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Blockwise Analysis of the Status of Deprivation in Nagpur Region: A Factor Analytic Approach

A D Gotmare, District Planning Officer(Human Development), Gadchiroli
P G Khot, Retd Professor, RST University, Nagpur
Corresponding author; A D Gotmare

ABSTRACT:*The present paper discusses the status of deprivation in the blocks of the districts of Nagpur region. Human Development report of Maharashtra shows that there are striking regional disparities with State and at the district level. Many government initiatives were taken place to wipe out the disparities at the district level and raise the human development index of deprived district through introducing human development programme. In this paper composite Index for deprivation is computed by using Factor Analytic approach. Indicators included in the analysis are availability of proper housing water, Electricity and sanitation facility at the block level and this is termed as deprivation Index. Index measures the level of deprivation at the district and block levels based on the indicators. An Attempt has been made to propose the deprivation Index which provides the method of identifying where allocation needs to be undertaken in order to remove block level disparities of the district.*

KEYWORDS: *Factor Analysis, Human Development, Deprivation Index, Regional Imbalance.*

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I. INTRODUCTION

Analyzing multivariate structures requires techniques for reducing the many dimensions of a data set while keeping as much information as possible. Principle Component analysis is one often used method to obtain a new set of variables that contain maximum amount of variation in the underlying multivariate data set. The method of Principle Component analysis was first described during the first decades of the 20th century (Jolliffe2002), for explaining a maximum amount of total variation in a set of underlying variables through "Components" created by using correlation matrices. Various authors computed composite index by using different methods. Narain et al. (1991) gave a composite index to measure socio-economic development for each state by using standardized variables (Z SCORE). The composite index was calculated as square root of sum of squared deviations from the best value for variables under study. Narainet al. (2007) modified earlier index by weighing the deviations inversely proportional to coefficient of variation and evaluated the disparities in the level of development among various districts. The level of socio-economic development was estimated for different states. Pajankar et al (2010) calculated composite indices of development in respect of education development – elementary school education using Narain et al (1991) methodology. Raju et al (2008) constructedthe index on educational development and highlighted the interstate disparity in development of elementary school education. The study used the method by accommodating expert driven weights in an equal weight in an equal weighing method. Nagar and Basu (2002) developed a composite index using the weights derived from Principle Component Analysis (PCA). The weights are derived objectively from correlation matrix. The principle component variables are independent and uncorrelated. The objective of Principle component Analysis is to reduce the dimensionality of the data set but retain most of the original variability in the data.

II. DATA AND METHODOLOGY

Census 2011 data on indictor Drinking Water, Housing Condition, Electricity and Sanitation are used to compute block level Deprivation Index of the district. Procedure of deriving principle components is based on computations of the covariance matrix of original data. Using the vector X with n random variables, the covariance matrix is given by E(XX') and denoted by $\sum$. The ijth element of $\sum$ is thus the covariance between variables i and j. Defining α' as a vector of weights for forming linear combinations of the original variables, gives the kth principle component by

$\xi_k = \alpha'_k x$

The variance of the new variable E($\xi\xi$') is equal to $\alpha'\sum \alpha$, and is to be maximized subject to the constraints that $\alpha' \alpha = 1$.

Maximizing the value of a function subject to a constraint is by using Lagrange multipliers, which is also the standard method for deriving principle components. Function to be maximized

$$\xi = \alpha' \sum \alpha - \lambda (\alpha' \alpha - 1)$$

where λ is the Lagrange multiplier. Taking the first derivative of the above expression with respect to α gives a vector of partial derivatives defined as:

$$\frac{\delta \xi}{\delta \alpha} = 2\sum \alpha - 2 \lambda \alpha, \text{ setting derivatives to zero yields,}$$

$$(\sum - \lambda I_p) \alpha = 0$$

Where I_p is the pxp identity matrix. Λ is therefore an eigenvalues of the correlation matrix ∑, and α is the corresponding eigen vector (Jolliffe, 2002).

To decide which of the n eigenvectors give maximum variance:

$$\alpha' \sum \alpha = a' \lambda a = \lambda a' a = \lambda$$

Since Var (α'x) = α'∑ α = λ the maximum variance is λ, the largest eigen value of the matrix, and α is the corresponding eigen vector.

