

Dhanya John “Impact of urbanization on sustainable environment in Kerala - a study based on Thrissur district.” Thesis. Research and Post Graduate Department of Economics, St. Thomas’ College (Autonomous), University of Calicut, 2019.

CHAPTER – 4

PROFILE OF THE SAMPLE CITY

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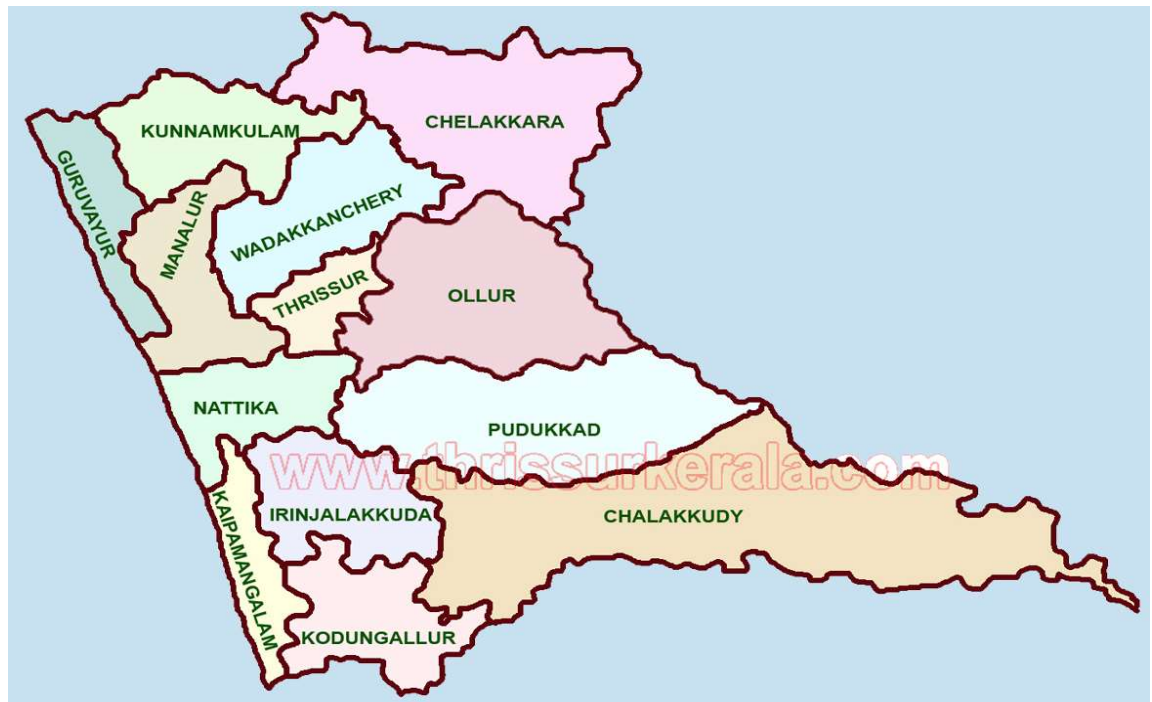
4.1 Thrissur District

Thrissur is one of the important historical cities of Kerala, which is known as the cultural capital of Kerala. Thrissur district came into existence on 1st July 1949. The district has an area of 3027 sq.km and is located in the central part of the state. The district ranks the fifth in area among the districts.

4.1.(i) Topography

The district lies between North latitudes 10° 10' 22" and 10° 46' 54"; and East longitudes 75° 57' 20" and 76° 54' 23", in the survey of India Toposheet No. 58B and 49N. It is bounded on the north by Malappuram district and south by Ernakulam and Idukki districts, touching Western part of Tamil Nadu on the east and Lakshadweep Sea on the west. Thrissur district accounts for 7.8% of the area of the state (Economic Review, 2016).

