



# GOVERNMENT OF PUDUCHERRY

*Puducherry Pollution Control Committee*

## ENVIS HUB NEWSLETTER

State of Environment & its Related Issues in Puducherry

### ABSTRACTS OF AIR AND WATER POLLUTION



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## 1. Water pollution due to dying effluents in Noyyal river, Tirupur-A case study

**Authors:** Marimuthu K.N, Ruby Thomas, B. Yamini, S. Bharathi and K. Murugavel

**Name of the College:** Department of Chemistry, Saveetha Engineering College, Chennai 602 105.

Water pollution is the introduction into fresh or ocean waters of chemical, physical, or biological material that degrades the quality of the water and affects the organisms living in it. This process ranges from simple addition of dissolved or suspended solids to discharge of the most insidious and persistent toxic pollutants (such as pesticides, heavy metals, and non degradable, bio accumulative, chemical compounds). Examples of water pollution are Mining, Agricultural Wastes and Industrial affluent such as paint, dying units etc. Dying industries are polluting Noyyal river which is running across Tirupur, Erode and Karur districts of Tamilnadu state. Dying industries in and around Tirupur and Erode districts violating all norms prescribed by both state and central pollution control boards and releasing their effluents into Noyyalriver without any treatment. The water from Noyyal river is stored in Orathuppalayam Dam which is one of the largest polluted dam in India. The several reports say that the total dissolved solids (TDS) is close to 2000 ppm and the water stored in the dam is not fit any purpose including irrigation.

**Keywords:** Water pollution, dying effluents, Noyyal river.

## 2. Study on Sequential Analysis of Trace Elements in the Sediments of Karaikal Coast, East Coast of India

**Authors:** G. Ramesh, T. Ramkumar & M. V. Mukesh

**Name of the College:** Department of Earth Sciences, Annamalai University Annamalainagar, India

The present work measures the concentration of different solid species of the trace elements Fe, Mn, Zn, Pb, Cu, Cr, Co and Ni in the surface sediments of Arasalar river estuary at different stations & seasons (2011-2012). Analysis of sediments for trace element concentration gives history of accumulation of metals in environments. Estuarine and marine sediments are very important

accumulation site of metals in the coastal areas; therefore analyses of these metals are important to assess the degree of pollution in the marine environment. The trace elements were extracted from sediment samples into five chemical phases (I-exchangeable, phase II-bound to carbonate, phase III-bound to Fe-Mn oxides, phase IV-bound to organic matter and phase V-residual). The results obtained from sequential extraction procedure showed that among all the five phases, residual phases (phase-V) was found to have much more metal concentrations for all the eight metals compared to other phases irrespective of seasons. The concentration of the metals at various phases are as follows, Fe – Phase V>III>IV>II>I, Mn – Phase V> III>IV>II>I, Cu – Phase V> III>IV>II>I, Zn - Phase V> III>IV>II>I, Pb- Phase IV>V>III>II>I, Cr - Phase V> III>IV>II>I, Co- Phase V> III>IV>II>I, Ni - Phase V> III>IV>II>I. The high proportion of metals in the residual phase generally related to low levels of extractable metals indicates that the sediments of Arasalar river estuary and adjacent beach environments were relatively unpolluted.

**Keywords:** Sequential extraction, Trace element concentration, metal origin, mode of occurrence

### **3. Impact of Industrial Pollution on Land, Water and Agricultural Production in Sipcot Industrial Region In Tamilnadu**

**Author:** I.Sundar

**Name of the college:** Associate Professor of Economics, and Coordinator of Economics Programmes, Directorate of Distance Education, Annamalai University

This paper deals with impact of industrial pollution on land, water and agricultural production in Cuddalore SIPCOT industrial region in Tamil Nadu. It outlines the impact of water pollution and land pollution on crop yield. This study makes an experimental analysis of crop yield in SIPCOT industrial region and non industrial region. In this study, impact of industrial activities on land and water quality has been examined on the basis of appropriate scientific method. The crop yield decline is explained with the help of soil and water test. This paper concludes with some interesting findings along with policy suggestions.

