



# GOVERNMENT OF PUDUCHERRY

## *Puducherry Pollution Control Committee*

**State of Environment & Related Issues in Puducherry**

### **ENVIS HUB NEWSLETTER**



### **STATUS OF AMBIENT AIR QUALITY & AIR QUALITY INDEX IN THE U.T OF PUDUCHERRY FOR THE YEAR 2018**

**Volume X-I**

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**Sponsored by**  
**Ministry of Environment, Forest & Climate Change**  
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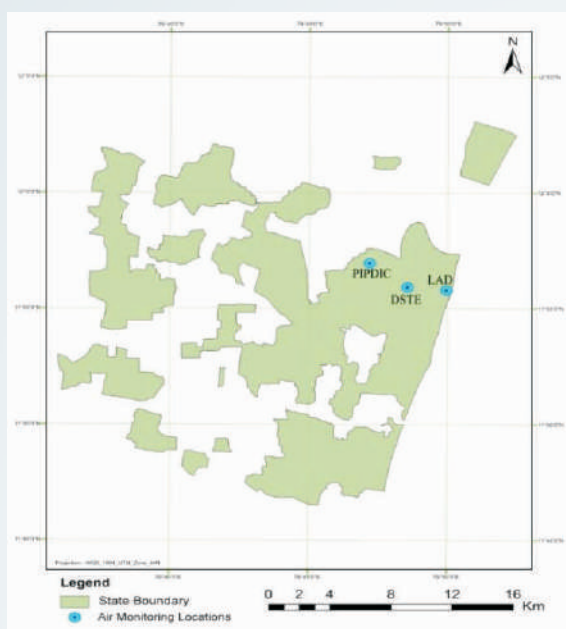
## Introduction

Puducherry Pollution Control Committee is carrying out manual ambient air quality monitoring at the following six locations in the U.T. of Puducherry under the 'National Air quality Monitoring Programme' (NAMP) of Central Pollution Control Board (CPCB). The monitoring of pollutants is carried out for 24 hours (4-hourly sampling for gaseous pollutants and 8-hourly sampling for particulate matter) with a frequency of twice a week.

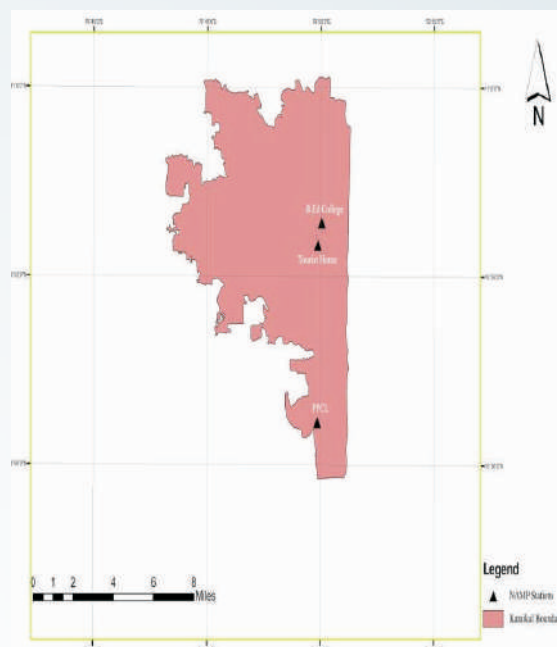
### Location of NAMP Stations

Sl. No.	Location Name	Location Type	Source of Pollution
1	Local Administrative Department Building (LAD), Suffren Street, Puducherry.	Residential area	Vehicle emission and natural dust from road
2	Dept of Science Technology and Environment Building (DSTE), Anna Nagar, Puducherry.	Residential cum Commercial area	Vehicle emission and natural dust from road
3	Electricity Department, Mettupalayam Industrial Estate (PIPDIC), Puducherry.	Industrial area	Industrial Pollution and vehicular pollution
4	B.Ed. College, Nehru Nagar, Karaikal	Residential area	Vehicle emission and natural dust from road
5	Govt. Guest House, Kovilpathu, Karaikal	Residential cum Commercial area	Vehicle emission and natural dust from road
6	PPCL, Polagam, T.R. Pattinam, Karaikal	Industrial area	Industrial Pollution and vehicular pollution

