a problem for social psychologists. When applied to immigration, it requires perceptions and careful synthesis of economic, demographic, sociological and political forces in both the country of immigration and the country of proposed immigration. Researchers are therefore required to “emigrate” themselves from their base disciplines to other “territories” where, with foreign colleague they may construct interdisciplinary models to explain the dynamics of international migrations.

CHAPTER III

METHODOLOGY AND PROFILE OF THE STUDY AREA

3.1 INTRODUCTION

This chapter attempts to describe the methodology adopted in the present study and the reason for choosing Madurai city as the study area which includes period of study, sampling technique, procedure for collection of data, tools of analysis and the concepts used in the present study. Further, it discusses the profile of the study area.
3.2 METHODOLOGY

Designing a suitable methodology and selection of analytical tools are important for a meaningful analysis of any research problem. This section is devoted to a description of the methodology which includes sampling procedure, period of collection of data and tools of analysis.

Sampling Procedure

Madurai city comprises 100 wards including 72 old and 28 new wards. The 27 wards are located on the northern side of the river Vaigai and the remaining 73 wards are at the southern side of the river. For the purpose of the analysis, the Madurai city has been classified into two zones namely, Zone I and Zone II. The new wards 28 are in zone I and 72 old wards are in zone II.

In the first stage, it was decided to take sample migrants after the identification of the migrant households in Madurai city. The identification started in the month of January 2011 and a list of migrant households was prepared separately for new 28 wards (zone I) old 72 wards (zone II) in Madurai
corporation. After the identification, it was found that there were a total of 6014 migrant households in 100 wards. Out of the 6014 migrant households, 1621 came under new 28 wards (zone I) and the remaining 4393 fell under new 72 wards (zone II). Finally, 300 sample migrant households (5 per cent of total population 6014) were selected by adopting simple random sampling technique. The proportionate probability sampling method is adopted to select migrant households from zone I (28 wards) and zone II (72 wards) in Madurai city. Table 3.1 shows the zone and number migrant households selected.

### TABLE 3.1

THE NUMBER OF SAMPLE MIGRANTS HOUSEHOLDS AT EACH ZONE IN MADURAI CITY

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Zones</th>
<th>Total Population</th>
<th>Sample Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I</td>
<td>1621</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>4393</td>
<td>219</td>
</tr>
<tr>
<td>---</td>
<td>-----</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6014</td>
<td>300</td>
</tr>
</tbody>
</table>

The sample random sampling method was adopted to select 81 migrant households in zone I and 219 from zone II in Madurai city for the purpose of analysis.

**Date collection**

Both primary and second data have been used for the present study. A reconnaissance survey was made in the selected wards to get acquainted with the migration and related issues. On the basis of the information gathered, a well designed pre-tested interview schedule was drafted and used in the field survey to collect primary data. Before undertaking the main survey, a tentative interview schedule was prepared and administered to 30 migrants in order to test the validity of the interview schedule. It facilitated the removal of the non-response and unwarranted questions and the modified final schedule was prepared on this basis. The selected respondents were contacted in person and the objectives of the study were clearly explained to them and their co-operation was ensured.
Secondary sources of data relating to city profile, list of migrants and other data related to study were collected from office of the Corporation of Madurai, published and unpublished records, journals, periodicals, magazines and the like.

**Period of Study**

The field survey was conducted from September 2011 to April 2012 for the collection of primary data. The reference period of the survey was 2011-12.

**Data Analysis**

The collected data were analyzed in a meaningful manner so as to fulfil the objectives of the study. The primary data collected were edited and coded in order to put the data in a framework which would permit analysis and comprehension. Sub–tables and cross tables were drawn. Simple average, percentages and ratios were calculated wherever necessary. Besides, regression analysis and Probit and Logit analysis to have been used. Multiple regression
technique was applied to know the factors determining the incomes of the migrant and the non-migrant. The Chow test was used to find the differences between the regression equations of income functions of migrant and non-migrant households. Another multiple regression was also fitted to know the factors determining the amount of remittances from migrants to migrant households. Probit and Logit methods were used to know the probability of joint migration of dependent migrants and factors influencing the remittance from migrants to migrant households. A self-developed socio-economic status scaling technique was used to analyze the socio-economic status of the migrant households. The method of scaling has been discussed in appropriate places.