### **4. Mapping and Analysis of Marine Pollution in Tuticorin Coastal Area Using Remote Sensing and GIS**

**Authors:** Rajchandar Padmanaban and Rejeesh Kumar P.

**Name of the college:** Department of Remote Sensing, Anna University of Technology, Tirunelveli

In this project, the Marine Pollution Information System has been suggested with the help of Remote Sensing and GIS. This system provides pollution hot spot area and spread rate of the Tuticorin coastal area in Tamilnadu, India. The spread rate and hot spot analysis has been analyzed with the aid of various chemical, biological and physical parameters such as pH, Temperature, Total Suspended Sediments (TSS), Salinity, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Nitrate, Nitrite, Phosphorus as Phosphate PO<sub>4</sub>, Chlorophyll-a, Silicate, primary productivity and Ammonia. The Remote Sensing data plays vital role in pollution monitoring and analysis. The Geographic Information System and Remote Sensing facilitate to scrutinize various marine pollution such Industrial pollution, sewage pollution and anthropogenic pollution. The various pollution parameters are examined with the allusion of “General Coastal Cater Quality Standard”. The preliminary investigations of pollution spots were identified on the remote sensing data (IRS P6) through the visual interpretation techniques. From the visually interpreted data the major polluted spots were identified on the ground by ground survey method. The water samples were collected from the polluted spots. The various samples had undergone with diverse laboratory analysis and readings were stored in GIS database. The various pollution parameters reading are compared with General Coastal Cater Quality Standard values in GIS environment. The various parameters Map, Hot Spot Map and Spread Rate Map are generated with the assist of Weighted Overlay Analysis and Statistical Analysis in ARC-GIS.

**Keywords:** Remote Sensing, Geographic Information System, Marine Pollution, Digital Image Processing, Field Survey, Statistical and Overlay Analysis

### **5. A Study on Air Pollution and its Impact on Human Health in Chennai City**

**Authors:** P.Thilagaraj, R.Ravinder, R.Kesavan

**Name of the college:** Department of Production technology, MIT Campus, Anna University, Chennai, India)

Human activities since preindustrial time have resulted in large increase in air pollution. Air pollutants are substances which when present in the atmosphere adversely affect the human health, animals, plants, or microbial life; damage materials, or interfere with the normal activities of life. In this paper, the air quality index in four places of Chennai such as Anna Nagar, Adyar, T.Nagar, Kilpauk was calculated. The pilot survey was conducted based on

the questionnaires from various categories of people such as vendors, auto drivers and passers by. The impact on human health is then presented in this paper.

**Key words:** Air quality Index, Ambient air Quality, RSPM, and SPM.

## **6. Studies on the Pollution Levels in Ariyankuppam Backwater, Puducherry Region**

**Authors:** G. Vijayakumar, M.A. Sivasankaran and V. Murugaiyan

**Name of the college:** Department of Civil Engineering, Pondicherry Engineering College, Pondicherry – 605014

A systematic investigation in the pollution level at Ariyankuppam backwater from March 2011 to February 2012 was carried out. The untreated domestic wastes from various parts of the Ariyankuppam town are directly discharged into the river which leads to an increased level of pollution. The present studies emphasis on the magnitude of pollution by monitoring key water quality parameters such as dissolved oxygen, temperature, pH, salinity, B.O.D, C.O.D and Chlorophyll content. Monthly water samples were collected from three different sampling stations, which give the information about the rate of pollution and its influence on the aquatic environment. Water temperature recorded for the entire study period showed a wide variation and ranged between 24° C to 29.5° C. The range of salinity varied between 260 to 3055 ppm. The pH level shows more alkaline during the month of December due to rain and less alkaline during the month of March. Some of the characteristics like DO, BOD, and nutrient loading are causes for eutrophication process in this backwater, found to be eutrophic throughout the year.

## **7. Ambient Air Quality Study on Sipcot Cuddalore Tamilnadu in India**

**Authors:** Ashok Kumar, D and Rajendran, M.

**Name of the college:** Department of Civil Engineering, Annamalai University, Annamalainagar

Air pollution is perhaps the commonest form of environmental degradation in urban and rural area of both developed and developing countries. In the environment there are many pollutants which have been observed particulate pollutants are more important. In this paper an attempt has been made to study the status and trend of sulphurdioxide (SO<sub>2</sub>) in the industrial area the specific pollutants Methyl Mercapten, Vinyl Chloride in State Industrial Promotion corporation Of Tamilnadu(SIPCOT) Cuddalore. The study has been carried out six months in six sampling station of SIP Pollution Control Board Cuddalore. Each of Air pollutants are analyzed by using BIS & USEPA methods.