Figure 4.1 Map of Thrissur District



4.1. (ii) Rainfall and Climate

The Thrissur district is characterized by wet type of climate and four types of seasons are identified. The hot summer season from March to May the southwest monsoon season from June to September, the northeast monsoon from October to December and a general cool and salubrious climate period during January and February. The average annual rainfall ranges between 2310.1 and 3955.3 mm in the district with mean annual rainfall of 3198.133mm (CGWB, Government of India,2013).

The month of July experience abundant rainfall and is the wettest month. The months of June, August, September and October also receive heavy rainfall. The year to year variability of annual rainfall is around 22%. In general it varies from 18.6 to 24.0%. The annual rainfall received in Thrissur district during the last 6 years is presented in table 4.1.

Table 4.1

Annual Rainfall (mm) Received in Thrissur District

Year	2006	2007	2008	2009	2010	2011
Rainfall (mm)	3576.7	3955.3	2310.1	3090.3	314.4	3142

Source: Central Ground Water Board, Ministry of Water Resources, Kerala State, Government of India, 2013.

The maximum temperature ranges from 29.3 to 36.20 C, whereas the minimum from 22.1 to 24.90 C in the district. The average annual maximum temperature is 32.300 C and minimum temperature 23.30 C. The humidity is higher during monsoon months from the June to October and is around 93% during morning hours and 76% during evening hours (Kerala State Environment Report, 2013).

4.1. (iii) Geomorphology and Soil Types

The three geomorphologic units of the Thrissur district are coastal plain, mid lands and high lands. Similarly, the soils in the district have been classified in the following types, based on the morphological features and physiochemical properties. They are the late rite soil, brown hydro orphic saline soil, coastal alluvium, reverie alluvium and forest loamy soil. These soil types vary according to different locations and climate conditions (Kerala State Environment Report, 2013).

4.1. (iv) Administration

Thrissur district has five taluks viz. Chavakkad, Thalappilli, Thrissur, Kodungallur, and Mukundapuram which comprises 17 blocks spread over a total of 97 panchayaths and 7 municipalities. Chavakkad, Guryayoor, Kunnankulam, Chalakkudy, Kodungallur, Irinjalakkuda are the 6 municipalities and Thrissur city is the municipal corporation.

Table 4.2

Distribution of Towns in Thrissur District as on 31-12-2009

Name of District / Taluks	No. of Towns	
	Statutory towns	Census towns
Talappilly Taluk	1	29
Chavakkad Taluk	2	20
Thrissur Taluk	1	45
Kodungallur Taluk	1	12
Mukundapuram Taluk	2	22
Thrissur District	7	128

Source: Census of India 2011.

The table 4.2 shows the number of statutory and census towns in five taluks of the district. The entire district comprises 7 statutory towns and 128 census towns. The district comprises of a single revenue division – Thrissur consisting of 5 taluks and 98 villages.

Table 4.3

Total Number of Villages and Towns – 2011

Villages/Towns		Kerala	Thrissur
Number of villages	Total	1,018	98
	Inhabited	1,017	98
	Uninhabited	1	-
Number of towns	Total	520	135
	Statutory	59	7
	Census	461	128

Source: Census of India, 2011.

Table 4.3 shows a comparison between Kerala and Thrissur in total number of villages and towns. According to the census report of 2011, in Kerala there are 1,018 villages and Thrissur the number is 98. Similarly the total number of towns in Kerala

is 520 and in Thrissur it is 135. This shows that the number of villages and its proportion is comparatively lower in Thrissur compared to towns.

Table 4.4

Population Statistics of Kerala and Thrissur – 2011

Population	State/District	
	Kerala	Thrissur
Total population		
Total	33406061	3121200
Males	16027412	1480763
Females	17378649	1640437
Rural Population		
Total	17471135	1024749
Males	8408054	488303
Females	9063081	536491
Urban Population		
Total	15934926	2096406
Males	7619358	992460
Females	8315568	1103946
% Urban Population	47.7	67.17

Source: Census of India, 2011.

