

SOME ASPECTS OF INTER DISTRICT DISPARITIES IN TAMIL NADU

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Abstract:

The study analyzes the inter-district variations in levels of income and human development in Tamil Nadu in recent years. It also tries to analyze the causes of the relatively low levels of income of some districts. For that purpose, it uses the district level data on per capita income and other indicators and constructs the human development index. The results indicate that the benefits of growth have not been spread evenly. There is a group of districts on the eastern part of the state below Kanchipuram, which has lagged behind economically and socially. However, the income inequality is much higher than the inequality in human development. The low-income districts are associated with low industrial development, low agricultural productivity, low human development, and larger proportion of SC/ST population and high infant mortality rate. We hope that the study could help policymakers and others to formulate appropriate policies to reduce the disparities.

Key words: *regional inequality, human development index, Tamil Nadu Districts.*

JEL Classification: *O5, R5*

1. Introduction

Tamil Nadu is one of the states in the country that has grown fairly fast during the 1990's and has forged ahead in almost all the economic sectors. Tamil Nadu has also done very well in terms of human development.¹ The performance of the state as a whole is commendable.² However, one has to consider the regional dimensions of development too. Considerable income disparities among the regions/districts within a state could co-exist with good average level of prosperity. While one has to attach importance to the economic growth and human development of the state as a whole, the lagged regions demand special attention.

In this study, we are putting together a picture of inter district disparities in levels of income and features of human development. An attempt is made to trace the causes of the relatively low levels of income of some districts. Districts with low values of indicators of human development are identified and on that basis backward regions are demarcated. Government's economic policies must address the problem of promoting the development of these regions.

This study proceeds as follows. Section 2 deals with the literature on the measurement of development. Section 3 describes the data and variables used in the study. Section 4 presents the results while Section 5 summarizes the findings and outlines some policy implications emerging from the study.

2. Measures of Development

The development economics literature suggests various measures of development. Initially, economists considered the GNP (or a related income measure) as the sole measure of development. Since there is a philosophical distinction between income and well being of people, many considered this measure as not fully satisfactory, or incomplete. Hence, alternative or supplementary approaches such as the Basic

Needs (BN) approach and Physical Quality of Life (PQL) approach have been developed. The BN approach focuses on the indicators of provision of material goods and services to the deprived population groups while the PQL approach uses a simple index derived from infant mortality rate, life expectancy and literacy rate as a measure of development.³ For elaborate discussion on these approaches, see Hicks and Streeten (1979) and Morris (1979).

Ram (1982) suggests the principal component technique, which is a well-known multivariate technique of factor analysis to construct the composite indices. This approach selects the indicators that capture the highest variance in the original variables series included in the analysis. However, this measure is a sample specific. It would select a set of indicators from a sample and a different set of variables from another sample based on the variance. Therefore, it is difficult to make comparisons across samples and over time.

In another effort, UNDP-1990 has formulated the Human Development Index (HDI) on the reasoning that the real wealth of a nation (a region) is its people and therefore one must link people and development. The HDI is a composite index containing indicators relating to three factors: life expectancy at birth (representing a long and healthy life), educational attainment (representing knowledge)⁴ and real per capita income in purchasing power parity dollars⁵ (representing a decent standard of living).⁶

In this approach, an index (I) is first calculated for the j^{th} nation/region with respect to the i^{th} indicator (X_{ij}) other than income using the formula: $I = (X_{ij} - \min X_{ij}) / (\max X_{ij} - \min X_{ij})$. To compute the income (Y) index, it uses a new formula: $I = [\log (Y) - \log (\min Y)] / [\log (\max Y) - \log (\min Y)]$.⁷ A simple average of these indices (with equal weights) gives the HDI of the nation/region. With normalization of the values of the indicators that make up the HDI, its value lies between zero and one. The HDI value for a unit (nation/state/district) shows the distance it has to travel to reach the

maximum possible value or its shortfall in terms of the maximum and it is useful for a comparison with values of other (sample) units.

The above-mentioned approaches are widely used in studies to analyze inter-country (e.g. UNDP reports; Ram, 1982), inter-state (e.g. CMIE, 1998; Ghosh and De, 2000) and inter-district (Bhattacharya, 1998) variations in development, standard of living, infrastructure development, etc. After constructing various indicators of development, we use the approach of comparing the districts on the basis of HDI as in the UNDP reports cited above.

