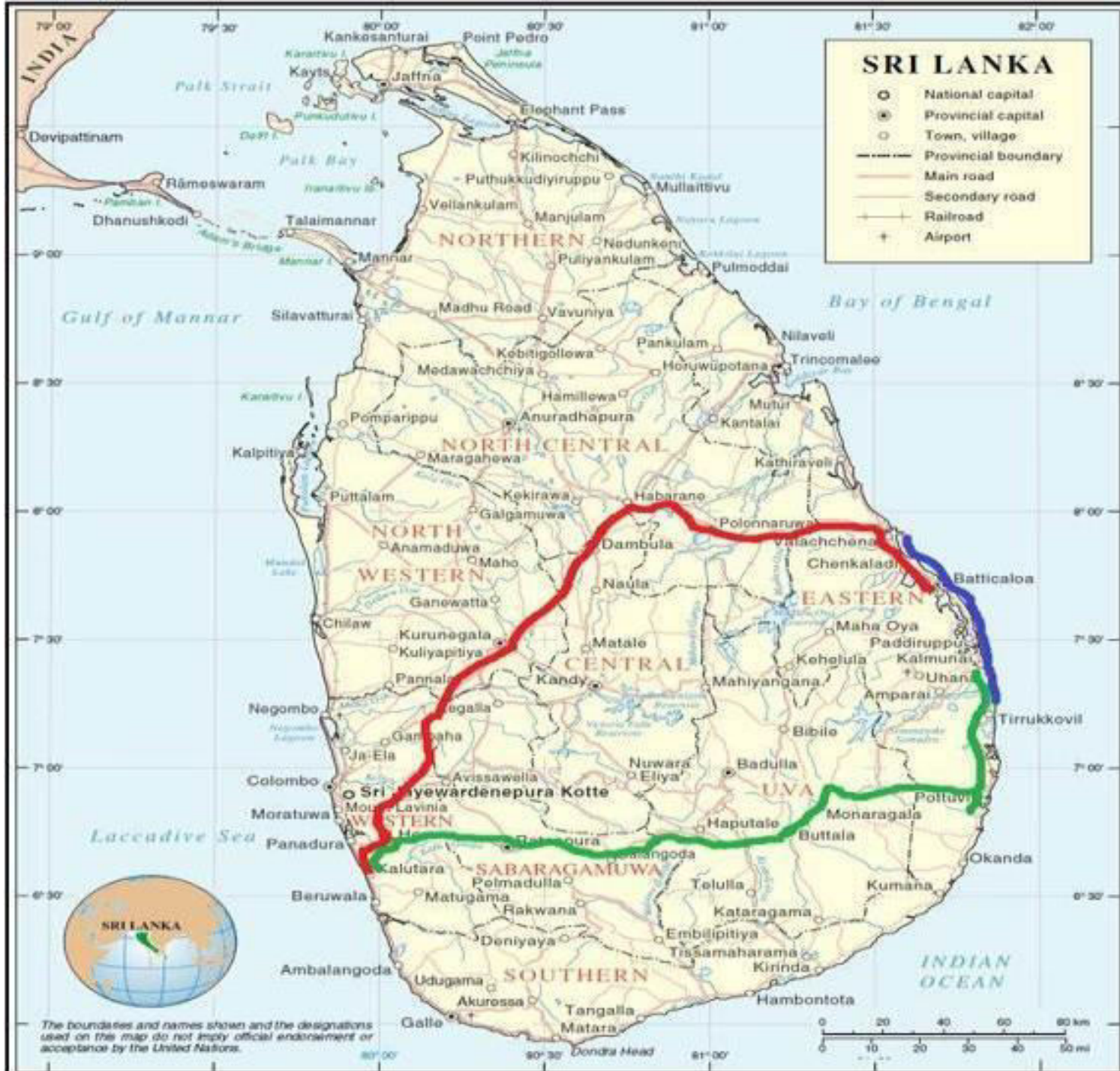
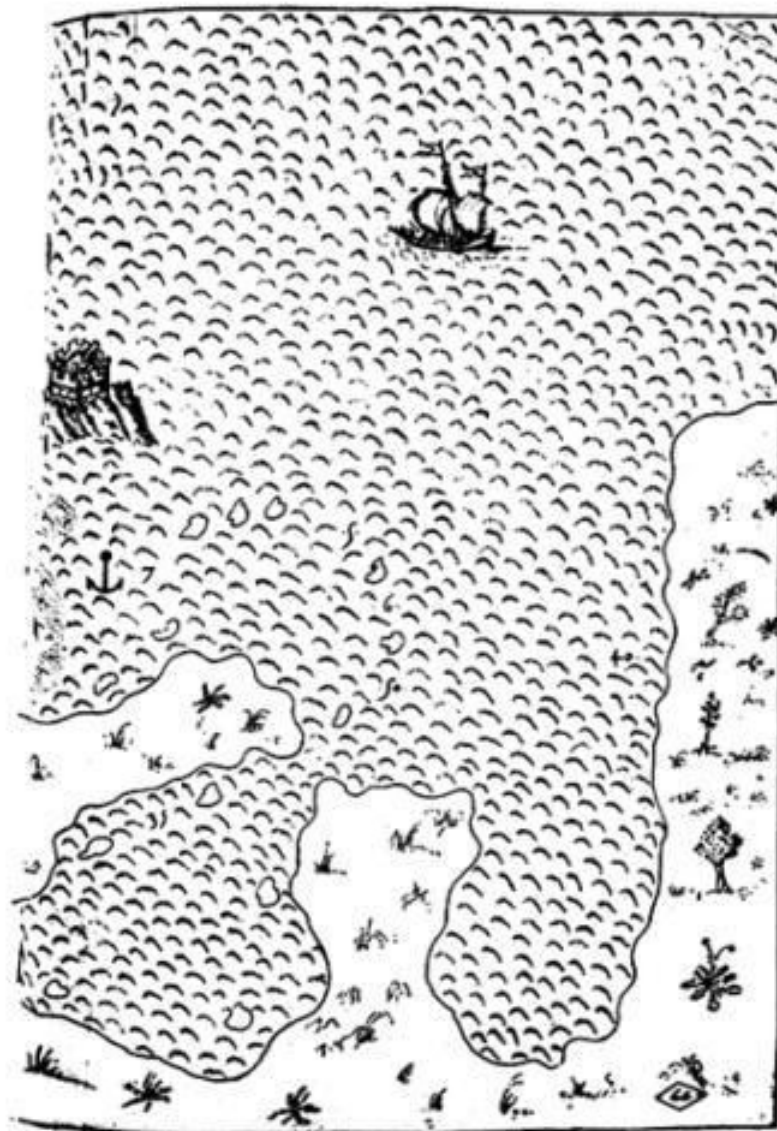
