

Empirical estimation human development status of Tirunelveli district – a study

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Abstract

Objective: To assess human development index through health, education and standard of living variables parameters as per the UNDP guidelines in Tirunelveli district, Tamil Nadu in India.

Methods: This study is based on secondary data sources from Census of India 2011, Nirmal Bharat Abhiyan, Ministry of Drinking Water and Sanitation, 2014 and Tamil Nadu Electricity Board survey data 2011. The health data pertaining to Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR) and under 5 Mortality Rate (U5MR) collected from Health Department, Tirunelveli during 2013-14. Literacy rate, Gross Enrollment Ratio of Primary Education (GER) and GER of Secondary education have been collected from education department during the year 2013-14. In addition, access to cooking fuel, access to toilet, access to drinking water and access to pucca house have been collected from District Rural Development Agency (DRDA), Tirunelveli District.

Findings: The HDI has been constructed for 19 blocks and a corporation in the district employing the present methodology. The index value varies from 0.88 (corporation) to 0.41 (Manur and Kuruvikulam). The high value for standard of living index and health index has determined to a large extent the HDI value of the corporation. On the contrary the low value of standard of living index and education index pushed down the HDI value of Melaneelithanallur to the lowest one in the district, placing it at the 20th rank. Tenkasi has an HDI value of 0.75 and is at the second spot because of its high positions in education index (0.78) and health index (0.76), Manur is at the 19th rank with 0.41 as HDI value because of its low rank in education index (0.36) and health index (0.42).

Application: According to UNDP guidelines, human development index have been computed based on 10 major parameters were taken from three core areas of living standard, education and health.

Keywords: Human development Index, Standard of living, Health, Education.

1. Introduction

Human Development is considered to be a hallmark against which the extent of human development that has taken place in a Tirunelveli district of Tamil Nadu. The paper has been analysed based on the methodology of the United Nations Development Programme (UNDP) on the reasoning that the real wealth of a nation (a region) is its people and therefore one must link people and development. The Human Development Index (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) and real per capita income in purchasing power parity dollars (representing a decent standard of living). Of late, the importance of such a compilation as been increasingly realized by UNDP, as a necessary yardstick of development at regional levels. Based on which, the UNDP has developed a composite HDI by taking into consideration, these three basic dimensions of standard of living, health and education parameters to measure the index values. HDI is a composite index, comprising longevity measured by Life Expectancy at Birth (LEB), educational attainment computed as a combination of adult literacy and enrolment ratios at the primary and tertiary levels and standard of living as measured by per capita real GDP adjusted for Purchasing Power Parity in dollars (PPP\$). All these parameters are considered of equal importance for human development and hence, they are given equal weight-age to construct composite index, fixed minimum and maximum values have been assigned for each of these indicators to construct an index. The HDI has been calculated as an average of the three indices that include the life expectancy index, the gross enrolment index and the GDP [1-3].

The HDI consists of three dimensions namely standard of living, health and education. The calculation of index for living standard comprises five indicators, two for health and two for education. In this calculation some of the indicators are positive such as cooking fuel, toilet, water, electricity, pucca house, literacy rate and GER at primary and secondary level and some other indicators such as child mortality rate and maternal mortality rate are negative. The index value for a positive indicator is calculated by: $\text{Index Value} = (\text{Actual Value} - \text{Minimum Value}) / (\text{Maximum Value} - \text{Minimum Value})$. The index value for negative indicator is calculated by using the formula: $\text{Index Value} = (\text{Maximum Value} - \text{Actual Value}) / (\text{Maximum Value} - \text{Minimum Value})$. For computing sectoral indices (health, education and standard of living) geometric mean is used and the method of calculation is as below. Thus, there are three indices, one for Standard of living and another for health and the other one for education. Sectoral Index = If I_1, I_2, \dots, I_n are the n indices for a particular sector, then the Geometric mean for the sector = $(I_1 \times I_2 \times \dots \times I_n)^{(1/n)}$.

