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Tiruchirapalli District: A Spatio-Temporal Analysis of Change in Occupational Structure (1971-2011)

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ABSTRACT

A study on the changing pattern of occupational structure may be helpful in the planning process for further development of the region. The study area lies between 10° 15' and 11° 12' North latitudes and 78° 10' and 79° 5' East longitudes (fig.2.1).The study area lies along the east coastal plain and form a part of the Deccan plateau, one of the natural divisions of India. These regions Poverty and Unemployment are major problems in the country. The decline in labor force from primary sector may enhance poverty and unemployment situation. In this context a study on population characteristics has to test the significance of change in the occupational structure statistically. Hence the Analysis of Variance One-Way classification is used to test the significance of change in Occupational structure. Now the participation of males and females are almost similar in any type of occupation. Hence there is a need to experiment the significance of change in Occupational Structure among males and females also, which is also performed using Analysis of Variance One Way classification.

Key words: *Occupational structure, Male Workers, ANOVA, Tiruchirappalli, Agricultural, Agriculture Labour*

INTRODUCTION:

A geographical analysis of changes in population characteristics enables us to identify the direction of change and their significance and its impact on other related phenomenon. Moreover the present study may form the base for further studies.

Change in occupational structure is a significant feature in any area. Empirical observation in various parts of Tamil Nadu has brought to light a change in occupational structure. The recent trend is a shift from primary sector to either secondary or tertiary sector. Such changes are the result of introduction of machineries in farming, increase in the proportion of wasteland due to degradation of the quality of land, decline in the fertility of the soil and the haphazard urban expansion on the good quality agricultural lands. It is worth stating that the decrease in the proportion of workers from the agricultural sector is not a healthy symptom of development. In a country like India where the size of population is huge ranking only next to China, the need for food is also a major basic requirement.

Donald B. Keesing : This Article summarizes the main findings of a detailed. Study of the changing occupational and industrial structure of Mexico's non-agricultural labor force from 1895 to 1930 and from 1930 to 1950, based on a comparison of population censuses, especially

those of 1895, 1930, and 1950. Structural changes in Mexico's labor force have never been adequately studied, and the results of the present research shed considerable new light on Mexico's development. The findings also suggest important paradoxes and discontinuities in the early stages of industrialization that merit systematic recognition in models and measurements of structural change over the course of development.

Dr. Sherap Bhutia: The study of occupational structure dealing with working (main and marginal) and non-working population has been carried out in the present study. It reveals from the study that the area under study proves to be a complicated region requiring considerable care & attention in the matter of intensive development.

Sean Lowery and Allen G. Noble**:** This paper examines the changes in occupational structure among the Amish of Holmes County, Ohio, the largest Amish settlement in the world. It also investigates differences in occupations among the three leading sects of Amish in this county. Occupations listed by the Amish themselves in the *Ohio Amish Directory* are used to trace the decline in farming, as well as to identify the growing types of non-farm employment. Not only are numbers of Amish in non-agricultural jobs increasing, so also is the range of employment opportunities available.

Vıctor Aguirregabiria and Cesar Alonso-Borrego: Recent studies have found evidence for the complementarity between white-collar labor and technological capital. However, the estimated elasticities appear too small to explain the observed changes in labor occupational structure.

STUDY AREA

Tiruchirappalli district is an inland district located in the central segment of the state of Tamil Nadu. The district lies between 10° 15’ and 11° 12’ North latitudes and 78° 10’ and 79° 5’ East longitudes (fig.2.1).The study area lies along the east coastal plain and form a part of the Deccan plateau, one of the natural divisions of India. But except for the presence of Pachamalai hills in the northern part of the district, the entire district is in the Cauvery basin. The river divides into Cauvery and Coleroon and reunites within the district, forming the Sri Rangam Island. The study area experiences semiarid climate. The annual temperature is above 25.5 ^{o}C, the average rainfall accounts to about 645.2mm. The area is formed of crystalline rocks of Archaean age. A total population of 2722290 people is spread over an area of 440412 hectares. The average density of population of the study area accounts to about 604 person per.sq.km. Around 83.23 percent of the population is classed as literates. The total workers in total population accounts to about 44.53 per cent, out of which 19.04 per cent of workers are classed as cultivators, 29.44 percent as agricultural labourers, 3.65 percent as secondary workers and 41.22 percent as tertiary workers. There are about 483 villages and 22 urban settlements spread in 14 panchayat unions. The study area has a well developed transport network. The understanding of the geographical environment of the study area will be helpful in understanding the spatio–temporal analysis of the demographic characteristics in Tiruchirappalli district.