3. Data and Development Indicators

In order to analyze the disparities in levels of development among the districts in Tamil Nadu, we consider the following economic and social indicators.

i. Economic indicators:

- (a) The per capita gross district domestic product (GDDP) in rupees in 1996-97,⁸ and
- (b) The share of non-primary sector in GDDP in per cent⁹.

ii. Education Indicators:

- (a) Number of primary schools per one lakh population in 1999,
- (b) Number of middle schools per one lakh population in 1999,
- (c) Combined gross enrolment ratio (GER) in primary, middle and high/higher secondary schools (in percent) in 1996-97 and
- (d) Literacy rate in 1995-96 (in per cent).¹⁰

iii. Health Indicators:

- (a) Life expectancy in 1996-97¹¹ and
- (b) Infant mortality rate (the number of infant deaths per 1000 live births) in 1998.¹²

We have compiled the data on these indicators for all 29 districts in Tamil Nadu from (i). State Planning Commission, (ii). Directorate of Statistics, Government of Tamil Nadu, and (iii). Vital Events Survey conducted by Danish International Development Agency (DANIDA) under Tamil Nadu Area Health Project. To compute the HDI, we follow the methodology in UNDP (1999). We use the following minimum and maximum values suggested in UNDP (1999) for each of the constituents of HDI measure.

- Life expectancy : 25 years and 85 years
- Adult literacy rate : 0 per cent and 100 percent
- Combined gross enrolment ratio : 0 per cent and 100 per cent
- Per capita income : \$ 100 and \$ 40000 (PPP \$)

Hence, our measure is comparable with UNDP's HDI values.

4. District Level Development in Tamil Nadu

Table 1 reports the district level data on income and other indicators selected for the study. It also shows the human development indices developed for the districts. For an easy reference, Table 2 presents the ranking of districts by these indicators.

Regional Economic Development:

The most widely used measure of relative regional economic development is the per capita GDP. We first consider the per capita income differences (Column 3 of Table 1). Among 29 districts in Tamil Nadu, Kanchipuram (Rs. 23075) and Chennai (Rs. 23044) ranked first and second in per capita income in 1996-97. Coimbatore had the third rank. Vilupuram (Rs. 8101), Tiruvannamalai (Rs. 8255) and Sivagangai (Rs. 9276) districts were the poorest, occupying the last three ranks. It is noted that the per capita income of the top ranked district is about 2.85 times larger than that of the poorest district (i.e., the latter is only 35 per cent of the former). The per capita income of the state was about

Rs. 14000. In about 2/3rd of the districts, the per capita income was below the per capita income of the state.

Share of Non Primary Sector in GDDP

Column 4 of Table 1 shows the share of the non-primary sector in GDDP of districts. The secondary and tertiary sector share of 98.9 per cent in GDDP in Chennai was almost double the share of 53.7 per cent in Vilupuram. However, Chennai is a special case. If we compare Coimbatore and Vilupuram, we find that the share of the non-primary sector in that district is 87.3 per cent as against 53.7 per cent in Vilupuram. The share of non-primary sector for the state was 69.7 per cent, which was only slightly lower than the corresponding share in the country as a whole of 70.7 per cent. From the ranking of the districts in Column 2 of Table 2, it is clear that the relatively high-income districts are associated with a larger share of non-primary sector in district income. Interestingly, all the poorest districts (with per capita GDDP below Rs. 10,000) fall in the eastern part of the state below Kanchipuram and Vellore (Map 1).

The districts with the highest incomes (above the state average) are in 3 segments: at the top in the east (Chennai, Kanchipuram and Tiruvallur), in the northwestern part (Coimbatore, Erode and Salem), and in the middle of the southern part (Tiruchirappalli, Madurai, Virudunagar and Tuticorin).

The two poorest districts Tiruvannamalai and Vilupuram are adjacent to the two richest districts (Chennai and Kanchipuram). It is surprising that prosperity did not spread to the neighboring districts from Chennai and Kanchipuram. Another fact to be noted is that 19 out of 29 districts have a per capita income below the state average. The fact mentioned earlier, namely, the per capita income of the poorest district is only 35 per cent of that of the richest district and the finding that the majority (66 per cent) have less than average per capita

income indicate that the inter-district distribution of income is very skewed.

Another important fact is that most of the poorest districts such as Cuddalore, Thanjavur, Tiruvannamalai, Tiruvarur and Vilupuram (and Ramanathapuram) are the major rice producers of the state. In all these rice-producing districts, the productivity (i.e. yield per hectare) is below the average productivity (of 2.67 tonne per hectare) of the state (see Table 3). We have found a positive and significant correlation between per capita income and rice productivity.¹³ Therefore, we can infer that low productivity in agriculture is another reason for low per capita income.

From Column 7 in Table 3, we can also observe that the most of the poorest districts have a higher proportion of SC/ST population. Column 8 of the table shows that the per capita power consumption is very low in the poorest districts. However, we find a low (and insignificant) correlation (0.28) between income and per capita power consumption.

