

Investigating the Hunger Index Evidence from Karnataka

S V HANAGODIMATH, V B ANNIGERI

The Global Hunger Index has directed attention to several methodological issues in understanding hunger. An attempt is made to formulate a Karnataka District Hunger Index using a modified version of GHI's methodology, developed by the International Food Policy Research Institute. The findings show that backward pockets in the state have a higher hunger index, which also holds for socially and economically backward populations. The database at the subregional level should be strengthened for a better understanding of hunger-related issues.

According to the Global Hunger Index (GHI) Report of 2016, the developing world has made significant progress in reducing hunger since 2000 (von Grember et al 2016). Around 30% of this reduction is found in developed countries. The report also indicates that this progress is not equally distributed across regional, national, and subnational levels. Huge disparity can be observed among and between countries. The GHI is found to be the highest in sub-Saharan Africa and South Asia.

These insights have relevance in the Indian context as well. Although India has a large population, substantial geographical area, and a higher level of economic activity compared to other South Asian countries, its human development indicators are average. Likewise, in the hunger index, its performance among the South Asian Association for Regional Cooperation (SAARC) countries is average.

As per the GHI report (2018) India's position is 103 out of 111 countries, which is marginally better than Pakistan (106) and Afghanistan (110). Other than these two countries, India seems to be doing poorly compared to other South Asian countries.

Out of the 39 sub-Saharan African countries that were part of the GHI report (2018), only six countries—Sudan, Sierra Leone, Zambia, Madagascar, Chad, and Central African Republic—were behind India. All other countries in the sub-Saharan Africa group were doing better than India.

South Asian countries have reduced their hunger index from 38.4 in 2000 to 30.5 in 2018, whereas African and sub-Saharan African countries have reduced their hunger index from 43.6 to 29.4 in the same period. For the same period, India has reduced its hunger index from 38.8 to 31.1. Thus, India needs to cover significant ground in this regard.

However, in the Indian context, except for a study by Menon et al (2009), no efforts have been made to analyse the hunger

index at a disaggregated level. Their study has constructed a hunger index for Indian states and named it the India State Hunger Index. The study has confined itself to the construction of hunger index up to the state level and has not examined issues at the district and sub-district levels.

Karnataka's Hunger Situation

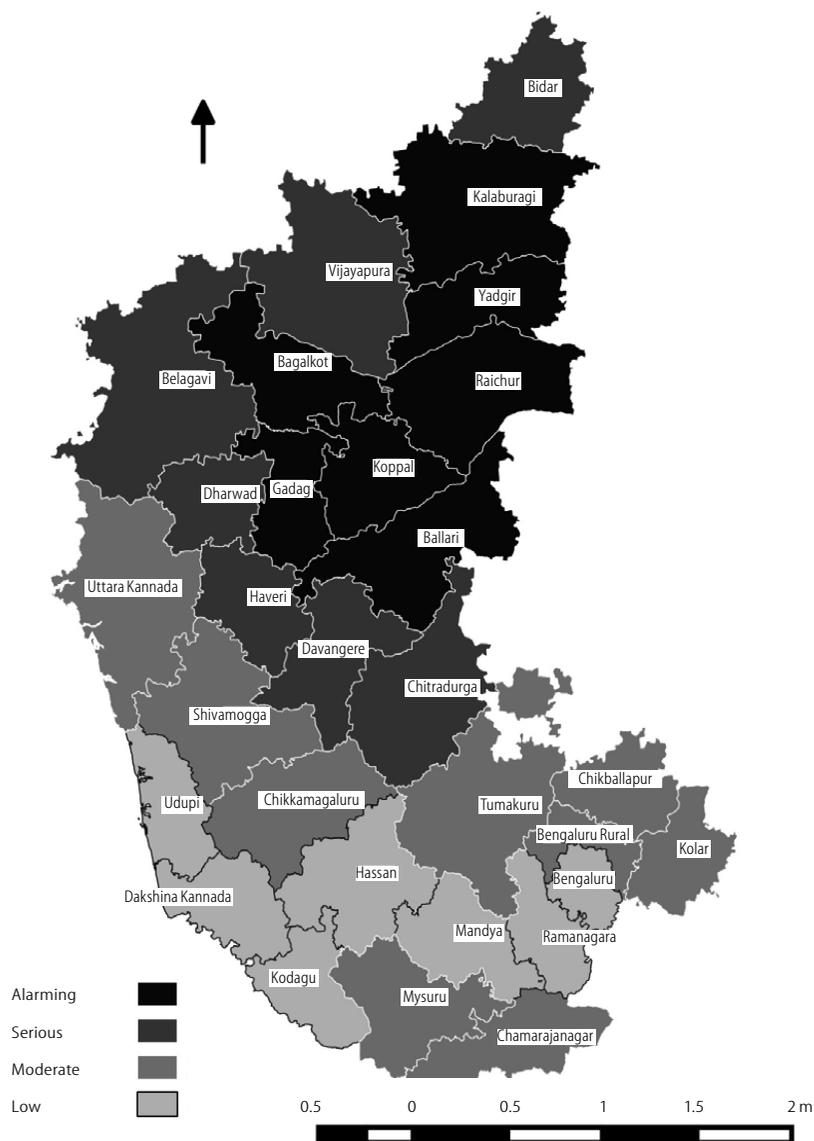
It is at the sub-state level that policies and programmes get implemented and their effects are felt to a greater extent than at the state level. In this context, it becomes very important to study the quantum of hunger at the district level. Hence, an attempt has been made in this article to construct and analyse a hunger index at the district level. For this purpose, Karnataka has been taken into consideration.

