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Changing Scenario Of Crop Intensity In Koppal District: A Geographical Study

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Abstract: In this paper, the shifting cropping intensity pattern in Koppal district is described, followed by a review of the area under specific crops. Bhatia's approach is used to concentrate selected crops. This report attempts to analyze changes in crop concentration in the study region. There has been tremendous variance in the area. Patrons of crop concentration in the research area. The crop concentration area indices were calculated for the years 2011 and 2021. The spatial differences in crop concentration were discovered to be the outcome of several interactions such as physiographic, climatic, hydrological, socioeconomic, and technological aspects in cultivational techniques and cropping patterns in the research area.

Key Words: Cropping pattern, Crop concentration index, GIS.

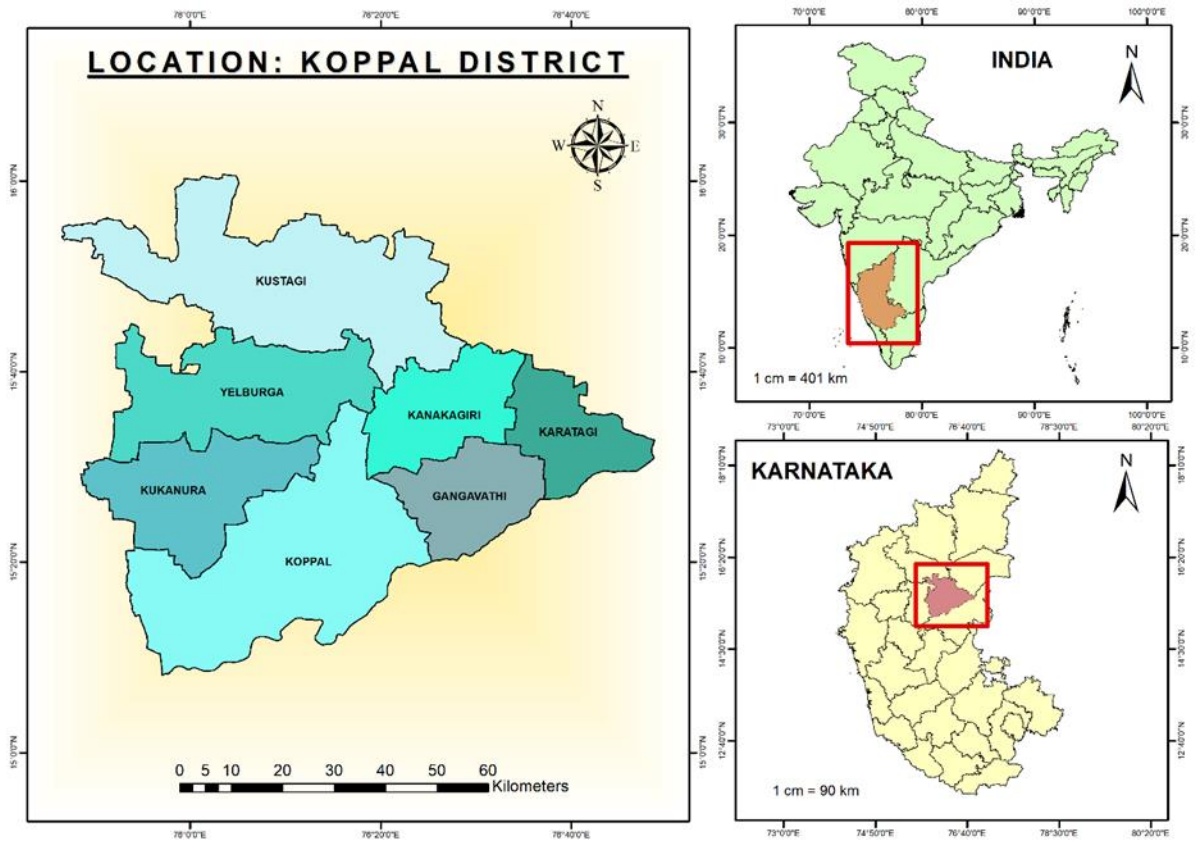
Introduction: Cropping Pattern refers to the proportion of area covered by various crops at a given site as it changes over time. Geo-climatic conditions have a significant impact on cropping patrons in a given region. Socioeconomic, historical, and political aspects (Hussain, M. 1996). Crop land use patterns in a region reflect the combined effect of the physical and human environments. Differences in attitudes regarding rural land. The level of prosperity and technology have changed. With emphasis. Their impact on landscape and land use traditions is expected to be far-reaching (Coppock, 1968). The current cropping pattern is heavily influenced by weather conditions. Cropping patterns vary depending on terrain. Topography. Soil. Slope, water availability for irrigation, pesticide, fertilizer, and mechanized application.

In layman's terms, cropping pattern refers to the amount of land planted with different crops at a given moment. It is a dynamic concept since no cropping pattern can be fixed to be optimal at all times in a certain region. It evolves in space and time to suit needs and is mostly driven by physical, cultural, and technological variables. The change in crop impact, particularly over time, clearly demonstrates the changes that have occurred in agricultural progress. These changes are caused by socioeconomic influence.

The many geographers used the location quotient approach to determine the degree of crop concentration in a certain research zone. Crop concentration refers to the aerial density of an individual crop. Crop concentration, on the other hand, shows the variation in the density of any crop in a specific location over time (Chouhan 1987). Florence (1948), Chishlom (1962), Bhatia (1965), and Jasbir Singh (1975) were pioneer geographers who contributed to the identification of agricultural regions using the quotient approach.

Study area: Koppal district is located in the northern region of Karnataka state. The district covers an area of 5,52,495 hectares between the latitudes 15°09′ to 16°03′ north and 75°47′ to 76°48′ east longitude. According to Peter Hogget's shape index approach, the district's shape resembles an inverted triangle. It consists of four talukas: Gangavati, Koppal, Kushtagi, and Yelburga. Later in 2017, three additional talukas were formed: Kanakagiri, Karatagi, and Kukanur, bringing the district's total to seven. The district is bordered in the north by Raichur and Bagalkot districts, in the west by Gadag district, in the south by Bellary district, and in the east by Bellary and Raichur districts. All of the districts surrounding Koppal belong to the state of Karnataka. The area is located in the Tungabhadra sub-basin of the Krishna basin. Tungabhadra River flows along the southern boundary in a north-easterly direction and is the principal perennial river. Tungabhadra River passes through Davangere, Haveri, Gadag, Bellary, and Koppal districts.

Fig no 1 Location of the study area



Objective:

1) To identify areas of crop concentration on the basis of Bhatia's method.

2) To study the crop concentrations in Koppal district during 2010-11 and 2020 -21.

Database and Methodology:

Secondary data was used to create a detailed picture of land utilization patterns and crop patronage. Obtained from Koppal district's Socio-Economic Abstract at a Glance. The location quotient is calculated using Bhatia's approach to determine crop concentration by taluk. Use the following formula. to determine crop concentration in Koppal District.

$$\text{Index for determining concentration of crop 'a'} = \frac{\text{Area of crop 'a' in the component areal unit (taluka)}}{\text{Area of all crops in the component areal unit (taluka)}} \div \frac{\text{Area of crop 'a' in the entire region (taluka)}}{\text{Area of all crops in the entire region (taluka)}}$$

Higher the index value of a crop. The bigger the concentration, the larger the region under that crop. This would give us an estimate of crop concentration. This strategy was acceptable in the current investigation. It was implemented in the years 2010–11 and 2020–21. The index values have been divided into three classes: i) High, ii) Medium, and iii) Low crop concentration.

Using the Arc- GIS software maps have been prepared based on the above classes.

Results and Discussion:

Paddy:

In 2010-11, Gangavathi Taluka had a high proportion of paddy. Koppal, Kustagi, and Yelburga Talukas have low concentration levels. However, no medium concentrations of paddy were detected in the district.

In 2020-21, there is a large concentration of Add yeast pound in Gangavathi and Karatagi Taluka. Kukanuru Taluka contains a medium concentration. Low concentrations are reported in Koppal, Kanakagiri, Kustagi, and Yelburga Talukas.

Gangavathi taluka has a high concentration in both the 2010-11 and 2020-21 study periods, as does Karatagi in 2020-21, because these talukas receive adequate rainfall and irrigation for crop growth.

Jowar:

In 2010- 11 the high concentration of Jowar is found in Yelburga taluka. Medium concentration is found in Kustagi taluka. And low concentration is found in Gangavathi, and Koppal talukas.

In 2020-21 High concentration of Jowar is found in Kukanuru, and Kustagi talukas. Medium concentration is found in Yelburga, and Koppal talukas. And Low concentration is found in Karatagi, Gangavathi, and Kanakagiri talukas.

In the year 2010-11 Yelburga was in high concentration it is slopped to medium concentration in 2020-21 due to division of the taluka. Kustagi taluka is in medium concentration in the year 2010-11 it is jumped to high concentration in the year 2020-21. Koppal taluka is in low concentration in the year 2010-11 it is jumped to medium concentration in the year 2020-21. Only Gangavathi taluka remains in low concentration in both the study periods.

Table- 1

Koppal District

Crop Concentration Indices 2010-11

(An Application of Location Quotient Method by Bhatia's)

Sl no	Name of the Taluk	Paddy	Jowar	Bajra	Maize	Ragi	Wheat	Minor millet	Tur	Horse gram	Green gram	Bengal gram	Ground nut	Sun flower	Cotton	Sugar cane
1	Gangavathi	2.69	0.48	0.27	0.21	0	0.05	0.60	1.75	0.5	0.66	0.83	0.84	1.23	0.47	0.8
2	Koppal	0.41	0.70	1.04	2.37	0	0.87	0.79	0.75	0.79	0.83	1.04	1.26	0.73	1.1	4.52
3	Kustagi	0.009	1.42	2.04	0.57	0	0.90	1.08	1.33	1.40	1.18	0.74	0.79	1.1	0.67	0
4	Yelburga	0.005	1.8	1.05	1	0	2.47	1.57	0.61	0.94	1.05	1.19	1.06	0.93	1.45	0.017

Note: Low =Below 0.70

Medium = 0.71 to 1.50

High= Above 1.51

Table-2

Koppal District

Crop Concentration Indices 2020-2021

(An Application of Location Quotient Method by Bhatia's)

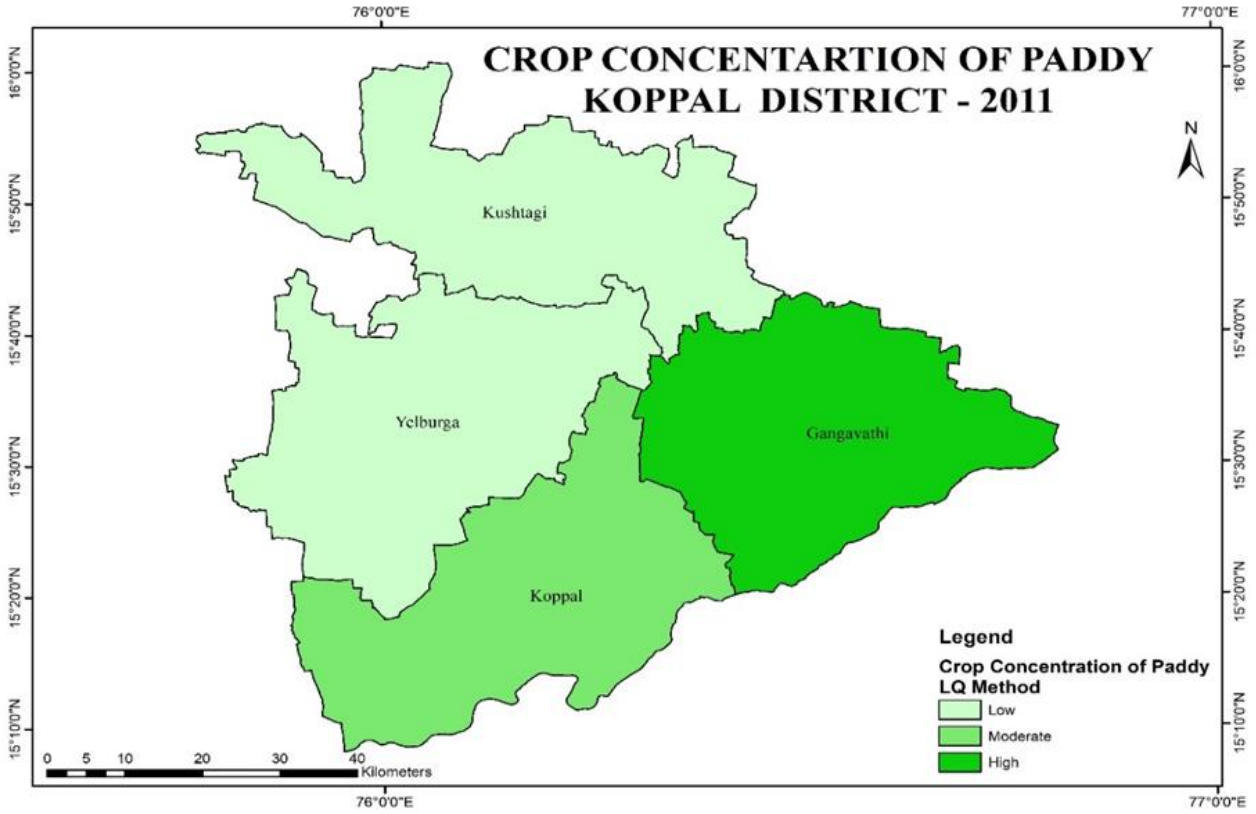
Sl no	Name of the Taluk	Paddy	Jowar	Bajra	Maize	Ragi	Wheat	Minor millet	Tur	Horse gram	Green gram	Bengal gram	Ground nut	Sun flower	Cotton	Sugar cane
1	Gangavathi	2.91	0.025	0.16	0.075	0.25	0	1.33	1	4	0.1	5	1.33	0.83	0.2	0.1
2	Kanakagiri	0.41	0.62	1.87	0.42	1.12	0.05	4.85	2.54	0.9	0.13	0.54	1.09	0.50	4.25	0.05
3	Karatagi	3.05	0.11	0.005	0.006	0.005	0	0.01	0.53	0.007	0.030	1.76	0	4	0.1	1.5
4	Koppal	0.40	1.05	1.05	1.95	0.55	0.8	0.45	0.53	0.76	0.53	1.38	0.59	1.77	1	3.5
5	Kukanuru	1.14	3	0.78	1.71	1.28	5.42	0.42	0.26	0.21	1.17	1.39	1.06	1.18	0.17	0.04
6	Kustagi	0.005	1.75	1.75	0.95	2.3	0.5	1.2	1.69	1.60	1.33	0.54	0.80	0.80	2.30	0.38
7	Yelburga	0.007	1	1.46	1.76	1.3	2.61	0.53	0.68	1.09	1	1.13	1.5	0.50	1.66	0.33

