CHAPTER 2

STUDY AREAS AND DATA USED

2.1 INTRODUCTION

To evaluate the performance of the four algorithms in different terrain conditions, satellite images pertaining to Urban (Chennai) and Non Urban (Pichavaram) areas have been selected and to study the performance in the different sensors, satellite image pertaining to Erode and its environs of IRS 1C LISS III and SPOT HRV (MLA) sensor images have been selected. These study areas are discussed as follows.

2.2 URBAN AREA (CHENNAI)

2.2.1 Location and extent

This study area is located in the coast of Bay of Bengal and is one of the major metropolitan cities in India (Figure 2.1). This area lies between the longitudes of 80° 10' and 80° 20' and latitude of 12° 55' and 13° 10'. In Chennai City the intensity of the settlement varies from dense (in the heart of the city) to sparse in the fringe area. This study area covers an area of about 208.4 sq.km.

2.2.2 Slope

The terrain of Chennai city is almost flat with the sloping category varying between 0% and 1%.
Figure 2.1 Location map of Chennai area
2.2.3 Landuse

The Chennai city has the most complex landuses. The heart of the city (George town) is highly congested and the north Chennai is mostly covered by the industries. The Raj Bhavan area, IIT and children’s parks are covered by dense forest.

2.2.4 Data used

Satellite : IRS 1C
Sensor : LISS III
Path- Row : 102 - 064
Date of Pass : 12-02-2000
Topo sheets : 66C/4,66C/8,66D/1 & 5

2.3 NON-URBAN AREA (PICHAVARAM)

2.3.1 Location and extent

This study area is located in the East coastal line of Cuddalore district of Tamilnadu (Figure 2.2). It lies between the longitudes of 79° 40' and 79° 52' and the latitudes of 11° 15' and 11° 27'. This study area covers about 84.64 sq.km.

2.3.2 Slope

The terrain in the study area is almost flat, with the sloping category varying between nearly level (0-1%) and gently sloping (3-5%) category. Major portion of the district falls within nearly level (0-1%) sloping category. In blocks like Nallur and Virudhachalam, the terrain varies between nearly level (0-1%) and gently sloping (3-5%) category.
Figure 2.2 Location map of Pichavaram area
2.3.3 Landuse

Major part of the district is covered under agricultural lands; water bodies and wastelands occupy a small portion of the block area, in almost all the blocks of the district. Forest lands are present in a portion of Portonovo and Kammnapuram block. The mangrove forest trees of Pichavaram are permanently rooted in a few feet of water and are one of the very few places where one can closely observe this kind of vegetation. These are considered one among the healthiest mangrove occurrence in the world and one can find rare species of plants like Avicennia and Rhizophora. There are also various bird species like Waterships, Cormorants, Egrets, Stocks, Herons, Spoonbills and Pelicans.

2.3.4 Data used

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<th>Path- Row</th>
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<td>LISS III</td>
<td>102 - 065</td>
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2.4 URBAN AND NON URBAN AREA OF DIFFERENT SENSORS (ERODE AND ITS ENVIRONS)

2.4.1 Location and extent

This study area is located in Erode district. It is bound by Karnataka in the North, Coimbatore and Nilgiri in the west, Salem, Namakkal and Karur in the east (Figure 2.3). Erode, a special grade Municipal Town is located at a distance of 100 km. East of Coimbatore and is situated on the bank of river Cauvery between 11° 19' and 11° 31' North latitude and 77 ° 42' and 77 ° 44' East latitude. Erode Local Planning Area extends over an area of 76.21sq.kms with the population of 2.48 lakhs as per 1981 census. Commercial area has been developed along the road side in all
Figure 2.3 Location Map of Erode area
major roads and which are concentrated near the junction of Brough road, Auchery road and Bazaar area.

2.4.2 Slope

The topography of the entire district varies between nearly level (0-1%) to steep sloping (>35%) category. The surface in almost all the blocks of Erode district, except Talavadi, Sathyamangalam and Andiyur varies between nearly level (0-1%) and gently sloping (3-5%) category. The variation in slope from moderately sloping (5-10) to steep sloping (>35%) category is very meagerly present in all the above said blocks. The terrain in Thavaladi, Sathyamangalam and Andiyur varies between moderately sloping (5-10%) to steep sloping (>35%) category, under influence of Western Ghats.

2.4.3 Land use

The dominant landuse categories in the district are agriculture and forest lands. The agriculture lands include group lands, which are further classified in to wet, and dry croplands. Among the above categories of landuse, agriculture land are predominantly present in almost all the blocks of erode district, except Thavaladi, Andhiyur and Sathamangalam blocks. The agricultures lands dominantly vary between 85% and 95% of the total area of the block. The extent of the Erode local planning area is 76.21 sq.km and developed land within the local planning area constitutes 13.44% of total area. The developed area in the municipal area alone constitutes 83.25% of total municipal area.

2.4.4 Data used

Satellite : SPOT
Sensor : HRV (MLA)
Date of Pass : 17-11-1989
Satellite : IRS 1C  
Sensor : LISS III  
Path- Row : 100-065  
Date of Pass : 23-Jan-2000  
Topo sheets : 58E/11

2.5 SUMMARY

The three study areas have been described in the above sections. The satellite image of Chennai area has heterogeneous land uses and most of the area is covered by the settlement with different densities. In few places dense to moderate dense forest have been noticed. In the Satellite image of Pichavaram area, agriculture land, wasteland and mangrove forest have been noticed. In the satellite image of Erode area, both urban and non-urban areas have been noticed. Classification of satellite image of three study areas using non-parametric classifier is presented in the following chapter.