## PUDUCHERRY



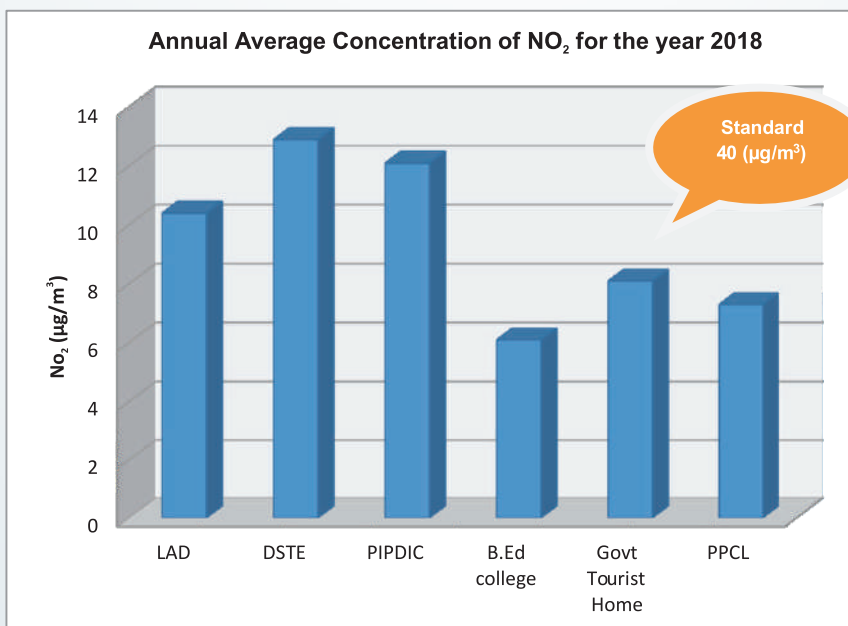
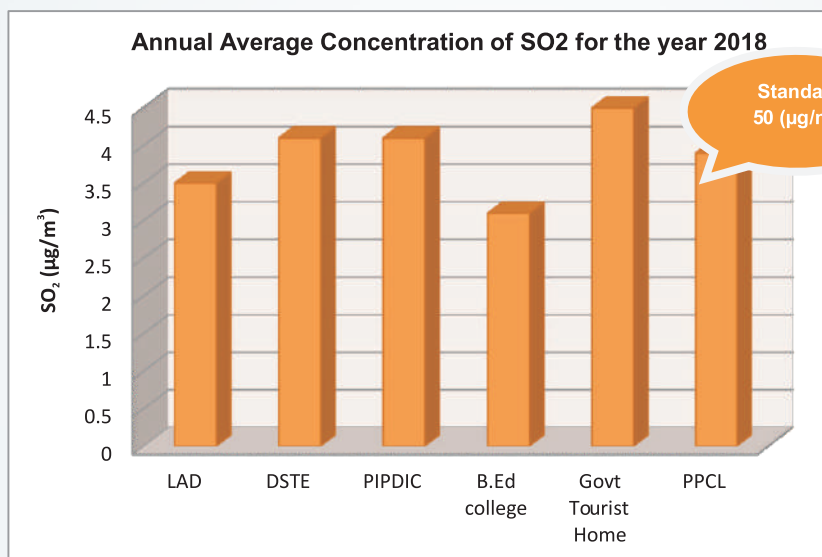
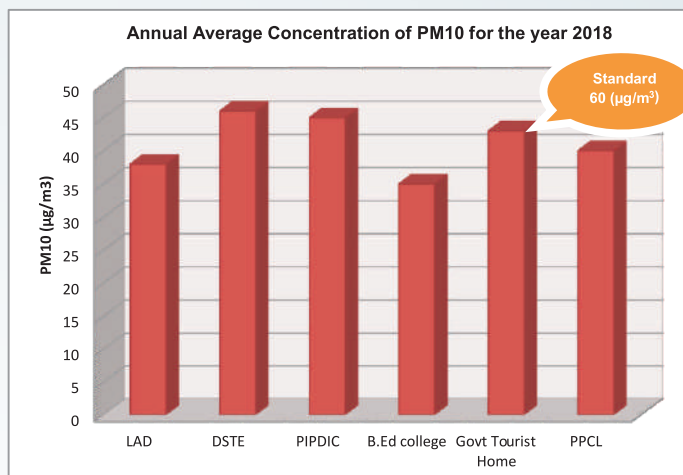
## Karaikal



