

A STUDY ON CROP COMBINATION REGIONS IN CHAMARAJANAGARA DISTRICT: A SPATIO-TEMPORAL ANALYSIS

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Abstract

Agriculture occupies an important status in economy of Chamarajanagara District. Chamarajanagara District is the southern-most district in the state of Karnataka. Chamarajanagara district is consisting of 4 taluks - Chamarajanagara, Gundlupet, Kollegala and Yelandur. The crops are generally grown in different crop combination in Chamarajanagra District. In this research paper made an attempt has been made to study crop combination regions. Crop combination is varies in various talkus of this district are closely influenced by fertility of soil, amount of rainfall, irrigation facilities and topographical features. Selected eleven crops have been identify for the crop combination region in the study area and Weaver's (1954) method is used for identify the different crop combination regions. Based on this method crops- fruits, cotton, bajra and paddy are plays major role in the district because these are stands in first position in the ranking of crops. Out of the four taluks of Chamarajanagara district in 2005-06 Gundlupet taluk having monoculture crop combination, i.e. cotton, Chamarajanagara and Kollegala taluk having 2 crop combination i.e., fruits+jowar, maize+bajra respectively and Yelandur taluk has 3 crop combinations i.e., Sugarcane+paddy+ maize. In 2014-15 Kollegala taluk having monoculture crop combination, i.e. bajra, Chamarajanagara and Gundlupet taluk having 2 crop combination i.e., fruits+jowar, cotton +vegetable respectively and Yelandur taluk has 3 crop combinations i.e., paddy +Sugarcane+fruits. Such types of study represents real situation of cropping pattern in Chamarajanagara District and helps to planners and agricultural scientist for agricultural planning in tehsil level.

Keywords: Crop Combination, Ranking, Principle Crops



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Introduction:

The crops are generally grown in combination and it is reality that a particular crop occupies a position of total isolation from other crops. The studies of crop combination region constitute an important aspect of agricultural geography as it provides a good basis for agricultural regionalization. The distribution pattern of crops in any region is an outcome of crops predominance of certain or combination of crops. This is in term of emergence of typical crop combination. The statistical technique provides accurate techniques for the study

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of agricultural land use and cropping pattern various methods have used by scholars, scientists and planners – Weaver's in 1954 has applied least standard deviation techniques for crop combination regions. This is based on the comparison of the actual percentage of cropped areas occupied by the different field crop combination.

Aim and Objectives:

The aim and objectives of the study is to find out the crop combination regions of Chamarajanagara District.

The main objectives are:

1. To identify the principle crops and ranking of crops in Chamarajanagar District
2. To find out the taluk wise crop combination regions in Chamarajanagra District.

Study Area:

Chamarajanagara District is the southern-most district in the state of Karnataka. It was carved out of the original larger Mysore District in the year 1998. Chamarajanagara town is the headquarters of this district. Chamarajanagara district is consisting of 4 taluks - Chamarajanagara, Gundlupet, Kollegala and Yelandur with 16 hoblis.

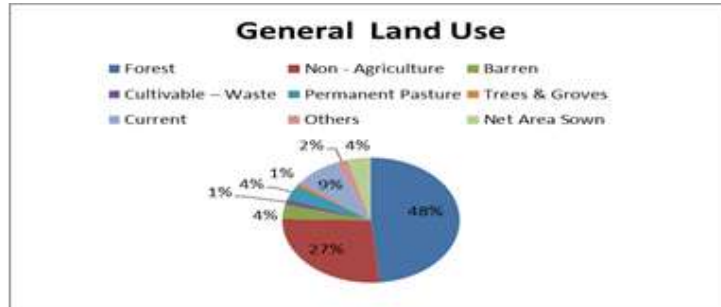
The study area forms a distinct land unit, besides being a cultural unity lying between 76°.24'and 77°.43' east longitudes and 11°.32'and 12°.16' north latitudes. It is bordered by Mysore and Mandya district of Karnataka state in the North, Nilgiris and Coimbatore districts of Tamilnadu state in the South-East, Waynad district of Kerala state in South-West. It has Geographical area of 5101 Sq. Kms. Chamarajanagara district lies in the southernmost part of Karnataka state.

The Chamarajanagara district has good drainage system the main water sources are: Suvarnavathi, Pallar, Moyar, and Udutoore Halla. The south-western and southern parts of the district are begins in the edge of western Ghats, well endowed with sufficient rainfall and known for the production of variety of reunified crops. In addition to reunified cultivation, the canal network of Suvarnavathi and Chikkahole.