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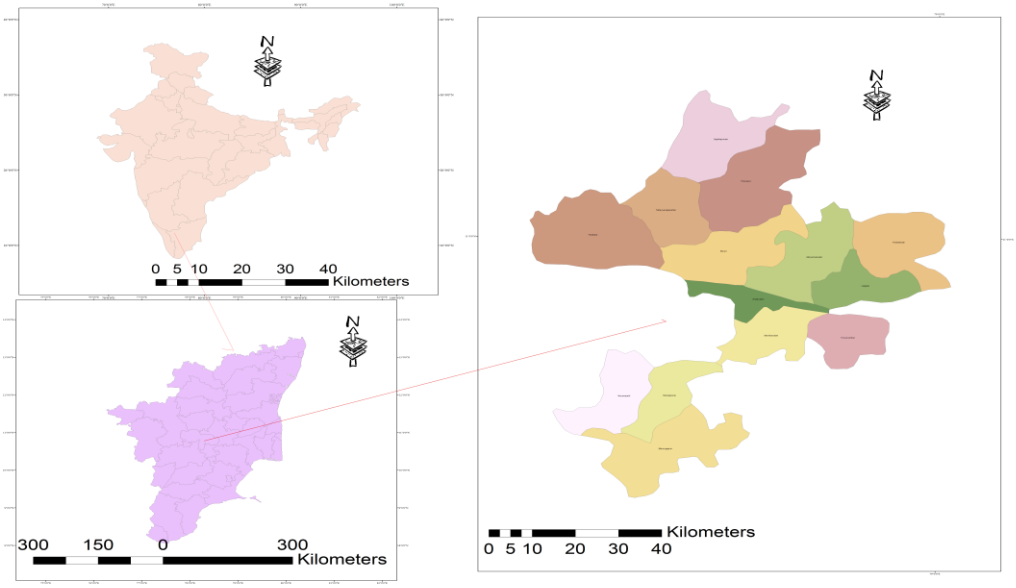

Figure No.:1 Study Area.

METHOD AND MATERIALS:

Aim and objective:

So far Geographers have analyzed the change in occupation based on maps. But the change if measured statistically could be of immense use for planning. Hence using the Analysis of Variance an attempt is made to measure statistically.

1. The significance of change in occupational types among total workers.
2. The significance of change in the occupational types among male workers.
3. The significance of change in the occupational types among female workers.

A statistical analysis may yield fruitful results when the observation is made for a reasonably longer period. Hence in the present analysis the analysis in performed for the statistical data obtained from the Tamil Nadu census reports for the census period 1971and 2011.

Technique

One of the most powerful tools of statistical analysis to study variation is "Analysis of Variance" a systematic procedure developed by R.A Fishers in 1920s and 1930s Analysis of variance is a statistical technique, which assesses the contribution made by each separate factor to the total variability of a set of data. The analysis of variance is the separation of variance ascribable to one group of causes from the variance ascribable to another group. It is a procedure by which the variation embodied in the data may be resolved with component variation due to the independent factors. Each of the components yields an estimate of the population variance and these estimates are tested for homogeneity by means of 'F' table.

The significance of change in occupational types in any area can be measured by using the one-way classification of analysis of variance. In one-way classification the data are classified according to only one criterion. Here the criterion is the variance in occupational types. In the

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present study the analysis of variance one-way classification is performed using Data Analysis procedure in Micro Soft Excel® software and SPSS-10 through computer.