### Air Pollutants Monitored Under NAMP, Method of Measurement, Their Sources and Effects

Sl. No.	Air Pollutant	Method of measurement	Possible sources	Effects
1	Particulate Matter – PM <sub>10</sub> (size less than 10 microns)	Gravimetric	Road traffic emissions particularly from diesel, vehicles, Industrial combustion plants Commercial and residential combustion	Visibility reduction cardio-pulmonary problems asthma, bronchitis, and pneumonia
2	Nitrogen dioxide	Improved West and Gaeke method	High temperature combustion (internal combustion engines, fossil fuel-fired power stations, industrial) Burning of Bio-mass and Fossil Fuels	Irritates the nose and throat, increase susceptibility to respiratory infections
3	Sulphur dioxide	Modified Jacob and Hochheiser	Combustion of fossil fuel. Combustion process in diesel, petrol.	Respiratory illness. Visibility impairment

Sl.No	Location	Pollutant in $\mu\text{g}/\text{m}^3$		
		PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>
1	LAD	38	3.5	10.4
2	DSTE	46	4.1	12.9
3	PIPDIC	45	4.1	12.1
4	B.Ed college	35	3.1	6.1
5	Govt Tourist Home	43	4.5	8.1
6	PPCL	40	3.9	7.3
Standard		60	50	40





### **Observation and Results:**

- The monitoring result reveals that 24 Hourly average concentration of Particulate Matter (Size less than  $10\text{ }\mu\text{m}$ ) -  $\text{PM}_{10}$  measured in all the six locations are within the prescribed standard limit of  $100\text{ }\mu\text{g}/\text{m}^3$ .
- Annual average concentration of  $\text{PM}_{10}$  measured in all the six locations are in the ranges from 35 – 46 ( $\mu\text{g}/\text{m}^3$ ) which is within the prescribed standard limit of  $60\text{ }\mu\text{g}/\text{m}^3$ .
- The annual average concentrations of the pollutants viz.,  $\text{SO}_2$  &  $\text{NO}_2$  in all the six locations are within the prescribed standard limits. One of the reasons for low levels of pollution in coastal cities like Puducherry is that it has sufficient ventilation effects due to sea and land breezes, which reduces pollution levels.

### **Air Quality Index:**

Air Quality Index is a tool for effective communication of air quality status to people in terms which are easy to understand. It transforms complex air quality data of various pollutants into a single number (index value), nomenclature and colour.

There are six AQI categories, namely Good, Satisfactory, Moderately Polluted, Poor, Very Poor, and Severe. Each of these categories is decided based on ambient concentration values of air pollutants and their likely health impacts (known as health breakpoints). AQ sub-index and health breakpoints are evolved for eight pollutants ( $\text{PM}_{10}$ ,  $\text{PM}_{2.5}$ ,  $\text{NO}_2$ ,  $\text{SO}_2$ ,  $\text{CO}$ ,  $\text{O}_3$ ,  $\text{NH}_3$ , and Pb) for which short-term (upto 24-hours) National Ambient Air Quality Standards are prescribed.

Based on the measured ambient concentrations of a pollutant, sub-index is calculated, which is a linear function of concentration (e.g. the sub-index for  $\text{PM}_{2.5}$  will be 51 at concentration  $31\text{ }\mu\text{g}/\text{m}^3$ , 100 at concentration  $60\text{ }\mu\text{g}/\text{m}^3$ , and 75 at concentration of  $45\text{ }\mu\text{g}/\text{m}^3$ ). The worst sub-index determines the overall AQI.

**Status of Category -wise numbers of AQI in the U.T of Puducherry for the year 2018.**

AQI Category	AQI Range $\mu\text{g}/\text{m}^3$	Colour Code	Number of AQI Values in Different Category		Pollutant - wise Number of AQI Values in AQI Category	Possible Health Impacts
			No of AQI Values	% of AQI Values	PM <sub>10</sub>	
Good	0-50		463	82.1	463	Minimal Impact
Satisfactory	51-100		101	17.9	101	Minor breathing discomfort to sensitive people
Total AQI Values			564	100	564	

Note:- One observation means one AQI calculated for daily ambient air quality data at one station.

