



## History of industrial development in Madurai region with environmental issues

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### Abstract

Historical and social factors combined with pre conditions shaped the growth of new metropolis during the last millennium. Technological development in transport and communications triggered steady changes in the growth of urban areas leading to a phenomenon of locating industries and activities. The present study focus on Madurai is a historical and ancient place credited with development of Tamil sangam. The city is the centre of the southern districts and ideal for a second capital one third of the population of Tamilnadu is living in the fourteen southern districts. More trade and industrial units are needed to ensure economic growth in south Tamilnadu. The environment are abundant with economic, social activity facilitated by rapid developments in commercial, industrial sectors. So, the importance of strict enforcement of development control ensures healthy, comfortable and safe environment to the present and future generations. The fact that Sustainable development in Madurai will help to generate employment and improve the standard of living for the people is now fully recognized. Given the significant socio – economic benefits, sustainable and eco-friendly development is imperative for growth. A planned approach to developing responsible environmental plan should be adhered to. In the wake of climate change and global warming, there is an increasing awareness towards protecting the environmental and integrating conservation and community benefits to long term business return.

**Keywords:** Industrial development, Urbanization, Environment, Technology, Sustainable

### 1. Introduction

Madurai has been declared a heritage city. Agriculture is the main occupation. Among 13 community development blocks in the study district, six blocks are undertaken by sericulture namely Melur, Alanganallur, Usilampatti, Sedapatti, Thirumangalam and Kallikudi. The total area under mulberry is 101.05 acres. A large number of textile and spinning mills provide employment to thousands people and contribute to the economy of the district. The city has also emerged as a major centre for trading activity industries. In the sunrise sectors like IT and automobile accessories manufacturing sector are coming up. The district of Madurai has a long history of being a centre of educational excellence. It was also found that barriers of caste were no hindrance to the spread of education. Health care is a major strength of the city. Government Rajaji hospital situated in the northern part of the city, treats over 7,000 out patients daily, Madurai has this emerged as a city that provides quality health care at reasonable cost. The centre and state government large given a big push for improving road connectivity in Madurai. Madurai with its vast resources and enterprising people in expected to grow rapidly in the coming year.

#### 1.1 Objectives defined and met

- To study the history of industrial development in Madurai.
- To find out the environmental impact of industries.

## 1.2 Review of Literature

According to the conception base and review of literature gave the base for the present investigation of industrial development. On government policy, schemes and programmes launched for the development of industrial sectors and also collected some information regarding conservation through one of the NGO in Madurai affirmative steps to environmental issues in Madurai region are also taken as a source for this study.

## 1.3 Methodology

Historical method in this research referred to history of industrial development of Madurai so the researchers has historical available of the study as an original document and Survey method (Sample) to study the industrial developments in Madurai region. Questionnaire was administered to the residents of different parts of Madurai city in the age group 45-75 years, to find out the conditions of schemes and the awareness provided by the Government. Data was collected from primary and secondary sources. Primary data was collected through government orders, archival materials, policy notes, master plan, implementation of new schemes, structured questionnaire etc. Random sampling conducted from the selected respondent was evaluated with the help of a questionnaire. Structured interview schedule consisted of both open ended and close ended questions included in the suggestions. Study was conducted mainly in /around Madurai city (Tamilnadu). The research was done by visiting various government and private organizations. Tamilnadu pollution control board, NGO (Non Governmental Organization), Forest Administration etc.

## 1.4 Area of the study

The area undertaken for the study was in and around Industries in Madurai region.

## 1.5 Statement of The Problem

In the name of modernization and industrialization, Madurai has been develop for the past fifty years, but it's have more negative than positive.

## 2. Industrial development in Madurai

Historically Madurai has been an important trading center for handloom, silk weaving, pottery, leather industry etc. The significance of which (trade and commerce) reduced over a period of time. Lack of entrepreneurship and limited resources are the main reasons for non-development of industries in this district. However, the town maintains its significance as a major tourism destination in India. The three major industrial estates in the district are K. Pudur industrial estate at Kappalur and industrial estate at Uranganpatti for Hosiery products. Apart from the above a functional electrical and electronic industrial estate has been established at Kappalur. All major estates are located a long the periphery of the municipal located within the city.

At present the economy is mainly dependent on tourism corporation and serve the town in terms of employment opportunity. There are some small scale industries business and corporation from other towns and other states has altered the potential of the town leading to reduced growth rates and as well educated the inflow of floating population. Total floating population of Madurai is estimated at 2,10,000 visitors per day. The inflow of foreign tourists is more doing the period from November to March, while the influx of

domestic visitors stretches from April to June. Tourism related activities strive in the district, since Madurai serves as a transit place for religious tours to Southern towns like Trichendur, Rameshwaram, Kanyakumari and other places in Southern Kerala. However, the region of Madurai is attracting large investments in textiles and associated industries. It has been noted that three integrated textile parks are expected in the region which would boost the economy, particularly the export. Major employment in the city is provided by territory sector, mainly by tourism industry and other related allied activities. Tertiary sector private nearly 92 percent of the employment opportunity at present.

