

# Performance Audit

## Group VIII

# Environment Audit

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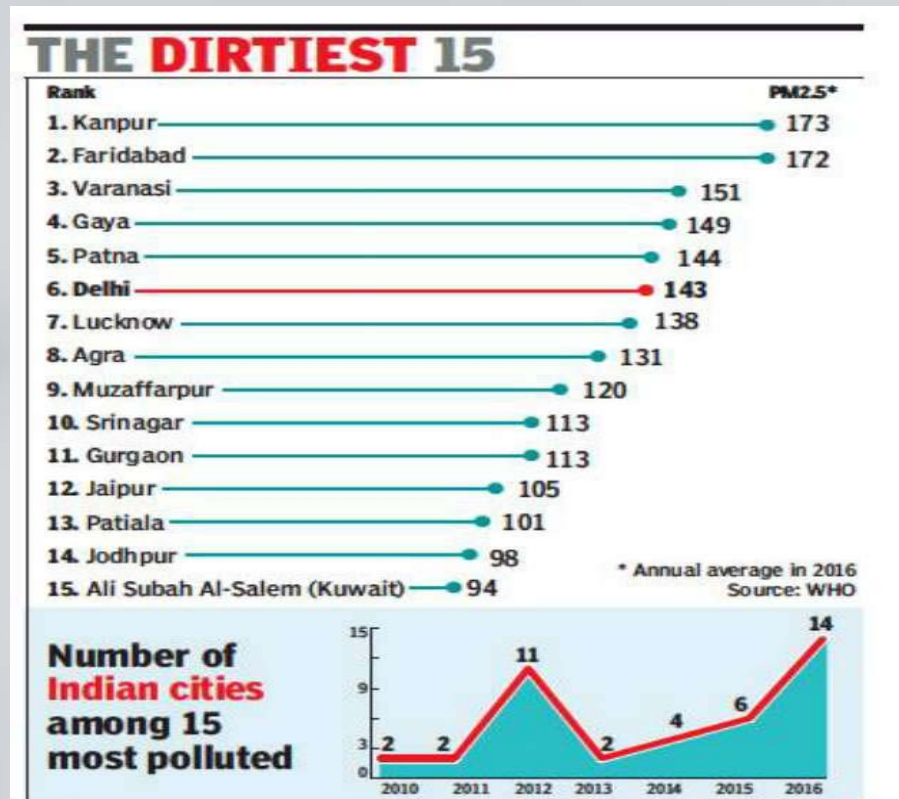
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**Presented on 02-04-2019**

# INDIA and World Air Pollution

- **WEF's Environmental Performance Index**-India's Rank-177/180 in 2018 and 141/180 in 2016
- According to **WHO** report, Kanpur is the world's most polluted city while Delhi is world's most polluted capital.
- North Indian cities occupy 14 of the top 15 slots.



- **Lancet Report-**
  - 12.40 lakh deaths in India were due to air pollution, roughly 1 in 8 deaths.
  - 77% of total population exposed to outdoor air pollution levels above NAAQS.
  - WHO report on “Air Pollution and Child Health”.

According to the report, every day around 93% of the world's children under the age of 15 years (1.8 billion children) breathe air that is so polluted that it puts their health and development at serious risk. In poorer countries, 98% of all children under five are exposed to PM2.5 above WHO guidelines.







# Air Monitoring in India

## ❑ CPCB's National Air Quality Monitoring Program :-

- To determine status and trends of Ambient Air Quality
- To ascertain compliance of NAAQS (National Ambient Air Quality Standards)
- Sulphur Dioxide, Oxides of Nitrogen, Respirable Suspended Particulate Matter(PM10) and Fine Particulate Matter(PM2.5) have been identified for regular monitoring at all the locations
- To identify non-attainment cities
- To understand the natural process of cleaning in atmosphere
- To undertake preventive and corrective measures

## ❑ SAFAR (System of Air Quality and Weather Forecasting and Research)

- A project of Ministry of Earth Sciences.
- To provide location specific information on air quality in near real time.
- Forecast 1-3 days in advance.

