RESEARCH ARTICLE

CROPPING PATTERN IN SALEM DISTRICT, TAMIL NADU, INDIA

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ARTICLE INFO	ABSTRACT
	The quantitative measure of crop distribution is an important analysis to understand the cropping pattern of an area. The multifaceted agriculture practices, bring different crops in fields. The concept of agricultural regionalization is not dividing a land into different fragments but also a method of understanding the agricultural patterns. The existing patterns will strongly show the combinations of physical and socio-economic balance of an area. To map the cropping pattern the following analysis were required they include crop combination, cropping intensity, crop diversification and crop combination. In the present study analysis the above mention analysis, the results suggest that there are fourteen crops widely occupies in the study area. Among the fourteen crops oilseeds, Tapioca, paddy and maize were the top five crops. Cropping intensity result reveals that the highest cropping intensity found in Tharamangalam, Veerapandi, Panamarathupatty. The moderate cropping intensity found in Thalaivasal, Ayothiyapattinam, Yercaud, Omalur, Kadayampatty, Mecheri and Kolathur. The crop diversification indicates that Yercaud, Gangavalli and Thalaivasal shows lower crop diversification, other blocks in the study area have the index value more than 0.7 which indicates that the blocks have high diversification. The crop combination analysis also sight that oils seeds, Maize, Tapioca as fist ranking crop in several blocks, similarly oil seeds, paddy, Tapioca founds as second ranking crop and paddy is found as third ranking crop in the study area. The cropping pattern analysis will provide the agricultural and agro-climatologist to suggest better land use planning of an area.

INTRODUCTION

In agricultural geography the quantitative measure of crop distribution is necessary to understand the physical and human interaction of an area. Crop distribution is controlled by various natural and cultural phenomena. Distribution of crops and land use varies with diverse climatic conditions and terrain characteristics. Due to the multifaceted agriculture practices, different combination of crops in fields are common. The concept of agricultural regionalization is not dividing a land into different fragments but also a method of understanding the agricultural patterns. The existing patterns strongly show the combinations of physical and socio-economic balance of an area. The mapping of agricultural patterns has two important phases they are definition and delimitations. The definition accounts for structural attributes of agriculture which includes the process of identification of dominant crops and their combination and diversifications. The second phase is called delimitation.

The delimitation is done through drawing boundaries for the regions with help of statistical analysis such as clustering and deviations. Shyam S. Bhatia (1965) brought out the patterns of crop concentration and diversification in India. Bhalsing (2009) studied the impact of irrigation on crop diversification in Ahmed Nagar, Yuvaraj (2014) analyzed the principle crop concentration in Cauvery Basin, Tamil Nadu, Shyamal Dutta (2012) mapped the spatio temporal analysis of crop diversification in Hugli District of West Bengal. Najmal Islam Hashmi (2012) critically studied the patterns of crop concentration and diversification in Upper Ganga Yamuna Doab, Mohammad Maqbool Bhat (2013) narrated the agricultural land-use pattern in Pulwama Distirct of Kashmir Valley. Kamalika Majumder (2014) elaborated the nature and Pattern of crop diversification in West Bengal, M. Sambasiva Rao. M (2015) Studied the Water Balance and Cropping Pattern of the Garladinne Mandal, Anatapuramu District, Andhra Pradesh.

Aim

The aim of the study is to bring out the cropping pattern of Salem District.

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Objectives

a) Describe the crop concentration of the study area
b) Estimate the cropping intensity
c) Delineation of Crop diversification
d) Bring out the crop combination

Study area

The study area is Salem District of Tamil Nadu which is located between 11.14^0 and 12.53^0 North and 77.44^0 and 78.50^0 East in the north central part and it is spreads about 5245sq.km, and it is a land locked area. The area has well marked with hills in the north and south eastern direction. The study area is a southern extension of Mysore plateau and Salem District is also called as Talaghat upland. The elevation decreases from north to south and towards east. The study area's an ideal location for bi-model rainfall; peculiarly summer showers bring half of the seasonal rain. Generally this area is called as Geologic paradise due to the occurrence of many varieties of rocks and minerals, and also famous for its rainfed and irrigated agriculture. Salem is famous for steel plant, Stanley Reservoir and spinning mills. Shervory hills are famous hill station is found in Salem. The population of Salem district is 34, 80, 008 according to 2011 Census and it ranked fifth among the District wise population of the Tamil Nadu state. At present Salem District contains 9Taluks, 20 Blocks, 33 town panchayats, 4 revenue divisions, 631 revenue villages, 4 municipalities and one corporation. The Study area is shown in the Figure 1.

The land use & land cover and cropping data for the period 2008 - 2009 is collected from statistical office, Block maps were digitized from Taluk sheets. The crop concentration is worked out by using Bhatia (1965) Location quotient method for the selected crops in the study area. Cropping intensity is calculated between total cropped area and net sown area of each block. Crop diversification of the study area is calculated based on Gibbs – Martin Index (1962) of Diversification and Crop combination is analyzed individually for each block based on J.C Weaver (1954) and all indices were portrayed using GIS to understand the spatial distribution.