To compute HDI, the three sectoral indices are aggregated applying geometric mean. Therefore, $\text{HDI} = (SI_l \times SI_h \times SI_e)^{(1/3)}$; where SI_l is the sectoral index for living standard, SI_h is the sectoral index for health and SI_e is the sectoral index for education. In this chapter, attempts have been made to calculate the HDI at block level to know about the human development at the bottom structure of the economy. The index would reveal the status of the blocks and would help the formulation of suitable plan and policy at the panchayat union levels and thus, would enable the country to adopt inclusive economic growth. This would also pave way for development from below and thus would ensure people’s participation in the development process. The dimensions and the respective indicators considered for the estimation of HDI are shown in Table 1:

Table 1. HDI

Dimensions	Indicators
Standard of Living	Access to Cooking fuel
	Access to Toilet
	Access to Water
	Access to Electricity
	Access to Pucca house
Health	Infant Mortality Rate
	Maternal Mortality Rate
	Under 5 Mortality Rate
Education	Literacy Rate
	Gross Enrolment in Primary
	Gross Enrolment in Secondary

2. Methodology

This study is based on secondary data were collected from difference sources like Census of India 2011, Nirmal Bharat Abhiyan, Ministry of Drinking Water and Sanitation, 2014 and Tamil Nadu Electricity Board survey data 2011. The health data pertaining to Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR) and under 5 Mortality Rate (U5MR) have been collected from Health Department, Tirunelveli during 2013-14. The literacy rate has been collected from census 2011. The Gross Enrollment Ratio of Primary Education (GER) and GER of Secondary education have been collected from education department during the year 2013-14. In order to validate the data of access to cooking fuel, access to toilet, access to drinking water and access to pucca house in Tirunelveli district, a cross verification has been done with data available in the District Rural Development Agency (DRDA), Tirunelveli District. In addition, the latest UNDP Report-2010 on HDI continues to adopt the same basic three indicators of education, health and standard of living/income for the calculation of HDI. To compute HDI, 10 indicators were used covering the area of living standard, education and health. There are three indicators for measuring health, three for education and five for standard of living (See Annexure). All these indicators reflect human development as shown in Table 2.

Table 2. Indicators for measuring HDI

Dimensions	Indicators
Living standards	Percentage of HHs having access to Cooking fuel
	Percentage of HHs having access to Toilet
	Percentage of habitations having access to Drinking Water
	Percentage of HHs having access to Electricity
	Percentage of HHs having access to Pucca house
Health	Infant Mortality rate
	Maternal Mortality Ratio
	Under 5 Mortality Rate
Education	Literacy Rate
	Gross Enrolment Rate (Primary
	And Gross enrollment in secondary) Schools

1. Estimating HDI

For the estimation of the HDI, the following steps may be followed:

All computations would be done at two stages. The first computation would help in understanding the relative positions of different blocks within the district. The second set of computation would relate to the position of a block with reference to other blocks.

As a first step, a minimum and maximum value has to be set for each of the above 11 indicators to transform them into indices lying between zero and one. For this purpose, the observed minimum and maximum figures for each of the indicators will be taken. Since the Geometric Mean has to be calculated, in the case of a positive indicator, the minimum value would be taken as 10 per cent less than the observed minimum value in the block similarly, in the case of a negative indicator, the maximum value would be taken as 10 per cent more than the observed maximum value.

The index value (in the case of a positive indicator) can be calculated using the formula –

$$\text{Index Value} = (\text{Actual Value} - \text{Min. Value}) / (\text{Max. Value} - \text{Min. Value})$$

Eg: calculations will be based on highest values being assigned highest ranking

The index value (in the case of a negative indicator) can be calculated by using the formula –

$$\text{Index Value} = (\text{Max. Value} - \text{Actual Value}) / (\text{Max. Value} - \text{Min. Value})$$

For Computing sectoral indices (health, education and standard of living) geometric mean is to be used and the method of calculation is as below. Thus there will be three indices one for Standard of living, another for health and the last for education.

Sectoral Index = If I_1, I_2, \dots, I_n are the n indices for a particular sector, then the Geometric mean for the sector = $(I_1 \times I_2 \times \dots \times I_n)^{(1/n)}$.

To compute HDI, aggregate the three sectoral indices using geometric mean with the following formula.

