

A SPATIAL ANALYSIS OF CROPPING PATTERN AND CROPPING INTENSITY IN DINDIGUL DISTRICT

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Abstract

In the present paper an attempt has been made to analyze Spatial Analysis in cropping pattern and cropping intensity in agriculture of Dindigul District. Data were obtained from Statistical Handbook of Dindigul District. Cropping pattern and cropping intensity have been presented in the percentage forms. Results of the study reveal that cropping pattern is much diverse with high level of cropping intensity in agriculture of the District. It has been found that Maize is still most cultivated crop in the District, covering an area of 20.1% to total cropped area during 2019-2020. Oilseeds has been found second most cultivated crop with increasing trend of area. The area under rice and pulses crop has decreased rapidly over the period. Cropping intensity has also continuously increased during the period. The highest cropping intensity has been recorded in Palani (108.21%) whereas lowest registered in Guiliamparai (100%) block of the District.

Keywords: *Cropping Pattern; Cropping Intensity; Net Sown Area; Gross Cropped Area*

I. Introduction

In general Geographical studies are mainly concerned with the phenomenal of spatial analysis. It deals with regions and, therefore the concept of region is of fundamental importance in geographical studies. A region may be defined as a part of the earth having certain characteristics which enable it to be recognized as a unit, distinguishing it from other units which surround it, and which may themselves be identified by similar or different characteristic features. Agricultural region is an uninterrupted area having some kind of homogeneity with specifically defined outer limit. Looking at the importance of agricultural terms in the agricultural regionalization, it is of paramount importance to

explain in some details the concepts of cropping patterns, crop concentration and diversification, crop combination and agricultural productivity (Majid Husain, 1996).

II. Cropping Patterns

Cropping pattern means the proportions of area under various crops at a point of time. The crop statistics are used to denote cropping pattern. The cropping pattern differs from macro to micro region, both in space and time and is governed largely by the physical, cultural and technological factors. For the purpose of agricultural regionalization and planning, it is necessary to divide the area/ region into homogeneous region on some well-defined basis (Majid Husain (1979)). There can be a number of physical, climatological and agronomic criteria on which cropping pattern can be made. It may vary from region to region depending on the terrain, topography, slope, temperature, amount and reliability of rainfall, soils and availability of water for irrigation. The perception and assessment of environment also guide to grow certain crops in a region. The cropping patterns of a region or areal unit may be determined on the basis of areal strength of individual crops. The first, second and third ranking crops of an areal unit may be called as the dominant crops of that unit. The importance of adoption of suitable cropping patterns in a developing country like India cannot be over emphasized. The horizontal expansion of agriculture is not possible without heavy capital investments. Only judicious utilization of land by adopting more remunerative cropping patterns, scientific rotation of crops and multiple cropping may help in overcoming the food and raw material problems of the country.

II. The Study Area

The district was bifurcated from Madurai district on 15th September 1985. Dindigul town which serves as the district headquarters has a rich historical background and located between 10⁰05' and 10⁰09' North latitude and 77⁰30' and 78⁰20' East longitude. Dindigul District located in the south western part of Tamil Nadu. This district is bound by Erode, Tiruppur, Karur and Tiruchirappalli districts in the North; Sivaganga and Tiruchirappalli districts in the East; Madurai district in the South and by Theni and Tiruppur districts and Kerala in the West. Geographically the district falls between N100⁰ 05' and N100⁰ 09' and E77⁰ 30' and E78⁰ 20' and it is spread over on an area of 6266.64 square km. presently, there are 8 taluks in the district. There are 1 Corporation (Dindigul) and 2 Municipalities

(Palani and Kodaikanal), 24 Town Panchayats and 7 Census Towns in the district. There are 14 Community development Blocks and 362 Revenue Villages (330 inhabited) in Dindigul district (Fig: 1.1)