Regional Human Development:

Column 5 of Table 1 presents the HDI values.¹⁴ Chennai has obtained the highest HDI value (0.752) and Vilupuram the lowest value (0.569). Thus, Chennai has a shortfall in the HDI of about 25 per cent and Vilupuram has a shortfall of 43 per cent. For all other districts, the shortfall ranges between 25-43 per cent. The HDI value for the state has been computed as 0.636.¹⁵ This figure is higher than our country's value of 0.545 in 1997 reported in UNDP (1999).¹⁶ In 18 districts, the HDI value is found to be below the state figure. However, in all the districts the value is found to be above the value for the country.¹⁷

In map 2, we classify the districts into those with HDI values above 0.636, between 0.636 and 0.6 and below 0.6. All of the low-income districts shown in Map 1, with per capita income below Rs. 10,000 (except Sivagangai) have the HDI value below 0.6. In addition,

Dharmapuri, Dindigul and Perambalur, which have a per capita income slightly higher than Rs. 10, 000 also fall in this category.

We have also utilized the literacy rates for 2001 published recently by the Director of Census Operation, Tamil Nadu and recalculated the human development indices and named them as HDI-1 (see Column 11 in Table 3). The computed value for the state is 0.643 (the earlier HDI is 0.636). We have found a high positive correlation between the HDI and HDI-1 (0.94). The rankings of the districts are more or less the same in both measures. However, the ranks of a few districts change drastically due to wide variations in the literacy rates. For instances, Cuddalore obtains 17th rank in HDI-1 instead of 25th rank (in HDI), while Ramanathapuram obtains 24th instead of 15th rank. Nagapattinam has the 11th rank instead of 17th while Theni has the 25th rank instead of 18th rank. Since the components of HDI-1 refer to different years, the HDI-1 is not comparable. Hence, we use the HDI for our comparisons below.

Linkages between Economic and Human Development:

While it has been argued that better human development could lead to more healthy and qualified labor force and hence to higher productivity (e.g. Anand and Sen, 2000), it is common experience that good economic performance has not always led to a good HDI. In fact, India has done much better in terms of income growth than in terms of human development. In respect of the districts of Tamil Nadu, we find a rather close association between low income and poor human development performance, though it is not clear which is the cause and which is the effect.

As pointed out earlier, all the low-income districts (in the third category) except Sivagangai have low HDI value (below 0.6). Even Sivaganagai has an HDI value only 0.61. However, Dindigul, Dharmapuri and Perambalur that are in the middle group in terms of

per capita income also have a below 0.6 HDI value. Like Sivagangai, they can be considered borderline districts.

From Column 12 of Table 2 (which shows the difference between the income rank and the HDI rank), we can observe that 12 districts rank higher on the HDI value than on the per capita GDDP one, suggesting that they have made better efforts to use income to produce the human development than some of the richer districts like Coimbatore, Madurai, Salem and Erode.

However, Table 4 shows that the per capita GDDP is positively and significantly correlated with the HDI (the correlation coefficient is 0.80) and with the share of non-primary sector in GDDP (0.83).¹⁸ Therefore, we can infer that a higher proportion of non-primary sector development leads to higher per capita income and also higher HDI.

Educational Attainment:

In terms of the number of primary schools per 1 lakh population, the highest income districts – Kanchipuram, Chennai and Coimbatore ranked 16th, 29th and 26th respectively while the low-income districts Sivagangai, Pudukottai and Ramantha puram attained the first three positions. Table 1 also shows that the number of primary schools per one lakh population is less than the state figure of 52.7 in 12 districts. In terms of middle schools per one lakh population, Chennai, Namakkal, Coimbatore, Salem, Tiruvallur, Dharmapuri and Tiruvarur districts have low ranking. However, since the details on the number of sections (standards) in each class at primary and middle level and the average number of students per school are not available, these results can be considered as suggestive rather than conclusive, and no conclusions are drawn.

The average (combined) gross enrolment ratio for the state was 85.1 per cent. Chennai had the first rank with 95 per cent and Virudunagar had the last rank with 77 per cent. In almost all the poor income districts, the rate was below the state figure. In districts like

Ramanathapuram, Dharmapuri and Virudunagar, the rate was less than 80 per cent. These districts need special attention in this regard.

Column 9 of Table 1 presents the details of literacy rate in 1995-96. The state average was 70 per cent. Chennai (86.5 per cent), Kanyakumari (85.3 per cent) and Tirunelveli (79.5 per cent) obtained the first three ranks. Cuddalore (55.7 per cent), Vilupuram (55.7 per cent) and Namakkal (62.8 per cent) occupied the last three ranks. From Map 3, we can observe that along with the last three ranked districts, Salem, Tiruvannamalai, Thanjavur, and Dindigul had literacy rate less than 65 per cent.