The Principle component analysis was carried out using SPSS software. Higher values of the index indicate development in agriculture production. The index is computed as the weighted average of all the principle component variables using eigen values as weights. Composite Index is computed as,

$$I = = \frac{\sum_{i=1}^{n} \quad Xi \left[\sum_{j=1}^{n} \quad |\alpha ij|.\lambda j\right]}{\sum_{i=1}^{n} \quad \left[\sum_{j=1}^{n} \quad |\alpha ij|.\lambda j\right]}$$

Where I is the index, Xi is the i^{th} Indicator; αij is the factor loading value of the i^{th} variable on the j^{th} factor;λj is the eigen value of the j^{th} factor.

Raw data is converted into normalized form by using,

$$NVij = 1 - \frac{\{ BestXi - ObservedXij \}}{\{BestXi - WorstXi\}}$$

The best and the worst values in an indicator are identified. The best and the worst values will depend upon the nature of a particular indicator. In case of a positive indicator, the highest value will be treated as the best value and the lowest, will be considered as the worst value. Similarly, if the indicator is negative in nature, then the lowest value will be considered as the best value and the highest, the worst value. Once the best and worst values are identified, the normalized values should be obtained in case of all the variables in computation of Agriculture Development Index. Normalized values always lie between 0 and 1.

Results and Discussion

Factor loadings and Eigen values and weights of deprivation Index for six district of Nagpur Region along with KMO statistics for sample adequacy are given in Table 1.

Table 1: KMO Measure of Sampling adequacy for Nagpur Region

Districts	KMO measure	Bartlett's test
Nagpur	0.553	P<0.001
Wardha	0.568	P=0.059
Bhandara	0.518	P=0.263
Gondia	0.547	P=0.434
Chandrapur	0.494	P<0.01
Gadchiroli	0.608	P<0.01

The KMO measure is used as an index of whether there are linear relationships between the variables and thus whether it is appropriate to run principal components analysis on current data set. Its value can range from 0 to 1, with values above 0.5 suggested as a minimum requirement for sampling adequacy, but values above 0.8 considered good and indicative of principal components analysis being useful. A KMO measure can be calculated for all variables combined and for each variable individually.

Factor loadings, eigen values and weights for computing deprivation indexof Nagpur district are given in Table 2. It is seen that no. of households not having latrines has maximum correlation with first component 0.942 followed by location of drinking water (away) 0.847, Census house dilapidated 0.832 and correlation with first component of main source of lightning- no lightning is 0.318. First component explains 59.94% of variation, eigen value above one are retained, λ1=2.398. Total of 28.3%, 28.81%, 10.8% and 32.05% of weights were assigned by four variables respectively.

Table 2:Factor Loadings, Eigen values and weights for computing Deprivation Index of Nagpur district

Indicator	Component 1 (h1)	Weights (h1* λ1)	Eigen Value & Variation Explained
Census House as Dilapidated	0.832	1.9951	λ1=2.398 Variation Explained=59.94%
Location of Drinking Water Away	0.847	2.0311	
Main Source of Lightning- No Lightning	0.318	0.7626	
No. of Households not having Latrines	0.942	2.2589	

Factor loadings, eigen values and weights for computing deprivation index ofWardhadistrict are given in Table 3. It is observed that Census house as Dilapidated has maximum correlation with first component 0.902 followed by no. of households not having latrines 0.883, Location of drinking water (away) 0.659 and correlation with first component of main source of lightning- no lightning is 0.012.

It is also seen that Main source of lightning- no lightning has maximum correlation with second component 0.954 followed by location of drinking water away -0.678, No. of households not having latrines -0.309 and correlation with second component of Census house as Dilapidated is 0.113.

Both the component explains 87.65 per cent of variation, eigen value above one are retained, $\lambda1=2.419$ and $\lambda2=1.087$. Total of 28.19%, 28.52%, 13.04% and 30.24% of weights were assigned by four variables respectively.