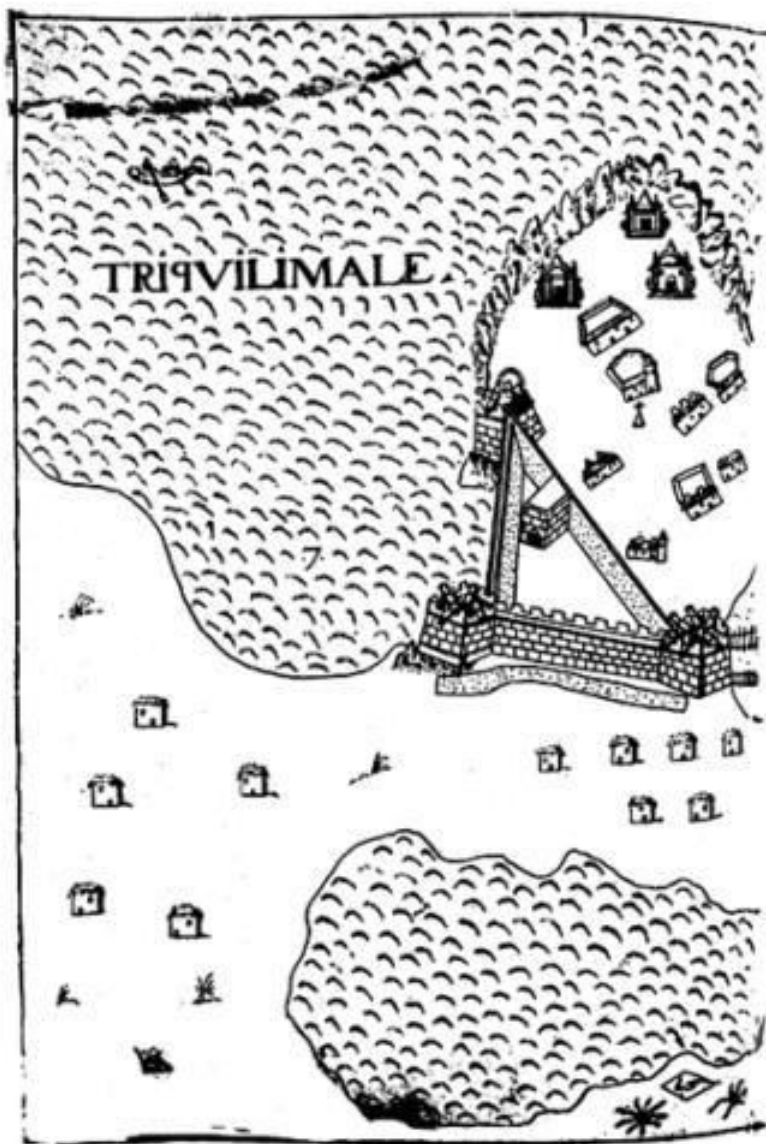


