

## **AGRICULTURAL DEVELOPMENT DISPARITY AMONG DISTRICTS OF KBK REGION OF ODISHA**

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### **Abstract**

*The present study analyses the levels of agricultural development and disparity at two points of time i.e. 1994-95 and 2011-12 across the districts of KBK region-the most economically backward region of the state of Odisha. Districtwise agricultural development indices are constructed by using Principal Component Analysis (PCA). Eight indicators of agricultural development are considered. The districts are classified into high, medium and low levels of development on the basis of their respective development index values. The study finds that there has been no significant change in the level of agricultural development in the districts of KBK region. On the contrary, the disparity level has increased among the districts between the two points of time under reference.*

Key words: Development, Disparity, Principal Components,

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## INTRODUCTION

Development is a multi dimensional concept which necessitates concurrent progress of different sectors of the economy such as agriculture, industry, infrastructure, services etc. However, agriculture plays a very significant role in the process of economic development particularly in less developed states and backward regions of a country. Besides supplying foods for teaming millions, agriculture creates employment opportunities for a large segment of population, generates savings, supplies vital inputs to manufacturing sector and above all earns precious foreign exchange for the country. Odisha is one of the economically backward states of India measured by any indicator of development. Moreover, the level of development has never been equal but skewed over the space. It is also equally true in case of Odisha when a comparison is made among different regions. The most widely talked KBK region of Odisha is situated in west-southern part of the state. It comprises eight districts viz. Balangiri, Sonepur, Kalahandi, Koraput, Malkangiri, Nabarangpur and Rayagada. This region is not only economically backward but also its progress heavily hinges on development of agricultural sector because except a few industries, the people of this region earn their livelihood from agriculture husbandry and forestry. Panda and Kanjilal (2013) has rightly stated that these districts having more than 80% of agricultural dependent population show bulk of the poor and destitute in the country. Keeping in view the backwardness of the region, the Government at the centre and the state have implemented several special programmes such as Area Development Approach for Poverty Termination (ADAPT), Long Term Action Plan (LTAP) and Revised Long Term Action Plan (RLTAP) for the all round development of the region. The most promised and hyped KBK interventions are yet to manifest results against its intended goals and objectives.

With the above backdrop, the present study makes an attempt to construct agricultural development index for the districts of KBK region in order to study the level of disparities existing among them. The specific objectives are:

- 1] To study the spatial distribution of agricultural development at the district level of KBK region of Odisha.
- 2] To classify the districts on the basis of the levels of agricultural development.
- 3] To find out changes, if any, in the levels of development over the years.

## DATA SOURCE AND METHODOLOGY

The study is based on the secondary data collected from the publications of Directorate of Economics and Statistics and Directorate of Agriculture and Food Production, Government of Odisha. District wise data on various indicators of agriculture are collected at two points of time, i.e. 1994-95 and 2011-12.

There are several ranking techniques including multivariate ones available to rank districts/states of a country (Iyengar and Sudarshan, 1982; Gulati, 1991; Mohanty and Ram, 2001; Ram and Chandrasekhar, 2006;). In the past, a good number of research studies (Dasgupta, 1971; Rao, 1973; Rao, 1977 and Narain et al. 1991) were undertaken on the basis of techniques developed by Iyengar and Sudarshan. However, Swain and Mohanty (2010) in their article have discussed several shortcomings associated with the method and advocated in support of using Principal Component Analysis (PCA) in multivariate analysis for ranking of districts/states of a country. PCA is a technique to find a few uncorrelated linear combinations of original variables which can be used to summarize the data, losing as little information as possible. In other words, it is a technique to transform the original set of variables into a smaller set of independent linear combinations so that most of the variation in the original data set is explained by those linear combinations (Swain and Mohanty, 2010). In the present study PCA approach has been adopted to classify the districts of the KBK region of Odisha on the basis of levels of agricultural development.

## INDICATORS

Keeping the objectives in view, the following indicators at two points of time are selected for the study.

