



# **600 MW THERMAL POWER STATION – 1** **NEYVELI** **TAMILNADU.**

## ***Unit Profile:***

Neyveli Thermal Power Stations are South Asia's first and only lignite fired Thermal Power Stations and also the first pit-head power stations in India. Today NLC Power Stations are generating about 2490 MW of Power. NLC's Power Stations are maintaining very high level Plant Load Factor (PLF) when compared to the National average.

The epitome of Indo-Soviet collaboration, the **600 MW Neyveli Thermal Power Station-I** was commissioned with one unit of 50 MW in May 1962. Presently this power station consists of six units of 50 MW each and three units of 100 MW each. The last unit of this power station was synchronized in February 1970. This 600 MW Thermal Power Station-I continuously achieved over 70% load factor from 1982-83 to 1991-92 against the National Average of around 50% and won continuously the Meritorious Productivity Award instituted by Department of Power. Earlier the power station had bagged the National Award from National Productivity Council in 1982 and 1983 when the award scheme was in operation.

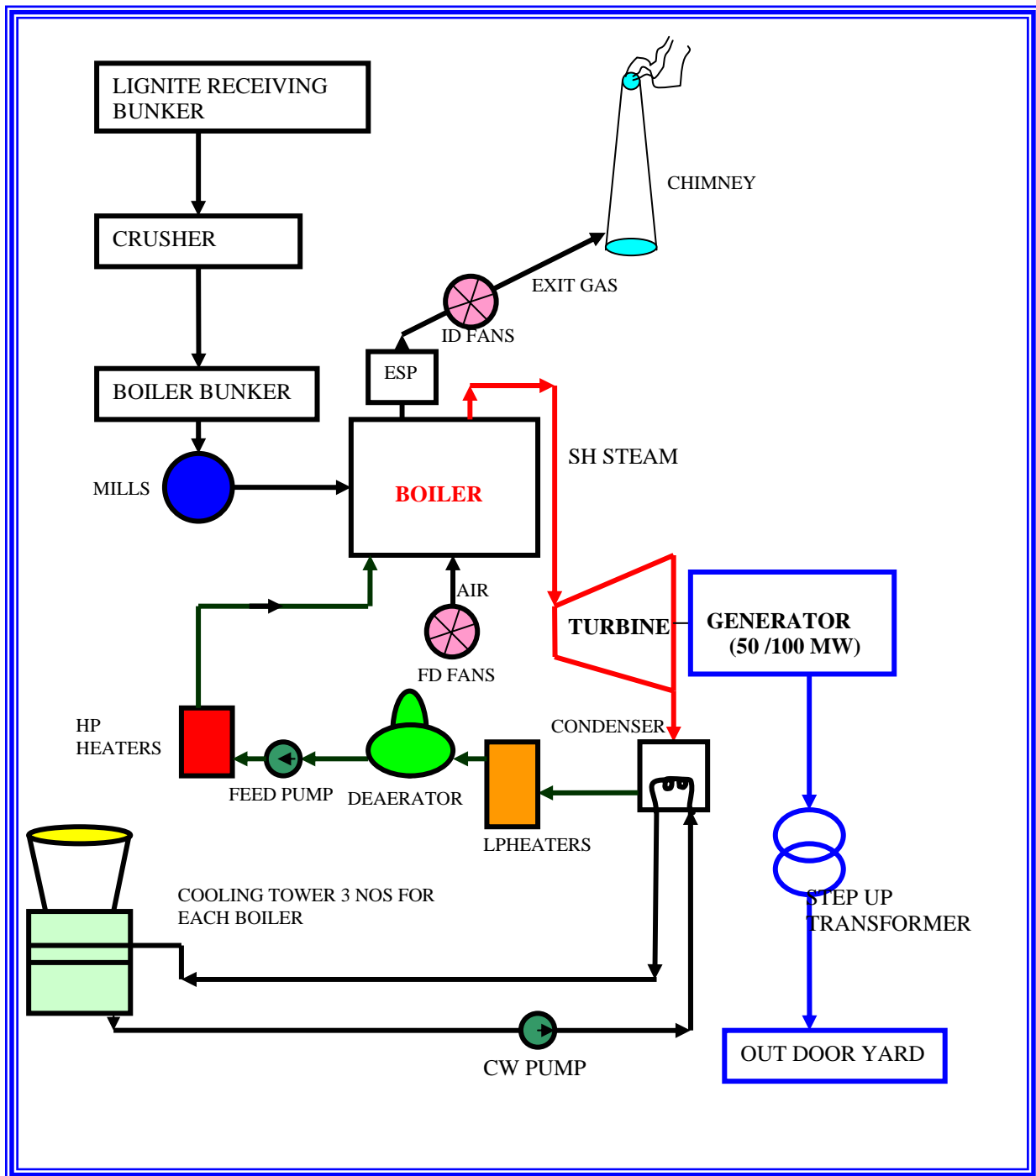
Some of the special features of this power station are:

- First Lignite Power Station in south East Asia
- First pit head power station in India
- First Power Station in India with Soviet Collaboration
- First largest Thermal Power Station in South India

The power generated from the Thermal Power Station is fed to the grid of Tamil Nadu Electricity Board, the sole beneficiary. Since all the units have secured more than 1,00,000 hours, Life Extension programme was carried out between 1992 and 1999 in tandem thus extending the life by another 15 years.



## SCHEMATIC DIAGRAM OF ELECTRICITY GENERATION IN 600 MW THERMAL POWER STATION-I

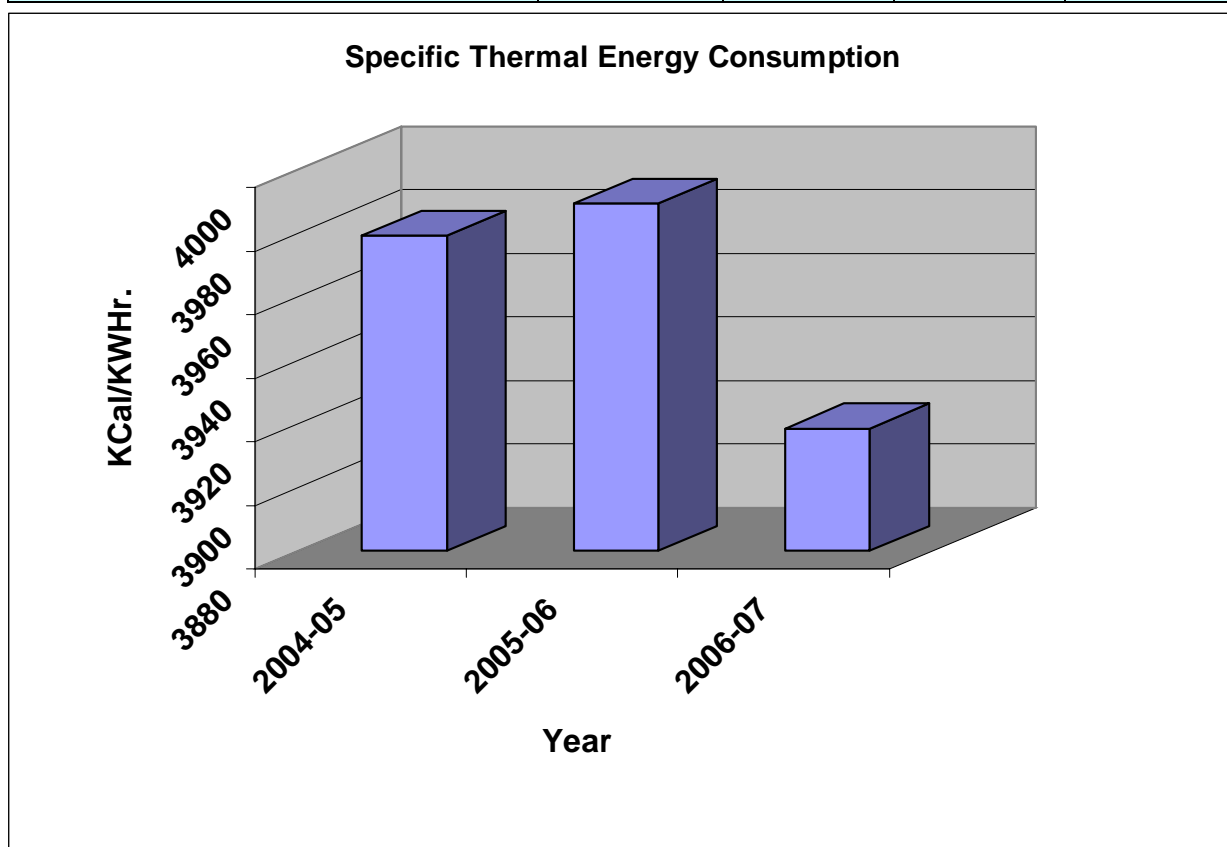


### Energy Consumption:



By implementing various energy conservation projects there has been a consistent decrease in the specific thermal energy consumption. Steps are being taken to reduce the Electrical Specific energy consumption also.

