CHAPTER –III
DESCRIPTION OF THE STUDY AREA

3.1. Profile of the Cuddalore District

Cuddalore is located at 11.45°N 70.45°E. It has an average elevation of six m (20 ft). The land is completely flat with large deposits of black and alluvial soil in inlands and coarse sand near the seashore. The sandstone deposits in the town are popular. The Pennayar River runs north of the town, while Gadilam River runs across it. Cuddalore is situated at a distance of 200 km (120 mi) from the state capital Chennai and 18 km (11 mi) from Puducherry, the neighboring union territory. The nearest airport is at Chennai, 200 km (120 mi) kilometers from Cuddalore. The period from November to February in Cuddalore is pleasant, with a climate full of warm days and cool nights. The onset of summer is from March, with the mercury reaching its peak by the end of May and June. The average temperatures range from 37 °C (99 °F) in January to 22.5 °C (72.5 °F) in May and June. Summer rains are sparse and the first monsoon, the South-West monsoon, sets in June and continues till September. Monsoon sets in October and continues till January. The rainfall during South-West monsoon period is
much lower than that of North-East monsoon. The average rainfall is 1,400 mm (55 in), most of which is contributed by the North-East monsoon.

**Rural Population**

As per 2011 census, 66.03 percent population of Cuddalore district lives in rural areas of villages. The total Cuddalore district population living in rural areas is 1,720,725 of which, males and females are 868,861 and 851,864 respectively. In rural areas of Cuddalore district, sex ratio is 980 females per 1000 males. If child sex ratio data of Cuddalore district is considered, figure is 880 girls per 1000 boys. Child population in the age 0-6 is 192,701 in rural areas of which males were 102,525 and females were 90,176. The child population comprises 11.80 percent of total rural population of Cuddalore district. Literacy rate in rural areas of Cuddalore district is 73.69 percent as per 2011 census data. Gender wise, male and female literacy stood at 82.85 and 64.48 percent respectively. In total, 1,126,045 people were literates of which, males and females were 634,883 and 491,162 respectively.
3.2. Economy of Cuddalore District

Being a coastal town, historically, Cuddalore's main industry is fishing. Although Cuddalore was once a port town, the shipping trade has now moved to larger centers. Cuddalore also hosts the heavy chemical, pharmacological and energy industries in SIPCOT, an industrial estate setup by the state government. The National Thermal Power Corporation (NTPC) and Tamil Nadu Electricity Board (TNEB) planned to commence power plants around the town.

The industrial development in Cuddalore's recent past has resulted in pollution. SIPCOT, the major industrial area in the town is a "global toxic hotspot". Local communities have voiced their concern about industrialization and pollution. The SIPCOT chemical industry estate in Cuddalore was investigated in November 2002 by a team from the Indian People's Tribunal headed by J. Kanakaraj. The team reported "a noticeable stench of chemicals in the air". The report published in July 2003 reported that "Villages like Kudikadu, Thaikal, Eachangadu and Sonnanchavadi lie in a virtual 'gas chamber' surrounded on three sides by chemical factories and bounded on the fourth by the river". There are reports of illegal dumping of toxic waste. On 22 March 2008, a report for the
"Tamil Nadu Pollution Board" prepared by the Nagpur-based "National Environmental Engineering Research Institute" found that residents of the SIPCOT area of Cuddalore were at least 2000 times more likely than their counterparts to contract cancer in their lifetimes due to exposure to high levels of toxic gases from chemical industries in the region.

The Cuddalore Port operates at the confluence of the Gadilam River and the Paravanar River. The ships anchor in mid-stream at a distance of about a mile from the shore, where cargo is loaded and discharged through lighters. There is a bar at the mouth of the combined river, which maintains a depth of five to six feet at low water. During the months of July to September, the depth over the bar is reduced to about three to four feet. Other ports under construction in Cuddalore are Thiruchopuram port, Silambimangalam port, Parangipettai port (Portonova) and PY-03 Oil Field (Operational).

