DISPARITIES IN THE LEVEL OF AGRICULTURAL DEVELOPMENT IN BAGALKOT DISTRICT: KARNATAKA: A GEO-SOCIO ANALYSIS

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ABSTRACT Agricultural land use and cropping patterns are the important components of the disciplines of agricultural economics and agricultural geography. Agricultural land use and cropping patterns often undergo remarkable change from time to time due to natural consequences of the influence of physical, cultural, technological and Socio economic factors. The analysis of variations in agricultural land use over a period of time gives us an insight in to the type and magnitude of transformation of an agrarian rural society. An analysis of agricultural land use is essential for a meaningful understanding of the agricultural system prevailing in a region.

Cropping pattern being the part of land use pattern has always been a dynamic phenomenon. The cropping pattern is in fact, a reflection of the interplay of the complex social, economic and physical factors. On account of dynamic socio-economic factors, the cropping pattern also changes in a long run sometimes it may get replaced totally. The change that is observed in the region is mainly due to the introduction of canal and other sources of irrigation, changing connectivity, urban influences and marketing systems. The major changes in the cropping patterns that have occurred in the study region are mainly from traditional crop to high yielding variety of crops and from cereals to commercial and cash crops.

Introduction: Agriculture development in true develops the quality of the agricultural system of a region in terms of productivity and efficiency. Agriculture development is a dimensional phenomenon, which is governed by several factors of the region. Physical conditions are greatly responsible for variations in regional pattern of agricultural phenomenon. However, the demographic, economic, technological factors influencing agricultural patterns are the major factors affecting to the regional development.

Concept and Review: While defining agricultural productivity one has to refer to the quantum of production per hectare or per unit area. Whereas efficiency denotes the level of existing performance of a unit of land, which differs from one area to another. The agricultural productivity and efficiency are the characteristics of the agricultural land performance seen in vertical dimensions. Therefore while making any comparison between areas one has to also look in to the lands carrying capacity in terms of quantum of production, and it helps in any scheme of reducing regional imbalances in agriculture for the planning purpose.

Owing to the multitudinous nature of agriculture, various mathematical and statistical techniques are used by the geographers for the measurement of agricultural productivity and efficiency, which may be considered a step ahead in the regionalization process.

The concept of productivity is a relative term and cannot be uniformly applied all over the world. The measurement of agricultural productivity is more complicated than in industry and posses many problems of concept and definition.

Jasbir Singh (1976) explains that productivity as defined in economics or agricultural geography means output per unit of input or per unit of area. Productivity and the improvement in agricultural productivity are generally the result of a more effective use of the factors of production viz. environment, arable land, labour and capital. Productivity industrial or agricultural is a difficult one both in concept and terms of measurements of its level. Therefore, any definition that is adopted is bound to suffer from certain weakness. It is important to remember that productivity is a physical factor rather than a value concept, which describes the relationship between the output and the major inputs utilized in production, Rao V.K.R. (1962). Bhatia equated agricultural productivity with agricultural efficiency and defined agricultural productivity as "the aggregate performance of various crops in regard to three out-put per acre, but the contributions of each crop to the agricultural efficiency would be relative to its share of the crop land. Jasbir Singh (1972) defined agricultural productivity as "the quantum of return from arable land." He argued that 'the quantity of produce denotes its intensity and the spatial expansion of its spread'. Therefore, agricultural productivity is more empirical and is closely related to per hectare yield.

The efficiency of agriculture obviously implies that maximum return is obtained from the land under prevailing physical (i.e. topography, soil, and climate), socio-economic (i.e. size of holding land ownership structure, type of farming and market structure), and techno-organizational factors (i.e. crop relation, cropping pattern, fertilizer and mechanization) with the application of human effort at the existing level of development.

Shafi (1960) applied the method for the first time in India. He used the acre yields of crops to measure agricultural efficiency in Uttar Pradesh.

There are many different concepts and definitions for the measurement of agricultural productivity and efficiency. Several studies have proved that such of the factors affect agricultural productivity to a large extent directly and indirectly.

Method and measuring of Agricultural Productivity

Various scholars from different disciplines have evolved several methods and techniques to regionalize agricultural productivity and efficiency at macro, meso and micro level by using different variables. The selected approaches reviewed in the present study are as follows:

a) Assessing the value of agricultural production per unit area.
b) Measuring production per unit of farm labor or man-hour.
c) Determining out-put in relation to in-put and out-put ratio.
d) Expressing production of agriculture in terms of gain equalent per head of population [buck (1967), E.de. Vries (1967), Clark and Haswell (1967)].
e) Considering out-put per unit are or yields per hectare after grading them in ranking order, thereby deriving the ranking co-efficient Kendal(1939), Stamp (1960), and Shafi (1960).
f) Giving weightage to the ranking order of the out-put per unit area with the percentage share under each crop (Sapre and Deshpande (1964), Bhatia (1967).
g) Determining an index of productivity [Enyedi (1964), Shafi (1972, 1974).]
h) Calculating the index number of agricultural efficiency by expressing the per unit area carrying capacity (in terms of population) of the component enumeration unit as a percentage of the per unit area carrying capacity for the entire region.(Singh 1972 and 1974).
i) Computing the crop yield and concentration indices ranking co-efficient (Singh, 1976).