Many studies have indicated the historical existence of regional variations in development in Karnataka. Several district-level studies have compared districts with regard to per capita income and human development indicators like education and health, as well as infrastructure. Furthermore, it was found that identification of regional imbalances should be made at the taluk level than at the district level. These analyses would help in framing policy interventions. Some of the important studies on district-level analysis of regional imbalances in Karnataka are Panchamukhi (2001), Kadekodi (2000), Shiddalingaswami and Raghavendra (2010), Shiddu and Aziz (2012), Shiddu et al (2012), and Shankaranand (2015). Among the studies that have taken taluks as the unit of study, Dadibhavi (1982), Nanjundappa (2002) (popularly known as D M Nanjundappa Committee report), Hanagodimath (2014), Karnataka Planning Department (2016), and Annigeri and Hanagodimath (2018) are very important. Among these studies, the D M Nanjundappa Committee is very crucial, because the recommendations of this committee have been implemented by the Karnataka government from 2007 onwards.

In these studies, many types of indices have been constructed at the district as well as at the taluk level, namely the Human Development Index (HDI), Gender Inequality Index (GII), Child Development Index (CDI), Comprehensive Composite Development Index (CCDI), Cumulative Deprivation Index (CDI), Food Security

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S V Hanagodimath (*shiddu22@gmail.com*) and V B Annigeri (*vinodann@yahoo.com*) teach at the Centre for Multi-Disciplinary Development Research, Dharwad, Karnataka.

Figure 1: Hunger Index Levels in Districts of Karnataka

Source: Based on Table 1.

Index (FSI), Composite District Development Index (CDDI), Composite Taluk Development Index (CTDI), Health Infrastructure Index (HII), and Health Status Index (HSI). However, there has been no attempt to construct a hunger index at the district level in Karnataka. Hence, in the present study, an attempt has been made to fulfil this research gap by developing a hunger index for the districts of Karnataka.

Menon et al (2009) found that out of the 17 selected states, Punjab, Kerala and Andhra Pradesh had lower levels of hunger, whereas Madhya Pradesh, Jharkhand and Bihar had higher hunger levels.¹ Karnataka was at the 11th position. Given this background, Karnataka has been considered for deeper examination. The

DM Nanjundappa Committee also found serious regional imbalance across development indicators in Karnataka. Therefore, it would be worthwhile to consider possible linkages between hunger levels and the backwardness of districts in Karnataka. Karnataka also has a rich database of human development reports across the districts. Better policy decisions can be taken if hunger levels and other development indices are juxtaposed.

Data and Methodology

The methodology of the present study has been borrowed largely from two reports, namely the Global Hunger Index (2016) and the India State Hunger Index (2009). The Karnataka District Hunger Index

(KDHI) uses the same methodology, which has been developed for the GHI by the International Food Policy Research Institute (IFPRI) with some modifications.² Four indicators have been considered to construct the index. These indicators are “Per Capita Daily Calorie Consumption” (PCD), “Prevalence of Wasting in Children under Five Years Old (in %)” (CWA), “Prevalence of Stunting in Children under Five Years Old (in %)” (CST), and “Proportion of children dying before the age of five (in %)” (CM).