RESULTS AND DISCUSSION

Crop concentration

The crop concentration is defined as the pattern of crop distribution in the density of any crop in a given space at a given point of time. Crop concentration has its own advantage over crop intensity and diversification in the process of determining the regional pattern of crop distribution or domination of one crop over other. The spatial strength of crop is controlled by the prevailing agroclimatic conditions, existing over the terrain and socio economic conditions of an area. Available agro economic data from the authorities with appropriate statistical method can help to understand the clear picture of complex agriculture. The index of crop concentration is calculated from "Location quotient method" Bhatia (1965).
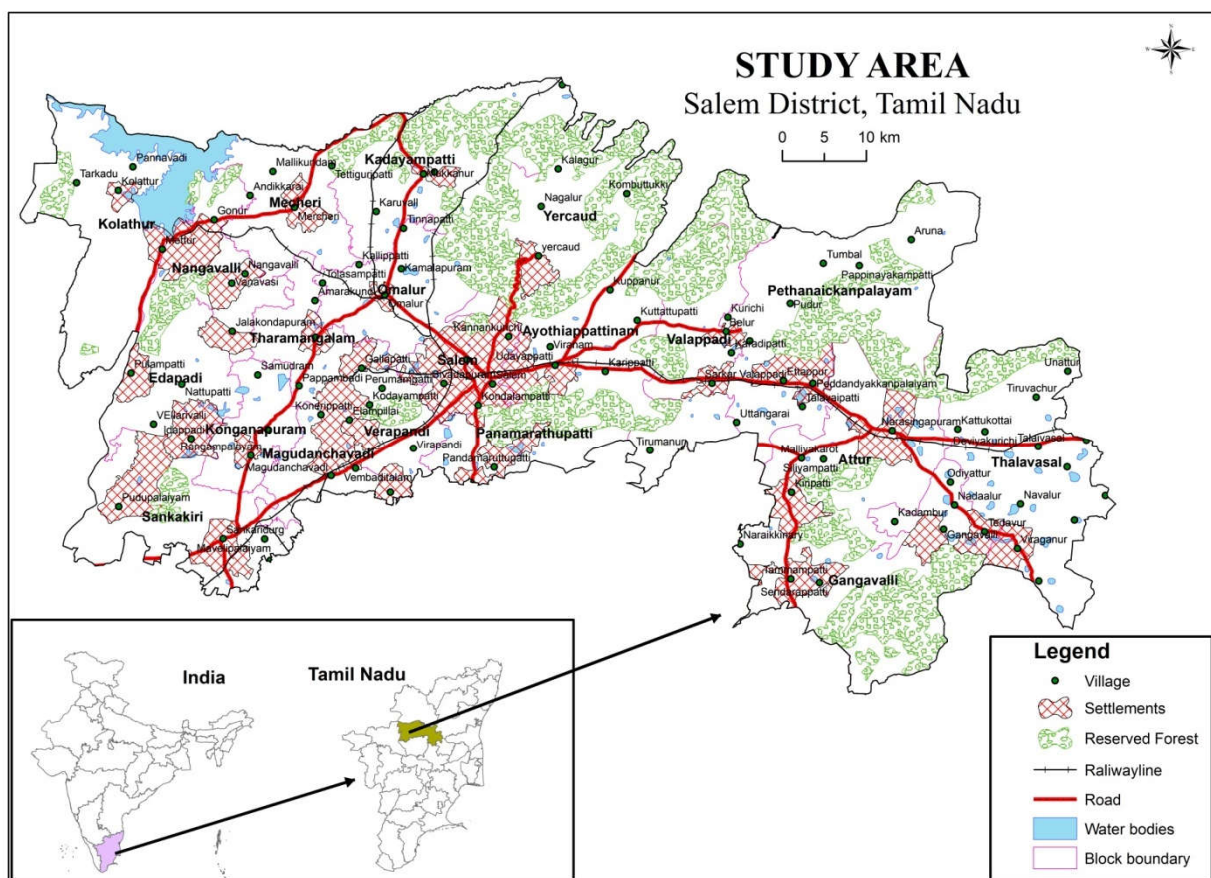

Figure 1. Study Area

The Location quotient method is applied to each block of the study area to find the spatial strength of the individual crops. This kind of concentration analysis help as to compare and associate different crop distributions on a uniform scale, further it is give a meaning full generalization of an area. The formula as follows

Index for determining concentration of crop 'a' =

$$\frac{\text{area of crop 'a' in the component areal unit}}{\text{area of all crop in the component areal unit}} \bigg/ \frac{\text{area of crop 'a' in the entire region}}{\text{area of all crops in the entire region}}$$

The higher index values represent high concentration and lower values represent low concentration or the index values are directly proportional to concentration. By using the index value that study area is classified into three categories known as High, Moderate and Low.

The following Table (1) shows the index of crop concentration of the study area and Figure 2 & 2a depicts the crop concentration of the study area.

Paddy

Paddy is another major important crop in the study area; Thalaivasal, Attur, Ayothiyapattinam, Gangavalli, and Sankagiri are major producer of paddy. Thalaivasal and Attur are the major concentrations of paddy and high paddy concentration found in Attur, Thalaivasal and Sankagiri.

The moderate concentration of paddy found in Pethanaickenpalayam, Ayothiyapattinam, Panamarathupatty, Edappady, Kolathur and Gangavalli. Yercaud, Mecheri, Nangavalli, Konganapuram, Magudanchavadi and Veerapandi express the low concentrations of paddy.

Cholam

Cholam is another popular crop in this study area, cholam is highly concentrated is Pethanaickenpalayam, Kadayampatty, Omalur, Salem, Tharamangalam and Sankagiri the moderate concentration of Cholam presents in Yercaud,

