Journal of Agricultural Development and Policy, 2025
Volume 35, No. 2, 347-356
https://doi.org/10.63066/23220457.35.2.020

NAAS - 4.34
UGC CARE List Journal

Assessing Determinants and Inter-State Disparities for Common Minimum Needs within India

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Abstract

Regional disparities persist in fulfilling common minimum needs (CMN) in India despite decades of planned development and reforms. This research aimed to identify the determinants of CMN and assess inter-state disparities to promote equitable access to essential services and improved living standards using state-wise secondary data. The Composite Index (CI), assessed across zones and individual states, revealed pronounced regional disparities in development. Southern states such as Kerala (CI: 0.2882) and Tamil Nadu (CI: 0.3213) demonstrated relatively higher levels of socio-economic development, whereas Eastern states like Arunachal Pradesh (CI: 0.8265) and Bihar (CI: 0.8992) ranked the lowest. Key determinants that influenced CMN development included literacy rate, gender ratio, access to electricity, banking accessibility, labour migration patterns, menstrual hygiene practices, family planning uptake and disability prevalence. The study suggested adoption of successful strategies from high-performing states, particularly emphasizing stronger government interventions for effective service delivery and efficient allocation of resources.

Keywords: Development, Common minimum needs, Inter-state variation, Composite Index, Regression analysis

JEL Classification: A14, I32, I38, O18, R11, R12

Introduction

Common Minimum Needs (CMN) constitutes a foundational framework for evaluating the essential requirements needed to ensure a minimum standard of living and advance social equity. The CMN framework encompasses a comprehensive range of demographic, social, infrastructural and health indicators that collectively shape human well-being and overall development outcomes (Rao and Min, 2017). These indicators act as the foundation of inclusive development, linking economic progress with improvements in the decent quality of life, particularly for marginalized and vulnerable sections of society.

The assessment of CMN through a multidimensional perspective is crucial for effective policy formulation, especially in developing countries where access to essential services remains unequal (Alkire and Santos, 2014). In India, regional disparities in achieving basic needs persist as one of the most pressing development challenges. The Minimum Needs Programme (MNP) was introduced in the first year of the Fifth Five Year Plan (1974–78), to provide certain basic requirements and improve the level of welfare of individuals. It aims at "social and economic development of the community, particularly the underprivileged and underserved population". Despite sustained efforts through welfare-oriented policies and economic reforms, wide inter-zonal and inter-state variations continue to exist in the accessibility, quality, and efficiency of basic public services (Anonymous, 2013). These differences reflect the uneven capacity of states to deliver social and infrastructural amenities, resulting in asymmetrical development outcomes. Achieving balanced regional development in CMN is thus fundamental to realizing the goals of sustainable and inclusive growth. It was envisioned in India's development policy framework (Dreze and Sen, 2013). Thus, keeping view of this important sector, present study was conducted to identify determinants of CMN and assess inter-state disparities to promote equitable access to essential services and improved living standards.

Data Sources and Methodology

The study employed secondary data covering twenty common minimum needs (CMN) variables across twenty-one, Indian states for the years 2020-21 to 2023-24. Data for six variables: percentage of migrant labour, disabled population, proportion of households with pucca housing,

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Table: 1 Common minimum needs indicators

S.No.	Variables	Source
1	Population density (persons/sq km.)	India Stat
2	Literacy rate (5years & above)	India Stat
3	Gender ratio (female per 1000 male, at birth)	India Stat
4	Percentage of migration of labour from other states	Press Information Bureau
5	Malnutrition	National Health Profile
6	Proportion of disabled population /00000 population	National Health Profile
7	Dependency ratio	India Stat
8	Percentage of seats won by women in legislative assemblies	Press Information Bureau
9	Percentage of women having a mobile phone that they themselves use	National Data and Analytics Platform
10	Percentage of women using hygienic methods of protection during their menstrual period (age 15 to 24 years)	National Data and Analytics Platform
11	Percentage of married women using any family planning methods(age group 15 to 49 years)	National Data and Analytics Platform
12	Percentage of households having access to improved source of drinking water	India Stat
13	Percentage of consumption of LPG	Indian Petroleum and Natural Gas Statistics
14	Percentage of households with pucca house	Open Govt. Platform
15	Percentage of rural households having toilet facilities	India Stat
16	Percentage of households with electricity	India Stat
17	Percentage of availability of assets (Radio/TV/Mobile/Computer)	India Stat
18	Percentage of households availing banking services	RBI Handbook
19	Road length (km) per sq.km	India Stat
20	Number of vehicles/00000 population	Statistical abstract of Punjab

toilets, electricity assets and banking services had been obtained from the Census 2011. Statistical records for seven states had not been included, as their minimal population size and small geographical area did not provide a sufficient basis for comparative analysis. All the variables were sourced from reliable Government of India databases. Data was standardised due to its non-availability for the same period from different sources.

