भारत सरकार
Ministry of Environment Forest & Climate Change
Government of India

AIR POLLUTION INFOGRAPHICS

A Pictorial Guide for Awareness to Action

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Dr. Ravindra Khaiwal

भारत सरकार
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National Clean Air Programme: Hon'ble Prime Minister during his address to the nation from the ramparts of the Red Fort on the 15th August, 2020 announced National Clean Air Programme (NCAP) as a priority area with mission motto **'CLEAN AIR FOR ALL'.** In order to address the increasing air pollution across the country, the Ministry of Environment, Forest & Climate Change (MoEF&CC) launched a pan India time bound national level strategy to tackle the increasing air pollution problem in comprehensive manner.

Overall objective of the NCAP envisages comprehensive management plan for prevention, control & abatement of air pollution besides augmenting the air quality monitoring network across the country. The NCAP focuses on collaborative & participatory approach covering all sources of pollution & coordination between relevant Central Ministries, State Governments, local bodies & other stakeholders. The main components of NCAP inter-alia includes implementation of city specific air pollution abatement action plan for non-attainment cities, increasing number of monitoring stations, creation of technical assessment cell, technology support, public participation in planning & implementation, setting up of Air Information Centres for data analysis, source apportionment studies, setting up of national emission inventory, guidelines for indoor air pollution & setting up of rural monitoring stations, etc.

CLEAN AIR FOR ALL

Acknowledgement :-

The authors gratefully acknowledge the support from the Ministry of Environment, Forest & Climate Change, New Delhi (India) under the "Community Environmental Empowerment Program (CEEP)" project. The purpose of air pollution infographic is to aware & empower individual & communities for air pollution reduction to ensure better health, climate & environmental sustainability.

मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन,
सूचना एवं प्रसारण और
भारी उद्योग एवं लोक उद्यम
भारत सरकार

एक कदम स्वच्छता की ओर

सत्यमेव जयते

प्रकाश जावडेकर
Prakash Javadekar

MINISTER
ENVIRONMENT, FOREST & CLIMATE CHANGE,
INFORMATION & BROADCASTING AND
HEAVY INDUSTRIES & PUBLIC ENTERPRISES
GOVERNMENT OF INDIA

MESSAGE

Air pollution has increased with rise in population, vehicles, industrial and household waste. Ministry of Environment, Forest and Climate Change has taken several initiatives to reduce pollution in the country and one of the most important program is National Clean Air Programme, launched in January 2019 to tackle the problem of air pollution comprehensively.

Creating awareness and sensitizing the public on the concerns of Air Pollution and its causes are essential to bring in behavior changes and also contribute to the objective in long term. Use of social media for such awareness programs has been found very effective. Info-graphic mode of dissemination of information with the help of pictures and associated important aspects is a good tool to propagate the message to mass in very easy and accessible way. This e-booklet covers the various prevalent sources of air pollution, its impacts, and possible solutions at individual level to deal with the problem of air pollution in an easy and understandable manner to achieve the "Clean Air for All" mission.

I am sure that the pictorial booklet 'Air Pollution Infographics - A Pictorial Guide for Awareness to Action' developed by the Department of Environment Studies, Panjab University (PU), Chandigarh & Department of Community Medicine & School of Public Health, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh with support of Ministry of Environment, Forest and Climate Change will be a valuable tool to educate and engage citizens, professionals and authorities.

With best wishes.

Date: 31.05.2021

(Prakash Javadekar)

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Babul Supriyo
Union Minister of State
Ministry of Environment, Forest & Climate change
Government of India

बाबुल सुप्रियो
केन्द्रीय राज्य मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
भारत सरकार

सत्यमेव जयते

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Message

There is increasing evidence that air pollution affects our environment, climate, and human health. People are being exposed to pollutants such as airborne fine particles, vehicular exhausts, fly ash, and tropospheric ozone, associated with increased mortality and hospital admissions due to respiratory, cardiovascular and other associated diseases. Air pollution has been reported to be responsible for reducing life expectancy on a scale greater than wars, diseases, and other forms of violence.