Table 1. Index of crop concentration

Blocks	Tapiaco	Coffee	Paddy	Cholam	Ragi	Maize	Pulses	Spices and con	Sugar crops	Fruits	Vegetation	Cotton	Oil seed crops	Fodder
Attur	1.61		1.96	0.65	0.00	1.95	0.15	2.17	0.75	0.38	0.36	1.10	0.55	0.07
Ayothiyapattinam	1.74		1.43	1.40	0.46	0.34	0.64	0.83	0.35	1.30	0.53	0.02	1.30	1.47
Edappady	0.25		0.82	0.32	0.97	0.23	2.55	0.13	1.29	0.31	0.23	1.27	1.65	1.92
Gangavalli	1.12		1.10	0.36	0.02	4.22	0.09	1.20	0.21	1.09	0.76	0.46	0.21	0.02
Kadayampatty	0.88		0.73	1.99	2.74	0.03	1.95	0.55	2.85	1.04	1.45	0.74	1.03	0.49
Kolathur	0.19		0.61	0.12	1.16	0.46	0.53	3.12	1.03	3.12	0.30	1.97	1.42	1.40
Konganapuram	0.67		0.15	0.27	0.35	0.16	2.01	0.04	1.09	0.28	0.28	1.17	2.06	2.44
Magudanchavadi	1.08		0.26	1.38	0.22	0.10	1.45	0.07	1.28	0.88	0.40	0.77	1.67	2.40
Mecheri	0.08		0.36	0.15	6.24	0.00	3.44	0.13	0.41	0.92	7.48	0.38	0.97	0.78
Nangavalli	0.26		0.20	0.39	4.51	0.02	2.05	0.06	0.07	1.28	0.53	2.32	1.57	1.71
Omalur	0.79		0.74	1.79	1.37	0.02	1.50	0.83	4.07	0.57	0.56	0.29	1.14	1.25
Panamarathupatty	2.62		1.42	0.87	0.06	0.13	0.12	1.18	0.42	1.92	1.03	0.29	0.96	1.61
Pethanaickenpalayam	2.71		1.34	1.62	0.06	1.06	0.31	2.32	1.18	1.23	0.26	0.75	0.43	0.12
Salem	0.27		2.16	1.84	0.19	0.01	0.09	0.53	1.48	1.25	0.92	0.11	1.01	2.77
Thalaivasal	0.34		1.52	0.67	0.04	2.88	0.24	1.28	0.60	0.33	1.10	3.01	0.38	0.06
Valapady	2.16		1.13	1.02	0.25	1.36	0.40	2.07	0.47	0.82	0.93	0.75	0.68	0.68
Veerapandi	0.83		0.85	0.92	0.08	0.10	0.29	0.23	0.77	1.14	1.70	1.07	1.51	2.92
Yercaud	0.01	30.20	0.16	0.92	1.35	0.03	0.08	0.28	0.00	2.43	0.48	0.00	0.13	0.00
Sankagiri	0.74		1.60	1.05	0.08	0.01	0.28	0.14	1.13	1.07	0.22	0.09	1.94	2.19
Tharamangalam	0.00		0.34	4.50	2.85	0.01	3.59	0.12	0.68	0.34	1.78	2.33	0.85	0.12

Tapioca

Tapioca is cultivated in the study area as a commercial crop which gives prominent input to the sago industries of the District. Pethanaickenpalayam is the highest contributor of Tapioca 5798.21 ha of land under tobacco. The high tapioca concentration shows the following blocks they are Attur, Pethanaickenpalayam, Valapady, Ayothiyapattinam and Panamarathupatty. The moderate concentration present in Gangavalli, Kadayampatty, Omalur, Veerapandi, Konganapuram, Sankagiri and Magudanchavadi The rest of the blocks Thalaivasal, Yercaud, Salem, Mecheri, Nangavalli, Kolathur and Edappady represents low concentrations of Tapioca.

Ayothiyapattinam, Valapady, Panamarathupatty, Attur, Thalaivasal and Veerapandi. The lowest concentration of Cholam present in Kolathur, Nangavalli, Mecheri, Konganapuram and Gangavalli.

