Results of the GSP Survey on Air Pollution and Health for Schools

Webinar
Thursday, 28 May 2020
11 am - 12 pm
GT Young - https://www.downtoeearth.org.in/category/young
<table>
<thead>
<tr>
<th>S.No</th>
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<th>State</th>
<th>District</th>
<th>Category</th>
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<tbody>
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<td>1</td>
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18 Green; 23 Yellow; 3 Orange
## GSP Audit 2019 Status

<table>
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<th>S.No</th>
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<th>State</th>
<th>District</th>
<th>Category</th>
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<td>SARALA NODAL HIGH SCHOOL SAINTA</td>
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18 Green; 23 Yellow; 3 Orange
Air Pollution Seminar
AAETI - 2019

• AAETI Campus Walk
• Affordable sensors for alternative monitoring in schools
• Mobility practices and trends; possible solutions
• Air Pollution Impact on Health
• Spirometer Test
• Survey exercise and Point Source Mapping
• Exposure Visit - Central Pollution Control Board (CPCB) Monitoring Station, ITO, Delhi
**Air Pollution Survey**

- **Student Survey on air pollution and health:** to be filled by eight students each from grade 4 to 9. Young students could take parents' help.
  - Air quality and public health
  - Source of air pollution
  - Mobility practices
  - General awareness

- **Mapping Exercise** by one student each
  - from Grade 7 to 9
## Survey Participation

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<th>States</th>
<th>No. of Schools</th>
<th>Number of responses</th>
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<td>Online Survey</td>
<td>Mapping Exercise</td>
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<td>West Bengal</td>
<td>1</td>
<td>56</td>
<td>3</td>
<td></td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>26</strong></td>
<td><strong>1139</strong></td>
<td><strong>18</strong></td>
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</table>
Survey findings – overall

- Air Quality status response indicates the need to develop understanding about the ambient air quality Index (AQI), among the students.

- Maximum exposure is to the traffic and smoky vehicles - 64 per cent respondents. More than 60 per cent respondents spend one to four hours outside.

- Air pollution sources observed more in the residential areas than in the schools’ vicinity. Major sources include road dust, vehicle exhaust, large and small industries and garbage burning.

- Interestingly, the majority think that there is no impact of outside air pollution on the indoor air quality.
Survey findings – overall

• 75 per cent take sustainable or non-polluting mode of transport. 41 per cent respondents get stuck in traffic and take 30 minutes or more to reach school - face exposure time of minimum one hour in the congested areas, every day.

• More than 35 per cent respondents say that the frequency of visit to doctors increases in winters.

• 38 per cent respondents face special discomfort during severe smog episodes, most common issues include – eye irritation, wheezing, cold, suffocation, etc.

• **95 per cent of the students attribute the increase in respiratory problems to air pollution** and more than 80 per cent are aware that outdoor air pollution is amongst the top killers in the world and in India.
State-wise survey analysis

States:
- Andhra Pradesh
- Bihar
- Karnataka
- Kerala
- Odisha
- Tamil Nadu
- Telangana
- West Bengal
Introduction

- 13 cities from Andhra Pradesh come under the list of non-attainment cities list, namely: Anantapur, Chittoor, Eluru, Guntur, Kadapa, Kurnool, Nellore, Ongole, Rajahmundry, Srikakulam, Vijayawada, Vishakhapatnam, Vizianagaram. 5 schools participated. 3 in rural areas and 2 in urban.

- School from three districts participated in the survey namely Chittoor (60 responses), Krishna (52 responses) and Guntur (53 responses).

Survey Findings

- 30 per cent of the survey respondents know that air pollution is worsening. However, 24 per cent believe it has in fact improved.

- Major source of pollution close to residence is from road dust (32 per cent), cooking (23 per cent) and construction & demolition (15 per cent), while commuting to school and near the school the main source of pollution is road dust and vehicle exhaust emissions, as responded by 40 per cent and 47 per cent.
Health Impact of Air Pollution

• 52 per cent respondent says that indoor air quality at home gets affected by smoking and other sources such as cookstoves, incense sticks.

• Around 39 per cent of survey respondents have complained of respiratory ailments during winters.

• More than 75 per cent get stuck in traffic while commuting to school.

