

TNPCB



news letter

செய்தி மடல்

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July - Sep. 2008

Impact of Climate Change



Heat Waves



Displacement



Hurricane



Drought



Flood



Forest Fire

LET US SAVE EARTH. STOP GLOBAL MELTDOWN.

தமிழ்நாடு மாசு கட்டுப்பாடு வாரியம்
Tamil Nadu Pollution Control Board

மாசற்ற உலகம் படைப்போம்

PUBLIC NOTICE

Starting 2nd October Smoking in 'Public Places'

BANNED

As per the notification GSR 417(E) dated 30th May 2008, the Central Government has revised the rules relating to 'Smoking in Public Places' w.e.f. 2nd October, 2008. The salient features of these rules include

- ★ Smoking is strictly prohibited in all public places. "Public Place" includes auditorium, hospital buildings, health institutions, amusement centres, restaurants, public offices, court buildings, educational institutions, libraries, public conveyances, stadium, railway stations, bus stops, workplaces, shopping malls, cinema halls, refreshment rooms, discotheques, coffee house, pubs, bars, airport lounge etc.
- ★ Any violation of this act is a punishable offence with fine upto Rs. 200.
- ★ However, a Hotel having thirty or more rooms or restaurant having seating capacity of thirty persons or more & airports may provide / have a separate smoking area or space, as required by the rules.
- ★ The owner, proprietor, manager, supervisor or in charge of the affairs of a public place shall ensure that:
 - a) No person smokes in the public place (under his jurisdiction / implied)
 - b) The board as specified in schedule-II of the rules; is displayed prominently at the entrance(s) of the Public place and conspicuous place(s) inside.
 - c) No ashtrays, matches, lighters or other things designed to facilitate smoking are provided in the public place.
- ★ The owner, proprietor, manager supervisor or in charge of the affairs of a public place shall notify and display prominently the name of the person to whom a complaint of any violation may be made.
- ★ If the owner, proprietor, manager, supervisor or the authorized officer of a public places fails to act on report of such violation, the owner, proprietor, manager, supervisor or the authorized officer shall be liable to pay fine equivalent to the number of individual offences.



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ENVIRONMENTAL STATUS OF THANJAVUR DISTRICT

Thanjavur district is located on the eastern part of TamilNadu surrounded by Tiruvarur, Nagapattinam district in the East, Pudukottai district in the South, Tiruchirappalli district in the West, Ariyalur district in the North. Thanjavur district lies in between the latitude of 1°0'08' and 11° 12' and longitude of 78° 48' and 79° 38' with an area of 3,396.57 Sq.Km and population of 22,05,375 as per 2001 census. This district comprises of 8 revenue Taluks (viz. Thanjavur, Thiruvaiyaru, Papanasam, Kumbakonam, Thiruvudaimaruthur, Orathanadu, Pattukkottai and Peravurani), 3 Municipalities 22 Town Panchayats and 14 Panchayat Unions and 589 Village Panchayats. Most of the famous ancient temples like Brahadeeshwarar (Thanjavur Big temple, Kumbeswarar temple, Kumbakonam Mahamahakulam temple, Oppliappan temple, PunnaiNallur Mariamman temple, Swamimalai etc., are located in this district. Thanjavur district, one of the districts of Cauvery delta which had a wonderful environment in the past decades is in the need of environmental preservation and its improvement. The main river that flows across the district are Cauvery, Coleroon, Kudamurutty, Arasalar, Vennar, Vettar, Vadavar and Grand anicut canal etc.,

Activities of Tnpcb In Thanjavur District

The district office headed by the Assistant Environmental Engineer is functioning at No.3, 4th Cross Street, Sree Ram Nagar, Reddipalayam Road, Thanjavur - 613004. In this office jurisdiction, 494 industries have applied for consent of the Board under Water (Prevention and Control of Pollution) Act, 1974 as amended and Air (Prevention and Control of Pollution) Act, 1981 as amended. Among them, 1 Distillery, 3 Sugar mills, 2 Co-generation power plant, 1 chemical unit, 1 LPG bottling plant, and a 120 MW Gas based power plant are the large scale industries. The majority of small scale industries are hospitals, rice mills with few aluminium/brass circle units, electroplating units, chemical units, automobile service and repair units, hotels, coir units, stone crushers, plastic product units, etc.,

Hazardous Waste Management

27 units are identified as Hazardous Waste generating units and all the units have obtained authorization under Hazardous Waste (Management and Handling) Rules, 1989 as amended.

Municipal Solid Waste Management

Out of 3 Municipalities, 2 Municipalities have identified land for developing compost yard and 2 Municipalities obtained NOC of the Board. Out of 22 Town Panchayat 15 have applied for authorization under Municipal Solid Waste (Management and Handling) Rules, 2000.

Bio Medical Waste Management

113 private hospitals have applied and obtained authorization for handling of Bio Medical



AUTOCLAVE & MECHANICAL LOADING INCINERATOR



VENTURY SCRUBBER

Waste under the Bio Medical Waste (Management & Handling) Rules, 1998 as amended. A common Bio

Medical Waste treatment facility M/s Medicare Enviro Systems is functioning since September 2004 at Sengipatti village, Thanjavur taluk, Thanjavur district to cater to the needs of hospitals located at Thanjavur, Nagapattinam, Thiruvarur, Tiruchy, Pudukkottai and part of Sivaganga districts. Maximum distance covered by the facility is 130 KM in radius with 380 private hospitals. 15 Government hospitals in Thanjavur district have also joined as member in the above facility. The common facility has a dual chamber incinerator with a capacity of 150 Kg/hr, an autoclave with a capacity of 500 Lit/cycle and a shredder as its treatment components. The unit has provided a ventury scrubber with a stack to a height of 30 metre for the incinerator. Also, the facility has an Effluent Treatment Plant to treat the trade effluent arising from autoclaving, vehicle washing and floor washings.

First Gas Based Power Plant in the World Approved as CDM Project



VIEW OF THE POWER PLANT

M/s Aban Power Company Limited located at Karuppur village, Thiruvudaimaruthur Taluk is a Gas based Combined Cycle Power Plant* with a capacity of 120 MW. The natural gas used as the fuel, which is a sweet gas, does not contain sulphur and hence its emission is free from Oxides of Sulphur. The latest technology in controlling the NOx in the field of Gas turbine is the installation of Dry Low NOx burners (DLN), which specifically tunes the burners of the



RAIN WATER HARVESTING POND WITH PERCOLATION PITS

turbine, controlling the formation of NOx at low level, enhances the efficiency of the engine and does not use DM water or steam for quenching the NOx level as in the conventional engines. It was reported that Gas turbine with DLN burners is a most suited machine in terms of cost, consistency in operation, control on emission of NOx. R.O. Plant is provided to achieve zero discharge of effluents arising from Heat Recovery Steam Generator (boiler), DM Plant and boiler blow down for Auxiliary cooling tower. The R.O. reject is being sent to engineered solar evaporation pans. Rain water harvesting pond having approximately 18000 KL holding capacity with percolation pits are provided. **It was reported that this is the first gas based power plant in the world approved as CDM project under AM 0029 methodology with ISO 14001 & OSHAS 18001 Certification.**

(*Heat engines are able to use a portion of energy their fuel generates. The remaining heat from combustion is generally wasted. In a Combined Cycle Power Plant (CCPP), a gas turbine generates electricity and the waste heat is used to make steam to generate additional electricity via a steam turbine.)

Reverse Osmosis Process to Treat the Distillery Spent Wash



Reverse Osmosis Plant

A distillery unit, M/s Thiru Arooran Sugars Limited located at Thirumandangudi village, Papanasam Taluk, has installed a R.O. Plant with a capacity of 800 M³ /day to treat the bio methanated effluent. The bio methanated effluent is filtered by the sand filter and cartridge filter, which removes the foreign materials and then it is pressurized over the membrane by the high pressure pump. The entire operations of the R.O. plant is automatically controlled by a stored programme in the micro processor fitted in the control panel. The R.O. permeate of about 50% is recycled in the fermentation process and the reject is utilized for bio compost. **It was reported that this is the only distillery installed with the R.O. Plant for treating the distillery effluent in Tamil Nadu and highest of its R.O. capacity (i.e.) 800 M³/day in Asia.**

A. Rengasamy

Assistant Environmental Engineer
TNPCB, Thanjavur

வாரியத்தில் சுதந்திரதின விழா



வாரியத்தலைவர் R. பாலகிருஷ்ணன் I.A.S. அவர்கள் கொடியேற்றி சிறப்பித்தார்

MONITORING OF CHENNAI CITY WATERWAYS

Tamil Nadu Pollution Control Board is monitoring the four city waterways i.e. Adyar river, Cooum river, Buckingham Canal and Otterinullah to assess the level of pollution by collecting water samples every month both in water bodies and industrial outlets.

Adyar River

In Chennai city the Adyar river basically serves as a flood carrier. However it also receives treated/partially treated domestic wastewater from industrial and domestic sector. The annual average values of TSS, BOD & COD during the period April 2007 to March 2008 are 52 mg/L, 32 mg/L and 131 mg/L respectively. Among the five river stations Thiru-Vi-Ka Bridge shows higher value of inorganic content i.e. TDS 10685 mg/L and Chloride 5953 mg/L.