Ragi

Mecheri in the highest producer of Ragi in the study area, during this year (2008-2009) 2783.85 ha of land is used to cultivate Ragi. Kadayampatty, Mecheri, Nangavalli, Tharamangalam blocks have the high concentration of Ragi. Salem, Yercaud and Kolathur show the moderate concentrations rest of the blocks have lowest concentration of Ragi.
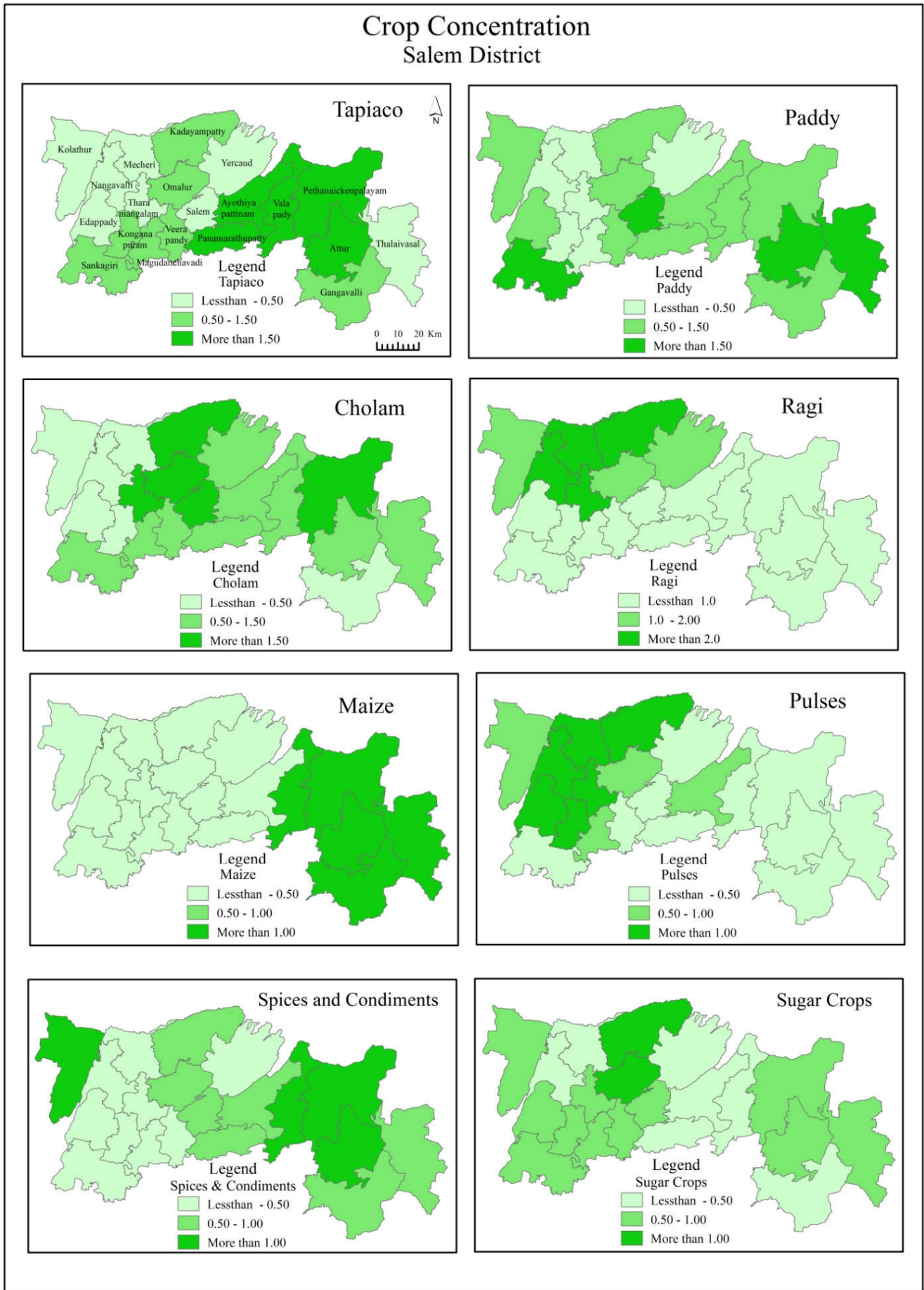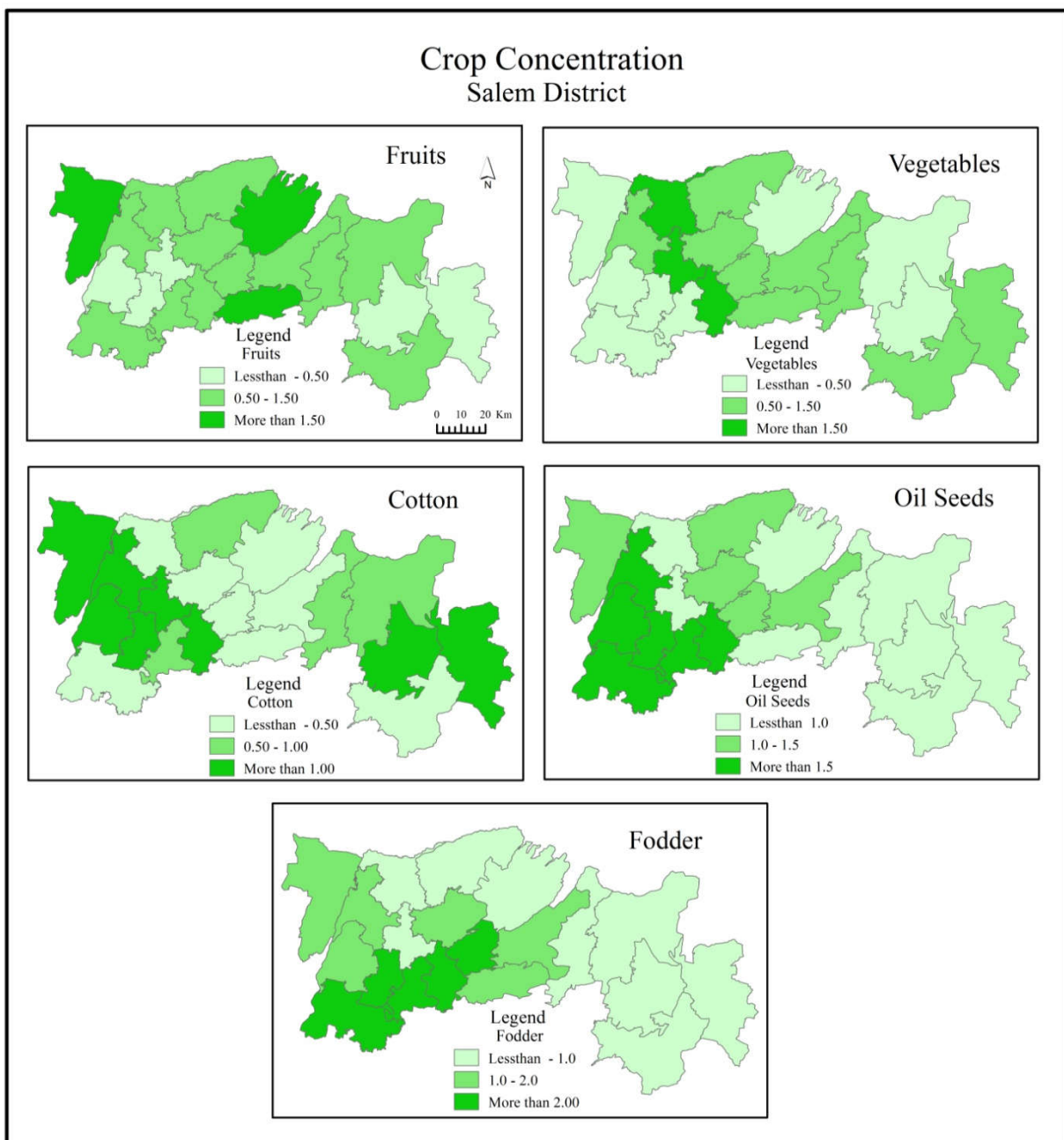
Figure 2. Crop Concentration

Figure 3a. Crop Concentration

Maize

Gangavalli and Thalaivasal are the Major producer of Maize in the study area, 12563.87 ha and 8970.2 ha of land under Maize respectively. The crop concentration analysis shows that Thalaivasal, Gangavalli, Attur, Pethanaickenpalayam, Valapady.