3.3 CONCEPTS USED

Migrant Household

A household is one which has at least one migrant.

Migrant

A person who satisfies the following conditions is called a migrant:
(a) He should have migrated after 14 years of age.
(b) Migration should be voluntary one.
(c) Migration should be in search of employment or after getting a job.
(d) He should have migrated between 1990 and March 2012.
(e) Migration should be of a permanent nature of atleast the person should be continuously out of their native place, at the time of survey.

**Migrant Household Head**

One who has taken the migration decision, and who takes major decisions in the household.

**Household Income**

It includes personal earnings of the members of the household, income from investment, business, property and agriculture.

**Formal Sector**

Establishments are covered by the Factory Act 1948. It is applicable to all establishments where 10 or more persons are employed and where power is used. Where the power is not used, the workers should be 210 or more.
Informal Sector

All the establishments and jobs do not come under the formal sector. In the present study the following jobs come under the informal sector. Manual work, rickshaw pullers who do not have their own rickshaws but hire them on a daily basis, building construction workers, hotel servants, carpenters and goldsmiths working for daily wages, quarry workers, agricultural labourers, labourers employed in private hospitals and shops, loadmen, coolies, and other casual workers.

Non–Manual Workers

Persons employed in private, government or semi-government administrative work.

Self–employed Service Sector

Persons like doctors, lawyers, chartered accountants, persons running repair shops and other are treated as self – employed in the service sector.

3.4 PROFILE OF THE STUDY AREA
Tamilnadu, the southern most State of the Indian Union lies between 80°05’ and 13°34’ north latitude and 76°14’ and 80°21’ east longitudes. The state covers an area of about 1.3 lakh square kilometers representing 4 per cent of the total area of the country. According to the 2011 census, the total population of the State is 7.21 crores. The male total population constitutes 3.61 crores as against the female population of 3.60 crores. The growth rate of the population from 2001–2011 is 15.61 per cent in Tamilnadu with a density of population of 555 per sq.km. The literacy rate of the state is estimated to be 80.09 per cent, out of which the male total literacy rate is 86.77 per cent, and the female total literacy rate 73.14 per cent.

The state is surrounded by Andhra Pradesh on the North, Karnataka on the North–West and Kerala on the West. It is bordered by the Bay of Bengal on the east and the Indian Oceans on the south. Administratively the state is divided into 30 districts.

Madurai is Tamilnadu’s most important cultural arena. It is the second biggest urban centre in the state of Tamilnadu. It is narrated in the legend that
Madurai was originally a forest known as Kadampavanam. One day, a farmer named Dhananjaya who was passing through the forest, saw Indra (The king of the gods) worshipping a Swayambhu (self created Lingam) under Kadamba tree, Kulasekara Pandya cleared the forest and built a temple around the lingam. A city was soon planned with the temple as its centre. On the day the city was to be named. Lord Shiva is said to have appeared and drops of nectar from his hair fell on the town. Hence, the place was named Madurai–Maduram meaning ‘Sweetness’ in Tamil. Madurai has a rich historical background in the sense that Lord Shiva himself performed sixty–four wonders called “Thiruvilaiyadals”.
Historical Background of the City