Among the outlets slaughter house outlet shows the alarming average level of TSS 21046 mg/L, BOD 21880 mg/L and COD 32563 mg/L. The level is slightly increased when compared to previous year. Guindy Industrial Estate outlet shows slightly increased level of pollutants when compared to previous year. Nesapakkam STP outlet shows slightly reduced level of pollutants when compared to previous year.

Buckingham Canal

Buckingham Canal shows the annual average values of 219 mg/L, 45 mg/L and 438 mg/L of TSS, BOD and COD respectively. The values shows marked increase when compared to previous year. As usual higher values of pollutants are observed in Buckingham canal among the four city waterways. Among the river stations Elliots Road Bridge shows higher value of pollutants followed by Basin Road Bridge and then by wallajah Road Bridge.

Among the outlets Ennore Thermal Power station outlet shows higher values of TDS, BOD and COD values. Kodungaiyur STP I outlet performance is increased to the satisfactory level as it is indicated by the ten to fifteen fold decrease in the level of pollutants at outlet of STP. Perungudi STP outlet though it shows decreased level of pollutants the performance can be improved to the desired level.

Cooum River

The annual average of 2006-2007 of Cooum river shows the value of TSS 100mg/L, BOD 57 mg/L and COD 210 mg/L. There is a no change in the level of pollutants when compared to previous year. The Cooum river falls in second rank among the four city waterways in the level of pollutants. Among the river stations samples collected at Aminjikarai Bridge shows higher values of organic pollutants followed by Quaid- E - Millet Bridge. Koyembedu STP outlet shows five fold decrease in the level of pollutants than the inlet.

Otteri Nullah

Otteri Nullah ranks third in the level of contamination among the four city waterways. The annual average values for the period 2007 - 2008 are TSS 121 mg/L, BOD 73 mg/L, and COD 203 mg/L. These values are slightly increased when compared to previous year. Among the river station Avadi Road Bridge shows higher values of pollutants.

Among the outlets slaughterhouse outlet shows very high level of TSS 7019 mg/L, BOD 5649 mg/L and COD 14407 mg/L. The same trend of high level of pollutants is maintained. Among the four city waterways the level of contamination is high in Buckingham Cannel followed by Cooum and then Otteri Nullah. Adyar river shows lesser value among the city waterways

| Sl.No. | Source | TSS(mg/L) | BOD(mg/L) | COD(mg/L) |
|--------|------------------|-----------|-----------|-----------|
| 1 | Adyar | 52(40) | 32(27) | 131(148) |
| 2 | Buckingham Canal | 219(87) | 115(58) | 438(250) |
| 3 | Cooum | 100(63) | 57(49) | 210(212) |
| 4 | Otteri Nullah | 121(80) | 73(41) | 203(199) |

Values in brackets indicates the values of previous year.

P.V.Marimuthu
Assistant Director, AEL, TNPCB

RISKS OF PASSIVE SMOKING

Tobacco smoke exposure has immediate and substantial effects on blood and blood vessels in a way that increases the risk of a heart attack, particularly in people already at risk. Exposure to tobacco smoke for 30 minutes significantly reduces coronary flow velocity reserve in healthy nonsmokers.

Non-smokers are not safe:

The non smokers inspite of their clean habit fall into the category of Passive smokers in the company of smokers. Passive smokers are the innocent non-smokers who involuntarily inhale the smoke from tobacco products. It occurs when tobacco smoke permeates any environment, causing its inhalation by all people within that environment. This even includes the babies. Babies who are exposed to cigarette smoke in the house before or after birth have an increased risk of Sudden Infant Death Syndrome (SIDS). United States Environment Protection Agency (USEPA) has concluded that exposure to secondhand smoke can cause **lung cancer** in adults who do not smoke. USEPA estimates that exposure to secondhand smoke causes approximately 3,000 lung cancer deaths per year in nonsmokers. Exposure to secondhand smoke has also been shown in a number of studies to increase the risk of heart disease.

Passive smoking:

Passive smoking can damage the health of a non-smoker to quite an extent. Passive smoking is inhaling second hand smoke. Secondhand smoke is

a mixture of the smoke given off by the burning end of a cigarette, pipe, or cigar, and the smoke exhaled by smokers. This secondhand smoke (SHS) is also called environmental tobacco smoke (ETS) and exposure to secondhand smoke is sometimes called involuntary or passive smoking.

Effects of passive smoking:

A study issued in 2002 by the International Agency for Research on Cancer of the World Health Organization concluded that nonsmokers are exposed to the same carcinogens as active smokers. Sidestream smoke contains more than 4000 chemicals, including 69 known carcinogens such as formaldehyde, lead, arsenic, benzene, and radioactive polonium 210, and several well-established carcinogens have been shown by the tobacco companies' own research to be present at higher concentrations in sidestream smoke than in mainstream smoke.

Tobacco smoke exposure has immediate and substantial effects on blood and blood vessels in a way that increases the risk of a heart attack, particularly in people already at risk. Exposure to tobacco smoke for 30 minutes significantly reduces coronary flow velocity reserve in healthy nonsmokers.

The smoke contains chemicals that can cause cancer. Some of these carcinogenic ingredients are:

- Carbon monoxide.
- Tar.
- Arsenic.
- Cyanide.



- Benzene.
- Formaldehyde.
- Methanol.
- Acetylene.
- Ammonia.
- Lead.

Short-term effects:

Adults or children with asthma can experience attacks brought on by passive smoking. Since the 1980s there has been substantial evidence that there is a relationship between parents smoking in the house and children developing asthma and other related illnesses. Research has shown that the younger the child—as young as a fetus even—the more susceptible and harmful the effects of second hand smoking can be. These children of smokers tend to have a lung capacity that is less than children of the same height, weight, age, and sex of those children who are not exposed to constant second hand smoke. Children who are exposed to cigarette smoke in their home day after day are more likely to cough, wheeze, get sore throats, and respiratory problems than children who live in homes with non-smokers.

Long-term effects:

Research has generated scientific evidence that secondhand smoke causes the same problems as direct smoking, including heart disease, cardiovascular disease, lung cancer, and lung ailments such as bronchitis and asthma. Specifically, meta-analyses have shown lifelong non-smokers with partners who smoke in the home

have a 20–30% greater risk of lung cancer, and those exposed to cigarette smoke in the workplace have an increased risk of 16–19%.

There is some evidence that reducing exposure to tobacco smoke cuts the risk of heart attack. Some studies find that non-smokers living with smokers have about a 25% increase in risk of death from heart attack, are more likely to suffer a stroke, and can sometimes contract genital cancer.

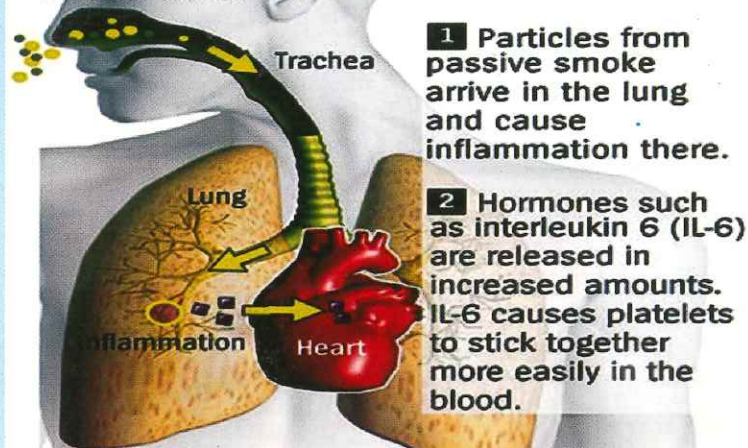
A wide array of negative effects are attributed, in whole or in part, to frequent, long term exposure to secondhand smoke. Some of these effects include:

- **Cancer:**
 - **General:**
 - Overall increased risk; reviewing the evidence accumulated on a worldwide basis, the International Agency for Research on Cancer concluded in 2002 that “Involuntary smoking (exposure to secondhand or ‘environmental’ tobacco smoke) is carcinogenic to humans.

- **Lung cancer:**
 - The effect of passive smoking on lung cancer has been extensively studied. A series of studies from the USA from 1986–2003, the UK in 1998, Australia in 1997 and internationally in 2004 have consistently shown a significant increase in relative risk among those exposed to passive smoke.
- **Breast cancer:**
 - Breast cancer risk is increased by 70% in younger, primarily premenopausal women.

Sheer Heart Attack

Possible effects of passive smoking on the human heart



3 If an artery is already clogged, this can lead to a blood clot forming - thereby causing a heart attack

According to a study from Scotland, **the number of heart attacks has dropped by 17 percent in the total population and by 20 percent among non-smokers since the introduction of the smoking ban.**

DER SPIEGEL

Serious Health Risks to Children

The National Asthma Council of Australia cites studies showing that environmental tobacco smoke (ETS) is probably the most important indoor pollutant, especially around young children. Children are particularly vulnerable to the effects of secondhand smoke because they are still developing physically, have higher breathing rates than adults, and have little control over their indoor environments.