**Employment**

Table – 3.1

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Category</th>
<th>Cuddalore (in Lakhs)</th>
<th>Tamilnadu (in Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2001 (%)</td>
<td>2016 (%)</td>
</tr>
<tr>
<td>1</td>
<td>Workers</td>
<td>9.73 (42.6)</td>
<td>13.60 (13.63)</td>
</tr>
<tr>
<td>2</td>
<td>Main Workers</td>
<td>7.29 (31.9)</td>
<td>8.37 (57.64)</td>
</tr>
<tr>
<td>3</td>
<td>Marginal workers</td>
<td>2.44 (10.7)</td>
<td>3.32 (3.32)</td>
</tr>
<tr>
<td>4</td>
<td>Non-workers</td>
<td>13.12 (57.4)</td>
<td>14.36 (14.36)</td>
</tr>
<tr>
<td>5</td>
<td>Population</td>
<td>22.85 (100.00)</td>
<td>26.09 (100.00)</td>
</tr>
</tbody>
</table>

*Source: Population census 2001 & district statistical handbook cuddalore-2014*
Table 3.1 shows that work force in Cuddalore district was 9.73 lakhs, i.e., out of total population, work force accounted for 42.6 per cent. It shows that the Cuddalore district has a higher percentage of work forces in the year 2014 and to total population compared to Tamilnadu, which constitutes 44.76 percent of the total population.

### Table - 3.2

**Rural and Urban Workers of Cuddalore District**

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Cuddalore</th>
<th>Tamilnadu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Workers Participation Rate (WPR) (Percentage)</td>
<td>Workers (Lakhs)</td>
</tr>
<tr>
<td>Rural</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td>28.7</td>
<td>4.39</td>
</tr>
<tr>
<td>Women</td>
<td>18.9</td>
<td>2.29</td>
</tr>
<tr>
<td>Persons</td>
<td>47.1</td>
<td>7.29</td>
</tr>
<tr>
<td>Urban</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td>26.1</td>
<td>1.97</td>
</tr>
<tr>
<td>Women</td>
<td>6.1</td>
<td>0.46</td>
</tr>
<tr>
<td>Persons</td>
<td>32.3</td>
<td>2.43</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td>27.9</td>
<td>3.63</td>
</tr>
<tr>
<td>Women</td>
<td>14.7</td>
<td>3.36</td>
</tr>
<tr>
<td>Persons</td>
<td>42.6</td>
<td>9.73</td>
</tr>
</tbody>
</table>

**Source:** Population Census 2001.
Table 3.2 shows that rural work participation rate was more than the urban work participation rate. It was 47.1 percent in rural Cuddalore and 32.3 percent in urban area. Higher work participation rate in rural areas of Cuddalore District is due to larger dependence of people on agriculture for their livelihood. The work participation rate for rural men was 28.7 per cent and a rural woman was 18.9 per cent. For urban male it was 26.1 percent whereas for women it was 6.1 per cent. Put together it was 27.9 percent for men and 14.7 per cent for women. It is to be noted that the women work participation was lower than that of men. It bears upon gender development index. Compared to the State, the Cuddalore district has a higher work participation rate both for male and female.

3.3. Agriculture and Horticulture

Land Utilization: Geography and Physical Features

The most part of the district is flat plain sloping gently from the west to the sea on the east and also from the north to the south except for a strip of high ground running across the district for Pondicherry to Vridhachalam. The region can be distinguished into the following natural divisions. The eastern
region consists of red soil tracts and wide spread paddy fields and green groves of fruit bearing trees marked here and there by broad open tanks- special characteristics of these parts. The southern region of the district, particularly Chidambaram taluk and a few parts of Vridhachalam taluk, is comparatively green and fertile and is made up of even expanse of irrigated land which resembles to a great extent, the deltaic part of Thanjavur district. This is in contrast to the rest of the composite South Arcot district. The seashore is fringed with a belt of blown sand of varying width. The total geographical area of the district was 362.82 sq.km, in 1995-96. Cropped area accounts for about 65 percent of the total area. Forest cover is very minimum accounting for only about 3 percent of the land. A significant portion of the land falls under the category of ‘non available for cultivation’ and ‘fallow lands’.

**Trend in Production and Productivity of Important Crops**

Cereals, pulses and oil seeds are the three important crops produced in the district. The productivity pattern over the past 15 years indicates that the productivity of cereals and oil seeds has gone up while that of pulses has gone down. The productivity of cereals has gone up from 2032 kg/ha., to 4050
kg/ha., While in the case of oil seeds, it has gone up from 1098 kg/ha., to 1780 kg/ha. Another significant feature is the reduction in the area under production for cereals and the increase in the area under production for oil seeds and pulses. The reason for fluctuation of production may be the rotation of crops seasonally.

