

Deprivation as a measure of Poverty: A District Level Analysis for Karnataka State

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Abstract

Comparing the value of an individual's consumption and the required income level for achieving particular level of consumption bundle is the method adopted for identification of poor in India. One-dimensional measure of poverty measured solely by money income is being questioned by many economists. The concept of income poverty does not speak of the cause of the problems in which they are in. Poverty involves deprivation of crucial assets and capabilities. It is more appropriate to view poverty as a failure to acquire a basic minimum set of capabilities. In this context, the present study adopts the concept of 'deprivation' which is broader concept than the concept of 'poverty'. Deprivation is intrinsically a multidimensional concept with economic and social dimensions. The advantage of deprivation approach is that it is based on actual physical and social possessions of the people rather than income data alone.

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Introduction

Across developing countries, poor and non - poor are counted using calorie-based poverty lines. The common practice in Indian poverty literature is to identify the poor by comparing the value of an individual's consumption bundle with the value of reference bundle of nutritional minimum in 1973. Although poverty lines in India are revised for inflation with much debate, the original link with calorie-based food content is still maintained. With no acceptable and capable poverty line with political and economic consensus for targeting antipoverty policies, policy makers are in lack of opportunities to effectively target the poor.

A body of recent theoretical and empirical works (Alkire and Foster, 2009; Subramanian, 2006) has questioned the one-dimensional measure of poverty measured solely by money income. Poverty is typically defined as the inability to afford specific consumption needs in a given society (Ravallion, 2007). Although, income has direct impact, it is not the only factor for poverty. For poor, not having money is much the same thing as not having enough food, clothing, water, housing as well as increasing number of necessary goods (Deaton and Kozel, 2005). Poverty involves deprivation of crucial assets and capabilities, debilitating effect of which is hardly temporary (Mookherjee, 2007). The concept of income poverty does not speak of the cause of the problems in which they are in. Hence the solution for transforming the lives of the poor becomes a

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distant mirage. Further, the measure of income poverty is insensitive towards human development approaches of enhancing capabilities, functioning, freedom and opportunities of the poor as human development is a multidimensional concept of development. Income poverty alone undermines the pressures of poor housing, poor water facility, unemployment, poor education, poor health, etc. faced by the people. Thus, income poverty as a unidimensional concept is considered as conceptually inadequate measure of poverty. It is more appropriate to view poverty as a failure to acquire a basic minimum set of capabilities that excludes people from participating in social and economic activity in some “normal” manner on par with the rest of the society (Mookherjee, 2007). It is in this context, the notion of ‘deprivation’ has become the accepted conceptual device to deal with the twin issues of poverty and disadvantage (Cloke et. al., 1995)

The belief at the core of this study is that income measure of poverty alone will not help to escape the poor out of poverty and thus the concept of ‘deprivation’ needs to be adopted for better measure and targeting poverty. In this context, the present study adopts the concept of ‘deprivation’ which is broader concept than the concept of ‘poverty’. Deprivation is intrinsically a multidimensional concept with economic and social dimensions. Poverty measured through income approach is only a dimension or sub-set of deprivation (Srinivasan and Mohanty, 2004). The experience of deprivation is broader and complex than the concept of mere income poverty. The advantage of deprivation approach is that it is based on actual physical and social possessions rather than income data alone.

The objective of the study is to assess the status of deprivation and its variations at district level for Karnataka with available indicators. Also, an attempt is made to assess the differentials in deprivations for districts of North Karnataka using selected indicators.

Data and Methods

A Comprehensive Deprivation Index (CDI) is constructed by the amalgamation of 12 indicators chosen across 5 dimensions namely: Education, Health, Standard of Living, Social Dimensions of Deprivations and, Employment and Income (Table 1). The method of Principal Component Analysis (PCA) is employed to construct CDI (Appendix). The advantage of the PCA is that the weights for each indicator are statistically assigned and the problem of collinearity is also addressed.