Hence, it is vital to aware and engages the public about the health risks associated with poor air quality and how they can be part of the solution by espousing small but important changes in their daily lives. I noticed that the pictorial booklet 'Air Pollution Infographics – A Pictroial Guide from Awareness to Action' aims to generate awareness using easy to grasp infographics. The infographic used in the booklet explains the menace and different air pollution sources and acts as a step-by-step guide for all of us to be the heroes of environmental protection and curb air pollution.

This pictorial booklet also guides why we need to avoid various common practices such as burning household waste and use of firecrackers as they harm the environment and adversely affect human health. Hence, it is crucial to adopt some of the best practices suggested in this infographic to stay healthy and also to protect ecology & wildlife. I am sure the pictorial booklet 'Air Pollution Infographics' will be a valuable tool to educate everyone in simple, easy-to-grasp pictures about aspects of Air Pollution and its effects on human health will inspire them to live a healthy life.

I congratulate the team members from Post Graduate Institute of Medical Education & Research (PGIMER), Chandigarh, Panjab University (PU), Chandigarh, and my Ministry for developing this excellent infographic booklet. I am confident that this pictorial booklet will motivate the public to adopt eco-friendly and healthy practices to ensure environmental sustainability & promote human well-being.

(Babul Supriyo)

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SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

आर पी गुप्ता
R P Gupta

MESSAGE

Ministry of Environment, Forest and Climate Change has taken several initiatives to reduce pollution in the country and one of the most significant achievements is the National Clean Air Programme (NCAP), launched in January 2019 to tackle the problem of air pollution comprehensively.

NCAP has a target-specific approach to reduce particle matter concentration by 20 to 30 percent by 2024, keeping 2017 as a base year in 124 non-attainment cities. The program has holistic and integrated approach involving various stakeholders at various level including academia, researchers, regulators, concerned Ministries and Department of Centre and State, urban local bodies. Public participation and awareness are very critical for the success of the program.

Each state has different sources of air pollution; therefore, all states need their specific plans for the reduction of air pollution. Emissions from automobile vehicles can be reduced by promoting electric vehicles in cities. Public participation is part of the solution and success of this program depends on degree of such participation.

This booklet explains the general aspects of air pollution issues and possible solutions in an easy to understandable manner for urban as well as rural environment. Dissemination of critical scientific based information to public with the help of picture through easily available communication tools like mobile, internet and e-books provides faster coverage to higher number of targets. Such inforgraphic presentation is very attractive and widely accepted among common citizen specially the children.

I am sure that the pictorial booklet 'Air Pollution Infographics - A Pictorial Guide for Awareness to Action' developed by the experts from Department of Environment Studies, Panjab University (PU), Chandigarh & Department of Community Medicine & School of Public Health, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh and MoEF&CC, will be a valuable tool to educate and engage citizens, professionals and authorities.

[R P Gupta]

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INDEX

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AIR POLLUTION

:EVERYONE SHOULD HAVE A BLUE SKY

Air Pollution?

It is contamination of the indoor & outdoor environment by any physical, chemical or biological substance that alter the natural characteristics of the atmosphere.

Pollutants Classifications

Primary Pollutants: They are directly emitted into the atmosphere by the source.

Secondary Pollutants: Originate by the reaction of primary pollutants in the presence of sunlight, temperature & humidity e.g. ozone & photochemical smog.