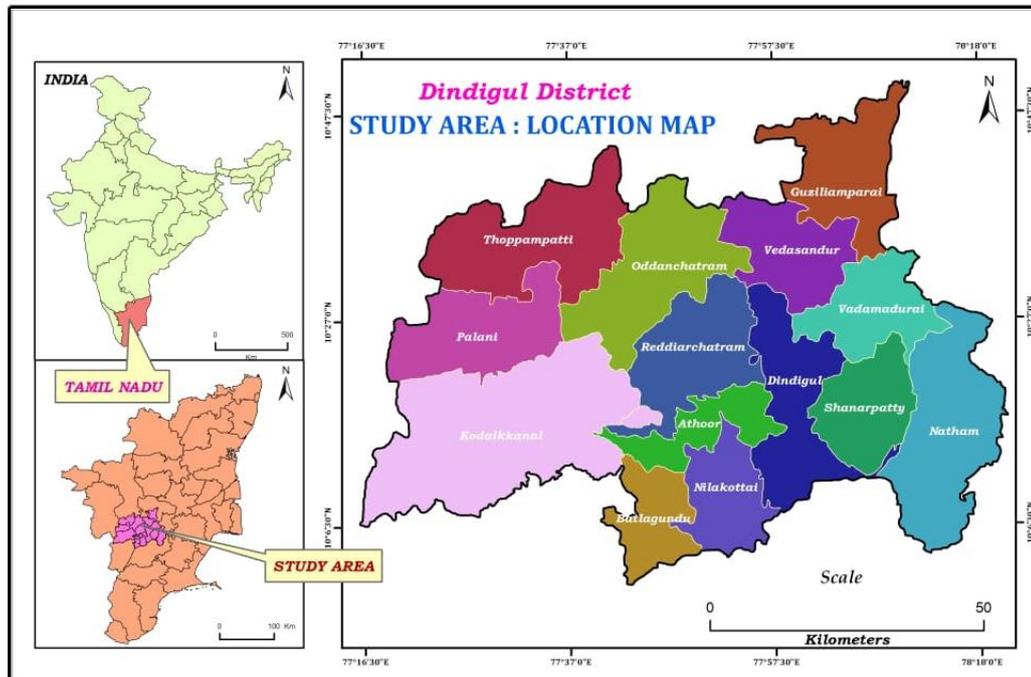


Fig: 1.1

III. Materials and Methods

The Present study is primarily based on secondary data obtained from various issues of Department of Statistics and other publications of the Directorate of Economics and Statistics, Government of TamilNadu, for the period 2019-2020. Cropping pattern shows the proportional area under various crops to total cropped area in the study area. Proportional area of various crops has been calculated with the help of total cropped area. Cropping intensity has been calculated by the ratio of net sown area to gross cropped area and multiplied by 100. Gross cropped area is the addition of net sown area and area sown more than once. Net sown area refers to total area sown with crops and orchards counting area sown more than once in the same year only once (Agricultural Census, 2019-2020).

$$\text{Cropping Intensity} = \frac{\text{Total Cropped Area}}{\text{Net Sown Area}} \times 100$$

IV. Results and Discussion

Cultivation of crops is the dominant occupation of Dindigul District and is the leading economical activity for the development of the District. The spatial variations in the cropping pattern of the present study area (Figure 1.2) are identified based on secondary data collected from the department of Statistics. Since the cropping pattern is seasonal and depends on monsoon rains, the land is not covered with vegetative growth throughout the year. Agricultural lands are divided into small fields based on site conditions and land holdings of the district. But the agricultural activities mainly depend on northeast monsoon rains both for rain fed and irrigated agriculture

More than 70% of the total cropped areas are devoted for food crops. Maize crop has always covered the largest area of total cropped area in the District and has recorded as 20.1% (**Table.4.1**). The area under oilseed crop has continually increased from 18.05 per cent total cropped area in 2019-2020. The area under paddy and cotton and sugarcane crop has declined from 6.2 1.6 per cent and 0.7 per cent respectively of total cropped area during the period. The area under pulses (gram, mash, moong and massar) has also rapidly increased from 11.4 per cent of the total cropped area over periods. The area under oilseeds including mustard, rape seeds, linseeds, sasamum and groundnut 11.5 per cent of the total cropped area during same periods. The area under fruits and vegetables and other non food crops has increased over the period in the district. There has not been found large changes in the area of other crops including vegetables, fruits and fodder crops in the study area