<b>Good*</b> 1-50		Minimal hazard
<b>Satisfactory</b> 51-100		Minor breathing trouble to sensitive people
<b>Moderate</b> 101-200		Breathing trouble for asthmatics, those with lung/heart problems
<b>Poor</b> 201-300		Breathing trouble to most on prolonged exposure
<b>Very Poor</b> 301-400		Respiratory illness on prolonged exposure
<b>Severe</b> 401-500		Impacts healthy; impacts those with existing illnesses seriously

# Recent Government Measures

- Ban on **pet coke** as a fuel
  - High Sulphur content , SO<sub>2</sub>
  - Higher CO<sub>2</sub> emissions
  - It contains toxic metal vanadium
- **National Policy on Biofuels** targets
  - 20% blending of ethanol with gasoline
  - 5% blending of biodiesel with diesel, by the year 2030
- **Methanol Cooking Fuel Program** plans to replace LPG, Kerosene, Wood, Charcoal as preferred cooking fuel
- **BS Emissions Standards**
  - BS VI standards for vehicles will be applicable from 1st april 2020 (already in place for Delhi)
  - BS VI compliant fuel is expected to have about 80% reduced SO<sub>2</sub>, particulate matter and Nox emissions.
- **WAYU** a device developed by CSIR to address air pollution at high traffic zones



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- **Non attainment cities**

Cities marked by CPCB who have fallen short of the NAAQS for PM10 and NO2 over 5 years.

- **SC Ruling on Fire Crackers**

Banned loud and toxic crackers allowing only reduced-emission green crackers.

Banned joined/series crackers (Laris).

“Community” bursting in case of NCR at pre-designated areas.

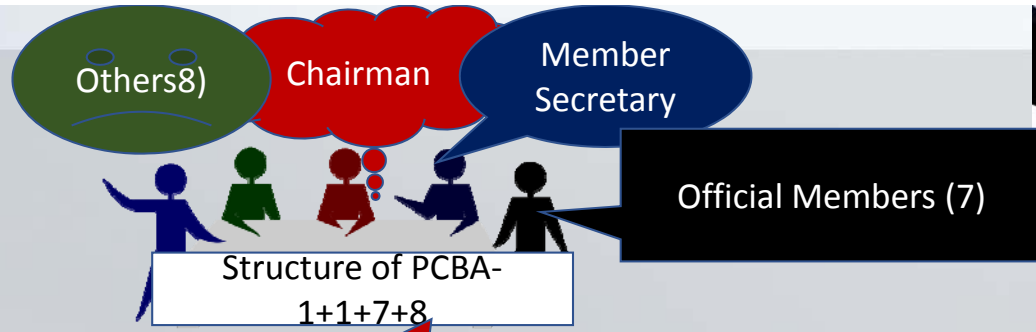
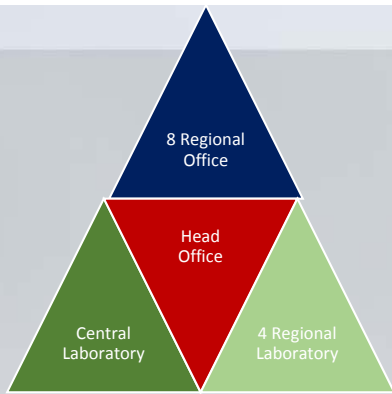
- **FAME-2** (Faster Adoption and Manufacturing of hybrid and Electric vehicles in India)

- **Green Bonds** - Bonds issued by multilateral institutions like the WB having specific mandate from the buyers to invest the proceeds in green projects.

***Audit Objective 1: To ensure whether Pollution Control Board of Assam(PCBA) and concerned stakeholders complied with all Acts ,Rules, Government policies and instructions for prevention ,control and abatement of pollution***

***Audit Objective 2: To ensure effective mechanism was in place in the Government organisations and private entities , involved in prevention, control and abatement of pollution , to ensure that adverse impact of their processes and activities on the environment was minimised***