- Exposure to secondhand smoke can **cause asthma** in children who have not previously exhibited symptoms. Exposure to secondhand

smoke increases the risk for **Sudden Infant Death Syndrome**.

- Infants and children younger than 6 who are regularly exposed to secondhand smoke are at increased risk of lower respiratory track infections, such as **pneumonia and bronchitis**.
- Children who regularly breathe secondhand smoke are at



increased risk for **middle ear infections**.

Where do you stand?

Do people who choose not to smoke have to be forced to do so by a smoker? People should have a right to live and work in a smoke-free environment. If you really need to smoke and seek the death do it where you don't affect the health of others. Smoking in public places also tempts smokers who are trying to quit. So please quit smoking and save the health of yours as well as others.

Compiled by **M. Mythili**,
Environmental Scientist, AEL,
TNPCB

The California Environmental Protection Agency has concluded that passive smoking causes breast cancer and the US Surgeon General has concluded that the evidence is “suggestive,” one step below causal.

- **Ear, nose, and throat:**
 - Risk of ear infections
- **Circulatory system:**
 - Risk of heart disease, reduced heart rate variability, higher heart rate
- **Lung problems:**
 - Risk of asthma.
- **Pregnancy:**
 - Risk of premature birth.
- **Risk to children:**
 - Risk of sudden infant death syndrome (SIDS).
 - Risk of developing asthma.
 - Risk of lung infections.
 - More severe illness with bronchiolitis.
 - Increased risk of developing tuberculosis if exposed to a carrier.
 - Risk of allergies.
 - Risk of learning difficulties, developmental delays, and neurobehavioral effects.
- **General:**
 - Worsening of asthma, allergies, and other conditions.
 - Animal models suggest a role for nicotine and carbon monoxide in neurocognitive problems.
 - Overall increased risk of death in both adults, where it is estimated to kill 53,000 nonsmokers per year, making it the 3rd leading cause of preventable death in the U.S. and in children.

HOW GREEN ARE WE?

A middle-aged man, buying mangoes at the market, asks for an extra plastic bag to hold the fruit. A couple, holding hands at the beach carelessly lets the biscuit wrapper drift away till a wave laps it up. A family watching T.V. forgets to switch off the motor and lets the tank overflow. Workers cut huge trees along a road to put in telephone wires. A young man shaves while the water flows on from the tap.

Lack of empathy:

Simple and mundane stuff but these things have huge consequences? Global warming, climate change, food scarcity, rampant pollution and destruction of forests are being discussed.

But what does the common man know about this? Are schools concentrating on making children aware of their surroundings and being more responsible citizens?

The biggest challenge for positive change is denial and lack of empathy. We don't think it's dangerous enough nor do we care. But danger is looming ahead. Consumption of natural fuels and pollution of the environment has multiplied to dangerous levels. Our planet is under great pressure.

Unless we wake up to the dangers, we will lose out and eventually perish.

Become eco-friendly and take up the gauntlet to save the planet. Talk to as many people and convert them to go green.

Nothing gives us the right to exploit our surroundings. It's upto each of us to do what we can to save our world.

What we can do:

- Use energy efficient appliances
- Plant trees and stop people from cutting them down.
- Change bulbs to CFLs that use less electricity.
- Plastic is passe, Carry our own shopping bags. Do not accept plastic bags unless they are bio-degradable.
- Ignore any product that says use and throw. Recycle whatever we can.
- Segregate daily garbage into two containers. Plastics and glass in one perishable waste in another.
- Drive a hybrid vehicle, if possible. Carpool to reduce fuel consumption.
- Throwing a party? Buy cutlery made of palm leaves and recycled materials.
- Always shut down electronic appliances when not in use. Don't leave laptops, music systems and fans running.
- Use water judiciously. Just because we get 24 hours supply does not mean we can waste it.
- Start a community drive to keep our locality plastic free.

R. Kumar

Joint Chief Env'tl. Engr.,
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GROUNDWATER CONTAMINATION AND POLLUTANT TRANSPORT STUDY

Water is a prime natural resource, a basic human need and precious natural asset that enables the existence and survival of life on earth. It is a limited and valuable resource. The demand for water is ever increasing with explosive population growth, improving living standards, increased agricultural, industrial production and other interaction systems such as navigation and recreation, but the water resources are limited. Fast growing needs for fresh water necessitates effective planning and management of water resources systems.

Surface water and groundwater resources are the major sources of water in our country. Among this groundwater constitutes an important source of water for various purposes like domestic needs, industries and irrigation, which needs to be managed carefully, especially in drought prone and hard rock areas. Surface water resources are inadequate to meet the water requirement due to the vagaries of monsoon and unequal distribution of precipitation in our country. This uneven spatial and temporal distribution of the precipitation leads to floods and drought, affecting the vast areas of the country. Hence, groundwater resources represent the only reliable source of natural freshwater. Groundwater accounts for about 97 percent of the fresh water sources in the world today.

Most inhabitants are dependent on agriculture, and as the surface water is limited, groundwater is the main source of water. Continuous increase in population has led to increased demand for water and overexploitation of the water resources. Groundwater is exploited through open wells and tube wells for domestic, industrial and agricultural purposes. Withdrawal of groundwater in excess of natural replenishment of groundwater resources leads to lowering of the water table. The only replenishment of this exploited resource is rainfall, which is limited to few monsoon months in a year, particularly in semi arid regions of our country (United Nations Development Programme, 1971). The annual rainfall in the semi arid region is often scanty and recurring drought often prevails. In order to arrest the depletion of groundwater level and to achieve sustainable development, several measures

including artificial recharging of groundwater with available surface water are required in these semi arid hard rock regions. Since groundwater aquifers receive recharge from some surficial source, polluting activities by humans on the surface often cause pollutants to reach the aquifer.

Groundwater contamination resulting from improper waste management practices not only threatens public health and the environment, but can cost businesses large sums of money. However, businesses routinely generate wastes such as seemingly harmless wastewaters which can threaten groundwater quality. Businesses responsible for groundwater contamination can encounter fines, lawsuits and cleanup costs running into billions of rupees. Moreover, banks increasingly require environmental audits before extending loans to businesses. By properly managing their wastewaters, businesses can avoid these difficulties while protecting human health and the environment.

The groundwater quality deterioration may manifest itself in the form of increased salinity, or increased concentrations of nitrates or other undesirable chemical species, or increased concentrations of harmful microbes and viruses. While a good deal of attention was devoted in promoting groundwater irrigation, inadequate or no attention was paid to sustain this precious resource. Further, all the pollution abatement laws hitherto enacted, have not appreciably protected pollution of water bodies-both surface and sub-surface-contributing to permanent damage to our ecology and environment. The unregulated and over-use of groundwater has raised a fundamental question of its sustainability and the availability of this resource to our future generation. At present, very few countries have regular monitoring programs to gauge the health of their aquifers. This is partly logistical: it is extremely costly to adequately track the health of underground water resources, for the same reasons that make it so difficult to clean them.

In the subsurface, the various contaminants undergo complex physical, chemical, and biological transformations. Once reaching an aquifer,

contaminants are transported with the moving groundwater, eventually reaching wells that pump water for domestic or industrial use. The discovery of subsurface contaminants in concentrations that pose a hazard to human health, or to the environment, calls for remedial action. Regulations may require cleanup the contaminated aquifer, the unsaturated zone, or of both.

A tool is needed that will provide this information. The tool for understanding the system and its behavior and for predicting this response is the model. Usually, the model takes the form of a set of mathematical equations, involving one or more partial differential equations. We refer to such model as a mathematical model. The preferred method of solution of the mathematical model of a given problem is the analytical solution. The advantage of the analytical solution is that the same solution can be applied to various numerical values of model coefficients and parameters, say within the framework of a sensitivity analysis aimed at coping with the uncertainty associated with the values these coefficients and parameters. Unfortunately, for most practical problems, because of the heterogeneity of the considered domain, the irregular shape of its boundaries and the non-analytic form of the various source functions, solving the mathematical models analytically is not possible. Instead, transform the mathematical model into a numerical one, solving it by means of computer programs.

Pollution of groundwater has been growing incessantly in several parts of the country particularly due to the indiscriminate discharge of waste water from the industries, which either do not have or have inadequate treatment facilities. These industries discharge their waste water into the immediate neighbourhood open channels which ultimately confluences with ponds; streams, rivers etc.,. The chemical constituent of the waste material often seeps down from the entire course and from the stagnated points into the groundwater system. Once the groundwater system gets polluted, cleaning and redemption is prohibitively costly. The problem of groundwater pollution has appeared, not only in developed countries, but also in developing countries. Groundwater pollution is a serious environmental problem that may damage human health, destroy the ecosystem, and cause water shortage. Hence a systematic and scientific

management of this vital resource is essential to achieve optimum results.

In the protection and improvement of groundwater quality, two challenging problems have been presented: for uncontaminated aquifers, it is required to assess the potential dangers of pollution; for contaminated aquifers, it is required to draw up remediation projects. In both situations, we need a tool to predict the pollutant distribution in groundwater. Obviously, field experiments cannot serve this purpose. The only tool that we can use is mathematical modeling. In the past two decades, mathematical modeling techniques were extensively used in the study of mass and heat transport in groundwater and soil. Presently, we can stimulate a three-dimensional multi-component transport in a multi-phase flow using a computer without any essential difficulty. Since simulation models can provide forecasts of future states of groundwater systems, the optimal protection or rehabilitation strategy may be found by incorporating a simulation model into a management model.