These approaches used by deferent scholars with case studies out of which some important ones are reviewed in this present study.

Of these the first three techniques (a,b,c) seem to require such statistics as are readily available and even easily accessible in most of the under developed and developing countries of the world. Statistics, though available at the farm level in some states of India, do not seem to be adequate for analysis of agricultural efficiency.

The agricultural efficiency would be the aggregate performance of various crops in regard to their output per hectare but relative to its share of cropland. A weighted average of the yield efficiency of all crops in a component regional unit, where the weights are proportionate to the share of cropland devoted to each crop, would give a measure of overall agricultural efficiency of the component regional unit relative to the entire region. This may be expressed as Bhatia's method of measurement of agricultural efficiency.

$$\text{i) Iya} = \frac{Yc}{Yr} \times 100$$

Where, Iya – is the yield index of a crop 'a'

Yc – is the acre yield of crop 'a' in component acres 'w' unit

Yr – is the acre yield of crop 'a' in the entire region.

$$\text{ii) Ei} = \frac{Iya \times ca + Iyb\ cb + \ldots\ldots Iyn \times cn}{ca + cb \times + \ldots\ldots\ldots\ldots\ cn}$$

Where, Ei – is the agricultural efficiency index

Iya, Iyb……Iyn are the yield indices of different crops ca, cb,…….cn are the percentage of crop land share under different crops.

Keeping this in view, Jasbir Singh (1976) has adopted a new technique of measuring the level of agricultural production, which may be called the "crop yield and concentration indices ranking co-efficient."

In order to measure the productivity he used the average food grain, yields and the production of these crops in the harvested area. The crop yield and concentration indices are divided for all the regional units and the crops area marked separately. The procedure adopted may be explained as under.

$$\text{i) Yi} = \frac{Yae}{Yar} \times 100$$

Where,

Yi- is the crop yield index

Yae-is the average yield per hectare of crops 'a' in the component enumeration unit,

Yar- is the average yield of the crop 'a' in the entire region.

$$\text{ii) Ci} = \frac{Pae}{Par} \times 100$$

Where,

Ci = is the crop concentration index.

Pae =is the percentage strength of crop 'a' in the total harvested area in the component enumeration unit .

Par = is the percentage strength of crop 'a' in the total harvested area in the entire region or state.

Yield and concentration ranks for individual crops are added and thereafter divided by 2, thus giving the "crop yield" and concentration indices ranking co-efficient. The formula is as follows.

iii) Crop yield and Concentration indices Ranking Co-efficient of a crop 'a'

$$= \frac{\text{Crop yield index ranking of crop 'a'} + \text{crop concentration ranking for a crop 'a'}}{2}$$

The result thus divided will give us an idea of the level of agricultural productivity, the lower the ranking co-efficient, the higher the level of agricultural productivity and vice-versa. This method fails to measure the productivity in the area where crop diversification is very high. For crops occupying less than 5 percent of the harvested area in an enumeration unit, this approach may give very descriptive results.

Methodology: The study is based on secondary data and information collected from various sources. The area under different crops and their production are obtained from annual seasonal crop reports and plan statistics. Revenue circle level yield per hectare for different crops are worked out by dividing the total production of a particular crop by the area under it. In order to minimize the anomalies arising out of fluctuations in area and out- put, the selected ten crops (i.e. Jowar, Bajra, Maize, Wheat, pulse, Green gram, Bengal gram, Cotton, Sugar cane, Groundnut, Sunflower, and Vegetables) have been studied for two point of time i.e. 2005-06and 2015-2016.

Secondly, the ranking co-efficient have been derived by adding all the ranks of crop yield and concentration indices for each Revenue circle and divided by two, and are categorized in three groups, i.e. high, medium and low. The results derived are mapped with the help of choropleth method to bring out the regional disparities in the level of crop production in the study region, which can be correlated with physical and non-physical factors.

For the analysis of individual crop productivity, in the study region the revenue circle wise yield data are used and yield indices were calculated to the total harvested area, for two point of time i.e. 2005-06 and 2015-16, based on Jasbir Singh's (1976) method. The crop yield and concentration indices are derived for all the selected principal crops at revenue circle level in the region.

In order to know agricultural efficiency, the composite index values have been obtained by selecting relevant indicators for two point of time. Then both productivity and efficiency index values are classified with the help of mean and standard deviation method. In order to understand the regional disparities in the level of agricultural development, stepwise regression or simple multiple correlation co-efficient method has been used and results derived from the study are mapped cartographically.

SPATIAL PATTERN OF AGRICULTURAL PRODUCTIVITY REGIONS:

Using the techniques of Jasbir Singh (1976) agricultural productivity indices were calculated for each of the 18 revenue circles of the district. In order to reveal the spatio-temporal variations, the area is divided in to three broad categories like high, medium and low which are used to differentiate agricultural productivity regions in the study area.