<b>Audit Question</b>	<b>Audit Criteria</b>	<b>Audit Evidence</b>	<b>Data Collection Methodology</b>
<ul style="list-style-type: none"> <li>•Whether the pollutants are measured as per CPCB guidelines.</li> <li>•Whether there is a mechanism for periodic regulation of emissions from industries and vehicles.</li> <li>•What is the mechanism of collecting fines</li> <li>•Whether there is art of technology available for measuring the required pollutants</li> <li>•Whether required manpower and infrastructural facilities are in place</li> </ul>	<ul style="list-style-type: none"> <li>•All related acts like The Air (Prevention &amp; Control of Pollution) Act, the Environment(Protection) Act,1986, the Motor Vehicles Act,1988 and the Central Motor Vehicles Rules</li> <li>•National Ambient Air Quality Standards(NAAQS)</li> <li>•Orders , instructions , guidelines standards issued by Government , Central Pollution Control Board (CPCB) etc</li> <li>• Section 25 of Water Act and rules made there under</li> </ul>	<ul style="list-style-type: none"> <li>•Pollution Control Board of Assam(PCBA) records</li> <li>• Photographs</li> <li>•Reports of Air quality monitoring stations</li> <li>•Observations taken during joint physical inspection</li> <li>•Observations on periodical monitoring reports</li> </ul>	<ul style="list-style-type: none"> <li>•Information was collected from the office of Transport, Census, Industry,</li> <li>•Entry Conference with all stakeholders</li> <li>•Collection of data through document analysis, response to audit queries, questionnaires, joint Physical Verifications, joint collection of samples and photographic evidence</li> <li>•Public comments asked on the subject</li> <li>•Study Reports of different institutions/Scholars and of various implementation agencies</li> </ul>



CPCB - PCBA

## Audit Findings



- Inadequate Monitoring of Air Pollutants
- Unscientific Location of Air Quality Monitoring Stations
- Ambient Air Quality at Different Stations of Guwahati



Total Numbers=1145

- Industries Operating without Valid Consent for Operation
- Inadequate Inspection of Industries
- Emission of PM in Excess of Standard
- Continuous Stack Emission Monitoring System not Installed



- Inadequate Monitoring of Auto emission testing stations
- Joint Inspection findings of Vehicle Pollution Emission Testing Centres
- Higher Benzene level near Petrol/ Diesel Retail Stations

## Recommendations

- Establish Air Quality Monitoring stations: Eco-Sensitive, Commercial Industrial
- Monitor all Parameters Prescribed
- Functioning of Vehicular pollution emission testing centres should be reviewed
- Regular monitoring and strict action against agencies issuing inaccurate PUC certificates

# Air Pollution - Jammu

- Jammu among 102 Non-Attainment Cities in the country.
- In 2014, WHO has put Jammu among the 20 most polluted cities in the world (Govt. refuted the claim).
- RSPM level in Jammu city is moderately polluted to poor.
- Reasons for Pollution:

## a) vehicular pollution

## b) deforestation due to expanding habitation

## c) dust generated by construction activities

## d) bricks kiln

## e) use of firewood and coal

## f) unmetalled roads

### Vehicular pollution :

- Around 9 lakhs vehicles are registered in Jammu division of which around 7 lakhs are in Jammu district.
- About 98 percent of cities commercial vehicles in Jammu do not meet norms set out by the SPCB air quality guidelines.( As reported in Kashmir times 13/1/2019)
- BS-III norms.
- Maximum age of vehicle fixed at 25 years.
- Vehicles plying without pollution under control certificate.

**Source:** J&K Govt. Website

### Jammu State Pollution Control Board

- Constituted in 1986, tasked with monitoring pollution and enforcement of rules and regulations.

### Indoor Pollution:( Tobacco: J & K is emerging as smoking capital of Northern India)

1. Exposure to passive smoking **at workplace** J & K has highest prevalence (**1 st rank**) in the country.
2. Smokers aged above 15 spend Rs. 513.60 in J&K , while national average is Rs399.20 monthly.