• 34 per cent feel that they visit doctors more frequently for respiratory problems during winters.

• 90 per cent of the respondents do not have any history of respiratory problems.
Sources of pollution - AP

- School Commute
- Close to school
- Close to residence

- Road dust: 18
- Vehicles exhaust emission: 23
- Cremation, Aircrafts: 21
- Garbage Burning: 32
- Domestic Sources - cooking etc: 24
- Road dust: 32
Bihar

Introduction
• Three cities from Bihar come under the list of non-attainment cities in India - Patna, Gaya and Muzaffarpur.
• As per the data from Bihar Economic Survey, It is observed that in the prevalence of main disease, in 2018-19, the number of cases was the highest in respect of Acute Respiratory Infections.

Survey Findings
• 70 per cent of the survey respondents think that air pollution is worsening.
• Almost 76 per cent of the survey respondents think that traffic and smoky vehicles contribute primarily to the problem of air pollution.
• 10 continuous ambient air quality monitoring stations are working in the state and out them six are stationed in Patna only
Health Impact of Air Pollution - Bihar

• Around 51 per cent of survey respondents have complained of respiratory ailments during winters

• 56 per cent respondent says that indoor air quality at home gets affected by smoking and other sources such as cookstoves, incense sticks, etc

• 55 per cent of respondents say they feel discomfort in breathing during smog and 48 per cent think the air quality is very bad in their city and around the school

• Cough and Running/congested nose was observed in the responses, by 41 and 35 per cent

• More than 69 per cent get stuck in traffic while commuting to school
Sources of pollution - Bihar

- School Commute
- Close to school
- Close to residence

- Road dust: 19
- Vehicles exhaust emission: 22
- Diesel genset: 22
- Road dust: 17
- Domestic Sources - cooking etc: 48
- Garbage Burning: 52
Odisha

Introduction
• Six cities from Odisha come under the list of non-attainment cities in India: Angul, Balasore, Bhubaneswar, Cuttack, Rourkela, and Talcher.
• Only one school (12 responses) from Cuttack submitted the survey.

Survey Findings
• Approximately, 91 per cent of the survey respondents think it has neither improved nor declined over time but has remained the same.
• 75 per cent of the survey respondents think that traffic and smoky vehicles contribute primarily to the problem of air pollution.
• 75 per cent respondents say that indoor air quality at home gets affected by smoking and other sources such as cookstoves, incense sticks, etc.
• Commuting to school and near the school is the main source of pollution is road dust and vehicle exhaust as reported by 58 per cent and 33 per cent respondents respectively.
Karnataka

Introduction

• 4 non-attainment cities—Bengaluru, Devanagere, Gulbarga, and Hubli-Dharwad
• Lake Montfort School, Bengaluru. Located in the outskirts.
• 56 per cent responses from secondary grades. Rest from primary

Survey Findings

• 86 per cent students say that air quality is worsening. 5 per cent feel it is improving
• Overall, traffic and smoky vehicles main source according to 67 per cent
• 56 per cent students only use buses to commute. 10 per cent use only cars. 85 per cent SMV and 10 per cent NPT (GSP Audit)
# Major Sources of Air Pollution: Karnataka

<table>
<thead>
<tr>
<th>Source</th>
<th>Close to Residence</th>
<th>Close to School</th>
<th>School Commute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Emissions</td>
<td></td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>Road Dust</td>
<td></td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>Garbage Burning</td>
<td></td>
<td>33%</td>
<td></td>
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<tr>
<td>Large Industries</td>
<td>35%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road Dust and Vehicle Emissions</td>
<td>36%</td>
<td></td>
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<tr>
<td>Concrete Batching</td>
<td></td>
<td></td>
<td>55%</td>
</tr>
<tr>
<td>Road Dust</td>
<td></td>
<td></td>
<td>60%</td>
</tr>
<tr>
<td>Construction and Demolition</td>
<td></td>
<td></td>
<td>68%</td>
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</table>
Health Impact of Air Pollution

- 34 per cent students spend 5 hours or more outdoors every day. 69 per cent feel that indoor air quality does not get affected by outdoor pollution—need for awareness.

- 59 per cent get stuck in traffic in commute—increased exposure to emissions.

- 67 per cent feel that they visit doctors more frequently for respiratory problems during winters.