Table 1: Dimensions, Indicators and Data Source

Dimensions	Indicators	Data Source
Education	Illiteracy Rate	Census, 2011
Health	Infant Mortality Rate	NRHM - Karnataka, 2013
Standard of Living	Percentage of HHs with no access to modern cooking fuel	Census, 2011
	Percentage of HHs with no access to toilet facilities	Census, 2011
	Percentage of Households with no access to water	Census, 2011
	Percentage of HHs with no access to electricity	Census, 2011
	Percentage of without pucca houses	Census, 2011
	Percentage of HHs with none of the specified assets	Census, 2011
Social Dimension	Percentage of SC/ST population to total population	Census, 2011
Employment and Income	Percentage of Agri. labourers to total workers	Census, 2011
	Percentage of Marginal workers to total workers	Census, 2011
	Per capita income	Statistical Abstract of Karnataka, 2012-13

The CDI constructed were classified into four categories: 'No Deprivation' (0.00 to 0.24), 'Mild Deprivation Status' (0.25 to 0.49), 'Moderate Deprivation Status' (0.50 -0.74) and 'Severe Deprivation Status' (0.75 to 1.00).

Results and Discussion

The CDI estimates inter – district disparities in attained deprivations captured by the considered indicators. Table 2 provides the rank, CDI value and the deprivation status of all districts of Karnataka. The value of CDI varies between 0.000 and 1.000 for Bangalore (Urban) and Yadgir district respectively. The value of 0.000 depicts relatively lowest deprivation status and the value of 1.000 depicts relatively highest level of deprivation. Accordingly, more than 50% of the districts fall in the deprived category of which six districts, viz., Yadgir, Bijapur, Raichur, Koppal, Bidar, Chamarajanagar and Gulbarga are in the severely deprived category. Here, except Chamarajanagar all other six districts belongs to North Karnataka.

Ten more districts, viz., Bagalkot, Gadag, Chitradurga, Bellary, Haveri, Belgaum, Chikkaballapura, Tumkur, Davangere and Kolar fall under moderately deprived category. Mandya, Ramanagar, Mysore, Hassan, Chikmagalur, Dharwad, Uttara Kannada, Shimoga Kodagu and Bangalore (Rural) are in the mild deprivation category. Finally, the districts of Udupi, Dakshina Kannada and Bangalore (Urban) least deprived category. The status of deprivation is mapped in Figure 1. There is more or less a clear geographical demarcation of different deprivation categories.

Table 2: Rank, CDI value and Deprivation Status

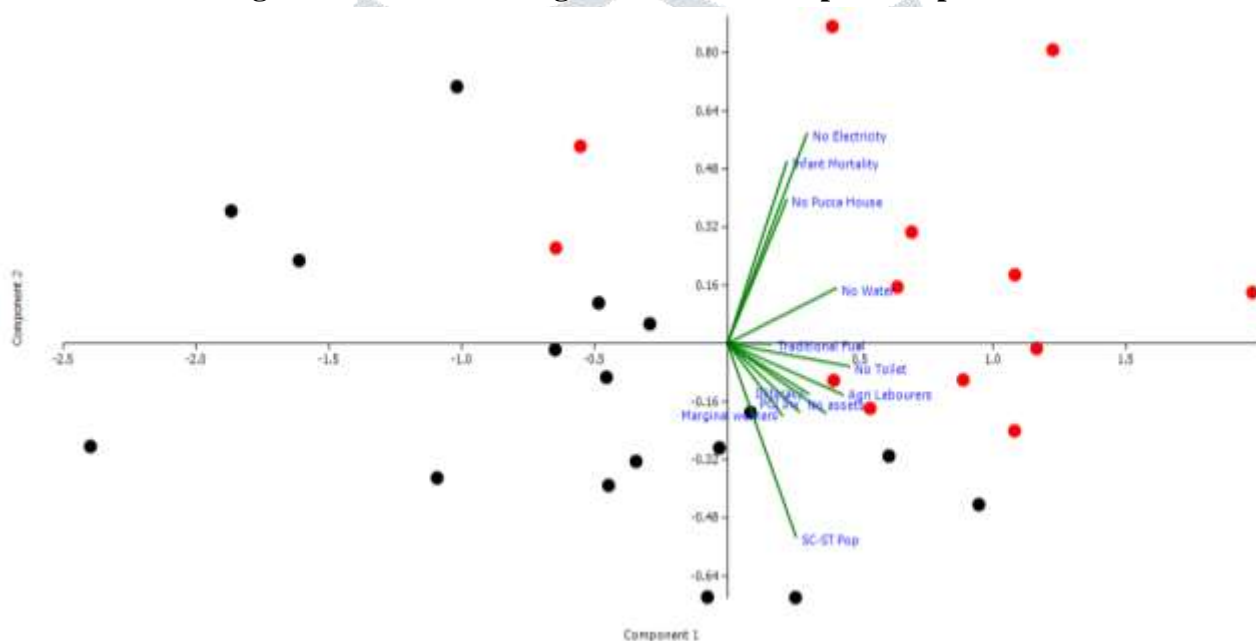
Rank	District	CDI	Status
1	Yadgir	1.000	Severe Deprivation
2	Bijapur	0.828	
3	Raichur	0.812	
4	Koppal	0.794	
5	Bidar	0.794	
6	Chamarajanagar	0.763	
7	Gulbarga	0.750	
8	Bagalkot	0.707	Moderate Deprivation
9	Gadag	0.693	
10	Chitradurga	0.687	
11	Bellary	0.671	
12	Haveri	0.639	
13	Belgaum	0.637	
14	Chikkaballapura	0.606	
15	Tumkur	0.568	
16	Davanagere	0.541	
17	Kolar	0.531	
18	Mandya	0.481	Mild Deprivation
19	Ramanagara	0.469	
20	Mysore	0.446	
21	Hassan	0.444	
22	Chikmagalur	0.437	
23	Dharwad	0.421	
24	Uttara Kannada	0.3994	
25	Shimoga	0.3989	
26	Kodagu	0.315	
27	Bangalore Rural	0.298	