4.1 Cropping pattern in Dindigul block wise

In the Dindigul, Area under land cultivation in the block was about 234926.6 hectares during the year of 2019-2020. Maize is the first dominating crop in the study region. Because of the rivers of Maruthanathi and Kamarajar dam are flows in this district (**Table.4.1**)

Out of the total cropped area 29.5 per cent was covered by oilseeds and 17.6 per cent area was under cholam. It means cholam were second dominating crops under area after oilseeds. The area under other crops, Fruits and vegetables and paddy were 13.2, 12.3, and 10.8 per cent respectively in first quinquennial. Area under pulses, other cereals, and

cumbu and spices percentage share was 7.8, 5.6, 2.0, 0.8 per cent respectively in this study region, which was almost negligible.

In the Batlagundu block, Area under land cultivation in the block was about 7206 hectares during this year. An oil seed is the first dominating crop in this block. Out of total cropped area 26.9 percent were covered by oilseeds. The second dominating crop are other crops is 22.2 percent, Cholan is 14.4 per cent, Paddy is 11.9 percent, and Pulses is 10.1 per cent. Fruits and vegetables, Cumbu, Other cereals, Cumbu, Cotton were first quinquennial. Irrigation facilities are moderate in this block. (Fig.4.1)

Table.4.1

Block Wise Cropping Pattern in Dindigul District (2019-2020)

S.NO	Name of the Blocks	Paddy %	Cholan %	Cumbu %	Other cereals %	Pulses %	Oil Seeds %	Cotton %	Sugar cane %	Fruits Veg %	Species %	Other Crops %
1	Athoor	10.8	17.6	0.8	5.6	7.8	29.5	0.3	0	12.3	2	13.2
2	Batlagundu	11.9	14.4	2.4	3.9	10	26.9	2.3	0	5.8	0	22.2
3	Dindigul	4.1	16.4	0.2	17.3	15	12.4	0	0.1	5.4	1.1	28.5
4	Gujiliyumparai	2.3	47.6	1.5	1.4	6.8	25.7	0.1	0.5	12.1	0.1	1.9
5	Kodaikanal	0	0	0	0	0	0	0	0	38.2	43.6	18.2
6	Natham	1.8	6	0	0.1	24	18.1	0	0.1	0.1	0.5	49.6
7	Nilakottai	13.2	28.6	2.5	14.3	11	11.9	0.4	1.3	4.6	0	11.7
8	Oddanchatram	0.3	18.8	0.1	27.1	1.9	14.5	7.8	0.2	11.9	4.5	12.9
9	Palani	26.4	4.7	0	19	13	16.7	1	6.4	0.6	0	12.1
10	Reddiyarchatram	1.9	9.7	0.1	27.3	2	14.3	6.2	0.1	5.4	2.8	30.2
11	Sanarpatti	3.1	22.1	0	1.5	19	17.8	0	0.2	0.3	0.2	35.8
12	Thoppampatti	3.5	19.1	0	20.7	20	18.2	3.9	1.5	5.7	0	7.1
13	Vadamadurai	4.1	34.1	0.2	6.2	22	19.2	0.1	0	9.3	0.1	5
14	Vedasandur	3.1	41.7	0.1	4	8.7	28.1	0.3	0	4.2	0	9.8

Source: Dindigul District Agricultural Statistical Handbook 2019-2020

In the Dindigul block, Area under cultivation in the block was about 9635.2 hectares during this year. Other crop is 28.5 per cent it is first dominating crops. The second dominating crops are other cereals (17.3), Cholam (16.4), Pulses (14.5), and Oilseeds (12.4). The first quinquennial is Fruits and vegetables (5.4), Pulses (4.1), Cumbu (0.2), Spices (1.1), and Sugarcane (0.1). In this block, Urbanization is developing than the other block.

In the Gujiliyumparai block, Area under cultivation in the block was about 10417 hectares in this year. Cholam (47.6) is the first dominating crop in this block. The second dominating crop is Oilseeds (25.7). Fruits and vegetables (12.1), Pulses (6.8) are first quinquennial. Such remaining crops are second quinquennial. In this block, most cultivating crop is cholam and oilseeds, because these crops no need of much water to irrigation.