The indicator “Proportion of People Undernourished” (based on the National Sample Survey Office (NSSO) 68th Round) yielded results that were contrary to the established reality at the district level. For example, Udupi district was found to be in the lower performing group of districts, which is not so in real terms. As this district is doing well in many of the indicators like per capita income, literacy rate, and infant mortality rate, it may be wrong to consider Udupi as a low calorie-consuming district. Hence, we have considered the PCD in this regard. Indicators like the CWA and CST have been taken from the 4th National Family and Health Survey (NFHS-4).³ The last indicator, that is, CM, has been taken from the estimates done by Ram et al (2013). The Karnataka District Hunger Index (KDHI) scores are calculated using the following steps.

At the outset, component indicators have been standardised⁴ as indicated below:

$$\text{Standardised PCD} = 1707/\text{PCD} \times 100$$

$$\text{Standardised CWA} = \text{CWA}/43.1 \times 100$$

$$\text{Standardised CST} = \text{CST}/55.8 \times 100$$

$$\text{Standardised CM} = \text{CM}/81.8 \times 100$$

The PCD is standardised differently because all other indicators are moving in a negative direction and the exception is found in the case of PCD. It is to be noted here that, barring PCD for other indicators, standardisation has been made using the observed maximum values as denominator. For PCD, standardisation is made using the observed minimum value as the numerator because of its unique feature.

Further, the component indicators have been aggregated as indicated below:

$$\text{KDHI} = \left[\frac{1}{3} \times \text{Standardised PCD} \right] + \left[\frac{1}{3} \times \text{Standardised CWA} \right] + \left[\frac{1}{6} \times \text{Standardised CST} \right] + \left[\frac{1}{6} \times \text{Standardised CM} \right]$$

Denominators are the weights which are as used in the GHI (2016).

Karnataka Hunger Index

Using the above-mentioned data sources and methodology, a hunger index for Karnataka has been prepared and discussed in this section. In Table 1, district-wise scores of the hunger index have been presented along with component indicators. It is found from the figure that Raichur is in the last position with a higher hunger index of 88.91 and Dakshina Kannada is found in the first position with a hunger index of 48.45. Raichur's hunger index is twofold higher than that of Dakshina Kannada.

Raichur, Kalaburagi, Yadgir, Koppal, and Gadag are found to have hunger indices. Interestingly, out of these hunger-stricken districts, none of the districts are found from the south Karnataka region. Moreover, except Gadag, the other five districts are from the Hyderabad-Karnataka region, which is a backward area of the state.

Table 1: District-wise Hunger Index along with Component Indicators

Category	District	Per Capita Daily Calorie Consumption	USMR	Stunting	Wasting	Hunger Index	Rank
Alarming	Raichur	1,837	81.8	37.2	34.9	88.91	30
	Kalaburagi	1,710	59.8	52.2	34.0	86.38	29
	Yadgir	1,710	59.8	55.5	31.3	86.32	28
	Koppal	1,861	70.7	55.8	26.4	86.27	27
	Gadag	1,756	60.5	34.8	43.1	84.12	26
	Ballari	1,807	66.6	49.5	26.9	83.81	25
Serious	Bagalkot	1,762	52.3	47.3	24.6	77.23	24
	Chitradurga	1,782	51.7	28.6	31.8	73.83	23
	Dharwad	1,840	43.1	37.4	33.8	72.73	22
	Vijayapura	1,888	41.2	44.9	29.1	71.58	21
	Belagavi	1,960	44.8	36.7	31.7	70.50	20
	Bidar	1,707	37.2	42.8	23.6	70.40	19
Moderate	Davangere	2,007	46.5	46.4	22.4	69.81	18
	Haveri	2,011	43.2	43.8	20.4	66.87	17
	Tumakuru	2,179	41.6	28.6	26.2	61.73	16
	Kolar	2,103	41.2	32.0	18.4	60.51	15
	Mysuru	2,177	47.3	25.1	17.3	59.60	14
	Uttara Kannada	2,008	30.5	37.9	18.3	59.16	13
Low	Chikballapur	2,426	41.2	37.7	17.2	58.16	12
	Chamarajanagar	2,310	41.3	30.5	19.1	57.96	11
	Chikkamagaluru	1,905	26.8	21.1	22.3	55.71	10
	Bengaluru (Rural)	2,294	33.0	28.7	22.8	55.64	9
	Shivamogga	2,066	29.0	35.3	14.3	55.43	8
	Bengaluru (Urban)	2,104	18.5	28.1	28.9	54.15	7
Low	Kodagu	2,340	35.5	29.8	16.4	54.03	6
	Ramanagara	2,319	33.0	22.0	20.3	52.40	5
	Mandya	2,287	31.5	18.6	23.2	52.24	4
	Hassan	2,199	24.2	27.0	19.1	51.18	3
	Udupi	1,857	13.4	21.1	20.9	50.48	2
	Dakshina Kannada	2,250	23.1	23.9	17.1	48.45	1