The table 4.4 shows the distribution of villages & towns in Kerala as well as Thrissur with classification of villages and towns along with population statistics. It gives total population, total male & female population and rural & urban population. The data shows that percentage of urban population in Kerala is 47.7 and in Thrissur district it is 67.7 percent which shows that Thrissur district is far ahead than the state in urbanization.

Table 4.5**Area and Density of Population in Kerala and Thrissur – 2011**

State / District	Area (in sq.Km)	Density of population (persons per sq.km)
Kerala	38852	860
Thrissur	3027	1031

Source: Census of India, 2011.

Table 4.6**Sex Ratio of Kerala and Thrissur – 2011**

Sex ratio (number of females per 1000 males)	Kerala	Thrissur
Total	1,084	1,108
Rural	1,078	1,099
Urban	1,091	1,112

Source: Census of India.

Table 4.5 shows that the state has an area of 38852 sq. kms, with 860 density of population in 2011. Thrissur district has the area of 3027 sq.kms with 1031 density of population which is much higher than the state density. Similarly, table 4.6 represents that the sex ratio of the district is 1108 in total, 1099 in rural areas and 1112 in urban areas which are higher than the state.

There are 7 cities in the district which comes under the district administration. Those are – Thrissur Municipal Corporation, Kodungallur, Kunnamkulam, Chalakkudy, Chavakkad, Irinjalakuda, and Guruvayoor. The share of population of these cities is given in table 4.7. According to the census report of 2011, the major share of urban population is from Thrissur city (3,15,957) followed by Kodungallur (60,190) and Kunnamkulam (54,071). Thrissur Municipal Corporation occupies the top position in urban population of the district.

Table 4.7**Cities and Urban Population in Thrissur District**

Cities	Population	Area (km ²)
Thrissur	3,15,957	101.4
Kodungallur	60,190	26.8
Kunnamkulam	54,071	34.2
Chalakkudy	49,525	25.2
Chavakkad	39,098	7.5
Irinjalakkuda	28,741	11.2
Guruvayoor	20,510	12.4

Source: Census of India 2011, Thrissur District Data.

4.2 Thrissur City

Thrissur Municipality came into existence on 1st July 1942 and later in the year 2000 it was upgraded to the level of the municipal corporation, by merging the adjoining Ayyanthole, Ollukkara, Koorkanchery, Ollur and Vilvattom Panchayaths and parts of Nadathara Panachayath with the erstwhile municipal area. Thrissur Municipal Corporation came into being on 2nd October 2000.

The city has been scientifically planned and built around a hillock on which the famous Vadakkunnathan Temple is situated. The city is built around the vast open space called “ThekkinkaduMaidanam” surrounding the centrally located Vadakkumnnathan temple.

Thrissur city is located 75km North of Kochi, 133 km West of Coimbatore and 144 Km South of Kozhikode. The city is well connected by road and rail network due to which it acts as a connecting place to all local bodies in the surrounding areas. The total population of the city accounts for 10.61 percentage of the total population of the district (Thrissur City Development Plan, 2016).

Figure 4.2 Map of Thrissur City



The Thrissur Municipal Corporation (TMC) is the civic body that governs the Thrissur city in Kerala. It is the second largest corporation in Kerala by area and fourth by population. The Kerala Municipality Act 1994 (KM act) governs all functions in TMC. The TMC is responsible for civic infrastructure and administration; the distribution of electricity and water for Thrissur city. The corporation manages a total area of 101.42 sq.km of Thrissur city, which limits through 55 wards. These wards are classified under six zones namely Ayyanthole, Vilvatom, Ollukkara, Ollur, Koorkanchery and the Central Zone or Old Municipal Area (CSP, 2016).

Thrissur has a tropical humid climate. The south west monsoon is from June to September and North east monsoon from October to November. The remaining months are generally dry. The hottest period in the city ranges from March to May. The average annual rain fall of the city is 3000 mm (City Sanitation Plan, 2016).