In the Kodaikanal block, Gross cropped area is 15869 hectares. The first dominating crops are spices (43.6 per cent). The Second dominating crops are Fruits and vegetables and other crops were (38.2) and (18.2). Spices and Fruits and vegetables are high, because of the hilly region.

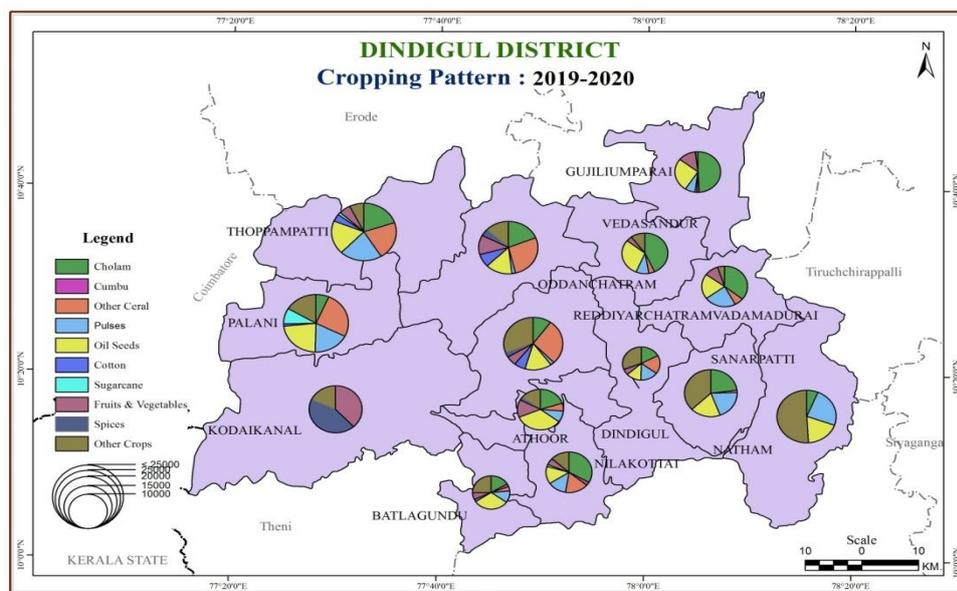


Fig: 4.1

In the Natham block, Total cropped area is 21505 hectares in this year. The first dominating crops are othercrops 45.9 per cent. The second dominating crops is Pulses and oilseeds were (21.9) and (24.1) per cent. Such remaining crops are quinquennial crops. In this blocks having skilled labour are high.

In the Nilakottai block, Total cropped area 11749 hectares in this year. The first dominating crops are Cholan is 28.6 per cent. The second dominating crops is other cereals (14.3), Paddy (13.2), pulses (1.4), Othercrops (11.7), Oilseeds (11.9). Fruits and vegetables (4.6 per cent). Cumbu (2.5), sugarcane (1.5 per cent) is first quinquennial. In this block, Mavoor dam is located in this region.

In the Oddanchatram block, Total cropped area 21494 hectares in this year. Other cereals are the first dominating crops 27.1 per cent. Cholan (18.8), Oilseeds (14.5), Fruits and vegetable (11.9), other crops (12.9) are second dominating crops. Cotton (7.8), Spices (4.5). Pulses (0.3), cumbu (0.1), sugarcane (0.2) are quinquennial. In this block cholam, oilseeds, fruits and vegetables, othercrops are highly cultivated. In this block, parappalar and Nanganchar dam are located. The daily market places for agriculture and transport facilities are well.

In the Palani block, Gross cropped area 26303 hectares in this year. Paddy (26.4) are the first dominating crop. Other cereals (19), Oilseeds (16.7), Pulses (13.2), Othercrops (12.1), and Sugarcane (6.4) are the second dominating crop. Fruits and vegetables (0.6), Cotton (1.0) is quinquennial. Paddy is the most cultivating crop, because of the palarpurundalar dam, varathamanathi dam, kuthiraiaru dam are located in this block. So, the irrigation facilities are well to the agricultural field.

In the Reddiyarchatram block, Gross cropped area 20139 hectares in the year of 2015-2016, Othercrops are first dominating crop value is 30.2. Other cereals (27.3), Oilseeds (14.3), cholam (9.7), such remaining crops are quinquennial. In this block, have occupied, moderate irrigation.