Method of Analysis

The data was analysed using composite index , step-wise regression method and residual analysis using the statistical software R. Mapping and spatial visualization was performed using QGIS software.

Wroclaw Taxonomic Method (Composite Index)

Any single indicator cannot fully evaluate the impact of developmental activities, as it is a multidimensional process. Hence, the composite indices of development for different states were evaluated by applying the Wroclaw Taxonomic method developed by Florek et al. (1951), which optimally combines different indicators to achieve the objectives of study. States performance was compared according to ranks assigned to indicators. Variables for different developmental indicators were taken from different population distributions and recorded in different measurement units. The values of these variables were not suitable for combined analysis. Hence, the variables were transformed for the combined analysis as

Let [X_{ij}] be the data matrix giving the values of the variables of *the* i^{th} state and J^{th} indicator

i =1, 2,... n (number of states)

j=1, 2,...k (number of indicators).

$[X_{ij}]$ is transformed as: $[Z_{ij}] = \dfrac{X_{ij} - \overline{X}_j}{S_j}$

$\overline{X}_j$ = mean of the j^{th} indicator, S_j = standard deviation of the j^{th} indicator and Zij is the matrix of standardized indicators.

$[Z_{ij}]$, identify the best value of each indicator. Let it be

denoted as Z_{oj}. The best value can be either the maximum or minimum value of the indicator, depending upon the direction of the indicator's impact on the development level. The pattern of development was

$$C_i = \left[\sum_{j=1}^{k} P_{ij}/(CV)_j\right]^{1/2}$$

Where, $P_{ij} = (Z_{ij} - Z_{oj})^2$; $(CV)_j$: Coefficient of variation of X_{ij} for j^{th} indicator

A composite index of development is given by $CI = C_i/C$:

Where $C = \overline{C} + 3S_{Di}$; $\overline{C}$: Mean of C_i ; S_{Di} : Standard Deviation of

A smaller value of CI will indicate a high level of development, and a higher value of CI will indicate a low level of development.

States were categorized into four categories: High, High Middle, Low Middle and Low as:

Categories	High (H)	High Middle (HM)	Low Middle (LM)	Low (L)
Composite Index (CI)	< (Median-S.D.)	(Median-S.D.) to Median	Median to (Median + S.D.)	≥ (Median + S.D.)

Stepwise Regression Analysis

The stepwise regression analysis (Draper and Smith, 2003) was applied to identify the most significant indicator variables affecting composite indices. This method evaluated common minimum needs related indicator variables for their potential contribution and excluded those variables that were not statistically significant in the multiple regression models ($p \leq 0.05$). Stepwise regression had the advantage of using a small subset of the least correlated variables without losing a considerable portion of the explanatory power of the data, thus minimizing the effects of multicollinearity on the regression model (Huang and Townshend, 2003).

$Y_i = \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_k X_{ki} + e_i$

Where Y: Composite index and X_i's (i =1, 2… 21) are 20 development indicators of CMN

Comparison and Validation

Model validation was the most important step in the model-building process. Once a regression model was constructed, it was essential to calculate the goodness-of-fit statistics of the model and test the residuals. The developed models were compared using goodness-of-fit statistics: coefficient of determination (R^2), adjusted R^2, and Akaike Information Criterion (AIC).

R^2: the variability explained by the regression model; $0 \leq R^2 \leq 1$

Adjusted $R^2 = 1 - [(1 - R^2)(n-1)/(n-p)]$; used to compare models with different parameters

$AIC = n + n \log(2\pi) + n \log(RSS/n) + 2p$; RSS = Residual sum of squares

Where 'n' was the number of observations and 'p' number of parameters in the model

R^2 and adjusted R^2 measure the proportion of variation in the dependent variable explained by fitted model. AIC measures the quality of the model. A model with the highest value of R^2, adjusted R^2, and the lowest value of AIC was considered the best model.

Tests Applied to Check Assumptions of Residuals

Analysis of residuals to check model suitability is required to test the regression model $e_i \sim N_{id}(0, \sigma^2)$ assumptions. Thus, a Run test was applied for testing the independence of residuals, t-test for testing zero mean, the Breusch-Pagan test (Breusch and Pagan, 1979) for constant variance, and the Shapiro-Wilk (W) test (Shapiro and Wilk, 1965) for normality.

