International Journal of Agriculture, Environment and Biotechnology
Citation: IJAEB: 9(6): 995-1000, December 2016
DOI: 10.5958/2230-732X.2016.00127.3

AGRICULTURE ECONOMICS

Disparities in socio-economic development: A district level analysis in Karnataka

Ramesh, Venu B.N*, Umesh K.B and Jagannath Olekar

Department of Agricultural Economics, UAS Bengaluru, India

*Corresponding author: gowdaregalia@gmail.com

Paper No. 530 Received: 17 June 2016 Accepted: 14 December 2016

Abstract

The level of development was estimated with the help of composite index based on optimum combination of socio-economic indicators. The level of development has been separately estimated for agriculture, Animal husbandry, industry and transport and communication. In case of transport and communication sector, Bengaluru district ranked first and Chamarajnagar was least in development. Wide disparities were obtained in the level of development among different districts. Positive and significant association is found between the agriculture and industrial sector. Karnataka require improvement in various dimensions for enhancing the level of overall socio-economic development for unified balanced integration of curative, preventive and promotional services.

Highlight

- The correlation coefficient between the development in industry, transportation and communication sectors is found to be significant at one per cent.
- However, the correlation coefficient between the development in Industrial and animal husbandry facilities is not significant.
- The correlation coefficient between the development in Industrial and transport and communication sectors is also not significant.
- There is a need for strengthening animal husbandry by improving veterinary research and extension services by providing infrastructural facilities.

Keywords: composite index, level of development, development indicators, agriculture, industry

Karnataka has been a key State in contributing to the progress and development of the nation. About 56 per cent of the total geographical area is net sown. Area under forest is about 20 per cent. Out of six crore population, majority (61.3 %) live in rural areas (Anon., 2014). Seventy one per cent of working population are engaged in agriculture and allied activities in the state. Gross per capita Income is ₹ 86864. The State has population density of 234 per square kilometer and the adult literacy rate of 56 per cent. Agriculture is an important primary sector. It provides food to the growing population, row materials to the agro based industries and various other products to fulfill the basic needs. The region's economy is largely depends upon agricultural sector. In this paper data in respect of 27 districts of Karnataka had been critically analyzed and wide disparities in the level of development were found in different stages. It was, therefore, felt necessary to make a deeper analysis for socio-economic indicators for evaluating the imbalances of development in the districts of Karnataka. Socio economic development, by definition, is not a pre-determined state but it is a continuous process of improvement in the level of living (Narain *et al.*, 2000). It implies the availability of goods and services to the existence of an agricultural, industrial and technological infrastructure and human related services of education and health. Considering the multi-dimensional process and dynamics of socio

economic development, a need for building up of a composite index of development based on various socio-economic variables was felt necessary. Hence, an attempt has been made to quantify the socio-economic development of different districts of Karnataka State by constructing composite index of development for each district and compared among them.

Methodology

Development is a multidimensional continuous process. Its impact cannot be evaluated fully by any single indicator. Moreover, a number of indicators were analyzed individually do not provide an integrated and easily comprehensible picture of reality. Hence, there is a need for building up of a composite index of development based on various indicators combined in an optimum manner. For this study, the Karnataka has been taken as the unit of analysis and 27 districts are included in the study. The data on various development indicators were utilized in the analysis.

Developmental Indicators

Each district faces situational factors of development unique to it, as well as common administrative and financial factors. The indicators which are common for all the districts were included in the analysis for the evaluation of level of development. The composite indices of development were calculated for different districts by using following indicators:

1.1 Agricultural Sector:

1. Non-agricultural area (ha)
2. Total fallow land area
3. Total area sown (ha)
4. Agricultural land holding & area
5. Consumption of fertilizers (tonnes)
6. Total net irrigated area (ha)

1.2 Livestock sector:

1. Total no. of cattle
2. Total no. of sheep's
3. Total no. of veterinary hospitals

1.3 Industrial sector:

1. Total no. of factories
2. Total no of employees

1.4 Transport and communication sector:

1. Total no. of motor vehicles.
2. Railway route length (km)
3. Total no. of post office.
4. Total no. of telephones

These indicators may not form an all inclusive list but these are the major interacting components of development in the region at different districts level. Out of these indicators, six indicators are depicting the progress of agricultural development, three indicated are depicting the progress of livestock development, two are concerned with industrial and four are concerned with the Transport and communication sector.