Pulses

Mecheri and Edappady are the major producer of Pulses 2847.37 ha (17.08%) high concentration of pulses were found in Kadayampatty, Mecheri, Nangavalli, Konganapuram and Tharamangalam moderate concentration of Maize present in Ayothiyapattinam, Salem and Magudanchavadi concentrations of Maize were low in Sankagiri, Salem, Veerapandi, Yercaud,

Panamarathupatty, Valapady, Pethanaickenpalayam, Attur, Thalaivasal and Gangavalli have high concentration of maize.

Spices and condiments

Gangavalli, Kolathur, Pethanaickenpalayam, Thalaivasal and Valapady shares 6547.91 ha (67.37 %) of spices and condiment cultivation high concentration of spices and condiments found in following block, they are Pethanaickenpalayam, Attur, Valapady and Kolathur. The medium concentrations have seen in Thalaivasal, Gangavalli, Kadayampatty, Salem, Omalur, Ayothiyapattinam and Panamarathupatty. The low concentrations of spices and condiments were found in Yercaud, Nangavalli, Konganapuram, Mecheri, Magudanchavadi, Veerapandi, Sankagiri and Yercaud.

Sugar Crops

Omalur is the highest producer of sugar crops 2166.63 ha of land under sugar crops cultivated in this block. Kadayampatty is the second largest share holder in sugar crop production which shares 1845.21 ha (16.09%) of land for sugar crop cultivation. The crop concentration analysis indicates the high concentration found in Omalur and Kadayampatty. Moderate concentrations were found in Pethanaickenpalayam, Attur, Thalaivasal, Kolathur, Edappady, Sankagiri, Konganapuram, Tharamangalam, Magudanchavadi, Salem and Veerapandi. The lowest sugar crops were concentrated in Mecheri, Nangavalli, Yercaud, Ayothiyapattinam, Valapady, Panamarathupatty, and Gangavalli.

Fruits

Kolathur and Yercaud were major contributor for fruit cultivation, they share 1111.77 ha and 630.83 ha (24.42%) High concentration of fruit cultivation seen in the following blocks they are Kolathur, Yercaud and Panamarathupatty. The moderate concentrations of fruits were seen in Mecheri, Nangavalli, Kadayampatty, Ayothiyapattinam, Pethanaickenpalayam, Nangavalli and Valapady. Concentration of Fruits were low in Edappady, Konganapuram, Tharamangalam, Attur and Thalaivasal.

Vegetables

The high concentration of vegetables were found in Mecheri, Tharamangalam and Veerapandi. The concentrations of vegetables are moderate in Nangavalli, Kadayampatty, Valapady, Thalaivasal and Gangavalli. Vegetables were concentrated less in Kolathur, Edappady, Konganapuram, Magudanchavadi, Sankagiri, Yercaud, Pethanaickenpalayam and Attur.

Cotton

In Thalaivasal Cotton is cultivated in 3942.94 ha of land (28.09%) and it is the highest contributes is the study area. Attur, Edappady, Pethanaickenpalayam, Tharamangalam and Kolathur shares more than 900 ha for cotton cultivation. Which is reflected is the concentration were seen in Kolathur, Nangavalli, Edappady, Konganapuram, Tharamangalam, Veerapandi, Thalaivasal and Attur, moderate concentration found in Kadayampatty Magudanchavadi, Pethanaickenpalayam and Valapady concentration of cotton were low in Sankagiri, Mecheri, Salem, Omalur, Panamarathupatty, Yercaud, Ayothiyapattinam and Gangavalli.

Oil Seeds

In Salem district oil seed contribution is highly preferred by cultivations 44350.7 ha (17.6 %) of land under for oilseed cultivation. Expect Yercaud all the blocks in the study area shares more than 100 ha for oil seed cultivation. High oil seed concentration were seen in Edappady, Nangavalli, Sankagiri, Konganapuram, Magudanchavadi and Veerapandi. Moderate concentration of oil seeds were seen in Kolathur, Kadayampatty, Salem, Omalur, Ayothiyapattinam. Low

concentration of oil seeds were found in Mecheri, Tharamangalam, Yercaud, Panamarathupatty, Valapady, Attur, Pethanaickenpalayam, Thalaivasal and Gangavalli.

Fodder

Fodder occupies fifth position in overall ranking of crops. Sankagiri (14.45%) in the highest concentration of Fodder crops in Salem district followed by Magudanchavadi, Edappady, Ayothiyapattinam and Konganapuram. Crop concentration analysis clearly indicates that Sankagiri, Konganapuram, Veerapandi and Salem were the fodder crop is highly concentrated. Moderate concentration of Fodder present in Kolathur, Nangavalli, Edappady, Omalur, Panamarathupatty and Ayothiyapattinam. The fodder crops were low in Mecheri, Kadayampatty, Tharamangalam, Yercaud, Valapady, Pethanaickenpalayam, Attur, Thalaivasal and Gangavalli.

Crop diversification

Crop diversification is a concept which opposite to specialization. Crop diversification index used to identify the behavior of crops over a period in a particular aerial unit. Advantage of the assessment of crop diversification enables the researcher to understand the physical and socioeconomic balance of an area. Further, it helps to identify contemporary competition among crops in a unit of land. Higher diversification means larger number of crops in an area and each occupy equal area were as specialization means few number of crops raised in an area (Bhalsing 2009). "The keener the diversification and lesser the competition the greater will the trend toward specialization or monoculture farming were emphasis on one or two crops" (Jasbir Singh 2002). In this study Gibbs – Martin Index of Diversification (1962) is useful index for measuring the extent of diversification in cropping patter in a unit of area.

$$\text{Index of Diversification} = 1 - \sum X^{2} / (\sum X)^{2}$$

Where X is the percentage of total cropped area occupied by each crop under an individual crop. If the index of diversification value close to 1, the diversification is relatively high and the value not close to one, it indicates the areal units have low diversification. If the total area in a region is devoted to one crop (i.e. specification) the index value will be zero and it is distributed evenly among all crops (i.e. diversification) the index value will be one. Crop diversification index calculated for each blocks of the study area by using above said formula. The following Table (2) shows the index of crop diversification.