Sources: Undernourishment—Calculated from unit level data of NSSO 68th Round, USMR—Ram et al (2013), Stunting—NFHS-4, Wasting—NFHS-4, Hunger Index—Authors' calculations.

On the other hand, all the five districts that have the lowest hunger indices are from the southern part of the state, like Dakshina Kannada, Udupi, Hassan, Mandya, and Ramanagara. Except Ramanagara, all the remaining districts are from the Mysuru division. From Figure 1 (p 19), it is clear that the north-eastern part of Karnataka is facing a more alarming hunger problem than the rest of the state and the Mysuru division seems to be in a better position.

Mere analysis of the ranking of the hunger index will not give a clear and meaningful understanding about the situation of different districts. Hence, these districts have been categorised into four groups, namely “Alarming,” “Serious,” “Moderate,” and “Low.” The rationale in this regard is as stated below.

At the outset, districts are categorised with the above state average values and below the state average values. This overall state average is Average 1.

In the next step two more averages are worked out, namely for the group of districts whose values are above the state average, that is, Average 2, and for the districts whose values are below the state average, that is, Average 3.

The districts whose values are above and below Average 2 are classified as two categories, namely “Alarming” and “Serious” districts, respectively. The districts whose values are above and below Average 3 are classified as “Moderate” and “Low” districts, respectively (Table 1).

Some of the interesting observations about the regional distribution of hunger indices in Karnataka are summarised below. Seven out of the 30 districts of Karnataka are found in the “Low” hunger category, and all seven of these districts are from south Karnataka. There are nine districts in the “Moderate” category, and all those districts are

from the southern part of the state except Uttara Kannada. In the “Serious” category, there are seven (23.3%) districts, and all those districts are from north Karnataka, except Davangere and Chitradurga. Except Bidar, none of the districts are from the Hyderabad-Karnataka region. In the “Alarming” category, seven (23.3%) districts are found. Five out of the six districts of the Hyderabad-Karnataka region fell in this category. The other two districts in the “Alarming” category, namely Gadag and Bagalkot, are from the Bombay-Karnataka region.

None of the districts from the Mysuru or Bengaluru division are found in the “Alarming” category. This suggests that hunger seems to be haunting the districts of north Karnataka as compared to the districts of south Karnataka in general and Hyderabad-Karnataka in particular.

Historically, the southern districts of Karnataka seem to be progressive on many socio-economic indicators. This may be on account of the political stability that existed in the southern part of Karnataka before independence and reorganisation of the state. In contrast, the Bombay-Karnataka region in general and districts of Hyderabad-Karnataka region in particular were backward. This attitude of “neglect,” both from the political front as well as the administrative front, continues to haunt northern Karnataka. This could be the reason for the poor performance of the districts in this part of the state.