## **8. Assessment of Air Quality Index of Coimbatore City in Tamil Nadu**

**Authors:** R. Saravanakumar<sup>1</sup>\*, S. Sivalingam and S. Elangovan

**Name of the college:** Department of Mechanical Engineering, KPR Institute of Engineering and Technology, Coimbatore – 641407 and Environmental Division, Public Works Department, Coimbatore Division, Coimbatore, Tamil Nadu, India;

**Background/Objectives:** The prime objective of this work is to study the condition and quality of the air in Coimbatore city by measuring Air Quality Index (AQI) and to compare the measured values with standard values. This work also examines the variation of ambient air quality with various climatic conditions. **Methods/Statistical Analysis:** The quality of air was determined based on National Ambient Air Quality Standards (NAAQS). This was carried out based on measuring four major air pollutants such as PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>2</sub> at different climate



conditions during January 2015 to December 2015. Respirable Dust Sampler (RDS) and Fine Particulate Sampler were used to determine PM<sub>10</sub> and PM<sub>2.5</sub> respectively. Findings: The present work shows its significance because there is no such data available for researchers for reference. Industrial (foundry units) and automobile emissions are the major pollution source which determines the quality of ambient air in the city. Among the different climatic conditions, summer exhibits more pollution level in the air while monsoon exhibits less pollution level. Results also reveals that the Industrial area experiencing more pollutants followed by commercial and residential areas. As per the AQI category, all locations are coming under moderate category except industrial location which requires stringent control measures to reduce the particulate matters in the air. Applications: Since no data is available for the Air Quality Index study of the region, this can be taken as a reference for future study.

**Keywords:** Air Quality Index, Automobile Emission, Dust sampler, Pollution Level and Particulate Matter.

## **9. A Study of Traffic Related Air Pollution at Dindigul District, Tamil Nadu, India**

**Authors:** V. Prathipa,\*, A. Sahaya Raja, D. Sarala Thambavani

**Name of the college:** Department of Chemistry. PSNA College of Engineering and Technology, Dindigul – 624 622, TN, India.

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Air pollution has emerged as one of the challenging problems before mankind in the past few decades. With rapid rise in population, industries and automobiles the air pollution has become a major environmental problem in the modern world. Sulphur dioxide and oxides of nitrogen concentration at Dindigul district are for residential areas were well below the prescribed permissible standard. Suspended Particulate Matter concentration exceeded standard very often in Dindigul district. From the air quality index values of the stations such as residential, Traffic cum commercial and industrial areas under investigation, it is clear that the ambient air in Dindigul district is fairly clean especially near the residential area. Traffic cum commercial and industrial areas was more polluted which may be due to heavy vehicular movement as well as population. An air quality index may be calculated and reported to the public on a daily basis. More stringent measures should be taken to control vehicular and industrial pollution. Source studies of SPM may be carried out to ascertain the sources and put up relevant control measures in place.

## **10. Assessment of Groundwater Pollution Potential in and Around Ranipet Area, Vellore District, Tamilnadu**

**Authors:** K.Ambiga and Dr. R. AnnaDurai

**Name of the college:** SCSVMV University, Enathur, Kanchipuram. Tamil Nadu, India

Department of Civil Engineering, SRM University, Kattakalathur TamilNadu India

Drinking water is contaminated through the pipe distribution system or directly through groundwater due to addition of waste water discharged from domestic, industrial and agricultural sources. The present study deals with the physic-chemical characteristics of subsurface water quality in Ranipet area. Such a water samples were collected from different identified bore wells and dug wells for the purpose of studying the quality of groundwater during July 2012. The bore wells from which the samples were collected are extensively used for drinking purpose. It has been proved from the present investigation findings that value of few parameters are TDS, Total

hardness, Calcium, Magnesium, Sulphate, Chloride, Fluoride and Nitrate fall out of the permissible range with reference to BIS. Drinking standards. Hence, suggested to take proper care to avoid contamination of groundwater pollution through periodic monitoring of the water quality.

