



REGIONAL DISPARITIES IN AGRICULTURE DEVELOPMENT OF KARNATAKA

Surgery

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ABSTRACT

The present study assesses the regional disparities in level of agriculture development at the district level in Karnataka with the help of composite index based on optimum combination of nine indicators related to agriculture and allied sector for the year of 2013-14. The districts are classified into four development categories according to the values of the constructed development index. The result showed that wide disparities among the districts of Karnataka, 12 districts are fall on high and high middle developed and 18 districts are fall in low middle developed and low developed category. Ballari district was ranked first and Kodago district was ranked last with respect to the selected indicators. The study suggests that low developed districts require improvement in most of the indicators for enhancing their levels of overall Agriculture development.

KEYWORDS

Regional Disparities, Composite Index, Agriculture development.

INTRODUCTION

The agriculture and allied sector continues to be pivotal to the sustainable growth and development of the Indian economy. Not only does it meet the food and nutritional requirements of 1.3 billion Indians, it contributes significantly to production, employment and demand generation through various backward and forward linkages. Moreover, the role of the agricultural sector in alleviating poverty and in ensuring the sustainable development of the economy is well established. Karnataka is India's eighth largest state in geographical area covering 1.92 lakh sq km and accounting for 6.3 per cent of the geographical area of the country. The state is delineated into 30 districts and 176 taluks spread over 27,481 villages. In Karnataka, agriculture is the major occupation for a majority of the rural population. As per the population Census 2011, agriculture supports 13.74 million workers, of which 23.61 per cent are cultivators and 25.67 per cent agricultural workers. A total of 123,100 km² of land is cultivated in Karnataka constituting 64.6% of the total geographical area of the state. The agricultural sector of Karnataka is characterized by vast steppes of drought prone region and sporadic patches of irrigated area. Thus, a large portion of agricultural land in the state is exposed to the vagaries of monsoon with severe agro-climatic and resource constraints. Agriculture employs more than 60 per cent of Karnataka's workforce. Agriculture in Karnataka is heavily dependent on the southwest monsoon. While only 26.5 per cent of the sown area (30,900 km²) is under irrigation, 64.60 per cent of the total geographical area is under cultivation. According to Nanjundappa report most of the regions were backward in agriculture development in Karnataka. Identification of backward districts could be helpful for government in formulating regional plan to reduce disparity. The present study deals with the development in agriculture and allied sector by constructing the composite index of development at district level in Karnataka state.

OBJECTIVES OF THE STUDY

- 1) To Construct Composite Development Index for Agriculture development in Karnataka.
- 2) To Analyse the Levels of Agriculture Development in Karnataka.

This paper is organised into four sections. The first section gives the introduction, second section describes the database and methodology, third section reveals the result and discussion and fourth section is conclusion.

METHODOLOGY

Development is a multi-dimensional process and it cannot be estimated by a single indicator. But number of indicators when analysed individually, do provide an integrated and easily comprehensive picture of reality. Thus, there is a need to build up a composite index of development based on optimum combination of various development indicators. Each district faces some situational factors unique to it. Indicators common to all the districts have been included in the analysis of evaluating the level of development. The present study considered nine indicators related to agriculture and allied sector which were used by Nanjundappa Report in 2002. The

indicators included in the study are 1) Percentage of total cropped area to net area sown 2) Percentage of area under food grains to total cropped area 3) Percentage of area under horticultural crops to total cropped area 4) Percentage of area under commercial crops to total cropped area 5) Percentage of net area irrigated to net area sown 6) Fertilizer (NPK) consumption in kilogram per hectare (total cropped area). 7) Number of tractors per 1000 hectares area sown 8) Livestock units per lakh rural population 9) Per capita bank credit (Commercial and regional rural banks) to agriculture (in rupees). The study is completely based on secondary data. Data on the above mentioned indicators was collected of all districts of Karnataka for the year of 2013-14. The required data collected from Economics Survey of Karnataka, statistical abstract of Karnataka, district at a glance of all districts of Karnataka.

Method of estimation of composite index of development

Briefly stated, the steps involved in this method are given below:

Let $[X_{ij}]$ be the data Matrix provides the values of the variables of i th district and j th indicator

$i = 1, 2, 3, \dots, n$ (No. of districts) and
 $j = 1, 2, 3, \dots, m$ (No. of indicators)

for combined analysis, $[X_{ij}]$ is transferred to $[Z_{ij}]$ as follows

$$Z_{ij} = \frac{(x_{ij} - \bar{x}_j)}{SD}$$

Where \bar{x}_j = mean of the j^{th} indicators and
SD = standard deviation of the j^{th} indicator.

Now $[Z_{ij}]$ is the matrix of standardized indicators.

From $[Z_{ij}]$, we identify the best value of each indicator, let it be denoted by Z_{0j} . The best value will be either maximum value or minimum value of the indicator depending upon the direction of the impact of indicator on the level of development. For obtaining the pattern of development C_i of i^{th} district, first we calculate the square of the deviation of the individual value of transformed variate from the best value. In other words we calculate P_{ij} as $P_{ij} = (Z_{ij} - Z_{0j})^2$ for each i and j

The pattern of the development is given by

$$C_i = \sqrt{\sum_{j=1}^k \frac{P_{ij}}{(CV)_j}}$$

Where $(CV)_j$ = coefficient of variation of X_{ij} for j th indicator.
Composite index of development is given by D_i

$$D_i = \frac{C_i}{c}$$

$$C = \bar{C} + 3SD_i$$

Where, C = mean of C_i , SD_i = Standard Deviation of C_i

As the measurement of development is always non-negative and lies between 0 and 1. Closer the measure of development to 0, the more developed region and closer to 1, the less developed is the region.