In the Sanarpatti block, Total cropped area 17792 hectares in the year of 2015- 2016, other crops (35.8) are the first dominating crop. The second dominating crop is Cholan (22.1), pulses (19), oilseeds (17.8). Paddy, other cereals, fruits and vegetables, spices,

sugarcane are quinquennial. Other crops and cholam are highly cultivated crops. Because irrigation facilities, are mostly available in this block.

In the Thoppampatti block, Total cropped area 34009 hectares in this year, other cereals, pulses are the first dominating crops that the value is 20. Cholam and oilseeds are the second dominating crops values are (19.1), (18). Such others are quinquennial crops. In this block, Irrigation facilities are high, because of canal, well, tube irrigation are higher level than the other blocks, not equal to the Oddanchatram and Palani.

In the Vadamadurai block, Total cropped area 129846 hectares in this year, Cholam (34.1) are the first dominating crops. Pulses (22), Oilseeds (19.2), other cereals (6.2), Fruits and vegetables (9.3), paddy (4.1), other crops (5). In this block, cholam is highly occupied crops in the total cropped area, because of that crops no need of much water facilities.

In the Vedasandur block, Total cropped area 11271 hectares in this year, the first dominating crops is cholam (41.7). The second dominating crops are oilseeds (28.1), other crops (9.8), Pulses (8.7), paddy (3.7). In Vedasandur block, Kudagnar dam is located for the irrigation of agricultural field. **(Fig4.1)**

4.2 Cropping Intensity

Cropping intensity has been defined as the ratio between the net sown area and the gross or cropped area. The double and multiple cropped areas added into the net cultivated area gives the total cropped area. The Department of Agriculture, Government of India developed the following formula for the measurement of agriculture intensity

The agriculture intensity depends on the geo-climatic, pedological, socio-cultural and infrastructural factors. Thus, the agricultural intensity is generally high in the well irrigated alluvial plains areas, low intensity in the less rainfall areas.

Cropping intensity indicates the extent to which the unit of area has been used intensively for various purposes of agriculture. The cropping intensity usually refers that the number of crops grown an area in particular time. Therefore higher intensity indicates the maximum and multiple usages of land and vice versa. The following formula is used to estimate the cropping intensity of Dindigul District. (Table 4.1)(Fig 4.1)

Table.4.1

Block Wise Cropping Pattern in Dindigul District (2019-2020)

S.No	Name of the Blocks	Cropping Intensity	Net Sown Area (in hectares)	Total Cropped Area
1	Athoor	101.98	14107.27	14386.5
2	Batlagundu	100	7206	7205
3	Dindigul	100.14	9621.38	9807
4	Gujiliyumparai	100	10417	10418
5	Kodaikanal	106.01	14969	15869
6	Natham	102.79	20921	21505
7	Nilakottai	106.05	11079	11749
8	Oddanchatram	101.45	21186	21493
9	Palani	108.21	24307	26303
10	Reddiyarchatram	102.78	19595	20139
11	Sanarpatti	105.3	16896	17791
12	Thoppampatti	100.54	33827	34005
13	Vadamadurai	103.4	12548.67	12985
14	Vedasandur	100.83	11178.96	11271.1

Source: Dindigul District Agricultural Statistical Handbook 2019-2020

Very High Cropping Intensity (>105)

The very high cropping intensity are found in the Southwestern area and Southern area in this blocks. They are Kodaikanal (106.01), Palani (108.21), and Nilakottai (106.05). Because Kodaikanal block are hilly area average rainfall is high and well climatic conditions are there. So, the major crops of Fruits and vegetables, spices and other crops are cultivated. Palani block are well irrigated area, the major crops of paddy, cholam, oilseeds, pulses, other cereals and other crops. Nilakottai are also well irrigated area, the major crops are paddy, cholam, pulses, other crops, and other cereals arecultivated in these blocks. Inspite of the hilly areas in Kodaikanal, Varathanathi and kuthiraiaru dams are in the Palani block.