There are, however, several difficult problems in groundwater quality modeling that have not yet been adequately solved.

The first one is called the "scale effect problem". The identified dispersivities may vary with the scale of experiment and the size of element of numerical discretization.

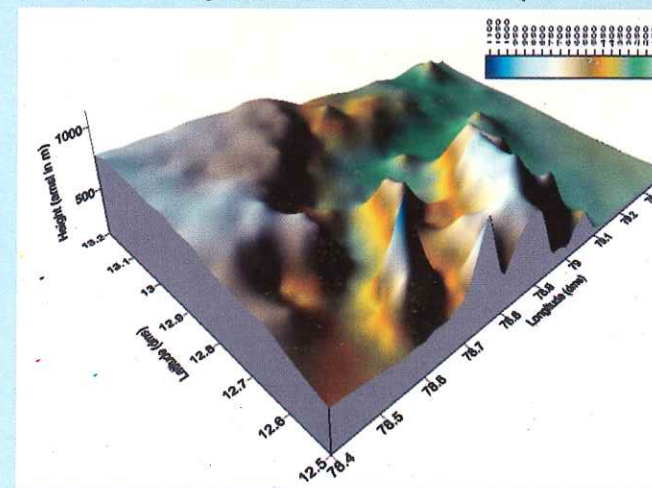
The second one is called the "numerical dispersion problem". Sharp concentration fronts are difficult to simulate accurately using a numerical method.

The third difficulty is caused by the "uncertainty enlargement problem". The uncertainties associated with hydraulic conductivities, porosities and head distributions may be enlarged and propagated to the calculation of velocity fields through Darcy's Law. Incorrect velocity distributions may cause large components of contaminant transport and fate.

The fourth difficulty is caused by the "data insufficient problem". Tracer tests can only be carried out on a small region and it is difficult to observe concentration plumes in three-dimensional space. Generally, we do not have enough data for calibrating the mass transport model of regional problems.

These difficulties make the modeling study of groundwater quality problems is significant, the accuracy of a mass transport model and, thus, the reliability of management decisions derived from the model, are often questionable.

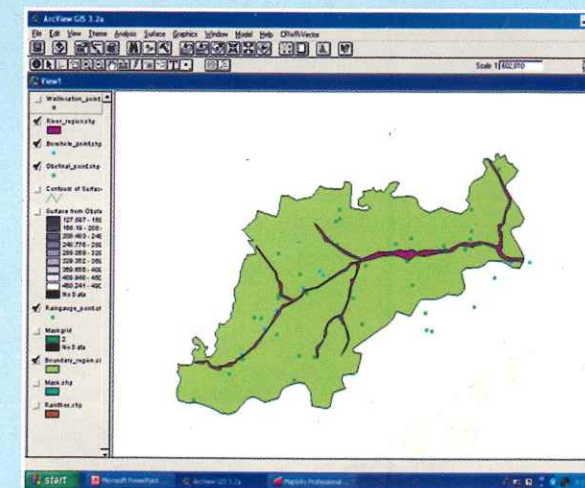
The chemical and biological constituents contained in groundwater depend on two factors: the natural environment of groundwater storage and movement, and human activities. Precipitation, infiltration and surface water percolation are the natural sources of groundwater. The total dissolved solids (TDS) of precipitation is generally very low, but its chemical components will be changed when infiltrated through solid beds by a series of actions, such as solution, oxidation, reduction, ion exchange, and so on. The infiltration and percolation water will be involved in groundwater movement in both the vertical and the lateral directions in the aquifer. During this process, the TDS of groundwater will continually increase as rocks and minerals are dissolved into the water. Human activities may change the natural process and cause groundwater to contain organisms, hydrocarbons, heavy metals and other harmful matter. Groundwater, therefore, should be looked upon as a multicomponent fluid. If the groundwater quality (including its physical, chemical, and biological properties) has been changed so that it is no longer suited to the preferred uses, then the groundwater is said to be polluted.



Digital Elevation Model (DEM) of the Upper Palar Basin.

The predictive calculations for some aquifers have shown that even if the pollution source has been removed, self-purification will take several decades, or even hundreds of years. It is more difficult to abate groundwater pollution in fine porous media. High costs and a long period of time are needed for remediating groundwater pollution compared to what is required for surface water. Therefore, preference should be given to prediction and prevention, as well as regular monitoring and analysis of groundwater quality.

Integration of GIS with groundwater models i.e a groundwater model using GIS has many distinct advantages over traditional methods. GIS is a technology that can greatly facilitate the development, calibration, and verification of groundwater models, as well as the display of groundwater model parameters and results. Through linking of a digital mapping system to a database, GIS has the ability to integrate data layers and perform spatial operations on data. Thus, GIS can automate many of the data compilation and management duties in groundwater modeling. GIS facilitated multiple simulations in a short time, reduced the probability of data entry errors, and proved useful in interactions between hydrologists and decision makers. The value of GIS in groundwater modeling studies has been well documented in recent years.



Processed Upper Palar Basin Map in Arcview

**S.Raghupathi, A.E.E.,
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ECO FRIENDLY SOLAR THERMAL POWER SYSTEMS

Introduction

Sun is the principal source of almost all conventional and non conventional energies. Although the utilisation of solar radiation especially for heating and drying is from time immemorial, power production is a recent development. In fact, conversion of solar energy to electricity is a viable technology now-a-days that provides benefits like energy conservation, environmental preservation and economic development.

Solar thermal power systems

Several solar thermal power systems are in operation worldwide. The major power systems among them are (i) Parabolic trough collector based power system (ii) Parabolic dish collector based power system and (iii) Heliostat based power system. It is worth mentioning that solar thermal power plants based on parabolic trough collectors have recorded the maximum power generating capacity so far in the world.

Parabolic trough collector based power system

This system mainly consists of parabolic trough collector made of curved mirrors, absorber tubes and tracking mechanism. The parabolic trough collector is



Parabolic trough based power system

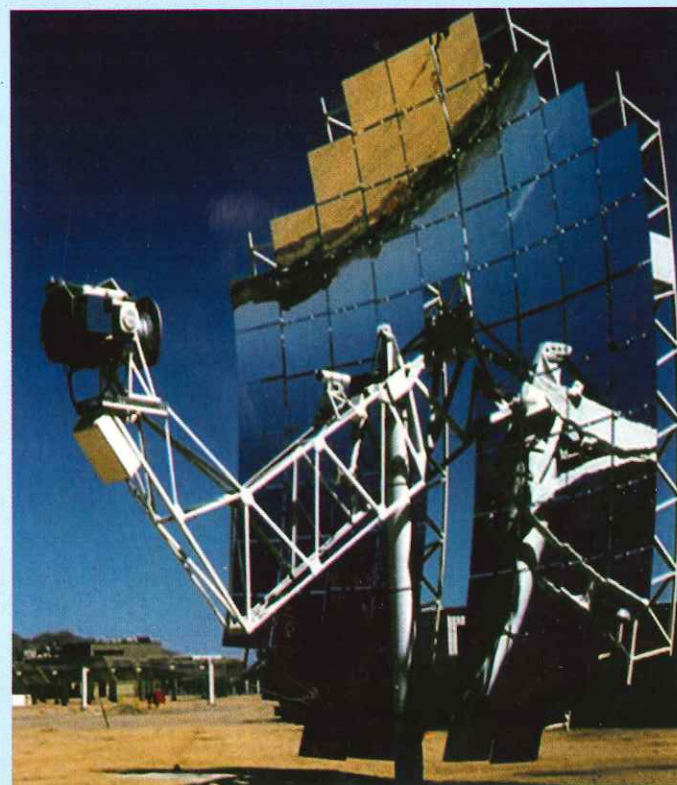
shaped like a parabola for the collection of solar radiation. This collector can track the sun in a single axis from east to west. The radiation collected is

concentrated on absorber tubes through which the heat collection fluid can flow. The receiver tubes are selectively coated and they are normally enveloped by a co-centric evacuated glass tube. While selective coating is used to enhance absorption of solar radiation, evacuated glass tube is used to reduce heat losses.

The collector field of the power plant consists of arrays of line focusing parabolic collectors. The working fluid can be heated as high as 400 °C and is transferred to water through heat exchangers to produce superheated steam that can be used for electricity production through a turbine.

Parabolic dish collector based power system

This system mainly consists of parabolic dish collector, receiver and tracking mechanism. The



Parabolic dish collector based power system

parabolic dish collector is shaped like a parabola for the collection of solar radiation. This collector can track the sun in two axes and can reflect the incident solar energy to the focus of the dish. The reflected radiation is absorbed by the receiver



Heliostat based power system

The receiver can attain temperatures of about 800°C. The heat thus produced is transferred to a heat engine that converts it into mechanical energy. This energy then drives a generator to produce electricity.

Heliostat based power system

This power system mainly consists of heliostats (solar collectors) made of flat mirrors with high reflectivity, receiver and tracking mechanism. In fact, the heliostats reflect the incident radiation tracking the sun in two axes. The reflected radiation is concentrated on a receiver, which is placed on top of a tower at the focal point of the array.