Column 10 of Table 1 shows the literacy rate for 2001. In 15 districts, the literacy rate is found to be below the state average of 73.5 per cent. Kanyakumari (88 per cent), Tuticorin (82 per cent), the Nilgiris (81 per cent), Chennai (80 per cent) and Trichy (79 per cent) attained the top five ranks. Perambalur (65.9 per cent), Salem (65.7 per cent), Erode (65.5 per cent), Vilupuram (64.7 per cent) and Dharmapuri (59.2 per cent) obtained the last five ranks (see Column 9 in Table 2).¹⁹

Health Development:

The life expectancy for the state was 66.7 years and for India it was 62.6 years. Chennai obtained the highest figure (74 years) while Dharmapuri got the lowest (62 years). In about 17 districts, the life expectancy was below the state average. Only in Madurai, Dharmapuri and Perambalur, it was less than the national average (See Map 4).

The infant mortality rate for Tamil Nadu State was 41 (for India, it was 71). In 12 districts, the rate was above the state value. It may be noted that the highest infant mortality rate of 70 was in Salem district.²⁰

Table 4 shows that the literacy rate is significantly and positively associated with per capita GDDP and the share of non-primary sector in GDDP while the infant mortality rate is significantly and negatively correlated with life expectancy. It also shows that the life expectancy is

positively and significantly correlated with the per capita income. Therefore, we can infer that a higher per capita income and a higher proportion of non-primary sector income do have an impact on the literacy rate and life expectancy.

It is noted that Table 4 shows a low correlation between infant mortality rate and per capita GDDP (i.e. $r = -0.08$). Studies such as Goldstein (1985) show that the IMR follows a non-linear relationship with per capita income. Following them, we specify the following equation to analyze the relationship between IMR and per capita GDDP: $IMR = \beta [1/\text{per capita GDDP}]$, where β is the parameter to be estimated. The model is estimated using the district level cross-section data and the Ordinary Least Squares method with no intercept term. The estimated β value is 467953 and is significant at 1% level. Therefore, the effect of per capita GDDP on IMR is $(d\ IMR / d\ \text{per capita GDDP})$ is $(-467953/13985^2) = -0.002$. Thus, 1% increase in per capita GDDP in Tamil Nadu would seem to lead to 0.002% decline in IMR.

The results discussed above indicate that significant disparities exist among the districts. It is also seen that the poor districts are associated with low human development, low industrial development, low agricultural (rice) productivity and high proportion of SC/ST population.

Dimensions of Inter-District Disparities:

In order to gain an idea of the magnitude of the inequalities, we present the unweighted sample means, standard deviations and coefficient of variations of the indices and the inequality index L of Bourguignon (1979) in Table 5. The L index is given by the natural logarithm of the ratio between the populations weighted arithmetic and geometric means of the index.²¹ Results shown in Table 5 imply that considerable inter district inequality (L) exists in all the indicators. The income inequality index (3.55) is a little higher than the HDI index

(3.46). The coefficient of variation measure suggests that the variations are high in per capita GDDP (30 per cent) and much lower in the HDI (6 per cent). This means that variations in the other constituents of HDI are less than that in per capita GDDP.

5. Summary and Policy Implications

In the present study, we have analyzed the inter district disparities in Tamil Nadu using available cross section data on per capita income, education and health and other indicators. We have also computed the human development indices for districts, following the UNDP methodology.

Kanchipuram ranked first in per capital income and ranked second in the HDI, while Chennai attained the first place in the HDI and the second in per capital income. Vilupuram was identified as the poorest district in Tamil Nadu in both income and human development. Of the 29 districts, 19 had a per capita income that was below the state average of Rs. 14000 and 18 had the HDI value which was below the state value of 0.636. The per capita income of Kanchipuram was about three times that of Vilupuram, that is the measure of the gap between the richest and the poorest districts. The HDI value for Chennai was 0.75 and for Vilupuram, it was 0.57.

Thus, one finds that there are considerable inequalities in income and disparities in levels of human development among the districts in Tamil Nadu, which is indeed a cause for considerable concern. In addition, the income inequality is much higher than the inequality in human development. While the state as a whole has performed well during the nineties, it appears that growth itself and the benefits of growth have not been spread evenly. There is a group of districts on the eastern part of the state below Kanchipuram which has lagged behind economically and socially.

One cause for the relatively low income of these districts could be the low degree of industrialization. Most of the poorest districts are the

major rice producers of the state. Surprisingly, the rice productivity is very low in these districts. In addition, these poorest districts have a high proportion of SC/ST population. Therefore, low agricultural productivity and social backwardness could also be reasons for the low income. Other possible causes must be identified. On the basis of the findings suitable policy measures must be formulated and implemented.