In Cuddalore district, during the year 2007-08, out of the total paddy coverage of 122688 Ha, SRI coverage was 35200 Ha. For the year 2008-09, the paddy coverage target was 122000 Ha. of which SRI coverage would be 47900 ha. To encourage the farmers to go for SRI cultivation, the State Government is providing an incentive of Rs.23000 per hectare which includes Conoweeder and other inputs. Farmers are also provided training on this method by the Agriculture Department as well as by Krishi Vigyan Kendra., Vridhachalam. Seed Village Scheme is under implementation in this district from 2006-07 onwards. The Agriculture Department identifies pockets for better seed production and chooses atleast 50 willing farmers for production of certified seeds of the same crop in the same area. The identified farmers would be provided foundation Certified seeds at 50
percent cost and also training in different phases to enable them to produce quality seeds.

**Paddy Crop in Cuddalore District**

Paddy is the major crop of the district covering an area of around 1, 10,000 Ha. on an average. The average productivity of the crop is 3750 Kg. /Ha. The crop is grown in almost all the blocks of the district. Wherever there are assured irrigation facilities, paddy is grown both during Samba and Kuruvai seasons and where the irrigation is dependent on canal water, the crop is grown during Samba only. In delta blocks, viz. Kumaratchi and Kattumannarkoil, rice fallow pulses are also cultivated in the paddy fields.

System of Rice Intensification (SRI) is the latest technology which is widely popularized both by Agriculture Department and Krishi Vigyan Kendra and the farmers are evincing lot of interest in adopting this technology. Paddy cultivation target for the district for the year 2008-09 is set as 122000 Ha. of which SRI would be 47900 Ha. The popular varieties grown are White Ponni, Ponmani (Savithri), ADT.43, ADT.39, BPT 5204 etc. To market the produce there are regulated markets set up at various places in the district. In
addition to this, the Tamilnadu Civil Supplies Corporation has set up Direct Procurement Centers at various places, where the SMP is offered to the farmers.

**Crop - Wise Irrigated Area of Cuddalore District**

**Table-3.3**

**Principal Crop-Wise Area Irrigated 2009-10**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Crop</th>
<th>Area (in Hectares)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Area Irrigated</td>
<td>Total Area</td>
</tr>
<tr>
<td>1</td>
<td>Paddy</td>
<td>1711880</td>
<td>1845553</td>
</tr>
<tr>
<td>2</td>
<td>Cholam (Jowar)</td>
<td>24467</td>
<td>238476</td>
</tr>
<tr>
<td>3</td>
<td>Cumbu (Bajra)</td>
<td>6049</td>
<td>54427</td>
</tr>
<tr>
<td>4</td>
<td>Ragi</td>
<td>10175</td>
<td>82335</td>
</tr>
<tr>
<td>5</td>
<td>Sugarcane</td>
<td>293325</td>
<td>293329</td>
</tr>
<tr>
<td>6</td>
<td>Cotton</td>
<td>29818</td>
<td>104095</td>
</tr>
<tr>
<td>7</td>
<td>Ground nut</td>
<td>155968</td>
<td>413011</td>
</tr>
<tr>
<td>8</td>
<td>Other Crops</td>
<td>10,06,552</td>
<td>25,40,492</td>
</tr>
</tbody>
</table>

**Source:** Department of Economics and Statistics, Chennai-6

Table-3.3 shows crop-wise areas irrigated in cuddalore district. Paddy crop irrigated area is 1711880Ha, and total area is 1845553Ha, at 92.76 percent. Cholam (Jowar), Cumbu (Bajra), and Ragi irrigated areas are 24467Ha, 6049 Ha, 10175Ha, and total are 23876Ha, 54427Ha, 82335Ha. Sugarcane, cotton, groundnut irrigated areas are 29335Ha. 29818Ha, 155968Ha, and in this total are 29332Ha, 104095Ha, and 41300Ha. It is to be noted that paddy crop
irrigated area is higher than other crops irrigated area in the Cuddalore district.

**Consumption of Fertilizers and Pesticides**

The consumption of Chemical Fertilizers was 45,285 metric tonnes in 1995-96, out of which more than a half constitutes the nitrogenous fertilizers. There has also been an intensive use of Bio fertilizers (for which Block wise details are not available) followed by overall pesticides 23,700 metric tonnes of Urea and 295,000 pockets of Bio-fertilizers that were used in 1995-96. Among Pesticides, the liquid variety was more popular with 14,750 liters and 8,400 kg of powder pesticides were also used in 1995-96.