Estimation of Composite Index of Level of Development

Variables in respect of different indicators are taken from various population distributions and recorded in different levels of measurement. For obtaining the composite index of development, the values of indicators are transformed as follows. These indicators also reflect some degree of variability.

Let X_{ij} be the value of j^{th} indicator for i^{th} unit, i = 1, 2, …, n and j = 1, 2, …, k. X_{ij} is transformed to Z_{ij} as follows:

$$Z_{ij} = \left(X_{ij} - \bar{X}_j\right) / S_j$$

Here, $\bar{X}$ = mean of the j^{th} indicator;

S_j = Standard Deviation (SD) of j^{th} indicator

The best value of transformed variables for different indicators applied during 2013. The value obtained in the study is based on statistical analysis (with maximum value depending upon the direction of the impact of indicator on development) is identified and the squares of the deviations of the transformed variables from best values are obtained. The inverse of coefficient of variation of original variables issued as weight to obtaining the pattern of development. The composite indices is worked out separately for agricultural, livestock, industrial, transport and communication. The value of composite index lies between 0 and 1. A value close to zero indicates high level of development

Table 1: Composite index of development

Districts	Industries		Agricultural		Animal husbandry		Transport & Communication	
	C.I	Rank	C.I	Rank	C.I	Rank	C.I	Rank
Bagalkot	0.1374	5	0.3937	13	0.0535	4	0.0766	10
Belgaum	0.3438	21	0.0509	1	0.0602	5	0.0663	8
Bellary	0.3656	23	0.2722	6	0.5779	25	0.2087	19
Bengaluru	0.0240	1	0.5498	21	0.0215	2	0.0130	1
Bengaluru (R)	0.1234	4	0.3075	7	0.3601	18	0.0326	3
Bidar	0.7810	27	0.6355	25	0.4776	24	0.1988	18
Chamarajanagar	0.6048	25	0.5956	23	0.3593	17	0.5221	27
Chickamagaluru	0.3350	19	0.4256	16	0.0509	3	0.3087	25
Chitradurga	0.0437	2	0.0732	2	0.3840	19	0.0761	9
Dakshinakannada	0.3187	18	0.4860	18	0.3942	20	0.1959	16
Davanagere	0.3123	17	0.3935	12	0.3505	16	0.2090	20
Dharwad	0.2927	14	0.3357	10	0.3240	15	0.1919	15
Gadag	0.3550	22	0.5769	22	0.2152	10	0.2266	22
Gulbarga	0.3422	20	0.3165	8	0.3133	14	0.2219	21
Hassan	0.0466	3	0.1267	3	0.2562	11	0.3053	24
Haveri	0.2838	13	0.6127	24	0.4418	23	0.0941	12
Kodagu	0.3116	16	0.4227	15	0.0162	1	0.0630	7
Kolar	0.1901	8	0.7931	27	0.1897	9	0.0596	6
Koppal	0.1523	6	0.3270	9	0.5825	26	0.1983	17
Mandya	0.2495	10	0.2672	5	0.2764	12	0.1153	14
Mysore	0.2821	11	0.1978	4	0.1863	8	0.0293	2
Raichur	0.2822	12	0.6994	26	0.6955	27	0.4084	26
Shimoga	0.2257	9	0.4834	17	0.3109	13	0.1021	13
Tumkur	0.1575	7	0.5259	19	0.4161	21	0.0345	4
Udupi	0.3024	15	0.3688	11	0.1853	7	0.0524	5
UttaraKannada	0.7389	26	0.5459	20	0.4218	22	0.0842	11
Vijayapura	0.4977	24	0.4010	14	0.1845	6	0.2703	23

and a value near to one indicates poor level of development. Level of development will help in identifying a given position stands in relation to other. The study also throws light on relationships of socio-economic development with agricultural development, livestock development, industrial, transport and communication development.