**National Air Quality Index**

AQI	Possible Health Impacts
<b>Good (0-50)</b>	Minimal Impact
<b>Satisfactory (51 - 100)</b>	Minor breathing discomfort to sensitive people
<b>Moderate (101 - 200)</b>	Breathing discomfort to the people with lung disease, heart disease to the children and older adults
<b>Poor (201 -300)</b>	Breathing discomfort to people on prolonged exposure
<b>Very Poor (301 -400)</b>	Respiratory illness to people on prolonged exposure
<b>Severe (&gt;400)</b>	Respiratory effects even on healthy people

## **Overall summary**

The calculated AQI values for 24 hourly average concentrations are categorized as Good to Satisfactory for the year 2018 at all the six locations. The Prominent parameter is  $PM_{10}$ . The AQI value calculated for the two cities for  $PM_{10}$  showed 82.1 % of AQI value i.e. 463 AQI values in the U.T of Puducherry out of total 564 AQI values revealed good air quality 17.9 % of AQI value i.e. 101 AQI values showed satisfactory air quality .

## **Conclusion**

The overall AQI can give clear view about ambient air and the report reveals that  $PM_{10}$  is mainly responsible to determine the air quality which can be easier for a common man to understand. The  $PM_{10}$  concentration in the Puducherry and Karaikal region is sourced predominantly from the anthropogenic activity, which may be due to the increase in vehicle movement, road dust etc.

## **Broad guidelines for Public/Citizens:**

AQI is an initiative intended to enhance public awareness and involvement in efforts to improve air quality. People can contribute by maintaining vehicles properly (e.g. get PUC checks, replace car air filter, maintain proper tyre pressure), following lane discipline & speed limits, avoiding prolonged idling and turning off engines at red traffic signals. In addition to the above, during severe or very poor AQI, people should minimize travel; avoid using private vehicles and instead use public transport, bikes or walk, and carpool.

## **Ambient Air and Noise Pollution Levels – Deepavali 2018**

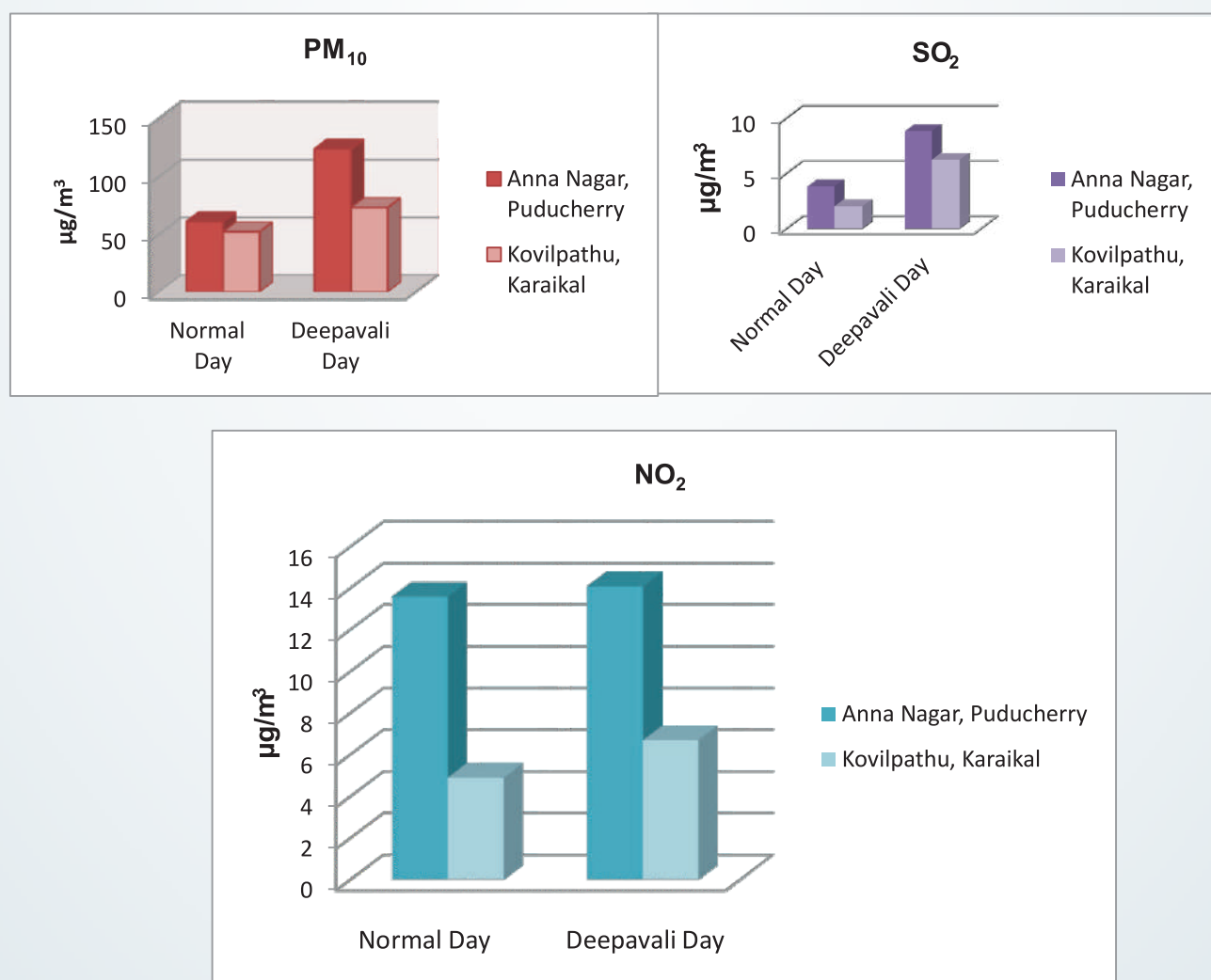
Every year Puducherry Pollution Control Committee conducts air quality monitoring to ascertain the impact of crackers bursting during Deepavali festival. This year also, Puducherry Pollution Control Committee conducted Ambient Air Quality and Noise Monitoring during normal day and on Deepavali day to assess the environmental impact of bursting of crackers.