# Climate Resilient City and Urban Environmental Sustainability

**City of Trincomalee**











Population of Trincomalee district is 422821

- Sinhala -111493,
- tamil - 129762,
- Moor - 179588,
- Others - 1969

## **CLIMATE**

The topography of the district is relatively flat in the coastal areas and undulating in the western part of the district. The landscape of the district is varied with agricultural lands, forests, scrublands, wetlands and lagoons. Being in low country dry zone, the district receives more rainfall during the North-East monsoon period (October to February) and less rainfall during South-West monsoon period (April to August). The average annual rainfall in the district is 91.6 mm.

The mean annual temperature of the province is 28.00C (maximum of 31.7 0C and minimum 24.4 0C). The significant climatic characteristics of the province are high temperatures, clear skies, bright sunshine, high evaporation and low humidity. The highest temperature is recorded during the months of June, July, August and September.

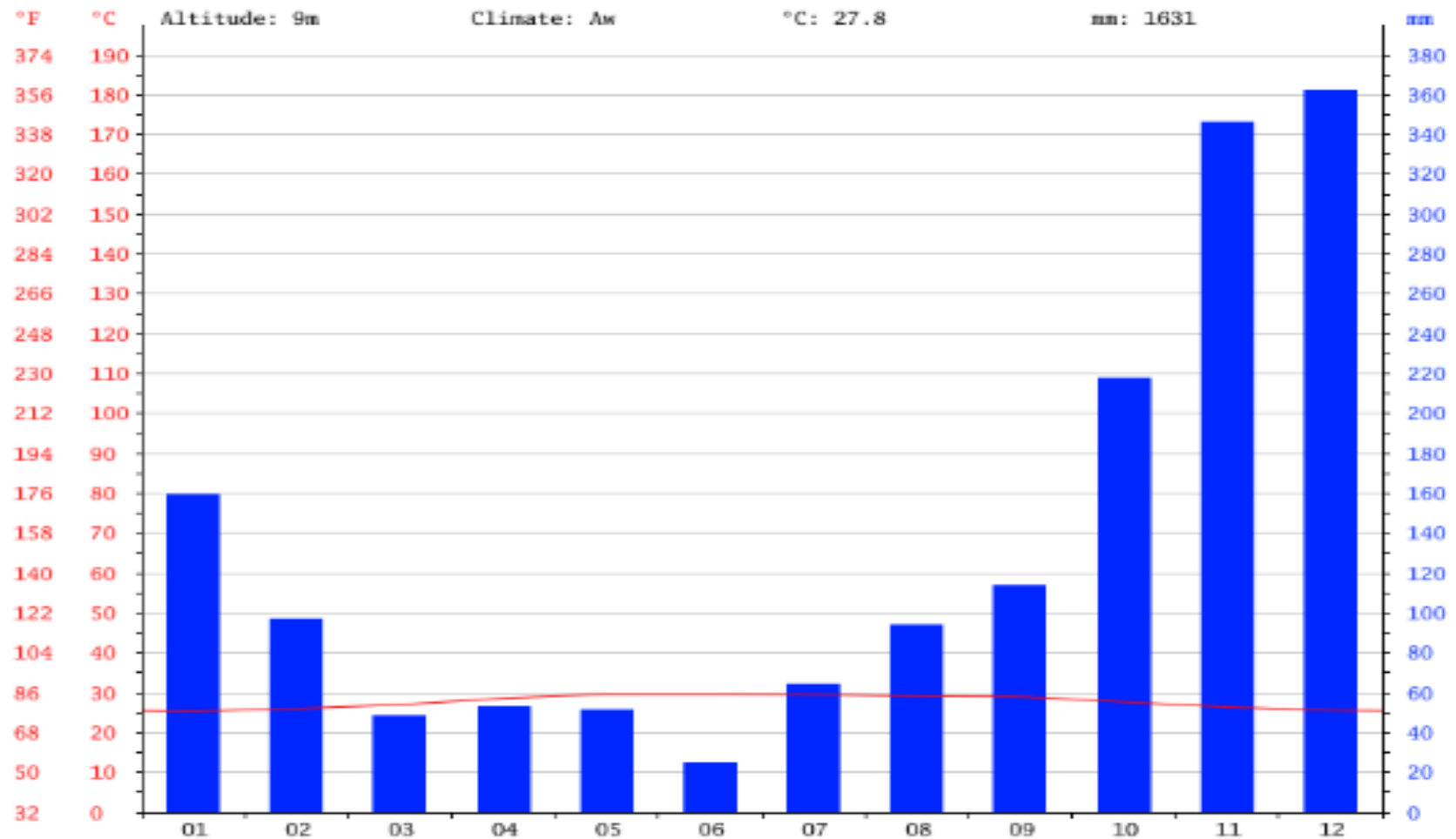
## Climate data for Trincomalee (1961–1990)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	34.8 (94.6)	35.4 (95.7)	39.2 (102.6)	39.0 (102.2)	39.8 (103.6)	39.5 (103.1)	39.0 (102.2)	39.4 (102.9)	39.5 (103.1)	38.7 (101.7)	36.2 (97.2)	32.7 (90.9)	39.8 (103.6)
Average high °C (°F)	27.9 (82.2)	29.2 (84.6)	30.9 (87.6)	33.0 (91.4)	34.5 (94.1)	34.7 (94.5)	34.4 (93.9)	34.2 (93.6)	33.9 (93)	31.8 (89.2)	29.3 (84.7)	28.1 (82.6)	31.8 (89.2)
Daily mean °C (°F)	26.1 (79)	26.9 (80.4)	28.0 (82.4)	29.4 (84.9)	30.5 (86.9)	30.6 (87.1)	30.1 (86.2)	29.9 (85.8)	29.6 (85.3)	28.2 (82.8)	26.7 (80.1)	26.1 (79)	28.5 (83.3)
Average low °C (°F)	24.3 (75.7)	24.5 (76.1)	25.1 (77.2)	25.8 (78.4)	26.4 (79.5)	26.4 (79.5)	25.8 (78.4)	25.5 (77.9)	25.2 (77.4)	24.6 (76.3)	24.2 (75.6)	24.2 (75.6)	25.2 (77.4)
Record low °C (°F)	18.5 (65.3)	18.2 (64.8)	19.5 (67.1)	19.2 (66.6)	19.1 (66.4)	20.6 (69.1)	21.2 (70.2)	20.9 (69.6)	18.7 (65.7)	18.7 (65.7)	18.7 (65.7)	18.7 (65.7)	18.2 (64.8)
Average <a href="#">precipitation</a> <a href="#">n</a> mm (inches)	132 (5.2)	100 (3.94)	54 (2.13)	50 (1.97)	52 (2.05)	26 (1.02)	70 (2.76)	89 (3.5)	104 (4.09)	217 (8.54)	334 (13.15)	341 (13.43)	1,569 (61.77)
Average precipitation on days (≥ 1.0 mm)	7	4	4	5	4	2	4	5	7	12	16	16	86
Average <a href="#">relative humidity</a> (%) (at Daytime)	75	72	71	70	64	58	60	61	63	71	78	80	69
Mean monthly <a href="#">sunshine hours</a>	257.3	268.4	300.7	279.0	263.5	231.0	235.6	244.9	207.0	217.0	171.0	167.4	2,842.8
Mean daily <a href="#">sunshine hours</a>	8.3	9.5	9.7	9.3	8.5	7.7	7.6	7.9	6.9	7.0	5.7	5.4	7.8