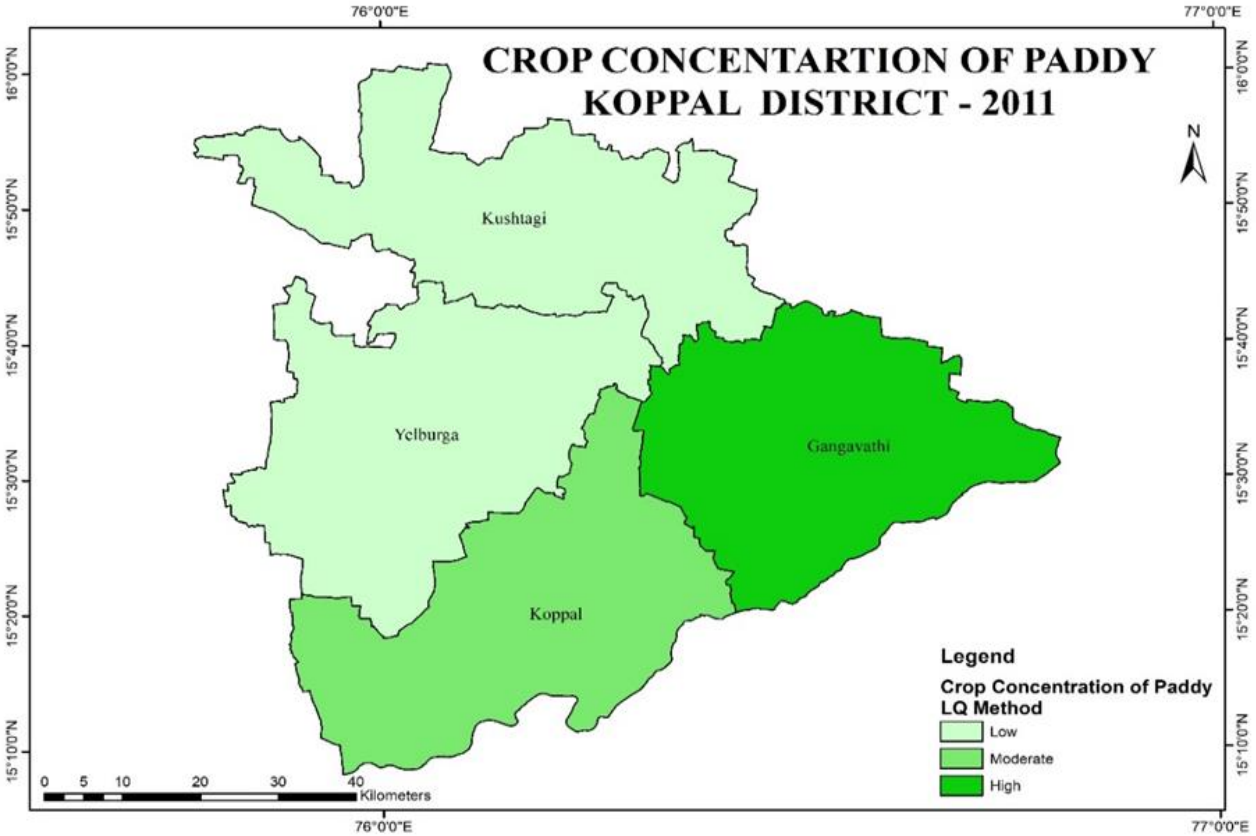
Note: Low =Below 0.70

Medium = 0.71 to 1.50

High= Above 1.5

Fig 1.2 Crop Concentration of Different Crops 2010-11 and 2020-21





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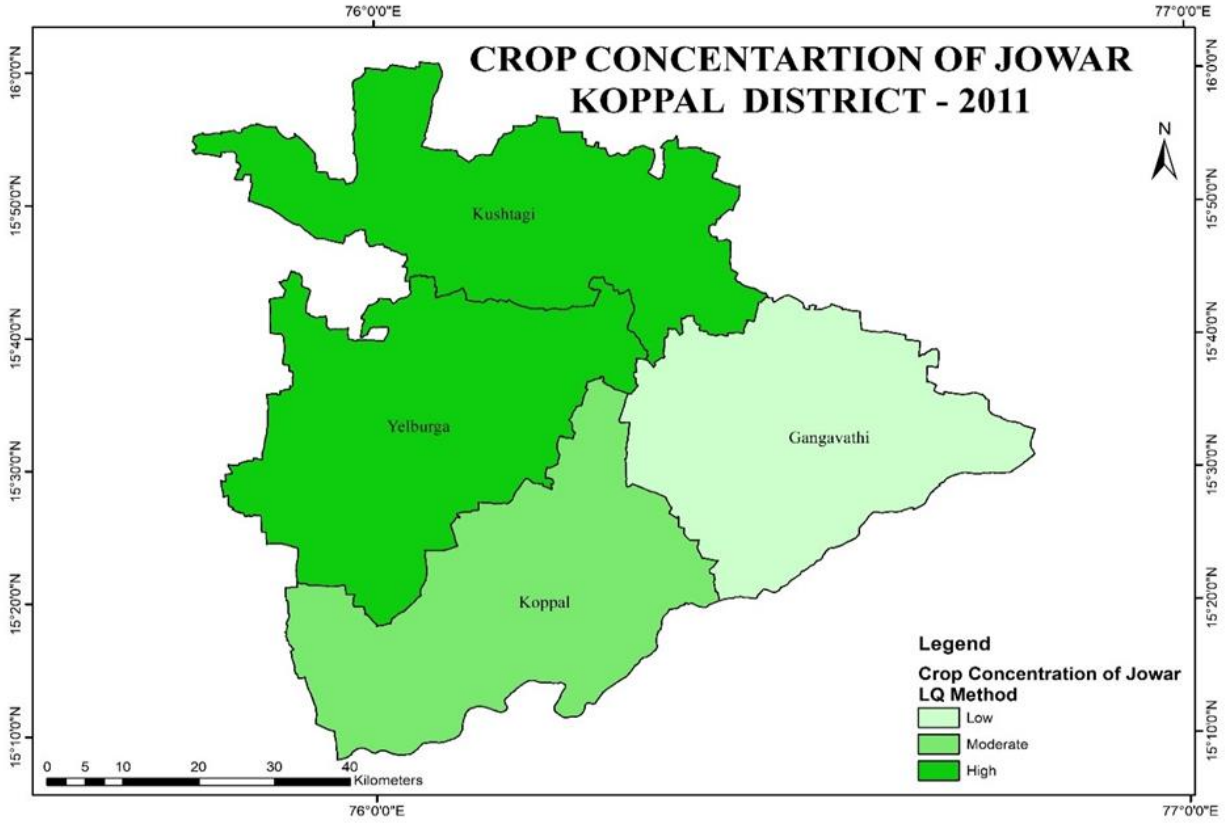
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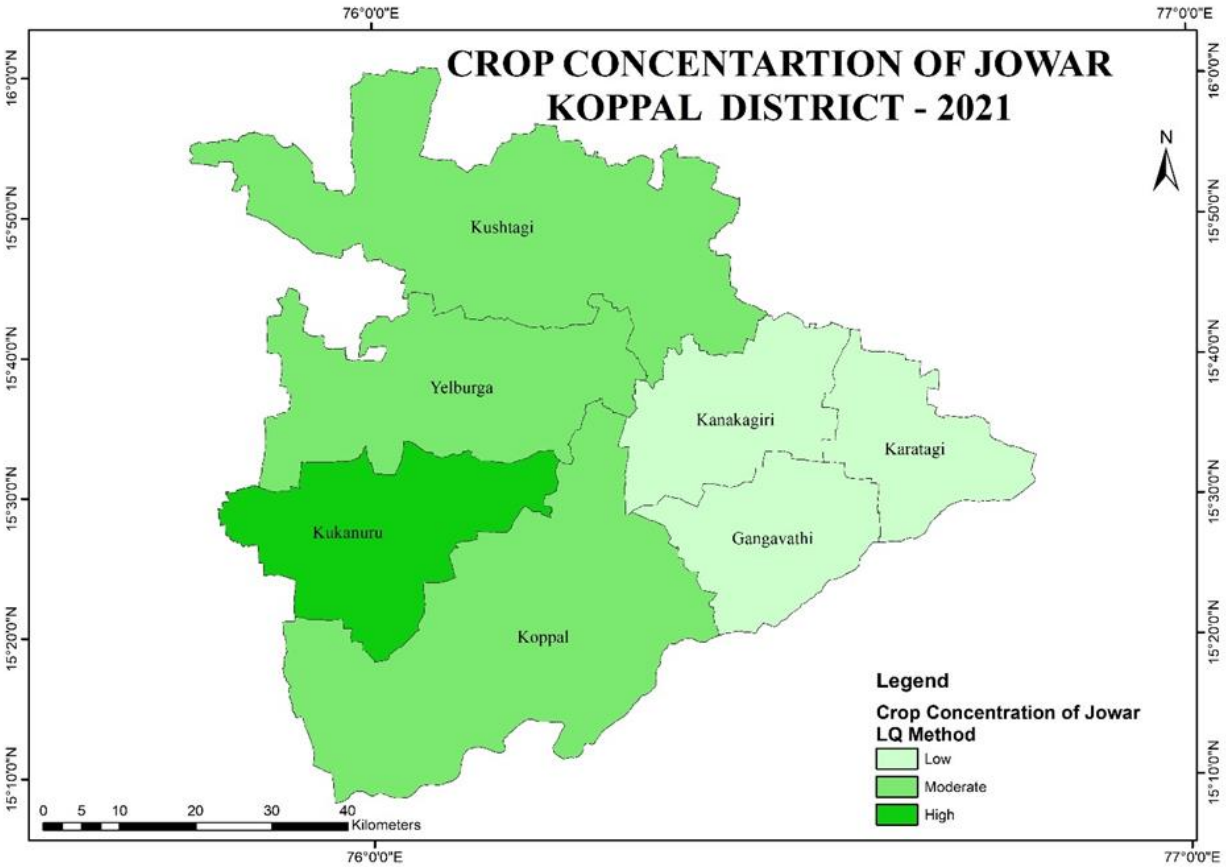
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Jowar
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers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KOPPAL DISTRICT - 2021
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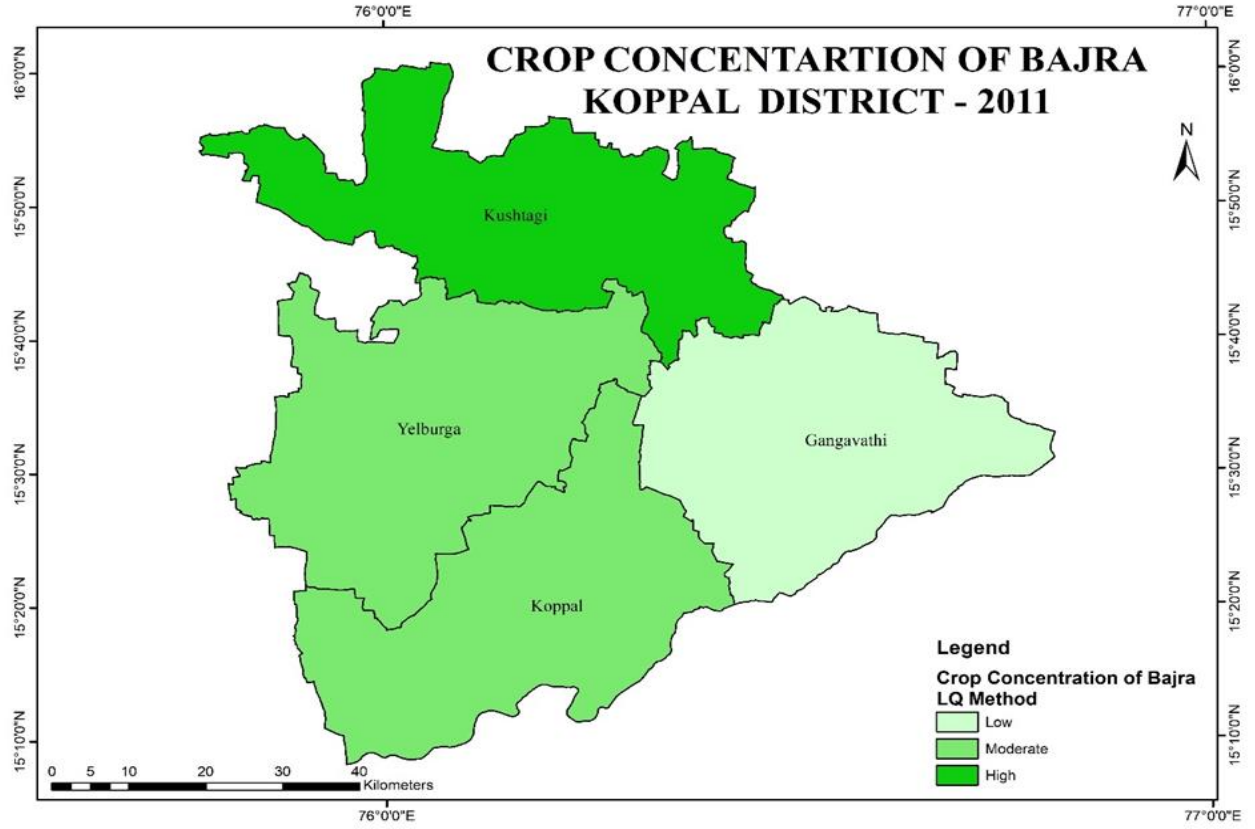
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Jowar
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers

Continued……


CROP CONCENTARTION OF BAJRA
KOPPAL DISTRICT - 2011
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Bajra
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
76°0'0"E
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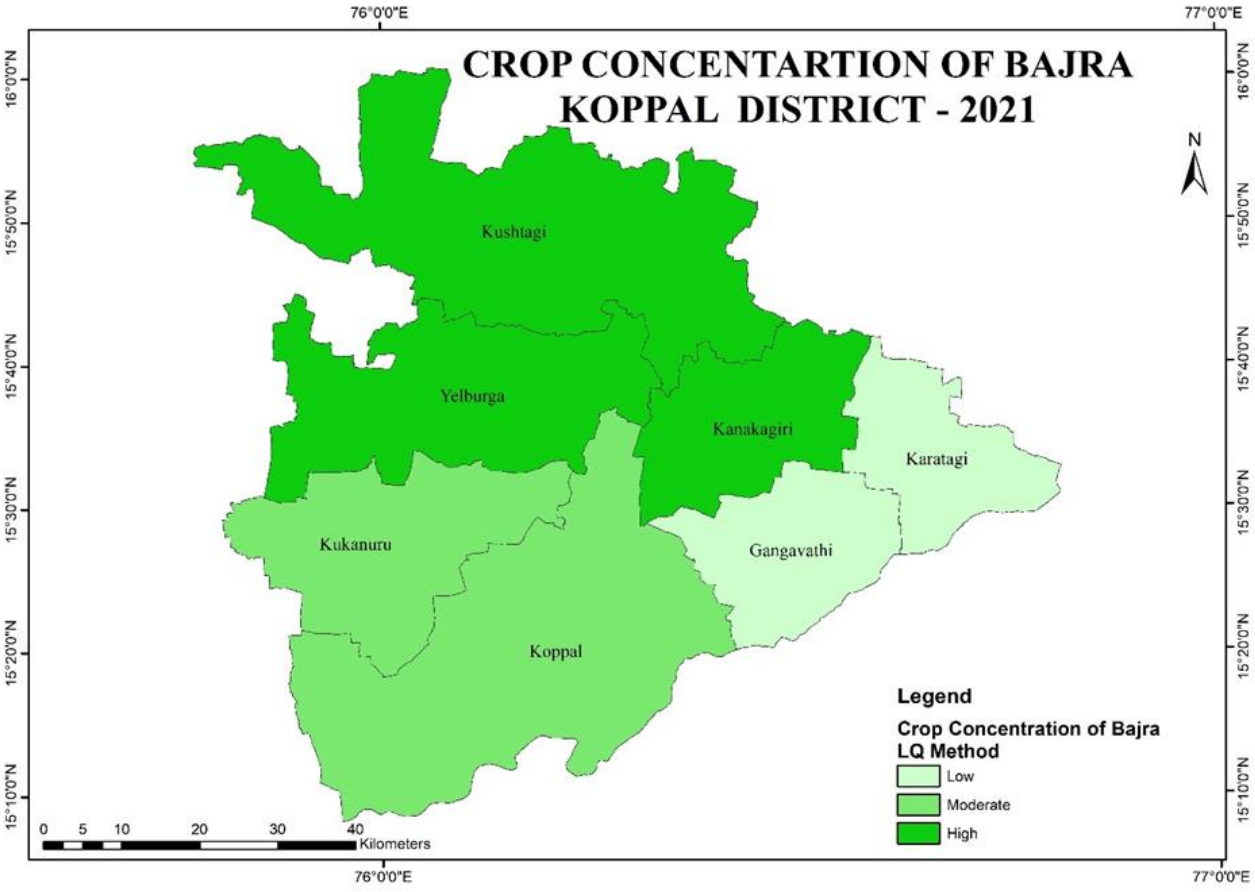
15°10'0"N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KOPPAL DISTRICT - 2021
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Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Bajra
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
76°0'0"E
77°0'0"E
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15°20'0"N
15°10'0"N