Pandian Kings patronized Tamil language in a great way. During their period, many masterpieces were created. “Silappathikaram” the great epic in Tamil was written based on the story of Kannagi who burnt Madurai as a result of the injustice caused to her husband Kovalan. In April 1311, Malik Kafur, the general of Alauddin Khilji who was then the ruler of Delhi, reached Madurai and raided and robbed the city for precious stones, jewels and other rare treasures. This led to the subsequent raids by other Muslim Sultans. In 1323, the Pandya Kingdom including Madurai became a province of the Delhi Empire, under the Tughlaks. Today, Madurai is the thriving pulse of Tamil Nadu industrial growth. Madurai is more than 2,500 years old and has a rich cultural heritage and history. Madurai was an important cultural and commercial centre even as early as 550 AD. Madurai was the capital city for the great Pandya Kings.
In 1371, the Vijayanagar dynasty of Hampi captured Madurai and Madurai became part of the Vijayanagar empire. Kings of this dynasty were in the habit of leaving the captured land to governors called Nayaks. This was done for the efficient management of the empire. The nayaks paid a fixed amount annually to the Vijayanagar Empire. After the death of Krishnadeveraya (King of Vijayanagar Empire) in 1530 AD, the Nayaks became independent and ruled the territories under their control. Among Nayaks, Thirumalai Nayak (1623-1659) was very popular. Even now he is popular among the people since it is he who was responsible for the creation of many magnificent structures in and around Madurai. The Raja Gopuram of the Meenakshi Amman Temple, the Pudu Mandapam and the Thirumalai Nayaker’s palace are living monuments to his artistic fervour.

Being known as the “Temple City” it is also known for the Tamil Academics, which date back to the third century. The academics called “Sanghams” were the meeting place of great scholars and poets, whom the Pandian Kings patronized. In mythology Meeakshi a Pandian Princess, married Lord Shiva. During the Sangham age a number of scholars made their contribution to classical Tamil literature.
The famous temple, which he dedicated to Goddess Meenakshi in Madurai is rich in architectural and artistic traditions of the Pandian and Nayak Dynasties. Madurai is a pilgrim centre and attracts tourists and pilgrims. There are interesting places to be visited in Madurai namely, Shree Meenakshi temple, Vandiyur Mariamman Teppakulam, Azhagar Koil, Thirumalai Nayak Palace, Gandhi Museum, Thirupparamkundram etc. An ariel view of Madurai presents a picturesque landscape with two stirring rock formations – Anamalai (Elephant Hill) and Nagamalai (Snake Hill) at the foot of which the Madurai Kamaraj University is located.

Madurai started slipping into the hands of the British’s East India Company. In 1781, British appointed their representatives to look after Madurai. George Proctor was the first collector of Madurai. After India’s independence, Madurai is one of the major districts of Tamilnadu state. It is famous for Jasmine flowers. Jasmine flowers are transported to other cities of India from Madurai. Madurai city is famous for its temples. They are known for their rich Architecture and Sculptural works. As per the 2001 census, the city area is 8.56 sq. miles with a population of 10,94,273. The river Vaigai is the prominent physical feature of
Madurai. It separates the city into two major halves. The city is well connected by road, rail and air.

**Location of the City**

Madurai, the second largest urban centre in the state of Tamilnadu is situated in the southern part of India at a distance of about 450 kms South – West of Chennai, on latitude 9°55 N and longitude 78°7 E. It lies at an average altitude of 100 m above mean sea level. The city is linked with the surrounding regions as well as other parts of Tamilnadu by a network of regional roads as well as railways. An interstate river Vaigai traverses the city.

**Administrative Setup of the City**

Madurai District has a rich cultural heritage and a glorious past. In 1971, the Madurai Municipality was upgraded into Madurai Corporation. At that time, the corporation had 45 wards. It was increased to 65 wards in 1977. At present, there are 100 wards. Madurai local planning area extends over 142.62
sq.km encompassing the Madurai Municipal Corporation, Six Town Panchyats, one township and twenty three rural settlements. For Administrative Convenience, Madurai city has been classified into Madurai North, Madurai South, Madurai East and Madurai west.

Madurai city is a nodal centre. It has a railway station, goods yard and truck terminals. It is well connected by broad gauge railway links with Chennai in the North and Kanyakumari in the south. Metal gauage railway links the city with Rameswaram in the east and Bodinayakanur in the west. Nearly 15 to 20 trains pass through Madurai junction daily. Madurai is also linked by air with Chennai and other parts of the country.