Notes:

- ¹ For instances, Tamil Nadu ranks near top in terms of health and family welfare indicators such as low birth rate, infant mortality rate and maternal mortality rate. It ranks second in terms of industrial development and educational attainment and fifth in terms of per capita income among the major states.
- ² Ghosh and De (2000) show that Tamil Nadu ranks second in terms of infrastructure development index among the major states.
- ³ The BN approach was widely used by the World Bank, ILO and Overseas Development Council during the 1970s. It generally considers indicators from six areas-education, health, food, water supply, sanitation and housing. However, the multiplicity of indices and multi dimensionality in their representations constitute serious impediments to making overall comparisons. That is, there exists the problem of weighting. The PQL approach is also criticized on the ground that it totally neglects income and other basic need indicators.
- ⁴ Adult literacy rate (two-thirds weight) and the combined gross primary, secondary and tertiary enrolment ratio (one-third weight) measure the educational attainment.
- ⁵ The purchasing power parity dollar value is used to compare the per capita income of the nations.
- ⁶ UNDP argues that if people have these three “choices”, they may be able to access other opportunities as well.
- ⁷ UNDP uses the ‘treatment of income’ approach on the reasoning that achieving a respectable level of human development does not require unlimited income. Until 1999, it used a drastic discounting formula to discount the income (Y) above the threshold level of world average income. However, this procedure discounted the income above the threshold level heavily, penalizing the countries in which income exceeded the threshold level. From 1999 onwards, it has been using this new formula.
- ⁸ To compute HDI, we convert the income into purchasing power parity dollar (PPP \$).
- ⁹ One would consider the degree of urbanization as an alternative to this indicator. However, the urbanization variable would not capture the non-agricultural activity in rural areas.
- ¹⁰ The Department of Statistics computed the literacy rate on the basis of the National Sample Survey data.
- ¹¹ This is a qualitative indicator of the benefit of economic development to a common man. It also measures the progress made in public health and nutritional status of the people.
- ¹² Many authors cite infant mortality rate as a good indicator of the degree of lack of availability of sanitation and safe water facilities, because of the susceptibility of infants to water borne diseases. It has also been characterized as an outcome variable summarizing multiple health and nutritional afflictions of very young children.
- ¹³ We have also found a negative and significant correlation between rice area and rice yield. One reason for this association may be that more and more marginal and infra marginal lands are under cultivation in larger areas.

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- ¹⁴ Many argue that the assignment of equal weight to each of the constituents of the HDI would lead to misleading results because there is a possibility for the variables to vary in terms of their relative importance over different time spans in a comparative static framework across nations/regions. To overcome this problem Ram (1982) suggests the principal component technique. Following this suggestion, we applied the method of principal components and derived the weights as 0.811, 0.808 and 0.732 for income, education and life expectancy variables, respectively. These weights slightly alter the magnitude of the HDI values computed earlier, but not the rankings. Therefore, we do not present the HDI values computed using the weights.
- ¹⁵ Bhattacharya (1998) constructed the HDI of the major states in India, considering literacy rate, infant survival rate and per capita income of the states (a modified HDI). In that study, the HDI value for Tamil Nadu was estimated at 0.451 in 1981 and 0.567 in 1991. According to UNDP (1993) estimates, India's HDI value was 0.392 in 1991.
- ¹⁶ India had the 132nd rank among the countries in the world in 1997 and Canada obtained the first rank with HDI value of 0.932 (UNDP, 1999).
- ¹⁷ UNDP (1999) has grouped the countries with values between 0.5 and 0.799 under the medium human development category. Notably, all districts in Tamil Nadu fall in this category. Chennai is very much close to the high human development category (0.8 and above).
- ¹⁸ The Spearman's rank correlation coefficients between the per capita GDDP and the HDI (0.76) and between the per capita GDDP and the share of non-primary sector in GDDP (0.82) are also positive and significant.
- ¹⁹ Between 1991 and 2001, the literacy rate in Tamil Nadu state increased by 10.8 per cent. During the same period, the literacy rate in Tiruvannamalai and Vilupuram increased by more than 15 per cent, where as the rate in Namakkal, Dindigul, Dharmapuri, Perambalur, Pudukkottai and Cuddalore increased by above 13 per cent. In Chennai, it declined by 1.5 per cent.
- ²⁰ It is likely that female infanticide in Salem, Dharmapuri and Madurai districts has a bearing on the high IMR in these districts.
- ²¹ Bourguignon (1979) argues that this is the only population weighted, additively decomposable inequality measure that satisfies Pigu-Dalton condition. In fact, it is the same as Theil's population weighted inequality index, which has been used in several studies (eg. Ram, 1982). Considering the advantages of this index, we use this measure.