Table 3: Factor Loadings, Eigen values and weights for computing Deprivation Index of Wardha district

	Component 1 (h1)	Component 2 (h2)	Weights (h1* λ1+h2* λ2)	Eigen Value & Variation Explained
Census House as Dilapidated	0.902	0.113	2.3048	λ1=2.419 λ2=1.087 Variation Explained=87.65%
Location of Drinking Water Away	0.659	-0.678	2.3311	
Main Source of Lightning- No Lightning	0.012	0.954	1.0660	
No. of Households not having Latrines	0.883	-0.309	2.4719	

Factor loadings, eigen values and weights for computing deprivation index of Bhandara district are given in Table 4. It is seen from the table that No. of households not having latrines has maximum correlation with first component 0.859 followed by main source of lightning- no lightning 0.854, Location of drinking water (away) 0.840 and correlation with first component of main source of lightning- no lightning is -0.045.

It is also seen that Census house as Dilapidated has maximum correlation with second component 0.989 followed by Main Source of Lightning- No lightning -0.410, Location of drinking water-away 0.045 and correlation with second component of No. of households not having latrines is -0.015.

Both the component explains 83.022% of variation, eigen value above one are retained, $\lambda1=2.292$ and $\lambda2=1.029$. Total of 15.03%, 26.44%, 31.91% and 26.61% of weights were assigned by four variables respectively.

Table 4: Factor Loadings, Eigen values and weights for computing Deprivation Index of Bhandara district

	Component 1 (h1)	Component 2 (h2)	Weights (h1* λ1+h2* λ2)	Eigen Value & Variation Explained
Census House as Dilapidated	-0.045	0.989	1.1208	λ1=2.292 λ2=1.029 Variation Explained=83.022%
Location of Drinking Water Away	0.840	0.045	1.9716	
Main Source of Lightning- No Lightning	0.854	-0.410	2.3792	
No. of Households not having Latrines	0.859	-0.015	1.9843	

Factor loadings, eigen values and weights for computing deprivation index of Gondia district are given in Table 5.It is seen that No. of households not having latrines has maximum correlation with first component 0.0.817 followed by Location of drinking water 0.804, Census house as dilapidated -0.784 and correlation with first component of main source of lightning- no lightning is -0.068.It is also seen that Main source of lightning- no lightning has maximum correlation with second component -0.938 followed by Location of drinking water 0.434,Census house as dilapidated 0.330 and correlation with second component of No. of households not having latrines is0.182.

Both the component explains 78.571% of variation, eigen value above one are retained, $\lambda1=2.043$ and $\lambda2=1.100$. Total of 27.6%, 29.8%, 16.4% and 26.2% of weights were assigned by four variables respectively.

Table 5: Factor Loadings, Eigen values and weights for computing Deprivation Index of Gondia district

	Component 1 (h1)	Component 2 (h2)	Weights (h1* λ1+h2* λ2)	Eigen Value & Variation Explained
Census House as Dilapidated	-0.784	0.330	1.9647	λ1=2.043 λ2=1.100 Variation Explained=78.571%
Location of Drinking Water Away	0.804	0.434	2.1199	
Main Source of Lightning- No Lightning	-0.068	-0.938	1.1707	
No. of Households not	0.817	0.182	1.8693	

having Latrines				

Factor loadings, eigen values and weights for computing deprivation index of Chandrapurdistrict are given in Table 6.It is seen that Main source of lightning- no lightning has maximum correlation with first component 0.941 followed by Location of drinking water 0.873, No. of households not having latrines 0.353 and correlation of first component with main source of lightning- no lightning is 0.068.Census house as Dilapidated is -0.191. It is also seen that Census house as Dilapidated has maximum correlation with second component 0.932 followed by No. of households not having latrines 0.858,Location of drinking water 0.350 and correlation ofsecond componentMain source of lightning- no lightning is -0.191.

Both the component explains 89.35% of variation, eigen value above one are retained, $\lambda1=2.038$ and $\lambda2=1.536$. Total of 21.71%, 27.62%, 26.37% and 24.29% of weights were assigned by four variables respectively.