Source #1: NOAA (normals and August record low)<sup>[83]</sup>Source #2: [Deutscher Wetterdienst](#) (precipitation days, 1968–1990 and sun, 1975–1983),<sup>[84]</sup> Department of Meteorology (records up to 2007)<sup>[82]</sup>

# CLIMOGRAPH TRINCOMALEE

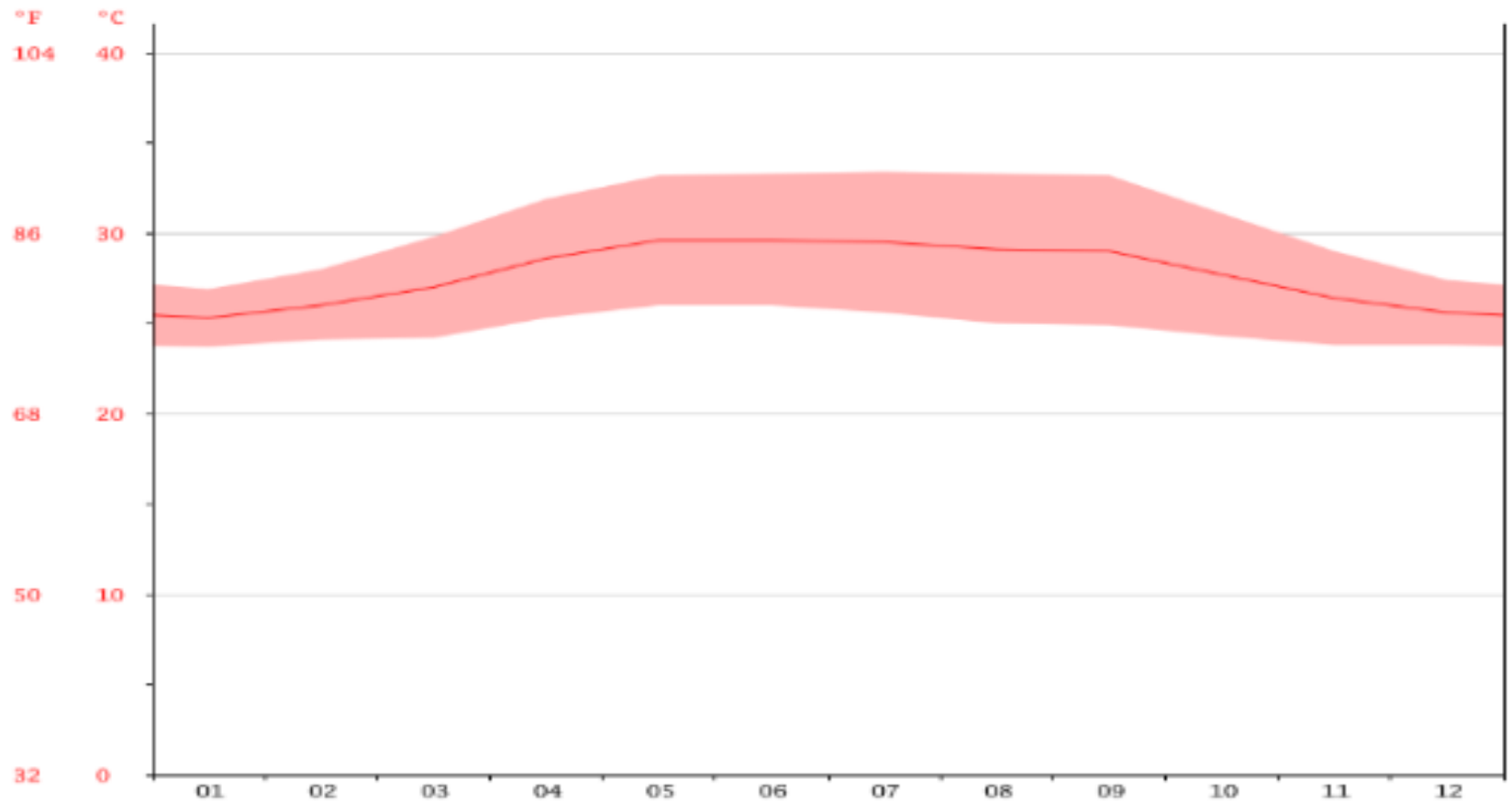
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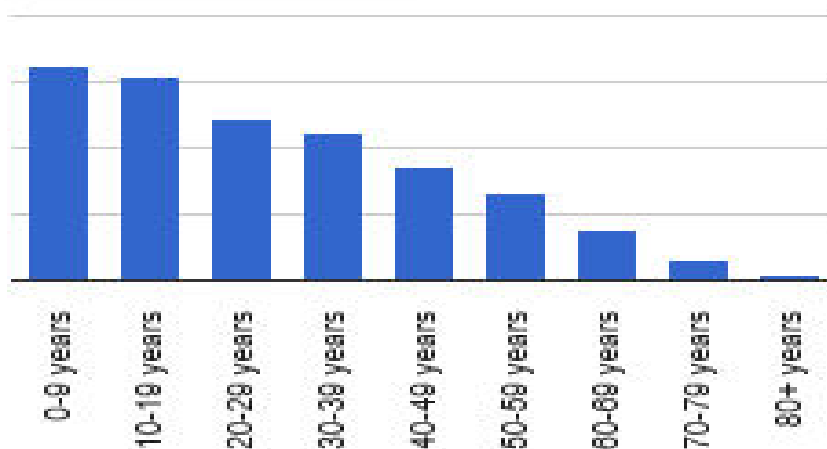
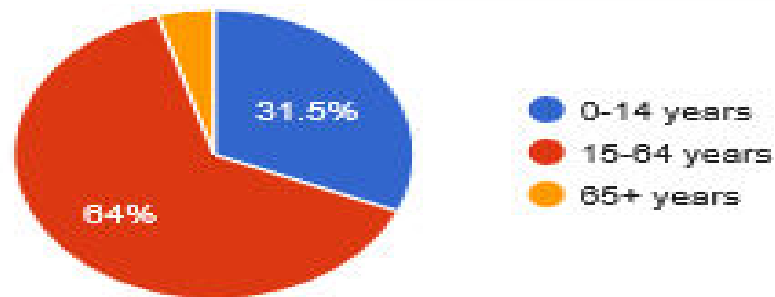
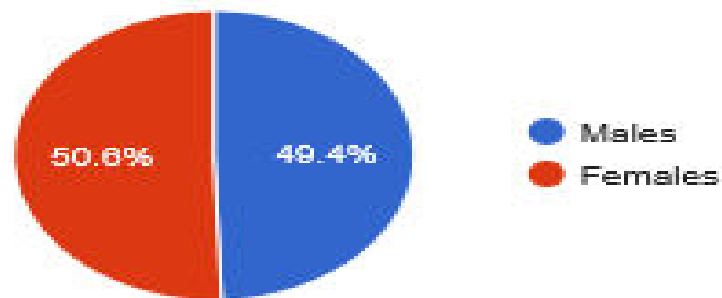
- Precipitation is the lowest in June, with an average of 25 mm. Most of the precipitation here falls in December, averaging 362 mm.