TableNo-1, Proportionate distributional patterns of agricultural productivity in Bagalkot district and their regional differences can be explained with reference to diversions in physic-socio and economic variables. In the area of better conditions, the productivity is high while in areas of constraints it is low.

The study reveals that the productivity index value varies from 5.20 to 11.85 during 2005-06, and 5.75 to 10.35 during 2015-16.

High productivity regions: Spatial variations in productivity are marked in the regions depending upon the nature of relief, shape, drainage, soil and rainfall, as well as the level of diffusion of agricultural innovations. The high agricultural productivity during 2005-06 was observed in seven revenue circles viz. Anagawadi, Jamakhandi, Bilagi, Savalagi, Teradal, Mudhol and Lokapur with an index value of less than 7.50. whereas in the year 2015-16, Jamakhandi, Savalagi, Mudhol and Lokapur continued to have high agricultural productivity and Badami, Kerur, and Kulageri revenue circles are added in this category, with an index value of less than 7.50. It is because of development in irrigational facilities, increase in the percentage of high yield varieties of seeds and better socio- economic facilities (Table No-1).

Medium productivity regions: During the year 2005-06, there are five revenue circles namely Kerur, Bagalkot, Kaladagi, Sitimani and Aminagad that fall in the category of medium productivity region, with an index value of 7.50 to 9.00, whereas in 2015-16, these seven revenue circles are again involved in this category namely Guledagudda, Bagalkot, Kaladagi, Sitimani, Aminagad, Teradal, revenue circles with an index value of 7.50 to 9.00. Lesser amount of rainfall received by these revenue circles, limited water supply through bore well and tube well, and lesser amount of water supply through canals and soil fertility status etc. are factors which are responsible for the medium productivity in the district Fig No-6.1.

Low productivity regions: In the year 2005-06 the low productivity regions were observed in the southern part of the district, which includes the revenue circles of Badami, Guledagudda, Kulageri, Hunagund, Ilkal, and Karadi with an index value of more than 9.00, whereas in 2015-16, the number of revenue circles decreased to three viz. Hunagund, Ilkal and Karadi fall in the category of low productivity regions, with an index value of more than 9.00. This prevalence of low agricultural productivity was mainly due to environmental constraints, (rainfalls and topography), farmers failure to use the recommended seeds, followed by fertilizers and methods of cultivation etc.

AGRICULTURAL EFFICIENCY REGIONS

In the present study an attempt has been made to study and examine the levels of agricultural efficiency in Bagalkot district at revenue circle level by selecting relevant selected indicates for two points of time i.e. 2005-06 and 2015-16. The selected indicators approach appears to be of special relevance in the present analysis. The indicators of the agricultural efficiency have been selected after a careful study of their relative importance. The selected indicators fall in to three broad groups, viz. demographic, economic and Socio infrastructural which show significant growth and development in terms of agricultural development in the study region.

As stated earlier, the agricultural efficiency is a function of the combined interplay of a variety of factors. The term agricultural efficiency means, it is much more than agricultural productivity and conveys a more comprehensive and wider meaning. It is the composite index of all the factors.

In view of this, the present study attempts to examine the level of agricultural efficiency at taluka level by selecting different indicators for two points of time i.e. 2005-06 and 2015-16. The following variables are considered for determining the levels of agricultural efficiency in the present study

YIELD OF PRINCIPAL CROPS IN BAGALKOT DISTRICT

2005-06 (Yield in kg per hectare/ cane tone per hectare)

Sl no	Revenue Circle	Jowar	Bajra	Maize	Wheat	Pulses	Sugar cane	Cotton	Ground nut	Sun flower	Vegetables
1	Badami	660	703	2751	703	693	70	330	698	976	2392
2	Guledgudd	642	675	2755	705	725	60	308	702	961	2360
3	Kerur	645	684	2760	712	766	71	318	705	965	2355
4	Kulageri	661	710	2890	672	728	74	304	667	986	2373
5	Bagalkot	668	586	2998	805	701	70	352	767	871	2571
6	Kaladagi	679	569	3017	772	696	75	359	803	884	2584
7	Sitimani	660	579	2973	778	675	74	330	815	852	2465
8	Anagwadi	601	581	3402	768	740	79	456	789	1012	2704
9	Bilagi	623	565	3288	752	760	73	484	807	996	2680
10	Amingad	651	658	2810	718	700	69	321	707	784	2205
11	Hunagund	635	635	2754	768	713	64	341	686	805	2098
12	Ilkal	634	629	2572	730	665	55	346	680	780	1984
13	Karadi	628	618	2696	764	703	60	332	687	815	2089
14	Jamkhandi	734	667	3648	789	729	86	509	1027	1032	2829
15	Savalagi	706	684	3510	832	738	73	503	1002	1014	2763
16	Teradal	729	680	3612	824	737	84	473	1031	1035	2817
17	Mudhol	703	621	3742	845	736	79	535	1041	1052	2769
18	Lokapur	687	649	3648	835	742	73	505	1019	1036	2739
19	Total	664	631	3187	774	756	73	414	838	952	2542

YIELD OF PRINCIPAL CROPS IN BAGALKOT DISTRICT

2015-16 (Yield in kg per hectare/ cane tone per hectare)