Results and Discussion

This segment presented a systematic analysis of the socio-economic development patterns among Indian states, utilizing a multidimensional composite index as the core analytical framework. The findings were organized around three key dimensions: inter-regional (zone-wise) comparisons, intra-state variations, and an econometric assessment of the factors influencing developmental outcomes.

Zone-wise Composite Index (CI) of Common Minimum Needs

The composite index (CI) for basic needs disparities revealed significant inter-regional variations, reflecting uneven progress in achieving essential living standards. The zonal analysis highlighted the comparative standing of states within their respective regions and the northern states revealed comparatively balanced performance (Table 2). Lower CI values denote better performance and greater access to minimum needs, while higher values showed areas lagging behind in achieving equality and inclusiveness.

Appraisal of the north zone revealed Himachal Pradesh as the foremost state with composite index of 0.1469.This state emphasised strong outcomes in literacy rate, gender balance, electrification, and access to improved drinking water (Annexure-1). These achievements were further reinforced by higher female participation and high percentage of households having access to banking services (Aashish and Sharma, 2022). However, low rate of population migration coupled with poor healthcare were the limitations for the state.

Uttarakhand with CI value of 0.2425 stood at the second place, characterized with balanced demographic structure, favourable health conditions, and improved access

to infrastructural amenities demonstrated notable progress. Moreover, the heightened awareness among women regarding their rights and entitlements further contributed to advancing the state's overall socio-economic development and human well-being (Deshpande, 2011).

Uttar Pradesh (CI: 0.3965) and Haryana (CI: 0.5827) revealed widening inequalities that reflected deep-rooted structural and socio-economic imbalances within these states. In Uttar Pradesh, a vast population base combined with stark rural–urban contrasts contributed to uneven access to education, healthcare, and sanitation facilities (Bardhan, 2010). Rural regions lagged behind in essential amenities such as safe drinking water, toilet facilities, and electricity, whereas urban centres experienced concentrated growth, leading to polarized development patterns.

While, Haryana, despite its relatively high per capita income and industrial advancement, faced significant intra-state inequalities. The benefits of rapid economic growth and urbanization remained largely confined to some parts near the National Capital Region (NCR), while the southern and western parts of the state witnessed slower progress in public health infrastructure, gender equality, and access to social services (Hooda et.al, 2017). These disparities brought to light the need for region-specific policy interventions to ensure inclusive growth and equitable distribution of developmental gains across both states. Punjab (CI: 0.6024) demonstrated relatively better performance in education, gender ratio, and migration indicators. However, the state continued to face widening disparities that were largely driven by rural–urban divides, uneven infrastructure development, and pronounced variations in health and sanitation coverage. These structural imbalances limited the translation of social gains into uniform well-being across districts and intensified intra-state inequality.

The eastern region displayed significant variations in the overall advancement across states. West Bengal led the region with CI value of 0.3000. This state reflected the higher literacy rate, gender ratio, low dependency ratio and higher women participation. Moreover, easy access to social services and better infrastructure contributed to the better living standard of the individuals (Bardhan, 2010). While, worse health conditions and migration of the population became a constraint in the path of development of the state. Chhattisgarh (CI: 0.3921) and Assam (CI: 0.4244) occupied intermediate positions in the composite index, reflecting moderate progress in fulfilling Common Minimum Needs

Table: 2 Zone-wise Composite Index (CI) of Common Minimum Needs along with rank

Zone	State	CI	Rank
North	Himachal Pradesh	0.1469	1
North	Uttarakhand	0.2425	2
North	Uttar Pradesh	0.3965	3
North	Haryana	0.5827	4
North	Punjab	0.6024	5
East	West Bengal	0.3000	1
East	Chhattisgarh	0.3921	2
East	Assam	0.4244	3
East	Jharkhand	0.5259	4
East	Odisha	0.5381	5
East	Arunachal Pradesh	0.5550	6
East	Bihar	0.8158	7
West	Madhya Pradesh	0.4017	1
West	Maharashtra	0.6271	2
West	Rajasthan	0.6297	3
West	Gujarat	0.7186	4
South	Kerala	0.1495	1
South	Andhra Pradesh	0.5252	2
South	Karnataka	0.5302	3
South	Tamil Nadu	0.5502	4
South	Telangana	0.5749	5

(CMN) across various dimensions. In Chhattisgarh, persistent challenges stemmed from its predominantly rural and tribal population and inadequate access to quality education and healthcare (Harriss-White, 2004). Despite improvements in household electrification and drinking water availability, the state faced constraints in women's empowerment indicators, including low participation in the legislative assemblies and limited access to financial and digital resources. Assam, while showing improvement in literacy, continued to grapple with infrastructural gaps, poor connectivity, and uneven distribution of social services. The state's high dependency ratio and limited employment opportunities constrained its overall socio-economic progress. Moreover, women's development indicators such as access to mobile phones, representation in decision-making, and adoption of family planning methods remained below the national average.