Table 2. Crop diversification

Block Name	Index	Block Name	Index
Mecheri	0.98	Nangavalli	0.78
Kadayampatty	0.86	Magudanchavadi	0.77
Omalur	0.83	Tharamangalam	0.77
Kolathur	0.82	Salem	0.75
Valapady	0.82	Sankagiri	0.75
Pethanaickenpalayam	0.81	Veerapandi	0.75
Attur	0.79	Konganapuram	0.74
Panamarathupatty	0.79	Thalaivasal	0.66
Ayothiyapattinam	0.78	Gangavalli	0.46
Edappady	0.78	Yercaud	0.33

The crop diversification of the study area indicates that the blocks were highly diverse in nature the index values range between 0.33 to 0.98. Except blocks like Yercaud has the least value (0.33), which indicates that since the Yercaud block completely a hilly region dominated by Coffee plantation. Similarly Thalaivasal and Gangavalli have index values 0.66 and 0.46 respectively, these blocks also dominated by Maize and Paddy. Mecheri (0.98) have the highest diversity followed by Kadayampatty (0.86), Omalur (0.83), Kolathur (0.83), Valapady (0.82) and Pethanaickenpalayam (0.81). The Moderate diversification seen the following blocks the index is from 0.75 to 0.79 they are Attur, Panamarathupatty, Ayothiyapattinam, Edappady, Nangavalli, Magudanchavadi, Tharamangalam, Salem, Sankagiri and Veerapandi. The crop diversification was less in Thalaivasal (0.66), Gangavalli (0.46) and Yercaud (0.33). The higher t he value which is close to "1" indicates higher diversification and the value close to "0" indicates less crop diversification. Fig 4. depicts the Crop Diversification.

The estimation of cropping intensity of the study area intends to classify the area in to three categories such as High (> 150 %), Moderate (130 - 150) and Low (< 130%). The crop intensity analysis reveals that the Salem Blocks have the maximum intensity since the block is occupied by buildup lands the remaining land utilized for cropping intensively.

Table 3. Cropping Intensity

| Blocks	Cropping intensity	Blocks	Cropping intensity
Attur	127.9	Omalur	144.6
Ayothiyapattinam	131.9	Panamarathupatty	162.1
Edappady	128.4	Pethanaickenpalayam	123.2
Gangavalli	123	Salem	288.4
Kadayampatty	137.6	Sankagiri	128.8
Kolathur	132.6	Thalaivasal	140.8
Konganapuram	126.3	Tharamangalam	156.7
Magudanchavadi	138.1	Valapady	119.2
Mecheri	132.9	Veerapandi	165
Nangavalli	127.8	Yercaud	130.2
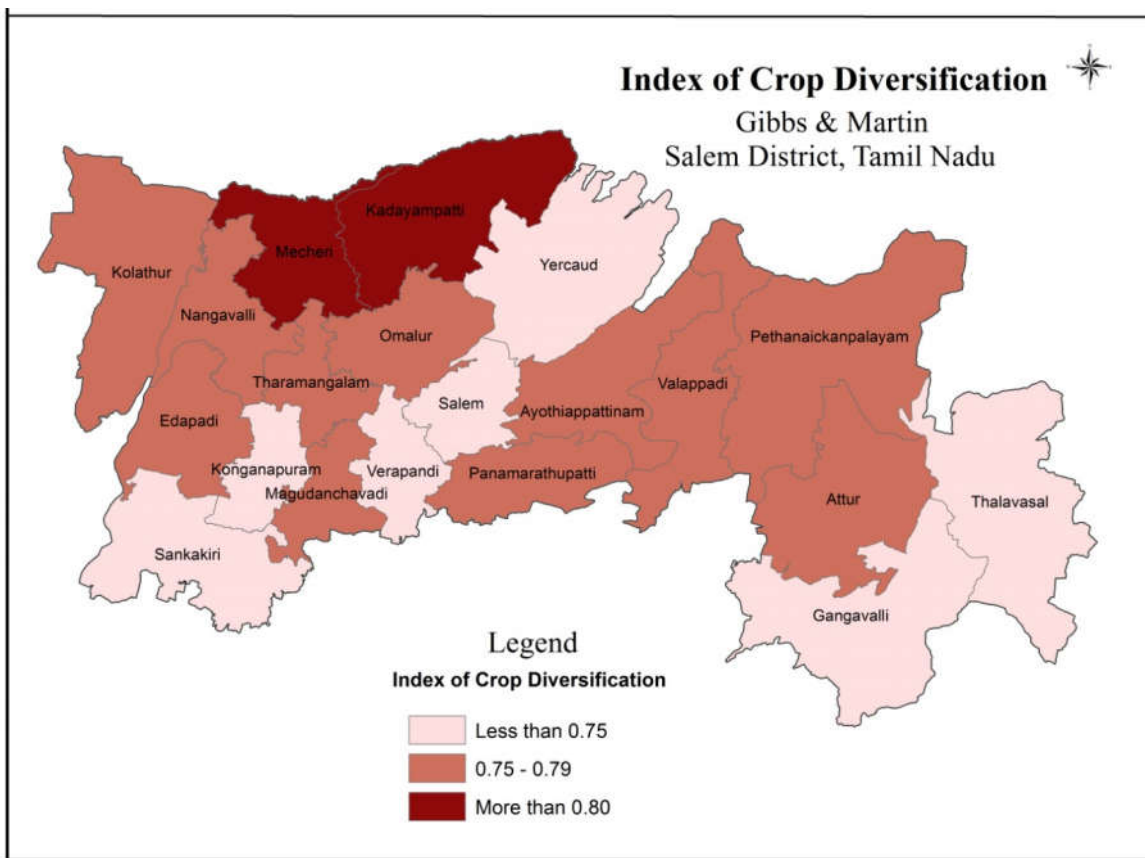
Figure 4. Crop Diversification

Cropping Intensity

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 Salem District.