X1 : Percentage of cultivable area to total land area

X2 : Percentage of net area sown to total cultivated area

X3 : Percentage of irrigated area to net area sown

X4 : Percentage of HYV area to net area sown

X5 : Cropping intensity

X6 : Average yield of foodgrains

X7 : Average consumption of fertilizer per hectare

X8 : Agricultural worker as a percentage of main worker

## DATA ANALYSIS

The district wise agriculture development indices have been constructed using the weights of the Principal Components corresponding to the first four eigen values. The reason for taking first four principal components corresponding to eigen values greater than 0.5 is due to the fact that together they explain 96.26 per cent of variations in the data for the year 1994-95 and 93.92 per cent for the year 2011-12. Further, in order to construct the indices and convert the negative values in the series to positive values and make them to lie between 0 and 1 the following method is adopted.

$$\text{The index of } i^{\text{th}} \text{ district } I_i = \frac{\bar{d}(i) - \text{Min}(\bar{d})}{\text{Max}(\bar{d}) - \text{Min}(\bar{d})}$$

Where,  $\bar{d}(i)$  is mean of  $d$  for the  $i^{\text{th}}$  district and  $d$  is the sum of  $d_1$ ,  $d_2$ ,  $d_3$  and  $d_4$ . The values of  $d_1$ ,  $d_2$ ,  $d_3$ , and  $d_4$  have been arrived at by multiplying principal components  $PC^1$ ,  $PC^2$ ,  $PC^3$  and  $PC^4$  with respective Z values of indicators, i.e.  $Z_1$ ,  $Z_2$ ,  $Z_3$  and  $Z_4$ .

Z values of indicators have been estimated as follows:

$$Z_i = \frac{X_i - \mu_i}{\sigma_i}, \text{ Where } \mu_i \text{ is the mean of } X_i \text{ s and } \sigma_i \text{ is the standard deviation of } X_i \text{ s}$$

Computed agricultural development indices for the districts of KBK region at two points of time under reference, i.e. 1994-95 and 2011-12 are depicted in Table 1.

Table 1

AGRICULTURE DEVELOPMENT INDICES FOR THE  
DISTRICTS OF KBK REGION OF ODISHA: 1994-95 - 2011-12

Sl.No	Districts	1994-95		2011-12	
		Index	Rank	Index	Rank
1	Balangir	0.65346	3	0.38533	4
2	Sonepur	1	1	0.999995	1
3	Kalahandi	0.63639	4	0.654026	3
4	Nuapada	0.35956	6	0.317838	5
5	Koraput	0.32063	7	0.271819	6
6	Malkangiri	0	8	0	8
7	Nabarangpur	0.79451	2	0.728401	2
8	Rayagada	0.40836	5	0.250314	7
	Mean	0.52161		0.450965	
	SD	0.31292		0.320132	
	CV	59.9915		70.98823	

Note: 1994-95: (High: >0.678; Medium: 0.365 - 0.678 and Low: <0.365  
2011-12: (High: >0.611 Medium: 0.291 - 0.611 and Low: <0.291)

Source: Own estimation

It is observed that out of 08 KBK districts, Sonepur and Nabarangpur continued to maintain their first and second position in the ranking order in 2011-12 compared to 1994-95. Similarly, no change is marked in the ranking order of Malkangiri (8<sup>th</sup> rank) between two points of time. On the other hand, the ranking order of Kalahandi, Nuapada and Koraput districts has increased by one point each in 2011-12. The level of agricultural development in terms of index values has gone down in case of Balangir and Rayagada. As a result, Rayagada is down by two points and Balangir by one point in their respective ranking orders in 2011-12. The table further reveals that the estimated coefficient of variation (CV) has increased from 59.99 per cent in 1994-95 to 70.99 per cent in 2011-12. It implies that the level of disparity which existed across the districts of the KBK region in 1994-95 has widened in terms agricultural development over the years.

The districts are classified into three categories such as High, Medium and Low on the basis of their respective agricultural development indices and are presented in Table 2 ( Map 1 and 2). The method used for the classification is as follows:  $\bar{X} \pm .5 * \sigma$ , where,  $\bar{X}$  is the mean and  $\sigma$  is the standard deviation of indices.