$HDI = (SI_l \times SI_h \times SI_e)^{(1/3)}$, where SI_l is the sectoral index for living standard, SI_h is the sectoral index for health and SI_e is the sectoral index for education.

3. Analysis and Discussion

The HDI has been constructed for 19 blocks and a corporation in the district employing the present methodology. The index value varies from 0.88 (corporation) to 0.41 (Manur and Kuruvikulam). The high value for standard of living index and health index has determined to a large extent the HDI value of the corporation. On the contrary the low value of standard of living index and education index pushed down the HDI value of Melaneelithanallur to the lowest one in the district, placing it at the 20th rank. Tenkasi has an HDI value of 0.75 and is at the second spot because of its high positions in education index (0.78) and health index (0.76), Manur is at the 19th rank with 0.41 as HDI value because of its low rank in education index (0.36) and health index (0.42). The Table 3 is comparative analysis of HDI which shows that the variation of HDI value between the blocks is very wide and in terms of reasons for high and low values of HDI, no single sectoral index and individual indicators can be attributed. Each block has distinct advantages and disadvantages and therefore a detailed study on each sector and indicator is attempted for policy suggestions and development programmes.

Table 3. Top and bottom three blocks in human development index

Top Three		Bottom Three	
Corporation	0.88	Melaneelithanallur	0.45
Tenkasi	0.75	Manur	0.41
Vallioor	0.69	Kuruvikulam	0.41

Modern fuel includes LPG, electricity and bio-gas. These fuels are easily controllable, transported and flexible to use according to requirements. The heat energy produced is also not wasted, it is comparatively safe and leaves less carbon or sulphur. In India, most of the rural people still use firewood for cooking purpose and there by women are often affected by the smoke, resulting in headache to lung problems. It also takes more time for cooking. Modern fuels such as LPG are mostly used by urban and rural rich people. Thus, use of LPG is taken as one of the variables for understanding human development [4-5].

In the district, in the blocks such as Corporation, Tenkasi and Ambasamudram, the percentage of people using modern fuel is high. Melaneelithanallur, a block which is identified as a backward one by the Government of Tamil Nadu is trailing behind all other blocks as rural people consume less modern fuel. The high index value for modern fuel has been noticed in Corporation, Tenkasi and Ambasamudram and the low index value is associated with Melaneelithanallur, Manur and Kuruvikulam. The high value goes with agriculturally advanced blocks and urban areas. Kuruvikulam which has a low value is an agriculturally backward block. Here, it can be inferred that high-income group consumes modern fuel even in rural areas. Keeping this in view, it is suggested that rural people can be given more subsidized gas.

In Tirunelveli, the urban population has more toilet facilities and 96% of the people in Tirunelveli corporation use modern toilet facilities and among blocks, Vallioor tops the rank (81%) and Melaneelithanallur has only 35% coverage. In the index value for this item, Corporation, Vallioor and Ambasamudram secure top three ranks and the bottom three are Melaneelithanallur, Manur and Kuruvikulam. In this Melaneelithanallur and Kuruvikulam find low literacy value. Therefore, people in these blocks apart from low income, due to low literacy rate, do not know the importance of sanitation. Moreover, in Melaneelithanallur access to water for toilet facility remains a great hurdle due to scarcity of water. The average rain fall in Melaneelithanallur is well below the district level. River water is also not available. This may be another reason for low toilet facility in Melaneelithanallur.

In Tamil Nadu, supplying safe drinking water is crucial for people and it is directly and indirectly linked to the livelihood of the people. Providing safe drinking water is one of the priorities of the panchayat union. A comparison of consumption of safe drinking water among the households of different blocks shows vast difference. In the district, only 83% of the people are covered under safe drinking water schemes and this is well above the national average as per the census data. As the consumption of the safe drinking water reflects people's living standards, its index value for water supply habitation wise is considered for HDI measurement. In the analysis of index value for safe drinking water, it is understood that Tenkasi and Corporation have outstripped other blocks. As already noticed Melaneelithanallur and Kuruvikulam are lagging behind in other positive indices implying the backwardness of these blocks, water supply also has the same situation here. Water supply should be ensured in these areas. Electricity is an integral utility in modern society and is the backbone of the development of the industry, agriculture, communication, transport and is also associated with every walk of life. Even entertainment is dependent on power supply. Therefore, the index value for electricity is included in the calculation of HDI.