Sl no	Revenue Circle	Jowar	Bajra	Maize	Wheat	Pulses	Sugar cane	Cotton	Ground nut	Sun flower	Vegetables
1	Badami	1298	1039	3227	1259	846	76	827	1902	1239	2810
2	Guledgudd	1278	1003	3159	1213	871	65	806	1864	1202	2345
3	Kerur	1285	1008	3102	1239	868	72	815	2215	1220	2655
4	Kulageri	1299	1038	3312	1229	874	79	832	2419	1247	2890
5	Bagalkot	1330	947	3149	1112	836	73	776	2010	1185	2860
6	Kaladagi	1351	976	3179	1101	818	75	779	2085	1196	2855
7	Sitimani	1336	999	3080	1063	790	65	785	1860	1189	2787
8	Anagwadi	971	902	3153	1332	897	93	884	2044	1305	2909
9	Bilagi	1001	878	3087	1358	894	85	874	2062	1319	3115
10	Amingad	839	843	3006	1249	817	74	927	1829	910	2618
11	Hunagund	841	847	2992	1236	792	68	932	1799	875	2504
12	Ilkal	855	743	2955	1251	811	67	890	1736	869	2346
13	Karadi	853	827	2995	1220	825	67	889	1813	906	2392
14	Jamkhandi	1215	723	3496	1641	870	99	610	2369	1458	2965
15	Savalagi	1249	759	3409	1609	886	88	631	2353	1415	2750
16	Teradal	1241	753	3469	1352	874	101	625	2340	1447	2901
17	Mudhol	1329	701	3592	1596	832	105	703	2491	1380	3111
18	Lokapur	1291	729	3508	1562	825	93	683	2449	1356	3047
19	Total	1135	764	3232	1354	850	83	782	2126	1238	2823

YIELD AND CONCENTRATION INDICES' CROPS

2005-06 **Jasbhir singh method** (Yield in kg per hectare/ cane tone per hectare)