**Trend in consumption of Fertilizers and Pesticides**

The usage of chemical fertilizer fluctuates between 44,000 and 49,000 tonnes during the past 15 years. In a general manner the consumption pattern indicates that there is a reduction in the usage of chemical fertilizers while the consumption of Bio-fertilizers shows a steady increase indicating the predominance of usage of non-conventional methods. Both powder and liquid varieties of pesticides have registered a decrease in their consumption over the years.
Soil Types

Black soil is the predominant soil type in this district accounting for 45.2 percent of the total area under agriculture. Red Loam and red sandy soil are the other types of soil prevalent in the district. Sandy coastal alluvium soil occupies the coastal stretches of the district.

Soil Problems

About 3.83 percent of the land available for cultivation suffers from salinity/alkalinity and another 3.49 percent is prone to floods. About 5.23 percent of the soils comprise sand and hardest characteristics. In all, about 15 percent of the land presently available for cultivation is subject to problems arising from poor soil conditions.

Status of Soil and Water Conservation Programs

Soil conservation works were being undertaken in 11129.49 hectares of cropping area. These conservation works have been done only in 7 blocks in the district. There has been no new construction of wells in Government sector for irrigation in the district. As regards the construction of check
dams/stop dams, Panruti is the only block wherein 22 check dams have been constructed as on 1995-96.

**Forest Resources**

There are 21 forest blocks in Cuddalore district constituting a total forest area of 13303.01 (13.30 sq.km) hectares. 20 forest blocks fall under the Reserve Forest category with 13106.49 (13.10 sq.km) hectares and one under Reserve Lands with 196.52 hectares. All the 21 forest blocks are classified as scrub forests.

**Mineral Resources**

The Neyveli Lignite Corporation (NLC): The NLC was registered as a Company on 14th November 1956. The mining operations in Mine- I were formally inaugurated on 20th May 1957 by the then Prime Minister Pandit Jawaharlal Nehru. The main constituent Units are the two Lignite Mines, two Thermal Power Stations, a Fertilizer Plant and the Briquetting and Carbonization Plant.

Mine –I with a capacity of 6.5 Million Tonnes lignite per annum feeds Thermal Power Station – I (600 MW), Briquetting
and Carbonization plant (2,62,000 tonnes of Coke achievable capacity) and the Process Steam Plant.

Mine – II with a capacity of 10.5 Million Tonnes lignite's per annum feeds Thermal Power Station – II (1470MW). The Fertilizer plant has an achievable capacity of 1,29,200 tonne urea per annum. In March 1992, Government of India has sanctioned the expansion of Mine –I from its present capacity of 6.5 to 10.5 MT per annum and life extension programme Thermal Power Station – I. In February '96, Government of India has sanctioned the addition of 2 x 210 MW units to the Thermal Power Station-I from its present capacity of 600 MW.NLC am one among the Public Sector Enterprises, which is continuously earning profit for the last two decades. The Lignite deposits in India occur mostly in sub-surface deposits and as part of tertiary formations. Their depths of occurrence vary from 100 m to depths deeper than 300 m, as in Mannargudi and East of Veeranam block in Tamil Nadu.

**Area Irrigated and Sources of Irrigation in Tamil Nadu**

The State's irrigation potential in per capita terms is 0.08 ha. when compared to the all-India average of 0.15 ha. Agriculture is the single largest consumer of water in the State consuming 75
percent of the State’s water resources. About 58.78 percent of the net area sown is benefited by irrigation.

The State has a net irrigated area of 29.12 lakh hectares (L.ha) (2010-11). The irrigation intensity (ratio of gross irrigated area to net irrigated area), worked out to 129.32 percent during the 1950s, and it declined to 124.90 percent during the 1990s and it came down further to 115.00 percent in 2010-11. The area irrigated by canals marginally increased from 7.88 L.ha in 1950-51 to 8.01 L.ha in rivers, tanks and wells. There are about 41,127 tanks, 2,239 irrigation main canals and 18.26 lakh irrigation wells in the state. The area irrigated by various sources is furnished in the Table 3.4 and subsequently declined to 7.47 L.ha in 2010-11. However, the share of canal irrigation in the net area irrigated declined from 42.48 to 28.60 percent between 1950-51 and 2000-01 and has further fallen to around 25.65 percent in 2010-11.
Table - 3.4
Source of Irrigation Area in TamilNadu and Cuddalore District