Air Pollution Types

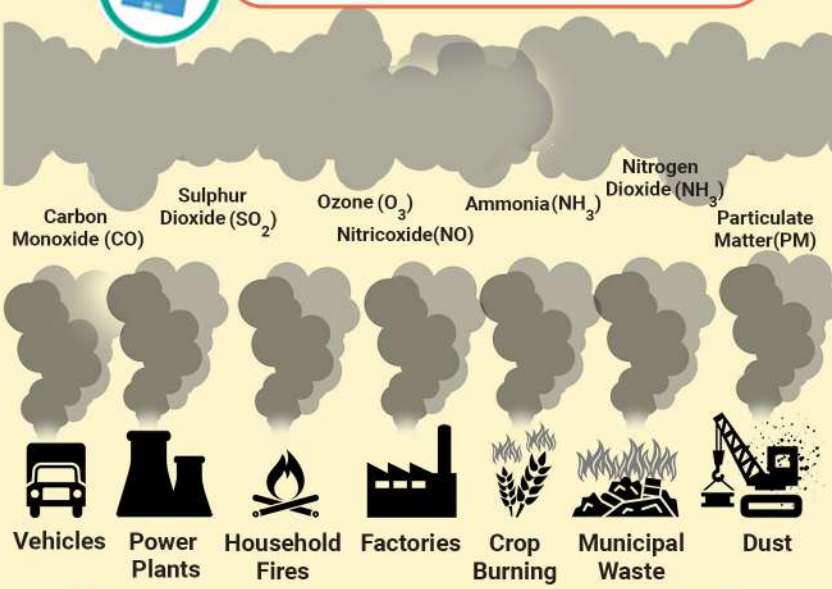
Sources of Air Pollution?

Natural Sources

Forest fires, volcanic eruptions, pollen dispersal, evaporation of volatile organic compounds & natural radioactivity.

Human-Made Sources

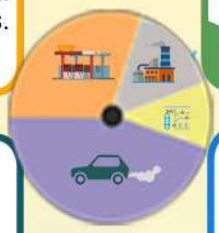
Vehicles, industries, power plants, pesticides, insect repellents & many cleaning products.



Types of Human-Made Sources

AREA SOURCE: Pollution sources like gas stations & auto body paint shops. It also includes residential source like fire places.

POINT SOURCE: Is a single identifiable source of air pollution such as factory, mine or refinery.



MOBILE SOURCE: Emissions by Motor vehicles, airplanes, locomotives which move from one location.

FUGITIVE SOURCE: Emission of gases or vapours from pressurized equipment due to leaks from industrial activities.

INDOOR AIR POLLUTION

:WHERE WE WORK & LIVE...

Indoor Air Quality: The quality of air within a structure or building which could affect occupant's health & comfort.

Indoor Air Pollution is the characteristic of air in the indoor environment (building, home, institution etc.) causing adverse health impacts.

Indoor Air Need Focus

- One of the top five environmental risks to public health.
- 10 times worse than the outdoor air pollution.
- Second biggest killer after high blood pressure in India.
- 2 Million premature deaths per year due to indoor air pollution.

Indoor Air Pollutants

- Particulate Matter (PM)
- Carbon Monoxide (CO)
- Volatile Organic Compound (VOCs) e.g. Formaldehyde
- Biological Pollutants e.g. Bacteria, Virus
- Lead (Pb)
- Asbestos
- Radon (Rn)

SOURCES OF INDOOR AIR POLLUTION

- Animal hair & dander
- Moulds, mildew & odours
- Pathogens from toilet water
- Tobacco/ Cigarette smoke
- VOCs from electronic equipments
- Mildew, Bacteria, vocs from cleaning products & insecticides
- Lead & formaldehyde from paints, varnishes & furniture
- Moulds, VOCs & odours from ACs
- Outdoor air containing particulate matter, VOCs, Pathogens etc.
- Dust, mites & other allergens from carpets, curtains & furniture fabric
- CO, Particulate Matter from unvented gas stoves & cooking
- Radon from floor cracks