This city is well connected by road with other cities. It has two bus stations for city services and three bus stations for mofussil service. Madurai has one University, one agricultural University, two medical colleges, seven engineering colleges, one law college, two Pharmacy colleges, Two nursing colleges, two music colleges and thirty arts and science colleges. As a result, there is a rich cultural agglomeration.
Since Madurai city is also the district headquarters, people from surrounding areas visit the city almost daily for various purposes such as education, business, medical facilities and for entertainment. It has a total of 145 hotels and 160 community halls for catering to the needs of the floating population.

Many super-speciality hospitals, maternity homes and dispensaries in this city extend medical assistance to people from surrounding villages’ everyday. A huge vegetable market to an extent of 2.06 ha is located at the heart of this city. This city is characteristically conspicuous by the absence of major industries.

Madurai city is often referred as Temple city. An ancient temple Sri Meenakshi Amman Temple named after the deity and known for its sculptural marvel, forms the epicenter of this sprawling city. Owing to the existence of a large number of mythological important temples in it, the city is also very often referred as the Athens of South India. Thus, the city attracts a huge population of pilgrims throughout the year.
Thirumalai Nayak Mahal, a relic of a 16th century palace, an ancient tower of architectural importance called as Rajagopuram, an art museum with curious of ancient culture, a historical hall standing on 1000 pillars with ancient sculptures and Gandhi Museum holding the belongings of Mahatma Gandhi invite travellers from all over the world and thereby increase the floating population.

Devotees of different orders throng this city in large numbers during different periods of the year because of the co-existence of many religious establishments. Every year from November to March tourists from different countries also visit this city. Domestic tourists choose to visit it from April to June. Thus there is always a buzz of activity for eight to nine months in a year. According to a survey conducted by the Information and Tourism department of the Government of Tamilnadu, the number of tourists, both domestic and international, visiting this city is estimated to be 25,000 to 35,000 per day.

In addition to the above, domestic and business men visiting this city are considered, and the total visitors would be around 50,000 per day. This city has the fame of visitors such as Magesthanes during 320 BC.
In 1866, Madurai city acquired the status of a town, during which time it had an area of 2.56 km$^2$ with a population of 41,600. At that time the city was situated only on the southern bank of the river Vaigai. In 1969 the city had a sprawl of 22km$^2$ with a population of 4,24,810. Later in 1989 the city sprawl increased to 44km$^2$ with a population of 7,65,120. Now it has developed into the second most populous city in the state of Tamilnadu with an extent of 51.62 km$^2$ holding a population of 9,28,869. This works out to a density of 17,994 / km$^2$. The city is now subdivided into 100 administrative units called wards. The ward wise population density ranged from 20,000 to 1,60,000 persons/km$^2$.

As it was already indicated, Madurai city is traversed by an interstate river Vaigai running west to east which divides the city into southern and northern parts. After the expansion of the city on the northern side of the river five over bridges, four causeways were built across the river which effectively link the southern and northern parts. The increase in population density during the past decades due to various reasons resulted in inadequacy in service such as water supply, sewage disposal and solid waste management.
Increase in the number of residential population, urbanization, tourism and progressive civilization created an atmosphere of distress to the city dwellers mostly due to issues connected with the waste disposal. Owing to the need to concentrate on other pressing issues, waste management is normally given a low priority by the local bodies vested with the responsibility of administering the city. The inhabitants of the city are very often either reluctant to understand the problem connected with waste disposal or willing to participate in the operation. They consider that throwing the waste in public places is the end of their problem. As a result, corporate sectors in Indian cities which are responsible for the upkeep of the cities are assigned with the job of waste collection and disposal.

In the above circumstances it is worth mentioning that a clear inventory of the waste disposed in qualitative and quantitative terms is not available in the corporate sectors in many cities as the above is bound to alter according to the change in human activities throughout the year.