The Noise survey result reveals that there is an increase in ambient noise level on the day of Deepavali [87.2 Leq dB (A)] in comparison to the normal day [74.2 Leq dB (A)]. The main cause of increase in the ambient noise level during festivals is bursting of crackers and also due to vehicular movement, whereas in normal day the main contributors to the ambient noise level in that area is due to two wheeler movement. However, the measured noise levels because of bursting of crackers were found to be within the Hon'ble Supreme Court directive on noise level of 125 dB(A).

In Puducherry, the Air Quality Monitoring report reveals that the 24 hourly average concentration of Particulate Matter was found significantly higher ( $124 \mu\text{g}/\text{m}^3$ ) on the day of Deepavali when compared to normal day ( $61 \mu\text{g}/\text{m}^3$ ) and it is above the prescribed standard limit of  $100 \mu\text{g}/\text{m}^3$ . The monitoring conducted at Karaikal reveals that the concentration of Particulate Matter ( $73 \mu\text{g}/\text{m}^3$ ) on the day of Deepavali is higher when compared to normal day ( $52 \mu\text{g}/\text{m}^3$ ) and it is within the prescribed standard limit  $100 \mu\text{g}/\text{m}^3$ . The concentration of gaseous pollutants viz.,  $\text{SO}_2$  and  $\text{NO}_2$  are within the prescribed standard limit  $80 \mu\text{g}/\text{m}^3$ .

The analysis of AQI in Puducherry on the day of Deepavali indicates that the value is falling in Moderate category and on Normal day the value is falling in Satisfactory and in Karaikal the value is falling under Satisfactory category on Normal day and on Deepavali day.

#### Ambient Air Quality Level on Normal Day & Deepavali Day



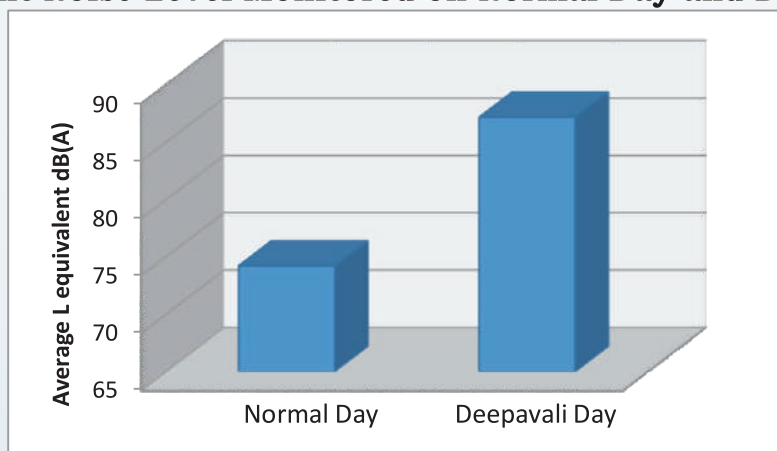
## Compliance of Hon'ble Supreme Court Judgement dated 23.10.2018