ENVIRONMENTAL TOBACCO SMOKE

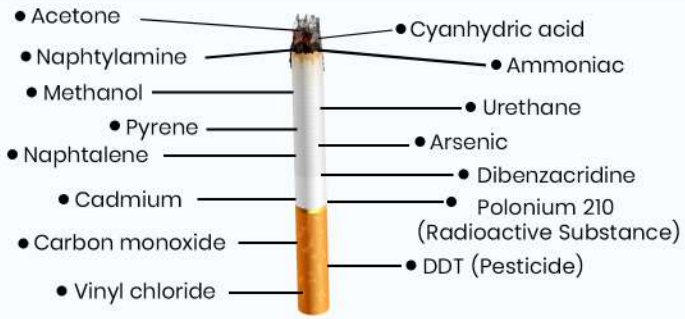
YOU & YOUR FAMILY'S HEALTH IS IN YOUR HANDS

DON'T TAKE SMOKE, AS A JOKE

Environmental Tobacco Smoke or Secondhand Smoke:

When a person burn or smoke tobacco products (e.g. cigarette, beedi or water pipes). Smoking generate air particles & vapours, which can fill an enclosed space such as bedroom, offices or restaurants with smoke.

Harmful Substances in Cigarette Smoke



There are more than 4000 chemicals in tobacco smoke, of which atleast 250 are known to be harmful & more than 50 are known to cause cancer.

AIRBORNE POLLEN & HEALTH

What are Pollens?

Pollen grains are male biological structure produced by higher plants cells vital for sexual reproduction. Their size range varies between 2 µm- 300 µm Pollen itself are immobile & dispersion is aided by agents such as water. Winds, insects & birds.

Pollens Allergies:

Pollen is one of the most common triggers of seasonal allergies. Many people know pollen allergy as "hay fever/ pollinoisis/ allergic rhinitis"). Exposure to allergic pollens are also linked to a range of health effects, including atopic dermatitis [eczema), anosmia, rhinorrhoea, angioedema, sinusitus, conjunctiva hyperaemia, otitis media & even exacerbation of asthma & chronic obstructive pulmonary diseases (COPD) in susceptible individuals.

Prevalence of Allergies:

About 10-30% of the global population is affected by allergic rhinitis. According to (International Study of Asthma & Allergy in Children) ISSAC phase 3 study:

- Prevalence of wheeze among 6-7yr & 13-14yr Indian Children (7%).
- 7-13yr-nasal symptoms (12.5%) & rhinoconjuctivitis (3.3%).
- 13-14yr nasal symptoms (18.6%) & rhinoconjuctivitis (5.6%).

Sources of Pollen Allergie :

Trees | Weeds | Shrubs/Herebs | Grasses

Signs & Symptoms of Pollen Allergies:

Sneezing | Running nose & mucus production | Cough | Red, itchy & watery eyes | Nasal congestion | Rhinitis (nasal inflammation) | Fatigue | Eczema (atopic dermatitis)

Tips to Minimize allergy symptoms:

Stay inside & limit your outdoor activities when pollen counts are high | Avoid gardening & yard work | Keep windows & doors closed during pollen season | Bathe after playing outside | Protect your eyes | Limit close contact with pets that spend a lot of time outdoors

Change & wash clothes worn during outdoor activities | Vacuum often | Use HEPA filters, if possible | Allergy medication | Wear mask

Treatment Available

Allergy Shots | Immunotherapy | Nasal Spray

HOUSEHOLD AIR POLLUTION (HAP)

: GLOBALLY ATTRIBUTED TO PREMATURE DEATHS

It not only affect your  **&**  **but also causes**

18% Stroke
27% Ischaemic Heart Disease

27% Acute Lower Respiratory Disease

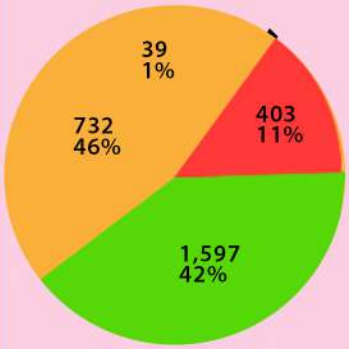
20% -Chronic Obstructive Pulmonary Disease

8% Lung Cancer

HOUSEHOLD AIR POLLUTION

Air pollution generated due to combustion of household solid biomass fuels leading to indoor air pollution & results in adverse health impacts due to exposure.