## TEMPERATURE GRAPH TRINCOMALEE



At an average temperature of 29.6 °C, May is the hottest month of the year. January is the coldest month, with temperatures averaging 25.3 °C. As far as renewable energy options are concerned the city is ideal for Solar power , wind power and tidal power(sea).



### Gender (C 2012)

Males	187,472
Females	192,069

### Age Groups (C 2012)

0-14 years	119,381
15-64 years	242,892
65+ years	17,268

### Age Distribution (C 2012)

0-9 years	80,659
10-19 years	76,955
20-29 years	60,597
30-39 years	55,693
40-49 years	43,153
50-59 years	33,421
60-69 years	19,227
70-79 years	7,547
80+ years	2,289

# Climate Resilient City and Urban Environmental Sustainability



## Urban council Trincomalee



Local authorities are established under three Laws,

**1.the Municipal Councils Ordinance No. 29 of 1947,**

**2.the Urban Councils Ordinance No. 61 of 1939,**

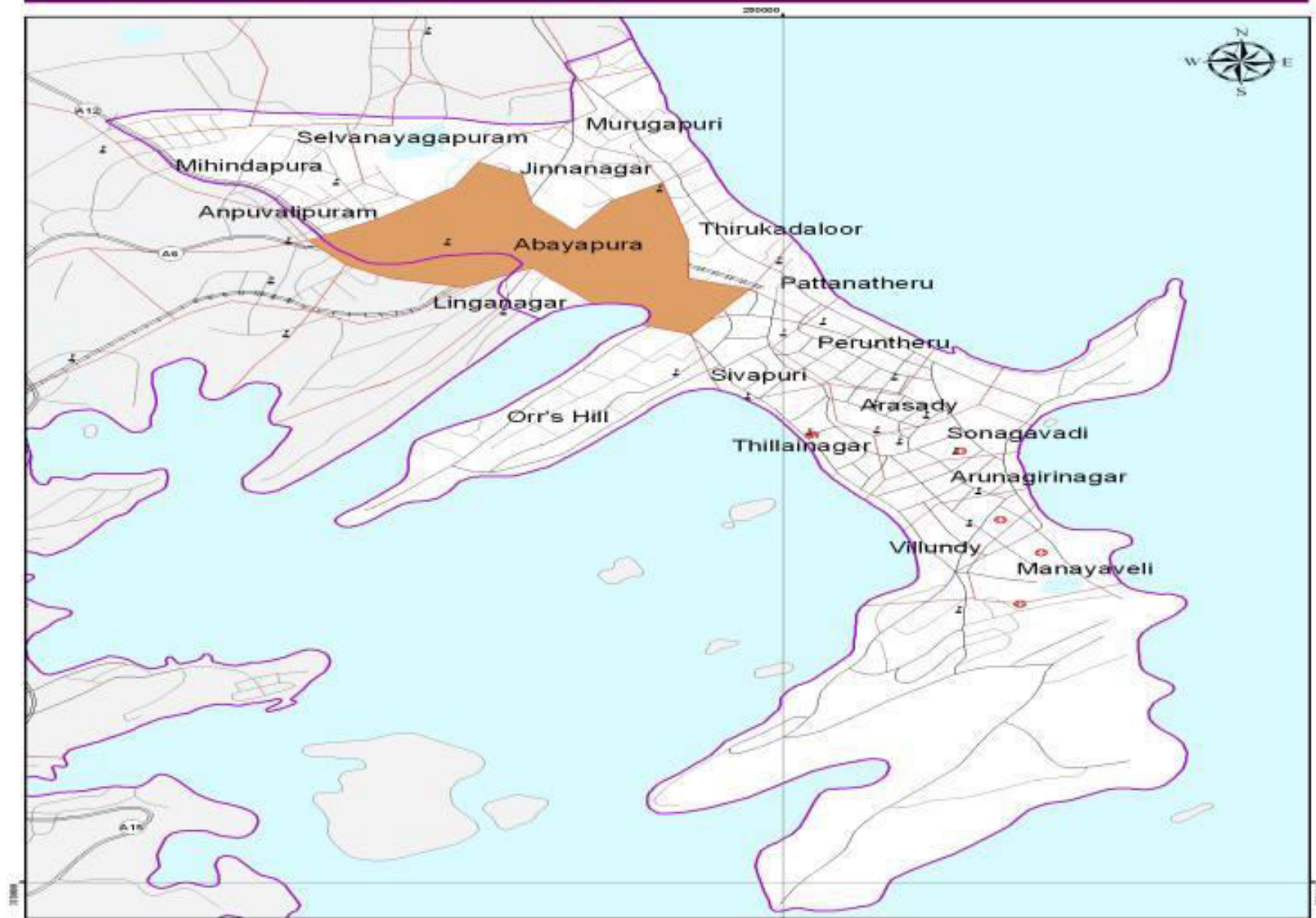
**3.the Pradeshiya Sabha Act No.15 of 1987.**