DESCRIPTION	UNIT	2004-05	2005-06	2006-07
Annual electricity Generation	Lakhs kWh	42590	39902	39902
Total electrical energy consumption /annum	Lakhs kWh	4862	4499	4606
Specific energy consumption - electrical	kWh/kWh	0.1141	0.1127	0.11546
Total Thermal energy consumption /annum	MKcals	16947104	15918326	15630847
Specific energy consumption - Thermal	Kcals/kWh	3979.077	3989.42	3918.46



**Energy conservation Commitment, Policy and set up:**



600 MW Thermal Power Station – I gives utmost importance to the energy efficiency through energy conservation. Though it is a generating unit, electricity is being used preciously. Higher priority to the energy conservation projects is being given in the Budget provision and approval by Industrial Engineering Wing. Monthly review meeting on Energy conservation projects is being conducted in the presence of Unit Head. Energy manager has presented three technical papers on Energy conservation at various national level seminars conducted as a part of *National Campaign on Energy Conservation*. In house Awareness training programme are conducted every quarter by inviting external faculty. Regular inter unit seminars are conducted to share the experience among the units. Energy Conservation week celebrated every year from 14-Dec to 21 – Dec. During that time to create awareness among employees various competitions like poster, slogan, essay and quiz are conducted and awarded prizes for the winners and participants. The prize articles are CFL lamps to emphasize the advantage of CFL.

Corporate Energy Policy is framed. The company has formed Quality Circle and they give importance to reduce the auxiliary power consumption through energy efficiency. There are 15 such circles comprises of senior executives as leader with members from each subdivision.

Safety, Environment, ISO and Energy conservation cell are under one division, which enable the Energy Manager to function effectively.



(A Government of India Enterprise)

## NEYVELI LIGNITE CORPORATION LIMITED

(A Mini Ratna Enterprise)

THERMAL POWER STATIONS (TPS-I, TPS-II Export & TPS-III)

NEYVELI - 607 807, CUDDALORE District

TAMIL NADU, INDIA

Regd. Office: 'Neyveli House', #125, EMS Postpet High Road, Kibbuki, Chennai - 600 010

### ENERGY POLICY

We, at Neyveli Lignite Corporation, Thermal Power Stations are committed to optimally utilize various forms of Energy in a Cost-Effective manner in order to effect conservation of Energy Resources.