With respect to the level of development, districts are classified in to four categories: Highly developed, Developed, Developing and Backward.

Criteria	Category
Less than Mean - SD	Highly Developed
Mean - SD to Mean	Developed
Mean to Mean + SD	Developing
More than Mean + SD	Backward

To examine the relationship among development of agricultural, livestock, industrial, transport and communication, pair wise correlations have been worked out.

Results and Discussion

The composite indices of development was worked out separately for agricultural sector, livestock, industrial and transport and communication sector for different districts of Karnataka and given in Table 1. The sectors were ranked on the basis of level of development. It is observed from the table that, Belgaum district is ranked first and the Kolar district is ranked last in agriculture development. The composite indices vary from 0.0509 to 0.7931 in case of agriculture facilities. While in case of

livestock development Kodagu district is found to be on the first position and Raichur district is ranked last and composite index varies from 0.0162 to 0.6955. In industrial sector, Bengaluru district ranked first and Bidar is at last and composite indices of development vary from 0.0240 to 0.7810. In case of transport and communication, Bengaluru district is first and Chamarajanagar is ranked last. The composite indices of development ranges from 0.0130 to 0.5221.

Different Stages of Development

Table 2 (A.B.C.D) depicts the classification of districts lying indifferent levels of development along with percentage area and population and values are based on standard conversion.

Table 2: Area and population in different levels of development

Table 2.A: *Industrial development*

Level of Development	Name of districts	Area %	Population %
Highly Developed	Bengaluru, Gadag, Mysore, Bengaluru®, Bagalkot, Hassan, Tumkur, Kolar, Shimoga	29.02	42.22
Developed	Mandya, Koppal, Raichur, Haveri, Dharwad, Udupi, Kodagu, Davanagere, Dakshinakannada, Chickamagaluru, Gulbarga, Belgaum, Chitradurga, Bellary	53.15	46.77
Backward	Chamarajanagar, UttaraKannada, Bidar, Vijayapura	17.83	11.01

In case of industrial development, Bengaluru, Gadag, Mysore, Bengaluru rural, Bagalkot, Hassan, Tumkur, Kolar and Shimoga district are found to be highly developed as compared to other districts. These districts occupy 29.02 per cent area and 42.22 per cent population of the Karnataka. Mandya, Koppal, Raichur, Haveri, Dharwad, Udupi, Kodagu, Davanagere, Dakshina Kannada, Chikkamagaluru, Gulbarga, Belgaum, Chitradurga and Bellary districts are under developed category and it coveres 53.15 per cent area and 46.77 per cent population. Backward or poor developed districts are Chamarajanagar, Uttara Kannada, Bidar and Vijayapura. These districts cover 17.83 per cent area and 11.01 per cent population.

Initiation of Global Investors meet in Karnataka has major impact towards industrial development. In addition to this, the Government has started providing loans at subsidized rate for small scale industries in Karnataka. From the result it is found that, the rate of growth of investment, infrastructural development etc., have been pegged at a higher level in south Karnataka as compared to north Karnataka. The main source of labourers for the construction sector in the cities was the migrant laborers from North Karnataka due to push and pull factors of migration.

Table 2.B: *Agriculture development*

Level of Development	Name of districts	Area %	Population %
Highly Developed	Belgaum, Bagalkot, Hassan, Mysore, Mandya, Bellary	26.03	27.27
Developed	Bengaluru(R), Gulbarga, Koppal, Dharwad, Udupi, Chitradurga, Davanagere, Vijayapura, Kodagu, Chickamagaluru.	35.15	26.82
Developing	Shimoga, Dakshinakannada, Uttara, Kannada, Haveri, Bengaluru, Raichur, Tumkur	27.79	36.65
Backward	Chamarajanagar, Bidar, Gadag, Kolar	11.04	9.25