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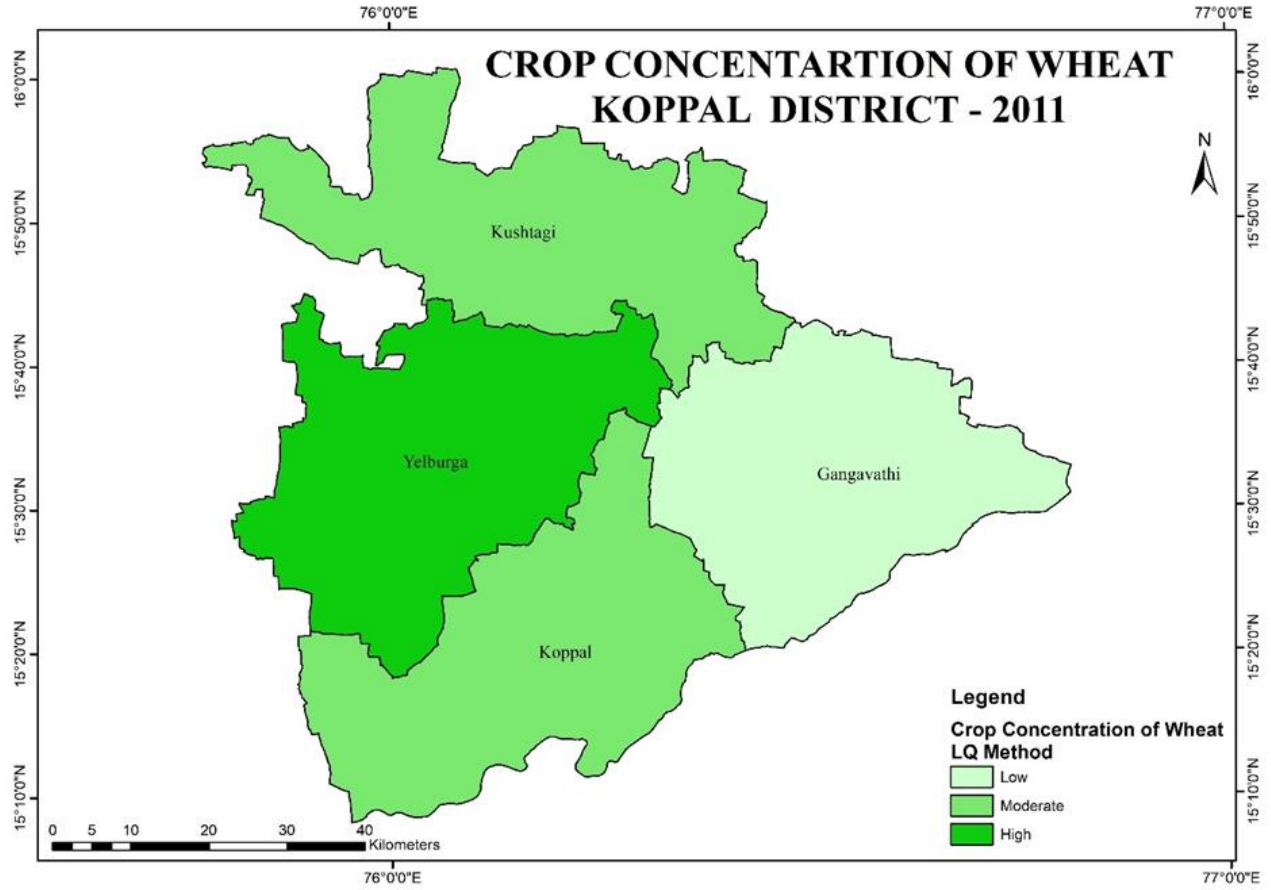
CROP CONCENTARTION OF WHEAT
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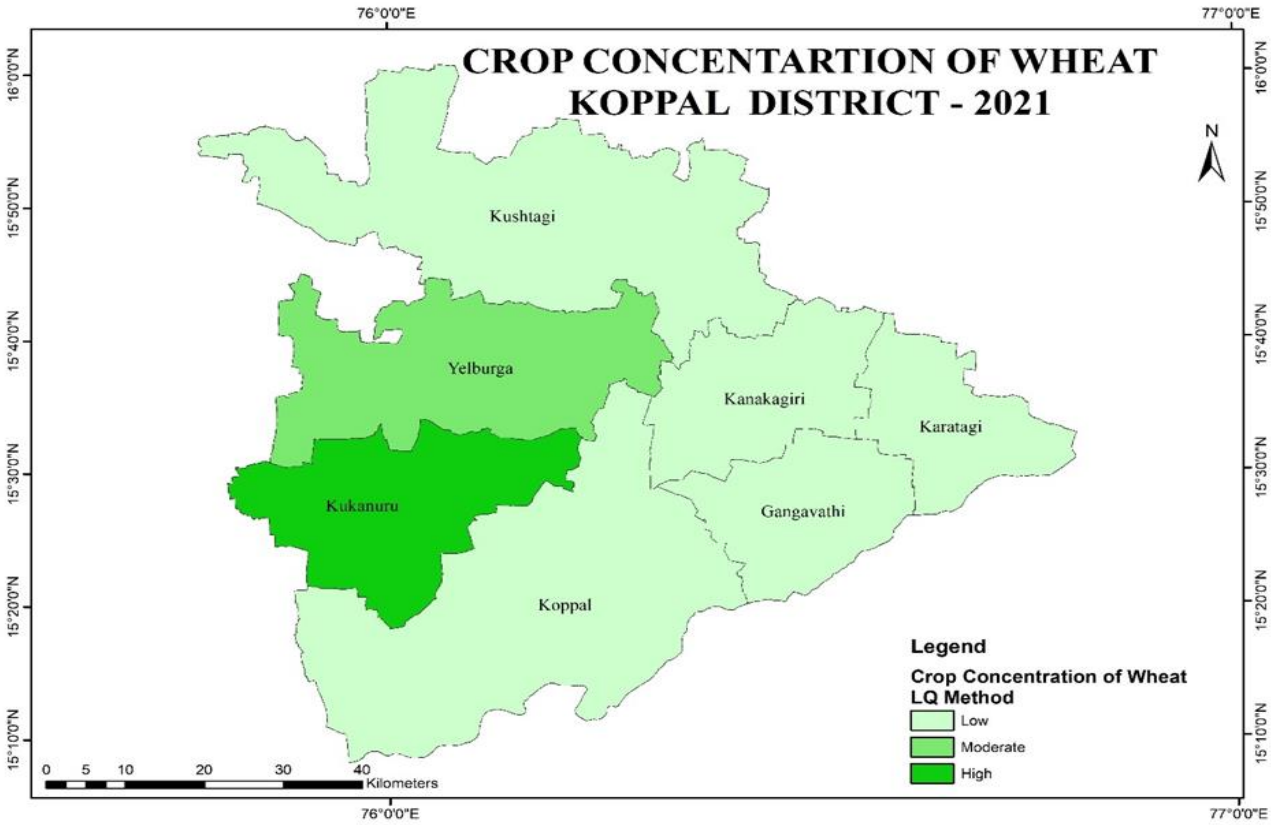
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Wheat
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers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KOPPAL DISTRICT - 2021
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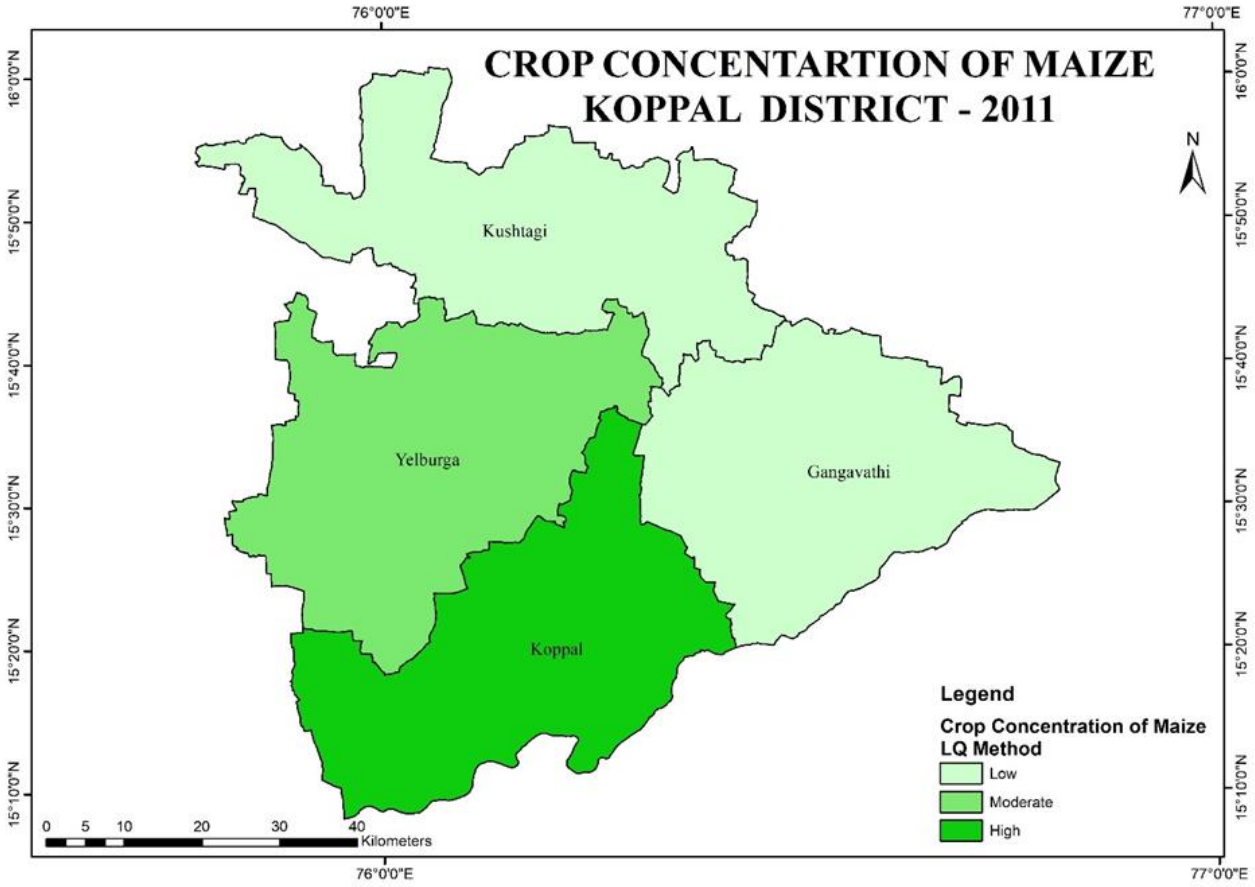
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Wheat
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers

Continued……


CROP CONCENTARTION OF MAIZE
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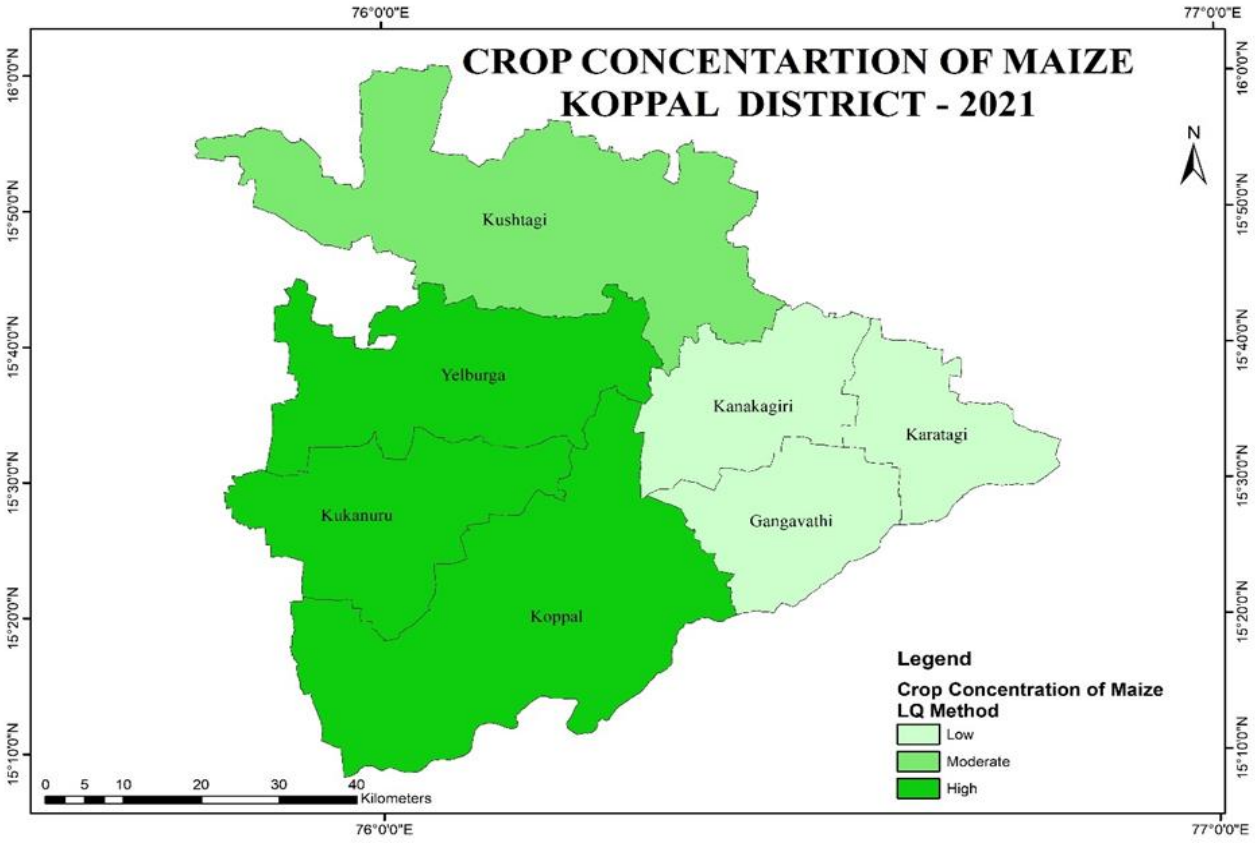
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Maize
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers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KOPPAL DISTRICT - 2021
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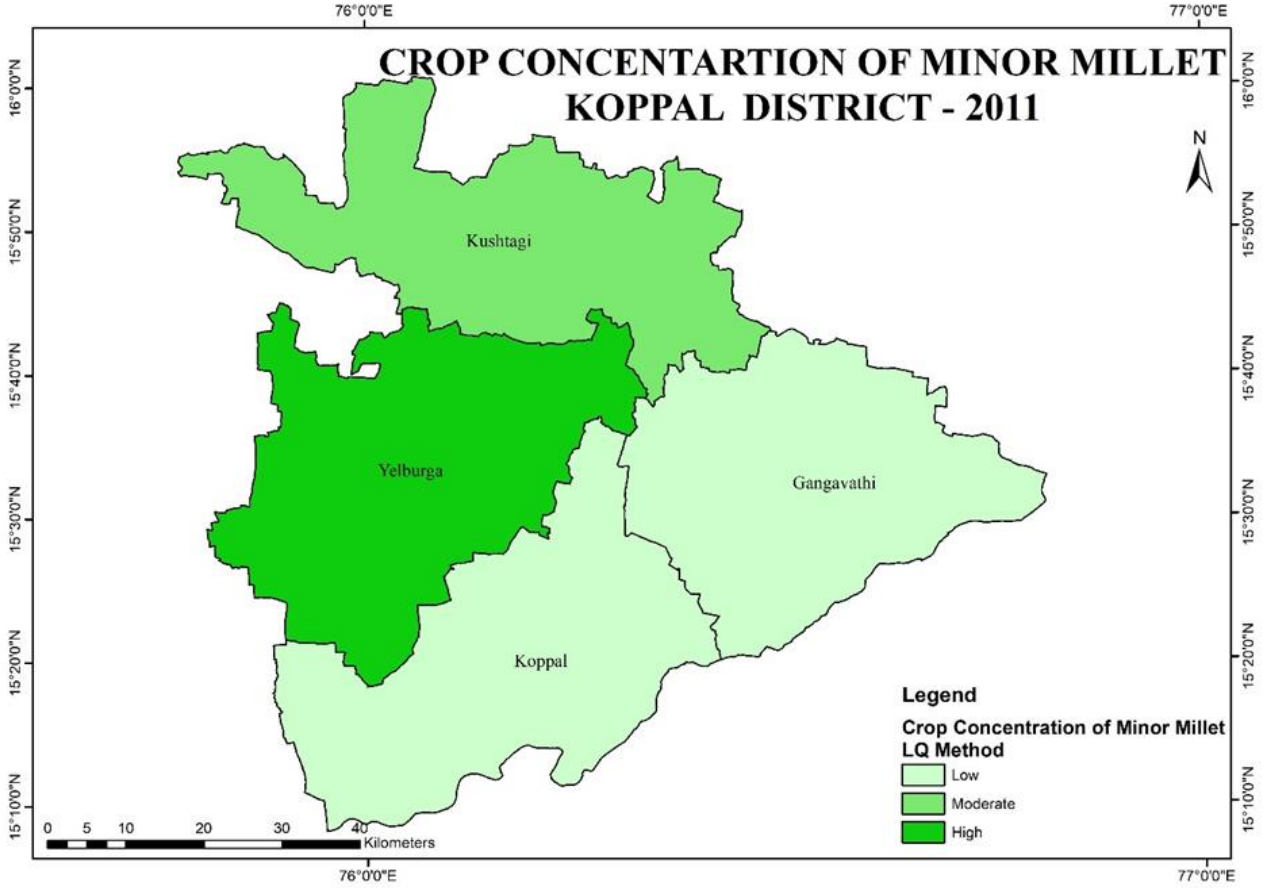
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Maize
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers

Continued……


CROP CONCENTARTION OF MINOR MILLET
KOPPAL DISTRICT - 2011
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Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Minor Millet
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
76°0'0"E
77°0'0"E
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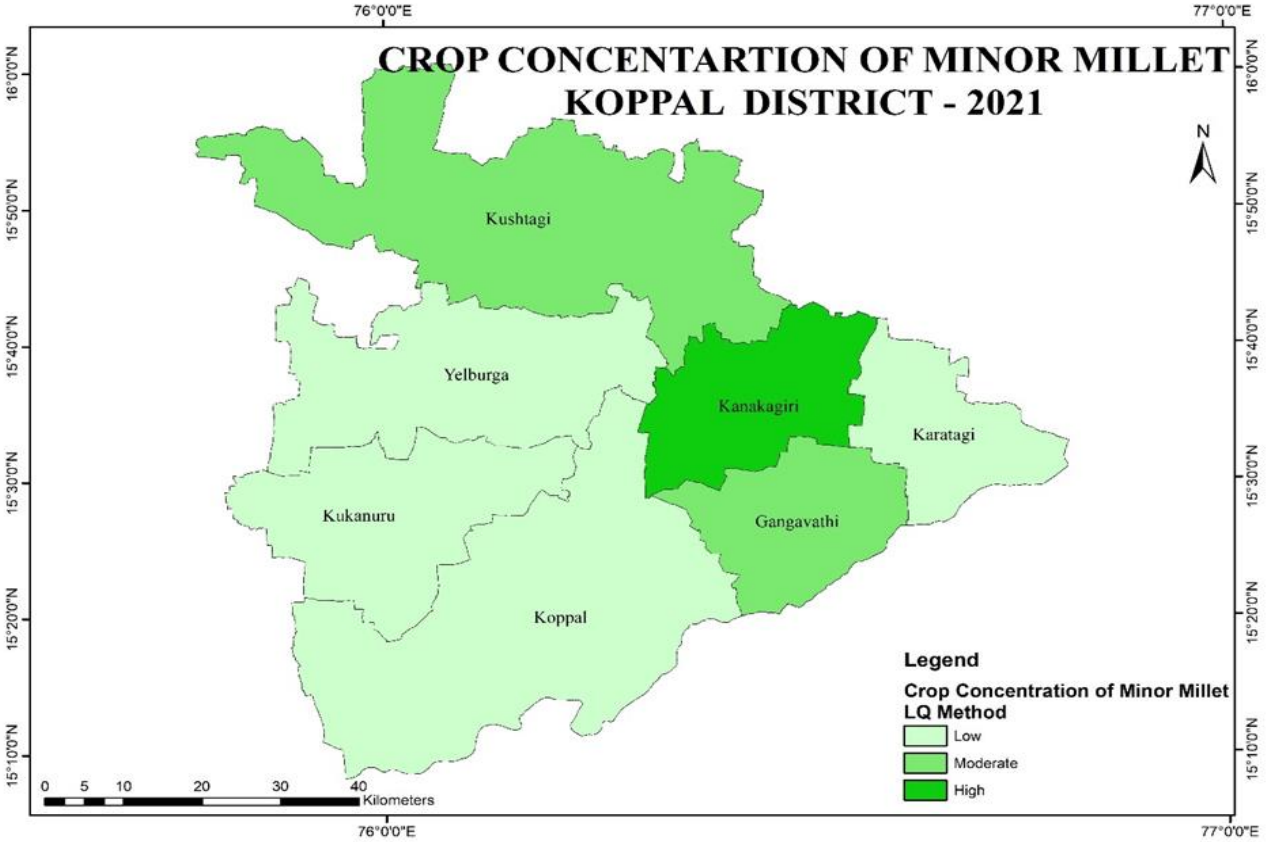
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KOPPAL DISTRICT - 2021
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Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Minor Millet
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
76°0'0"E
77°0'0"E
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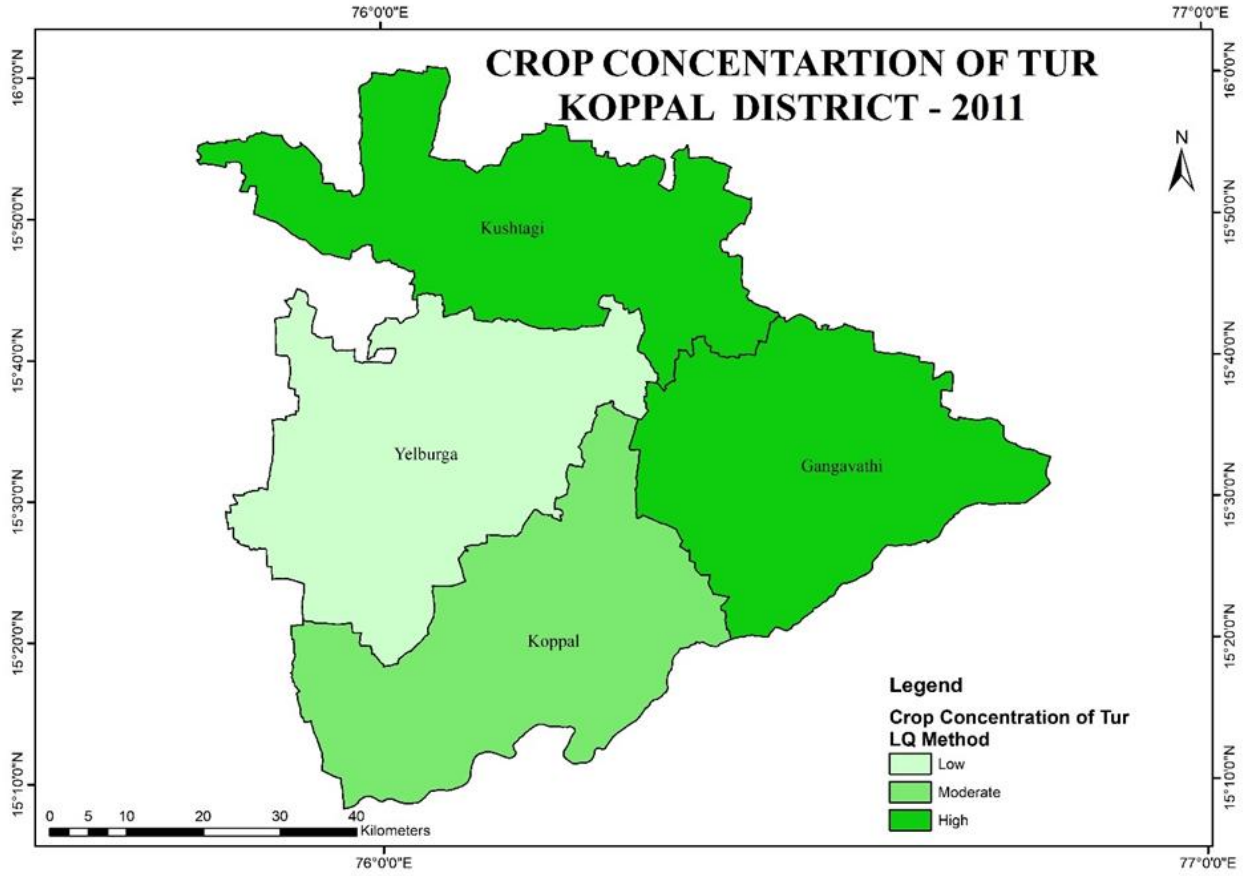
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KOPPAL DISTRICT - 2011
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Tur
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
76°0'0"E
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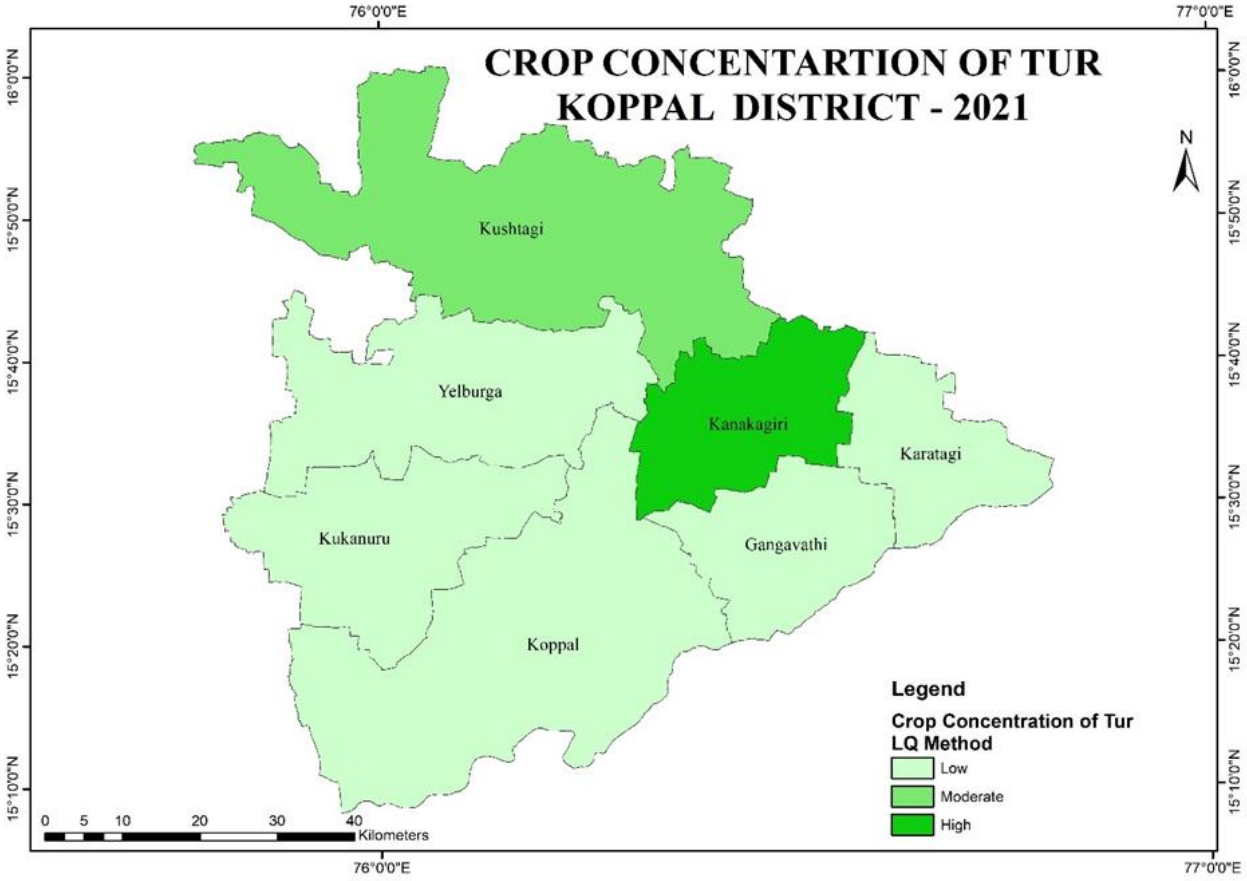
CROP CONCENTARTION OF TUR
KOPPAL DISTRICT - 2021
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Tur
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
76°0'0"E
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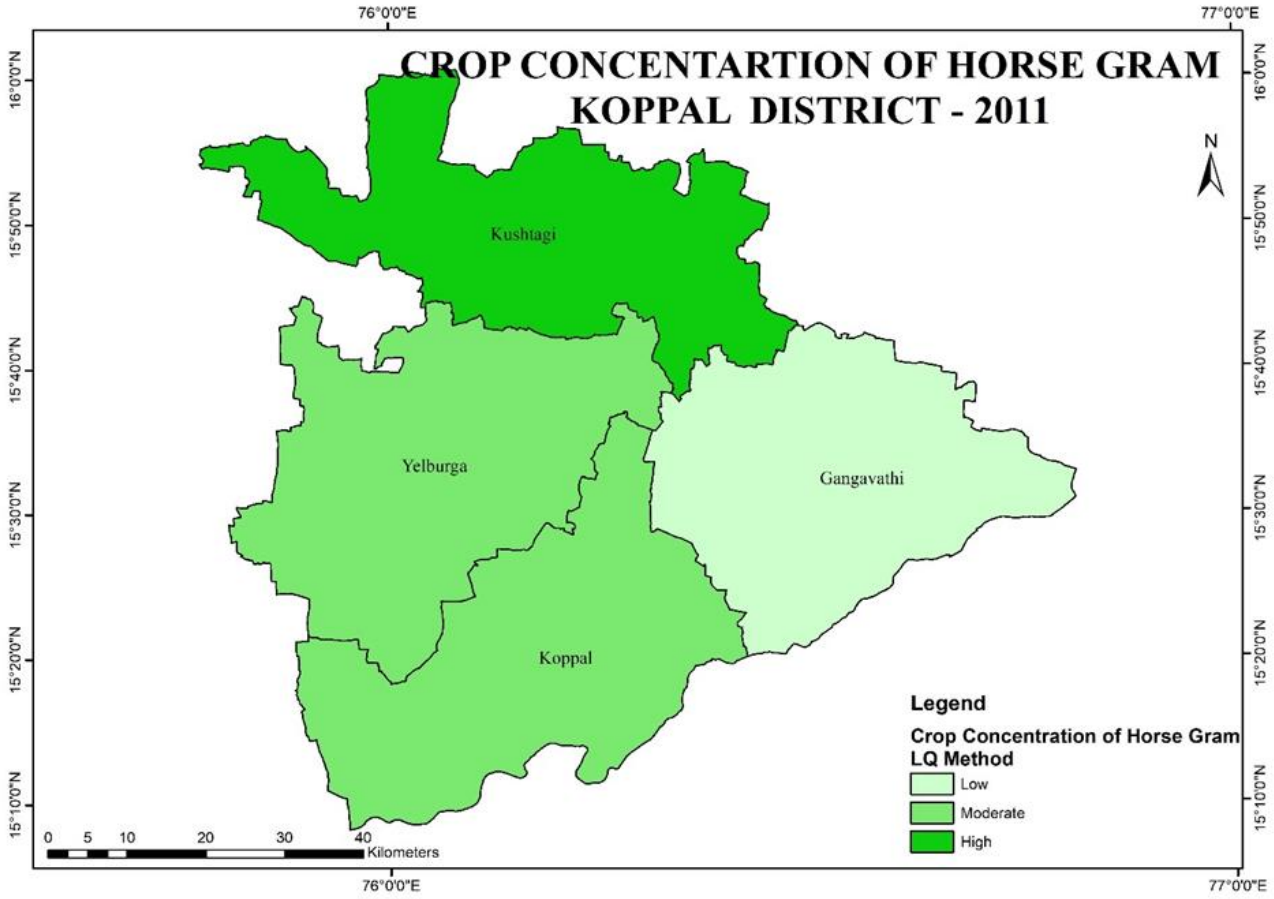
CROP CONCENTARTION OF HORSE GRAM
KOPPAL DISTRICT - 2011
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Horse Gram
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
76°0'0"E
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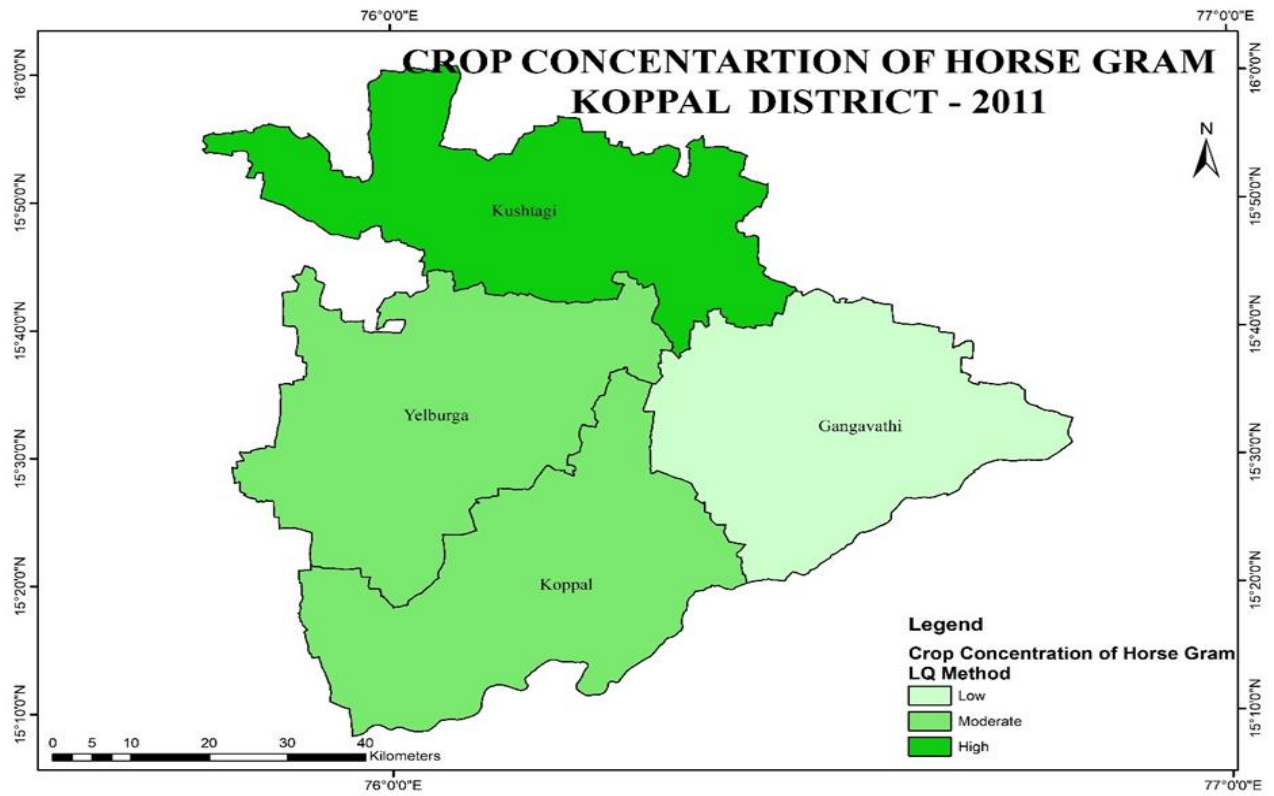
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KOPPAL DISTRICT - 2011
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Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Horse Gram
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
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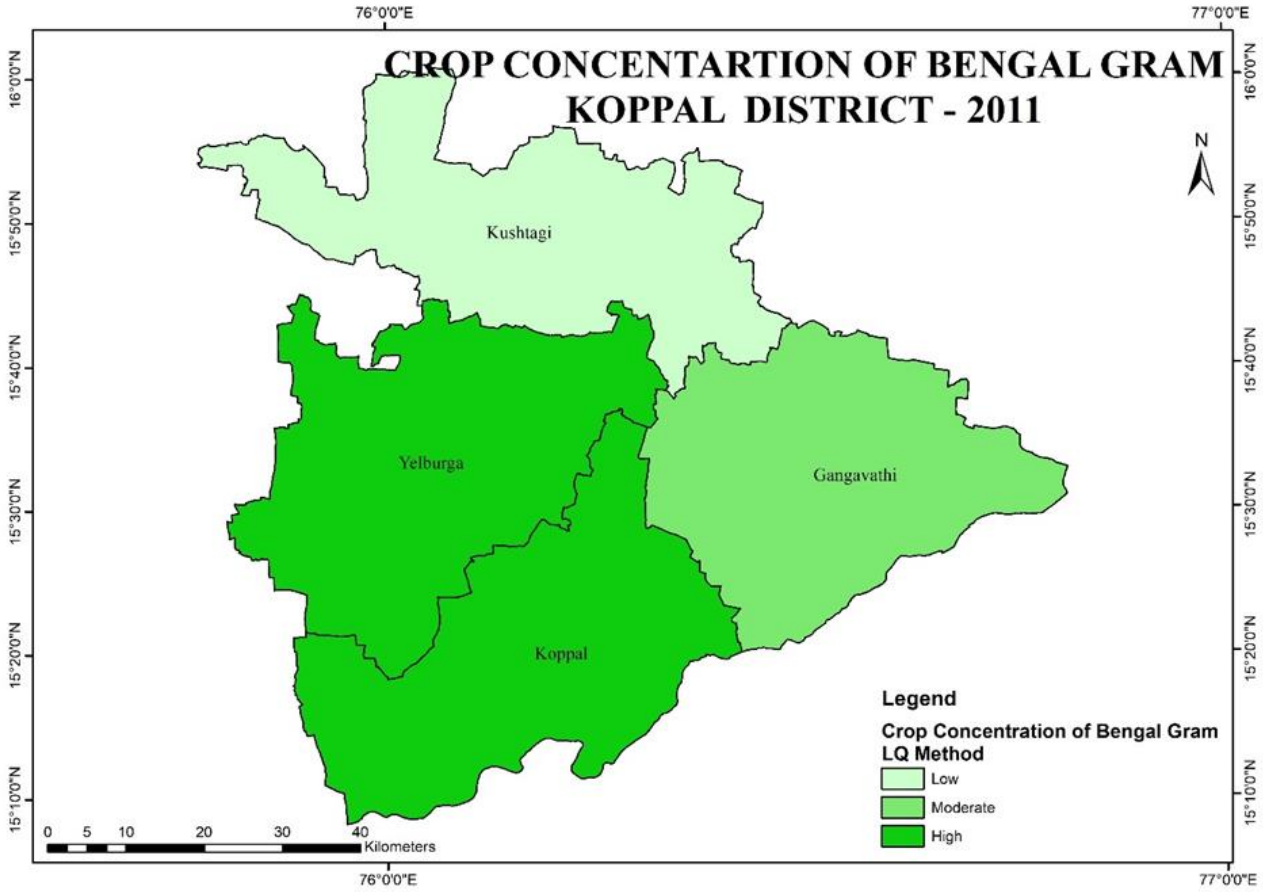
CROP CONCENTARTION OF BENGAL GRAM
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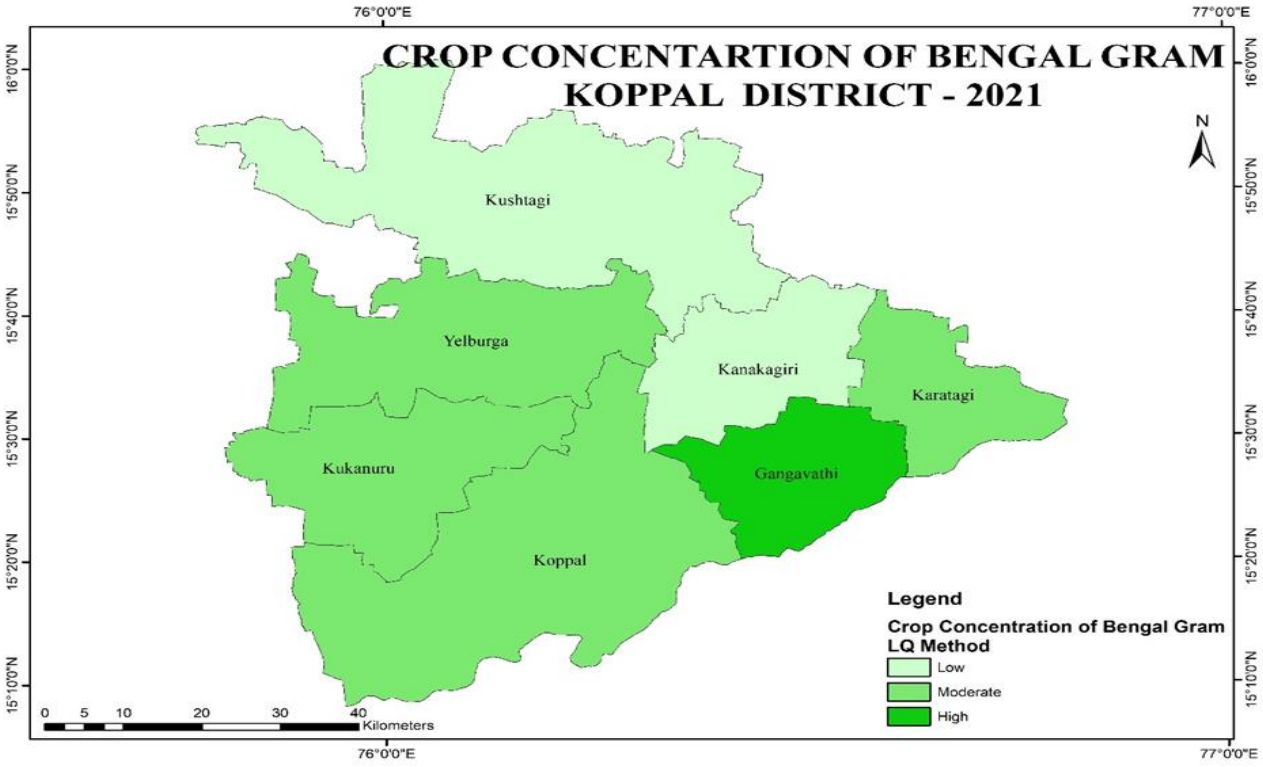
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Bengal Gram
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers


CROP CONCENTARTION OF BENGAL GRAM
KOPPAL DISTRICT - 2021
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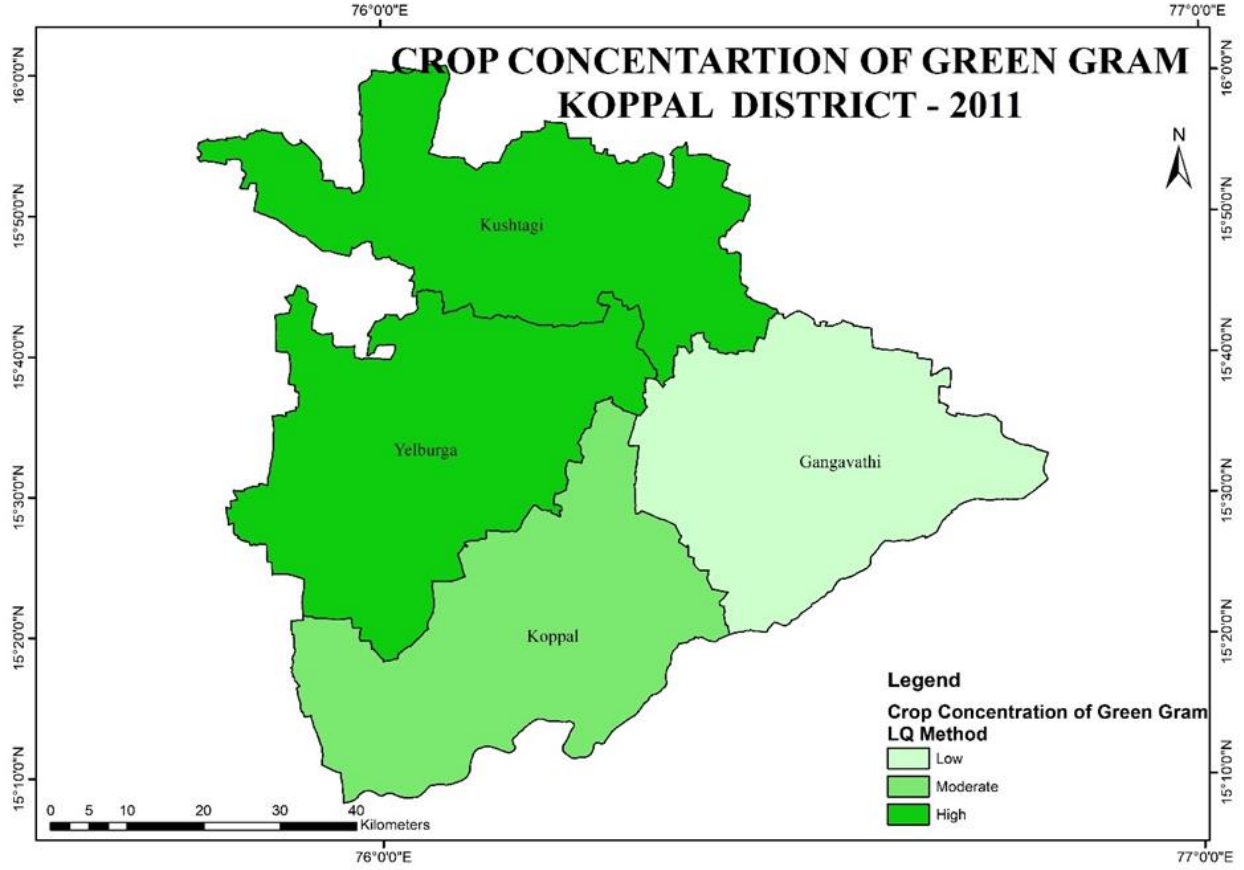
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Bengal Gram
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers

Continued……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KOPPAL DISTRICT - 2011
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15°40'0"N
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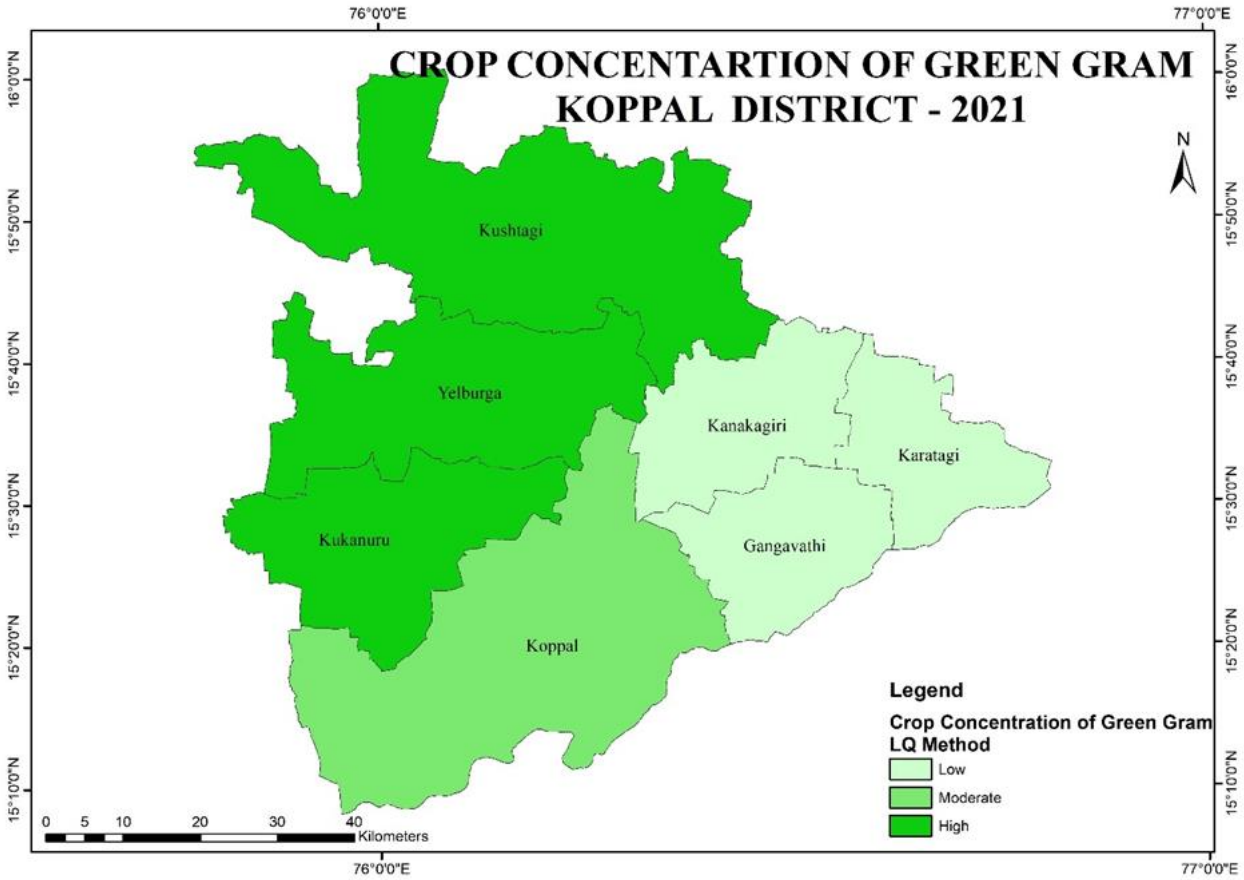
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Green Gram
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers


CROP CONCENTARTION OF GREEN GRAM
KOPPAL DISTRICT - 2021
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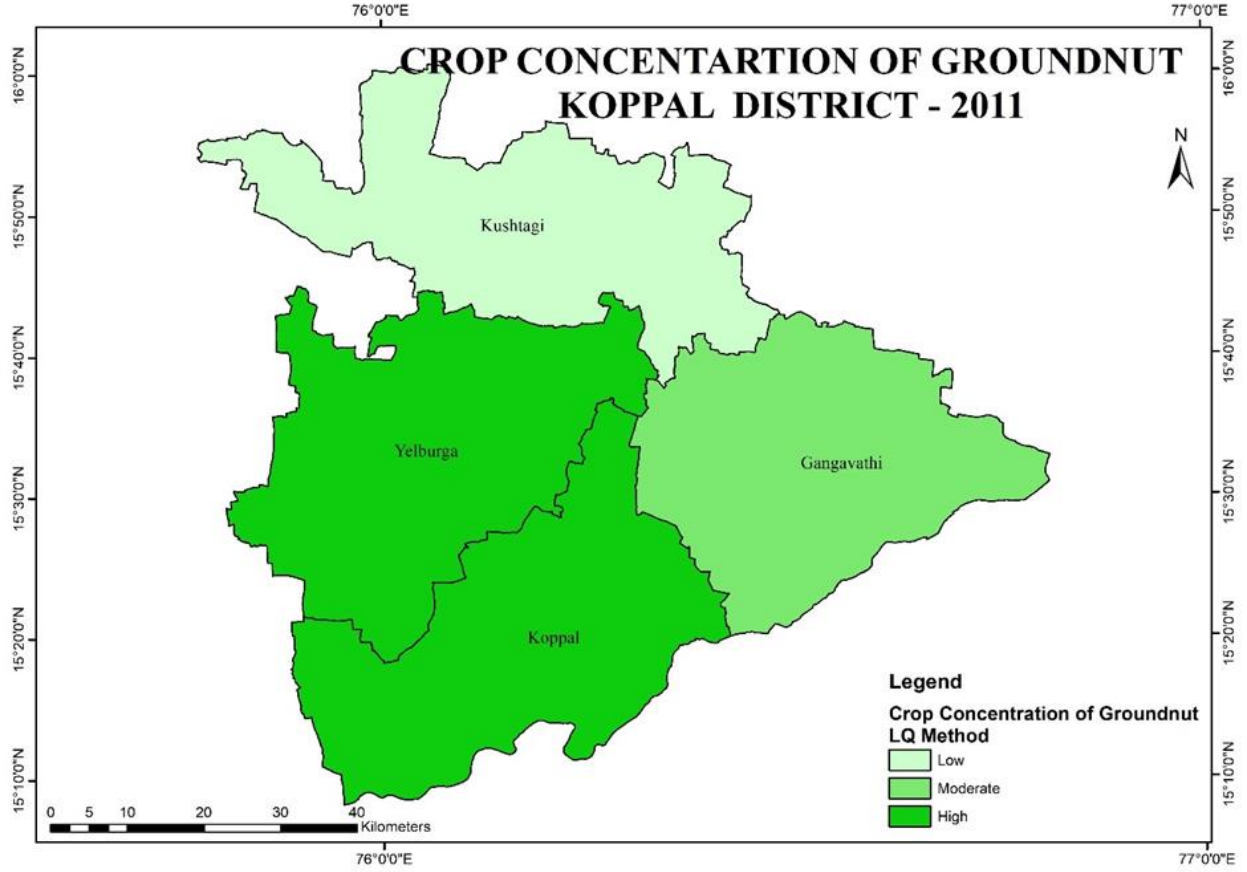
77°0'0"E
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Green Gram
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers

Continued……


CROP CONCENTARTION OF GROUNDNUT
KOPPAL DISTRICT - 2011
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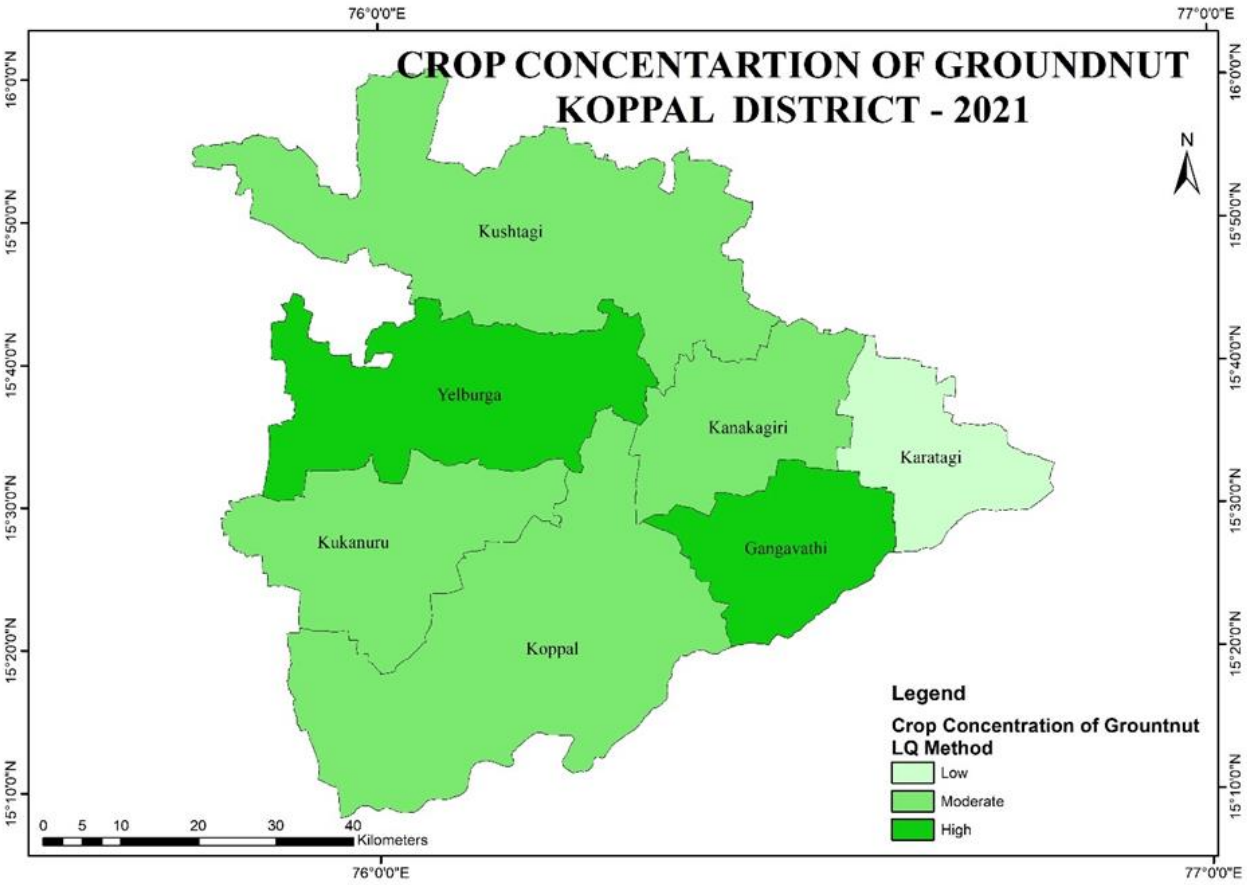
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Groundnut
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers


CROP CONCENTARTION OF GROUNDNUT
KOPPAL DISTRICT - 2021
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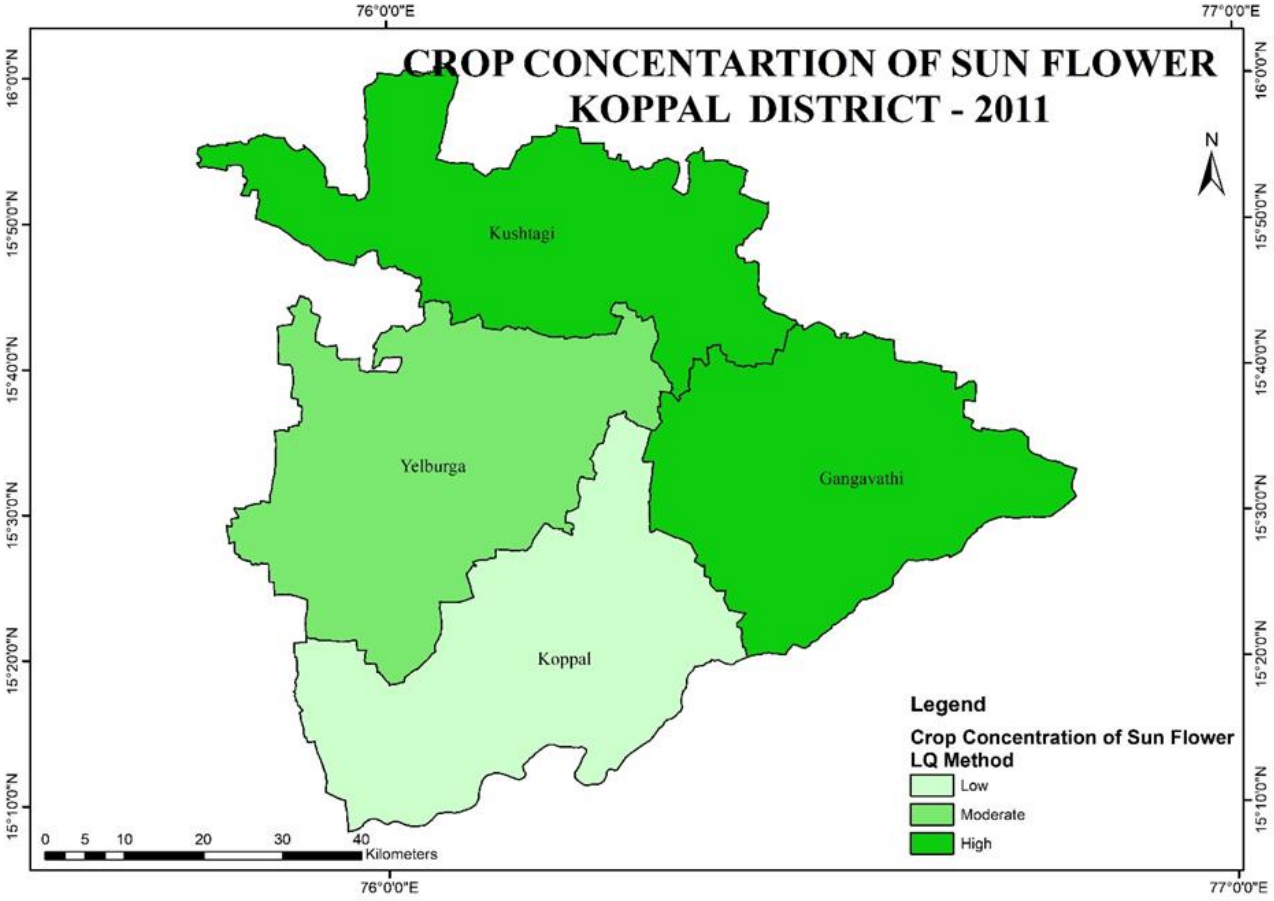
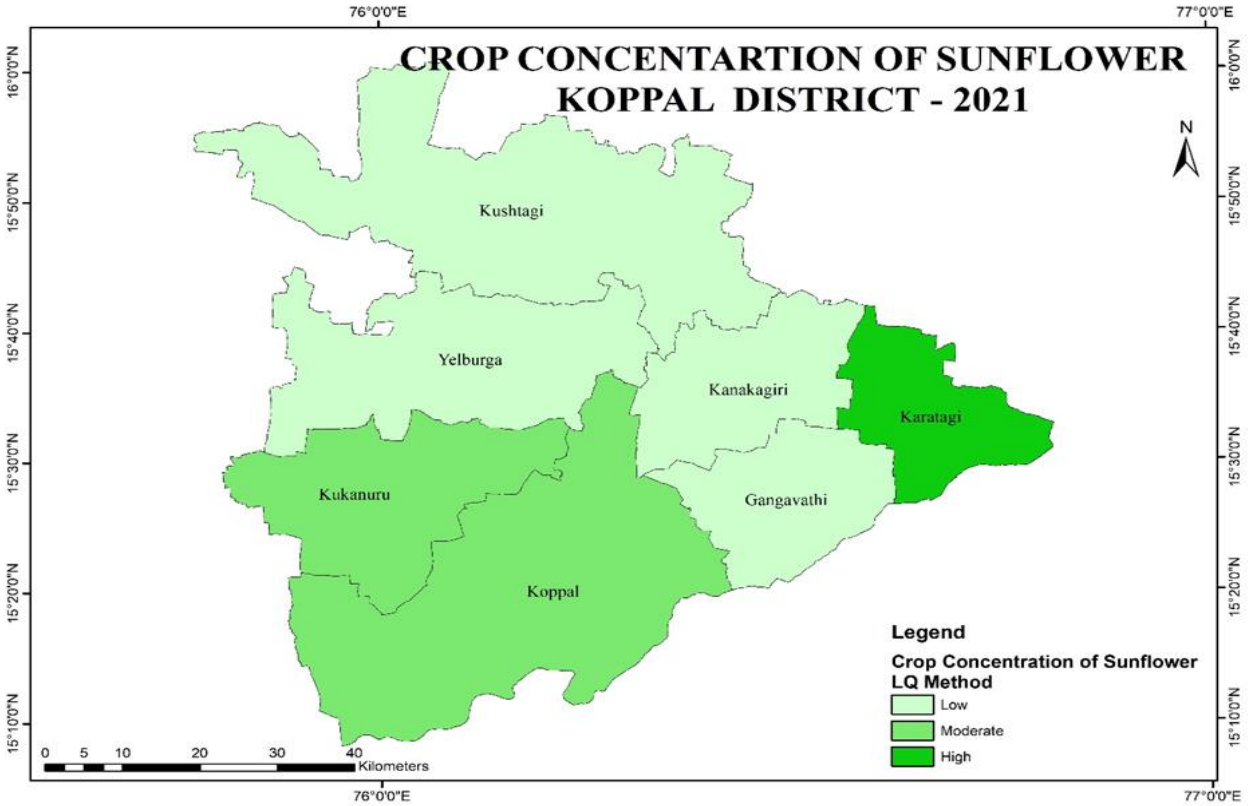
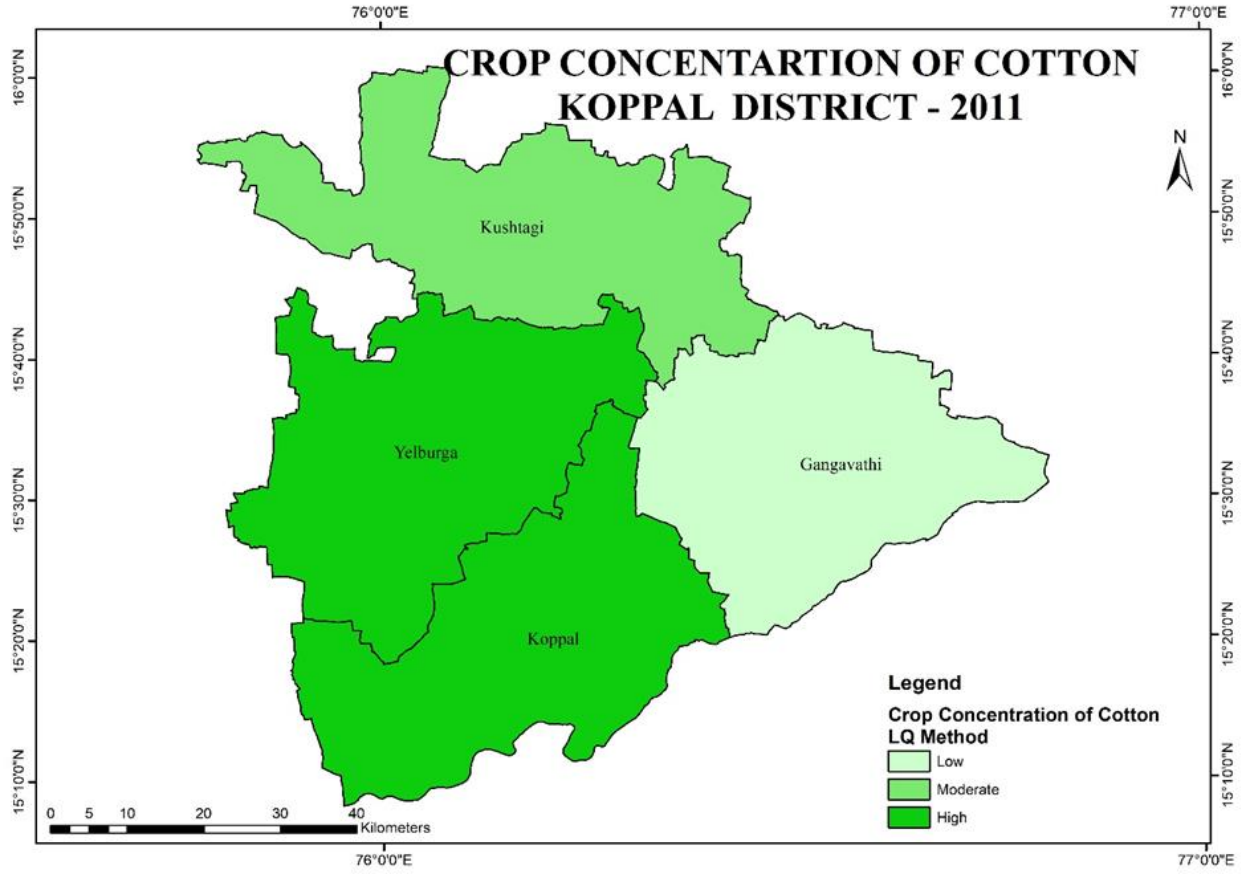
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Grountnut
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers

Continued……


CROP CONCENTARTION OF SUN FLOWER
KOPPAL DISTRICT - 2011
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Sun Flower
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
76°0'0"E
77°0'0"E
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N


CROP CONCENTARTION OF SUNFLOWER
KOPPAL DISTRICT - 2021
N
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Sunflower
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers
76°0'0"E
77°0'0"E
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N

Continued……


CROP CONCENTARTION OF COTTON
KOPPAL DISTRICT - 2011
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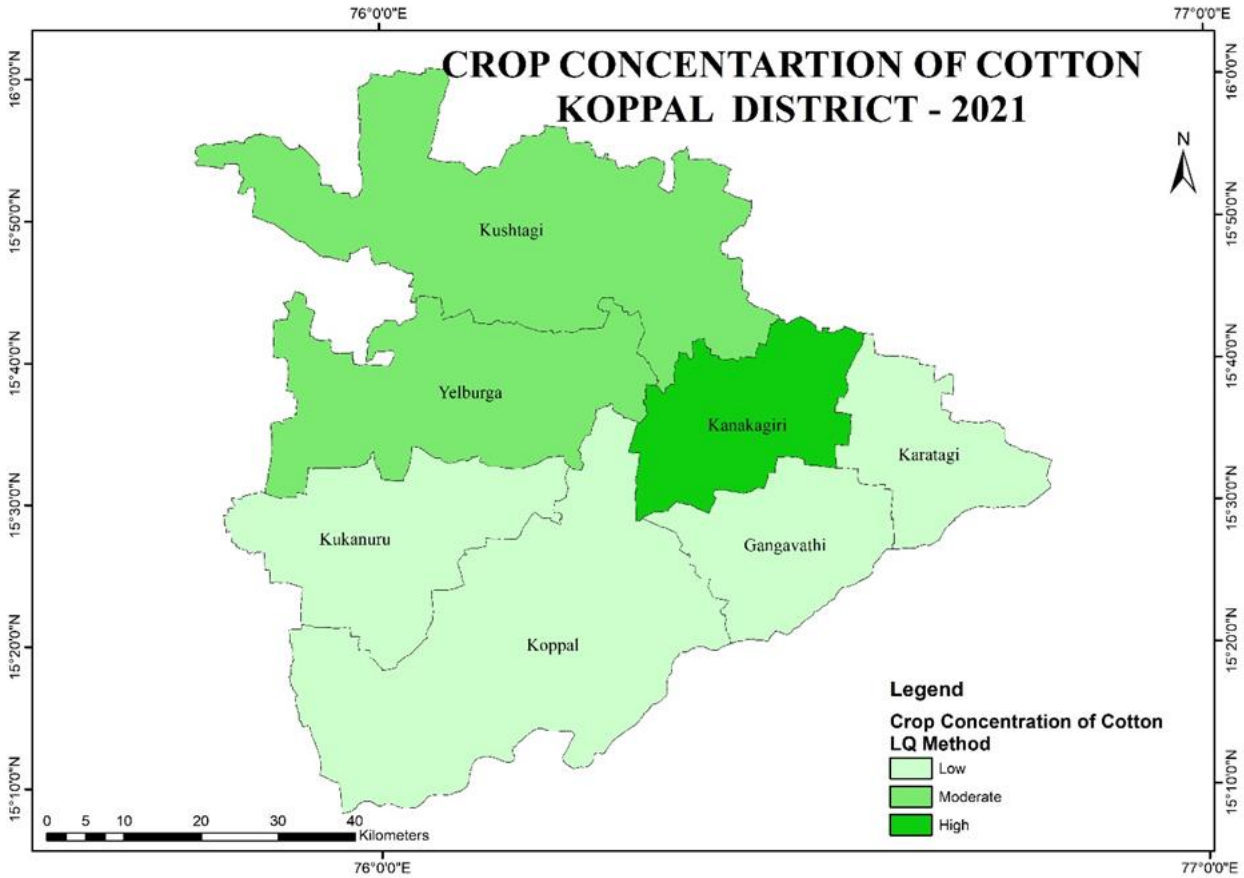
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Cotton
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers


CROP CONCENTARTION OF COTTON
KOPPAL DISTRICT - 2021
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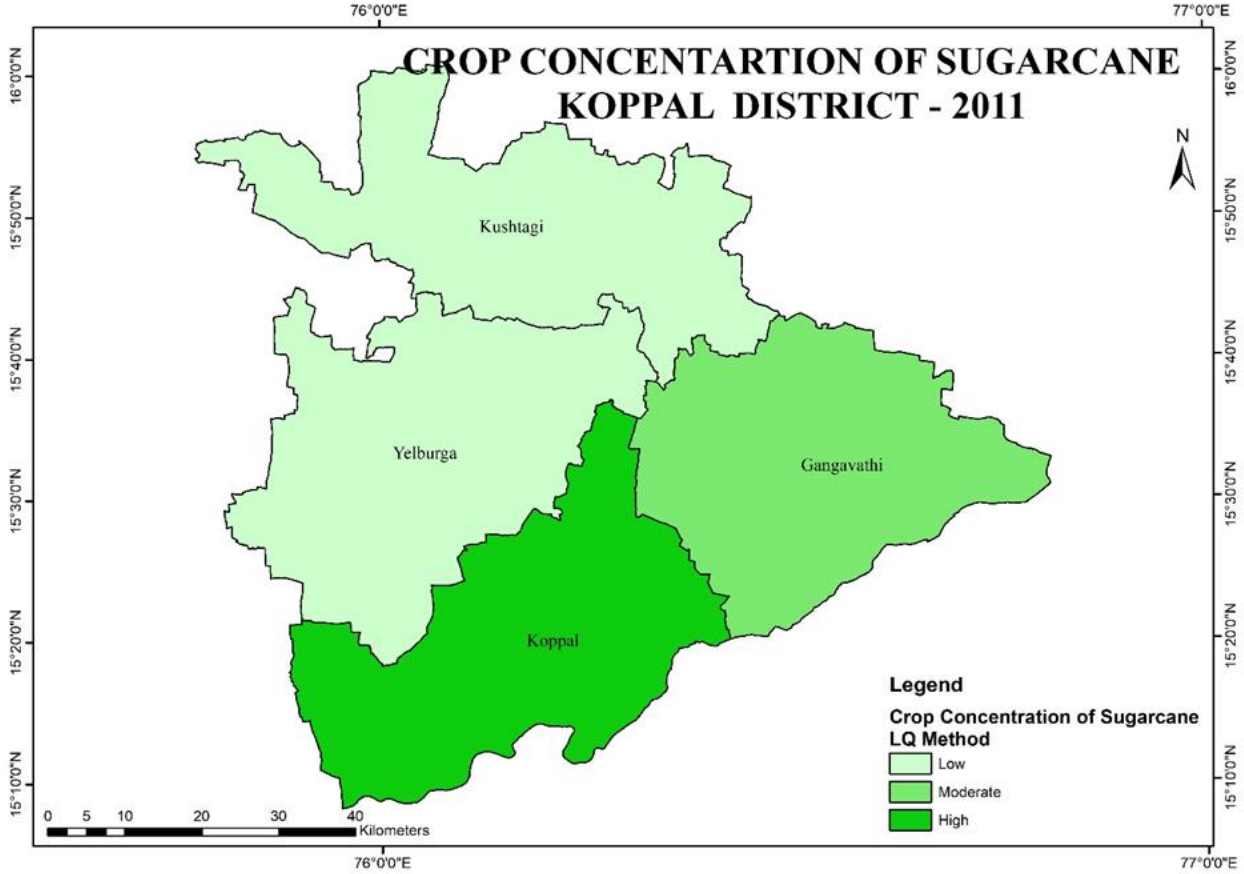
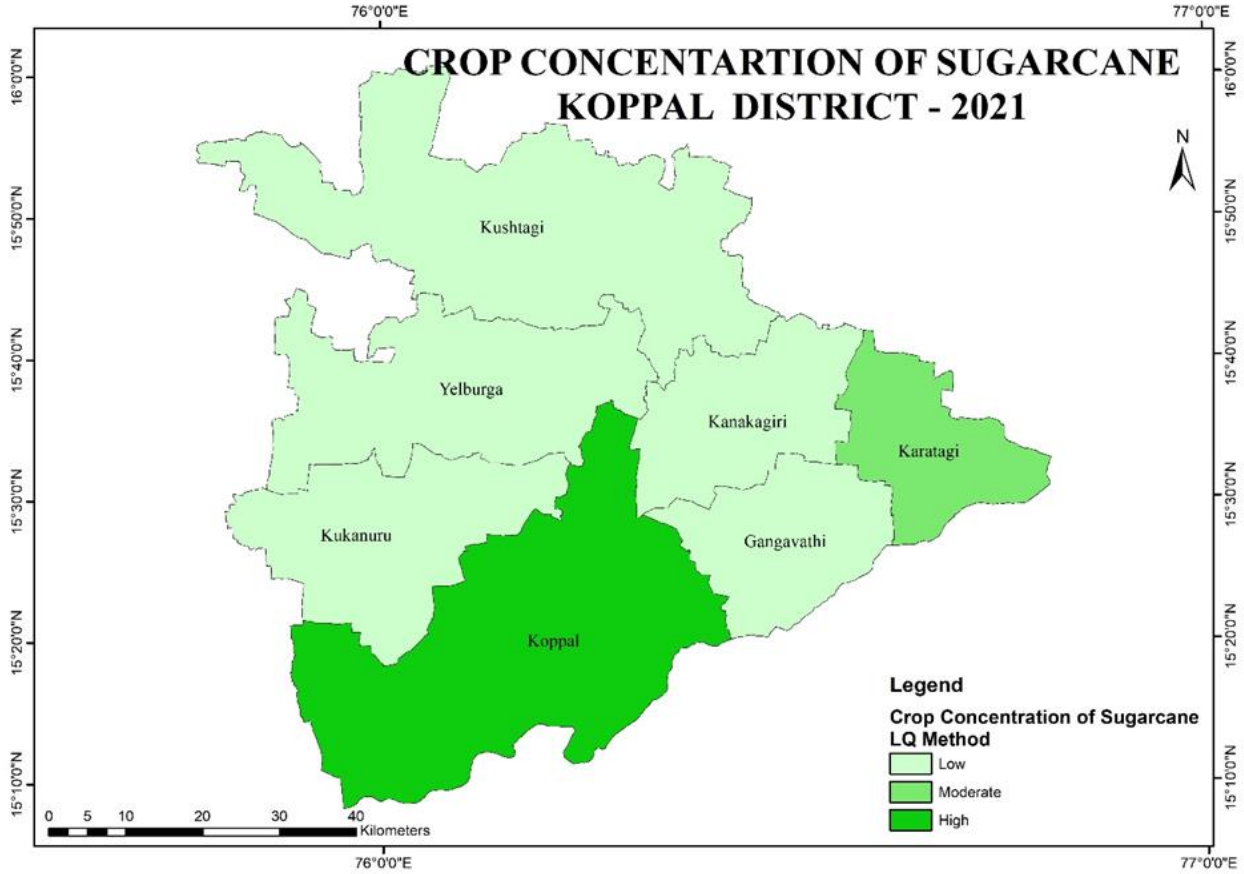
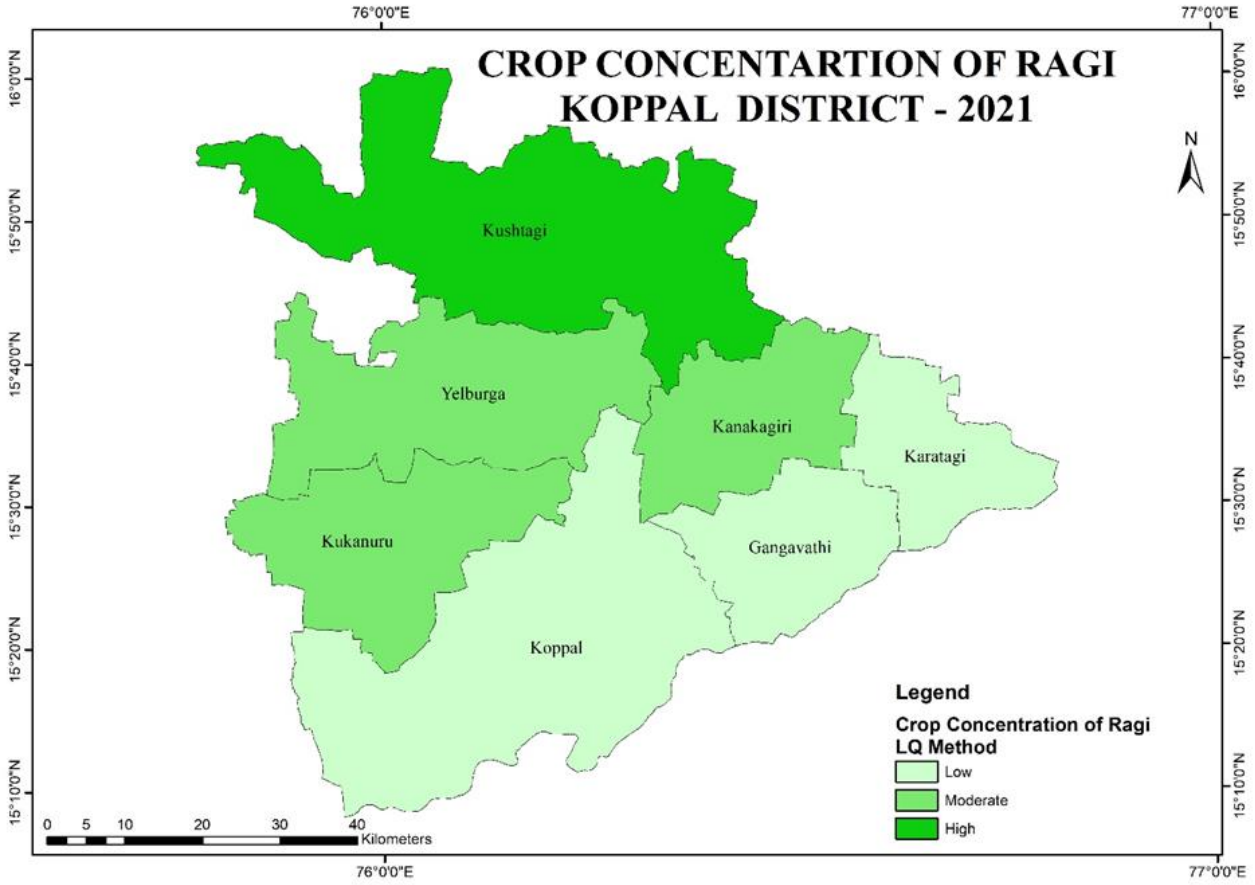
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Cotton
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers

Continued……


CROP CONCENTARTION OF SUGARCANE
KOPPAL DISTRICT - 2011
76°0'0"E
77°0'0"E
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Gangavathi
Koppal
Legend
Crop Concentration of Sugarcane
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers


CROP CONCENTARTION OF SUGARCANE
KOPPAL DISTRICT - 2021
76°0'0"E
77°0'0"E
16°0'0"N
15°50'0"N
15°40'0"N
15°30'0"N
15°20'0"N
15°10'0"N
N
Kushtagi
Yelburga
Kanakagiri
Karatagi
Kukanuru
Gangavathi
Koppal
Legend
Crop Concentration of Sugarcane
LQ Method
Low
Moderate
High
0 5 10 20 30 40
Kilometers

Continued……



Bajra:

In the year 2010-11 high concentration of Bajra is found in Kustagi Taluka. Medium concentration is found in Yelburga and Koppal talukas. And low concentration is found in Gangavathi taluka.

In 2001 and 2021 high concentration of Bajra is found in Kanakagiri and Kushtagi Talukas. Medium concentration is found in Yelburga, Koppal and Kukanuru Talukas. And Low concentration is found in Karatagi and Gangavathi Talukas.

In the study period 2010-11 Yelburga has high concentration. It is slipped to medium Concentration during 2020-21 due to division of Taluka. We find high concentration in Kushtagi, and Kanakagiri Talukas because it has good climate for growth of this crop.

Maize:

In the year 2010-11 High concentration of maize is found in Koppal Taluka. There is no taluka in medium concentration. No concentration is found in Gangavathi, Kushtagi and Yelburga Talukas.

In the year 2020-21 high concentration is found in Koppal, Yelburga, and Kukanuru talukas. Medium concentration is found in Gangavathi and Kustagi talukas. And low concentration is found in Kanakagiri and Karatagi talukas.

Koppal Taluka remains in high concentration in both the study periods. Whereas Yelburga is in low concentration in 2010-11 it is jump to high concentration in the year 2020-21. Both the Gangavathi and

Kushtagi Talukas were in low concentration in the year2010- 11. They both jumped to medium concentration in the year 2020-21. It is due to adaptation of food crops in the talukas.

Ragi:

There is no cultivation of Ragi crop in the entire district. In the study. Period 2010-11.

In the year 2020-21 high concentration of Raagi is found in Kustagi taluka. Medium concentration is found in Kanakagiri, Kukanuru and Yelburga talukas and low concentration is found in Karatagi, Gangavathi and Koppal Talukas.

Wheat:

In the year 2010-11 high concentration of Wheat is found in Yelburga Taluka. Medium concentration is found in Kustagi and Koppal Talukas and low concentration is found in Gangavathi Taluka.

In the year 2020-21 There is no wheat crop in Gangavathi and Karatagi Talukas. High concentration of Wheat is found in Kukanuru and Yelburga Talukas. There is no taluka under medium concentration. And low concentration is found in Kanakagiri, Koppal, and Kushtagi Talukas.

In both the study periods, Yelburga Taluka comes in high concentration. In the year 2010-11 Koppal and Kushtagi Talukas come under medium concentration slip to low concentration in the year 2020-21. It is due to cultivation of other food crops in the talukas.

Minor Millet:

In the year 2010-11 High concentration of minor milk is found in Yelburga Taluka. Needham concentration is found in Koppal and Kushtagi Talukas. And low concentration is found in Gangavathi Taluka.

In the year 2020-21 Height concentration of minor milk is found in Kanakagiri Taluka. Medium concentration is found in Gangavathi and Kushtagi Talukas. And lower concentration is found in Karatagi, Koppal, Kukanuru and Yelburga Talukas.

In the year 2010-11 Yell Burger Taluka is in high concentration. It is slipped to low concentration in the year 2020-21 due to division of taluka. Only Kushtagi Taluka remains in medium concentration in both study periods. Whereas Koppal is in medium concentration in the year 2010-11 Did he slipped to low concentration in the year 2020-21. And Gangavathi Taluka is in low concentration in the year 2010-11 Jump to medium concentration in the year 2020-21. It is due to change in growing areas of the footbox in the district.

Tur:

In the year 2010-11 High concentration of Tur is found in Gangavathi Taluka. Medium concentration found in Koppal and Kustagi Talukas. And low concentration is found in Yelburga Taluka.

In the year 2020-21 High concentration of tour is found in Kanakagiri and Kushagi Talukas. Medium concentration is found in Gangavathi Taluka. And low concentration is found in Karatagi, Koppal, Kukanuru and Yelburga Talukas.

In the year 2010-11 Gangavathi Taluka is in high concentration slip to medium concentration in the year 2020-21. Only Yelburga Taluka remains in low concentration in both study periods. Peres Koppal and Kushtagi Talukas is in medium concentration in the year 2010-11 Slip to low concentration in the year 2020-21. Main reason for this is mainly because of adaptation of food crops in these talukas

Horse Gram:

In the year 2010-11 there is no taluka under High concentration of the Horse gram in the district. Medium concentration is found in Koppal, Kustagi and Yelburga talukas. And low concentration is found in Gangavathi taluka.

In the year 2020-21 High concentration of Hores gram is found in Gangavathi and Kustagi talukas. Medium concentration is found in Yelburga and Koppal talukas. And low concentration is found in Karatagi, Kukanuru, and Kanakagiri Talukas.

In the year 2010-11 Gangavathi Taluka is in low concentration.it is jumped to high concentration in the year 2020-21. Yelburga and Koppal remains in medium concentration in both the study periods. Whereas Kustagi Taluka is in medium concentration in the year.2010-11 It is jump to high concentration in the year 2020-21. Main reason for this is mainly because of adaptation of food crops in these talukas.

Green gram:

In the year 2010-11 There is no taluka under high concentration of green gram in the district. Medium concentration is found in Gangavathi Kustagi and Yelburga talukas. Find low concentration is found in Koppal taluka.

In the year 2020-21 There is no taluka under high concentration of green gram in the district. Medium concentration is found in Yelburga, Kustagi, and Kukanuru talukas. Find low concentration is found in Karatagi, Koppal, Kanakagiri, and Gangavathi talukas.

There is no talocas in high concentration in both study periods. Kustagi and Yelburga talukas remain in medium concentration in both the study periods. Gangavathi taluka was in medium concentration in 2010-11 Slip to low concentration in the year 2020-21. Koppal taluka remained in low concentration in both the study periods.

Bengal gram:

In the year 2010-11 There is no taluka under high and low concentration of Bengal gram in the district. Medium concentration is found in Gangavathi.Kustagi, Koppal, and Yelburga Talukas.

In the year 2020-21 High concentration of Benga gram is found in Gangavathi, and Karatagi talukas. Medium concentration is found in Koppal, Yelburga, and Kukanuru talukas. And low concentration is found in Kanakagiri and Kustagi talukas.

In the year 2010-11 Gangavathi taluka is under medium concentration jump to high concentration in the year 2020-21. Whereas Koppal and Yelburga talukas remain in medium concentration in both the study periods. Kustagi Asian medium concentration in 2010-11 It is slipped to low concentration in 2020-21.

Ground Nut:

In the year 2010-11 there is no taluka under High and Low concentration of Ground nut in the district. Medium concentration is found in Gangavathi, Koppal, Kustagi and Yelburga talukas.

In the year 2020-21 there is no taluka under High concentration of Ground nut in the district.There is no Ground nut crop in the Karatagi taluka.Medium concentration is found in Yelburga, Kustagi, Gangavathi, Kukanuru, and Kanakagiri talukas.And low concentration is found in Koppal taluka.

Gangavathi, Kustagi, and Yelburga talukas remain in medium concentration in both the study periods. Whereas Koppal taluka under medium concentration in 2010-11 has slipped to low concentration in the year 2020-21. Shifting of Ground nut from one region to another is mainly because adaptation of food crops in the district.

Sun Flower:

In the year 2010-11 there is no taluka under High and Low concentration of sun Flower in the district. Medium concentration is found in Gangavathi, Koppal, Kustagi, and Yelburga talukas.

In the year 2020-21 High concentration of Sun Flower is found in Karatagi and Koppal talukas. Medium concentration is found in Kustagi, Gangavathi, and Kukanuru talukas. And low concentration is found in Kanakagiri and Yelburga talukas.

In the year 2010-11 Koppaltaluka under medium concentration is jumped to high concentration in the year 2020-21. Gangavathi and Kustagi talukas remain in medium concentration in both the study periods. Whereas Yelburga was in medium concentration in the year 2010-11 it is slipped to low concentration in the year 2020-21. Shifting of Ground nut from one region to another is mainly because adaptation of food crops in the district.

Cotton:

In the year 2010-11 there is no taluka under High and Low concentration of Cotton in the district. Medium concentration is found in Gangavathi, Koppal. Kustagi, and Yelburga talukas.

In the year 2020-21 High concentration of Cotton is found in Kanakagiri, Kustagi and Yelburga talukas. Medium concentration is found in Koppal taluka. And low concentration is found in Karatagi, Kukanuru and Gangavathi talukas.

Koppal taluka remains umder medium concentration in both the study periods. Gangavathi taluka under medium concentration in the year 2010-11 slipped to low concentration in the year 2020-21. Kustagi and Yelburga talukas under medium concentration in the year 2010-11 jumped to high concentration in the year 2020-21. These changes are due to the use of fertilizers, Insecticidies, and Pesticides.

Sugar Cane:

In the year 2010-11 there is no Sugar cane crop in the Kustagi taluka. High concentration of Sugar cane is found in Koppal taluka. Medium concentration is found in Gangavathi taluka. And low concentration is found in Yelburga taluka.

In the year 2020-21 High concentration of Sugar cane is found in Koppal taluka. Medium concentration is found in Karatagi taluka. And low concentration is found in Kukanuru, Gangavathi, Kustagi, Yelburga, and Kanakagiri talukas.

Koppal taluka remains under High concentration in both the study periods. Gangavathi taluka under medium concenyration in the year 2010-11 slipped to low concentration in the year 2020-21. Kustagi and Yelburga talukas under low concentration in both the study periods. Which is mainly due to adoption of some other crops that can grow within three or four months duration e.g. Ragi, Rice, Jowar, etc.

Conclusion:

Crop concentration of various crops was studied in seven talukas of Koppal district like Gangavathi, Koppal, Kustagi, Yelburga, Kanakagiri, Karatagi, and Kukanuru during the periods of 2010-11 and 2020-21. The Crop Concentration is categorized under three sections has Low (Below 0.70) Medium (0.71-0.50) High (Above 1.51).

In the period 2010-11 Gangavathi taluka has high concentration of Paddy and Tur. Koppal taluka has High concentration of Maize and Sugar cane. Kustagi taluka has High concentration of Bajra. Yelburga taluka has high concentration of Jower, Wheat, and Minor millets.

During the period of 2020-21 Gangavathi taluka has high concentration of Horsr gram and Bengal gram. Koppal taluka has high concentration of Maize, Sun flower, and Sugarcane. Kustagi taluka has high concentration of Jowar, Bajra, Ragi, and Tur. Yelburga taluka has high concentration of Cotton. Kanakagiri taluka has high concentration of Minor millets. Kukanuru taluka has high concentration of Wheat. Karatagi taluka has high concentration of Paddy.

The changes in Crop concentration of Koppal district in both the study periods i.e. 2010-11 and 2020-21 is mainly due to the formation of new talukas, Changes in Socio-Economic conditions, Land holdings, Adoption of food crops in place of commercial and oil seed crops.

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