Table 6: Factor Loadings, Eigen values and weights for computing Deprivation Index of Chandrapur district

	Component 1 (h1)	Component 2 (h2)	Weights (h1* λ1+h2* λ2)	Eigen Value & Variation Explained
Census House as Dilapidated	-0.191	0.932	1.82081	λ1=2.038 λ2=1.536 Variation Explained=89.35%
Location of Drinking Water Away	0.873	0.350	2.3168	
Main Source of Lightning- No Lightning	0.941	-0.191	2.2111	
No of Households not having Latrines	0.353	0.858	2.0373	

Factor loadings, eigen values and weights for computing deprivation index of Gadchiroli district are given in Table 7.It is seen that Location of Drinking Water Away has maximum correlation with first component 0.939 followed by No. of Households not having Latrines 0.882, Main Source of Lightning- No Lightning0.753 and correlation of first component withCensus House as Dilapidated is 0.335. First component explains 55.45% of variation, eigen value above one are retained, $\lambda1=2.338$. Total of 11.5%, 32.3%, 25.9% and 30.3% of weights were assigned by four variables respectively.

Table 7: Factor Loadings, Eigen values and weights for computing Deprivation Index of Gadchiroli district

	Component 1 (h1)	Weights (h1* λ1)	Eigen Value & Variation Explained
Census House as Dilapidated	0.335	0.7832	λ1=2.338 Variation Explained=55.449%
Location of Drinking Water Away	0.939	2.1954	
Main Source of Lightning- No Lightning	0.753	1.7605	
No of Households not having Latrines	0.882	2.0621	

Deprivation index of Nagpur district are given in Table 8.It is observed that blocks Katol, Kalmeshwar, Narkhed, Saoner, Bhiwapur are most deprived blocks in terms of Census house Dilapidated, blocks Parseoni, Hingna, Ramtek, and Nagpur rural are moderately deprived in terms of Census house Dilapidated and blocks Mouda, Umred, Kuhi, Kamptee are least deprived blocks in terms of Census house Dilapidated.

It is observed that blocks Ramtek, Parseoni,Kuhi, Mouda and Katol are most deprived blocks in terms of location of drinking water-away from home. Blocks Nagpur, Narkhed, Kalmeshwar, Nagpur rural, Umred and Kuhi are moderately deprived blocks in terms of location of drinking water-away from home. Blocks Bhiwapur, Kamptee, Parseoniare least deprived blocks in terms of location of drinking water-away from home.

It is observed that blocks Mauda, Hingna, Saoner, Katol and Ramtek are most deprived blocks in terms of Main Source of Lightning- No Lightning most of the houses are without electrification. Blocks Nagpur, Narkhed, Kalmeshwar, Kamptee, Nagpur rural, Umred, and Kuhi are moderately deprived blocks in terms of Main Source of Lightning- No Lightning while blocks Parseoni and Bhiwapur are least deprived in terms of Main Source of Lightning- No Lightning.

It is observed that blocks Narkhed, Katol,Kalmeshwar,Parseoni, Bhiwapurand Kuhi are most deprived blocks in terms of No. of Households not having Latrines. Blocks Saoner, Ramtek, Mouda and Hingna are moderately deprived blocks in terms of No. of Households not having Latrines. While, blocks Nagpur, Nagpur rural, Kamptee, Umred are least deprived blocks in terms of No. of Households not having Latrines.

Overall Index shows that blocks Katol, Ramtek, Kalmeshwar, Narkhed, Parseoni and Saoner are most deprived blocks with all four characteristics. Blocks Bhivapur, Mouda, Kuhi and Hingna are moderately

deprived blocks while blocks Umred, Nagpur rural, Kamptee and Nagpur are the least deprived blocks in overall Index.