DISCUSSION AND RESULT:

Total Workers

In the present analysis the proportion of total workers in different occupational types namely cultivators, agricultural labourers, secondary workers and tertiary workers is calculated as percent to total workers for the five census periods namely 1971, 1981, 1991, 2001 and 2011. The difference in the percentage values (table 1.1,) are computed and subjected for the ANOVA (table 1.2).

The analysis of variance one way classification is used to test the significance of change in the occupational structure in Tiruchirappalli district. The analysis is performed using Microsoft Excel® and SPSS10 through computer. For the purpose of interpretation the calculated F value is compared with the table F value. When the calculated F value is greater than the table value, it is concluded that the change in the occupational structure is significant and vice versa.

Table 1.1
Total Workers
Difference in Percentage (1971- 2011)

Panchayat Unions/ Blocks	CU	AG	SEC	TER
Uppiliyapuram	-19.34	18.86	-2.44	2.93
Thuraiyur	-7.81	4.11	-4.35	8.06
Thathiyangarpetai	-7.68	4.61	-5.90	8.97
Manachanallur	-19.55	5.88	-8.37	22.03
Musiri	-20.40	11.43	-2.73	11.72
Pullambadi	-16.09	17.18	-9.05	7.77
Thottiam	-17.35	15.95	-3.43	4.83
Lalgudi	-17.33	10.01	-5.38	12.70
Andhanallur	-14.82	1.32	-12.82	-21.79
Thiruverambur	-4.75	-0.54	-25.36	30.66
Manikandam	-26.33	-8.53	-17.10	2.35
Vaiyampatti	-15.47	12.60	-2.04	4.92
Manapparai	-19.48	3.77	-6.05	21.75
Marungapuri	-18.10	13.75	-1.12	5.47

CU-Cultivators, AG-Agricultural Laborers, SEC-Secondary Workers and TER- Tertiary Workers.

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Table 1.2

ANOVA ONE WAY CLASSIFICATION *(1971- 2011)*

Source of Variation	Sum of Squares	Df	Mean sum	F
Between Occupation Error Total	6173.85 3706.19 9880.04	3 52 55	2057.95 71.27	28.87*

Table value at 1% 4.2 and 5% 2.79 * Significant at 1%& 5% level.

The overall change in the occupational structure of total workers between 1971 and 2011 is presented in table 1.2. The calculated F value of 28.87 indicates a significant change at 1% and 5% level when compared with the table value. Thus the hypothesis that the study area has experienced a change in the occupational structure is proved.

Male Workers

Having proved the significance of change in the occupational structure in Tiruchirappalli districts among the total workers between 1971 and 2011, an attempt is made to test the significance of change in terms of male and female workers. Hence the proportion of the males employed as cultivators, agricultural laborers, secondary workers and tertiary workers to total male workers are expressed as percent for the census years 1971 and 2011. The difference in the occupational types in the panchayat unions between 1971- 2011 is (table 1.3) calculated and subjected to analysis of variance one way classification. (Table 1.4).

Table 1.3
Male Workers
Difference in Percentage (1971- 2011)

Panchayat Unions/ Blocks	CU	AG	SEC	TER
Uppiliyapuram	-21.58	16.15	-3.18	8.61
Thuraiyur	-13.22	2.71	-6.16	16.67
Thathiyangarpetai	-13.20	6.71	-8.68	15.17
Manachanallur	-22.76	4.32	-11.09	29.54
Musiri	-23.08	10.98	-5.42	17.52
Pullambadi	-18.61	15.39	-11.28	14.50
Thottiam	-22.21	18.16	-5.21	9.26
Lalgudi	-19.92	9.30	-7.74	18.37
Andhanallur	-15.46	4.27	-15.00	-16.14
Thiruverambur	-5.32	-1.01	-28.30	34.62
Manikandam	-28.66	-6.01	-19.33	9.79

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Vaiyampatti	-19.13	11.90	-2.61	9.84
Manapparai	-28.66	7.41	-9.06	30.31
Marungapuri	-21.15	13.46	-1.89	9.59

CU-Cultivators, AG-Agricultural Laborers, SEC-Secondary Workers and TER- Tertiary Workers.