The concentrated solar radiation can heat the working fluid passing through the receiver to temperatures as high as 550 °C. There are various other additional mechanisms by which the temperatures can be raised as high as 1000 °C. The collected heat can then be used for power generation.

Energy, environment and economic benefits

A wide gap in between demand and supply of electricity exists nowadays. Renewable systems

with special reference to solar thermal power systems can meet partially the existing demand for electricity in our country. Solar thermal power system is like a conventional thermal power system having steam boiler, turbine and generator. In a conventional thermal power system, water is heated by the combustion of coal or oil to produce steam, which rotates a turbine coupled to a generator to produce electricity. It is estimated that coal based thermal power systems emit 55,000 tones of sulphur dioxide, 27,000 tones of nitrogen oxides, 2,000 tones of carbon monoxide and 3,000 tons of particulate matter for the production of 1 GW of electricity per year. It is also estimated that oil based thermal power systems emit 37,000 tones of sulphur dioxide, 24,800 tones of nitrogen oxides, 710 tones of carbon monoxide and 1,200 tons of particulate matter for the production of 1 GW of electricity per year. Besides these air pollutants, liquid effluents like organic compounds, sulphuric acid, chlorides, phosphates, boron and suspended solids are emitted along with the solid wastes like bottom ash and fly ash. Whereas solar thermal power systems do not emit any gaseous pollutants, particulate pollutants and liquid as well as solid wastes due to the utilization of solar radiation for the generation of steam. Though the capital cost for the construction of solar thermal power systems is as high as that of other thermal power systems, the cost of fuel for the operation of these systems is substantially reduced as conventional fuels are replaced by renewable solar radiation. The potential and prospects of solar thermal power production is prosperous in our country and so it is concluded that the solar thermal power systems can provide a positive progress in the sustainable development of our country.

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WATER TREATMENT BY BATCH PROCESS FOR POTABLE WATER PRODUCTION

Abstract:

Experiments have been carried out to measure the various parameters like COD, salinity, heavy metal content and CFU directly and indirectly. COD of the water samples before and after passing it through the sand filter is estimated. This showed that the COD of the water is effectively reduced by 61.25 percent. Salinity of the water is treated with the capacitive deionization technique. It is found that salinity can be reduced up to 89% by treating it for half an hour. Heavy metal content in the water can be effectively removed by treated sawdust. It is found that when heavy metal is in range 1-3 ppm in water, 95-100% of it can be removed. Ceramic impregnated with silver nano particles is used to remove bacteria in water. The presence of bacteria is measured using CFU. The CFU reduced from 300cfu/ml to 180cfu/ml.

Introduction:

The water from the various sources contain suspended particles, heavy metals, alarming level of salinity, micro organisms etc., make the water unfit for human usage. So the removal of these substances is very important. We have adopted few techniques which removes most of the unwanted matters present in the water. The process involves the following techniques:

- Alum treatment: To flocculate the suspended particles.
- Sand filtration: To remove turbidity and for the efficient reduction of COD.
- Capacitive deionization: For the reduction of salinity in water.
- Heavy metal treatment: To remove heavy metals and dyes.
- Bactericidal treatment: To remove bacteria present in water.
- Acid/alkaline water charger: To separate the acid and alkaline components in water and to obtain the desired pH of water.

Alum Treatment:

The water sample is initially subjected to alum treatment. About 10mg of alum is added per liter of water and allowed to settle for 15 minutes. The top



layer of the water is decant into the sand filter for the removal of the flocculated impurities.

Inference:

The coagulated impurities are clearly seen after the addition of alum.

Sand Filtration:

The next step of the process is sand filtration. The water is allowed to pass through 15cm sand bed and collected in a temporary storage container. Flow rate is about 6 min/litre.



Analysis:

The water samples before and after the sand filtration is subjected to COD analysis. The following results are obtained.

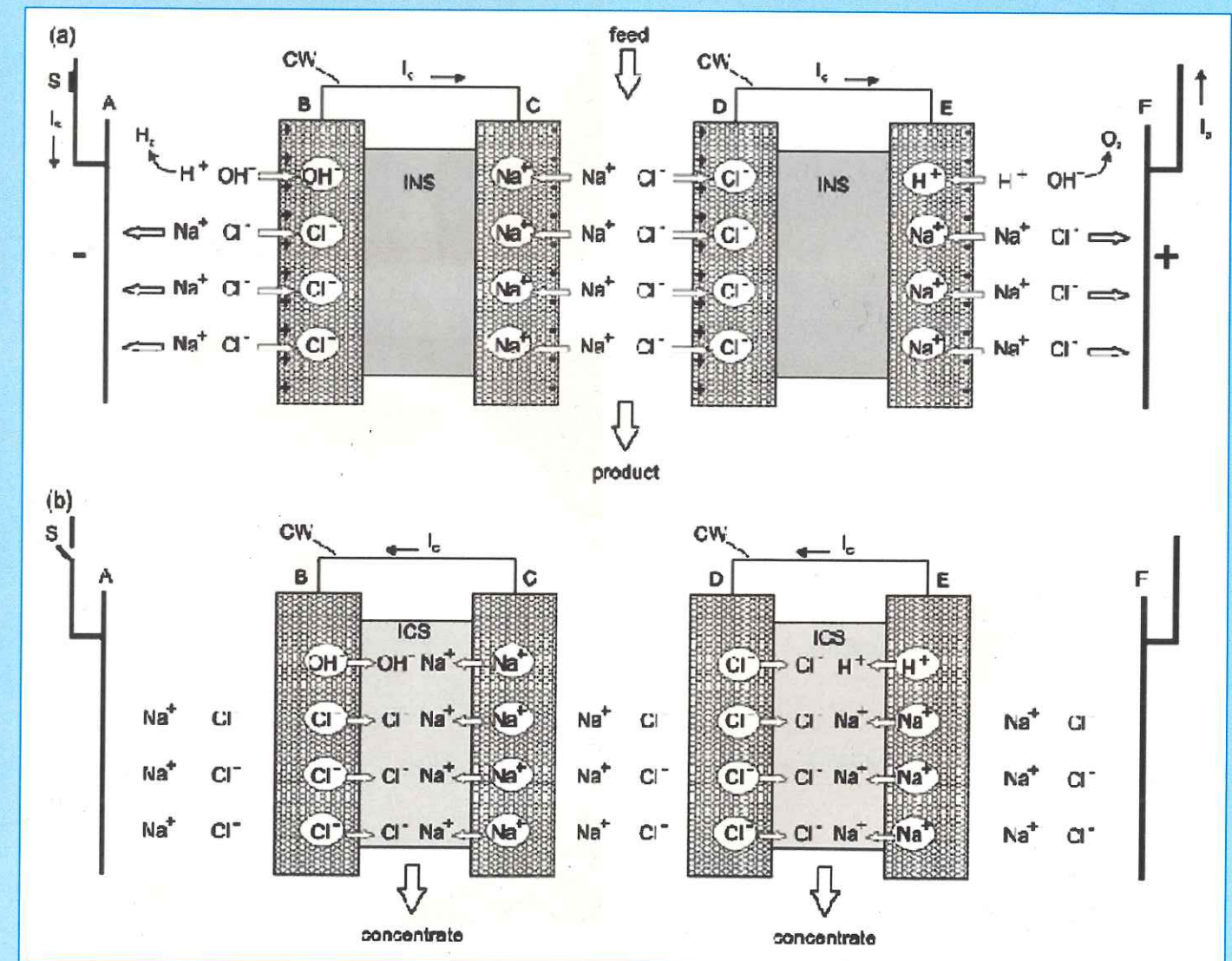
| S.No. | Sample | Parameters | Results |
|-------|------------------------|------------|---------|
| 1 | Before sand filtration | COD | 62 ppm |
| 2 | After sand filtration | COD | 24 ppm |

Inference:

- There was a significant reduction in the turbidity level.
- The COD of the sample was reduced by 61.29%.

Capacitive Deionisation:

Capacitive desalination has been a cost effective and efficient method to desalinate water. Water as high as 3000ppm can be desalinated efficiently. This process is done by placing 6 graphite electrodes inside a sealed chamber at a distance of 5mm. The electrodes are connected externally as shown. The water is fed into the alternate chambers. The voltage is supplied at the ends of the chamber. Deionization takes place as shown below resulting in the removal of salinity of the feed water.



Analysis:

The following are the results of desalination under different time and current intensity

| Time (sec) | Current (A) | Initial Conc (ppm) | % NaCl removed |
|------------|-------------|--------------------|----------------|
| 0 | 0.409 | 2925 | - |
| 240 | 0.311 | 2248 | 23.14 |
| 480 | 0.251 | 1727 | 40.95 |
| 720 | 0.225 | 1311 | 55.97 |
| 960 | 0.211 | 992 | 66.01 |
| 1200 | 0.192 | 701 | 75.93 |
| 1440 | 0.171 | 472 | 83.76 |
| 1680 | 0.153 | 301 | 89.65 |

Ref: Electrochemical Acta 53 (2008) 7123-7130

Saw Dust Treatment Coupled with Bactericidal Treatment:

The ceramic pot is coated with silver nano particles. About 20 grams of saw dust is introduced inside the pot. Sample water is poured into the ceramic pot and aerated for one hour.