Table 8:Deprivation Index of Nagpur District

Weights	**1.995**	**2.031**	**0.763**	**2.259**		
District	Dilapidated	Water Away	No Lightning	No Latrines	INDEX	Rank
Nagpur	0.054054054	0.022901	0.268293	0	0.359057	14
Narkhed	0.932432432	0.19084	0.243902	1	4.692896	4
Katol	1.027027027	0.458015	0.512195	0.858974	5.310376	1
Kalameshwar	1	0.389313	0.219512	0.815385	4.795136	3
Saoner	0.918918919	0.358779	0.585366	0.571795	4.300241	6
Parseoni	0.445945946	0.664122	0	0.928205	4.33531	5
Ramtek	0.5	1	0.439024	0.638462	4.80576	2
Mouda	0.162162162	0.48855	1	0.564103	3.353065	8
Kamptee	0.027027027	0	0.195122	0.223077	0.706728	13
Nagpur (Rural)	0.243243243	0.343511	0.268293	0.1	1.613549	12
Hingna	0.202702703	0.335878	0.682927	0.55641	2.864564	10
Umred	0	0.374046	0.243902	0.4	1.849385	11
Kuhi	0.040540541	0.580153	0.219512	0.720513	3.054295	9
Bhiwapur	0.594594595	0.358779	0.04878	0.858974	3.892538	7

Deprivation index of Bhandara district are given in Table 9.It is observed that blocks Lakhandur, Lakhani and Mohadi are most deprived blocks in terms of Census house Dilapidated, blocks Bhandara, Sakoli are moderately deprived in terms of Census house Dilapidated and blocks Bhandar urban, Tumsar are least deprived blocks in terms of Census house Dilapidated.

It is observed that blocks Lakhandur,Tumsar, Bhandara rural most deprived blocks in terms of location of drinking water-away from home. Blocks Lakhani, Sakoli, Bhandara are moderately deprived blocks in terms of location of drinking water-away from home. Blocks Pauni, Mohali are least deprived blocks in terms of location of drinking water-away from home.

It is observed that blocks Sakoli, Lakhandur, Tumsar, Bhandara rural are most deprived blocks in terms of Main Source of Lightning- No Lightning most of the houses are without electrification. Blocks Lahani, Bhandara are moderately deprived blocks in terms of Main Source of Lightning- No Lightning while blocks Pauni, Mohadi are least deprived in terms of Main Source of Lightning- No Lightning.

It is observed that blocks Tumsar, Sakoli, Lakhani, Bhandara rural are most deprived blocks in terms of No of Households not having Latrines. Blocks Lakhandur, Pauni are moderately deprived blocks in terms of No of Households not having Latrines. While, blocks Mohadi and Bhandara are least deprived blocks in terms of No of Households not having Latrines.

Overall Index shows that blocks Lakhandur, Tumsar and sakoli are most deprived blocks with all four characteristics. Blocks bhandara, Lakhani and bhandara rural are moderately deprived blocks while blocks Pauni and Mohadi are the least deprived blocks in overall Index.

Table 9: Deprivation Index of Bhandara District

Weights	**1.121**	**1.972**	**2.379**	**1.984**		
District	Dilapidated	Water Away	No Lightning	No Latrines	INDEX	Rank
Bhandara	0.432432432	0.5	0.538462	0.544218	3.831485	4
Tumsar	0.243243243	0.641304	0.769231	1	5.351328	2
Mohadi	0.540540541	0	0.153846	0	0.971946	8
Bhandara	0	0.608696	0.384615	0.136054	2.38528	6
Sakoli	0.324324324	0.48913	1	0.77551	5.245745	3
Lakhani	0.891891892	0.423913	0.230769	0.622449	3.619706	5
Pauni	1	0.304348	0	0.306122	2.328521	7
Lakhandur	0.918918919	1	0.769231	0.540816	5.905088	1

Deprivation index of Chandrapur district are given in Table 10.It is observed that blocks Gondpimpari, Pombhurna, Warora, Chimur, Saoli and Korpana are most deprived blocks in terms of Census house Dilapidated, blocks Sindewahi, Nagbhid and Chandrapur rural are moderately deprived in terms of Census house Dilapidated and blocks Chandrapur, Bramhapuri, Sindewahi, Bhadrawati, Mul, Ballarpur, Jivati are least deprived blocks in terms of Census house Dilapidated.

It is observed that blocks Jivati, Nagbhid, Chimur and Sindewahi are the most deprived blocks in terms of location of drinking water-away from home. Blocks Chandrapur rural, Bramhapuri, Pombhurna, Korpana are moderately deprived blocks in terms of location of drinking water-away from home. Blocks Warora, Saoli,

Bhadrawati, Chandrapur, Muland Rajura are the least deprived blocks in terms of location of drinking water-away from home.