Table 1.4

ANOVA ONE WAY CLASSIFICATION

(1971- 2011)

Source of Variation	Sum of Squares	Df	Mean sum	F
Between	10493.04	3	3497.68	48.16*
Occupation	3776.71	52	72.63	
Error	14269.75	55		
Total				

Table value at 1% 4.2 and 5% 2.79 * Significant at 1%& 5%level.

The significance of change in occupation among male workers between 1971 and 2011 is tested using ANOVA one way classification (table 1.3 and 1.4).

The overall change in the occupational structure of male workers calculated using Analysis of Variance one way classification shows a high significance with calculated F value of 48.16. Thus the occupational structure of male workers has also undergone significant change between 1971 and 2011 in the study area.

Female Workers

The analysis of change in occupational structure has revealed a change among female workers also Hence the need arises to test the significance of change among female workers classed as cultivators, agricultural laborers, secondary workers and tertiary workers. The workers in each occupation are calculated as percent to total female workers in each of the panchayat unions. The difference in percent in each category between 1971-2011 is calculated and tabulated (table 1.5) the change in the occupation among female workers is subjected to ANOVA one way classification (table 1.6).

The significance of change in the female occupational structure over a longer period of time namely 1971 and 2011 is attempted and presented in table 1.5 and 1.6.

Table 1.5

Female Workers

Difference in Percentage (1971- 2011)

Panchayat Unions/ Blocks	CU	AG	SEC	TER
Uppiliyapuram	1.12	-1.72	0.45	0.14
Thuraiyur	8.22	-10.27	0.90	1.16
Thathiyangarpetai	7.34	-12.49	0.72	4.43

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Manachanallur	-7.07	-6.50	-0.69	14.26
Musiri	-8.38	-2.77	4.01	7.14
Pullambadi	-5.26	5.51	-0.74	0.48
Thottiam	-0.48	-2.40	0.37	2.51
Lalgudi	-4.30	-3.22	0.92	6.60
Andhanallur	-4.37	-25.81	-2.00	-23.51
Thiruverambur	-0.88	-3.70	-8.83	13.40
Manikandam	-8.08	-34.79	-8.62	-4.99
Vaiyampatti	0.95	-3.76	0.53	2.28
Manapparai	3.57	-17.68	1.38	12.74
Marungapuri	-4.88	1.08	0.65	3.15

CU-Cultivators, AG-Agricultural Laborers, SEC-Secondary Workers and TER- Tertiary Workers.

Table 1.6

ANOVA ONE WAY CLASSIFICATION

(1971- 2011)

Source of Variation	Sum of Squares	Df	Mean sum	F
Between Occupation Error Total	936.45 3268.18 4204.63	3 52 55	312.15 62.85	4.97*

Table value at 1% 4.2 and 5% 2.79 * Significant at 1%& 5%.

The overall change in occupational structure between 1971-2011 calculated using Analysis of Variance one way classification is presented in table 4.24, It could be inferred that the calculated F value 4.97 is higher than the table value at 1% and 5% level, so it could be safely concluded that the change in occupational structure of female workers is also significant.

In the light of this analysis it could be concluded that in the study area the proportion of male workers engaged in various occupations has experienced a change. Male workers when compared to female workers have experienced a highly significant change. However there is decrease in male workers engaged in primary activities much more than the female workers. This is not a healthy trend as it indicates a declining trend in agricultural activities.

Further the data subjected to ANOVA reveals a decline in the workers classed as Cultivators and Agricultural labourers and an increase in the workers in the Secondary and Tertiary sector.

CONCLUSION:

The analysis to test the significance of change in occupational structure between 1971 and 2011 has brought into light the following conclusions:

1. The study area has experienced a significant change in the occupational structure between 1971 and 2011.
2. The change in the occupational structure is also significant among male and female population.
3. The workers engaged in tertiary sector have experienced a significant increase in the case of both male and female population.
4. The workers engaged in primary activities as cultivators and agricultural labourers have experienced a decline in the case of male workers, while female workers exhibit less significant change.
5. However the sizeable increase of female workers in tertiary sector is an inviting trend towards women development.

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