We are committed to

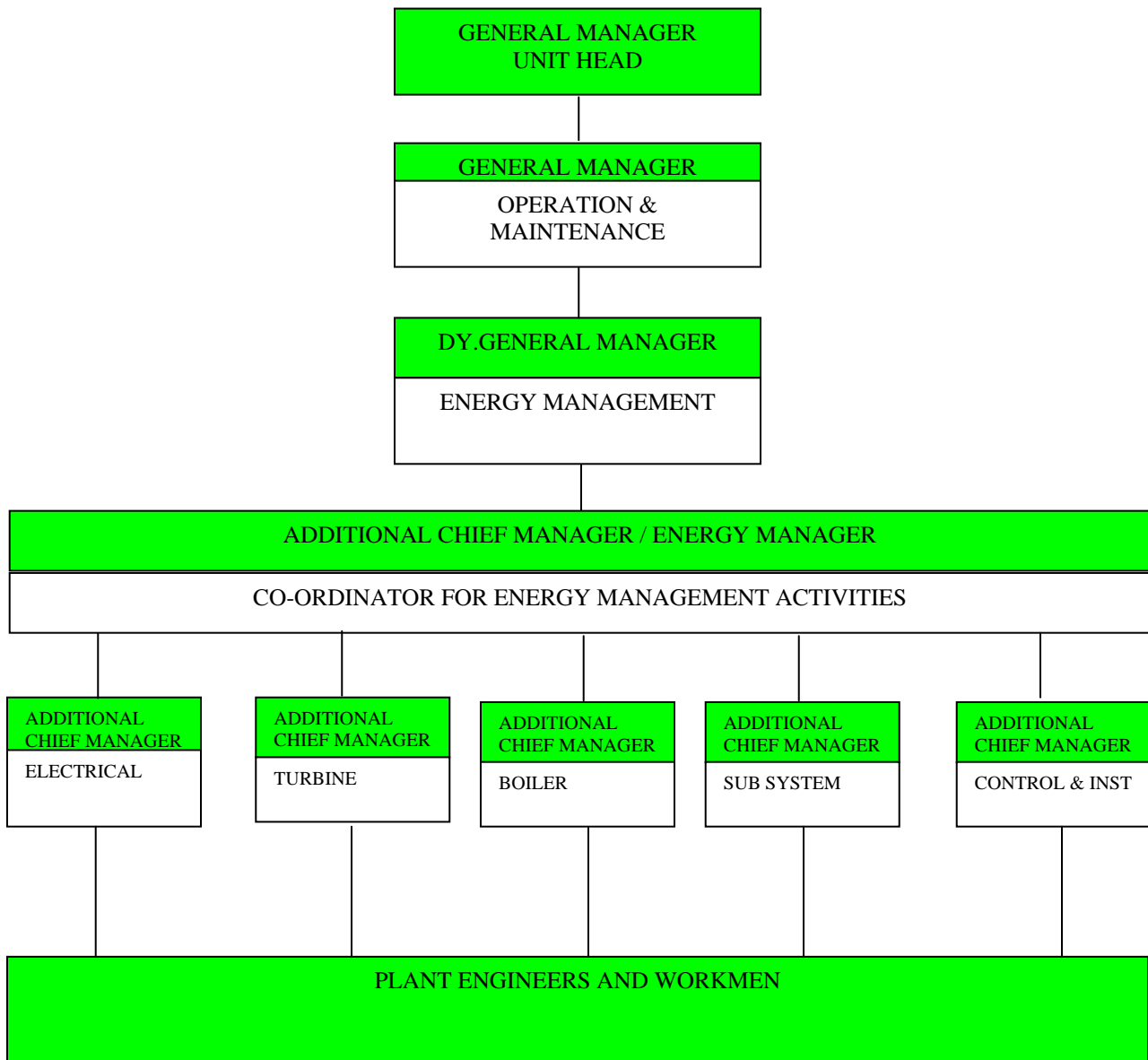
- > Effective and Efficient Management of Energy Resources with due attention to Environmental issues.
- > Create awareness on the needs and modes of Energy Conservation among Employees with inputs from within and outside the Organization.
- > Recognizing Employees' Energy conservation practices.
- > Conduct periodic review of the Energy Conservation procedures and strive for continual improvement with state-of-the-art technology.

Place: Neyveli  
Date: 22.10.2005

  
V. SETHURAMAN  
Director(Power)



## ENERGY CONSERVATION TEAM STRUCTURE





## Energy Conservation Achievements:

During the period from 2004- 2007 Thermal Power Station-I has implemented around 23 major proposals through Energy co-ordination committee meeting recommendations and suggestion from workmen resulting into total saving of Rs.806.7 lakhs with an investment of Rs.773.14lakhs. Apart from these major proposals, O& M practices were improved to conserve energy. This has resulted in a reduction of 1.81% in specific thermal energy consumption.