Jharkhand (CI: 0.5259), Odisha (CI: 0.5381) and Arunachal Pradesh (CI: 0.5550) recorded closely aligned composite index values, followed one another in terms of overall attainment of common minimum needs. The analysis examined that Jharkhand and Odisha reflected the similar results in terms of moderate literacy rate, gender ratio, and lower percentage of migrated population, average participation of women and better access to financial services. However, worse health conditions showed limitation for these states. Arunachal Pradesh stood better in education, migration and had lower percentage of children under malnutrition, yet it indicated moderate performance due to poverty, poor road connectivity and lesser vehicular availability. Bihar (CI: 0.8158) ranked as the lowest-performing state both regionally and nationally, reflecting multidimensional deprivation in basic needs. The state suffered from severe shortfalls in sanitation, housing quality, and access to safe drinking water, especially in rural areas. Low female literacy, limited workforce participation, and inadequate reproductive health services further constrained women's empowerment. Moreover, poor digital and communication access hindered socio-economic inclusion. These persistent gaps highlighted Bihar's challenges in translating policies into tangible outcomes, emphasizing the need for stronger investments in human capital, gender equity, and rural infrastructure (Drèze and Khera, 2017).

In the western zone, Madhya Pradesh (CI: 0.4017) emerged as the leading state, reflecting comparatively better performance supported by advancements in health indicators, access to safe drinking water and rural electrification. Enhanced road connectivity and a higher vehicle density further contributed to the state's overall progress. However, limited women's empowerment, low awareness levels and restricted access to infrastructural amenities continued to hinder its balanced and inclusive development. Maharashtra (CI: 0.6271) and Rajasthan (CI: 0.6297) manifested notable disparities largely driven by regional imbalances and the uneven impacts of rapid urbanization. Maharashtra, demonstrated a dual pattern of development. Major metropolitan areas benefitted from strong infrastructure, and higher living standards, while rural and backward regions, continued to face deprivation in housing quality and sanitation. Although, Rajasthan made progress in rural electrification and road connectivity yet persistent gender disparities, low literacy among women, and limited access to financial and digital services constrained social advancement. Apart from this, climatic conditions contributed to unequal access to basic amenities such as safe drinking water, sanitation, and healthcare, particularly in desert areas.

Gujarat's composite index of 0.7186 reflected a state ranked lowest, where economic dynamism coexists with social and infrastructural shortfalls. While industrial and urban zones have progressed rapidly but large sections of the population continue to face insufficient access to basic amenities, persistent health challenges, social disparities, uneven development outcomes. Gender disparities persisted in areas such as labour force participation, education, and political representation, limiting the inclusiveness of the state's growth. This imbalance highlighted that high economic growth alone did not necessarily translate into equitable human development. Thus, Gujarat's higher CI value demanded the need for more sustainable and inclusive policy measures that address gender equality, and balanced regional development (Guha, 2006).

Kerala (CI: 0.1495) emerged as the top-performing state in the southern zone, reflecting remarkable achievements. High levels of female literacy and empowerment, coupled with participation in governance, have played a pivotal role in enhancing the overall quality of life. Kerala had set a benchmark for inclusive social development in India (Varughese, 2024). The state's success stemmed from its consistent investment in human capital and social welfare policies which contributed to a more equitable distribution of resources and opportunities across both urban and rural areas.

Andhra Pradesh (CI: 0.5252) demonstrated moderate performance, followed by Karnataka (CI: 0.5302) and Tamil Nadu (CI: 0.5502) .The state of Andhra Pradesh supported by improvements in rural electrification, housing, and access to basic amenities. However, disparities persisted due to uneven rural infrastructure and gaps in sanitation and women's empowerment indicators. Karnataka reflected steady socio-economic progress driven by industrial growth and educational advancement, yet rural areas lagged in sanitation, drinking water access, and digital inclusion, highlighting the state's rural–urban divide. Tamil Nadu showed relatively balanced progress with strong performance in health, literacy, and women's participation, though disparities remained across some areas in housing quality and access to infrastructure in rural regions. Telangana, with a composite index of 0.5749, revealed comparatively weaker performance

in this region. Despite notable progress in literacy rate, gender ratio, and women's awareness, the state continues to face challenges such as unfavourable health conditions, low female workforce participation, inadequate digital access, poor road connectivity, and insufficient infrastructure development (Kabeer and Sweetman, 2015).