28	Udupi	0.179	No Deprivation
29	Dakshina Kannada	0.122	
30	Bangalore	0.000	

(Rural), Mysore and Chitradurga districts to a larger extent; and not having electricity, inadequate health infrastructure, no access to water and no pucca houses contribute to deprivation specifically for Belgaum, Bijapur, Kodagu and Dharwad districts. All other districts are facing deprivations are affected by most of the deprivation variables.

Figure 3 presents the pattern of factor loadings across 1st and 2nd PCs. Higher loadings for indicators of ‘SC-ST population’, ‘no access to electricity’, ‘inadequate health infrastructure’, ‘no pucca houses’, ‘large share of agricultural labourers among workers’, ‘no access to water’ and ‘no toilet’ suggests that the policy focus should be on allocating more resources for implementing special programmes to SC-ST population, promotion of non-agricultural employment, construction of good houses and sanitation facilities and improvement of health infrastructure in the deprived regions could reduce deprivation levels.

Figure 3: Factor Loadings 1st and 2nd Principal Components



Deprivation in North Karnataka

The differentials in deprivation across the districts of Karnataka are embedded in the differentials in deprivations in education, health, housing status, employment, social status and income. Table 3 shows that North Karnataka region is more deprived than South Karnataka region in all the indicators. Across the districts of North Karnataka, Yadgir is the most deprived district in 8 of the 12 indicators being considered. Dharwad, Bijapur, Koppal and Raichur are the districts most deprived in indicators of health, housing status, percentage of marginal workers and percentage of SC/ST population respectively.

Table 3: Indicator wise Deprivation in North Karnataka

Sl.No.	District	% of Illiterate Population	IMR	% of Households deprived from						% of Agri. labourers to total workers	% of Marginal workers to total workers	% SCST Population to total Population	Per capita Income
				Clean Cooking Fuel	Toilet Facility	Access to Water	Access to Electricity	Pucca Houses	Any of the Specified Assets				
1	Bagalkot	31.18	17	85.63	81.20	29.27	15.19	67.58	18.60	37.07	17.32	22.03	41516
2	Belgaum	26.52	30	73.40	67.19	34.29	16.08	55.39	14.72	30.85	17.63	18.30	75231
3	Bellary	32.57	30	75.59	67.59	25.51	8.58	45.14	16.62	36.36	13.21	39.50	33476
4	Bidar	29.49	17	88.40	76.78	41.53	13.42	50.14	24.72	39.86	21.47	37.32	40832
5	Bijapur	32.85	28	84.95	81.90	41.80	19.37	69.18	17.28	37.90	18.07	22.14	32342
6	Dharwad	20.00	33	61.59	42.99	17.32	6.48	49.62	13.90	26.46	11.96	14.37	70571
7	Gadag	24.88	25	84.45	78.82	30.33	8.13	66.45	22.22	40.41	14.58	22.15	39576
8	Gulbarga	35.15	18	82.94	74.47	36.09	13.00	50.38	21.74	38.20	22.34	27.82	38115
9	Haveri	22.60	17	86.45	62.69	22.22	9.07	66.33	21.53	42.63	17.55	22.62	33979