SL NO	REVENUE CIRCLE	JOWAR	BAJRA	MAIZE	WHEAT	PULSES	SUGAR CANE	COTTON	GROUND NUT	SUN FLOWER	VEGETABLES	TOTAL RANK SCORE	Yield & Concentration Index	Ranking Co-efficient Indices
1	Badami	YI 99.39(9) CI 78.12(12)	111.41 (2) 233.33 (2)	86.31 (15) 66.66 (8)	90.82 (16) 66.66 (5)	100.28 (16) 136.11 (4)	95.89 (8) 00.66 (12)	79.71 (13) 16.66 (8)	83.29 (14) 350.00 (1)	102.52 (9) 12.50 (14)	94.09 (11) 53.33 (11)	113 77	11.30 7.70	9.5
2	Guledagudd	YI 96.68(12) CI 146.87(2)	106.97 (5) 50.00 (11)	86.44 (13) 77.77 (7)	91.08 (15) 133.33 (3)	106.23 (9) 144.44 (2)	83.56 (11) 00.55 (13)	74.39 (16) 23.33 (7)	83.77 (13) 183.33 (2)	100.94 (11) 87.50 (9)	92.84 (13) 73.33 (9)	118 65	11.80 6.50	9.15
3	Kerur	YI 97.13(11 CI 90.62(10)	108.39 (3) 316.66 (1)	86.60 (12) 22.22 (10)	91.98 (14) 66.66 (5)	112.71 (2) 172.22 (1)	97.26 (7) 01.11 (11)	76.81 (15) 16.66 (8)	84.12 (12) 133.33 (5)	101.36 (10) 143.75 (5)	92.64 (14) 80.00 (8)	100 64	10.00 6.40	8.20
4	Kulageri	YI 99.54(8) CI 59.37(15)	112.51 (1) 200.00 (3)	90.68 (10) 66.66 (8)	86.82 (17) 33.33 (6)	106.09 (10) 106.66 (8)	101.36 (5) 01.11 (11)	73.43 (17) 10.00 (10)	79.59 (18) 166.66 (3)	103.57 (8) 237.50 (1)	93.36 (12) 46.66 (12)	106 79	10.60 7.90	9.25
5	Bagalkot	YI100.60(7) CI128.12(5)	92.86 (13) 150.00 (6)	94.06 (8) 11.11 (13)	104.00 (5) 66.66 (5)	103.00 (14) 91.66 (10)	95.89 (8) 02.22 (10)	85.02 (9) 16.66 (8)	91.52 (10) 150.00 (4)	91.49 (13) 81.25 (10)	101.14 (9) 133.33 (3)	96 74	9.60 7.40	8.50
6	Kaladagi	YI102.25 (6) CI109.37 (8)	90.17 (16) 133.33 (7)	94.66 (7) 55.55 (9)	99.74 (8) 100.00 (4)	101.71 (15) 83.33 (12)	102.39 (4) 07.77 (8)	86.72 (8) 83.33 (4)	95.82 (8) 150.00 (4)	92.85 (12) 50.00 (12)	101.65 (8) 93.33 (6)	92 74	9.20 7.40	8.30
7	Sitimani	YI99.39 (9) CI134.37(4)	91.75 (15) 116.66 (8)	93.28 (9) 11.11 (11)	100.51 (7) 66.66 (5)	98.19 (18) 108.33 (12)	101.36 (5) 04.44 (4)	79.71 (13) 33.33 (6)	97.25 (6) 166.66 (3)	89.49 (14) 106.25 (7)	96.97 (10) 86.66 (7)	106 64	10.60 6.40	8.5
8	Anagawadi	YI90.51(17) CI87.50(11)	92.07 (14) 183.33 (4)	106.74 (5) 144.44 (6)	99.22 (9) 133.33 (3)	109.17 (5) 102.78 (9)	108.21 (3) 66.66 (7)	110.14 (7) 200.00 (1)	94.15 (9) 100.00 (6)	106.30 (6) 50.00 (12)	106.37 (6) 100.00 (5)	81 64	8.10 6.40	7.37
9	Bilagi	YI93.82(16) CI115.63(6)	89.54 (17) 150.00 (6)	103.16 (6) 155.55 (5)	97.15 (11) 133.33 (3)	112.87 (1) 138.66 (3)	100.00 (6) 77.77 (6)	116.90 (5) 33.33 (6)	96.30 (7) 100.00 (6)	104.62 (7) 56.25 (11)	105.42 (7) 80.00 (8)	83 60	8.30 6.00	7.15
10	Aminagad	YI 98.04(10) CI112.50(7)	104.27 (7) 166.66 (5)	88.17 (11) 22.22 (11)	92.76 (13) 200.00 (1)	105.80 (12) 40.55 (17)	94.52 (9) 00.22 (15)	77.53 (14) 133.33 (3)	84.39 (11) 166.66 (3)	82.35 (18) 137.50 (6)	86.72 (15) 86.66 (7)	120 71	12.00 7.10	8.55
11	Hunagund	YI 95.63 (13) CI146.87 (2)	100.63 (9) 33.33 (11)	86.41 (14) 22.22 (12)	99.22 (9) 133.33 (3)	107.15 (7) 70.55 (13)	87.67 (10) 00.03 (17)	82.36 (11) 133.33 (3)	81.86 (16) 66.66 (7)	84.55 (16) 150.00 (4)	82.53 (16) 60.00 (10)	121 83	12.10 8.30	10.20
12	Ilkal	YI 95.48 (14) CI153.12 (1)	99.68 (10) 66.66 (10)	80.70 (17) 02.22 (14)	94.31 (12) 33.33 (6)	99.63 (17) 88.89 (11)	75.34 (13) 00.33 (14)	83.57 (10) 13.33 (9)	81.14 (17) 33.33 (8)	81.93 (17) 212.20 (2)	78.08 (18) 40.00 (13)	145 87	14.50 8.70	11.85
13	Karadi	YI 94.57 (15) CI140.62 (3)	97.93 (12) 33.33 (12)	84.59 (16) 02.22 (14)	98.70 (10) 166.66 (2)	105.23 (13) 70.10 (14)	82.19 (12) 00.04 (16)	80.19 (12) 146.66 (2)	81.98 (15) 66.66 (7)	85.61 (15) 187.50 (3)	82.17 (17) 26.66 (14)	137 87	13.70 8.70	11.20
14	Jamakhandi	YI110.54 (1) CI 68.75 (13)	105.70 (6) 16.70 (13)	114.46 (2) 188.88 (2)	101.93 (6) 133.33 (3)	106.07 (11) 102.78 (9)	117.80 (1) 344.44 (1)	122.94 (2) 66.66 (5)	122.55 (3) 66.66 (7)	108.40 (4) 50.00 (12)	111.29 (1) 193.33 (2)	37 67	3.70 6.70	5.20
15	Savalagi	YI 106.32 (3) CI 87.50(11)	108.39 (3) 83.33 (9)	110.13 (4) 166.66 (4)	107.49 (3) 100.00 (4)	107.83 (6) 54.67 (16)	100.00 (6) 222.22 (4)	121.49 (4) 200.00 (1)	119.57 (5) 66.66 (7)	106.51 (5) 56.25 (11)	108.69 (4) 120.00 (4)	43 71	4.30 7.10	5.70
16	Teradal	YI109.78 (2) CI37.50 (16)	107.76 (4) 33.33 (12)	113.33 (3) 222.22 (1)	106.45 (4) 200.00 (1)	106.94 (8) 123.33 (6)	115.06 (2) 333.33 (2)	114.25 (6) 133.33 (3)	123.03 (2) 16.66 (9)	108.72 (3) 43.75 (13)	110.82 (2) 226.66 (1)	36 64	3.60 6.40	5.5
17	Mudhol	YI105.87 (4) CI 65.62 (14)	98.41 (11) 16.66 (14)	117.41 (1) 188.88 (2)	109.17 (1) 166.66 (2)	109.66 (4) 61.67 (15)	108.21 (3) 288.88 (3)	129.22 (1) 07.66 (11)	124.22 (1) 33.33 (11)	110.50 (1) 100.00 (8)	108.93 (3) 100.00 (5)	30 82	3.00 8.20	5.60
18	Lokapur	YI 103.46 (5) CI 96.87 (9)	102.85 (8) 50.00 (11)	114.46 (2) 177.77 (3)	107.88 (2) 166.66 (2)	110.22 (3) 134.44 (5)	100.00 (6) 111.11 (5)	121.98 (3) 200.00 (1)	121.59 (3) 33.33 (1)	108.82 (2) 56.25 (11)	107.75 (5) 100.00 (5)	40 60	4.00 6.00	6.00