State-wise Composite Index (CI) of Common Minimum Needs

This research endeavours to analyse inter-state disparities in achievement of common minimum needs using composite index (Table 3). The spatial distribution of CMN attainment revealed a pronounced regional imbalance with CI values ranging from 0.2882 to 0.8992. Southern states such as Kerala and Tamil Nadu had consistently performed better in terms of health, education, and infrastructure compared to the northern, western and eastern states like Haryana, Gujarat, Arunachal Pradesh and Bihar (Dreze and Sen, 2013). The results clearly distinguished states into High (H), High–Middle (HM), Low–Middle (LM), and Low (L) performing categories, reflecting uneven progress toward meeting essential living conditions.

The southern states of Kerala (CI: 0.2882) and Tamil Nadu (CI: 0.3213) occupied the highest ranks, reflecting strong achievements in education, gender equality, and health services. Despite having smaller geographical areas, these states demonstrated efficient resource utilisation and strong institutional capacity to deliver basic services, evidenced by good access to infrastructure, digital services, and high levels of women's awareness and empowerment. The high–middle group of nine states showed a mixed pattern in which population pressure and geographical constraints strongly influenced performance. West Bengal (CI: 0.3835), with (7.26%) of the national population in only (2.82%) of geographical area, faced enormous strain on basic amenities (Bardhan, 2010). This population–area imbalance prevented the region from joining the high category despite favourable social indicators. Hill states such as Himachal Pradesh (CI: 0.3862) and Uttarakhand (CI: 0.4089), although characterised by low population densities, had rough topography that made road expansion, service delivery, and digital penetration difficult. Chhattisgarh (CI: 0.4440) and Assam (CI: 0.4812) lagged due to higher malnutrition and limited access to health and nutrition services, especially in tribal and remote pockets. Rajasthan (CI: 0.4655) and Maharashtra (CI: 0.4539) recorded moderate achievements but were constrained by high labour migration and large geographical spread, which made service delivery uneven. These regions revealed that the intersection of demographic load, terrain and institutional capacity created differentiated developmental outcomes (Singh and Chauhan, 2011).

The states in the low–middle cluster demonstrated that large populations, low social development, and weak women-centric indicators correlated with lower CMN rankings. Punjab's (CI: 0.5931) structural challenges had limited its upward movement in the performance scale. While this state performed reasonably well in basic amenities and infrastructure, its social and demographic indicators had pulled its composite index ranking downward. Uttar Pradesh (CI: 0.5977), holding (17.55%) of India's population, struggled with overwhelming demand for education, sanitation, and water services. Even though UP had a sizeable geographical spread, it's very high population-to-area ratio resulted in stretched resources and poor CMN outcomes.

Jharkhand (CI: 0.6128) and Odisha (0.6163) were constrained by limited infrastructure, high malnutrition, and low access to digital assets, reflecting structural underdevelopment rather than population pressure. The low-performing segment highlighted that overcrowding, isolation, and socio-economic deprivation—when coupled with governance challenges—created multidimensional deficits. Telangana (CI: 0.5717) and Haryana (CI: 0.5759) lagged in gender-related outcomes and women's representation, which pulled down their composite scores. Gujarat (CI: 0.7342), despite economic advancement, showed deep intra-state inequalities, indicating that economic growth alone did not guarantee CMN achievement. Arunachal Pradesh, (CI: 0.8265) with only 0.10 per cent of the national population spread over a vast mountainous region (2.32% of area), experienced low population density that increased the per-capita cost of service delivery, leading to CMN deficits. Structural poverty, high population density governance gaps, and limited infrastructure further constrained service delivery, which positioned Bihar (CI: 0.8992) firmly in the low-performing cohort.

Factors affecting Common Minimum Needs in India

The stepwise regression results presented in Table 4 provided important empirical insights into the key determinants influencing the fulfilment of common minimum needs across Indian states, with the Composite Index (CI) employed as the dependent variable. The model demonstrated exceptional explanatory power ($R^2 = 0.99$, $p<0.01$; Adjusted $R^2 = 0.98$, $p<0.01$), indicating that the selected variables collectively account for over (99%) of the variance in the socio-economic development status across states. AIC = –159.31 reflected model robustness and low information loss. VIF values (all < 2.2) confirmed no multicollinearity concerns, meaning the predictors contributed independently to the CI.