It is observed that blocks Jivati, Nagbhid,Sindewahi and Chandrapur rural are most deprived blocks in terms of Main Source of Lightning- No Lightning most of the houses are without electrification. Blocks Chandrapur, Saoli, Mul and Rajura are moderately deprived blocks in terms of Main Source of Lightning- No Lightning while blocks Warora, Chimur, Bramhapuri, Bhadrawati, Ballarpur, Korpana and Gondpimpari are the least deprived in terms of Main Source of Lightning- No Lightning.

It is observed that blocks Jivati, Pombhurna, Korpana, Rajura and Chimur are most deprived blocks in terms of No. of Households not having Latrines. Blocks Chandrapur rural, Warora, Nagbhid, Saoli, Bhadrawati, Mul are the moderately deprived blocks in terms of No. of Households not having Latrines. While, blocks Bramhapuri, Sindewahi, Chandrapur, Ballarpur are the least deprived blocks in terms of No. of Households not having Latrines.

Overall Index shows that blocks Jivati, Pombhurna, Nagbhid, Chimur, Gondpimpari and Korpana are most deprived blocks with all four characteristics. Blocks Rajura, Saoli, Sindewahi, Chandrapur rural, and Warora are moderately deprived blocks while blocks Mul, Bhadrawati, Bramhapuri, and Chandrapur are the least deprived blocks in overall Index.

Table 10: Deprivation Index of Chandrapur District

Weights	**1.821**	**2.317**	**2.211**	**2.037**		
District	Dilapidated	Water Away	No Lightning	No Latrines	INDEX	Rank
Chandrapur	0.431192661	0.3425	0.333333	0.541063	3.417919	10
Warora	0.669724771	0.2625	0.166667	0.512077	3.239383	11
Chimur	0.550458716	0.46	0.25	0.804348	4.259412	4
Nagbhid	0.449541284	0.5725	0.583333	0.463768	4.379543	3
Brahmapuri	0.28440367	0.3125	0.125	0.330918	2.192416	14
Saoli	0.532110092	0.28	0.375	0.673913	3.819618	8
Sindewahi	0.440366972	0.5	0.5	0.357488	3.794111	9
Bhadrawati	0.293577982	0.235	0.25	0.400966	2.448619	13
Chandrapur	0	0.15	0.5	0	1.45305	15
Mul	0.275229358	0.2	0.416667	0.410628	2.722292	12
Pombhurna	0.825688073	0.3575	0.5	0.944444	5.361239	2
Ballarpur	0.146788991	0	0.166667	0.272947	1.191796	16
Korpana	0.532110092	0.365	0.166667	0.92029	4.057808	6
Jivati	0.293577982	1	1	1	7.099606	1
Rajura	0.541284404	0.225	0.291667	0.842995	3.86906	7
Gondpimpari	1	0.3875	0	0.710145	4.165403	5

Deprivation index of Gadchirolidistrict are given in Table 11.It is observed that blocks Sironcha, Chamorshi, Mulchera and Aheri are most deprived blocks in terms of Census house Dilapidated, blocks Gadchiroli rural, Wadsa, Armori, Gadchiroli and Bhamragad are moderately deprived in terms of Census house Dilapidated and blocks Kurkheda, Korchi, Dhanora, Etapalli are least deprived blocks in terms of Census house Dilapidated.

It is observed that blocks Bhamragad, Aheri, Mulchera, Etapalli, Sironcha and Chamorshi are the most deprived blocks in terms of location of drinking water-away from home. Blocks Gadchiroli rural, Korchiand Dhanora are moderately deprived blocks in terms of location of drinking water-away from home. Blocks Wadsa, Armori, Kurkhedaand Gadchiroli are the least deprived blocks in terms of location of drinking water-away from home.

It is observed that blocks Bhamragad, Sironcha, Etapalli, Dhanora, Vadsa and Aheri are most deprived blocks in terms of Main Source of Lightning- No Lightning most of the houses are without electrification. Blocks Gadchiroli, Chamorshi are moderately deprived blocks in terms of Main Source of Lightning- No Lightning while blocks Armori, Kurkheda, Korchi and Mulchera are the least deprived in terms of Main Source of Lightning- No Lightning.