The soils of the district can be broadly classified as the red-loam, sandy loam and black cotton soil. In the taluk of chamarajanagar, Gundlupet and Kollegala there is deep red loam base occasionally interspersed with black soils. The red sandy loamy boils are derived from the granites and gneisses. The share of land use of chamarajanagara district is varies from one

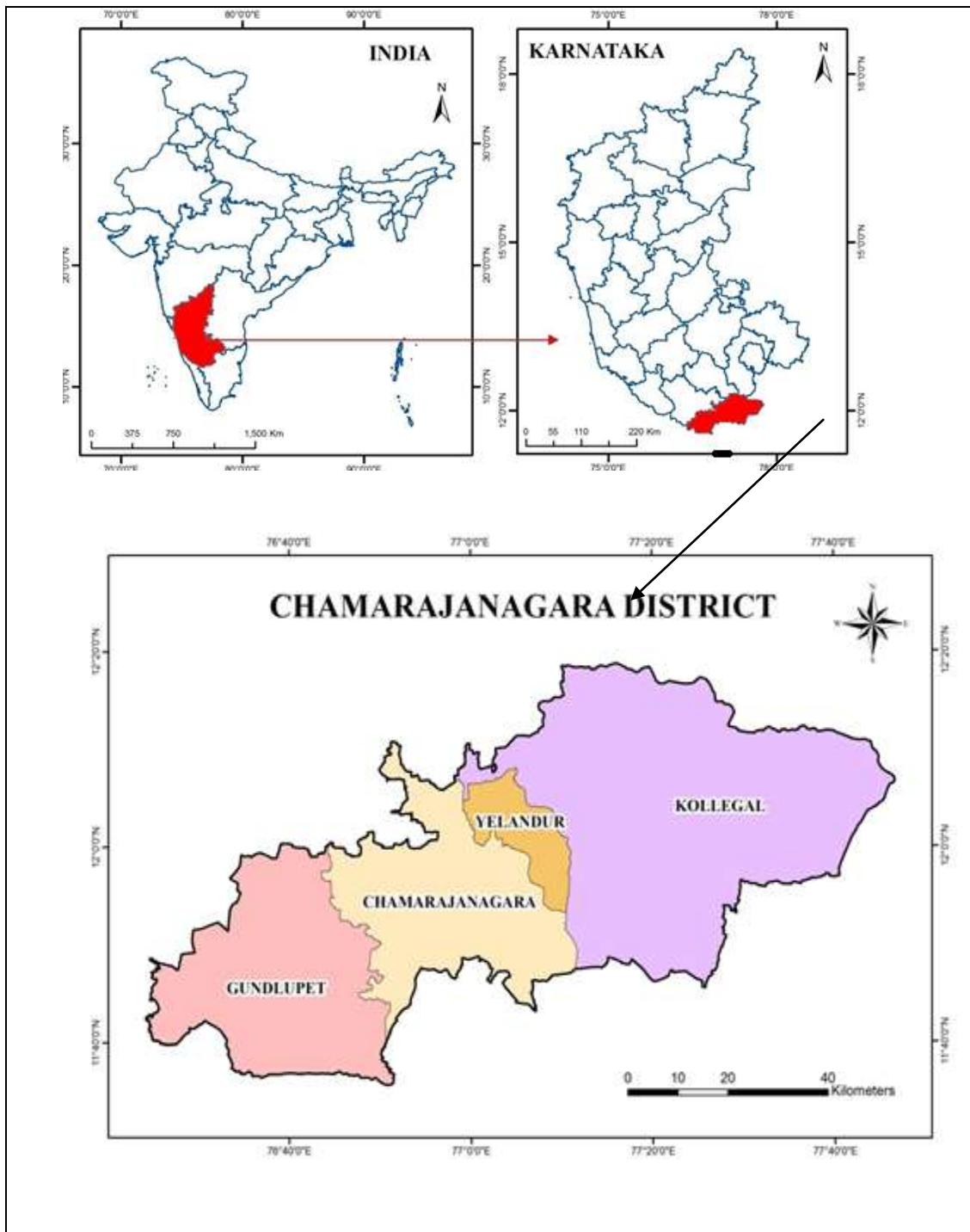
sector to another. The district land will be used in different purpose it is shown in the given Chart no.1

Chart No.1: General Land Use of Chamarajanagara District



Source: District At Glance (2014-15)

Map.No.1: Location Map of Chamarajanagara District



Data Base and Methodology:

In this present research data has been collected from secondary sources such as, District Census Report 2001 and 2011, District At a Glance from 2005-06 to 2014-15, and Statistical Handbook of Chamarajanagara District.