- 92 per cent of the respondents do not have any history of respiratory ailments. Despite this, majority feels respiratory issues due to the extent of pollution.
Kerala

Introduction
• State with cities that have NAAQS within prescribed limit. Status varies district-wise or even within a district
• 5 schools participated. 3 in rural areas and 2 in urban

Survey Findings
• 34 per cent students say that air quality is worsening. 36 per cent feel it is improving
• Traffic and smoky vehicles main source, as per 67 per cent
• 68 per cent students only bus/car to commute. 23 per cent carpool to school. All schools rely mostly on sustainable motorised vehicles
## Major Sources of Air Pollution: Kerala

<table>
<thead>
<tr>
<th>Source</th>
<th>Close to residence</th>
<th>Close to school</th>
<th>School commute</th>
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<tr>
<td>Vehicle Emissions</td>
<td>19%</td>
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<tr>
<td>Garbage Burning</td>
<td>19%</td>
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<tr>
<td>Road Dust</td>
<td>23%</td>
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<tr>
<td>Vehicle Emissions</td>
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<tr>
<td>Domestic Sources</td>
<td>48%</td>
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<tr>
<td>Road Dust</td>
<td>69%</td>
<td></td>
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</table>
Health Impact of Air Pollution

• 48 per cent students spend 6 hours or more outdoors every day.

• 50 per cent get stuck in traffic in commute. Increased exposure to emissions

• 34 per cent feel that they visit doctors more frequently for respiratory problems during winters

• 80 per cent of the respondents do not have any history of respiratory ailments. Despite this, the majority feels respiratory issues due to the extent of pollution
Tamil Nadu

Introduction
- Non-attainment cities: Thoothukudi and Trichy
- Chennai’s status and TN in Global Burden of Diseases 2017
- Schools: Eight schools, 386 responses*; four mapping exercise
- State’s Combined Ambient Air Quality Monitoring Station (CAAQMS) and Manual AQMS

Survey findings
- Air pollution status as observed:
  21 per cent believe that air pollution is worsening; here too 60 per cent - **IAQ not affected by outdoor** *
- Sources of pollution:
  Industries, garbage burning smoke (seen by 32 per cent), traffic and smoky vehicles
- Mobility:
  Sustainable modes by 69 per cent
- Exposure to dirty air:
  more than 50 per cent reported –less than 15 minutes to reach school
  20 per cent get stuck in traffic
  61 stay within 500m of main road – exposed to traffic fumes and road dust
- Good news! 65 per cent do not use car: use car ones:
  26 do carpooling
Tamil Nadu – Source of Pollution

- **Industries - point sources or large industries**
  - School Commute: 11%
  - Close to school: 11%
  - Close to residence: 15%

- **Industries - Area source - (includes small units)**
  - School Commute: 11%
  - Close to school: 16%
  - Close to residence: 20%

- **Diesel gensets**
  - School Commute: 6%
  - Close to school: 11%
  - Close to residence: 13%

- **Hotels/Restaurants**
  - School Commute: 12%
  - Close to school: 11%
  - Close to residence: 15%

- **Construction and demolition**
  - School Commute: 8%
  - Close to school: 9%
  - Close to residence: 12%

- **Garbage burning**
  - School Commute: 4%
  - Close to school: 5%
  - Close to residence: 12%

- **Concrete batching**
  - School Commute: 3%
  - Close to school: 4%
  - Close to residence: 14%
More than 30 percent of survey respondents have complained of respiratory ailments during winters and that the frequency of visit to the doctors increases in winters.

In a 1:1 ratio, respondents were informed by doctors that air pollution acts as a trigger for ailments like nasal, throat and eye irritation.