These Laws define the functional role and responsibility in terms of  
regulation, control and administration.



## **History**

Trincomalee Urban Council (TUC) is the local authority for the city of Trincomalee in eastern Sri Lanka. TUC is responsible for providing a variety of local public services including roads, sanitation, drains, housing, libraries, public parks and recreational facilities. Trincomalee was administered by a Local Board between 1884 and 1933. Between 1933 and 1939 the city administered by a Local Development Board. The city was promoted to an Urban Council on 1 January 1940. Trincomalee is one of the largest cities in Sri Lanka without municipality status. Cities and towns with much lower population than Trincomalee, Trincomalee has been overlooked as MC.



# City profile

<b>Population</b>	<b>53550</b>
<b>Area</b>	7.5 sq.km
<b>GN Division</b>	18
<b>The mean annual temperature</b>	29.00C (maximum of 39.70C and minimum 24.4 0C)
<b>The average annual rainfall in the 91.6 mm.</b>	91.6 mm.
<b>Density</b>	13,000/km <sup>2</sup> (34,000/sq mi)
<b>Height above sea level</b>	9 m
<b>Coordinates:</b>	<a href="#"><u>8°34'0"N 81°14'0"E</u></a>
<b>Annual municipality budget</b>	2017 - Total Recurrent Revenue – 24.89mn Other Grants – 285.84mn Own Revenue – 117.05mn

## Socio Economic

Community of Trincomalee are working with several sectors such as, **cultivation and home gardening,**

**fishing,**

**business**

**industries**

**and service.**

The agriculture, fisheries, forestry and mining sectors have significant potential and presently make important contribution to economic growth. **Sector-wise employment data indicate that the service sector employs about 49% of the total labour force. The agriculture sector employs 30% and the Industries sector employs about 21% of the total labour force.**

Trincomalee area is one of the most vulnerable regions to climate change it faces drought, heat and flood. All of city people are expecting to gain water & sanitary requirement as they wish. Availability of Safe drinking water is 97% of householders.



Main source of drinking water	District	City
Protected Well	48,175	4,805
Unprotected Well	3,448	402
Piped Borne Water	34,827	18,149
Rural Water Supply Project	1,374	235
Tube Well	1,586	258
Bottled Water	80	19
River / Tank / Stream / Spring etc.	6,375	231
Number of Households	95,871	24,099

## **GN Division**

There are 18 GN Division under the Urban Council area.

## **Total Population OF Urban Council Area**

Population 53,550

Sinhales -8256

Tamil-38226

Muslims-6308

Others- 762

Total Famlies 18500.

Woman Headed Families-1187

## 2.4 Population By Age Group in GN Division - 2016

S.No	GN Division	Infra <sup>nt</sup>		Children		Teenage		Adult		Elders		Total	
		<5		6-12 years		13-19 years		20-59 years		60>			
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	Abayapura	240	245	445	460	389	441	1044	1093	196	224	2314	2463
2	Anpuvalipuram	91	127	225	270	242	298	1069	1500	146	298	1773	2493
3	Arasadi	57	68	118	140	86	79	396	455	233	247	890	989
4	Arunagirinagar	80	87	160	175	190	200	495	520	63	83	988	1065
5	Jinnanagar	190	230	227	266	275	293	687	571	288	259	1667	1619
6	Linganagar	101	111	115	107	202	208	860	869	159	161	1437	1456
7	Manayaveli	133	155	130	184	153	177	955	1088	190	222	1561	1826
8	Mihindupura	76	88	55	70	200	230	115	127	71	66	517	581
9	Murugapuri	32	39	331	346	202	300	1000	1030	36	39	1601	1754
10	Orr's Hill	162	159	232	250	227	215	1400	1398	349	465	2370	2487
11	Pattanatheru	39	46	207	203	105	85	311	327	62	71	724	732
12	Peruntheru	64	84	158	175	166	176	448	481	133	139	969	1055
13	Sivapuri	81	121	327	358	267	398	1097	1259	157	198	1929	2334
14	Sonagavadi	95	93	81	87	186	187	682	687	148	160	1192	1214
15	Thillainagar	10	15	22	25	191	198	718	910	78	90	1019	1238
16	Thirukadaloor	144	135	201	213	298	317	929	914	136	183	1708	1762
17	Uppuveli	52	49	68	72	103	120	430	500	39	47	692	788
18	Villundy	169	193	144	156	158	171	826	834	122	140	1419	1494
Total		1816	2045	3246	3557	3640	4093	13462	14563	2606	3092	24770	27350

## Educational Level (2016)

S.No	GN Division	No Schooling		Year 5		G.C.E. (O/L)		G.C.E. (A/L)		Graduate		Post Graduate		Doctorate Level	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Total		1715	2159	1691	1724	2715	3099	1877	4342	742	463	206	207	59	45