Table 4.8
Socio- economic Profile of Thrissur City – 2011

Sl. No	Indicators	Total number
1	Total Population	3,15,957
2	Population Density	3,112
3	No. of households	86,604
4	Average household size	4.5
5	Below poverty line population (2009 survey)	21,809
6	Number of notified slums	133
7	% of slum population	10
8	Sex ratio	1076
9	Literacy rate	97.24%
10	Total workers (Socio economic survey, 2010)	1,03,234
11	City sanitation rank (Hand book of urban statistics, 2016)	67 out of 476 class I cities in India

Source: Census 2011, City Sanitation Plan, 2016.

With a total area of 101.42sq.kms, Thrissur MC accounts for 3.3% of the geographical area of the district. The table 4.8 reveals that the population of the city is 3,15,957 which constitute 10% of the district population. The male population is around 48% of the total indicating a higher sex ratio. The population density of Thrissur city is 3112 persons /sq.km as per 2011 census which is much higher than the district density of 1125 persons/sq.km. The literacy rate is 97.24 percent. For men the literacy rate is 98.12 % and for females it is 96.09% as per census report of 2011.

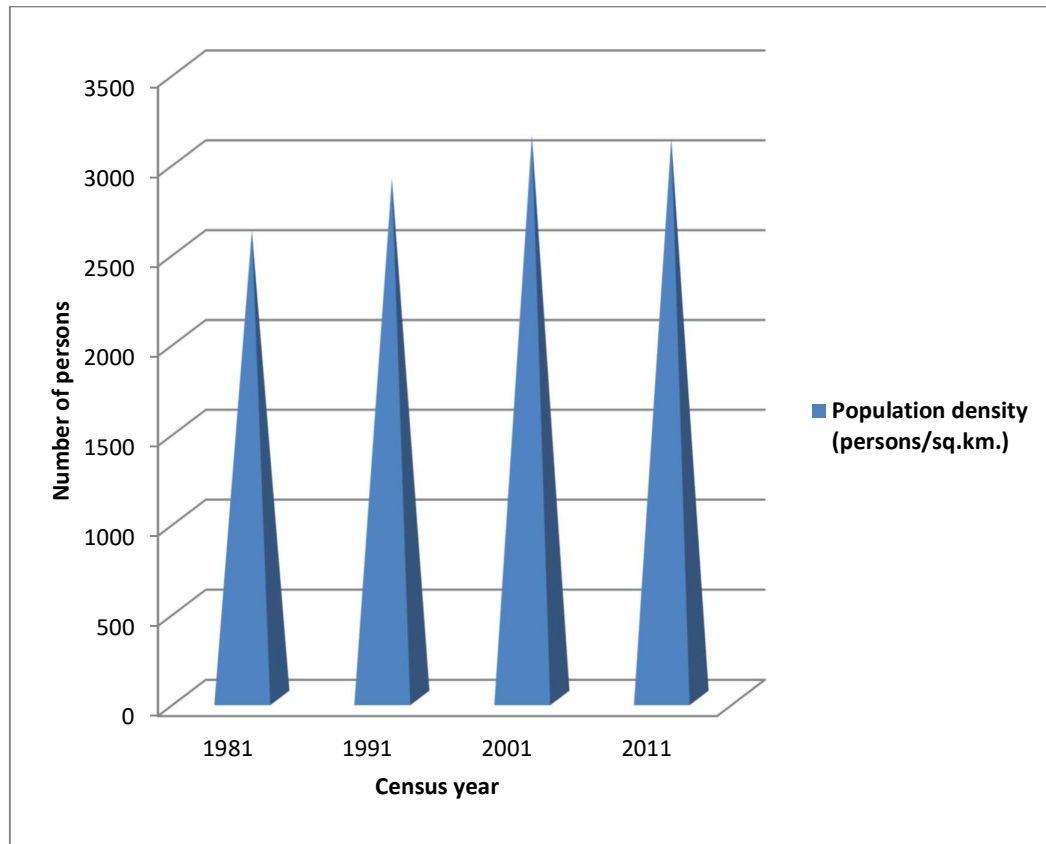
Table 4.9
Growth of Population of Thrissur City

Census year	Population	Decadal growth rate (%)	Population density (persons/sq.km.)
1981	263,584	4.71	2599
1991	292,963	11.15	2889
2001	317,526	8.38	3130
2011	315,957	-0.49	3112

Source: Census 2011, City Sanitation Plan, 2016.