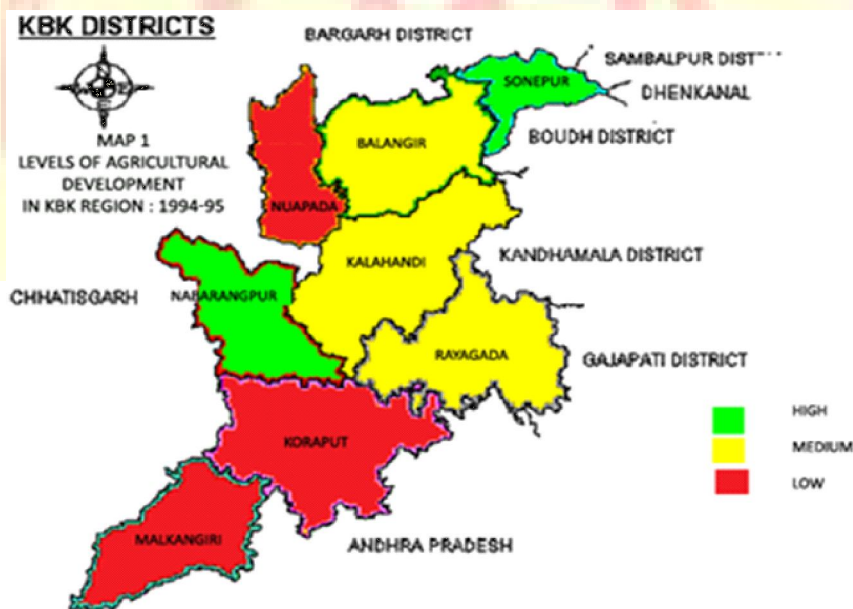
Table 2

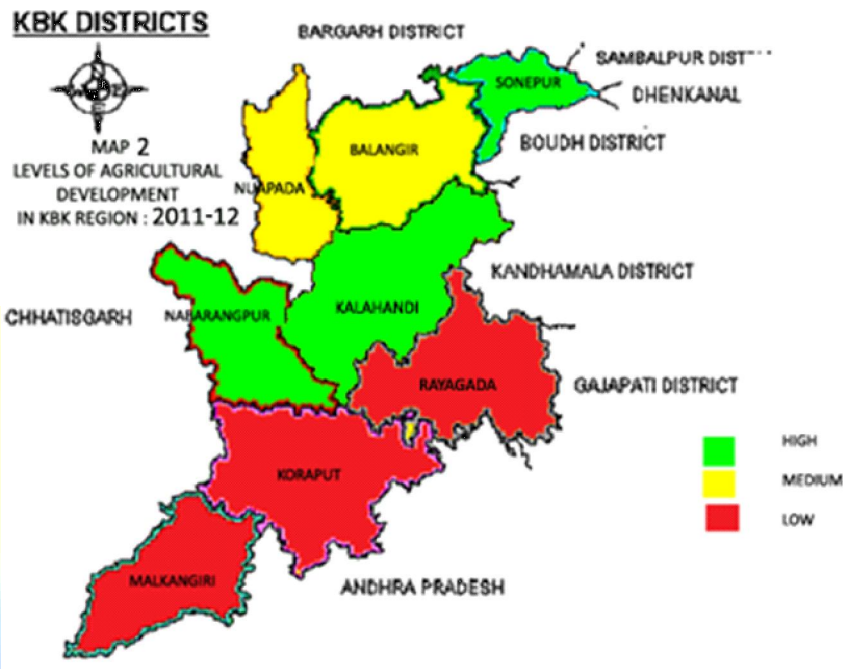
CLASSIFICATION OF DISTRICTS BY LEVEL OF AGRICULTURAL DEVELOPMENT

<i>Year</i>	<i>High</i>	<i>Medium</i>	<i>Low</i>
1994-95	Sonepur Nabarangpur	Balangir Kalahandi Rayagada	Koraput Nuapada Malakangiri
2011-12	Sonepur Nabarangpur Kalahandi	Balangir Nuapada	Koraput Rayagada Malakangiri

Source: Table 1

The Table 2 shows that there were two districts such as Sonepur and Nabarangpur in the high level category in 1994-95. While they continued to maintain their levels of development, only one more district, Kalahandi could move from medium level to high level in 2011-12. On the other hand, the level of agricultural development in Rayagada district has gone down from medium level to low level in between 1994-95 and 2011-12. No change is observed in case of Balangir. It continued to stay in the medium level. In the low level category, there were three districts viz. Koraput, Malkangiri and Nuapada in 1994-95. In 2011-12, Nuapada is found in the medium level and Rayagada in the low level of agricultural development.





## CONCLUDING REMARKS

From the foregoing analysis it has come to the fore that only two districts viz. Kalahandi and Nuapada have experienced development in agriculture while there is deceleration in Rayagada district. On the other hand, the level of disparity across the districts has increased over the years. Further, it is observed that the mean of agricultural development index for the KBK region taken as a whole has declined in 2011-12 compared to 1994-95. It raises the question mark on the effectiveness of all those policies and programmes especially implemented for this region. Thus, given the economic backwardness of the districts of KBK region, pragmatic and more effective programmes should be implemented so that the region can progress faster to catch up with other regions of the state.

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