Knowing its significance, Tamil Nadu has almost 100% electricity coverage. Now ensuring continuing power supply is the need of the hour. In Tirunelveli over 90% of households are provided with power. The percentage for electricity coverage is high among all blocks. Therefore, it reflects well and positively in the standard of the living index of the district. However, for the development of agriculture and industry in the district, uninterrupted power supply is necessary. Pucca housing facilities mean better living environment and better health and improved productivity of the people. It also raises the social status of people and this is reflected in the wellbeing of people. In the analysis of index of pucca house in Tirunelveli district, Manur block has the highest percentage (81%) of people with good housing facilities and the lowest is Pappakudi (30%) block. The index value for pucca house is maximum for Corporation with one and Keelapavoor block has the lowest value (0.13).

Understanding this, the housing project of the present Chief Minister of Tamil Nadu, "Green House" is implemented with all seriousness throughout the district to improve the housing facilities of people. In India, after Independence, achievement in health is modest and expenditure on health both by private and public is low. There is also a sharp inequality that exists in access to health between the rich and the poor and between the rural and urban people. Therefore, it is a necessity to increase public expenditures on health. Against this, the public health investment has declined from 1.3% of GDP in 1990 to 0.9% in 1999. Only recently the budgetary allocation has been increased marginally. Health plays a vital role in human development. Sound body and sound mind are essential components of productivity. Good health is not limited to a particular religion, caste, region or gender. To understand the health status of the people in Tirunelveli, IMR and MMR are considered. Infant mortality rate is a sensitive indicator of health and the social and economic attainment of the people. It reflects the probability of a child dying within one year. In India, infant mortality has declined from 134 in 1947 to 47 in 2010. The main causes of this tragedy are pre-mature birth, respiratory infections and diarrhea. With a view to reducing the IMR and strengthening the health care system, the National Rural Health Mission was launched in 2005. Even then it is estimated that there is a shortage of 19,590 sub-centres and 4,252 primary health centres in India.

Tamil Nadu has made tremendous progress in reducing the IMR. It has been reduced from 113 in 1971 to 24 in 2010, which is well below the all India figure of 47 during the year. As regards the gender gap in IMR, Tamil Nadu did well and it was almost equal between boys (23) and girls (24) in 2010. As infant mortality rate is one of the indicators of health status, it is included in the HDI. High infant mortality rate means, underdevelopment. In Tirunelveli district, Corporation (7.50), Valliyoor (7.54) and Palayamkottai (10.44) have low incidence of infant mortality and thus find a high index value in the indicator and Manur (20.93), Kuruvikulam (20.05) and Cheranmahadevi (20.45) have high incidence of infant mortality and thus, secure a low index value. In fact the one block which are rural and corporation which is urban are with one as index value which is an exemplary achievement. Even in other blocks where infant mortality is high, it is less than the national figure, 47 in 2010. However, the district has to embark upon new plans and programmes to curtail the infant mortality rate as all blocks have high IMR compared to the IMR of developed countries.

Generally, the Maternal Mortality Rate (MMR) is the annual number of female deaths per 1,00,000 live births from any cause related to or aggravated by pregnancy or its management. Simply, the MMR includes deaths during pregnancy, childbirth, or within 42 days of termination of pregnancy for a specified year [6]. Globally the MMR has decreased from 400 in 1990 to 210 in 2010. The major causes for maternal death are hemorrhage, sepsis and anaemia. The other reasons are toxemia and malposition. All these pinpoint inadequate health facilities. It also shows lack of knowledge and delayed medical attention in the rural areas. The MMR also varies between various social groups. The antenatal coverage has to be increased to the poor and the socially under privileged women.