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Table 1
Selected Indicators of Development and Human Development Index
for Districts in Tamil Nadu

Sl. No	Districts As on 1996-97	GDDP Per Capita (in Rs.)	Share of Non-Primary Sector (%)	Human Development Index	Primary Schools*	Middle Schools*	Gross Enrolment Ratio (%)	Literacy Rate (%) *	Literacy Rate in 2001 (%)\$	Life Expectancy in Years	IMR (no. per thousands)#
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	Kanchipuram	23075	85.1	0.685	54.7	12.6	85.3	73.7	77.6	69.3	25.1
2	Chennai	23044	98.9	0.752	7.9	5.15	95.3	86.5	80.1	74.2	-
3	Coimbatore	19930	87.3	0.663	39.8	6.26	83.0	68.2	76.9	69.3	35.5
4	Madurai	16554	77.8	0.633	44.8	9.18	86.3	75.9	78.7	62.2	47.6
5	Salem	16548	69.6	0.622	47.4	5.56	86.4	62.8	65.7	65.2	70.1
6	Erode	16225	66.5	0.644	61.1	8.04	83.1	65.1	65.5	69.2	40.0
7	Tuticorin	16157	75.7	0.675	70.2	18.30	89.3	78.3	82.0	68.3	37.4
8	Tiruvallur	15755	85.1	0.654	38.6	6.67	85.3	73.7	76.5	67.4	30.6
9	Trichy	14634	69.0	0.638	45.3	11.80	86.3	67.6	79.2	67.5	43.2
10	Virudunagar	14484	83.4	0.639	65.6	9.99	77.4	75.2	74.2	66.6	36.4
11	Nilgiris	13319	64.8	0.667	52.3	9.07	85.2	79.5	81.4	69.2	34.7
12	Vellore	13191	78.6	0.635	53.1	9.83	90.3	71.9	73.1	65.6	45.1
13	Tirunelveli	13111	74.4	0.652	57.7	15.40	88.8	79.7	77.0	65.8	38.9
14	Nagapattinam	12960	56.2	0.618	68.6	15.00	81.6	66.9	76.9	66.4	31.4
15	Namakkal	12453	69.6	0.611	58.0	5.16	86.4	62.8	67.7	66.2	44.3

16	Theni	11895	77.8	0.618	32.3	10.10	86.3	75.9	72.0	62.7	59.6
17	Dindigul	11841	64.9	0.599	66.4	10.20	83.7	64.0	69.8	64.6	45.7
18	Karur	11609	69.0	0.628	74.0	9.43	86.3	67.6	68.7	68.1	42.8
19	Perambalur	11040	69.0	0.592	63.3	9.93	86.3	67.6	65.9	62.1	57.2
20	Darmapuri	10559	62.0	0.576	80.2	7.64	78.5	66.0	59.2	61.8	67.4
21	Pudukkotai	10535	59.7	0.612	82.4	12.70	89.8	67.5	72.0	65.5	36.8
22	Ramanatapuram	10325	57.9	0.622	81.4	13.90	79.8	78.4	73.1	65.2	43.9
23	Kanyakumari	10266	66.3	0.679	19.7	9.17	80.1	85.3	88.1	72.7	21.0
24	Thanjavur	9630	63.9	0.586	49.6	9.60	82.1	64.8	76.1	64.4	36.4
25	Cuddalore	9544	53.7	0.590	52.4	10.10	81.2	55.7	71.8	68.9	39.9
26	Tiruvarur	9361	56.2	0.598	52.8	8.83	81.6	66.9	76.9	66.0	29.8
27	Sivagangai	9276	64.6	0.608	86.0	13.70	82.6	66.9	72.7	67.7	32.1
28	Tiruvannamalai	8255	53.9	0.586	69.5	9.64	82.2	63.1	68.2	66.6	37.9
29	Vilupuram	8101	53.7	0.569	59.0	9.90	89.7	55.7	64.7	65.1	41.4
	Tamil Nadu	13985	69.7	0.636	52.7	9.56	85.10	70.4	73.5	66.7	41.3
	India@			0.545			55.0	53.5	65.4	62.6	71.0

* - Primary and middle schools refer to the number of primary and middle schools per one lakh population in 1999. Literacy rate refers to 1995-96. Data Source for these indicators is the State Planning Commission, Tamil Nadu (Unpublished).

\$ - The source for the literacy rate is The Census of India 2001 (Provisional Tables), Director of Census Operation, Tamil Nadu.

- Infant Mortality Rates are provided by the Danida Tamil Nadu Health Care Project-Phase III, Vital Events Survey, 1998.

@ All values for India refer to 1997. These values have been taken from UNDP (1999).

Note: (1). Districts are arranged according to the descending order of per capita GDDP. The worst is ranked 29th while the best district first. (2). Per Capita GDDP, Gross Enrolment Ratio and Life Expectancy Figures refer to 1996-97. The data source for these indicators is Department of Statistics, Government of Tamil Nadu.