In this research the time period considered from 2005-06 to 2014-15. Here used simple statistical tools like percentage for total net sown area under cultivation and adapted J C Weaver (1954)'s Minimum Deviation Method for demarcate the crop combination regions and GIS technology used for showing the crop combination map.

Result and Discussion:

In the present study based on J C Weaver (1954)'s Minimum Deviation method has been used to identify the crop combination region in each taluk and given ranks for crops in the Chamarajanagara district these are shown below;

Ranking of Crops:

For the purpose of analysis the crop combination the ranking method were used for each crop. In this present study there are eleven major crops were considered for identify the crop combination it is shown in the Table no.2 and Table no.3. while observing the ranking of crops in the district in from 2005-06 to 2014-15 there six crops were dominating crops in the district and it plays a major role in a agriculture sector viz., Fruits, Cotton, Maize, Sugar Cane, Bajra and Pulses.

Based on the ranking of crops there are two crops were changed in year of 2014-15 i.e., Bajra and Pulses in Chamarajanagara district. While observing the ranking of crops in each taluk there are different crops stands in different position in ranking system.

In Chamarajanagara taluk in the year of 2005-06 the major dominating crops are Fruits, Jowar, Pulses, Ragi and Vegetables, were as in the year of 2014-15 the major crops are Fruits, Jowar, Sugar Cane, Maize and Vegetables here there is changes in two crops over the period.

In Gundlupet taluk in the year of 2005-06 the major dominating crops are Cotton, Vegetables, Jowar, Oil seed and Pulses were as in the year of 2014-15 the major crops are Cotton, Vegetables, Oil seed, Jowar and Fruits, here there is one crop changing over the period. .

In Kollegala taluk in the year of 2005-06 the major dominating crops are Maize, Bajra, Pulses Ragi and Oilseed, were as in the year of 2014-15 the major crops Bajra, Ragi, Maize, Pulses and Sugar cane, here there is one crop changing over the period.

In Yelandur taluk in the year of 2005-06 the major dominating crops are Sugar cane, Paddy, Maize, Fruits and Pulses, were as in the year of 2014-15 the major crops Paddy, Sugar cane, Fruits, Maize and Ragi, here there is one crop changing over the period.

Table No.2: Talukwise Ranking of crops 2005-06

| | | Ranking of Crop 2005-06 | | | | | | | | | | |
|-------|-------------------|-------------------------|---|----|----|----|----|----|----|----|----|----|
| Sl.No | Name of the Taluk | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1 | Chamarajanagara | F | J | PU | R | V | SC | P | OS | M | B | C |
| 2 | Gundlupet | C | V | J | OS | PU | F | B | R | SC | M | P |
| 3 | Kollegala | M | B | P | R | OS | SC | PU | F | V | C | J |
| 4 | Yelandur | SC | P | M | F | PU | R | V | J | OS | B | C |

Note: P-Paddy, PU-Pulses, R-Ragi, V-Vegetabel, SC-Sugar Cane, OS-Oil Seed, M-Maize,

C-Cotton, F-Fruits, J-Jowar, B-Bajra

Table No.2: Talukwise Ranking of crops 2014-15

| | | Ranking of crops 2014-15 | | | | | | | | | | |
|-------|-------------------|--------------------------|----|----|---|----|----|----|----|---|----|----|
| Sl.No | Name of the Taluk | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1 | Chamarajanagara | F | J | SC | V | M | PU | OS | R | C | P | B |
| 2 | Gundlupet | C | V | OS | J | F | PU | R | M | B | SC | P |
| 3 | Kollegala | B | R | M | P | SC | F | C | OS | V | PU | J |
| 4 | Yelandur | P | SC | F | M | R | PU | V | OS | J | B | C |

Note: P-Paddy, PU-Pulses, R-Ragi, V-Vegetabel, SC-Sugar Cane, OS-Oil Seed, M-Maize,

C-Cotton, F-Fruits, J-Jowar, B-Bajra.