## 2.1 Transport and communication

The development of transport has had a great effect of the mobility of people and goods. It has a passive role in the development of a region. Madurai the third largest district in Tamilnadu is well connected with all other major state by road, railways and airways in all directions. The exciting road system in the study area comprises if national highways, state highways and major district roads and other, totaling up to a road length of approximately 615 kms road. The following national and state highways cross the study area.

1. National Highway 7 connecting Bangalore with Kanyakumari.
2. National Highway 49 connecting Rameshwaran with Kochi.
3. National Highway 45 B connecting Chennai with Thoothukudi.
4. National Highway 206 connecting Kollam with Madurai.
5. State Highway 33 connecting Madurai with Thondi.
6. State highway 72 connecting Madurai with Natham.

Due to the mixed land uses, encroachments and unclear demarcation of road width, these all road length is not maintained. Madurai is maintaining 520 kms length of roads 61 kms length of permanent lines and side walls. About 79 percent of total municipal road length has surfaced roads. Everyday about 2,00,000 people from outside visit this religious tourist day. In Madurai there is sufficient number of city buses, minibuses and a large number of mofussil buses, flying to meet the ever growing demand generated by a large number of public travelers living in and around Madurai. In spite of this the two divided parts of Madurai which are spreading an both the sides of river vaigai are well connected by means of 5 over bridges- first at Annanagar, second at Gorpalayam, third at Sellur, fourth at Thathaneri and fifth at Gnanolipuram and four gauge ways first at Satyamangalam, second at east Santhaipettai. third at Kalpalam at Goripalayam and fourth at Thathaneri making the inner city transport much easier. At present share autos also flying around Madurai to meet the growing demand of the people. Madurai is one of the important junctions on the great network of the Indian railway and is the headquarters of the Madurai division of the southern Railway. Railway route connected will all major cities by meter broad gauge line. Regarding the Airways the airport is located outside the corporation limit at a distance of about 15 kms away from city on the Aruppukottai road at Perungudi village. Now the airport is upgraded to an international airport.

## 2.3 Industrial infrastructure in the Madurai District IT- Information Technology

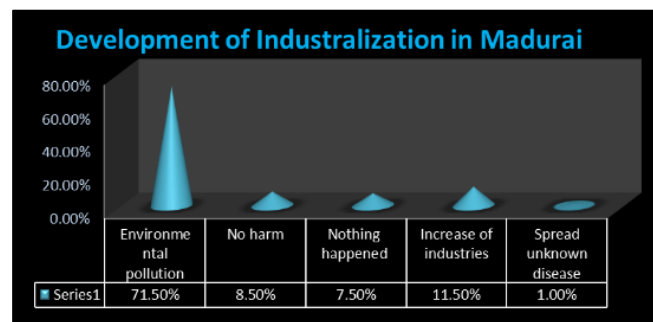
Elcot has setup two in Madurai district. It was located in 29 acres at Ledaikulam village, Madurai North, 4 kms from the

city limit and other in 213 acre at Vadapalanji nagar, opposite to Madurai Kamaraj University, out of 240 acres of integrated information technology campus. 50 acres of the IT is to promoted through public private partnership (PPP) mode to create IT space with social infrastructure major IT companies such as TCS Solve, HCL. Honeywell Southernland Chella software

**Table 1:** Industrial land usage for IT

Name of IT	Total notified area (Area of hectares)	Total area utilized (Area in hectares)	Also lying vacant in processing area
Elcot 1	11.69	6.03	5.66
Elcot 2	86.43	69.61	16.82

**Source:** Industrial land usage report, TNPCB, Madurai



**Fig 1:** Development of Industrialization in Madurai

About 71% of the respondent accept that the development of industrialization in Madurai increased environmental pollution and 8.5% of the respondent accept no harm and 7.5% of the respondents agree that nothing happened due to development of industrialization and 11.5% of the respondent said because of increasing of industries and 1% of the respondent is strongly agree with spread of unknown disease.

### 3. Industrial impact of Madurai District

Madurai was traditionally an agrarian society, with rice paddies as the main crop, cotton crop, Cultivation in the regions with black soil in Madurai district was introduced during the Nayak rule during 16<sup>th</sup> century to increase the revenue from agriculture. The paddy fields cultivated in the Vaigai delta across Madurai North, Melur, Nilakottai, Uthampalayam are known as double crop paddy belts.

Farmers in the district supplement their income with subsidiary occupations like dairy farming, poultry farming, pottery, brick making, mat weaving and carpentry. Madurai is famous for its jasmine plantations, called Madurai malli, Primarily carried out at the foot hills of Kodaikanal hills and traded at the Madurai morning flower market. An average of 2,000 farmers sell flowers daily at the flower market.