Puducherry Pollution Control Committee conducted short term ambient air quality monitoring in Puducherry for 14 days (Commencing from 7 days prior to Diwali and ending 7 days after Diiwali) of the parameters namely particulate matters such as  $PM_{10}$ ,  $PM_{2.5}$ , Sulphur Dioxide( $SO_2$ ), Nitrogen Dioxide( $NO_2$ ), Lead(Pb), Arsenic(As), Nickel(Ni), Aluminum(Al), Barium(Ba), Iron(Fe), Strontium(Sr) and Sulphur(S) as instructed by Central Pollution Control Board for compliance of Hon'ble Supreme Court Judgement dated 23.10.2018.

Accordingly, 14 days monitoring was conducted at two locations viz., (i) Balaji Nagar, Reddiarpalayam and (ii) Bharathi Street, Nainarmandabam (Report is enclosed). The analysis report reveals the following:

- The increase in concentration of  $PM_{10}$  and  $PM_{2.5}$  is observed at both location on the day of Deepavali.
- The concentration of  $PM_{10}$  at location I on 31.10.2018 and 13.11.2018 and at location II on 13.11.2018 are higher than the prescribed standard limit of  $100 \mu g/m^3$  due to wind blown dust.
- The concentration of  $SO_2$  and  $NO_2$  remains within the prescribed standard limit in all the days. Nickel and Arsenic are present in  $PM_{10}$  at both location. This may be due to anthropogenic emissions.
- Aluminium and Barium was found higher on the day of Deepavali, but within the short term standards/critical values of  $40 \mu g/m^3$  and  $4 \mu g/m^3$  respectively. This may be due to bursting of fire crackers.
- The concentration of sulphur also found higher on the day of Deepavali.
- The concentration of potassium also present in the  $PM_{2.5}$  at location I on 6.11.2018 and 7.11.2018 and at location II from 5.11.2018 to 7.11.2018. This may be due to bursting of crackers. The standard yet to be proposed.