Heavy metal analysis:

1 gram of mercuric chloride is added to 100ml of water and the conductivity of the sample is determined. It is then aerated along with saw dust for one hour and the conductivity of the final sample is determined.

The results are obtained as below:

| S.No. | Sample | Parameters | Results |
|-------|---------------------------|----------------------|-------------------|
| 1 | Before absorption process | Conductivity at 25°C | 9983 μ mho/cm |
| 2 | After absorption process | Conductivity at 25°C | 8665 μ mho/cm |

Inference:

Hence we conclude that saw dust can adsorb 35mg per gram

Bacterial analysis:

CFU analysis is used to determine the presence of bacteria in the sample. The water sample is transferred into the ceramic pot and is set aside for 1 hour. The 10^6 dilution of the initial and final water sample is used for bacterial culture.

The results obtained are mentioned as below:



Before Filtration



After Filtration

Result obtained:

| Before filtration (cfu/ml) | After filtration (cfu/ml) |
|----------------------------|---------------------------|
| 300 | 180 |

Acid/alkaline Water Charger:

The cathode and anode are separated by a synthetic chamois cloth. The flow of water is restricted by means of a perforated PVC sheet. Water is transferred into the acid/alkaline water charger and a voltage of around 20V is applied across the chamber. The pH of the water is checked periodically, and when the desired pH (6.5-7.5) is obtained, the alkaline water is immediately discharged to the water storage container.

Cost Per 1000 Litre of Water Production

| S.No | Material | Quantity | Cost (INR) |
|------|-------------------------------|----------------------|------------|
| 1 | Potash alum | 10g | 0.50 |
| 2 | AgNO ₃ solution | 1L of 1mmol solution | 11 |
| 3 | Tri-sodium Citrate | 50g | 30 |
| 4 | Saw Dust including activation | 20g | 15 |

Cost per 1000 litre = Rs. 56.50

Single Time Investment:

| S.No. | Material | Quantity | Cost(INR) |
|-------|-------------|----------|-----------|
| 1 | Bubble top | 2 | 60 |
| 2 | Glass setup | 1 | 200 |
| 3 | Bucket | 1 | 50 |
| 4 | Pipes | 10m | 50 |
| 5 | Graphite | 500g | 45 |
| 6 | Pot | 1 | 15 |
| 7 | Aerator | 1 | 100 |
| 8 | Adhesive | - | 50 |
| 9 | Adaptor | 1 | 150 |

Total single time investment=RS720.00

Conclusion:

Hence we conclude that this model is a cost effective, eco-friendly and simple method of water treatment for house hold and bulk production.

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SMALL TIPS FOR BIG BENEFITS

- ◆ A few minutes of planning ensures a big fuel saving
- ◆ Soak before cooking.
- ◆ Shallow, wide vessels save fuel.
- ◆ Allow frozen food to reach room temperature before cooking
- ◆ Pressure cooking saves fuel
- ◆ Use optimum quantity of water
- ◆ Reduce the flame when boiling starts.
- ◆ Put the lid on to avoid heat loss.
- ◆ The small burner is more fuel efficient
- ◆ A clean burner helps save fuel
- ◆ GAS SAVED is MONEY SAVED.

Courtesy
HP GAS
G. Uma Maheswari,
S.T., AEL, Chennai-32

Know about ENVIRONMENTAL CONVENTIONS

Vienna convention for the protection of the ozone layer (Vienna, 22 March 1988) and montreal protocol on substances that deplete the ozone layer (Montreal, 16 September 1987):

Adopted on 22 March 1985. Entry into force 22 September, 1988.

Objectives: Recalling the pertinent provisions of the Declaration of the United Nations Conference on the Human Environment, and in particular principle 21, which provided that "States have, in accordance with the sovereign right to Nations and principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction,"

To protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer.

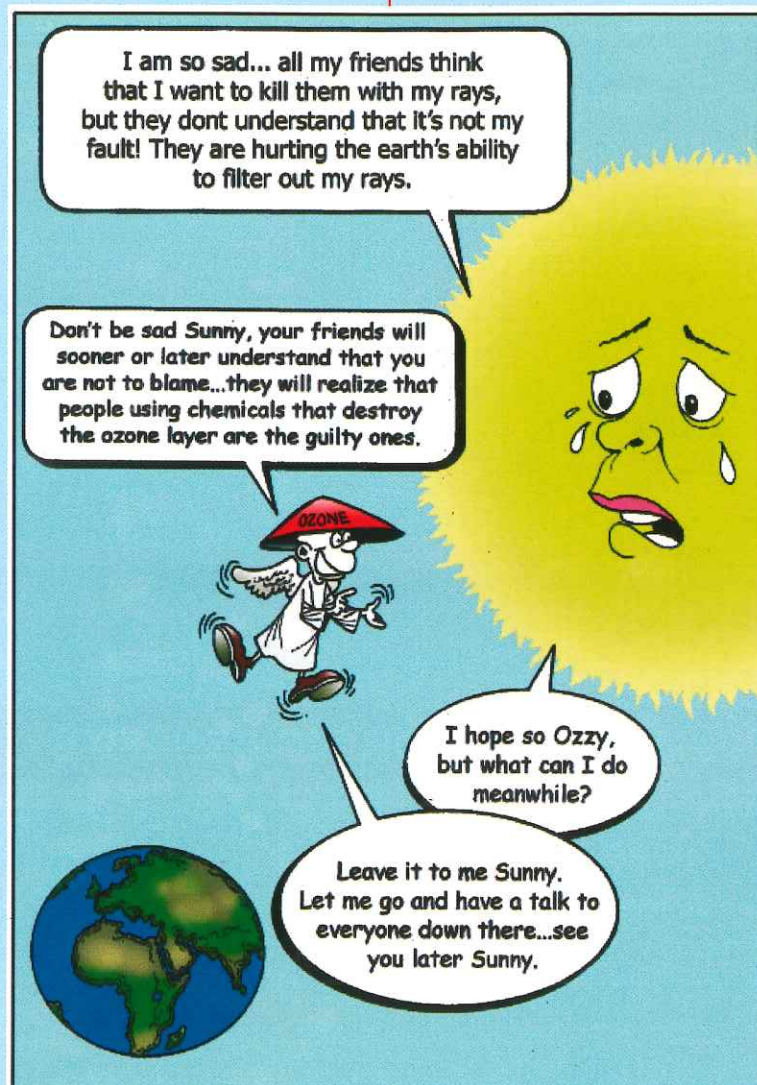
To adopt agreed measures to control human activities found to have adverse effects on the ozone layer.

To co-operate in scientific research and systematic observations.

To exchange information in the legal, scientific and technical fields.

Ozone is a simple molecule of three oxygen atoms and it is present in the two lowest layers of the atmosphere, troposphere and stratosphere. Ozone is naturally formed due to the action of sunlight with oxygen molecule. Molecular oxygen is broken down in the stratosphere by solar radiation to yield atomic oxygen which then combines with molecular oxygen to form ozone. Ozone is also formed in the lower atmosphere due to man-made activities. In presence of sun light it is formed due to catalytic reaction of nitrogen oxides and hydrocarbons. The presence of ozone in the upper atmosphere prevents ultraviolet rays reaching the earth. It is a toxic gas which is irritating to the respiratory system while present in the lower tropospheric layer. Ozone is also one of the gases responsible for increasing the temperature of the earth.

Over the past 20 years, there has been a large and unexpected loss of ozone in the stratosphere. Till date, it was thought that Nitrogen oxides released from supersonic aircraft, industrial process, etc. are the major sources responsible for depletion of Ozone. Now, there is a strong scientific evidence that man-made chlorine and bromine as well s organic



compounds like chlorofluorocarbons (CFCs), halons, etc. are mostly responsible for ozone depletion in the upper atmosphere. In the lower atmosphere the chemically inert CFCs and halons are virtually unreactive while in stratosphere they react with ozone and deplete the ozone level thereby creating so-called 'ozone hole'

Ozone Depleting Substances(ODS):

Fully halogenated chlorofluorocarbons(CFCs) contain only chlorine, flourine and carbon and have a high ozone depleting potential. Chemicals containing flourine, carbon and hydrogen but no chlorine or bromine are known as hydrofluorocarbons or HFCs. CFCs and related chemicals have been used in a wide variety of products since the 1930s when CFC - 12 began replacing ammonia and sulphur dioxide as primary coolant. CFCs are used in refrigerators as primary coolant and till now have been a crucial ingredient in refrigeration and air conditioning units.

They are used to make soft and rigid foams for furniture, cushions, mattress, packaging, building insulation material, computer cabinets, tennis racket, steering wheels, etc. Other CFCs are used as solvents, propellants in fire fighting equipment. Two other chemicals that significantly damage the ozone layer are Carbon Tetrachloride(CTC) and Methyl chloroform(MCF). CTC is used as a feed stock in production of CFC-11, CFC-12 and many pesticides, as a solvent in manufacture of synthetic rubber and dyes, as a metal degreaser, and as a dry cleaning agent. Methyl chloroform is used mainly as an all purpose industrial solvent for vapour degreasing operations and cold degreasing of fabricated metal parts, etc.