## Infrastructure Details

Length of Roads belong to LA	80 Km
Length of Tarred Roads in	28 Km
Length of Concrete Roads in	36 Km
Length of Gravel Roads in	16 Km
Length of Drainage maintained by the LA	19.03 Km

# City profile

<b>Vision</b>	TO MAKE TRINCOMALEE TOWN A MORE ATTRACTIVE TOURIST DESTINATION WITH SUSTAINABLE DEVELOPMENT.
<b>Mission</b>	TO ENHANCE THE LIVING STANDARD OF PEOPLE IN OUR AREA BY ENSURING A PROPER PUBLIC WELFARE SYSTEM, EFFICIENT HEALTH SERVICE INCLUDING MAINTANCE OF PUBLIC ROAD.



## Service Delivery

Local authorities are considered as autonomous which can make decisions depending on the resources they possess within their boundaries of statues. Respective Ordinances & Acts and delegated authorities provide powers to regulate, control and administrate subjects of **Public Health, Thoroughfares, Utility, Welfare and Environmental and Sanitation**. Local Governments in Sri Lanka are responsible to **prepare local development plans, allocate budget according to development priorities** and involve citizens in both planning and implementation of activities.

The relevant Ordinances and Acts state that local authorities have authority for integrated development planning at local level and that they should work in coordination with Divisional Secretaries and other relevant agencies and promote vigorous participation of people in the planning process with bottom-up approach.

At local level, public utility buildings with their services are run by the respective local authorities.

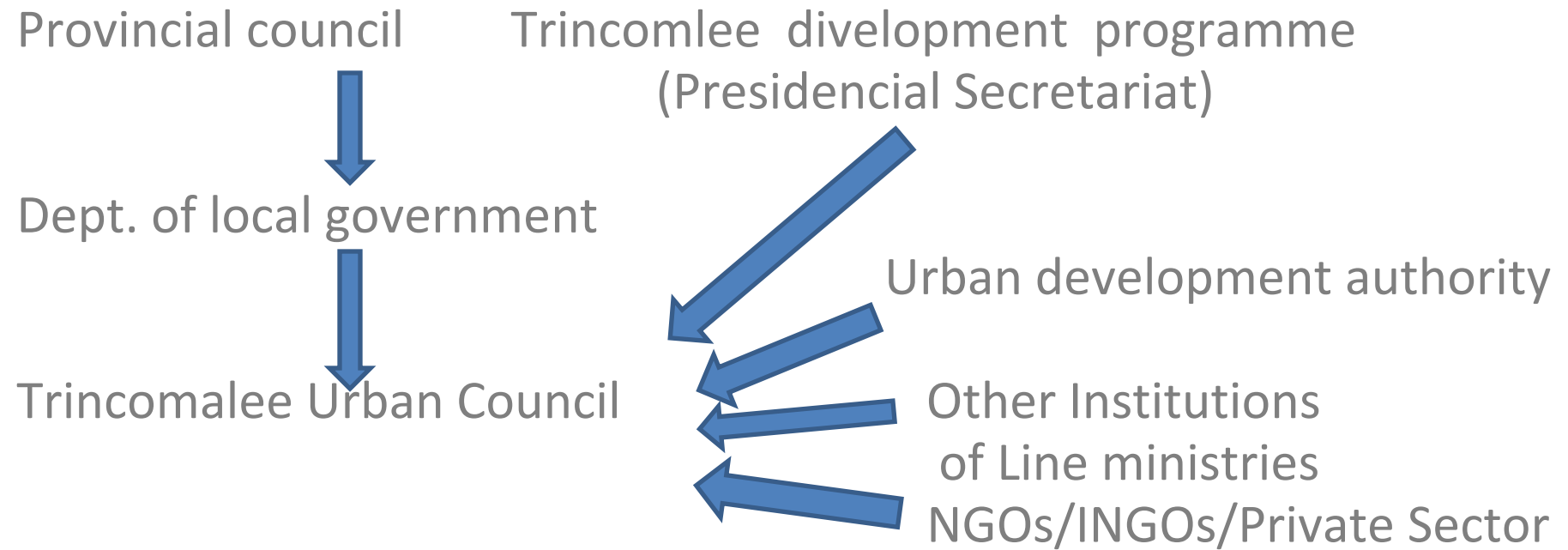
## **Service Delivery**

- Solid Waste management Service,
- Gally Bowser Service ,
- Issue the Environmental Certificate
- Crematorium
- Fire Service
- Provide the Public utilities and ; Library Service
- Advertisement Service
- Three Wheeler Service
- Meet store issuing for the rental service
- Entertainment Tax
- Leasing for the Market
- Assessment
- Non vesting certification issue
- Provide the New assessment Number
- Providing the rental Service (Urban Council Property)
- Building approval
- Complain and requesting making a field visit and problem solving

## Involved stakeholders:

- Presidential secretariat
- Line ministries
- Ministry of local government
- Provincial council
- Dept. of local government
- Urban development authority
- INGOs/NGOs...Etc...

# Institutional structure of the city





## SWOT Analysis

### Strengths

1. Adequate experienced & knowledgeable staff.
2. Fund allocation for infrastructure development.
3. Properly managed office culture.
4. Availability of Management Information System.
5. Progress monitoring system through web based data base.

### Weaknesses

1. Lack of technical & planning capability in supervision of works
2. Non availability of revenue enhancement of by laws
3. No proper approved cadre
4. Vacancies exist in the key position for a long period

## **Opportunities**

1. Better coordination with NGOs & other government departments
2. Financial support from government & projects
3. Revenue from hotel industries and other tourist attractive places
4. Selection of projects from Local Authority Participatory Development Plan
5. Adoption of 5S system in all the Local Authorities.