10	Koppal	31.91	28	87.37	81.52	30.46	13.97	60.85	20.94	41.70	22.40	30.42	36175
11	Raichur	40.44	23	84.31	79.32	41.33	12.46	64.10	20.12	42.45	19.64	39.82	60922
12	Uttara Kannada	15.94	18	68.62	40.66	18.16	9.10	46.34	16.21	19.12	18.11	10.48	48541
13	Yadgir	48.17	18	90.23	88.76	45.73	22.05	66.31	31.02	42.84	20.17	35.78	29895
	North Karnataka	30.13	23	81.07	71.07	31.85	12.84	58.29	19.97	36.60	18.03	26.37	44705
	South Karnataka	23.45	14	70.22	43.83	17.60	9.13	40.11	14.25	22.38	15.62	25.43	60408
	Karnataka	26.34	18	74.92	55.63	23.78	10.74	47.99	16.73	28.54	16.66	25.84	53603

However per-capita income do not give a clear picture of deprivation as Raichur and Belgaum which are deprived districts have per capita income higher than that of state average per capita income. Except Dharwad and Uttara Kannada districts which match up to the level of state average in most of the indicators, all other districts of North Karnataka a fall below the state average. Deprivation to water accessibility is higher than the state average in all districts of North Karnataka except districts are Dharwad, Haveri and Uttara Kannada districts.

The districts with overlapping deprivations are the districts with high intensity of deprivations. Such an intensity of deprivations shows the absence of minimally acceptable level of human development. It undermines the core principles of 'basic needs' and 'positive freedom' approach of welfare economics.

Conclusion

The paper gives a brief critical overview of the current poverty measure and has presented how districts vary in the measure of deprivation status. This provides an alternative option of identifying the deprived people. Deprivation index provides a more comprehensive measure of poverty. Evidences show that many districts face multiple deprivations, especially in North Karnataka. The strategies of multiple sector approach with stronger incentives are needed to escape from the poverty with multiple deprivations. With the multi-pronged approach of targeted transfers, policy makers can address the problems of regional disparities, inequality, human incapacities and thus stimulate pro-poor inclusive growth. In the absence of accepted 'accepted official poverty line', adoption of the concept of deprivation receives significance in political and policy making discourses. One hopes that such an approach of recognition and intervention can prove very beneficial for mainstream policy making at district and micro level planning. Unlike the measure of income poverty, the measure of deprivation and its segregates gives policy makers a clear target for eliminating poverty and strategies to build a welfare society. Without timely interventions, the deprivation status of the household or region is bound to be passed on through the future generations.

Appendix: Construction of CDI from Principal Component Analysis

The appendix demonstrates the method of construction of Composite Deprivation Index (CDI) from Principal Component Analysis. Since deprivation is a negative measure, all positive indicators among the 12 selected indicators were transformed into negative indicators. Further the all the negative indicators were normalized as follows:

$$N_{ji} = \frac{O_{ji}}{\mu_j}$$

where,

N_{ji} = Normalised value of i^{th} observation in j^{th} variables

O_{ji} = Actual Value of i^{th} observation in j^{th} variable

μ_j = Mean of j^{th} variable

i = No. of observations / district (1, 2, 3..... 30)

j = No. of variables (1, 2, 3.....10)

Using correlation matrix, the factor loadings of the first Principal Component was extracted for constructing the index (I_i):

$$I_i = \sum F_j \times N_{ji}$$

where,

I_i = Index constructed from first principal component

F_j = Factor loading of j^{th} variable

N_{ji} = Normalised value of i^{th} observation in j^{th} variables

Further the indices obtained for 30 districts were rescaled (CDI_i) between 0.00 to 1.00 as follows:

$$CDI_i = \frac{I_i - \text{Min } I_i}{\text{Max } I_i - \text{Min } I_i}$$

where,

CDI_i = Composite Deprivation Index

I_i = Index constructed from first principal component

$\text{Max } I_i$ = Maximum value in I_i

$\text{Min } I_i$ = Minimum value in I_i

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