Crop Combination Analysis:

Crop combination is a dynamic concept. Cropping pattern and crop associations change in space and time. Now a day the crop combination analysis in geographical studies has gained its significance. There so many scholars have made an attempt on the crop combination analysis. Among these different methods J C Weaver’s method of minimum deviation has been used to get the crop combination regions.

Theoretical curve for the standard measurement is employed as follows:

1. Mono culture – 100% of the total harvest crop land in one crop
2. 2- crop combination – 50% of each two crop
3. 3- crop combination – 33.33% of each three crops
4. 4-crop combination – 25% of each four crops
5. 5-crop combination - 20% of each five crop.....

Weaver pointed out, the relative, not absolute value being significant square root were not extracted so the actual

Formula used is as follows:

Standard Deviation:

$$\frac{S.D. = \sqrt{\frac{\sum d^2}{N}}}{N}$$

Where, **d** = is the differences between the actual crop percentage and the

Appropriate percentage in the theoretical curve

n = no. of crop in a given combination

Talukwise Crop Combination in Chamarajanagara District:

Chamarajanagara district have different crop combination region in each taluk over the period from 2005-06 and 2014-15. The change of crop combinations has shown in the Table No.4. and also shown in the Map No.2 and Map No.3.

Chamarajagara taluks has same two crop combinations in 2005-06 and 2014-15 viz., Fruits+Jowar. There is no change of crops over the period. The same crop combination continuous over the period and these are the major dominating crops in this taluk.

Gundlupet taluks has monoculture crop combinations in 2005-06 i.e., Cotton and in 2014-15 it has two crop combination viz., Cotton +Vegetable. There is one crops increase over the period due to the irrigation facilities there is one positive change of this taluk.

Kollegala taluks two crop combinations in 2005-06 viz., Maize+Bajra and in 2014-15 it has monoculture i.e., Bajra. There is one negative change in crop combination over the period because it receives less amount of rainfall during this year.

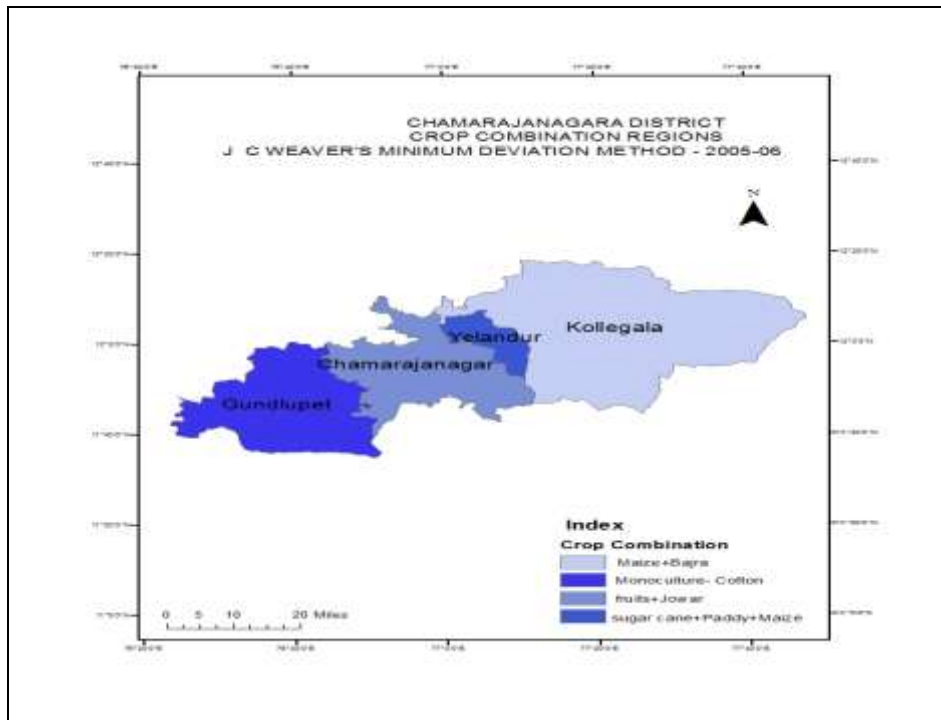
Yelandur taluks has three crop combinations in 2005-06 viz., Sugarcane+Paddy+Maize, and in the year 2014-15 also having three crop combination viz., Paddy +Sugarcane+ +fruits. In this taluk three crop combinations are continue over the period but in this three crop combination fruits were taking place of Maize in the year 2014-15. Because the availability of irrigation facilities and improving of marketing facility in this taluk.