As the MMR is also another indicator of health, it is included in the index calculation and as regards the index value, Corporation, Valliyoor, Tenkasi, Melaneelithanallur and six other blocks showed greater performance (10) in eliminating MMR in the study period and Kadayam (195.95) and Ambasamudram (174.22) blocks performed poorly. Melaneelithanallur outshines other blocks, which has to be appreciated and it has to be considered as role model for other blocks in this aspect. Kadayam which has high BPL families and high percentage of SC population needs to be provided with more health care facilities to bring down the MMR. Under 5MR is also considered as one of the indicators of the health and high under 5MR shows low level of health achievement. In India, in 2010 under 5MR is 59, states such as Assam (83), Madhya Pradesh (82), Uttar Pradesh (79), Odisha (78) and Rajasthan (69) are with great levels of under 5MR and Kerala (15) and Tamil Nadu (27) are with the lowest figures (Council for Social Development 2013). In this, Tamil Nadu has 30 for rural and 24 for urban as U5MR whereas for India, it is 66 and 38 respectively. Similarly, gender discrimination is found even among children as under 5MR for male is 55 and 64 for female in India in 2010. However, the achievement of Tamil Nadu is to be applauded as the gap has narrowed down to 2 (26 for males and 28 for females). However, there are miles to go before Tamil Nadu reaches Kerala's landmark feat (14 for males and 16 for females). In Tirunelveli district, Corporation has very low U5MR (7.50) signifying the health facilities available in the region. In contrast, Kuruvikulam (20.40), Manur (20.93), Cheranmahadevi (22.80) and Ambasamudram (26.10), have very low index.

Therefore, a special health package in terms of health infrastructure and health care staff including doctors should be provided at once. However, most of the blocks are better off, since the under 5MR is lower than the state value for most of the blocks including the corporation. Education is the most important component of human resource development. All forms of education transform the society and provide economic benefits. Moreover, it creates the required social environment for people to live in harmony. Thus, every state in India vies for becoming fully literate, since literacy rate of state explains the status of attainment in this field and also in human development.

Tirunelveli district is considered to be the Oxford of the state. Palayamkottai has cluster of schools and colleges providing quality education. In the district Corporation (90.39%), Vallioor (88.64%) and Radhapuram (88.61%) blocks have achieved higher literacy rate in terms of its index value and Melaneelithanallur (72.74%), Kuruvikulam (74.10%) and Manur (76.70%) and blocks stand opposite. The above fact indicates blocks which have higher number of schools obtained higher index value and blocks with lower number of schools naturally descend in the order. Therefore, it is suggested that school infrastructure may be created in those blocks where low literacy is there. Further, blocks such as Kuruvikulam and Melaneelithanallur which are backward do not fare well in literacy. Here, poverty may be the reason for low literacy. The Education System has a uniform structure of 10+2 system. School education is divided into primary, upper primary, secondary and higher secondary. In India, government and private institutions offer school education. Enrollment ratio at primary and secondary levels also assume major role in human development. Hence, universalization of primary education is a prime objective of all the states, a major task for the country now. Towards this end, the country has increased educational facilities and now there are 8.1 lakh primary schools, 14.94 lakh upper primary schools in the country. The enrollment of children at primary level is 13.3 crore and at upper primary enrollment is 5.45 crore. In the country many programmes are launched to increase the enrollment at the primary and upper primary levels. Programmes include Operation Black Board and SarvaShikshaAbhiyan. Tamil Nadu has almost achieved the Himalayan task of universalization of primary education. However, the educational status of the district is known for better educational plans and for understanding human development in the district.

Within the districts, Tenkasi (127.89%), Vasudevenallur (122.61%) and Ambasamudram (115.43%) blocks have achieved higher gross enrollment ratio at primary level and Kuruvikulam (85.76%), Manur (85.78%) and Melaneelithanallur (85.84%) blocks stand last. It has been observed that Kuruvikulam and Melaneelithanallur are already at the bottom in literacy rate too. Hence, more investment on education in these two blocks is needed to improve human development and also to bring social development. As far as Manur is concerned, it is abysmally low both in education and health pointing out a strong linkage between the two sectors. It means good education leads to sound health and vice versa. Therefore, in Manur block, investment in both health and education is needed. Considering the geographical area, Manur is the largest block in the district. Therefore, it has to be examined whether smaller block leads to better governance in the light of Kalakadu a small block securing fourth rank in HDI and second rank in GII among the 19 blocks of the district. Similar to primary education, secondary education in the country has also grown significantly. However, due to poverty, social inhibition and inadequate infrastructure, the transition rate from upper primary to secondary has fallen greatly. This is more so for the girl child. Access to higher education is also affected by inadequate infrastructure such as roads and transport. This has a greater impact on ST, SC and Muslim girls. In district Ambasamudram (105.65%), Vasudevenallur (105.25%) and Vallioor (103.37%) blocks have achieved higher gross enrollment ratio at the secondary level and whereas Manur (98.68%) block has low enrollment ratio. Hence, an all out effort with a big push is needed to make these blocks develop. This includes sizeable investment both from public and private for improving education in the blocks.