The quantity and quality of sewages being generated was not clearly studied. As on date a portion of Madurai city alone is privileged to have an organized sewage disposal system. There is a prospective plan to provide
underground connections to all the city establishments. In the absence of a proper sewage collection system, and with inadequate pumping facilities, sewage makes entry into the river which flows across the centre of the city. The above sewage ultimately sinks down in the river bed only to make a re-entry in the drinking water tube wells available in the neighbouring villages. This is a matter of great concern especially in the event of an outbreak of any epidemic.

**Topography**

Madurai has, in general, flat topography with mild slopes here and there. The area to the north of Vaigai River has mild slope towards the Vaigai River and the area to the South of Vaigai River has a gentle slope towards South and Southeast. There is a small hillock within the study area but not within the city limit. These are located at Aanaimalai, Nagamalai, Pasumalai and Sikandamalai and the distant ranges of Sirumalai, Karandamalai, Alagar Malai and Aaliur Hill which form the panoramic landscape features.
The area is dotted with a number of large and medium size tanks which were formed to store water for the purpose of irrigation. These tanks to the north of Vaigai River are fed by Periyar Channel through a number of small channels. The Periyar channel originating from Periyar dam flows towards east.

**Urbanization**

The urban configuration of Madurai city is defined in four distinct zones as below:

The old city limits to the south of the river Vaigai bounded by Madurai – Rameswaram railway line in the South Anuppanady Road in the east, Madurai Chennai railway line in the west.

The newly developed area to the north of the river Vaigai.

The newly developed area to the west of Madurai – Chennai railway line.

The newly developed area to the south of Madurai – Rameswaram railway line and Madurai – Tirunelveli railway link.
The river Vaigai divides the new city limits into two parts and Madurai – Rameswaram railway line forms the Southern boundary of the present city. The area to the east of Madurai – Chennai railway line is the oldest part of the city with Meenakshi temple in the core. At present, this area has become the central zone of the present city limits. All important functional elements of land use fall within this area and they are, Thriumalai Naickar Mahal, Head Post Office, Central Bus Stand, Railway Station, Wholesale market, Christian Mission Hospital, Cinemas, Auditorium, Markets and Lodges.

The area to the north of river Vaigai comprises Goripalayam, Chokkikulam, Tallakulam and other newly developed residential areas viz., Gandhinagar, Shenoy Nagar, Anna Nagar, K.K. Nagar etc., and this area forms the administrative centre of the city. Government office, court, corporation building, Rajaji Hospital, Medical College, Law College and other Arts Colleges are situated in this area.

**Climate and Rainfall**
Madurai is known for its hot climate. High dry climate generally prevails over the district. The city gets rainfall both from the south–west and north-east monsoons between June and September and between October and December respectively. March to June and July to December are the summer and winter seasons respectively. The average rainfall is 85 cms in a year. When monsoon breaks usually after July, the average rainfall reaches above 10 cms. The average temperature varies between 32°C and 41°C in the city. In January and February, the wind blows steadily between the north and eastern directions. From May to July in the prevailing direction is South West.

**Soil**

The nine–fold classification of land use has been generalized into six broad groups. Viz., forest, non-agricultural uses, net sown area, fallow land and cultivable waste areas, hilly area and the like. The major types of soil that are found in the city and its environs are the black and red variety, Kaarisel, Chevval and Vandal.

**Irrigation**
The river Vaigai is not a perennial river and only during floods it is in full flow. It flows through districts of Theni, Madurai and Ramanathapuram and joins the Palk Bay near Mandapam. The world’s first attempt to link a river of floods with a river of drought across mountains, the Periyar project, was contemplated in the 19th century. A big dam with a live storage capacity of 278 mm$^3$ has been constructed across the Periyar Valley.

Water flows in the Suriliyar, a tributary of the Vaigai, after irrigations about 5665 hectares in the Suriliyar basin, the water is again picked up at the Peranai Regulator across the Vaigai in the plains about 120 kms down stream of the tunnel. Further it is diverted into the Periyar main canal along the left side of the river. The canal is 58 kilometers long and irrigates 68505 hectares.