## Electrical & thermal saving during 2006-07:

Project description	Achievement of energy savings per year basis				Investment incurred on the project (Rs. Lakhs)
	Electricity	Fuels*		Total savings in (Rs. Lakhs)	
	(Lakhs (kWh))	Lignite (tonnes)	Total (fuel) in Mkal)		
<b>Blinding of one stage in the existing Feed pump to optimise the flow Quantity</b>	<b>9.84</b>	<b>0</b>	<b>0</b>	<b>17.91</b>	<b>0.10</b>
<b>190 Nos. of conventional Choke tube Lights were replaced with 28 W energy efficient tube lights.</b>	<b>0.208</b>	<b>0</b>	<b>0</b>	<b>0.38</b>	<b>1.32</b>
<b>Insulated ESV, HPHs and all turbine side valves of unit 2&amp;9</b>	<b>0</b>	<b>27424</b>	<b>73825.41</b>	<b>217.00</b>	<b>12.00</b>
<b>Reduced O2 % from 6.2 to 5.5 % in unit-2 as per the energy audit recommendation</b>	<b>0</b>	<b>1932</b>	<b>5200.944</b>	<b>15.39</b>	<b>0.00</b>
<b>Maintaining the Exit Flue gas of Unit-2 at 170 Deg.C</b>	<b>0</b>	<b>1860</b>	<b>5007.12</b>	<b>14.82</b>	<b>0.00</b>
<b>Attended air ingress in Boiler 9-A</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>27.00</b>	<b>10.00</b>
<b>Replaced AHU 3 &amp;5</b>	<b>3.82</b>	<b>0</b>	<b>0</b>	<b>6.96</b>	<b>10.00</b>
<b>Attended the by-pass valve of MCP-2A</b>	<b>1.03</b>	<b>0</b>	<b>0</b>	<b>1.87</b>	<b>0.00</b>
<b>Reduced the idle running time of external conveyors by 2 Hours per day</b>	<b>2.08</b>	<b>0</b>	<b>0</b>	<b>3.79</b>	<b>0.00</b>
<b>Sub Total</b>	<b>31.978</b>	<b>82700</b>	<b>84033.47</b>	<b>305.12</b>	<b>33.42</b>



**Future plans on energy conservation:**

Energy Conservation Measures (Planned)	Anticipated savings		Approx. investment (Rs.lakhs)	Project Commencement & Completion year	
				Commencement	completion
Replacement of old Boiler Feed Pump with New pump	1576800	28.71	25.00	2006-07	2007-08
Providing Hydro coupling for 4 Nos. of Feed Pumps	5044000	91.83	28.53	2006-07	2007-08
Introduction of Burner Management system in all the 12 Boilers.	-----	272.25	1089.00	2006-07	2007-08
Introduction of VFD for 2 Nos. of DM water Make up Pump	146120	2.66	4.00	2007-08	2007-08
Replacement of AHU 2,4, and AHU in MCB in phased manner	450420	8.20	15.00	2007-08	2007-08
Replace existing 400 Watt sodium vapor lamps by 400W Metal Halide lamps with 50% reduction in total no. of population at Turbine hall of UCB -6,7,8,9.	34620	0.63	0.60	2007-08	2007-08



## **ENVIRONMENT & SAFETY:**

Various initiatives on Safety awareness including Safety Audit, Risk Analysis, Monitoring and Measurement, health check-ups of all employees. Our Thermal Power Station is **ISO 9001:2000, EMS ISO 14001:2004 & OHSAS 18001:1999** certified Power Station.

### **Safety:**

Audits were conducted in line with our SH & E policy to maintain the optimization of resources elimination / minimization of OH&S hazard, at the first place and to bring better control by adopting the best practices and to sustain the zero accident at 600 MW Thermal Power Station-I. Hazard identification and risk assessment is carried out in the plant, which has resulted to identify proactively the potential risk and methodology to control SH & E performance in an ongoing manner. Various measures have been taken to avoid the fire hazard like installation of gas leakage detectors, sprinkler system & fire hydrant system etc. in the plant.

National safety day is observed every year in a grand manner. Various competitions are conducted to increase the awareness and consciousness among regular & contract workmen. Safety awards are also distributed to the selected Safety conscious workmen.

In addition, weeklong Safety week celebration is conducted every year involving all the mining industries in Kerala & Tamil Nadu. All the production & Services Units of NLC participate in the function and displaying different safety models. Top-level statutory authorities & dignitaries are invited for presiding over the function & the experts are delivering special lectures.



### **Environment:**

Industrialization should not be allowed to cause damage to Ecology and Environment. Being conscious that environmental regeneration is the foundation on which productivity has to be built, Neyveli Lignite Corporation started investing to Eco Care long back and it is continuing.

Neyveli Lignite Corporation has accorded the high priority to ecology development and pollution control. Continuous monitoring in respect of liquid/ gaseous effluents control is carried out at units and treated effluents meet all MINAS and the statutory requirements. To improve the environment the Corporation has a planned afforestation programmes, and reclamation of waste land development to control pollution free air in Neyveli as a regular activity of the Corporation.