Figure 4.3

Growth of Population of Thrissur City



Growth of population and its decadal growth rate along with density is illustrated in table and figure above. From 1981 to 1991 the growth rate of population is high which is marked as 11.15% and it slightly declined to 8.38% in 2001. During 2001-2011, the city exhibited negative growth rate of population (-0.49). Similarly, the density of population in Thrissur city was 2599. It increased to 3112 during 2011.

Thrissur city is one of the major cities of Kerala in educational services. There are a total of 112 educational institutions in the city including pre primary, high school, higher secondary and vocational higher secondary. These institutions are under government sector, government aided sector, unaided sector etc. This data is exhibited in table 4.10.

Table 4.10**Educational Facilities in the City**

Educational institutions	Government	Aided	Unaided	Total
Pre Primary	10	41	4	55
High School	4	10	12	26
Higher Secondary Schools	6	8	14	28
Vocational Higher Secondary Schools	3	0	0	3
Total	23	59	30	112

Source: City Development Plan 2016, Thrissur Municipal Corporation.

Table 4.11**Health Care Facilities in Thrissur City**

Type of Hospital	No. of Hospital / Dispensary	No. of Doctors	No. of Beds
Allopathic	32	743	5268
Ayurvedic	10	31	165
Homeopathic	2	3	25
Others	5	6	0
Total	49	783	5458

Source: City Development Plan 2016, Thrissur Municipal Corporation

The table 4.11 shows the level of health care facilities in the city. There are 32 allopathic hospitals in the city with 743 doctors and 5268 beds which is sufficient for a growing city. Similarly there are ayurvedic, homeopathic and other hospitals within the city limits. The total number of hospitals in the city is 783.

The trade and commercial activities of the city are mostly concentrated in Swaraj round, Kizhakkekotta, West fort, High road, Sakthan Market, Chettiyangadi, North bus stand, and Patturaikkal. Thrissur is also known as the gold capital of India. About 70% of manufacturing of gold happens in this city. It is also an important centre of silk garments. The city holds the record for the highest number of financial institutions as they exceed 1000, both government and private. Three predominant

schedule banks in Kerala- South Indian Bank, Catholic Syrian Bank and Dhanalakshmi Bank have their headquarters at Thrissur. Diamond polishing and automobile tire moldings are the remaining industries that play an important role in Thrissur economy.

Table 4.12

Industries in Thrissur City

Type	Number	Labourers
Large	3	520
Small	21	465
Micro	387	2832

Source: District Industry Centre (CSP, 2016), Thrissur Municipal Corporation.

The type, number and total labourers of various industries in the city are exhibited in table 4.12. Mostly small scale and micro industries function in the city. It includes brick and tile manufacturing companies packing case manufacturing units, gold covered ornament manufacturing unit, textile units, edible oil producing units, tailoring units, printing units, handloom weaving units etc. There are industrial estates at Ollur and Anchery Chira which are close to the city. There are 387 micro industries in the city which accommodate 2832 labourers.

Table 4.13

Zone Wise Water Supply Coverage of Households

Zone	Total No. of Households	Households with Water Tap Connection	Households without Water Tap Connection
Old municipal area	25818	23706	2112
Koorkanchery	9624	5763	3861
Vilvattom	8465	3675	4789
Ollukkara	8059	2649	5410
Ayyanthole	10662	7898	2764
Ollur	15708	3687	12021
Total	78336	47378	30957

Source: CSP, 2016, Kerala Water Authority, Thrissur.

