.77 percent) and maternal health (10.38 percent). Conversely, child-adolescent mortality (1.29 percent) and bank account (2.10 percent) have minimal impact on the rural MPI score. Assessing dimension-wise contributions in rural MPI, the health dimension stands out with the highest contribution (39.61 percent), while the education dimension has the least contribution (21.75 percent). To enhance the rural MPI score in India, strengthening developmental policies focused on rural health and education, with an emphasis on improving nutrition, maternal health, and years of schooling, is imperative.

On the urban front, sanitation (7.27 percent) emerges as the most significant contributor in the standard of living dimension, as detailed in Table 1, while indicators like electricity (1.54 percent), child-adolescent mortality (1.67 percent), and drinking water (1.92 percent) have minimal impact on urban multidimensional poverty. Dimension-wise contributions in the urban context reveal that the health dimension takes the lead with the highest contribution (41.90 percent) to the overall urban MPI in India during 2021. This underscores the need for development planners and policymakers to formulate effective policies, with a specific focus on nutrition, maternal health, years of schooling, school attendance, and urban sanitation for the betterment of the multidimensionally urban poor.

Figure 2. Indicator wise deprivation in rural and urban Multidimensional Poverty Index India
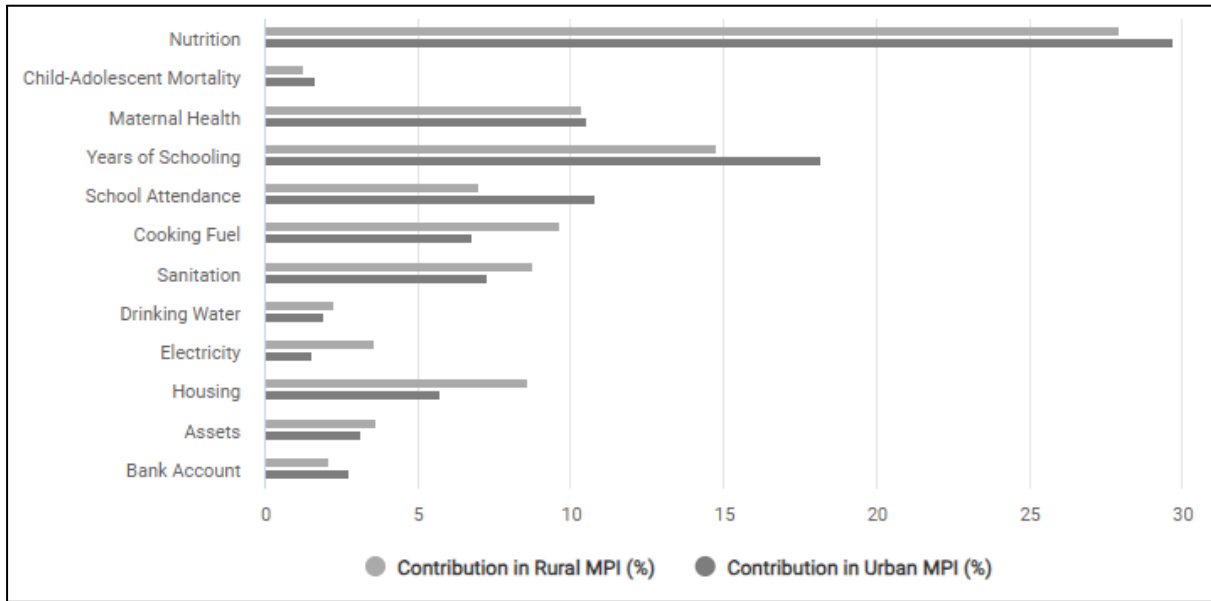
Source: Author's own compilation based on indicator wise censored headcount ratio as contribution to rural and urban multidimensional poverty index (in percentage)

6. Discussion

The majority of poverty-related studies lack the exploration of spatial patterns differentiating rural and urban multidimensional poverty in countries like India. This study aims to investigate the spatial pattern of multidimensional poverty in rural and urban India in 2021, utilising the NITI Aayog report on MPI based on the NFHS-4 dataset. The findings reveal significant interstate disparities in the spatial concentration and intensity of rural multidimensional poverty. States such as Bihar, Jharkhand, Madhya Pradesh, and Uttar Pradesh exhibit high levels of rural poverty due to historical, economic, and social factors, leading to persistent cycles of poverty. In contrast, lower levels of poverty are observed in Kerala, Sikkim, Goa, and Punjab, attributed to effective democratic practices, agrarian reforms, and economic diversification.

Additionally, the study indicates varying intensity levels of rural poverty, with Bihar, Meghalaya, and Jharkhand experiencing high intensity, while Himachal Pradesh, Goa, and Kerala show lower intensity. The central part of India exhibits high rural multidimensional poverty, while moderate levels persist in the western and northeastern regions, and low levels concentrate in the northern and southern states in 2021. Interstate deprivation in rural and urban MPI indicators is found to be acute in economically disadvantaged states and less severe in prosperous states. Targeted interventions are recommended for backward states to address multidimensional poverty effectively.