With the small scale advent of small-scale industries after 1991, the industrialization of Madurai increased employment in the sector, across the district from 63, 271 in 1992-93 to 1,66,121 persons in 2001-02. Madurai is one of the rubber growing areas in South India, and there are rubber based industries in Madurai. Gloves, sporting goods, mats, other utility products and automobile rubber components all the most produced items by these industries. TVS Srichakra (tyre manufacturing) Sundaram industries (Rubber division, coach division), Fenner India, Hi- tech Arai Ltd and Ixness India are some of the rubber – based industries in the city, automobile produces like general motors, Ford, Toyota are

the major consumer of components produced in the District. Madurai is promoted as a second tier city for IT and some software companies like Honeywell technology solutions have opened their offices in Madurai software technology parks of India, and agency of the Government of India, has authorized several such companies to receive benefits under its natural information technology development program. The state Government proposed two IT based special economic zones in Madurai, these have been fully occupied by various IT companies.

**Table 2:** Industrial estate in Madurai District

S. No	Madurai District Three Industrial Estate	Location
1.	SIDCO Industrial estate	K. Pudur, Madurai.
2.	SIDCO Industrial	Kappalur, Madurai
3.	SIDCO Industrial estate	Uraganpatti, Madurai
4.	Madurai Co.op. Indt. Estate	Kappalur, Madurai

**Sources:** Traffic survey for Madurai

Madurai has been clarified as occupying a second place in terms of industrial pollution. Especially the water bodies are polluted due to dying industries and open drainage and garbage dumping in the river beds. Automobile exhaust emission of carbon monoxide are higher than the prescribed standards in Madurai district. It leads to higher discharge of vehicular emissions thereby affecting human population living in the vicinity of transport.

**Table 3:** Working factories in Madurai district

S. No	Year	Number of factories working	Factories adding during the year
1.	1981	923	58
2.	1991	1338	88
3.	2001	1325	42
4.	2011	1370	136

**Source:** Detailed development project for Madurai district

#### 3.1 Growth of working factories

The working factories in Madurai district are increasing approximately 44 units every ten years. The annual growth in the number of factories added every ten years is 9 percent. The increase in the number of factories will contribute to an increase in the important air pollutants like residential suspended particulate matter (RSPM), suspended particulate matter (SPM), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), lead, sulphur dioxide (SO<sub>2</sub>) and also lead to water pollution due to dumping of industrial solid waste to the water sources.

#### 3.2. Growth of motor vehicles

Transport activities have a wide variety of effects on the environment such as air pollution, noise from road traffic. The percentage of motor vehicles was 22 percent in 2001-2005 and it was six fold of that in 2009-2010 recorded a yearly average increase of 8698. Non-commercial vehicles are increasing at a higher rate than the commercial vehicles, as people don't want to rely upon the public transport they have their own motor vehicles. The environmental effects of fuels like oil and petroleum products are of growing concern owing to increasing consumption levels. The combustion of these fuels in vehicles has been a major source of pollution. With the increasing vehicles in the district, the vehicular pollution has also increased and it accounts for a considerable share of air pollution in Madurai district. The different factors are the

types of engines used, the age of vehicles, poor road conditions and congested traffic.

### 3.3. Electricity usage of Madurai district

Madurai district is getting electricity from a Tamilnadu electricity board" as well as from a private electricity company, namely in Madurai power corporation, Samayanallur, Madurai. The production capacity of electricity of generations is 105 MV. Maximum requirement of electricity 241 MVA average requirement of electricity is 226 MVA.

### 3.4. Electricity consumption

The electricity consumption both in hypertension and lower tension are increasing every year. That annual increase in consumption of hyper tension electricity is 50.97 million units and annual increase in consumption of lower tension electricity is 1618.12 million units. Total electricity is due to the increase in the industrial activities and the commercial activities during the study period. An increase in the lower tension energy consumption may due to the increase in the electricity.

### 3.5. Sector- wise consumption of electricity

The sector- wise consumption of electricity. It is revealed form that the major consumer of electricity is industrial sector followed by the domestic and commercial sector stood at the next place in most of the years of the study period. The share of agriculture sector is very meager. As people are purchasing more comfort electrical goods in the recent years, the consumption of electricity by the domestic is increasing year after year.

### Conclusion

The social and economic and environmental problems ranging from housing problem, congestion, threat to biodiversity and power shortage, urban poverty, has deteriorated the urban environment and paved the way for many health hazard problems too. In the name of urbanization and industrial development, buildings in Madurai have been demolishing ecological values as well as major threatening to the environment. Pollution is a major threat to district. It increasing vehicular traffic and decreasing green cover are the main reasons. Encroachment disrupt free flow of vehicles. Potholes should be patched up and drainage system should be upgraded to avoid stagnation of rain water on roads. Due to disposal of sewage water, hospital, industrial effluents vehicular cleaning, bathing Ghats, detraction of human beings, cattle and dhobi washing, the ground water in and around the Vaigai river is affected. The urban water problem is very acute in Madurai district due to rapid increase of population. It marked increase population from 1961-2001 due to the influx people in search of work and employment. Due to high concentration of urban dwellings the demand for water has increased alarmingly and paved the way for diffusion of deep bore wells which drastically affected by the ground water level.

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