### Ambient Noise Level Monitored on Normal Day and Deepavali Day



## AMBIENT AIR QUALITY DURING BOGHI FESTIVAL, 2019

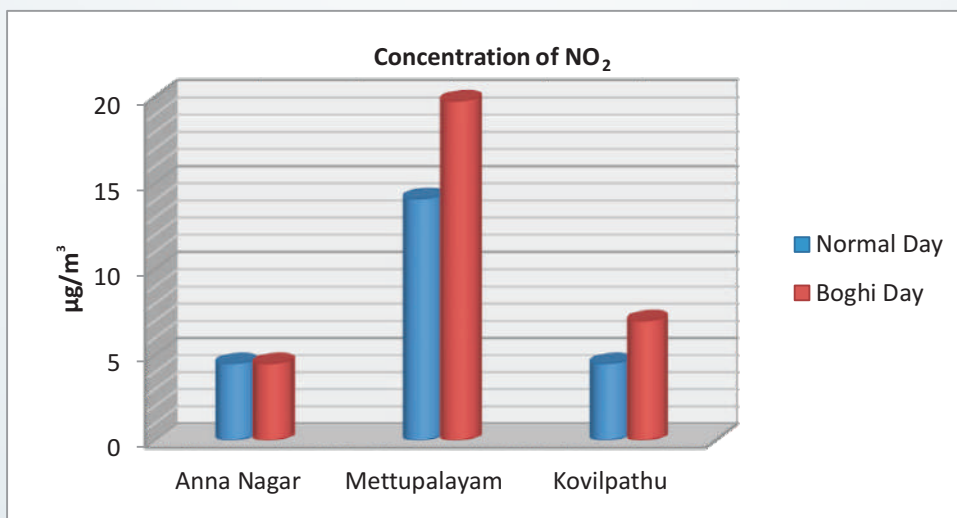
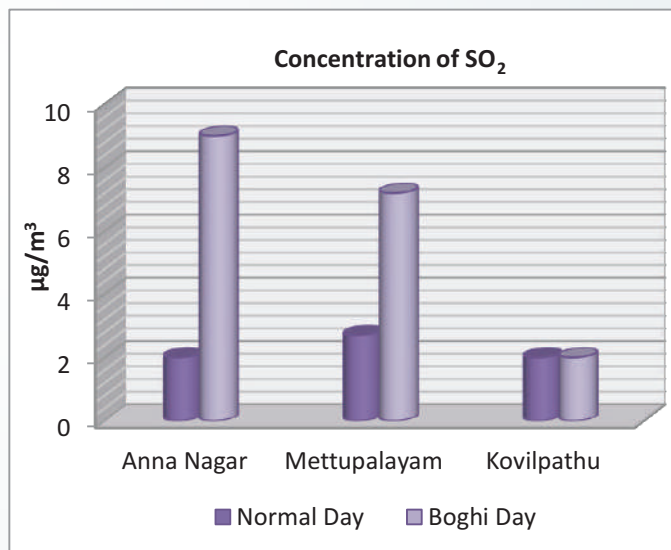
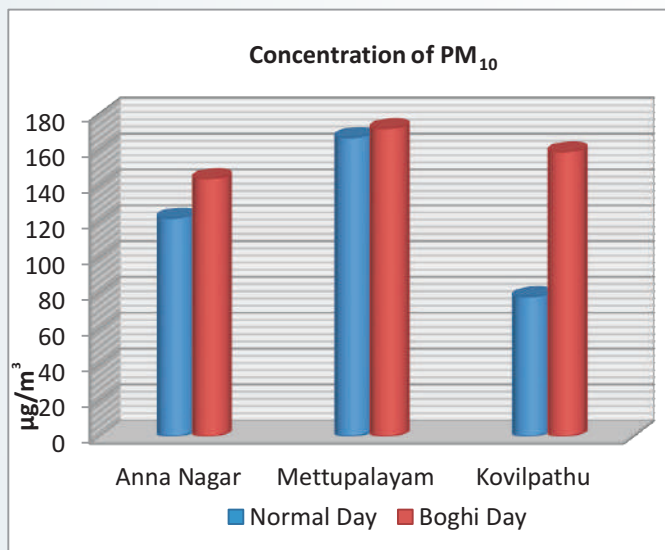
Puducherry Pollution Control Committee conducted ambient air quality monitoring at two locations in Puducherry and one location at Karaikal during Normal day 2019 and on Boghi day 2019 to assess the air quality.

### Trends in concentration of pollutants monitored on Normal day 2019 & Boghi day 2019

Location	Normal day - 2019			Boghi day -2019		
	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>2</sub>
Anna Nagar	122	2	4.5	144↑	9 ↑	4.5
Mettupalayam	167	2.7	14.1	172↑	7.2↑	19.8↑
Kovilpathu, (Karaikal )	78	2	4.5	159↑	2	7 ↑

(Concentration expressed in  $\mu\text{g}/\text{m}^3$ )

### Normal Day Vs Boghi Day 2019





## Environment Events

### Celebration of World Wetlands Day at Kasthurba College for Women, Villianur, Puducherry

World Wetlands Day Celebration was held at Kasthurba College for Women, Villianur, Puducherry on 02.02.2019. Nearly 80 students participated in the event. Dr. Cheryl-Ann Shivan, Principal, Kasthurba College for Women welcomed the gathering. Mrs. K. Bhuvaneswari, Assistant Professor gave inaugural address. Mrs. J. Nithiya, Programme Officer, ENVIS Hub Centre, Puducherry explained about the activities carried out by the Envis Hub Centre of the Puducherry Pollution Control Committee and also briefed the importance and way to conserve wetlands. Dr. Bubesh Gupta, Founder Director, Universal Eco Foundation gave special lecture on Wetlands, Biodiversity conservation and Climate Change and also the students were taken to sangarabarani river to raise awareness on wetland conservation. The students enthusiastically participated in the celebration. Students participated in painting, slogan writing and elocution competitions. The competition were judged by the Chief Guest, Principal and ENVIS Team. At the end of the competition, prizes were distributed to the winners. Awareness poster, pamphlet and stickers were released during the occasion. Posters were distributed to students for spreading the message on the importance of wetlands and its conservation.