The Vaigai Reservoir was constructed across the river in 1958. It is located 8kms below the confluence of the Suruliyar with the Vaigai. An additional 8740 hectares were brought under cultivation. Power generation also takes place among the three projects viz., Suruliyar, Periyar and Vaigai.

Population
As per 2011 census, Madurai Municipal Corporation had a population figure of 10,94,273. The historical population growth in Madurai city from 1866 to 2011 is given in the Table 3.2. It may be noticed that the growth trend from decade to decade is non–uniform and there is wide fluctuation in population change during 14 decades.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>Total Population</th>
<th>Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1866</td>
<td>41600</td>
<td>--</td>
</tr>
<tr>
<td>2.</td>
<td>1871</td>
<td>51987</td>
<td>10387</td>
</tr>
<tr>
<td>3.</td>
<td>1881</td>
<td>73307</td>
<td>21320</td>
</tr>
<tr>
<td>4.</td>
<td>1891</td>
<td>87428</td>
<td>14121</td>
</tr>
<tr>
<td>5.</td>
<td>1901</td>
<td>105954</td>
<td>18526</td>
</tr>
</tbody>
</table>

TABLE 3.2

MADURAI CITY POPULATION
### TABLE 3.3

SHARE OF MADURAI URBAN AGGLOMERATION POPULATION IN TOTAL POPULATION IN TAMILNADU

<table>
<thead>
<tr>
<th>Year</th>
<th>Madurai Urban Agglomeration Population in Million</th>
<th>Share of Madurai Urban Agglomeration in the Total Population in Tamilnadu (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>0.1338</td>
<td>0.64</td>
</tr>
</tbody>
</table>

Table 3.3 brings out that the share of Madurai Urban Agglomeration in the total population in Tamilnadu has increased gradually from 0.64 per cent to 3.77 per cent during the periods 1911 and 1981 respectively. The percentage share of Madurai urban agglomeration to Tamilnadu has decreased from 3.77 per cent in the year 1981 to 1.96 per cent in the year 1991. This may indicate that the rate of growth of population in Tamilnadu is greater than the rate of growth of population in Madurai urban agglomeration.

**Land Use Pattern**
The existing land use pattern is presented in Table 3.4

### TABLE 3.4

**EXISTING LAND USE PATTERN OF MADURAI CITY - 1991**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Use Zone</th>
<th>Extent in Hectares</th>
<th>Per cent to Developed Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Residential</td>
<td>2145.07</td>
<td>57.49</td>
</tr>
<tr>
<td>2.</td>
<td>Commercial</td>
<td>193.50</td>
<td>5.32</td>
</tr>
<tr>
<td>3.</td>
<td>Industrial</td>
<td>210.15</td>
<td>5.63</td>
</tr>
<tr>
<td>4.</td>
<td>Educational</td>
<td>172.05</td>
<td>4.61</td>
</tr>
<tr>
<td>5.</td>
<td>Public and semi public</td>
<td>265.19</td>
<td>7.10</td>
</tr>
<tr>
<td>6.</td>
<td>Transport and communication</td>
<td>740.58</td>
<td>19.85</td>
</tr>
<tr>
<td>7.</td>
<td>Total developed area</td>
<td>3731.54</td>
<td>100.00</td>
</tr>
<tr>
<td>8.</td>
<td>Agricultural</td>
<td>947.95</td>
<td>65.34</td>
</tr>
<tr>
<td>9.</td>
<td>Land under water</td>
<td>502.82</td>
<td>34.66</td>
</tr>
<tr>
<td>10.</td>
<td>Total under developed area</td>
<td>1450.77</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Total City Area** 5182.31 100.00

**Total Planning Area** 72636.67 --

Table 3.4 shows the existing land use pattern of Madurai city. In 1991 the total city area of Madurai was 5,182.31 ha. Out of his 3,731.54 (72 per cent) was developed area while 1,450.77 (28 per cent) was undeveloped area.