In case of agricultural development, the Belgaum, Bagalkot, Hassan, Mysore, Mandya and Bellary were found to be better developed as compared to other districts of Karnataka. These highly developed districts occupy 26.03 per cent area and 27.27 per cent population of the regions covered under the study. Bengaluru rural, Gulbarga, Koppal, Dharwad, Udupi, Chitradurga, Davanagere, Vijayapura, Kodagu and Chickamagaluru districts are under the category of developed, covering 35.15 per cent area and 26.82 per cent population. Shimoga, Dakshinakannada, Uttara Kannada, Haveri, Bengaluru, Raichur and Tumkur are in the developing stage and covers 27.79 per cent area and 36.65 per cent population. Chamarajanagar, Bidar, Gadag, Kolar districts fall under backward category

and these districts cover 11.04 per cent area and 9.25 per cent populations.

As agricultural development index is concern, irrigation plays major role in agricultural development. The districts fall under the category of developing and backward category, covers larger area land mainly depends on rain and come under rainfed situation. Besides this there is no assured source irrigation.

Table 2.C: *Animal Husbandry*

Level of Development	Name of districts	Area %	Population %
Highly Developed	Kodagu, Bengaluru, Chickamagaluru, Bagalkot, Belgaum, Vijayapura, Udupi, Mysore, Kolar	32.36	44.94
Developed	Gadag, Hassan, Mandya, Shimoga, Gulbarga, Dharwad, Davanagere, Chamarajanagar	28.92	23.93
Developing	Bengaluru(R), Chitradurga, Dakshinakannada, Tumkur, UttaraKannada, Koppal	26.21	20.57
Backward	Bellary, Bidar, Raichur.	26.21	20.57

In animal husbandry development, Kodagu, Bengaluru, Chickamagaluru, Bagalkot, Belgaum, Vijayapura, Udupi, Mysore and Kolar are found to be better developed and occupy 32.36 per cent area and 44.94 per cent population of Karnataka. The districts Gadag, Hassan, Mandya, Shimoga, Gulbarga, Dharwad, Davanagere and Chamarajanagar are developed and cover 28.92 per cent area and 23.93 per cent of population. Bengaluru(R), Chitradurga, Dakshinakannada, Tumkur, Uttara Kannada and Koppal are in the developing stage. These districts cover 26.21 per cent area and 20.57 per cent population. Only Bellary, Bidar and Raichur are observed to be in the backward category. These districts cover 26.21 per cent area and 20.57 per cent population.

Most of the developed districts in Karnataka are under rainfed situation, here farmers entirely depends on livestock for their livelihood security. On the contrary, majority of the backward districts in animal husbandry development are having the major area under assured irrigation and mainly depends on crop cultivation. In addition to this, promoting infrastructure for handling, processing and marketing of milk and milk products and veterinary hospitals and dispensaries are well equipped in highly developed districts compared to backward districts.

Table 2.D: *Transport and communication development*

Level of Development	Name of districts	Area %	Population %
Highly Developed	Bengaluru, Mysore, Bengaluru(R), Tumkur, Kolar, Kodagu, Belgaum, Chitradurga, Bagalkot, UttaraKannada, Haveri, Shimoga, Mandya.	50.36	59.88
Developed	Dakshinakannada, Koppal, Dharwad, Bidar, Davanagere, Bellary, Gulbarga, Gadag, Vijayapura.	33.92	29.93
Developing	Hassan, Chickamagaluru, Raichur.	12.56	8.41
Backward	Chamarajanagar.	3.16	1.77

In transport and communication development, it may be seen from the table that Bengaluru, Mysore, Bengaluru(R), Tumkur, Kolar, Kodagu, Belgaum, Chitradurga, Bagalkot, Uttara Kannada, Haveri, Shimoga and Mandya are found to be highly developed as compared to the rest of the districts. These districts occupy 50.36 per cent area and 59.88 per cent population of the state. Dakshina kannada, Koppal, Dharwad, Bidar, Davanagere, Bellary, Gulbarga, Gadag and Vijayapura districts are developed and covering 33.92 per cent area and 29.93 per cent population. Hassan, Chickamagaluru and Raichur are in the developing stage. These districts cover 12.56 per cent area and 8.41 per cent population. Chamarajanagar is the only district is observed to be in the backward category as transport and communication development is concern.