In addition, the decomposition analysis highlights the contribution of undernutrition to multidimensional poverty in both rural and urban contexts. The health dimension emerges as

the dominant contributor among the three domains in 2021. Strengthening developmental policies focused on health, nutrition, maternal health, and medical facilities is deemed crucial for improving overall MPI scores in rural and urban India. The study underscores the urgency of comprehensive analyses and evidence-based planning to address the heterogeneous nature of poverty across states and regions. Finally, the study's insights contribute to the broader literature on poverty studies in India and emphasise the importance of spatial considerations in development planning for rural and urban areas.

References

Alkire S., Foster J. (2007, revised in 2008), Counting and multidimensional poverty measurement, *OPHI Working Paper 7, University of Oxford,* https://www.ophi.org.uk/wp-content/uploads/ophi-wp7_vs2.pdf

Alkire S., Santos M.E. (2010), Acute Multidimensional Poverty: A New Index for Developing Countries, *Working Paper No. 38, Oxford Poverty and Human Development Initiative*, University of Oxford.

Alkire S., Foster J. (2011), Counting and multidimensional poverty measurement, *Journal of Public Economics*, *95*, 7-8, pp. 476-487, https://doi.org/10.1016/j.jpubeco.2010.11.006

Alkire S., Kumar R. (2012), Comparing Multidimensional Poverty and Consumption Poverty Based on Primary Survey in India, Presented in OPHI workshop, 21-22 Nov. 2012.

Alkire S., Seth S. (2013), Multidimensional Poverty Reduction in India between 1999 and 2006: Where and How? *OPHI Working Paper No. 60, Oxford Department of International Development*, University of Oxford, https://www.ophi.org.uk/wp-content/uploads/ophi-wp-60.pdf

Alkire S., Chatterjee M., Conconi A., Seth S. & Vaz A. (2014), Poverty in Rural and Urban Areas Direct comparisons using the global MPI 2014, *Oxford Poverty & Human Development Initiative.*

Alkire S., Santos M.E. (2014), Measuring acute poverty in the developing world: Robustness and scope of the multidimensional poverty index, *World Development, 59, C*, pp. 251-274, https://doi.org/10.1016/j.worlddev.2014.01.026

Alkire S., Seth S. (2015), Multidimensional poverty reduction in India between 1999 and 2006: Where and how, *World Development, 72, C*, pp. 93-108, https://doi.org/10.1016/j.worlddev.2015.02.009

Bhandari L., Chakraborty M. (2015), Spatial poverty in Sikkim, https://www.livemint.com/Opinion/PUvkZAswQKN1h6kkUS9KtN/Spatial-poverty-in-sikkim.html

Bourguignon F., Benassy-Queere A., Dercon S., Esrache A., Gunning J. W., Kanbur R., Klasen S., Maxwell S., Platteu J. & Sparado A. (2010), Millennium Development Goals: An

assessment, *in* KANBUR R., SPENCER M. (eds.), *Equity and Growth in a Globalizing World*, World Bank, Washington DC.

Das P., Ghosh S. & Paria B. (2021), Multidimensional poverty in India: a study on regional disparities, *GeoJournal,* https://doi.org/10.1007/s10708-021-10483-6

Dehury B., Mohanty S. (2015), Regional Estimates of Multidimensional Poverty in India, *Economics-e Journal*, *9*, 36, pp. 1-35.

Kumar, V., Kumar, S., Sonu. (2015), Multi-dimensional Poverty Index (MPI): A state wise study of India in SAARC countries. *International Journal of Enhanced Research in Educational Development* (IJERED), 3 (1), 14-21

Mohanty S. K., Vasishtha G. (2021), Contextualizing multidimensional poverty in urban India, *Poverty Public Policy, 13*, 3, pp. 234-253, https://doi.org/10.1002/pop4.314

Mothkoor V., Badgaiyan N. (2021), Estimates of multidimensional poverty for India using NSSO-71 and -75, *WIDER Working Paper Series wp-2021-1*, World Institute for Development Economic Research (UNU-WIDER).

Roy P., Ray S. & Haldar S.K. (2018), Socio-economic Determinants of Multidimensional Poverty in Rural West Bengal: A Household Level Analysis, *Journal of Quantitative Economics, 17*, 3, pp. 603-622, https://doi.org/10.1007/s40953-018-0137-4

Tripathi S., Yenneti K. (2020), Measurement of Multidimensional Poverty in India: A State-level Analysis, *Indian Journal of Human Development, 14*, 2, pp. 257–274, https://doi.org/10.1177%2F0973703020944763

UNDP (2019), *The Sustainable Development Goals Report 2019*, New York, retrieved on March 12, 2022 from https://unstats.un.org/sdgs/report/2019/The-Sustainable-Development-Goals-Report-2019.pdf

Sen, A.K.(1980), Equality of What? In McMurrin S (Ed.) The Tanner Lectures on Human Values , *University of Utah Press, Salt Lake City*, pp:197-220.

Sen, A, K. (1999), Development as Freedom. *Oxford: Oxford University Press.* Tsui, K. (2002), Multidimensional Poverty Indices, Social Choice and Welfare, 19(1), 69-93.

Strotmann H., Volkert J. (2018), Multidimensional poverty index and happiness, *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*, *19*, 1, pp. 167-189.

Soumyabrata M., Kumar, S., and Mishra A. P., (2023), Contextualizing spatiality of multidimensional poverty in rural and urban India: A geographical perspective, 1(23), *Belgo, open issues.* https://doi.org/10.4000/belgeo.59421