The regression analysis identified eight factors of socio-demographic development, among which all indicators were found to be statistically significant. The negative relationships observed between the variables and the Composite Index (CI) indicated that states with stronger basic amenities, improved human development, and more favourable demographic conditions achieved lower CI scores. A negative and significant regression coefficient of literacy rate ($\beta = –0.0005$;

Table 3: State-wise composite index (CI) of Common Minimum Needs along with rank and status

Zone	State	Geographical area (%)	Population (%)	CI	Rank	Status
South	Kerala	1.26	2.72	0.2882	1	H
South	Tamil Nadu	4.23	5.27	0.3213	2	H
South	Karnataka	6.19	4.83	0.3810	3	HM
East	West Bengal	2.82	7.26	0.3835	4	HM
North	Himachal Pradesh	1.49	0.55	0.3862	5	HM
North	Uttarakhand	1.95	0.84	0.4089	6	HM
East	Chhattisgarh	4.59	2.04	0.4440	7	HM
West	Maharashtra	9.99	9.49	0.4539	8	HM
West	Rajasthan	11.14	5.80	0.4655	9	HM
South	Andhra Pradesh	5.29	6.82	0.4684	10	HM
East	Assam	2.54	2.55	0.4812	11	HM
West	Madhya Pradesh	9.99	6.21	0.5540	12	LM
South	Telangana	3.64	2.81	0.5717	13	LM
North	Haryana	1.41	2.19	0.5759	14	LM
North	Punjab	1.64	2.26	0.5931	15	LM
North	Uttar Pradesh	7.64	17.55	0.5977	16	LM
East	Jharkhand	2.59	2.66	0.6128	17	LM
East	Odisha	4.85	3.28	0.6163	18	LM
West	Gujarat	6.11	4.93	0.7342	19	L
East	Arunachal Pradesh	2.32	0.10	0.8265	20	L
East	Bihar	3.04	8.17	0.8992	21	L

Note: - H: (0.2882-0.3235), HM: (0.3235-0.4812), LM: (0.4812-0.6389), L: (0.6389-0.8992)

Table 4: Stepwise regression analysis of composite index on different indicator

Indicators	Coefficient	SE	t-value	p-value	VIF
Intercept	1.14 e^{+01}	3.65 e^{-01}	31.31**	<0.01	-
Literacy Rate	-5.00 e^{-03}	1.10 e^{-03}	-4.56**	<0.01	1.93
Gender Ratio	-8.41 e^{-03}	3.99 e^{-04}	-21.07**	<0.01	1.22
Electricity Access	-2.11 e^{-02}	2.00 e^{-03}	-10.53**	<0.01	1.50
Banking Access	-9.24 e^{-04}	4.35 e^{-04}	-2.12*	0.05	1.63
Labour Migration	-4.59 e^{-03}	1.04 e^{-03}	-4.40**	<0.01	1.10
Menstrual Hygiene	-1.78 e^{-03}	3.20 e^{-04}	-5.56**	<0.01	2.13
Family Planning	-2.33 e^{-03}	5.16 e^{-04}	-4.52**	<0.01	1.61
Disability Rate	7.97 e^{-05}	1.48 e^{-05}	5.39**	<0.01	1.44
R^2=0.99** , Adj R^2=0.98**, AIC= -159.31					

***&* Significant at 0.01 and 0.05 per cent level of significance, respectively Note: ($3.99e^{-04}$ = 0.000399)*

$p < 0.01$) showed that higher literacy rates substantially strengthened CMN performance, with states possessing strong educational foundations ranking higher in the composite index. Education played a pivotal role in advancing socio-economic progress. A negative coefficient for the gender ratio ($\beta = -0.00841$; $p < 0.01$) showed that the states with higher gender ratios (more females per 1000 males) tended to record lower CI values, reflecting improvements in gender balance and better CMN performance. Electricity access exerted negative effects on the CI, indicating that states

Table 5: Test of residuals for the fitted model

Testing	Test used	Null Hypothesis	Test Statistic	p-Value
Randomness	Run Test	Residuals are independent	0.4595[s]	0.6459
Zero mean	t-test	Residuals have a zero mean	0.0000[s]	1
Heteroscedasticity	Breusch-Pagan Test	Residual variances are homogeneous	4.9746 [s]	0. 7603
Normality	Shapiro-Wilk Normality test	Residuals are normally distributed	0.9611	0.5381

s: Null Hypothesis satisfied, (p > 0.05)

with higher household electrification achieved better CMN outcomes. Although banking access was significant (p = 0.05), its negative coefficient indicated that greater financial inclusion supported better CMN outcomes.