Karnataka state has strategically planned transportation system with reference to airways, railways, and roadways- well connected state to major parts of the India. It is noticed from the result that, number of motor vehicles, post office, telephones and railway route length (Km) were increased over the years. As a result more number of districts was found in highly developed

and developed category. The development of Information and Technology (IT) sector mainly influenced by telecommunication service. This clearly represents that, there is a positive relationship among IT companies, education, transportation and communication.

Inter-relationships among Different Sectors

To examine the relationship among development of Industrial, agriculture, animal husbandry and transport and communication sectors a pair wise correlations was worked out and shown in the Table 3.

Table 3: Relationships among Different Sectors

Sl. No.	Pair of sector	Correlation
1	Industrial and agriculture	0.332
2	Industrial and animal husbandry	0.198
3	Industrial and transport and communication	0.361**
4	Agriculture and animal husbandry	0.193
5	Agriculture and transport and communication	0.191
6	Animal husbandry and transport and communication	0.344

*** Significant at 1 per cent level*

The correlation coefficient between the development in industry, transportation and communication sectors is found to be significant at one per cent. However, the correlation coefficient between the development in Industrial and animal husbandry facilities is not significant. The correlation coefficient between the development in Industrial and transport and communication sectors is also not significant.

Conclusion

The wide-ranging conclusions emerged from the study are:

- Bagalkot, Belgaum, Bengaluru, Chitradurga, Gulbarga, and Mysore were observed to be better off in socio-economic development where as the districts of Chamarajanagar Raichur, Bidar and Kolar districts are remained at the low level of development. These findings can be a guide for policy makers to further analyze the reasons and causes of underdevelopment and development of the districts and to address the problems in a holistic manner.
- Ballary, Bidar and Raichur districts are backward in animal husbandry development index. This is an important finding which calls for improvement in the animal husbandry sector in these districts. It also enlightens the importance of services and benefits provided by the veterinary department and Karnataka Veterinary, Animal and Fisheries Sciences University.
- There is a need for strengthening animal husbandry by improving veterinary research and extension services by providing infrastructural facilities. To increase livestock production by providing incentives for dairy, poultry farming, pig breeding and sheep /goat production, establishing more fodder extension services, state livestock breeding farms and overall sector.

References

Anonymous, 2013, Karnataka at a glance. Directorate of Economics and Statistics, Bengaluru.

Narain, P., Sharma, S.D., Rai, S.C. and Bhatia, V.K. 2000. Regional disparities in socio- economic development in Tamilnadu. *Journal of the Indian Society of Agricultural Statistics* **53**: 35-46.

Narain, P., Sharma, S.D., Rai, S.C. and Bhatia, V.K. 2002. Dimensions of regional disparities in socio-economic development in Madhya Pradesh. *Journal of the Indian Society of Agricultural Statistics* **55**: 88-107.

Narain, P., Sharma, S.D., Rai, S.C. and Bhatia, V.K. 2003. Evaluation of economic development at micro level in Karnataka. *Journal of the Indian Society of Agricultural Statistics* **56**: 52-63.

Narain, P., Sharma, S.D., Rai, S.C. and Bhatia, V.K. 2004. Estimation of socio-economic development in Hilly states. *Journal of the Indian Society of Agricultural Statistics* **58**: 126-135.

Narain, P., Sharma, S.D., Rai, S.C. Bhatia V.K 2000. Regional dimension of disparities in crop productivity in Uttar Pradesh. *Journal of the Indian Society of Agricultural Statistics* **54**: 62-79.

Sharma, A., Dhakre, S.D. and Sharma, R. 2008. Inter-District Disparities in Socio-Economic Development in Nagaland. *Productivity*, **49**(2): 196-200.