Cropping Intensity = [Total cropped area / Net sown area] x 100

The highest cropping intensity found in the following blocks they are Tharamangalam, Veerapandi, Panamarathupatty.

The moderate cropping intensity found in Thalaivasal, Ayothiyapattinam, Yercaud, Omalur, Kadayampatty, Mecheri and Kolathur. Gangavalli, Attur, Pethanaickenpalayam, Valapady, Nangavalli, Edappady, Konganapuram and Sankagiri have the intensity value less than 130 which are classified as low cropping intensity Fig 3. depicts the Cropping intensity.
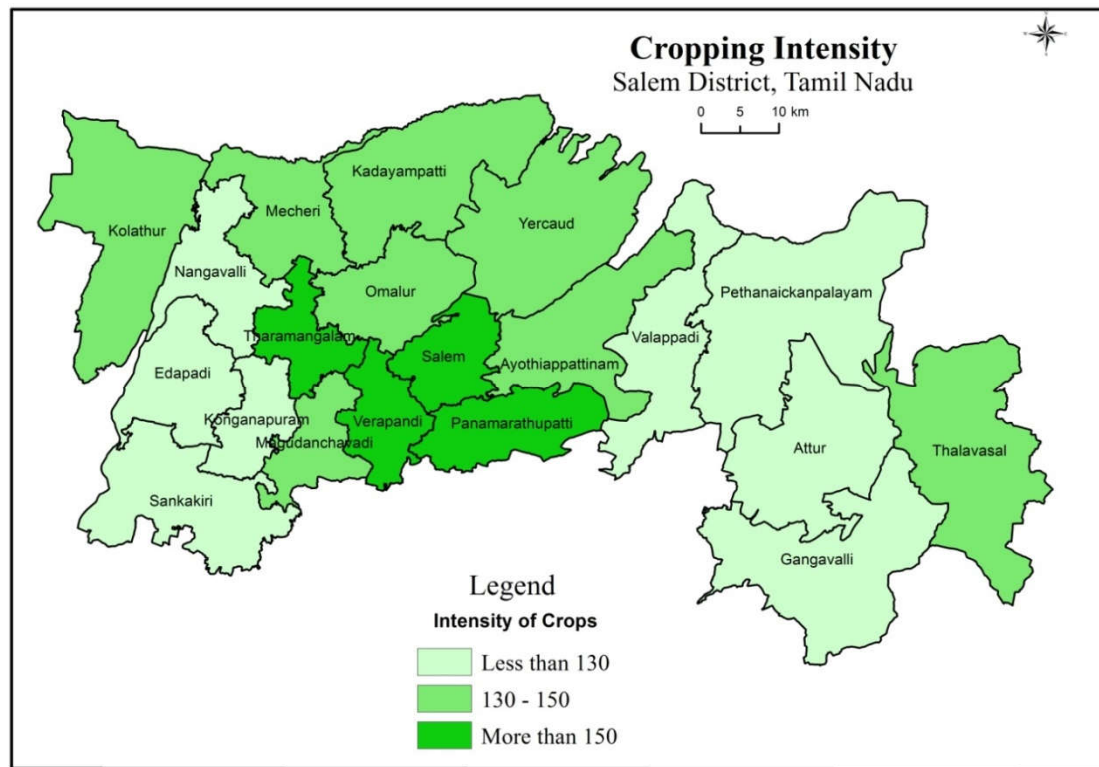
Figure 3. Cropping Intensity

Crop Combination

Crop combination analysis is a process of agricultural regionalization. Usually crops are grown in different combination and are rarely a single crop occupies a major portion of an area. Most of the farmers by inculcating the new advancement in agriculture they plan variety of crops of their lands. The variety of combination indicates the fertility of land and its suitability for different crops in appropriate seasons. A main advantage of crop combinational may avoid over simplification. In tradition, crop combination analysis is carried out by semi statistical and statistical technique. Among this statistical method is an appropriate method and it will bring out best possible combinations. Among the available statistical methods J.C Weaver (1954) multifactor approach is applied in this study. Weaver applied the similar approach in the middle U.S.A during 1954. In his analysis Weaver compared the actual percentage of total cultivated area with a theoretical percentage. For monoculture crop with 100%, two crop combinations are 50% and 10 crop combination is 10%. The following standard deviation formula is used for this analysis.

Standard Deviation = $(\sum d^2 /n)^{1/2}$

Where 'd' is the difference between the actual crop percentage of a block of the study area and the equivalent theoretical value. Weaver's minimum deviation method is worked out to bring out the various crop combinations and cropping region was present in Salem District. The result reveals that study area have four to twelve crop regions. 12 crop region were found only in Veerapandi Block and 11 crop region available in Thalaivasal Block.

10 crop region present in Ayothiyapattinam alone and eight blocks were with six crop region and five crop region in six blocks. Table (4) shows the cropping regions of the study area.