Neyveli Lignite Corporation is well aware of the effects of open cast mining to the environment. It therefore gives a lot of importance to pollution control, reclaiming land and maintaining ecological balance. A pollution level in air is being continuously monitored through six air monitoring stations in Neyveli. All the guidelines of the Central Pollution Control Board have been adhered to.

NLC's success in land reclamation of mines spoils and afforestation has been overwhelming. The mined out area or the de-coaled area is refilled with overburden, since this does not contain plant nutrients. Or have the proper texture; great effort is put to successfully reclaim the land.

The dumped soil is improved in stages through modern techniques to bring back its original fertility and the agricultural operations are carried out by adding nutrients, like organic, inorganic and bio-fertilizers. Now crops and vegetables of various varieties are being continuously raised in about 250 hectares. Further it is also proposed to increase this backfilled area into cultivable land.



## **AFFORESTATION IN AND AROUND MINES**

The dreary and parched atmosphere of Neyveli, where mining began has now given way to lush greenery. The plantation helps control air pollution, acts as a windbreaker and prevents soil erosion. Massive afforestation were carried out in Mine spoil area, Industrial Units and Township. The total plantation in NLC is around 17 Million trees of various species planted in an area of 2750 hectares.

**Reclamation in Mine Spoil :** Research work was carried out in the Mine Spoil area by Organic forming, biological reclamation using bio-fertilizer s and Humic Acid developed at CARD. Utilization of Fly Ash in agriculture also carried out in Mine Spoil and the studies are under progress.

**Ash Pond Reclamation :** Abandoned Ash pond proposes environmental problem to create green cover. R&D Works were undertaken to re-vegetate in the Ashponds. Field trials were carried out in these areas and successfully establish re-vegetation with Orchardd/Forest Species. Some medically important plants have also been found to grow as undergrowth in the afforested area.

The suspended dust particles, emitted from Mines, Thermal Power Stations and other industrial units, are being arrested by the dense tree coverage.

Afforestation programme does not stop with the planting of trees, but restoring the trees whenever some damage is caused to the trees. During the cyclone on 5.12.93, number of trees were partly uprooted. Immediate action was taken to replant the avenue trees wherever possible - around 600 trees were thus replanted.

**Formation of artificial lakes, ponds and picnic spots :** Lakes and ponds were formed in the afforested areas and a picnic spot was also created with boating facilities, along with a mini zoo with rabbit, peacock, dove, spotted deer, duck etc. Fishes are bred in the lake. Different varieties are being grown. Water bodies, green shady trees and good climate attract birds from far and near. Neyveli has become a bird sanctuary and hundreds of species visit during different seasons.



## **Water Conservation**

Many water conservation measures have been taken up by NLC like

1. Optimization of ground water pumping in Mines,
2. Introduction of dry ash disposal system.
3. Artificial recharging of ground water etc., and
4. Stoppage of ground water pumping for Township and using mine storm water after treatment for Township.

Neyveli is now rich with crops, trees, lakes making it clean and green.

## **HORTICULTURE IN NLC**

The Horticulture Division is playing a major role in preserving the Environment in Neyveli Township by looking after the following activities. Maintenance of Gardens and Lawns in Public Buildings, Public Parks, Traffic Islands, etc. in the Township. Technical guidance for the maintenance of gardens and lawns in the public buildings in the Industrial Units. Maintenance of Horticulture nurseries. Development of new Parks in the Township. Planting of roadside avenue trees in the newly developed areas. NLC is maintaining 20 Public Gardens, 4 Public Parks and 15 Traffic Islands with aesthetic lawns and vegetation. A newly laid park in an area of 15 acres in Block-8 was dedicated to Pandit Nehru and named after him as the Nehru Centenary Park. This park serves as the lung centre of Neyveli.

**Nurseries** : The Nursery in Neyveli was developed in the early 60s. Another fully equipped Nursery was developed during 1987. Special collection in the Nursery include varieties of Hibiscus, Croutons, Dracaenas, cacti, Coleus, etc. This nursery has a Mist chamber for quick multiplication of plants, plus grafting, layering and budding for propagation.

\*\*\*\*\*