Table No.4: Talukwise crop combination of Chamarajanagara District

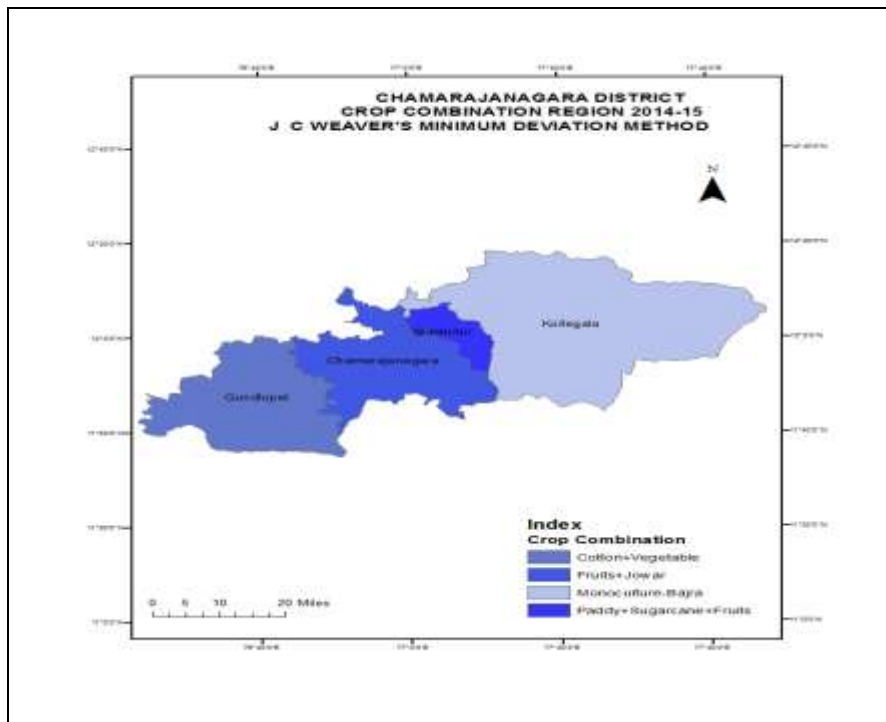
| Sl No | Name of the Taluk | Crop Combination 2005-06 | Crop Combination 2014-15 | Change in No. of crops |
|----------|-------------------|-----------------------------|-----------------------------|---------------------------|
| 1 | Chamarajanagara | 2 crop= F+J | 2 crop= F+J | Nil |
| 2 | Gundlupet | Monoculture =Cotton | 2 crop=C+V | +1 |
| 3 | Kollegala | 2 crop=M+B | Monoculture =B | -1 |
| 4 | Yelandur | 3 crop =SC+P+F | 3 crop =P+SC+F | Nil |

Note: P-Paddy, V-Vegetabel, SC-Sugar Cane, M-Miaze, C-Cotton, F-Fruits, J-Jowar, B-Bajra.

Map.No.3: Talukwise Crop combination of Chamarajanagara District 2005-06



Map.No.4: Talukwise Crop combination of Chamarajanagara District 2014-15



Summary and concluding remarks:

Chamarajanagara district has different crop combination in each taluk. In this present study J C Weaver's method has been used to identify the crop combination region. Based on this method in the year 2005-06 the district has monoculture, two and three crop combination.

Gundlupet taluk has monoculture i.e., Cotton, Chamarajanagara taluk, Kollegala taluk has two crop combination viz., Fruits+Jowar and Maize+Bajra respectively, Yelandur taluk has three crop combination viz., Sugarcane+Paddy+Maize. While observing in the year 2014-15 the same crop combination pattern were continue in the district such as Kollegala taluk has Monoculture i.e., Bajra, Chamarajanagara and Gundlupet taluk has two crop combination viz., Fruits+Jowar and Cotton +Vegetable respectively. Yelandur taluk has three crop combination viz., Paddy+Sugarcane+Fruits. While observe the changes of crop combination Gundlupet taluk has positive change and Kollegala taluk has negative change in number of crops and there is no changes in Chamarajanagara taluk crop combination the same crop combination were continue over the period. In Yelandur taluk also three crop combinations are continues over the period but in the three crops combination Fruits occupy the Maize place. All these are showing the different crop combination of the district.

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