Note- Yield of Cotton is in Bale/hectares

YIELD AND CONCENTRATION INDICES' CROPS

2015-2016 Yield in kg per hectare/ cane tone per hectare)

Sl no	Revenue Circle	Jowar	Bajra	Maize	Wheat	pulses	Sugar cane	Cotton	Ground nut	Sun flower	Vegetables	TOTAL RANK SCORE	Yield and Concentration Index	Ranking Co-efficient Indices
1	Badami	YI 114.36 (6) CI 58.82 (12)	120.25(1) 283.33(1)	99.84 (7) 185.71 (2)	92.98 (8) 20.00 (7)	99.50 (9) 66.15 (9)	91.56 (8) 29.41 (8)	105.75 (8) 250.00 (1)	89.46 (12) 466.66 (2)	100.08 (9) 83.33 (7)	99.53 (10) 25.00 (8)	78 57	07.80 05.70	6.75
2	Guledagudd	YI 112.59 (9) CI 194.11 (1)	116.08(4) 66.66 (7)	97.74 (9) 57.14 (11)	89.58 (15) 25.00 (6)	102.16 (8) 137.82 (6)	78.31 (15) 11.76 (10)	103.06 (10) 125.00 (5)	87.67 (14) 200.00 (4)	97.09 (11) 83.33 (7)	83.06 (18) 75.00 (6)	113 63	11.30 06.30	8.80
3	Kerur	YI 113.21 (8) CI 158.82 (2)	116.66 (3) 283.33 (1)	95.97 (12) 50.00 (12)	91.50 (11) 50.00 (5)	102.19 (7) 119.55 (7)	86.74 (12) 23.53 (9)	104.21 (9) 150.00 (4)	104.18 (7) 100.00 (6)	98.54 (10) 100.00 (6)	94.04 (13) 175.00 (2)	82 54	08.20 05.40	6.80
4	Kulageri	YI 114.44 (5) CI 123.53 (5)	120.13 (2) 200.00 (2)	102.47 (6) 200.00 (1)	90.76 (13) 100.00 (3)	102.96 (4) 35.32 (14)	95.18 (7) 23.53 (9)	106.39 (7) 125.00 (5)	113.78 (3) 133.33 (5)	100.72 (8) 183.33 (2)	102.37 (7) 50.00 (7)	62 53	06.20 05.30	5.75
5	Bagalkot	YI 117.18 (3) CI 123.53 (5)	109.60 (7) 66.66 (7)	97.43 (11) 50.00 (12)	82.12 (16) 75.00 (4)	96.46 (14) 161.86 (4)	87.95 (11) 23.53 (9)	99.23 (12) 25.00 (7)	94.54 (11) 833.33 (1)	95.71 (14) 50.00 (9)	101.31 (8) 250.00 (1)	107 59	10.70 05.90	8.60
6	Kaladagi	YI 119.03 (1) CI 76.47 (10)	112.96 (6) 100.00 (5)	98.36 (8) 157.14 (4)	81.31 (17) 100.00 (3)	95.36 (17) 59.96 (10)	91.36 (9) 58.82 (6)	99.61 (11) 225.00 (2)	98.07 (8) 200.00 (4)	96.60 (12) 83.33 (7)	101.13 (9) 75.00 (6)	98 57	09.80 05.70	7.75
7	Sitimani	YI117.70 (2) CI 135.29 (3)	115.62 (5) 100.00 (5)	95.29 (13) 64.29 (10)	78.50 (18) 150.00 (1)	95.76 (16) 116.35 (8)	78.31 (15) 47.06 (7)	96.54 (13) 75.00 (6)	87.48 (15) 200.00 (4)	96.04 (13) 50.00 (9)	98.72 (11) 125.00 (4)	121 57	12.10 05.70	8.80
8	Anagawadi	YI 85.55 (14) CI 105.88 (7)	104.39 (8) 116.66 (4)	97.55 (10) 150.00 (5)	98.37 (7) 125.00 (2)	105.43 (1) 36.28 (13)	112.04 (4) 123.53 (5)	113.04 (5) 200.00 (3)	96.14 (10) 133.33 (5)	105.41 (7) 83.33 (7)	103.04 (5) 125.00 (4)	71 55	07.10 05.50	6.30