It is observed that blocks Jivati, Bhamragad, Sironcha, Aheri, Etapalli, Mulchera, Dhanora and Korchi are most deprived blocks in terms of No. of Households not having Latrines. Blocks Gadchiroli rural, Chamorshi are the moderately deprived blocks in terms of No. of Households not having Latrines. While, blocks Wadsa, Armori, Kurkheda and Gadchiroli are the least deprived blocks in terms of No. of Households not having Latrines.

Overall Index shows that blocks Bhamragad, Sironcha, Etapalli, Aheri, Mulchera and Chamorshi are most deprived blocks with all four characteristics. Blocks Dhanora, Gadchiroli rural, Korchi and Kurkheda are moderately deprived blocks while blocks Armori, Gadchiroli, Wadsa are the least deprived blocks in overall Index.

Table 11: Deprivation Index of Gadchiroli District

Weights	**0.783**	**2.195**	**1.761**	**2.062**		
District	Dilapidated	Water Away	No Lightning	No Latrines	INDEX	Rank
Gadchiroli	0.349693252	0.484305	0.365854	0.715385	3.456251	8
Desaiganj (Wadasa)	0.349693252	0.004484	0.47561	0	1.121202	13
Armori	0.349693252	0	0.109756	0.405128	1.302465	11
Kurkheda	0.288343558	0.098655	0	0.430769	1.330566	10
Korchi	0	0.363229	0.195122	0.817949	2.827507	9
Dhanora	0.208588957	0.313901	0.52439	0.815385	3.457113	7
Gadchiroli	0.392638037	0.192825	0.04878	0.210256	1.250138	12
Chamorshi	0.619631902	0.506726	0.304878	0.776923	3.736342	6
Mulchera	0.429447853	0.807175	0.04878	0.866667	3.980976	5
Etapalli	0.153374233	0.762332	0.560976	0.935897	4.711109	3
Bhamragad	0.325153374	1	1	1	6.272595	1
Aheri	0.509202454	0.825112	0.45122	0.841026	4.738619	4
Sironcha	1	0.681614	0.646341	0.912821	5.299587	2

Deprivation index of Gondiadistrict are given in Table 12.It is observed that blocks MorgaonArjuni,Tiroda and Sadak-Arjuni are most deprived blocks in terms of Census house Dilapidated, blocksAmgaon, Gondia rural and Gondia are moderately deprived in terms of Census house Dilapidated and blocks Deori, Salekasa and Goregaon are least deprived blocks in terms of Census house Dilapidated.

It is observed that blocks Salekasa, Deori, MorgaonArjuniand Amgaon are the most deprived blocks in terms of location of drinking water-away from home. Blocks Gondia rural, Goregaon and SadakArjuni are moderately deprived blocks in terms of location of drinking water-away from home. Blocks Tiroda, and Gondia are the least deprived blocks in terms of location of drinking water-away from home.

It is observed that blocks Salekasa, Amgaon, and Tiroda are most deprived blocks in terms of Main Source of Lightning- No Lightning most of the houses are without electrification. Blocks Gondia rural and Deori are moderately deprived blocks in terms of Main Source of Lightning- No Lightning while blocks SadakArjuni, MorgaonArjuni, Deori and Goregaon are the least deprived in terms of Main Source of Lightning-No Lightning.

It is observed that blocks Salekasa, SadakArjuni, and Gondia are most deprived blocks in terms of No. of Households not having Latrines. Blocks Deori, and Gondia rural are the moderately deprived blocks in terms of No. of Households not having Latrines. While, blocks Goregaon, Tiroda, Amgaon and MorgaonArjuniare the least deprived blocks in terms of No. of Households not having Latrines.

Overall Index shows that blocks Salekasa, MorgaonArjuniand Amgaon are most deprived blocks with all four characteristics. Blocks Gondia, SadakArjuni, and Gondiarural are moderately deprived blocks while blocks Tiroda, Deori and Goregaon are the least derived blocks in overall Index.