Table 4. Cropping regions of Salem District

Crops	No of Blocks	Blocks
12	1	Veerapandi
11	1	Thalaivasal
10	1	Ayothiyapattinam
9	4	Kadayampatty, Kolathur, Magudanchavadi, Pethanaickenpalayam
8	2	Valapady, Yercaud
7	1	Omalur,
6	5	Attur, Edappady, Erumapatti, Konganapuram, Tharamangalam
5	5	Gangavalli, Mecheri, Nangavalli, Panamarathupatty, Salem
4	1	Sankagiri,

Oilseed cultivation preferred as first ranking crop in the following blocks they are Kolathur, Edappady, Nangavalli, Sankagiri, Konganapuram, Magudanchavadi, Omalur, Kadayampatty and Ayothiyapattinam. Fodder is first ranking crop in Salem and Veerapandi. Attur, Thalaivasal and Gangavalli Maize is the first ranking crop.

In Yercaud block Coffee is the first ranking crop. Tapioca is preferred as first ranking crop Panamarathupatty, Pethanaickenpalayam and Valapady. Paddy and Fodder crops were the second ranking crop in the study area, Paddy opted as a second ranking crop in Salem, Pethanaickenpalayam, Attur, Thalaivasal and Gangavalli. Fodder placed as second ranking in Kolathur, Nangavalli, Edappady, Konganapuram, Sankagiri and Magudanchavadi.
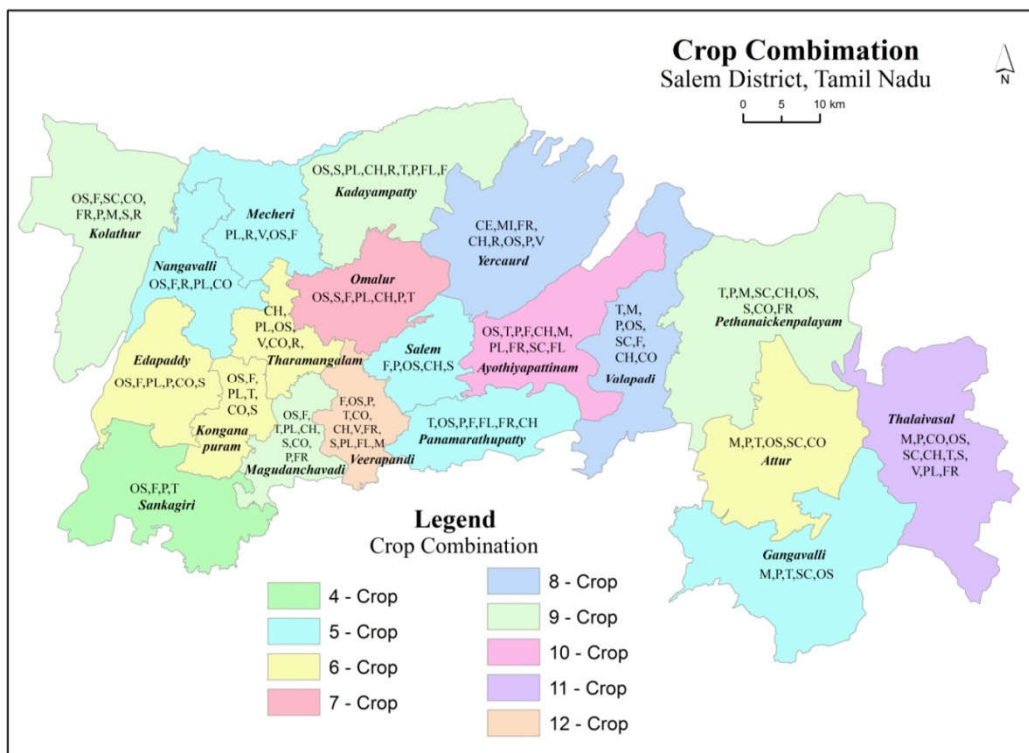
Fig. 4. Cropping region and Crop Combination

OS – Oilseeds, F- Fodder, FR – Fruits, CH – Cholam, R – Ragi, T – Tapioca, MI – Millet, P – Pulses, V – Vegetables, S – Sugar Crops, FL – Flower, SC – Spices and Condiments

Tapioca is found as third ranking crop in Attur, Gangavalli and Magudanchavadi. Paddy is placed in third ranking crop in Ayothiyapattinam, Valapady, Panamarathupatty, Veerapandi and Sankagiri. Pulses found as third ranking crop in Edappady, Konganapuram and Kadayampatty. Vegetable cultivation is found as third ranking crop in Mecheri and Fruit cultivation opted as third crop in Yercaud. The Fig (4) shows the cropping region and crop combination of each block of the study area.

Conclusion

The cropping pattern of the Salem District was brought out through calculating crop concentration, crop combination, cropping intensity and crop diversification. The analysis reveals that there are fourteen crops widely occupies in the study area. Among the fourteen crops oilseeds, Tapioca, paddy and maize were the top five crops. The cropping intensity result shows that the highest cropping intensity found in Tharamangalam, Veerapandi, Panamarathupatty. The moderate cropping intensity found in Thalaivasal, Ayothiyapattinam, Yercaud, Omalur, Kadayampatty, Mecheri and Kolathur. The crop diversification was calculated through GIBBS and Martin methods which indicates that Yercaud, Gangavalli and Thalaivasal shows lower crop diversification, Yercaud provides ample conditions for coffee cultivation and other fruits and flowers. Similarly Thalaivasal and Gangavalli were interest to cultivating maize and paddy, other blocks in the study area have the index value more than 0.7 which indicates that the blocks have high diversification. The J,C. Wever (1954) crop combination method was used to examine the

crop combination present in the study area, there are four to twelve crop combinations were present. The crop combination analysis also sight that oils seeds, Maize, Tapioca as fist ranking crop in several blocks, similarly oil seeds, paddy, Tapioca founds as second ranking crop and paddy is found as third ranking crop in the study area. The overall cropping pattern has influenced by the terrain, climate and local socio economic condition. The cropping pattern also gives sight to better understanding of agricultural practice and choice of crop by farmers.

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