HAP Mortality (000'S)



- Children≤ 5 year
- Children 5-15 year
- Women ≥15 year
- Men ≥15 year

Firewood Pollutants

150 mg/m³ Carbon Monoxide
002 mg/m³ Toxic Organics (PAHs)
650 mg/m³ Formaldehyde

Did You Know?

- Solid Biomass fuel burning results in 16% particulate in developing countries.
- Around 3 billion people use polluting fuels for cooking.
- 50% excess risk of stillbirths in pregnant women.
- 1 billion children are exposed to high levels of HAP globally.
- 7.7% of global mortality in 2016 was linked to household air pollution.

HOUSEHOLD AIR POLLUTION
: AN INVISIBLE SOURCE

Burning of household waste such as trash including paper, wood, lead, plastic etc in open space can contribute 20% to 30% of city pollution.

Open Burning of Waste: Key Pollutants

Leaf Burning is a Problem?

- 1 ton leaves produce 53kg CO, 18kg particulate matter & highly carcinogenic PAH's.
- Burning of waste releases pollutants close to ground level, which increases the risk of exposure.
- In winters air pollution poorly disseminate due to reduced winds & low atmospheric boundary height resulting in high air pollution in your city.

DO NOT BURN
Here is the solution

- ☑ Mow the leaves & use them to cover & protect perennials.
- ☑ Store leaves in bags with little moisture & create leaf mold (soil conditioner).
- ☑ Use them as blanket over soil to prevent weeds & protect soil.
- ☑ Try crafts

BENEFITS OF WASTE SEGREGATION

Social Benefits
Clean waste to work with good aesthetics & tourism. Better livelihood/environment for rag picker.

Environment Benefits
less green house gas emissions from landfill. More paper recycled more trees will be saved Clean & healthy

Economic Benefits
Better resource recovery Reduced waste processing cost. More involvement of people more will be the job opportunities.

SEGREGATE YOUR WASTE

Wet/ Biodegradable/ Organic Waste

KITCHEN WASTE
- ✓ Cooked food/left over food
- ✓ Vegetable/fruit peels
- ✓ Egg shell/rotten eggs
- ✓ Chicken/fish bones
- ✓ Tea bags/coffee grinds
- ✓ Coconut shells/fibers

GARDEN WASTE
- ✓ Fallen leaves/twigs
- ✓ Puja flowers/garlands

Green Bin

✓ Yes: Fruit & Veggies, Dairy Products, Egg Shells, Grain & Pasta, Meat & Bones, Puja Waste, Coconut Shells & Fibers, Garden Waste, Fish Bones

✗ No: No Plastic, No Pet Waste, No Glass, No Razors & Blades, No Cups, No Diapers & Baby wipers

Domestic Hazardous Waste

- ✓ CFL, Tube light
- ✓ Printer cartridges
- ✓ Broken thermometer
- ✓ CD's & old cassette's
- ✓ Used Batteries
- ✓ Button cells
- ✓ Expired medicines
- ✓ Used odonil box & Mosquito repellent refill bottles

Black Bin

✓ Yes: Expired Medicine, CFL/Bulbs, Used Acids & Paints Bottles, Electronic & Batteries, Old Cassette's

Dry/ Recyclables/ Inorganic Waste

PLASTIC WASTE
- ✓ Plastic covers
- ✓ Plastic bottles/Boxes
- ✓ Plastic cups/Plates
- ✓ Chips/Toffee/Soap/Choclate wrappers
- ✓ Milk/Curd/Juice packets
- ✓ Toothbrush/Shampoo bottle/ Paste bottles

PAPER WASTE
- ✓ Newspaper/magazines
- ✓ Tera packs
- ✓ Cardboard cartoons
- ✓ Pizza boxes
- ✓ Paper cups/plates

METAL
- ✓ Tins/cans
- ✓ Foil/containers

OTHER DRY WASTE
- ✓ Cosmetics
- ✓ Hair
- ✓ Rubber/thermocol
- ✓ Old mops/dusters/ sponges/discarded cloth
- ✓ Expired Credit/Debit Cards
- ✓ Wrapped diapers/ sanitary napkin