Substitutes for Ozone Depleting Substances (ODS)

Searching of substitutes for these seemingly indispensible chemicals began in 1987 with the signing of Montreal Protocol; Under the aegis of UNDP, a Technology Panel was established drawing knowledge of 110 experts from 22 countries which reported on the substitutes for ozone depleting substances. The panel recognised that the CFC substitutes should not be toxic in nature and these should not contribute to global warming.

ODS Substitutes/Alternatives:

| Use | Current Use | Substitutes/Alternatives |
|---------------------------------|-------------|----------------------------|
| Refrigeration & Airconditioning | CFC-11 | HFC-134a |
| | CFC-12 | HFC-152a |
| Foam blowing | CFC-11 | HCFC-22 |
| Fire fighting | CFC-12 | Hydrocarbons |
| Solvents | Halons | HCFC-22 |
| Sterilization | CFC-113 | HCFC-141b |
| Aerosol | CTC | HCFC-123 |
| | MCF | Dry chemical Powder, CO2 |
| | CFC-12 | Aqueous cleaning |
| | CFC-11 | No-clean technologies, yet |
| | CFC-12 | Organic solvents |
| | | Steam Sterilization |
| | | CO2, HCFC-22 |
| | | Hydrocarbons |
| | | Dimethylether |

In September 1987, 24 nations met to negotiate the final text and sign at he Montreal Protocol on Substances that deplete the Ozone Layer. The agreed Montreal Protocol which entered into force on January 1, 1989, limited production of most commonly used ODSs, i.e. Chlorofluorocarbons (CFCs) and halons. The Protocol required each party's production of chlorofluorocarbons (CFC-11,-12,-112,-113,-114 and -115) first to be frozen at 1986 levels and ultimately reduced to 50 percent of 1986 levels by 1998. Production of halons 1211,1301 and 2402 were to be restricted to 1986 levels. The Protocol called for a freeze in production of halons at 1986 levels beginning in 1992. In June 1990, the parties to the Protocol met in London and agreed to amendments that required more stringent controls on ODSs included in the original agreement. The London agreement added further control on other important ODSs such as Carbon Tetrachloride (CTC) and 1,1,1- trichloroethane (1,1,1-TCE) also known as Methyl chloroform(MC).

Multilateral Fund:

The Montreal Protocol calls on the developed countries to provide financial and technical assistance to developing countries. The Fund assisted activities are implemented through United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), United Nations Industrial Development Organization (UNIDO) and The World Bank.

Montreal Protocol Phase-out Schedule for India

| ODS | Reduction |
|---|------------------------------------|
| Annexure A, Group I | Base year- average of 1995-1997 |
| CFC- 11 (Trichlorofluoromethane) | 50% by 1994 |
| CFC- 12 (Dichlorofluoromethane) | 85% by 2007 |
| CFC- 113 (1.1.2. Trichloro 1,2,2 Trifluoroethane) | 100% by 2010 |
| Annexure A, Group II | Base year - average of 1995-1997 |
| Halon 1211 (Bromochlorodifluoromethane) | 50% by 2005 |
| Halon 1301 (Bromotrifluoromethane) | 100% by 2010 |
| Annexure B, Group II | Base year - average of 1998 - 2000 |
| CC I4 (Carbontetrachloride or Tetrachloromethane) | 85% by 2005, 100% by 2010 |
| Annexure B, Group III | Base year - average of 1998- 2000 |
| CH3 Ccl3 (Methylchloroform) or 1.1.1 Trichloroethane) | 30% by 2005, 100% by 2015 |
| Annexure C, Group I & II | |
| HC Fcs (Hydrochlorofluorocarbons) | 100% by 2040 |

The Govt. of India acceded to the Montreal Protocol along with its London Amendments on 19.6.92 and it came into force from 17.9.92. The Ministry of Environment and Forests, Govt. of India has set up an Ozone Cell which its a focal point for coordinating with the industry and provide necessary support to the Steering committee and its three Standing Committees. The Ozone Cell created in the Ministry of Environment and Forest (MEF) directly sends relevant documents to the enterprises who intend to submit project proposals for phase out of ozone depleting substances. The newsletter titled VATIS, an update of ozone layer protection is being published by the Asia Pacific Centre for Transfer of Technology with the support of the Ministry.

India has achieved 50% reduction target of CFC production from 22558 MT to 11294Mt and consumption from 6681 MT to 1940 MT as on 1.1.2005. Further the most important and critical target of 85% reduction target of CTC production and consumption has also been achieved by adopted suitable alternative technology for non-feedstock applications of CTC. Government of India has also taken a number of policy measures, both fiscal and

regulatory to encourage early adoption of new technologies by existing and new enterprises. Full exemption from payment of Customs and Excise duties is granted on capital goods required to implement ODS phase out projects funded by the MLF and this benefit is extended for projects and new-establishments using non-ODS technologies. The Ozone Depleting Substances (Regulation and Control) Rules, 2000 regulating ODS production, consumption and trade have also been but in place. These Rules are being enforced under the Environment (Protection) Act, 1986 with effect from 19th July, 2000. Three amendments have been made in 2001, 2003, 2004 and 2005 to the Rules thereafter. Since 1995, 16th September is celebrated every year as the International Day for Preservation of the Ozone Layer and commemorates the date of signing of Montreal Protocol. India has been bestowed the honor of receiveing the Montreal Protocol Implementers Award which will be given on 17th September 2007 at Montreal, Canada.

Source: Parivesh Newsletter: Ozone special issue

Our Story, UNEP
www.ozonecell.com
J.Theresa, Librarian, TNPCB

பட்டிமன்றம் - கிரீன் டிவியில் மாசில்லா தீபாவளி நிகழ்ச்சி வெடி வெடிப்பது சந்தோஷமா? சங்கடமா?

அறிவிப்பாளர்: நமது கிரீன் டிவியில் இன்னும் சில நொடிகளில் டேனியல் சுப்பையா அவர்களின் பட்டிமன்றம் கேட்டு மகிழலாம்.

நடுவர் ராதா: கிரீன் டிவி நேயர்களுக்கு தீபாவளி நல்வாழ்த்துக்கள்.. என்ன பலகாரம் எல்லாம் சாப்பிட்டு பட்டாசு வெடிக்க கிளம்பிட்டிகளா... கொஞ்சம் பொறுங்க இன்னைக்கு பட்டிமன்றத்தோட தலைப்பே வெடி வெடிப்பது சந்தோஷமா? சங்கடமா? சந்தோஷமே அப்படின்னு மூணு ஆம்பிளக பேச வந்திருக்காங்க.. சங்கடமேன்னு மூணு பொம்பளங்க பேச வந்திருக்காங்க..

வெடி வெடிப்பது சந்தோஷமே அப்படினு பேசுவதற்கு அணித்தலைவர் ஆட்டோபாம் அண்ணாமலை.. வாங்க பாத்து வெடிங்க

ஆட்டோபாம் அண்ணாமலை: கிரீன் டிவி நேயர்களுக்கும் நடுவர் உள்ளிட்ட அனைவருக்கும் தீபாவளி நல்வாழ்த்துக்கள். நடுவர் அவர்களே கொழுக்கட்டை இல்லாத வினாயகர் சதுர்த்தி, பொரி இல்லாத ஆயுத பூஜை, கரும்பு இல்லாத பொங்கல், ஸ்டார் இல்லாத கிருஸ்துமஸ், பிரியாணி யில்லாத ரம்ஜான் இவற்றையெல்லாம் உங்களால் கற்பனைப் பண்ணிக்கூட பார்க்கமுடியாது. இதே மாதிரி தான் வெடி இல்லாத தீபாவளியும். தூங்குமுஞ்சி புள்ளைங்ககூட ராத்திரி முழுக்க கண்ணு முழிச்சிகிட்டு எப்போ விடியும்னு தயாரா இருப்பாங்க. வெடிக்க அவ்ளோ சந்தோஷம்.. அதபார்த்து பெத்தவங்க எவ்ளோ சந்தோஷப்படுவாங்க தெரியுமா. இதுக்கெல்லாம் ஒரு ரசனை வேணும் நடுவர் அவர்களே. இதுக்கு மேலே சொல்ல எனக்கு தெரியலை. வாய்ப்புக்கு நன்றி கூறி விடைபெறுகிறேன் நன்றி.