4. Conclusion

The high value for standard of living index and health index has determined to a large extent the HDI value of the corporation in Tirunelveli district. On the contrary, the low value of standard of living index and education index pushed down the HDI value of Melaneelithanallur to the lowest one in the district and placing it at 20th rank.

Tenkasi has an HDI value of 0.75 and is at the second spot because of its high positions in education index (0.78) and health index (0.76), Manur is at the 19th rank with 0.41 as HDI value because of its low rank in education index (0.36) and health index (0.42). The inquiry into the factors determining the HDI in the district reveal that primary education is the most important factor that increases the human development. The health determinants such as IMR, MMR and U5MR which explain the variations in HDI may also be improved through additional primary health centres with medical and paramedical staff. Since there is inter sectoral linkage between various indicators, better education leads to better health and better health leads to better education and thus HDI will also be increased.

5. References

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Annexure

Block-wise HDI Indicators											
Block	Standard of Living					Health			Education		
	Cooking Fuel	Toilet Facilities	Drinking Water	Electricity	Pucca Houses	IMR	MMR	U5MR	Literacy Rate	GER Primary	GER Secondary
	Census	DRDA	DRDA	Census	DRDA	Health Department - Tirunelveli			Census	Education Department	
	2011	2013-14	2013-14 habitations	2011	2013-14	2013-14	2013-14	2013-14	2011	2013-14	2013-14
Alangulam	37	42	73	95	58	16.42	10.00	16.42	77.00	97.53	104.43
Ambasamudhram	55	70	91	96	63	23.23	174.22	26.10	87.38	115.43	105.65
Cheranmahadevi	50	57	90	94	39	20.45	113.64	22.80	86.23	96.54	102.03
Kadayam	34	61	100	95	55	15.02	195.95	17.10	81.63	98.00	99.80
Kadayanallur	53	61	69	97	65	15.87	10.00	15.87	77.24	100.00	101.38
Kalakadu	41	68	100	94	49	15.7	10.00	15.70	86.88	113.57	101.02
Keelapavoor	37	62	86	96	37	13.32	10.00	13.32	79.96	111.67	102.18
Kuruvikulam	25	46	100	95	59	20.05	10.00	20.05	74.10	85.76	101.28
Manur	29	44	97	93	81	20.93	56.56	20.93	76.70	85.78	98.68
Melaneelithanallur	23	35	92	95	51	15.04	10.00	15.04	72.74	85.84	102.04
Nanguneri	29	68	55	94	66	13.41	60.94	15.30	84.72	97.42	102.28
Palayamkottai	45	53	55	95	56	10.44	20.32	10.44	84.26	98.48	103.17
Pappakudi	39	68	100	96	30	22.3	82.58	22.30	80.88	98.39	100.16
Radhapuram	42	71	57	97	60	11.81	118.26	11.81	88.61	99.12	100.27
Sankarankoil	37	51	100	95	61	19.98	10.00	19.98	77.49	94.84	103.08
Shencottai	45	60	100	95	47	18.33	10.00	18.33	79.21	99.52	100.65
Tenkasi	55	68	100	95	61	14.04	10.00	14.04	82.16	127.89	100.97
Vallioor	41	81	73	95	64	7.54	10.00	14.60	88.64	92.35	103.37
Vasudevanallur	41	56	87	95	41	14.29	10.00	14.29	73.58	122.61	105.25
Corporation	64	96	100	97	100	7.5	98.74	7.50	90.39	111.76	102.34

