Challenges in estimating emissions from dispersed area sources

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Need for technical studies in air quality managment

What pollutes the air?

-***Source identification and mapping***

How polluted is the air?

-***Emission modeling, source apportionment---the NCAP directs non-attainment cities to carry out these assessments***

How is pollution affecting our health?

-***Dispersion and health risk modeling***

How do regulatory and technological intervention affect pollution levels?

-***Combination of all the above***

Fundamental modeling terminology

Source: Could be a point, line, area or volume source. For instance, an industrial stack would be a point source, a construction site would be an area source, etc.

Emission Rate: Emission load per unit time or emission rate per unit time per unit area (or per unit volume) depending upon the type of source.

Receptor: Location where the concentration of a particular pollutant is measured or predicted.

Understanding different types of sources

POINT

LINE

DISPERSED AREA SOURCES??????

Source classification

- *Point sources*
- Industries with stacks greater than 20 meters in height
- Thermal power plants
- *Line sources*
- Vehicle exhaust emissions
- *Area sources*
- Industries with stacks less than 20 meters in height, small boilers and cupola furnaces
- Hotels/restaurants/bakeries
- Construction and demolition
- Concrete batching
- Municipal solid waste burning
- Domestic-cooking and heating
- Dust-construction, road, agricultural

Relatively easier to estimate the quantum of load from point and area sources

Word of caution: **EFFECTIVE DATABASE MANAGEMENT NEEDED. DATABASES SHOULD BE UPDATED PERIODICALLY**

Data requirement for point sources

- Location of source
- Height and diameter of stack
- Exhaust temperature
- Flow rate of stack
- End of channel control

The emission monitoring system data for industries could be used to acquire emissions!

Data requirement for line sources

- Traffic volume counts
- Fleet characterization/composition-number, type and vintage of on-road vehicles (Primary surveys, PUC database)
- Information on the paving characteristics of road
- MOST CRUCIAL-**APPROPRIATE EMISSION FACTORS**

Data requirement for area sources

- For emissions from open burning

----Waste generation

----Composition-calorific value and moisture content

----Emission factor based on composition (difficult to determine???)

----points of generation and burning of waste

- For emissions from construction sites

---construction schedule

---amount of material being hauled

---type and duration of equipment being used on site

---dust management practices being followed on-site

---whether construction sites are employing a back-up generator or not

BURNING IN A DUMPYARD

ON-STREET BURNING

CONSTRUCTION DUST AND POLLUTION FROM CONSTRUCTION EQUIPMENT

Data requirement for area sources (continued)

- For emissions from open eateries and street food joints

----number of units

----fuel being used

----cooking arrangement

----type of cuisine (determines whether tandoor is being used or not)

EMISSIONS FROM TANDOOR

How is quantification of emissions from point and line sources easier?

- Specific location
- Numbers can be defined (to some extent)
- Emission factors available in literature

IN CASE OF DISPERSED AREA SOURCES, ALL THE ABOVE MENTIONED ADVANTAGES ARE LOST

What needs to be done?

- Periodic surveillance of landfill sites
- Every open burning incident should be penalised. Areas with a greater number of open burning incidents should be under constant surveillance.
- For large constructions, a construction schedule and equipment list should be submitted by contractors to the corporation/PCB prior to acquiring Consents.
- Surprise checks at construction sites to see whether dust management practices are in place or not.