Different Stages of Development

For relative comparison among different districts on the basis of the level of development, it appears quite appropriate to assume that the districts having the composite indices less than or equal to (Mean-SD) are highly developed and the district with composite indices greater than or equal to (Mean + SD) are low developed. The districts having the composite index in between Mean and (Mean - SD) are high middle level developed and districts having the composite indices in between Mean and (Mean + SD) are middle level developed. On the basis of this classification, districts are classified in four stages of development as high level, high middle level, low middle level and low level.

RESULT AND DISCUSSION

Composite Index Values and Ranks of the Districts

The composite index values for each district and their respective rank with respect to the selected variables have been shown in table 1. The districts have been ranked on the basis of composite indices. It can be observed from the table the district Ballari was ranked first and Kodagu district was ranked last. The composite indices varied from 0.445 to 0.934.

Table 1. Composite Index Values and Ranks of the Districts

Districts	CDI	RANK
Ballari	0.445	1
Gadag	0.455	2
Belagavi	0.485	3
Bagalkot	0.485	4
Mysore	0.487	5
Mandya	0.497	6
Koppal	0.515	7
Davanagere	0.518	8
Yadagiri	0.524	9
Raichur	0.546	10
Dharwad	0.557	11
Shivamogga	0.632	12
Haveri	0.635	13
Bidar	0.637	14
Vijayapur	0.640	15
Hassan	0.643	16
Chitradurga	0.658	17
Chamarajanagar	0.665	18
Kalburagi	0.682	19
Dakshina Kannada	0.696	20
Chikkaballapura	0.698	21
Bangalore Urban	0.707	22
Tumkur	0.710	23
Udupi	0.724	24
Chickmagalore	0.729	25
Uttar Kannada	0.763	26
Kolar	0.771	27
Ramanagara	0.777	28
Bangalore Rural	0.829	29
Kodagu	0.934	30

Stages of Development

Table 2 show that the districts having the composite indices less than or equal to 0.513 (Mean-SD) are classified under high level of development. The districts having the composite indices greter than or equal to 0.757 (Mean+SD) comes under low level of development. The districts having the composite indices between 0.513 (Mean) and 0.635 (Mean-SD) are categorized as high middle level developed districts, while the districts having composite indices between 0.635 (Mean) and 0.757 (Mean+SD) are classified under low middle level of development.

Table 2 Stages of Development

Category	Index Value
High Level Development	$CDI \leq 0.513$
High Middle Level Development	$0.513 < CDI \leq 0.635$
Low Middle Level Development	$0.635 < CDI \leq 0.757$
Low Level Development	$0.757 < CDI$

Classification of Level of Agricultural Development

From table 3 reveals that six districts of Karnataka, namely, Ballari, Gadag, Bagalkoti, Belagavi, Mysore and Mandya are fall under high

level of agriculture development with composite indices varying from 0.445 to 0.497. Six districts namely Koppal, Davanigeri, Yadgiri, Raichur, Dharwad, and Shivamogga are classified as high middle level developed districts with index values 0.515, 0.519, 0.525, 0.540, 0.558 and 0.632 respectively. Thirteen districts namely Haveri, Bidar, Vijayapur, Hassan, Chitradurga, Chamarajanagar, Kalburagi, Dakshina Kannada, Chikkaballapura, Bangalore Urban, Tumkur, Udupi and Chickmagalore, are classified as low middle level developed districts with index values varying from 0.635 to 0.729. Five districts namely, Uttara Kannada, Kolar, Ramanagara, Bangalore Rural and Kodagu falls under low level of agriculture development with composite development indices varying from 0.763 to 0.934.

Table 3. Classification of Districts on the Basis of level of Agriculture Development.

High level	High Middle level	Low middle level	Low level
Ballari	Koppal	Haveri	Uttara Kannada
Gadag	Davanagere	Bidar	Kolar
Bagalkot	Yadagiri	Vijayapur	Ramanagara
Belagavi	Raichur	Hassan	Bangalore Rural
Mysore	Dharwad	Chitradurga	Kodagu
Mandya	Shivamogga	Chamarajanagar	
		Kalburagi	
		Dakshina Kannada	
		Chikkaballapura	
		Bangalore Urban	
		Tumkur	
		Udupi	
		Chickmagalore	

CONCLUSION

The study measured the Agriculture development levels of different districts of Karnataka applying the composite index based upon optimum combination of selected indicators. The districts of regions are ranked precisely according to their levels of Agriculture development. The result show that wide disparities in the level of agriculture development among the districts of Karnataka and the composite indices varied from 0.445 to 0.934. while compared with an inter district level, Ballari district is top and Kodago district has ranked last in selected variables and also 12 districts are fall on high and high middle developed and 18 districts are fall in low middle developed and low developed category in the agriculture development. To enhance the agricultural production in relatively low developed districts by providing more irrigation facilities, the chemical fertilizer and other modern techniques of cultivation. Improvement in basic infrastructural facilities like health, education, power, irrigation and transport in low developed districts is a prerequisite to sustainable agricultural development in those districts.

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