The table 4.13 shows that the existing water supply system caters to 60.48 % of the households in the city. Total number of households in 6 zones of Thrissur city is 78336 and number of households with water tap connection is 47387. The number of households without water connection in the city is 30957. The gap in the water supply is reasonably managed by alternative sources like wells, tube wells, public taps and community oriented projects like ‘Swasraya’. The water supply system in the city is under the control of ULB (Thrissur Municipal Corporation) and Kerala Water Authority (KWA). The main water sources are Peechi Dam, and Karuvannur river- a downstream of Chimony Dam.

Similarly the status of water supply service levels of Thrissur city indicates that presently 60.48% is the coverage of water supply connections and the gap of 39.52% is found in this. Likewise the quality of water supplied is 80% and the gap is 20%. Hence there is significant gap between the present status and MOUD Benchmark in case of water supply services of the city (SLIP 2016-17).

Table 4.14 Status of Sewerage Network and Service Levels in Thrissur City

Sl. No	Indicators	Existing service levels	MOUD Benchmarks
1	Coverage of latrines (individual/community)	94.87%	100%
2	Coverage of Sewerage network services	-	100%
3	Efficiency of collection of sewerage	-	100%
4	Efficiency in treatment: Adequacy of Sewerage treatment capacity	-	100%

Source: CSP 2016, Thrissur Municipal Corporation.

The table 4.14 shows the status of existing sewerage network in Thrissur city. There is no centralized sewerage system in the city. Similarly, there is no sewerage treatment plant in the city. City’s drainages are designed for storm water only and mixing of sewerage in storm water drains is critical. Kerala Water Authority (KWA) is the sole authority responsible for sewerage in the city. The city generates around 34 MLD of sewerage. The table shows the fact that there are no ongoing projects to meet the existing gap in sewerage system. The sewerage system has to be planned 100% from the grass root level to implement a sustainable system to attain MOUD benchmarks.

Table 4.15**Solid Waste Generation and Collection Report of Thrissur City**

Waste Generation (MT)		150
Waste Collected by ULB		35
Waste Generation Units	Number	Quantity of Waste Composed (MT)
Hotels	403	11.00
Lodges	87	1.00
Convention centers & Marriage Halls	79	3.75
Hospitals	33	1.00
Educational Institutions	92	1.28
Flats	304	6.00
Markets	9	17.42
Waste Disposed System Supplied by ULB	Number	Quantity of Waste Composed (MT)
Bio gas plant	73	18.25
Pipe compost	140	10.50
Others	27	6.75
Household disposal by citizen	133	33.25
OWC plant	2	8.00
Common Biogas plant	8	2.00
Food waste collection centers	3	0.50
Dry waste collection centers	24	6.95
Total		127.65

Source: CSP, 2016, Thrissur Municipal Corporation.

Solid waste generation, collection and disposal of Thrissur city is highlighted in table 4.15. In the city 150 MT solid wastes are generated daily through various units; hence a fewer amount is composed. There are a number of waste disposal systems supplied by ULB; hence they are insufficient for proper waste management. The percentage of solid waste disposal at household level and different methods arranged by ULB comes to around 85%.

Table 4.16**Total Number of Power Connections in Thrissur City.**

Units	Number
Household	61,220
Commercial	22,604
Industrial	2,611
Agricultural	3,105
Others	67
Total	89,607

Source: City Development Plan 2016, Thrissur Municipal Corporation.

The table 4.16 shows that total number of power connections in Thrissur city is 89607 in which the major unit is households. Industrial and agricultural units in the city, in cast of power connections are marginal compared to commercial units.

Table 4.17**Roads and Street Lightings in the City**

Length of the Roads Available	
National highway	13km
State highway	22 km
Local	1785 km
Type of Roads	
Kuchha	84 km
Bitumen	1450 km
Concrete	235 km
Red metalled	26 km
% of roads facing vehicular congestion	46%
Street Light Coverage	
Total No. of streetlights	34507
Street light / Km of road length	22
% of tar roads / concrete roads with street lighting	89%

Source: City Development plan, 2016, Thrissur Municipal Corporation

The table 4.17 shows the length of roads, type of roads, street light coverage etc. of the city. On the basis of the data, it is clear that 46% of roads of the city are facing vehicular congestion. Similarly, 89% of the city roads are having street light coverage. Hence, there is gap to full street light coverage in the city.