9	Bilagi	YI 88.19 (13) CI 111.76 (6)	101.62 (9) 91.66 (6)	55.51 (18) 121.41 (8)	100.29 (6) 125.00 (2)	105.02 (2) 28.01 (16)	102.41 (6) 123.53 (5)	111.76 (6) 250.00 (1)	96.98 (9) 100.00 (6)	106.54 (6) 83.33 (7)	110.34 (1) 125.00 (4)	76 61	07.60 06.10	6.85
10	Aminagad	YI 73.92 (18) CI 105.88 (7)	97.56 (11) 166.66(3)	93.00 (14) 71.43 (9)	92.24 (10) 75.00 (4)	96.63 (13) 148.08 (5)	89.15 (10) 11.76 (10)	118.54 (2) 75.00 (2)	86.03 (16) 266.66 (3)	73.50 (15) 233.33 (1)	92.73 (14) 50.00 (7)	123 55	12.30 05.50	8.90
11	Hunagund	YI 74.09 (17) CI 88.24 (9)	98.02 (10) 50.00 (8)	92.57 (16) 21.43 (13)	91.28 (12) 75.00 (4)	93.97 (18) 233.65 (2)	81.92 (13) 04.71 (11)	119.18 (1) 10.00 (10)	84.61 (17) 133.33 (5)	70.67 (17) 116.66 (5)	88.69 (15) 175.00 (2)	136 69	13.60 06.90	10.25
12	Ilkal	YI 75.33 (15) CI 129.41 (4)	97.56 (11) 116.66 (4)	91.04 (17) 06.42 (15)	92.39 (9) 75.00 (4)	96.20 (15) 232.69 (3)	80.72 (14) 01.18 (12)	113.81 (3) 25.00 (7)	81.79 (18) 30.00 (8)	70.19 (18) 150.00 (3)	83.10 (17) 50.00 (7)	137 67	13.70 06.70	10.20
13	Karadi	YI 75.15 (16) CI 100.00 (8)	95.71 (12) 33.33 (9)	92.66 (15) 07.14 (14)	90.10 (14) 75.00 (4)	97.81 (11) 283.33 (12)	80.72 (14) 01.18 (12)	113.68 (4) 75.00 (6)	88.27 (13) 13.33 (10)	73.18 (16) 133.33 (4)	84.73 (16) 25.00 (8)	131 76	13.10 07.60	10.35
14	Jamakhandi	YI 107.40 (12) CI 70.58 (11)	83.68 (16) 08.33 (11)	108.16 (3) 164.28 (3)	121.19 (2) 125.00 (2)	102.61 (5) 23.55 (17)	119.27 (3) 270.59 (2)	78.00 (18) 15.00 (8)	111.42 (4) 26.66 (9)	117.77 (1) 66.66 (8)	105.03 (4) 75.00 (6)	68 77	06.80 07.70	7.25
15	Savalagi	YI 110.04 (10) CI 105.88 (7)	87.84 (13) 33.33 (9)	105.47 (5) 157.14 (4)	118.83 (3) 100.00 (3)	104.42 (3) 52.12 (11)	106.02 (5) 200.00 (3)	80.69 (16) 75.00 (6)	110.67 (5) 33.33 (7)	114.29 (3) 66.66 (8)	97.41 (12) 50.00 (7)	75 65	07.50 06.50	7.00
16	Teradal	YI 109.33 (11) CI 29.41 (14)	87.15 (14) 08.33 (11)	107.33 (4) 164.28 (3)	122.00 (1) 150.00 (1)	102.73 (5) 13.53 (18)	120.68 (2) 288.23 (1)	79.93 (17) 05.00 (11)	110.06 (6) 26.66 (9)	116.38 (2) 16.66 (10)	102.76 (6) 100.00 (5)	68 83	06.80 08.30	7.55
17	Mudhol	YI 117.09 (4) CI 35.29 (13)	81.13 (17) 10.00 (10)	111.13 (1) 142.86 (6)	117.87 (4) 150.00 (1)	97.87 (10) 48.76 (12)	126.50 (1) 288.23 (1)	89.89 (14) 12.50 (9)	117.16 (1) 33.33 (7)	111.47 (4) 83.33 (7)	110.20 (2) 75.00 (6)	58 72	05.80 07.20	6.50
18	Lokapur	YI 113.74 (7) CI 129.41 (4)	84.37 (15) 33.33 (9)	108.53 (2) 121.43 (7)	115.36 (5) 150.00 (1)	96.94 (12) 34.74 (15)	112.04 (4) 158.82 (4)	87.34 (15) 125.00 (5)	115.19 (2) 33.33 (7)	109.53 (5) 50.00 (9)	107.93 (3) 150.00 (3)	69 64	06.90 06.40	6.65