Blue Bin

✓ Yes: Aluminum & steel cans, Mops & Dusters, Expired Cards, Glass Bottles, Paper & Card Boards, Plastic Bottles

✗ No: No Garbage, Green Waste, Kitchen Waste

Burning of waste ₹ **Pay Fine** ₹5000 for simple burning ₹25000 or bulk burning

CONSTRUCTION & DEMOLITION (C&D) EMISSIONS : BUILD WITH MINIMUM POLLUTION

C & D emissions :

The construction sites produce high levels of emissions can stay for long period of time & travel for further distance.

Emission Sources at Construction Sites

C&D waste is created from constructing, renovating, repairing & demolition of infrasturctures

Noxious & toxic fumes

Major $PM_{2.5}$ source at construction sites are diesel engine exhausts

Dust resuspended in the air remain in atmosphere for days or even

Prevention & Control Measures for **C & D Waste**

The Indian Government has set guidelines & made it compulsory for owners of construction sites to adopt dust prevention measures to reduce environmental impacts.

Construction material should be properly shielded at the site & on the vehicles transporting them.

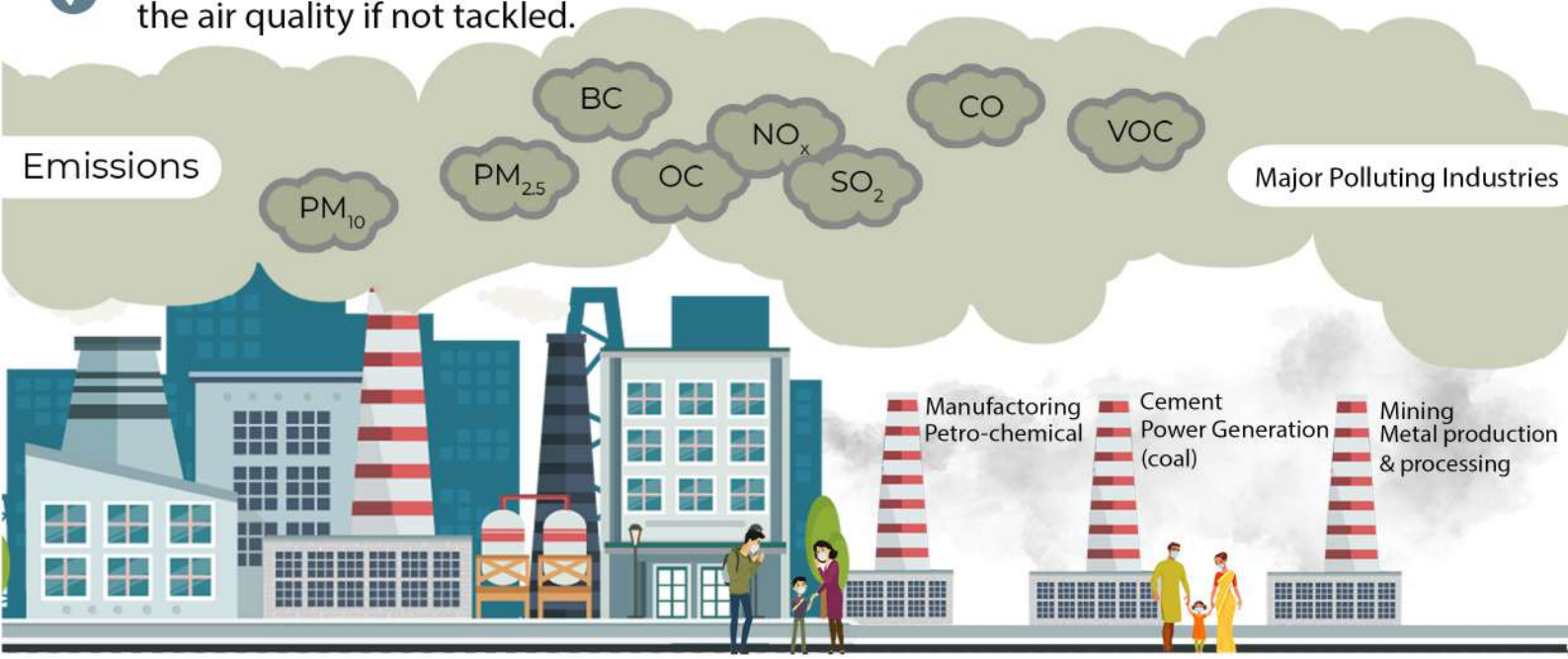
Keeping the surface moist at construction sites to make the dust settle & prevent spreading.