The availability of Green Space and Parks is almost sufficient in Thrissur city compared to other urban areas of the state. The existing area of park and open space accounts for 4.70 sq.kms, which come to 4.63% of the total area of the corporation. The ULB has adequate recreational facilities like park & open spaces, stadiums, theatres, zoo, museums, etc. The present status accounts for 14.89 sq.ms/ person, which exceed the bench mark of 10-12 sq.ms/ person at the national level (City Development plan, 2016).

4.3 Status of Pollution Levels in Thrissur City

Pollution is an important concern as it is associated with urbanization. Mainly there are land (soil) pollution, water pollution, air pollution and noise pollution. Thrissur city is one of the major cities of Kerala which exhibits growing trends of urbanization. Hence studies made by several environmental agencies and organizations reveals that Thrissur city is facing several environmental problem than other cities of the state. The quality of air & water is deteriorating the city.

In the Indian context most commonly used air pollution index (API) is a four parameter model. It is based on the values of National Air Quality Standards, 2009. The range of air quality index and its interpretations are given in table 4.18.

Table 4.18
Range of Air Quality Index and its Interpretations

Sl. No	API Value	Inference
1	0-25	Clean air
2	20-50	Light air pollution
3	50-75	Moderate air pollution
4	75-100	Heavy air pollution
5	>100	Severe air pollution

Source: CPCB, 2009

Air quality is measured based on the number of small particles in every cubic meter of air, specifically those smaller than 2.5 micrograms (PM2.5) or 10 micrograms

(PM10). These particles are capable of entering the human blood stream directly through lungs and increase the risk of heart attacks strokes and lung cancer (CPCB, 2009).

Studies made by CPCB and Kerala State Pollution Control Board (KSPCB) during 2008 to 2010 shows that two neighbouring and heavily urbanized cities of Kerala (Thrissur & Kochi) are facing air pollution. The average API values including suspended particulate matter in Thrissur is 72.89 and in Kochi it is 66.87. This exhibits that there is moderate air pollution in two cities.

A comparative study made by World Health Organization (WHO) during 2016 to 2018 period among two major cities of Kerala (Kochi and Thrissur) reveals aspects of environmental pollution. The results of the study are exhibited in the table 4.19.

Table 4.19
Environmental Pollution Aspects in Two Cities

Sl. No	Indicators	Kochi	Thrissur
1	Air Pollution (PM10)	70 (High)	73 (High)
2	Water Pollution	69.55 (High)	75.00 (High)
3	Water Quality	30.45 (Low)	25.00 (Low)
4	Noise and Light Pollution	52.73 (Moderate)	59.62 (Moderate)

Source: WHO, 2016, and 2018 (City Level Studies of Kochi & Thrissur)

The table shows that two cities of Kerala are facing high level of air pollution and water pollution. The quality of available water in two cities is low which results in severe health issues. Similarly, noise and light pollution is at a moderate level which may aggravate to high level in coming years. The study also shows that, drinking water pollution and inaccessibility of Thrissur is at a moderate level (50.00) which has deep impact as human health. This study also emphasizes that overall pollution index of Thrissur city is 66.55 in 2016 to 2018 period, and the expected scale of pollution in 2019 is 115.92. Hence, the pollution indicators of the city are reflecting the environmental situation along with problems of pollution on living things as a whole.

Thus the chapter exhibits a clear picture regarding the profile of the sample city with emphasis on its geographical, cultural and other aspects which are considered as the prerequisite for better environmental and living conditions. The study also highlights

the infrastructural deficiencies of the city which needed to be solved for sustainable urban development. Based on the available information regarding the infrastructural and other aspects of the district of Thrissur and its urban area the ecological, social and economic conditions for sustainable urban development can be examined.