The adoption of menstrual hygiene practices and family planning methods by women also demonstrated an inverse association with CI values, with coefficients of –0.00178 ($p < 0.01$) and –0.00233 ($p < 0.01$), respectively. This suggested that enhanced women's health awareness, reproductive autonomy, and access to basic hygiene resources contributed substantially to improved socio-developmental outcomes across states. Labour migration, driven by the search for employment, contributed meaningfully to the progress of destination states. This was clearly reflected in the negative relationship between CI and labour migration ($\beta = –0.00459$). The only positive and significant coefficient emerged for the disability rate ($\beta = +0.0000797$), showing that states with a higher prevalence of disability experienced higher CI values, denoting poorer CMN outcomes. This emphasised the need to eliminate disability for socio-economic development.

The robustness of the regression model was further established through diagnostic testing of residual assumptions at five per cent significance level.

The results presented in Table 5, revealed that the residuals of the composite index estimated through the stepwise regression model satisfied all major assumptions: independence, zero mean, homoscedasticity, and normality. Residual independence was confirmed using the run test of randomness ($p=0.6459>0.05$), which indicated the non-significance of the alternate hypothesis and, thus, acceptance of the null hypothesis. Therefore, the residuals were independent, suggesting no autocorrelation was present in the model. The assumption of the zero mean of residuals was tested using t-test ($p=1.0000>0.05$), implying non-significant results and accepting the null hypothesis that residuals had zero mean. The variance homogeneity assumption was tested by the Breusch-Pagan test ($p=0.7603>0.05$), which indicated acceptance of the null hypothesis that variance was homogeneous. The Shapiro-Wilk test tested the normality assumption ($p =0.5381>0.05$), implying acceptance of the null hypothesis that data had been normally distributed.

Conclusions and Policy Implications

The statistical evaluation of common minimum needs across twenty-one Indian states, using secondary data (2020-2024) of twenty basic indicators showed marked regional disparities. The composite index analysis categorized states into four performance levels, High, High-Middle, Low-Middle and Low. High-performing southern states Kerala and Tamil Nadu had benefitted from sustained investments in infrastructure and public health systems, whereas high–middle performers Karnataka, West Bengal, Maharashtra, Himachal Pradesh and Uttarakhand were often constrained by population pressure and challenging terrain. Low–middle performing states Jharkhand, Odisha, Haryana, Uttar Pradesh, and Punjab illustrated that weak women-centric indicators, high malnutrition, limited digital access, and infrastructural gaps collectively hindered CMN attainment. The lowest-performing states Gujarat, Arunachal Pradesh, and Bihar demonstrated that developmental deficits resulted from a combination of overcrowding, difficult geography, weak public service delivery, limited social development, and socio-economic exclusion. The zone-wise comparison showed that southern and northern states generally performed better in meeting basic needs, whereas the eastern and western regions displayed mixed outcomes with pockets of severe deprivation. Kerala, Himachal Pradesh, and Tamil Nadu consistently ranked at the top due to stronger human development outcomes, broad access to basic amenities, and higher levels of female empowerment. In the northern zone Punjab demonstrated at the lower position even than Haryana. Bihar, Gujarat, and Arunachal Pradesh with higher CI values indicated low development. Therefore strong policy implications are required to be developed for the states in the CMN sector. These findings emphasised that economic growth alone seen in states like Gujarat had not ensured balanced human development without parallel social investments. The stepwise regression analysis identified eight critical determinants that significantly shaped CMN outcomes. Indicators such as gender ratio, literacy rate, menstrual hygiene, family planning adoption, banking access, electricity access and labour migration revealed negative and significant relationships with the CI, indicating that improvements in these indicators contributed to socio-

economic development. The disability rate displayed a significant positive relationship with CI, indicated to reduce the disability for improvement. The residuals of the selected model satisfied all major assumptions of independence, zero mean, homoscedasticity, and normality.

Addressing these inequalities therefore required a holistic and integrated policy approach for strengthening social infrastructure and efficient allocation of resources in lagging states.

Acknowledgements

The authors gratefully acknowledge the State University Research Excellence (SERB-SURE) program of the Department of Science and Technology, New Delhi, for providing the necessary funding and facilities for the successful execution of this study. The authors also extend sincere thanks to Punjab Agricultural University, Ludhiana, for offering the institutional platform and support for carrying out this research.