## **Celebration of World Wetlands Day at Pondicherry Institute of Agriculture Science, Thavalakuppam, Puducherry**

World Wetlands Day Celebration was held at Pondicherry Institute of Agriculture Science, Thavalakuppam, Puducherry on 02.02.2019. Mr. C. Ganeche, the Founder and Chairman of PIAS welcomed the gathering. Dr. Arun Nagalingam, Principal gave inaugural address and Mr. Adhiguru, Scientist, ICAR, New Delhi briefed about the importance, causes and conservation of wetlands. Mrs. J. Nithiya, Programme Officer, ENVIS Hub Centre, Puducherry explained about the activities carried out by the Envis Hub Centre of the Puducherry Pollution Control Committee and also briefed about the importance and the way to conserve wetlands. Dr. Bubesh Gupta, Founder Director, Universal Eco Foundation gave special lecture on 'Wetlands, Biodiversity Conservation and Climate Change'. Around 70 students from the Department of Agriculture and Horticulture participated in quiz, slogans writing, essay writing and drawing competition. The students evinced keen interest to participate in the said function. The competitions were judged by the Chief Guest, Principal and Envis Team. At the end of the competition, prizes were distributed to the winners. Awareness poster, pamphlet and stickers were released during the occasion. Posters were distributed to students for spreading the message on the importance of the wetlands and its conservation.





## National Science Day, 2019

In order to commemorate the discovery of the Raman Effect in India by the Indian physicist, Sir Chandrasekhara Venkata Raman in the year 1930, the day is celebrated as National Science Day. For his great success in the field of science in India, Sir Chandrasekhara Venkata Raman had been awarded and honoured with the Nobel Prize in Physics in the year 1930. To honour this event, 28<sup>th</sup> of February is observed as National Science Day in India by the National Council for Science and Technology Communication (NCSTC). Each year a theme will be selected for the celebration of National Science Day. The theme for 2019 is **“Science for the People and the People for Science”**.

As part of the National Science Day, 2019 celebration on 28.02.2019, the following activities were organized by the Puducherry ENVIS Hub Centre.

1. Drawing and Quiz Competitions were conducted at Dhatchnamoorthy Government High School, Vambakeerapalayam, Puducherry.
2. Drawing, Quiz, Debate and Colouring Competitions were conducted at Savarirayalu Naicker Government Girls High School, Needarajapayer Street, Puducherry.
3. Drawing and Quiz Competitions were conducted at Sekkizhar Government High School, Thattanchavady, Puducherry.
4. Drawing and Quiz Competitions were conducted at Government High School, Kombakkam, Puducherry.



## International Day of Forests 2019

International Day of Forests is celebrated worldwide every year on 21<sup>st</sup> of March in order to increase the public awareness about the values, significance and contributions of the forests to balance the life cycle on the earth. The theme of this year was 'Forests and Education'. On this special occasion, a lecture and quiz competitions were conducted on the theme “Forests and Education” on March 21, 2019 at Government High School, Ariyankuppam, Puducherry. At the end, an awareness poster, pamphlet and stickers were released. The value added products distributed to students for spreading the message on the importance of forests and how people are dependent on forest resources for their livelihoods. Nearly 100 Students participated in the event. At the end of the competition, prizes were distributed to the winners.



## World Water Day Celebration 2019

World Water Day is an event hosted annually by the United Nations on March 22nd. The theme for World Water Day 2019 is 'Leaving no one behind,' which is the central promise of the 2030 Agenda for Sustainable Development: as sustainable development progresses, everyone must benefit. The event will seek to address the water crisis and the reasons why so many people, including women, children, refugees, indigenous people, disabled people and others are “being left behind” as they try to access and manage the safe water they need. In this special occasion, Special Lecture and Quiz Competitions were conducted at Government High School, Kuruvinatham, Bahour, Puducherry. The students enthusiastically participated in the above said events. At the end, an awareness poster, pamphlet and stickers were released. The value added products were distributed to students for spreading the message on the importance of fresh water and advocating for the sustainable management of freshwater resources. Nearly 70 Students participated in the event. At the end of the competition, prizes were distributed to the winners.





## Puducherry Environment News Report

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