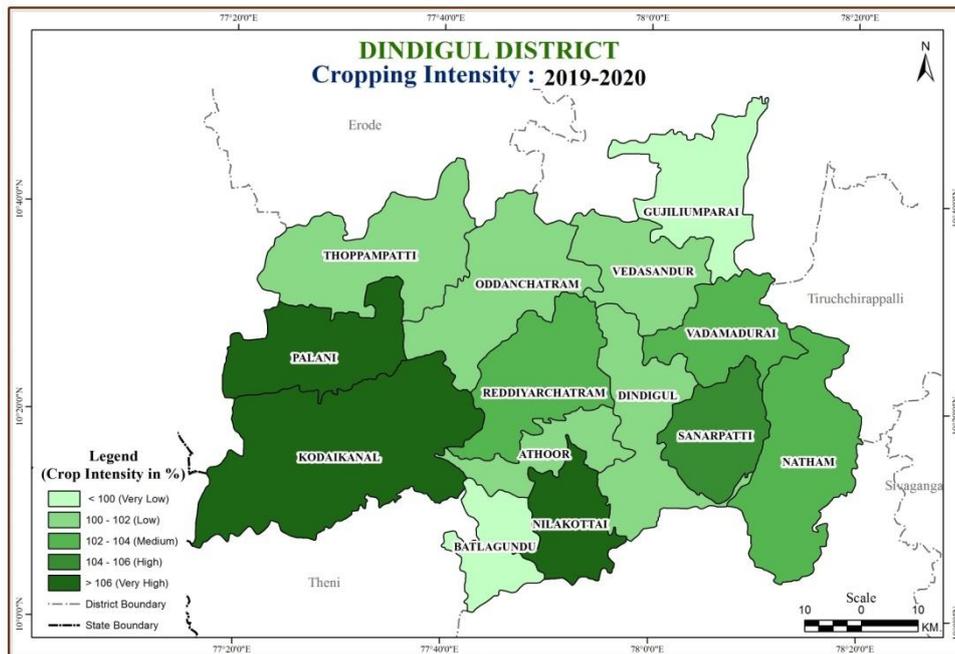


Fig: 4.2

High Cropping Intensity (104-105)

The high cropping intensity is found in eastern part of this block. That is Sanarpatti (105.3). In this blocks have irrigation facilities are available and rainfall in moderate in this block. The major crops are of Cholan, pulses, oilseeds; other crops are cultivated in these blocks.

Medium Cropping Intensity (102-104)

Out of fourteen blocks, there are three blocks are categorized in the cropping intensity. They are Reddiyarchatram (102.78), Vadamadurai (1034.74), and Natham (102.79). There were medium rainfall and irrigation in this area. The major crops are cultivated in this blocks are pulses, oilseeds, other crops, Cholan.

Low Cropping Intensity (100-102)

In the Fourteen blocks, there are five blocks are covering in the cropping intensity. They are Athoor (101.98), Dindigul (100.14), Vedesandur (100.83), Oddanchatram (101.45), and Thoppampatti (100.54). In this block have low rainfall and irrigation facilities are scanty. The major crops are Paddy, cholam, other cereals, oilseeds and pulses are cultivated.

Very Low Cropping Intensity (<100)

The very low cropping intensity are identified in this fourteen blocks are Gujiliyumparai (100), Batlagundu (100). The annual rainfall is less in this block and irrigation facilities are not available. Cholan, oilseeds, fruits and vegetables and other crops are cultivated.

VI. Conclusion

It can be concluded from the results of the study that Dindigul District, is more advanced in view of agricultural development with diversified cropping pattern and high level of cropping intensity. Nearly 41% of the total geographical area in Dindigul District is under cultivation. Forest occupies about 18% and other use occupies the rest of the area. The principal crops such as Cholan, Oilseeds and pulses are cultivated. The analysis of area under different crops revealed that the Cholan and Pulses dominates as single crop in most of the blocks in Dindigul District. Other crops Sugarcane, Cotton and Species have been recorded as minor grown crops. There is much need to take appropriate steps for increasing the area of pulses as area under pulses has rapidly declined over the period in the state. The level of cropping intensity has reached at the saturation. Changing of cropping pattern and availability of modern inputs helped in increasing the cropping intensity. The low intensity of cropping pattern it is because of high pressure of population with limited resource of land in the district. Population is increasing but the land is fixed.

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