**Keywords:** Groundwater, Physico – chemical parameter, Heavy metals

## **11. Assessment of water quality standards in the villages of Kanchipuram district, Tamil Nadu, India**

**Authors:** Rajkamal R.1\*, Muthu Kumar<sup>2</sup>, Madhan Raj<sup>1</sup>, Muthu Rajesh<sup>3</sup>, Jaya Kiruthiga<sup>4</sup>, Joy Bazroy<sup>5</sup>

**Name of the college:**

1. Assistant Professor, Department of Community Medicine, ACS Medical College, Tamilnadu, India
2. Assistant Professor, Department of Community Medicine, Shri Satya Sai Medical College and Research Institution, Tamilnadu, India
3. Assistant Professor, Department of Community Medicine, Madurai Medical College, Tamilnadu, India
4. Postgraduate, Department of Community Medicine, Shri Balaji Medical College, Tamilnadu, India
5. Professor, Department of Community Medicine, Pondicherry Institute of Medical Sciences, Puducherry, India.

**Background:** Water is the most common yet the most precious resource on earth without which there would be no life on earth. About 1.2 million people in the world still today do not have accessible to safe drinking water. In India only 84% of population has accessible to safe drinking water. Objective: To assess the Physical, Chemical, and Microbiological quality of drinking water in the villages of Kanchipuram district.

**Methods:** A community-based, cross-sectional study was carried out in Chunampet, a rural area in Kanchipuram district of Tamil Nadu in January 2014 among two villages (Villipakkam and Puthirankottai) near Chunampet. Drinking water was collected from the common water sources of both the villages and sent for Physical, Chemical and Microbiological analysis. Results: Out of 20 water samples for physical and chemical assessment all the water samples shows the physical parameters of the water such as PH, electrical conductivity (EC), total dissolved solids (TDS) were within the normal limits. In chemical analysis Water samples shows that Mg, HCO<sub>3</sub> levels were above the permissible limits as per BIS guidelines. Ten water samples were taken for biological analysis in which all the samples were heavily contaminated with high coliform count.

**Conclusions:** The study shows that the water samples collected from both the villages are not at acceptable level and it is not suitable for drinking.

**Keywords:** Health for all, Rural area, Safe drinking water, Water quality

## **12. River Water Quality Analysis by Fuzzy Approach-A Case Study of Chunnambar River Pondicherry**

**Authors:** K.R.Leelavathy<sup>1</sup>, V.Nirmala<sup>2\*</sup>, V.Nageshwaran<sup>1</sup>

**Name of the college:**

1. Department of Civil Engineering, University College of Engineering Tindivanam, Anna University Tamil Nadu, India.
2. Department of Mathematics, University College of Engineering Tindivanam, Anna University Tamil Nadu, India.

This paper reports the utility of Fuzzy Inference System (FIS) in an innovative way to assess the Water Quality Index (WQI) for Chunnambar River, Ariyankuppam, Puducherry Region, Southern India. Water quality management is an important issue of relevance in the context of present times. The aim of the present study is to

examine the influence of the various parameters namely Dissolved oxygen (DO), Biological oxygen demand (BOD), pH, Total Coliforms (Tco) and Temperature (Temp) on the potable quality of the river water. Two fuzzy inference systems, one with parameters DO,BOD and Tco and the other with the result of first FSI, pH and Temp, are modeled. Application of these two fuzzy rule based optimization models are illustrated with 12 samples collected during March'14 to February'15, from Chunnambar River. These samples were analyzed for the above said parameters and the analysis showed good agreement with the WQI which is being traditionally calculated in India. The Fuzzy Inference System (FIS) approach was a practical, simple and useful tool to assess river water quality.

**Keywords:** Water quality analysis, River water quality index, Chunnambar River, Fuzzy logic, Fuzzy inference system.

### **13. Applications of Water Quality Index for Groundwater Quality Assessment on Tamil Nadu and Pondicherry, India**

**Authors:** Sirajudeen J. and Abdul Vahith R.\*

**Name of the college:** Department of Chemistry, Jamal Mohamed College (Autonomous), Tiruchirappalli, Tamil Nadu (INDIA)

Groundwater samples were collected from different locations around Karaikal area and analyzed for their physicochemical characteristics. Eight groundwater samples were collected (five from Pondicherry and three from Tamil Nadu, India and studied for the period of January 2011 to October 2011 for two different seasons. The present investigation is focused on the determination of physicochemical parameters such as pH, Electrical Conductivity(EC), Total Hardness (TH), Total Dissolved Solids (TDS), Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Chlorides (Cl<sup>-</sup>), Sulphate (SO<sub>4</sub><sup>2-</sup>) and Nitrate (NO<sub>3</sub><sup>-</sup>). Groundwater suitability for domestic and irrigation purposes was examined by using WHO and BIS standards, which indicate the groundwater in a few areas, were not much suitable for domestic and agriculture purposes. Thus, the objective of this study is to identify the quality of groundwater especially in the Karaikal and nearby area whether groundwater is used for drinking and domestic purposes.