Note- Yield of Cotton is in Bale/hectares

BAGALKOT DISTRICT

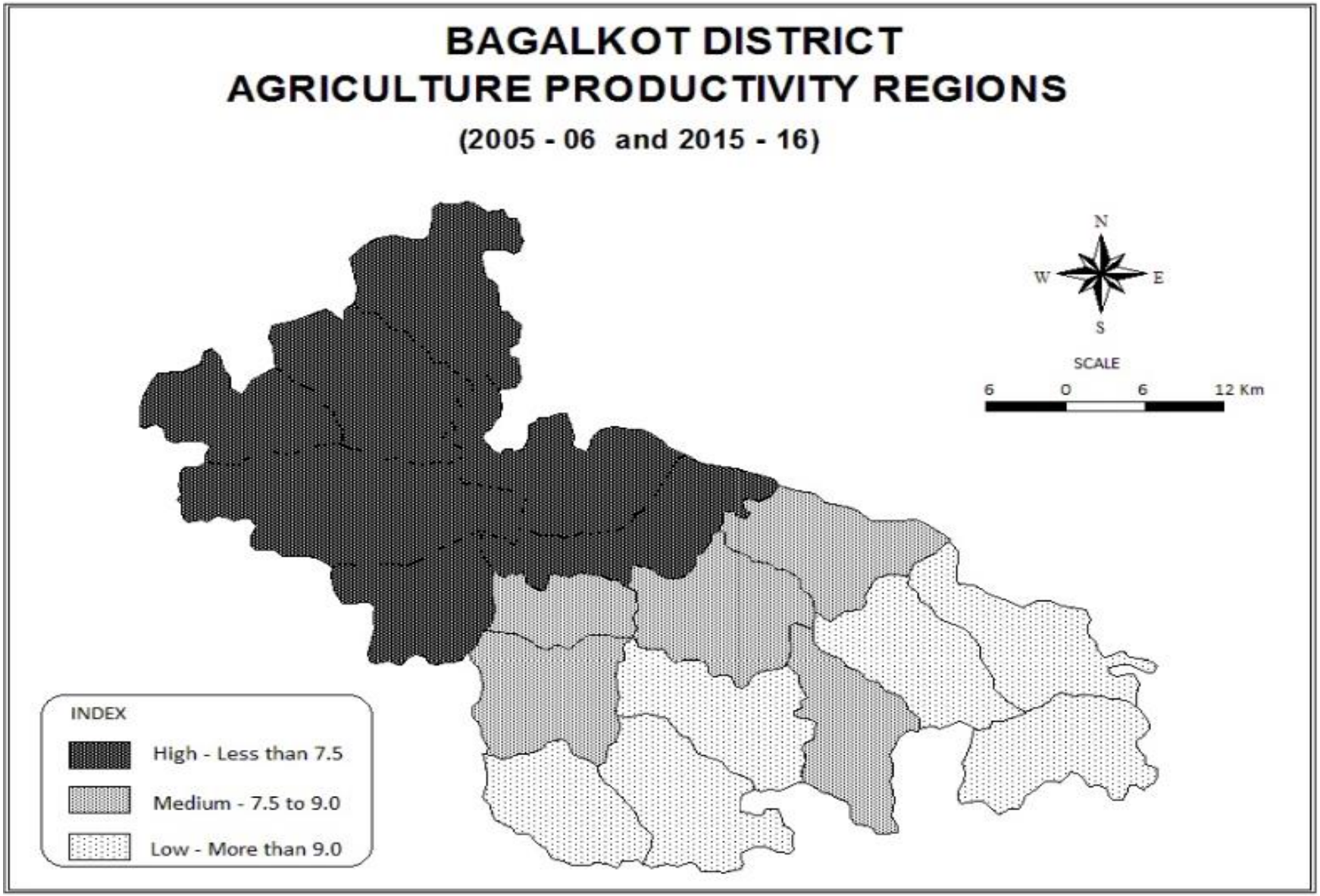
AGRICULTURE PRODUCTIVITY REGION

(2005-06 and 2015-2016)

	2005-06				2015-2016			
Sl no	category	Range of index	No. of Revenue Circles	Name of the Revenue circles	Category	Range of index	No. of Revenue Circles	Name of the Revenue circles
I	High	< 7.5	7	Anagawadi, Bilagi Jamakhandi, Savalagi,Teradal, Mudhol and Lokapur.	High	< 7.5	9	Badami, Kerur, Kulageri, Anagawadi, Bilagi, Jamakhandi, Savalagi, Mudhol and Lokapur.
II	Medium	7.5 to 9	5	Kerur, Bagalkot, Kaladagi, Sitimani, and Aminagad.	Medium	7.5 to 9	6	Guledagudd, Bagalkot, Kaladagi, Sitimani, Aminagad and Teradal.
III	Low	>9	6	Badami, Guledagudd, Kulageri, Hunagund, Ilkal and Karadi.	Low	>9	3	Hunagund, Ilkal and Karadi.

- Note: Index values are categorized on the basis of mean and standard deviation method.

  : Lower the index value higher will be the productivity and vice- versa.


BAGALKOT DISTRICT
AGRICULTURE PRODUCTIVITY REGIONS
(2005 - 06 and 2015 - 16)
N
W
E
S
SCALE
6 0 6 12 Km
INDEX
High - Less than 7.5
Medium - 7.5 to 9.0
Low - More than 9.0

CONCLUSION: The study reveals that low productivity was concentrated in those areas were non irrigated belts or hilly terrain and lack in modernization of agriculture. The high productivity was found especially in irrigated belts. The profitability of agriculture has greatly increased due to the impact of the sources of irrigation, assured rainfall condition, improved seeds and fertile soils in the region.

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