நடுவர் ராதா: ஆட்டோபாம் வெடிச்சமாதிரியே இருக்குதுய்யா. பொறக்கும்போதே முழுங்கிட்டிங்களா. என்ன செய்யப் போறாங்களோ எதிரணித்தலைவி வாங்கம்மா புஸ்வாணம் கஸ்தூரி, பார்க்கவே சங்கடமா இருக்கு

புஸ்வாணம் கஸ்தூரி: நடுவர் உள்ளிட்ட அனைவருக்கும் வணக்கம். எதிரணித்தலைவர் பேசும்போது ஏதோ குழந்தைங்க தூங்கம் விடியவிடிய முழுச்சிகிட்டு இருப்பாங்க வெடி வெடிக்க.. சரியாதான் சொன்னாரு நடுவர் அவர்களே ராத்திரி பூரா தூங்கம் இருந்ததுல, திரியில நெருப்பை தூங்கிட்டே வச்சிபுட்டு கை போயி, கண் போயி நல்ல நாள் அதுவுமா ஆஸ்பத்திரிக்கு கூட்டிகிட்டு போறாங்களே பெத்தவங்க அவங்களும் அவங்க குடும்பமும் சந்தோஷமா இருக்குமா சங்கடமா இருக்குமா? சொல்லுங்க நடுவர் அவர்களே

நடுவர் ராதா: நா ஒன்னும் சொல்லலமா. வேடிக்கை பாத்து கிட்டிருக்கேன். எம் மேலே கொளுத்திப் போடறீங்க

புஸ்வாணம் கஸ்தூரி: நல்ல நாள் பெரியவங்களாகட்டும் குழந்தைகளாகட்டும் புஸ்வாணம் கொளுத்தி அதைப்பாக்கறப்போ கலர் கலரா பூப்பூவா சிதறி விழுமே அந்த கண்கொள்ளா கட்சிதானே சந்தோஷம். வெடிக்கற வெடியில சங்கடம்தா வரும்னு சொல்லி என் உரையை நிறைவு செய்கிறேன் நன்றி.

நடுவர் ராதா: கஷ்டம்தா போல வெடிக்கற அணி என்ன செய்யப் போறீங்களோ வாங்க சரவெடி சங்கர் வாங்க

சரவெடி சங்கர்: கிரீன் டிவி நேயர்கள் மற்றும் நடுவர் உள்ளிட்ட அனைவருக்கும் தீபாவளி நல்வாழ்த்துக்கள். தமிழை சரவெடியாக்கி வெடித்துக் கொண்டிருக்கிற நடுவர் அவர்களே, 5000ம் வாலா சரவெடிய வெடிக்கிறப்ப எப்படி இருக்கும் தெரியுங்களா இளையராஜா இசையும், யுவன் சங்கர் ராஜா இசையும் சேர்ந்தா மாதிரி இருக்கும். இத ரசிக்க ரசிக்க சந்தோஷம் பெருகும். இதுக்கு மேலே எதுவும் சொல்ல வேண்டியதில்லை நடுவர் அவர்களே நன்றி

நடுவர் ராதா: என்னய்யா அநியாமா இருக்கு சரவெடி வெடிச்சா இசை வருமாய்யா. சிவகாசியில் இவங்களுக்கு காகவே தயார

சுகமான சுற்றுச்சூழல்

சுற்றுச்சூழல் பாருங்கம்மா
சுத்தம் நமக்கு தேவையம்மா

சுற்றமெல்லாம் ஒன்று கூடி
சுகமா என்று கேட்கிறோமே,
சுற்றுச்சூழல் பற்றி எங்கும்
யாராவது பேசுறோமா ?
பெண்களாலே முடியுமென்று
பேசிக்கொண்டு திரிகிறோமே,
பெண்களாலே சேரும் குப்பை போக்க
சுற்றும் நினைக்கிறோமா ?

மனித இன உறவுகளை பிரிக்க
சண்டை போடுறோமே,
மண்ணில் விழும் குப்பைகளை
பிரிக்க முயற்சி எடுக்கிறோமா ?
மக்கும் குப்பை, மக்கா குப்பை
என்று பிரிக்க தெரிந்து விட்டால்,
சுற்றுச்சூழல் பாதுகாப்பில்
மானிடருக்கு பெருமை உண்டு.

சடங்கு சம்ர தாயங்களை
சத்தத்தோடு செய்கிறோமா,
சத்தம் பெரும் மாசு என்று
சித்தத்திலே எண்ணலையே,
மூட பழக்க வழக்கங்களை
முழுமையாக நிறுத்திவிட்டால்
சுத்தமெல்லாம் குறைந்து மண்ணில்
சாந்தநிலை கிடைக்குமம்மா.

புதிது புதிதாய் சினிமா வந்தால்
முதலில் சென்று பார்க்கிறோமே,
சுற்றுச்சூழல் விழிப்புணர்வை காதில்
வாங்கி கொள்கிறோமா ?
தங்கம் போல தண்ணீருக்கு பணத்தை

செலவு செய்கிறோமே,
இயற்கை தந்த வளங்களை நாம்
காப்பாற்ற மறந்திட்டோமே.

பள்ளியிலே படிக்கும் சின்ன
பிள்ளைகளின் மனதிலே
சுற்றுச்சூழல் விழிப்புணர்வை சொல்லித்
தந்து வளர்த்துவிட்டால்,
வளரும் குழந்தை நலம் பெருகும்மா,
வருங்கால வாரிசுகள் வளமாய் வாழ முடியும்மா.

வீட்டிற்காக காவலுக்கு நாய்
ஒன்றை வளர்க்கிறோமே,
வீட்டிற்கொரு மரம் வளர்ப்போம்
என்று நாமும் நினைக்கிறோமா ?
மக்கள் நலம், மகளிர் நலம் காக்க
குழுக்கள் இருக்குதம்மா,
மண்ணின் வளம் காக்கும் அமைப்பு
இன்னும் நிறைய வேணும்மா.

காற்று இல்லா நிலையினிலே
மனிதனுக்கு வாழ்வு இல்லை,
மாசு இல்லா காற்று இப்போ
எங்கேயுமே கிடைப்பதில்லை,
குளத்து தண்ணீர் கெட்டுப்போச்சு, குட்டை நீரும்
கெட்டுப்போச்சு,
ஆற்று நீரும் கெட்டுப்போச்சு, அருவி கூட
கெட்டுப்போச்சு,
பாட்டில் தண்ணீர் குடிக்கக்கூட பயந்து சாக
வேண்டியிருக்கு.

சுற்றுச்சூழல் பாருங்கம்மா
சுத்தம் நமக்கு தேவையம்மா

த. ராதா,
ச.எ.த., த.நா.மா.க.வா.,
சென்னை

வாரியத்தில் ஓய்வுபெற்றோர்

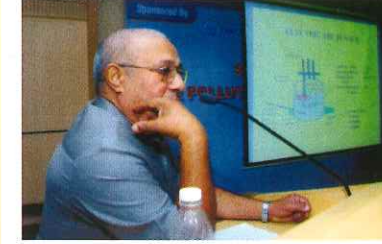
திரு. எம். வடிவேல், அலுவலக உதவியாளர், சேலம் அவர்கள் 09.11.1983 அன்று பணி நியமனம் செய்யப்பட்டு 24 வருடங்கள் 9 மாதங்கள் பணியாற்றி 31.08.2008 அன்று பணிமூப்படைந்து ஓய்வு பெற்றார்.

17.1.1985 அன்று பணி நியமனம் செய்யப்பட்டு 23 வருடங்கள் 6 மாதங்கள் பணியாற்றிய, Dr. V.N. ராயுடு, இணை இயக்குநர் (ஆய்வகம்) அவர்கள் 30.09.08 அன்று பணிமூப்படைந்து ஓய்வு பெற்றார்.

ETI Activities

IMPROVEMENT OF AIR POLLUTION CONTROL MEASURES IN FOUNDRIES

There are about 1000 foundry units in Tamil Nadu out of which 700 units are located in Coimbatore district alone. The foundry units operating with cupola furnace use coal or coke as fuel and during the



operation, the suspended particulate matter, Sulphur di oxide and nitrogen oxides are emitted. In order to create awareness among foundry units on control options and available technology, ETI, TNPCB has organized training program on **Improvement of air pollution control measures in foundries** at Coimbatore on 22.08.08 at COINDIA auditorium in association with Coimbatore Industrial Infrastructures Association (COINDIA). About 150 participants have attended.

COINDIA President Thiru. G. Rajendran welcomed the gathering, Thiru A. Palaniswamy, Director, ETI, TNPCB inaugurated the training program, Thiru. V.S.S. Baskaramoorthy, Director(Environment) NPC made technical presentation on control options, Thiru. S. Selvan and Thiru. Vijayabaskaran DEE, TNPCB also spoke. The seminar ended with interactive session.

URBAN ENVIRONMENT PROTECTION AND PROMOTION

Students visiting TNPCB Mobile Environmental Awareness exhibition during the seminar on 'Urban Environment Protection and Promotion' held on 24th September 2008, at organized jointly by School



BEST ENVIRONMENTAL PRACTICES FOR ELECTROPLATING

ETI, TNPCB has organized one day training programme on 'Best Environmental Practices for Electroplating Sector' at Ambattur, Chennai in association with Ambattur Electroplaters Association on 29.09.08. About 50 participants have attended the programme. Dr. S. Sundaramoorthy, former



Engineering Director, CMWSSB spoke on 'Sludgeless Technology' for metal recovery and Thiru. N. K.

Kuttiappan, LVK enviro consultant spoke on 'Cleaner Production and Waste Minimization'. The programme ended with panel discussion participated by officials of TNPCB.

A.Palaniswamy
Director, ETI, TNPCB,
Chennai

அன்று...



இயற்கையின் ஆளுமையில் மனிதன்

இன்று...



மனிதனின் ஆளுமையில் இயற்கை