Source: (1) Census of India, 2011, (ii) NBA, MDWS, New Delhi-2014, (iii) TNEB, (iv) Health and Education Department, 2013-14

Block-wise Human Development Index																
Block	Standard of Living				Health			Education			Sectoral Index			Overall Index	Rank	
	Cooking Fuel	Toilet Facilities	Drinking Water	Electricity	Pucca Houses	IMR	MMR	U5MR	Literacy Rate	GER Primary	GER Secondary	Standard of Living	Health			Education
Alangulam	0.38	0.17	0.47	0.85	0.42	0.51	1.00	0.58	0.46	0.40	0.93	0.40	0.66	0.56	0.53	11
Ambasamudhram	0.79	0.59	0.83	0.92	0.49	0.13	0.20	0.12	0.88	0.75	1.00	0.71	0.15	0.87	0.45	16
Cheranmahadevi	0.68	0.39	0.80	0.77	0.16	0.28	0.50	0.28	0.83	0.38	0.79	0.48	0.34	0.63	0.47	14
Kadayam	0.31	0.46	1.00	0.85	0.38	0.58	0.10	0.55	0.65	0.41	0.65	0.54	0.31	0.56	0.45	15
Kadayanallur	0.75	0.46	0.38	1.00	0.51	0.54	1.00	0.61	0.47	0.45	0.75	0.58	0.69	0.54	0.60	7
Kalakadu	0.47	0.56	1.00	0.77	0.30	0.55	1.00	0.61	0.86	0.72	0.73	0.57	0.69	0.76	0.67	4
Keelapavoor	0.38	0.47	0.72	0.92	0.13	0.68	1.00	0.73	0.58	0.68	0.79	0.43	0.79	0.68	0.61	5
Kuruvikulam	0.10	0.22	1.00	0.85	0.44	0.31	1.00	0.41	0.35	0.17	0.74	0.38	0.50	0.35	0.41	18
Manur	0.19	0.20	0.95	0.70	0.74	0.26	0.77	0.37	0.45	0.17	0.59	0.45	0.42	0.36	0.41	19
Melaneelithanallur	0.05	0.05	0.84	0.85	0.33	0.58	1.00	0.64	0.29	0.17	0.79	0.23	0.72	0.34	0.38	20
Nanguneri	0.19	0.56	0.11	0.77	0.53	0.67	0.75	0.63	0.77	0.40	0.80	0.34	0.68	0.63	0.53	12
Palayamkottai	0.56	0.33	0.12	0.85	0.39	0.84	0.95	0.86	0.75	0.42	0.85	0.37	0.88	0.65	0.60	8
Pappakudi	0.42	0.57	1.00	0.92	0.04	0.18	0.65	0.30	0.62	0.42	0.67	0.39	0.33	0.56	0.42	17
Radhapuram	0.49	0.61	0.15	1.00	0.45	0.76	0.47	0.80	0.93	0.43	0.68	0.46	0.66	0.65	0.58	9
Sankarankoil	0.38	0.30	1.00	0.85	0.47	0.31	1.00	0.41	0.48	0.35	0.85	0.54	0.50	0.52	0.52	13
Shencottai	0.56	0.45	1.00	0.85	0.27	0.40	1.00	0.49	0.55	0.44	0.70	0.57	0.58	0.55	0.57	10
Tenkasi	0.79	0.57	1.00	0.85	0.47	0.64	1.00	0.69	0.67	1.00	0.72	0.71	0.76	0.78	0.75	2
Vallioor	0.47	0.77	0.47	0.85	0.51	1.00	1.00	0.67	0.93	0.30	0.86	0.59	0.87	0.62	0.69	3
Vasudevanallur	0.47	0.38	0.75	0.85	0.19	0.62	1.00	0.68	0.33	0.90	0.98	0.46	0.75	0.66	0.61	6
Corporation	1.00	1.00	1.00	1.00	1.00	1.00	0.57	1.00	1.00	0.68	0.80	1.00	0.83	0.82	0.88	1

Source: Computed

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