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Source</th>
<th>Tamil Nadu (In L.ha)</th>
<th>Cuddalore Area (‘000 ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1950-51</td>
<td>2000-01</td>
</tr>
<tr>
<td>1</td>
<td>Canals</td>
<td>7.88 (42.48)</td>
<td>8.01 (28.60)</td>
</tr>
<tr>
<td>2</td>
<td>Tanks</td>
<td>5.65 (30.46)</td>
<td>5.37 (19.17)</td>
</tr>
<tr>
<td>3</td>
<td>Wells</td>
<td>4.26 (22.96)</td>
<td>14.49 (51.73)</td>
</tr>
<tr>
<td>4</td>
<td>Other s</td>
<td>0.76 (4.10)</td>
<td>0.14 (0.50)</td>
</tr>
<tr>
<td>5</td>
<td>Net area irrigated</td>
<td>18.55</td>
<td>28.01</td>
</tr>
<tr>
<td>6</td>
<td>Gross area irrigated</td>
<td>24.45</td>
<td>34.12</td>
</tr>
</tbody>
</table>

**Source:** Season and Crop Report.(Various Issues)
Figures in parentheses indicate percentage to net area irrigated.

**3.4. Water resources - Rivers, Canals and Waterways**

The principal river of the district is the Pennar or the Ponnaiyar. The river flows across the boundary between Cuddalore and Villupuram taluks and empties itself into the Bay of Bengal about 3 miles north of Cuddalore. The Gadilam River, which rises in the eastern part of Tirukkoyilur taluk of adjoining district, flows through Cuddalore taluk. In Cuddalore taluk, Malattar joins it on the right and then it flows into the Bay of Bengal at a point, just north of Cuddalore. The Ponnaiyar and the Gadilam are connected by a river course called the Malattar, which serves to carry the surplus water of the former into the latter. The Paravanar, also
called Uppanar, rises in Vridhachalam taluk. This river flows between Cuddalore and Chidambaran taluks, strikes northwards and falls into the Bay by the mouth of Gadilam. The Coleroon, which splits off from Cauvery River in Tiruchy district, is more a river of the Thanjavur district. It flows on the Southern boundary of Chidambaran taluk for 36 miles and joins the Bay of Bengal 6 miles south of Porto-Novo. The junction of the rivers, Vasishtanadi and Swetanadi, which rise in Salem district, forms the Vellar River. The Vasishtanadi enters the South Arcot district through Attur, passes just south of the Kalrayan and Tiruchirapalli for 16 miles. After it joins the Swetanadi, the united streams still follow the boundary and the river flows for another 20 miles, gathering the waters of Manimuktanadi, Gomukhanadi and Mayuratnadi which drain the eastern slopes of the Kalrayan. The river then passes through Chidambaran taluk and joins the Bay of Bengal near Porto-Novo. There are backwaters on the seacoast caused by the seawater breaking into the watercourse of streams and rivers. One such backwater is found near Cuddalore.
River Basins and their Catchment Areas

i. Catchment Areas Vellar, Coleroon, Ponnaiyar and Paravanar are the four catchment areas of the river basins in the district.

ii. Basin-wise status of the ground water availability:

Total Geographical areas of Vellar, Ponnaiyar and Paravanar river basins are 7659, 11257 and 760Sq. Km respectively. Paravanar gets maximum range of mean annual rainfall of 1068 mm. Vellar and Ponnaiyar get have range of mean Annual rainfall of 951 & 932 mm respectively.

iii. Details of Dams and reservoirs:

There is one reservoir existing in this district - namely Wellington reservoir, which gets water from Vellar, Veeranam Lake and Perumal Lake.

iv. Irrigation by Different Sources:

The main sources of irrigation in the district are Canals, tanks and wells. The gross areas irrigated by canals, tanks and wells are 53796 hectares, 16796 hectares and 77741 hectares respectively. On an average about 60 percent of the
total cropped area is irrigated; with some of the blocks achieving around 90 percent irrigation at the maximum.

v. Incidence of Drought, Flood and Cyclone:

Information on this head is very scarce. However, it has been ascertained from the available information that there was an incidence of cyclone in 1993-94. Flooding has occurred during 1992-93 and during 1993-94 in the past 10 years.

**Water Resources Organization in Cuddalore District:**

i. **Lower Coleroon Anicut System**

From Mettur dam the River Cauvery traverses a distance of 115 miles before reaching Upper Anicut in Thiruparaithurai Village limit in Tiruchirappalli District. All along this length it irrigates on both sides.