Table 2
Ranking of Districts in Tamil Nadu by Various Indicators

Districts As on 1996-97	Share of Non Prim-ary Sector	H D I	H D I	Primary Schools	Middle Schools	Gross Enrolment Ratio	Lite racy Rate(95-96)	Lite racy Rate (20 01)	Life Expec tancy	I M R	Dif -fere -nce *	Dif -fere -nce **
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Kanchipuram	3	2	2	16	7	14	10	7	4	3	-1	-1
Chennai	1	1	1	29	29	1	1	4	1	1	1	1
Coimbatore	2	6	5	25	26	19	13	9	3	9	-3	-2
Madurai	7	13	12	24	19	9	7	6	27	25	-9	-8
Salem	11	16	16	22	27	7	26	26	21	29	-11	-11
Erode	16	9	10	12	23	18	22	27	6	17	-3	-4
Tuticorin	9	4	4	6	1	5	6	2	8	13	3	3
Tiruvallur	4	7	8	26	25	15	11	12	12	5	1	0
Trichy	13	11	7	23	8	10	14	5	11	20	-2	2
Virudunagar	5	10	14	10	12	29	9	14	13	10	0	-4
Nilgiris	19	5	6	20	21	16	4	3	5	8	6	5
Vellore	6	12	13	17	15	2	12	15	19	23	0	-1
Tirunelveli	10	8	9	15	2	6	3	8	18	15	5	4
Nagapattinam	25	17	11	8	3	23	19	11	15	6	-3	3
Namakkal	12	20	19	14	28	8	27	24	16	22	-5	-4
Theni	8	18	25	27	10	11	8	18	26	27	-2	-9

Dindigul	18	22	22	9	9	17	24	21	24	24	-5	-5
Karur	14	14	15	5	18	12	15	22	9	19	4	3
Perambalur	15	24	28	11	13	13	16	25	28	26	-5	-9
Darmapuri	22	28	29	4	24	28	21	29	29	28	-8	-9
Pudukkottai	23	19	18	2	6	3	17	19	20	12	2	3
Ramanatapuram	24	15	24	3	4	27	5	16	22	21	7	-2
Kanyakumari	17	3	3	28	20	26	2	1	2	2	20	20
Thanjavur	21	26	23	21	17	22	23	13	25	11	-2	1
Cuddalore	28	25	17	19	11	25	29	20	7	16	0	8
Tiruvavur	26	23	21	18	22	24	20	10	17	4	3	5
Sivagangai	20	21	20	1	5	20	18	17	10	7	6	7
Tiruvannamalai	27	27	26	7	16	21	25	23	14	14	1	2
Vilupuram	29	29	27	13	14	4	28	28	23	18	0	2

Note:

1. We have arranged the districts according to the descending order of per capita GDDP.

2. Top five ranks are shown in bold case while the last five ranks are shown in bold and italic cases.

* Difference between the GDDP rank and the HDI rank. A positive figure indicates that the HDI rank is better than the per capita GDDP's rank; a negative the opposition.

** Difference between the GDDP rank and the HDI-1 rank.

Table 3
District Wise Area, Production and Yield of Paddy Crop, SC/ST
Population, and Literacy Rate in Tamil Nadu

Districts As on 1996-97	Rice Area in lakh hectare (1996- 97)	R A N K	Rice Output in lakh tonne (1996- 97)	R A N K	Rice Yield (tonne per ha) (1996- 97)	R A N K	% of SC/ST Populat ion in 1991	Per Capita Power consump tion (K.wh)in 1994	Lite- racy Rate in 1991 (%)	% increase in Literacy Rate between 1991- 2001	Human Develop ment Index -1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Kanchipuram	1.55	4	4.57	2	2.94	18	27.2	281	66.5	11.1	0.694
Chennai	0.00	29	0.00	29	-	29	14.0	741	81.6	-1.5	0.738
Coimbatore	0.17	25	0.65	25	3.73	8	17.1	719	66.4	10.6	0.682
Madurai	0.85	11	2.99	6	3.53	10	15.0	266	69.1	9.6	0.64
Salem	0.45	19	1.70	16	3.76	6	20.2	251	52.8	12.9	0.628
Erode	0.68	15	2.81	7	4.16	2	18.0	398	53.8	11.7	0.645
Tuticorin	0.14	27	0.61	26	4.23	1	17.4	485	73.0	8.9	0.683
Tiruvallur	1.07	9	3.22	5	3.01	13	27.2	281	66.2	10.3	0.660
Trichy	0.59	17	1.80	15	3.07	11	19.4	264	68.7	10.5	0.664
Virudunagar	0.29	21	0.82	23	2.83	19	18.7	480	62.9	11.3	0.637
Nilgiris	0.02	28	0.03	28	1.59	26	33.8	2302	71.7	9.7	0.672
Vellore	0.87	10	2.61	9	3.00	14	22.4	287	60.9	12.2	0.638
Tirunelveli	0.68	14	2.65	8	3.89	5	18.3	294	65.6	11.4	0.646