*Source: Global Adult Tobacco Survey(GATS)*



# PM 10 & PM 2.5 : Review

## Air Pollution Monitoring stations:

**Residential: Narwal & MA Stadium**

**Industrial: Bari Brahma**

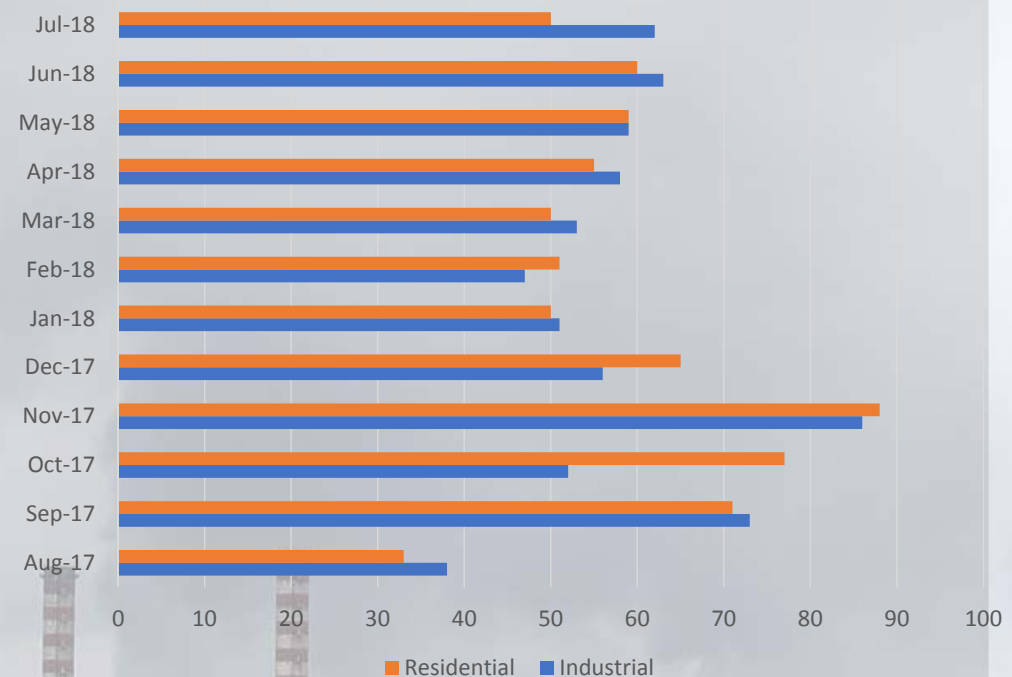
## Four pollutants are measured:

1. Particulate matter: PM 10 & PM 2.5
2. Gases: NO<sub>2</sub> & SO<sub>2</sub>

RSPM/PM 10 (Standard 100 ug/m<sup>3</sup>)



PM 2.5 (Standard 60 ug/m<sup>3</sup>)



## Inferences:

1. PM<sub>10</sub> is well above permissible standard level round the year.
2. PM<sub>2.5</sub> crossed permissible level for four months in winter.
3. Average level in industrial area is either equal or lower than residential area.
4. Level is generally highest during winter i.e Nov to Feb , due to persistent smog and temperature inversion.

## Recent Measures taken by JKPCB to Control Air Pollution

- Age of Vehicles to be reduced from 25 years to 15 years.
- Target of Adopting BS VI norms by April 2020.
- Issued an Order to Cover the Vehicles carrying Construction Materials.
- Restaurants, Eateries has to switch to LPG instead of Firewood.
- Re-register all BS III Vehicles in the state.

## Recommendations to Control Air Pollution

- Deploy Real time air quality monitoring setup at the earliest and provide the Air Quality Levels on their Website in real time.
- Old vehicles need to be phased out in a time bound manner in the city and it must be made mandatory for all to use CNG or LPG as fuel to run vehicles.
- It must be made mandatory for each Owner to produce 'No Pollution Certificate' at regular intervals of time to RTO.
- BS VI fuel norms will reduce vehicular emission by 51% - Vehicles run by battery producing zero emission need to be encouraged for tackling the problem of air pollution.
- Public Transport System needs to be augmented to discourage the private or Personalised transport.
- Appropriate measures need to be taken to check pollution caused by factories in and around Jammu

# Role of Technology in reducing Air Pollution

## Artificial Intelligence

- **Green Horizon Project from IBM** - analyzes environmental data and predicts pollution as well as tests “what-if” scenarios that involve pollution-reducing tactics.
- Chinese Xian and Beijing Smog Towers clean Air.
- China has become a hotspot for the ‘**Vertical Forest**’ building concept
- IQAir has developed AirVisual maps and app which uses bigdata and AI to analyse the weather data, government and Node data and Satellite Data to forecast the PM 2.5 readings.
- By machine learning algorithms(DeepMind AI), Google is able to cut the amount of energy it used at its data centres by around 15%.
- Delhi Government & University of Chicago Launched a unique UrbanLabs innovation Challenge.

## Cloud Seeding

- Cloud seeding is the practice of creating artificial precipitation to take place by dispersing substances like salts into the air through aircraft.



## Conclusion

- Contents of increasing trend of SO<sub>2</sub>,NO<sub>2</sub> and Particulate matters need immediate attention of Individuals and Concerned Authorities and effective measures should be taken to control the pollution.
- Provisions of Acts and Rules are required to be enforced promptly for the prevention, control and abatement of air pollution.