At upper Anicut the river Cauvery branches off into two arms. On the left side, it is called river Cauvery. A barrage had been constructed on the Coleroon arm in the year 1836. From this point the river Coleroon serves as a flood carrier and runs almost parallel to the Cauvery arm. In the Cauvery arm, there are a number of sluices to cater to the needs of the ayacut.
At Grand Anicut, about 20 miles down the Upper Anicut the surplus water is let into the River Coleroon. During Irrigation season 10 percent of the realisation at Grand Anicut is let into the River Coleroon to irrigate the ayacut in Chidambaram and Kattumannarkoil Taluks of the South Arcot District and Sirkali Taluk in Thanjavur District. In addition to the 10 percent realization at Grand Anicut let into the river Coleroon through its scouring sluices, water drained from the Cauvery ayacut also is received in the River Coleroon and utilised for the development of the ayacut of the Coleroon Anicut System.

At Anaikkarai about 67/2 miles down from Upper Anicut, a regulator has been constructed in the River Coleroon in the year 1836 to serve as a diversion work for the Ayacuts in South Arcot District and Thanajvur District and also as a flood Regulator. Originally it was an anicut, subsequently in the year 1901 shutters of 6 feet height were provided. Then it was increased to 8 feet in the year 1909. Then the shutters were raised to 9 feet in the year 1953. Four Channels namely Vadavar, Coleroon North Rajan, Kanjankollai and Vinayagantheru Channel take off from the left side of Regulator and irrigate an ayacut of 1,01,120 acres in 1st crop.
and 22,350 Acres in IIInd Crop in South Arcot District. Similarly four Channels namely Coleroon South Rajan, Kummukkimanniar, Melaraman and Keelaraman take off from the right side, irrigating an extent of 31,200 acres in Ist crop and 8,424 acres in IIInd crop in Thanjavur District.

ii. Veeranam Tank

Veeranam tank is one of the biggest tanks in Tamil Nadu. It is situated in the Western side of the Chidambaram, in South Arcot Vallalar District. The main bund for this tank is in the North-South direction, having black-toping road over it for a length of 16 kms., and its connects Sethiathope and Kattumannarkoil and it also has a foreshore bund for a length of 8 kilometres.

This tank is under Lower Coleroon Anicut System and the main source of supply for this tank is Vadavar Channel and this tank receives supply from its own catchment area of 165sq.mile (or) 427.35sq.km. The drainage from the catchment area passes into the tank mainly through two drainage courses namely Sengal Odai and Karuvattu Odai. The maximum inflow of water for the Veeranam Tank is during the monsoon period of North East Monsoon (i.e.), October to
December. This tank is having a water spread, area of 15 sq.mile (or) 38.85 Sq.km.

The ayacut of the tank is 44856 Acres (i.e.) 18,153 hectares. There are 34 sluices taking off frm Veeranam Tank for its ayacuts with branch Channels. Out of these 28 sluices are in the main bund. The main bund sluices are connected by a Channel excavated inside the tank and parallel to the bund called "Thotti Voikkal". The Thotti Voikkal is very useful to operate sluices even when the water level is low.

There are 6 sluices on the foreshore side of the tank called high level sluices. The supplies for these sluices are assured only when the tank is having more than 2/3rds of F.T.L.

On the Southern Flank end of the tank just below the entry of Vadavar Channel, there are two sets of three surplus weirs with manual operational shutters and also one natural paved bye wash for a length of 490 feet (or) 150 metres.

The total discharge of the surplus arrangements is 21362 cusecs. On the northern side of tank, there is a sluice called Veeranam New Supply Sluice (VNSS) through which the
Veeranam Tank water is supplied to Sethiathope Anicut, as supplemental supply of Sethiathope Anicut System. Also there is a surplus escape known as Veeranam north and surplus (VNES) takes off from the Channel carrying Veeranam water to the Vellar river at flood time.

iii. Sethiathope Anicut

The Sethiathope Anicut is located across the Vellar River in Sethiathope Village about 25 km. from Chidambaram Town in South Arcot District of Tamil Nadu. The river Vellar originates from Kalrayan Hills in Salem District and traverse for about 192 km. mostly in South Arcot District and empties into Bay of Bengal near Parangipettai.

The Sethiathope Anicut is the last Anicut across the River Vellar and is situated on the Kumbakonam-Madras Highways. This structure was originally constructed as an Anicut in 1847-1848. The bridge over the Anicut was built in 1850-1852. The Anicut suffered damages due to high floods in the years 1885, 1889, 1913 and those were rectified subsequently.
iv. Wallajah Tank

The Wallajah Tank has a catchment area of 191.6 Sq.km. Its original capacity of 2.57 MCM has shrunk to a reported 1.66 MCM due to human encroachment. The tank collects runoff from its catchment during the rainy season, receives year-round inflow from the Neyveli mines and receives surplus from the Vellar Rajan Canal (VRC). The tank supplies an indirect command area of 4,612 ha. through a network of 11 Channels.