Nagapattinam	1.45	6	2.40	10	1.65	25	24.4	123	65.7	11.1	0.640
Namakkal	0.25	22	0.95	22	3.75	7	20.2	251	54.4	13.3	0.622
Theni	0.19	24	0.68	24	3.57	9	15.0	266	60.3	11.7	0.609
Dindigul	0.23	23	0.95	21	4.10	4	20.0	408	56.7	13.15	0.612
Karur	0.15	26	0.46	27	2.97	17	19.4	264	56.06	12.7	0.631
Perambalur	0.48	18	1.42	19	2.99	16	19.4	264	51.8	14.1	0.588
Darmapuri	0.60	16	1.83	14	3.06	12	16.3	245	46.0	13.2	0.561
Pudukkotai	0.82	12	2.16	13	2.63	20	16.9	109	57.6	14.3	0.622
Ramanatpuram	1.34	7	1.48	18	1.12	28	18.2	288	61.6	11.4	0.611
Kanyakumari	0.34	20	1.39	20	4.13	3	5.13	86	82.1	6.0	0.686
Thanjavur	1.67	2	4.27	3	2.56	22	24.4	123	66.1	9.9	0.611
Cuddalore	1.16	8	2.19	12	1.88	24	28.3	182	58.6	13.3	0.626
Tiruvarur	1.55	3	2.39	11	1.54	27	24.4	123	66.1	10.7	0.620
Sivagangai	0.82	13	1.61	17	1.97	23	16.1	20	62.9	9.7	0.621
Tiruvannamalai	1.47	5	3.84	4	2.62	21	24.5	229	53.1	15.2	0.598
Vilupuram	1.86	1	5.58	1	3.00	15	28.3	182	48.4	16.3	0.589
Tamil Nadu	21.74		58.05		2.67		20.2	352	62.7	10.8	0.643

Note: (1). Districts are arranged according to the descending order of per capita GDDP. (2). The data source for the literacy rate and percent of SC/ST population is Census of India, 1991. The data source for the paddy area and output is the Season and Crop Report of Tamil Nadu, Government of Tamil Nadu. The data source for the per capita power consumption is Department of Statistics, Government of Tamil Nadu.

Table 4
Correlation Coefficients for Selected Indicators

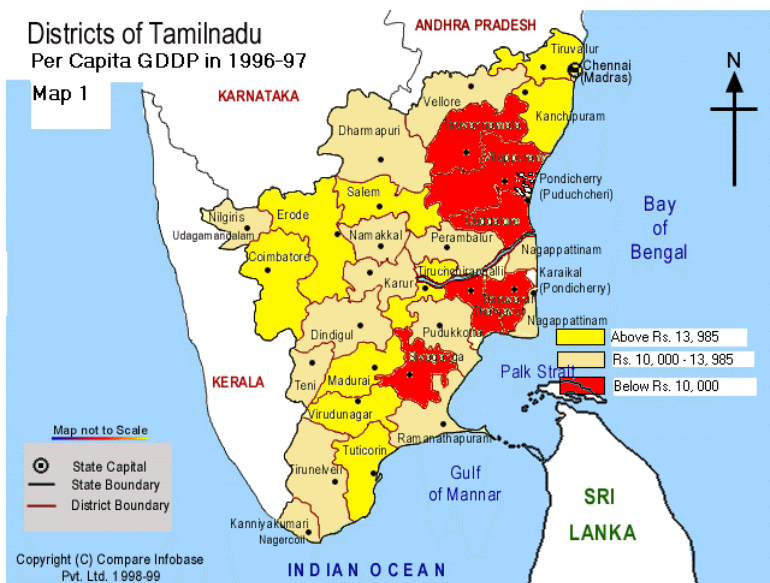
Indicators	Share of Non-Primary Sector	Primary Schools	Middle Schools	Gross Enrolment Ratio	Literacy Rate	Life Expectancy	Infant Mortality Rate	Human Development Index
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GDDP Per Capita	0.831**	-0.47*	-0.19	0.37*	0.43*	0.44*	-0.08	0.80**
Share of Non- Primary Sector	1.00	-0.55**	-0.26	0.40*	0.59**	0.32	-0.02	0.76**
Primary Schools		1.00	0.50**	-0.31	-0.42*	-0.45*	0.12	-0.58**
Middle Schools			1.00	-0.31	0.16	-0.10	-0.30	-0.42
Gross Enrolment Ratio				1.00	0.20	0.15	-0.14	0.40*
Literacy Rate					1.00	0.37*	-0.27	0.79**
Life Expectancy						1.00	-0.72**	0.74**
Infant Mortality Rate							1.00	-0.44*

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed).

Districts of Tamilnadu Per Capita GDDP in 1996-97

Map 1



Districts of Tamilnadu
Human Development Index
(1996-97)
Map 2