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Received: June 10, 2025 Accepted: December 12, 2025

Annexure-1

State	Population density (persons/ sq.km)	Literacy rate (5yr & above)	Gender ratio (female /1000 male) at birth	Migration of labour in the country	Malnutrition Children under 5	Proportion of disabled population	Dependency ratio	Participation of women in lgislative assemblies	Women having phone	Protection during menstrual	Any family planing method	Households having access tosource of drinking water located in premises	Consumption of liquefied petroleum gas (LPG)	Households with pucca house	Number of rural households having toilet facilities	Number of households by main source of lighting	Number of households having assets	Number of Households Availing Banking Services	Length of roads in Km	Number of vehicles
HP	133	87.30	941	0.72	24.57	2262.43	42.90	5.88	168.70	187.10	149.30	72.70	0.68	76.90	100.00	99.78	29.75	89.12	1.48	22236.16
UK	214	84.17	940	1.49	20.40	1836.92	43.60	7.14	128.80	184.20	143.00	68.10	1.14	90.70	100.00	99.49	22.73	80.71	1.01	25165.85
UP	962	74.87	933	7.62	29.70	2080.71	52.50	10.55	102.30	155.10	128.40	75.20	13.58	64.90	83.43	99.51	16.64	72.02	1.87	14569.41
HR	670	81.83	927	3.22	20.17	2155.24	44.80	10.00	108.50	188.30	146.40	70.80	3.30	77.10	100.00	99.05	25.30	68.13	1.15	28399.06
PB	604	82.07	926	3.00	17.33	2357.58	41.43	5.13	125.90	187.30	133.80	91.10	3.58	88.30	100.00	99.04	29.90	65.21	2.89	37170.77
WB	1107	82.07	949	4.00	28.77	2210.23	38.37	13.70	111.00	170.90	150.50	50.20	6.94	50.50	94.14	99.42	15.95	48.75	3.53	10561.89
CG	219	76.80	961	2.47	28.27	2446.42	42.37	14.44	95.20	148.00	138.10	38.00	1.19	30.80	100.00	99.57	11.93	48.80	0.73	24974.26
AS	448	84.53	944	1.38	29.93	1538.37	46.23	4.76	129.30	146.70	122.10	82.40	1.78	27.00	88.96	99.73	14.89	44.09	4.74	12076.24
JD	485	76.07	935	1.99	33.80	2334.12	53.70	12.35	108.90	159.00	126.40	33.50	1.44	38.20	84.23	99.85	12.91	53.95	1.01	13997.55
OD	294	77.47	936	2.06	26.27	2964.70	44.10	8.90	106.80	171.20	150.50	29.40	2.32	42.40	58.91	98.81	11.04	45.04	2.05	20129.10
AR	18	83.07	933	0.29	18.83	1931.65	42.93	5.00	157.20	184.90	116.50	82.00	0.09	18.70	100.00	87.36	18.73	53.03	0.74	15892.35
BR	1314	73.50	915	1.71	35.60	2239.22	63.77	10.70	111.10	130.70	116.90	85.60	5.69	48.10	60.81	99.66	12.03	44.40	3.15	8880.40
MP	275	74.77	940	5.83	29.23	2136.85	46.00	9.13	90.20	135.30	143.30	42.50	4.05	44.20	94.47	99.67	13.55	46.60	1.19	21281.13
MH	405	85.50	940	19.08	32.30	2637.08	41.70	8.33	111.30	170.30	132.30	70.30	11.58	68.40	100.00	98.81	23.21	68.88	2.05	28600.42
RJ	233	73.30	946	4.13	25.40	2281.17	49.63	12.00	110.80	174.10	145.90	50.20	5.27	71.50	100.00	98.86	16.12	68.02	0.91	24486.32
GJ	357	83.33	918	7.34	34.60	1807.25	41.50	7.14	102.20	136.20	131.70	77.50	4.59	75.10	100.00	98.83	21.48	57.87	1.20	39206.34
AP	324	71.67	952	9.02	25.63	2679.81	39.27	8.00	108.30	173.10	142.00	37.50	4.69	73.00	100.00	99.54	19.47	53.10	1.21	13951.94
KA	349	80.40	949	6.97	29.27	2167.45	41.40	3.14	127.60	170.70	137.80	59.00	6.84	66.80	91.61	99.53	24.61	61.11	1.87	38976.98
KL	915	93.10	959	1.72	19.63	2280.56	47.73	7.86	173.10	186.30	121.50	44.30	3.93	83.50	100.00	99.91	36.82	74.24	6.65	37438.08
TN	588	85.17	948	8.42	20.53	1635.50	40.70	5.13	150.10	196.60	137.10	50.90	8.35	70.70	99.74	99.51	30.79	52.52	2.08	44565.76
TG	383	76.23	933	9.02	28.87	2679.81	39.63	5.04	125.80	185.50	136.60	74.00	3.84	70.70	87.04	99.54	19.47	53.10	1.20	33306.15