Hydraulic Particulars:

Wallajah Tank under Sethiathope Anicut System is one of the major tanks with an ayacut of 11392 acres. The length of its bund is 4.91 km. The original capacity of the tank was about 90.72 M.Cft. (Approx). The water spread area of the tank is 1664 acres. It has got 11 sluices with surplus weirs of length 105.20 m. and 37.8m. The total surplusing capacity of the two surplus weirs is 13525 cusecs (9949 Cusecs + 3575 Cusecs).
v. **Perumal Tank**

The Perumal Tank has a combined catchment of 559.2 Sq.km. and an original capacity of 14.2 MCM. During the years it has silted up in part and its current capacity is estimated at 13.5 MCM. The tank supplies water to an indirect command of 2,632 ha. through 11 Channels. The tank is protected against flooding by two weirs on its southern flank, near the point where the Paravanar River joins it. Through these weirs surplus is discharged into the Lower Paravanar River.

**The use of water resources in the Perumal and Wallajah Tanks area**

The VRC Command receives waters through the Vellar Rajan Canal as releases are made from Veeranam Tank. From September-October the Vellar Rajan Channel receives most of its inflow from the Vellar River and also small surface runoff from its own command;

The Wallajah Tank and Perumal Commands receive surface runoff from the respective catchments of the two tanks, the Walajah command receives also ground water
pumped from Neyveli mines and surplus water from the Vellar, some of it reaching the Perumal Tank. Details of the distribution of inflows within the command area are given in water balance tables in the various operation scenarios. This does not include flood flows from either the Upper Paravanar River or the Vellar that inundate large parts of the Sethiathope Anicut System.

**Hydraulic Particulars**

Perumal Tank under Sethiathope Anicut System is one of the major tanks with an ayacut of 6503 Acres. The Length of its bund is 16.286 km. The Original Capacity of the tank was about 574 Mcft. The water spread area of the tank is 151.60 M.sft. It has got 11 sluices: the skill level of the highest sluice is +12.00 (Andarmullipallam Channel) and the skill level of lowest sluice is 6.30 (Omaiyan Channel). It has got two surplus weirs of length 122.75 m. and 91.35m. The total supplying capacity of the two surplus weirs is 24564 cusecs.

**vi. Wellington**

Wellington Reservoir is situated in Tittagudi Taluk of Cuddalore District at a distance of 240 Km in the South West
of Madras. The Reservoir is located in Vellar Basin across a tributary stream Periya Odai of Vellar River. It receives Regulated Supply diverted from Vellar River at Tholdur Regulator and an additional catchment area of 129 Sq. Km., of its own during North East Manson. The Reservoir was constructed during 1913-1923 and irrigates an ayacut of 11,200 Hectare.

**Water Quality Problems of NLC Irrigation**

Water used for irrigation can vary greatly in quality depending upon type and quantity of dissolved salts. Salts are present in relatively small but significant amounts. These salts are usually carried with the water to wherever it is used. In case of irrigation, the salts are applied with the water and remain behind in the soil as water evaporates or is used by the crop.

The suitability of water for irrigation is determined not only by the total amount but also by the kind of salt dissolved. Various soil and cropping problems develop as the total salt content increases, and special management practices may be required to maintain acceptable crop yields. Either water quality or suitability for consumption is judged on the
potential severity of problems that can be expected to develop during long-term use.

The problems vary both upon kind and degree, and are modified by soil, climate and crop, as well as by the skill and knowledge of the water user. As a result, there is no set limit on water quality; rather, its suitability for use is determined by the conditions of use which affect the accumulation of the water constituents and which may restrict crop yield. The soil problems, most of which commonly encountered and used as a basis to evaluate water quality are those related to salinity, water infiltration rate, toxicity and a group of other miscellaneous problems.

The rising food demands of the world population have often led to the use of marginal salt-affected soils and/or low quality waters. Thus, salinity of arable land is a mounting problem in many irrigated areas of the world and is an important factor in dipping crop productivity.

A salinity problem exists if salt accumulates in the crop root zone to a concentration that causes a loss in yield. In irrigated areas, these salts often originate from a saline, high water table or from salts in the applied water. Yield reductions occur when the salts accumulate in the root zone to such an
extent that the crop is no longer able to extract sufficient water from the salty soil solution, resulting in a water stress for a significant period of time.