Table 12: Deprivation Index of Gondia District

Weights	**1.965**	**2.119**	**1.171**	**1.869**		
District	Dipapidated	Water Away	No Lightning	No Latrines	INDEX	RANK
Gondia	0.378787879	0.5	0.35	0.364055	2.894088	6
Tirora	0.696969697	0	0.65	0.142857	2.397695	7
Goregaon	0.196969697	0.412281	0.1	-0.04608	1.291639	9
Gondia	0.348484848	0.280702	1	0.40553	3.208515	4
Amgaon	0.409090909	0.587719	0.85	0.133641	3.294365	3
Salekasa	0.136363636	1	0.2	1	4.490155	1
Sadak-Arjuni	0.5	0.45614	0	0.511521	2.905094	5
MorgaonArjuni	1	0.535088	0	0.156682	3.39169	2
Deori	0	0.596491	0.3	0.382488	2.330136	8

Deprivation index of Wardhadistrict are given in Table 13.It is observed that blocks Arvi, Samudrapur and Hinganghat are most deprived blocks in terms of Census house Dilapidated, blocks Wardha rural and Deoli are moderately deprived in terms of Census house Dilapidated and blocks Wardha, Ashti and Karanja and Seloo are least deprived blocks in terms of Census house Dilapidated.

It is observed that blocks Samudrapur, Hinganghat, Karanja are the most deprived blocks in terms of location of drinking water-away from home. Blocks Ashti, Seloo, are moderately deprived blocks in terms of location of drinking water-away from home. Blocks Wardha, Deoli and Arvi are the least deprived blocks in terms of location of drinking water-away from home.

It is observed that blocks Wardha, Samudrapur, and Ashti are most deprived blocks in terms of Main Source of Lightning- No Lightning most of the houses are without electrification. Blocks Wardha rural, Arvi,

Hinganghat are moderately deprived blocks in terms of Main Source of Lightning- No Lightning while blocks Karanja, Deoli are the least deprived in terms of Main Source of Lightning- No Lightning.

It is observed that blocks Samudrapur, Ashti, Arvi are most deprived blocks in terms of No. of Households not having Latrines. Blocks Seloo, Hinganghat and Wardha rural are the moderately deprived blocks in terms of No. of Households not having Latrines. While, blocks Wardha, Karanja and Deoli are the least deprived blocks in terms of No. of Households not having Latrines.

Overall Index shows that blocks Samudrapur,Arvi, Hinganghat are most deprived blocks with all four characteristics. Blocks Ashti, Wardha rural, and Seloo are moderately deprived blocks while blocks Karanja, Deoli and Wardha are the least deprived blocks in overall Index.

Table 13: Deprivation Index of Wardha District

Weights	**2.305**	**2.331**	**1.066**	**2.472**		
District	Dipapidated	Water Away	No Lightning	No Latrines	INDEX	RANK
Wardha	0.408451	0.537415	0.571429	0.554113	4.173102	5
Ashti	0.211268	0.62585	0.642857	0.874459	4.792777	4
Karanja	0.140845	0.795918	0	0.532468	3.496193	7
Arvi	1	0.462585	0.571429	0.770563	5.89726	2
Seloo	0.211268	0.544218	0.5	0.645022	3.883037	6
Wardha	0	0	1	0	1.066	9
Deoli	0.309859	0.44898	0.357143	0.445887	3.243745	8
Hinganghat	0.577465	0.863946	0.428571	0.636364	5.374862	3
Samudrapur	0.816901	1	0.642857	1	7.371243	1

III. CONCLUSION:

To arrive at regional disparity it is very difficult to construct Block level Human development index as data on health, education and income is not readily available. An attempt to compute human development index at block level is initiated by YASHADA. Hence, Deprivation index suggest alternative method to human development index to study block level disparity. Deprivation indices of all districts in Nagpur region computed on the basis of characteristics viz. Census House as Dilapidated, Location of Drinking Water Away,Main Source of Lightning- No Lightning and No. of Households not having Latrines shows blockwise variations. The analysis will definitely helpful to policymakers and planners of Districts and Blocks of Nagpur region for removing disparity and improving situation. Such analysis can be done for entire Vidarbha and Marathwada region for removing imbalances up to certain extent.

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