**Land Use Pattern in Madurai City**

The land use patterns prepared by the Directorate of Town and Country Planning, Government of Tamilnadu, are shown in Table 3.5.

**TABLE 3.5**

**LAND USE PATTERN IN MADURAI, MASTER PLAN AREA**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Use</th>
<th>Extent in Hectares</th>
<th>Percentage to Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Residential</td>
<td>9032.19</td>
<td>6</td>
</tr>
<tr>
<td>2.</td>
<td>Commercial</td>
<td>520.23</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>Industrial</td>
<td>575.18</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>Educational</td>
<td>249.19</td>
<td>8</td>
</tr>
<tr>
<td>5.</td>
<td>Public and Semi public</td>
<td>389.57</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>Transport and communication</td>
<td>1174.55</td>
<td>6</td>
</tr>
<tr>
<td>7.</td>
<td>Agricultural</td>
<td>156.63</td>
<td>5</td>
</tr>
</tbody>
</table>
Water Supply

Water supply was first introduced in Madurai city, with the installation of infiltration galleries on the Vaigai River Bed about 100 years back. This specific scheme known as Arappalayam Water Works was commissioned in 1892 but it was discarded in 1981 due to the depletion of the sand depth over the filtered gallery and pollution of river water by misuse. The water supply to the city was augmented with the execution of various water supply schemes subsequently. The Kochadai Water Works and Melakkal Water Works through infiltration wells and the Kochadai collector well and three newly added schemes at Pannaipatty, Tiruppuvanam and Tachampathu through collector well and infiltration well on the Vaigai River. The water is distributed in zonal system through reservoirs and in some high land areas through boosting.

Table 3.6 explains the details of water supply in Madurai city.
### TABLE 3.6

**DETAILS OF WATER SUPPLY IN MADURAI CITY**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Particulars</th>
<th>Quantity (in Nos.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Over – head tanks</td>
<td>211</td>
</tr>
<tr>
<td>2.</td>
<td>Hand pumps</td>
<td>634</td>
</tr>
<tr>
<td>3.</td>
<td>Wells</td>
<td>412</td>
</tr>
</tbody>
</table>


There are 211 overhead tanks, 634 hand pumps and 412 wells in the planning area. Public wells maintained by Panchayats are also used for drinking water. On the whole the supply of drinking water in the planning area is inadequate and needed improvements.
Sanitation

In 1924 the sewerage system was introduced in the old Madurai city area. The southern part of the Vaigai has 8 sewerage blocks with one common terminal pumping station. The sewerage from different blocks is pumped to the main terminal pumping station through different subsidiary pumping stations. After screening the sewage is led to sewage farm situated at Avaniapuram village at a distance of about 8 km from the city. The sewage is utilized for the cultivation of guinea grass.

Solid Waste Disposal

The system of collection and disposal of solid waste from the city is confined within the corporation limit beyond which there is no such system. In the corporation area it is estimated that about 400mt of solid wastes in generated daily. It is estimated that about one third of the total waste generated is handled presently the rest being dumped indiscriminately by individual households in nearby low areas, cannels etc.
Housing and Slum

Table 3.7 depicts that the growth of population and houses in Madurai. There is a positive relationship between the growth of population and the number of houses.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>Population</th>
<th>Houses</th>
</tr>
</thead>
</table>

**TABLE 3.7**

GROWTH OF POPULATION AND HOUSES IN MADURAI CITY


The distribution of slums in Madurai according to the land type is stated in Table 3.8.

**TABLE 3.8**

**DISTRIBUTION OF SLUMS IN MADURAI CITY**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Area</th>
<th>Number of Slums</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Corporation land</td>
<td>17</td>
</tr>
<tr>
<td>2.</td>
<td>Temple land</td>
<td>16</td>
</tr>
<tr>
<td>3.</td>
<td>Government and private land</td>
<td>174</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>207</td>
</tr>
</tbody>
</table>

Source: Housing Section, Madurai Corporation, Madurai, 2012.