If water uptake is appreciably reduced, the plant slows its growth rate. The plant symptoms are similar in appearance to those of drought, such as wilting, or a darker, bluish green color and sometimes thicker, waxier leaves. Symptoms vary with the growth stage, being more noticeable if the salts affect the plant during the early stages of growth. In some cases, mild salt effects may be entirely unnoticed because of a uniform reduction in growth across an entire field.

Salts that contribute to a salinity problem are water soluble and readily transported by water. A portion of the salts accumulated from prior irrigations can be leached below the rooting zone if more irrigation water infiltrates the soil than being used in the crop season. Leaching is the key to controlling a water quality-related salinity problem. Over a period of time, salt removal by leaching must be equal or exceed the salt additions from the applied water to prevent salt building up to a damaging concentration. The amount of leaching required is dependent upon the irrigation water quality and salinity tolerance of the crop grown.
An infiltration problem related to water quality occurs when the normal infiltration rate for the applied water or rainfall is appreciably reduced and water remains on the soil surface too long or infiltrates too slowly to supply the crop with sufficient water to maintain acceptable yields. Although the infiltration rate of water into soil varies widely and can greatly be influenced by the quality of the irrigation water, soil factors such as structure, degree of compaction, organic matter content and chemical make-up can also greatly influence the intake rate.

The two most common water quality factors that influence the normal infiltration rate are the salinity of water (total quantity of salts in the water) and its sodium content relative to the calcium and magnesium content. High salinity water will increase infiltration. Low salinity water or water with high sodium to calcium ratio will decrease infiltration. Both factors may operate at the same time. Secondary problems may also rise if irrigations must be prolonged for an extended period of time to achieve adequate infiltration. These include crusting of seedbeds, excessive weeds, nutritional disorders and drowning of the crop, rotting of seeds and poor crop stands in low-flying wet spots. One serious side effect of
an infiltration problem is the potential to cause disease and vector problems. Toxicity problems arise if certain constituents (ions) in either soil or water are taken up by the plant and accumulate to enough high concentration to bring out crop damage or reduced yields. The degree of damage depends upon the uptake and crop sensitivity.

The permanent, perennial types of crops (tree crops) are the more sensitive. Damage often occurs at relatively low ion concentrations for sensitive crops. It is usually first evident by marginal leaf burn and inter veinal chlorosis. If the accumulation is great enough, reduced yields result. The more tolerant annual crops are not sensitive at low concentrations but almost all crops will be damaged or killed if concentrations are sufficiently high.

3.5. Cropping Pattern

Paddy is the principal crop grown in the commands of both Walajah and Perumal Tank Systems. These Tank systems are blessed with continuous availability of water in the form of mine drainage from Neyveli, they raise two crops. In the tank irrigated commands, the first crop of paddy is usually a short term variety grown in June/July to September/October. The second crop in the commands of Walajah Tank is a medium
variety paddy crop grown during September/October to January/February, while the second crop in the commands of Perumal Tank is also a medium variety of paddy but grown during December-January to March/April. As the water availability is scarce during the South-West monsoon period, the third crop of paddy is usually a short term variety grown in the January/February to April/June in the command of Walajah tank only. The first crop covers only about one-third of the command area. The second crop, which is grown during the North-East monsoon period, covers about 90 percent of the command area. The third crop covers only half of the command area.

### Table – 3.5
**General Cropping Pattern of Paddy Crop**

<table>
<thead>
<tr>
<th>Season</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samba (I Crop)</td>
<td>July (Aadi)</td>
</tr>
<tr>
<td></td>
<td>December</td>
</tr>
<tr>
<td></td>
<td>(Markazhi)</td>
</tr>
<tr>
<td>Navarai (II Crop)</td>
<td>January (Thai)</td>
</tr>
<tr>
<td></td>
<td>March (Pankuni)</td>
</tr>
<tr>
<td>Kuruvai (III Crop)</td>
<td>April (Chitthirai)</td>
</tr>
<tr>
<td></td>
<td>June (Aanni)</td>
</tr>
</tbody>
</table>

**Source:** Department of Agriculture, Cuddalore.
Map – II
Cuddalore District
Map – III

Cuddalore : Bhuwanagiri Block
Panchayat Villages

(Map Not to Scale)
Digital Map Source: TWAD Board, Chennai
Web Design: NIC, TNSC
Cuddalore: Kurinjipadi Block
Panchayat Villages