<table>
<thead>
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<th>Respondents</th>
<th>Sibling</th>
<th>Adult Family Members</th>
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<tr>
<td>Throat irritation</td>
<td>13%</td>
<td>11%</td>
<td>24%</td>
</tr>
<tr>
<td>Fever</td>
<td>15%</td>
<td>17%</td>
<td>21%</td>
</tr>
<tr>
<td>Running/congested nose</td>
<td>23%</td>
<td>22%</td>
<td>25%</td>
</tr>
<tr>
<td>Cough</td>
<td>24%</td>
<td>24%</td>
<td>27%</td>
</tr>
</tbody>
</table>
Telangana

Introduction
- Non-attainment cities: Hyderabad, Nalgonda, Patancheruvu and Sangareddy
- Khammam and PM 10 levels by CPCB
- Schools: Bharatiya Vidya Bhavan’s Atmakuri Rama Rao School, Hyderabad and Kendriya Vidyalaya Khammam; 122 responses* and one mapping exercise
- State’s Combined Ambient Air Quality Monitoring Station (CAAQMS) and Manual AQMS

Survey findings
- **Air pollution status as observed:**
  worsening by 35 per cent; IAQ not affected by outdoor* - close to 60 per cent
- **Primary sources of pollution observed:**
  Traffic and smoky vehicles; smoke from garbage burning (seen close to school by 24 per cent), road dust
- **Mobility:**
  Sustainable modes by 85 per cent
- **Exposure to dirty air:**
  Majority less than 15 minutes or between half-one hour
  55 per cent get stuck in traffic
  50 stay within 500m of main road – exposed to traffic fumes and road dust
Telangana – Source of Pollution

- **Diesel Gensets**
  - School Commute: 6
  - Close to school: 7
  - Close to residence: 12

- **Garbage burning**
  - School Commute: 9
  - Close to school: 11
  - Close to residence: 14

- **Concrete batching**
  - School Commute: 6
  - Close to school: 12
  - Close to residence: 15

- **Construction and demolition**
  - School Commute: 10
  - Close to school: 12
  - Close to residence: 15

- **Vehicle Exhaust Emissions**
  - School Commute: 11
  - Close to school: 10
  - Close to residence: 16

- **Domestic Sources**
  - School Commute: 9
  - Close to school: 3
  - Close to residence: 14

- **Road Dust**
  - 18%

**Source of Pollution percentages:**
- Diesel Gensets: 18%
- Vehicle Exhaust Emissions: 36%
- Construction and demolition: 14%
- Road Dust: 18%
- Domestic Sources: 36%
- Garbage burning: 14%
Health impact

- 80 per cent - spend one to four hours outside daily
- More than 40 percent of survey respondents have complained of respiratory ailments during winters and that the frequency of visit to the doctors increases in winters
- 47 per cent were informed by doctors that air pollution acts as a trigger for ailments like nasal, throat and eye irritation
West Bengal

• Introduction
  - 7 non-attainment cities: Asansol, Barrackpore, Durgapur, Haldia, Howrah, Kolkata and Raniganj.
  - School: Mount Litera Zee School, DHR, South 24 Parganas (close to Kolkata); 56 responses and three mapping exercise responses
  - 32 per cent respondents are from primary classes; Maximum responses received from grade 8 students (23 per cent)

• Survey findings
  - 57 per cent know that air pollution is worsening
  - 80 per cent think that traffic and smoky vehicles contribute primarily to the problem of air pollution. Only nine per cent consider smoke from garbage burning as worrying
  - 57 per cent of the survey respondents agree that indoor air quality is affected by the air pollution
  - More than 50 per cent use the bus.
  - 40 per cent face traffic congestion during commute
82 per cent say road dust causes air pollution close to school and or residence, 57 per cent have seen burning of garbage close to school or residence.
Health impact

- 40 per cent of survey participants spend more than 6 hours outdoors.
- More than 55 percent of survey respondents have complained of respiratory ailments during winters and that the frequency of visit to the doctors increases in winters.
- 66 per cent were informed by doctors that air pollution acts as a trigger for ailments like nasal, throat and eye irritation.
- While outdoor time is absolutely essential for us, on high pollution days we should refrain from vigorous outdoor activities.
Suggestions and recommendations

- AQI monitoring [http://cpcb.nic.in/](http://cpcb.nic.in/)
- Enable mechanisms to report instances
- Schools could undertake promotional events for children
- Create green barriers
- Encouraging cycling through provision of cycling stands/parking
- Educate the children about the potential health risks related to sources of pollution, health risks, etc
- Preventive measures such as avoiding exposure, using masks, changing routes, etc.
GT Environment E-Summer camp

Coming Soon:
- GSP Audit from Home
- Online Course for teachers
- Activity Book
Thank you