Socio-economic Indicators

It is understood that areas that have higher levels of human development indicators like standard of living (per capita income) and a higher level of education should have lower levels of poverty and hunger. Furthermore, people belonging to the marginalised and deprived sections of society like Scheduled Castes (scs), Scheduled Tribes (sts), women, and agriculture workers have a lower level of well-being. In this context, an attempt has been made to examine the association of hunger index with select socio-economic indicators. This may throw light on the linkages between these variables, which may be useful for both policymakers and administrators. In light of this, the correlation coefficient method was

Table 2: Linkage between Hunger Index with Socio-economic Indicators/Indices

Indicator	Correlation Coefficient	Nature of Association	Broad Messages
Hunger index and per capita district income	-.598**	Negative association with statistical significance	Higher the per capita income, lower will be the hunger index value
Hunger index and literacy rate	-.632**	Negative association with statistical significance	Higher the level of literacy, lower will be the incidence of hunger
Hunger Index and Human Development Index (HDI)	-.790**	Negative association with statistical significance	Higher the HDI, lower will be the quantum of hunger index
Hunger Index and Gender Inequality Index (GII)	.846**	Positive association with statistical significance	Higher the gender discrimination, higher will be the incidence of hunger
Hunger Index and Child Development Index (CDI)	-.786**	Negative association with statistical significance	Higher the hunger index, lower will be the child development
Hunger index and percentage of SC population	0.502**	Positive association	Higher the SC population, higher will be the incidence of hunger
Hunger index and percentage of ST population	0.303	Positive association with statistical significance	Higher the ST population, higher will be the incidence of hunger
Hunger index and percentage of people dependent on agriculture (cultivators and agriculture labour of main and marginal workers)	.515**	Positive association with statistical significance	Higher the dependency on agriculture, higher will be the incidence of hunger

** Significant at the 99% level.

employed and the results in this regard have been presented in Table 2.

Conclusions

It is clear from our analysis that north Karnataka in general and Hyderabad-Karnataka in particular have higher levels of hunger as compared to the south Karnataka region. Furthermore, our analysis has found that a higher level of hunger is observed among people who have lower literacy rates, human development, and per capita income, face gender discrimination, and are dependent on agriculture more than other citizens. Districts like Kalaburagi, Yadgir, and Raichur need to be treated differently with regard to the implementation of various schemes with adequate resource allocation to mitigate the problems associated with higher hunger levels. With respect to the Hyderabad-Karnataka region, where Article 371(J) (special constitutional provision) has been already implemented, priority must be given to reduce hunger while implementing state policies and programmes.

Some of the schemes implemented in Karnataka, like the provision of mid-day meal with supplementation of eggs and milk to schoolchildren, provision of free rice to the poor, and vitamin supplements and maternal care to needy women have been addressing the issue of hunger. It is important to understand the efficacy of these schemes and chalk out a holistic initiative for fighting hunger in Karnataka.

The hunger index should be constructed for different taluks with a link for different

agroclimatic zones, which will help a lot for proper policy interventions. Availability of data is a major impediment towards constructing a hunger index on the basis of agroclimatic zones and taluks. Both the NSSO and the NFHS need to revisit their sampling framework and incorporate taluk-specific databases in their publications for the exercise of building an improved and comprehensive hunger index.

NOTES

- 1 India has only one state-level hunger index report, which is by Menon et al (2009).
- 2 The particular indicators for the GHI were selected for three reasons. One, inadequate food supply, which leads to hunger, and finally, undernourishment prevails. This indicator references the entire population, both children and adults. It is also used as a lead indicator for international hunger targets, including the Sustainable Development Goals (SDGs). Two, Under-Five Mortality Rate was selected because death is the most serious consequence of hunger, and children are the most vulnerable. This indicator improves the GHI's ability to reflect micronutrient deficiencies. Wasting and stunting only partially capture the mortality risk of undernutrition. Three, the indicators for child undernutrition-wasting and stunting go beyond calorie availability, and consider aspects of diet quality and utilisation. Children are particularly vulnerable to nutritional deficiencies. They are also sensitive to uneven distribution of food within the household. Stunting and wasting are nutrition indicators for the SDGs as well (von Grebmer et al 2018).
- 3 The study uses data from NSSO 68th round (2014) and NFHS-4 (2015). The time periods for both these are not coterminous. We were compelled to use these sources in the event of non-availability of any other relevant data sources to examine the issue at stake. As the analysis is for Karnataka, any policy changes which have taken place might not significantly affect the outcomes for these databases.
- 4 The logical explanation for the standardisation attempted stems from the fact that we were following the methodology of GHI report and we preferred not to deviate from the standardisation pattern of the same report.

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