## **Threats**

1. Uncertain climatic conditions
2. Increased occurrence of natural disasters - Drought, floods
3. Price Escalation due to inflation
4. Not receiving approved full imprest within the fiscal year

**Internal Coordination:** There are several functions implemented by LAs related to environment such as public health, physical planning, engineering services, sewage disposal, and community development. These functions need to be coordinated effectively.

**External Coordination:** Coordination with other organizations (GO, NGO and Private Sector) which are involved in environment and development activities within LA area.

□ **Environmental Improvement Role:** Improvement of the environment through improvement of infrastructure such as roads (Pavements, Vehicle parks, Sports grounds, public markets, drains) and improvement of public utility services such as waste management (Waste disposal, Water Supply, Drainage, Environmental health, Public health) will help prevent lot of environmental problems. LAs are empowered to undertake physical planning and zoning by which LAs can suitably locate industries and streamline construction activities and building construction. City beautification through establishment of parks, children parks, tree planting, landscaping and roundabouts,

## □ **Regulatory and Control role**

1. It is the responsibility of LAs to regulate and control activities which are detrimental to the environment and public health in accordance with powers and authority vested in LAs under Local Government laws and by-laws.
2. It is also the responsibility of LAs not only to regulate and control activities that have been entrusted to LAs by the CEA under the national environment law but to monitor and take legal action as and when necessary.

- **UN- SD Goals related to Local Authority Services**
- Goal 6: Clean Water & sanitation
- Goal 9: Industry, Innovation & Infrastructure
- Goal 11: Sustainable Cities & Communities

# Urban Development Planning

## 1. Key Thrust Areas and Goals :

Thrust Area 1 : Climate change resilient and sustainable environment

- Goal : **Preparedness to extreme weather condition related heat environment of the city and drought. Of the area .**
- Objectives:
  - Increased Cultivated Agriculture land in every seasons of the year by 20% within 05 years
  - Increased green cover of the city by 10% within 05 years
  - Fulfilled water & sanitary requirement of city community within 05 years.
  - doubled income of the city within 10 years.
  - Introduced Green Farming for 50% householders of the city by 2028
  - Constructed 100 Green buildings by 2028

### Thrust Area 1. Climate change resilient and sustainable environment

- Goals : 2. : **Improvement of Waste Management Systems of the city**
- Objectives:
  - Ensured integrated, participatory Solid Waste Management systems by 2020
  - Ensured integrated, participatory Liquid Waste Management systems by 2020

### Thrust Area 2 : Road & Transport Net work

#### Goal : **Improvement of Road & Transport Net work**

- objectives
  - Upgraded Roads
  - Improved Drainage & Crossed Drainage Structure
  - Provided Standard Transport Facilities
  - Improved integrated Transport Systems



Thrust Area 6 : **Institutional Development & Good Governance.**

Goals : Ensuring Good Governance.

Objectives;

- Provided quality services Delivery
- Established conducive working environment
- Ensured Transparency

## **Back Ground of the focal problem**

Supply of Water varies during the year depend on various factors.

1. Rain patterns and climate.
2. Water usage for cultivation.
3. Water usage for drinking and other purpose by city community.
4. Adapted technologies for cultivation and domestic water use.
5. Attitudes of community

Heat condition of the city depend on

1. Climate change
1. Green cover of the city
2. Green building of the city
3. Economic strategies of the city

## Problem Identified

- **Focal problem:** extreme weather condition related heat environment of the city and drought in the area .
- **Related problems:**
  1. increasing the temperature condition of the city
  2. Water is not sufficient for cultivation at all seasons in the year
  3. Water is not sufficient for drinking and other purpose 24 hours in days of the year
  4. Economy of the people is going down.

# Action plan

Thrust Area 1 : Climate change resilient and sustainable environment

Goal : Preparedness to extreme weather condition related heat Environment of the city and drought. Of the area .

Objectives	Strategy to mitigation and addaptation	Project/Action	Responci ble S-H	Budget (\$ MN)
<ul style="list-style-type: none"> <li>Increased Cultivated Agriculture land in every seasons of the year by 20% within 05 years</li> </ul>	Inovation(Seeds, methods, equipments) .Awareness Rules and regulation	Seeds production MT. drip irrigation systems 10000. Awareness program 1000.	MOA PC PS	500
<ul style="list-style-type: none"> <li>Increased green cover of the city by 10% within 05 years</li> </ul>	Green infrastructure	500 Green roof 100 Bioswales Tree pits 50 places Roop top plantation100bulding	UC MOE PS	50

Objectives	Strategy	Project/Action	Responsible	Budget(\$ MN)
<ul style="list-style-type: none"> <li>Introduced Green Farming for 50% householders of the city by 2028</li> </ul>	Green farming	Green farms 27000.	MOA UC	200
<ul style="list-style-type: none"> <li>Constructed 1000 Eco smart buildings by 2028</li> </ul>	Eco smart buildings	Common buildings 100 houses 900	UC MOE UDA PS D/of bild..	1000
<ul style="list-style-type: none"> <li>Fulfilled water &amp; sanitary requirement of city community within 05 years.</li> </ul>	Awareness Rules and regulation Water supply	Awareness program 100. Rules and regulation Water project 02	UC UDA WSDB	100
<ul style="list-style-type: none"> <li>doubled income of the city within 10 years.</li> </ul>	Tourism Green Industries Agriculture	Monitoring, Regulating, Awareness, Subsidizing	MOT Dept.Ind MOA	100

# Municipality initiatives











































**Thank you!**

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