**Keywords:** Physico-chemical parameters, Quality parameters, Analysis, WQI, WHO, BIS



## Environment Event:

### WORLD OZONE DAY CELEBRATION 2018

The international day for the preservation of ozone layer was observed globally on 16th September, 2018 with the theme of “Keep Cool and Carry on: Montreal Protocol”.



Half-a-day awareness technical Workshop was conducted on 19.09.2018 by Puducherry Envis Hub on the subject “Keep Cool and Carry on: Montreal Protocol” for the ITI Students of Puducherry Government Polytechnic at Dr. Abdul Kalam Science Centre and Planetarium, Puducherry. The skill development training program would help the ITI Students to handle the refrigerant and air-conditioner gases effectively which otherwise leads to environment issues.





Shri. Vipin Babu, Scientist & Coordinator ENVIS welcomed the gathering. He explained the theme for the Ozone day 2018 “Keep cool and Carry on! The Montreal Protocol”. Dr. R. Sagaya Alfred, Senior Scientific Officer, Department of Science, Technology & Environment, Puducherry briefed about the importance of protection of ozone layer and the need to reduce the usage of ozone depleting substances. Thiru R. Kamala Kannan, M/s Sakthi Refrigeration & Air- conditioning Enterprises, Chennai and Thiru. Sabapathi Kanaga, M/s. Siva Refrigeration, Chennai were invited as experts. The stakeholders were approximately 110 ITI students from Air Conditioning and Refrigeration in Puducherry Government Polytechnic College along with officials of DSTE, PPCC, PCS&T, ENVIS staff and public participated in the function.



An awareness posters and stickers has been released during the occasion. The posters were distributed to ITI Students for spreading the message on the importance of the protection of ozone layer.






## Puducherry Environment News clippings:

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## Today is Zero Shadow Day in Puducherry




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**PUDUCHERRY, AUGUST 21, 2018 08:02 IST**  
**UPDATED: AUGUST 21, 2018 10:09 IST**



### Events to be held across 20 centres

The Department of Science, Technology and Environment in association with Pondicherry Science Forum will be organising a massive outreach programme to popularise the Zero Shadow Day on Tuesday. The programme will be held in 20 centres across the city between 11.00 a.m. and 12.30 p.m.

ARUN NAGALINGAM

Arun Nagalingam, secretary, Pondicherry Science Forum, said when the place's latitude equals the sun's declination, its rays are perpendicular and exactly at noon the sun is right overhead and shadow of an object falls right below it.

Since Puducherry is inclined at the same angle with respect to the equator, the sun's rays fall exactly perpendicular at noon at around

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# Sewage in moat kills fish

STAFF REPORTER

NEW DELHI: Sewage flowing into the moat of the Yellow Fort in Varanasi has killed thousands of fish, officials said. The sewage was dumped into the moat by the city corporation on Saturday evening. The sewage was dumped into the moat by the city corporation on Saturday evening. The sewage was dumped into the moat by the city corporation on Saturday evening.



Officials say wastewater flowed into Varanasi Fort trench after the recent rains.

About 150 to 200 kg of fish were found dead in the moat of Yellow Fort. Sewage reportedly flowed into the moat following heavy rains on Saturday evening. Indiscriminate dumping of market waste into the moat also added to the pollution, officials said.

Hundreds of fish of various species were found floating in the moat on Monday. Officials of the Fisheries Department deployed men to remove the dead fish from the moat and about 80% of it was cleaned by Monday evening, officials said.

"The temperature was high on Saturday morning. However, there were heavy rains from 4 p.m. to 9 p.m. Following rains, drainage entered the moat and polluted the water. As a result, the oxygen level in the water dropped. This along with the change in climate resulted in the death of fish," said R. K. Singh, assistant director, Department of Fisheries, Varanasi.

He said plenty of waste, including from the nearby fish market, slaughterhouse and vegetable waste, was directly disposed into the moat, polluting the water. "Various fish were found in a corner of the fort."

Officials said the Fisheries Department and Archaeological Survey of India that maintains the fort have asked the Yellow Corporation to prevent dumping of waste in the moat.

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