Blockage of public drains, rivers & streams, traffic should not be done. Direct disposal of C&D waste should not be undertaken at landfill sites.

Putting barriers around construction site & shielding sand mounds with sheets of dust blockers.

INDUSTRIAL AIR POLLUTION:
MINIMIZING THEM TO BE RESPONSIBLE

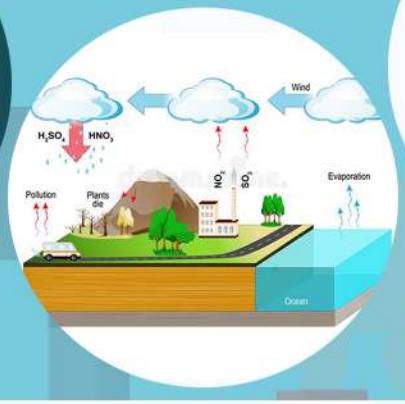
Air Pollution from industries can lead to serious degradation of the air quality if not tackled.



ECOLOGICAL IMPLICATIONS & HEALTH RISKS

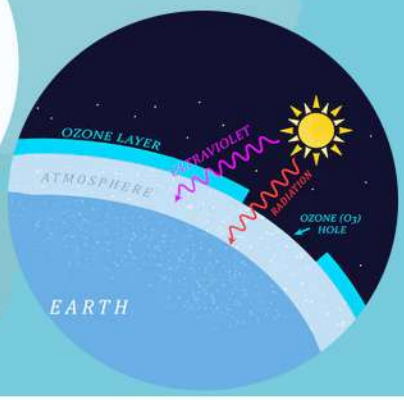
Global Warming

Acid Rain



Respiratory Disordes

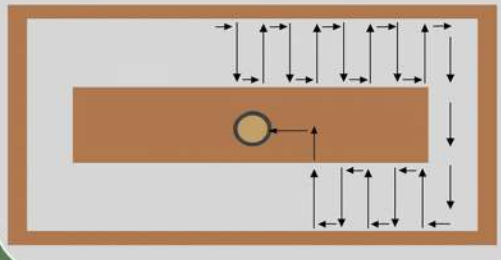
Depletion of Ozon layer



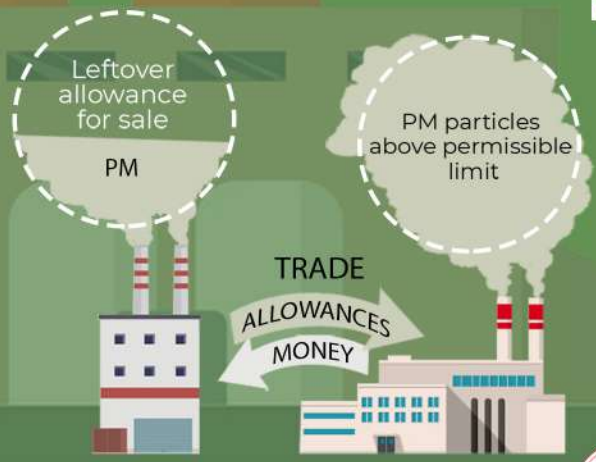
BEST PRACTICES

BRICK KILN ZIG ZAG TECHNOLOGY

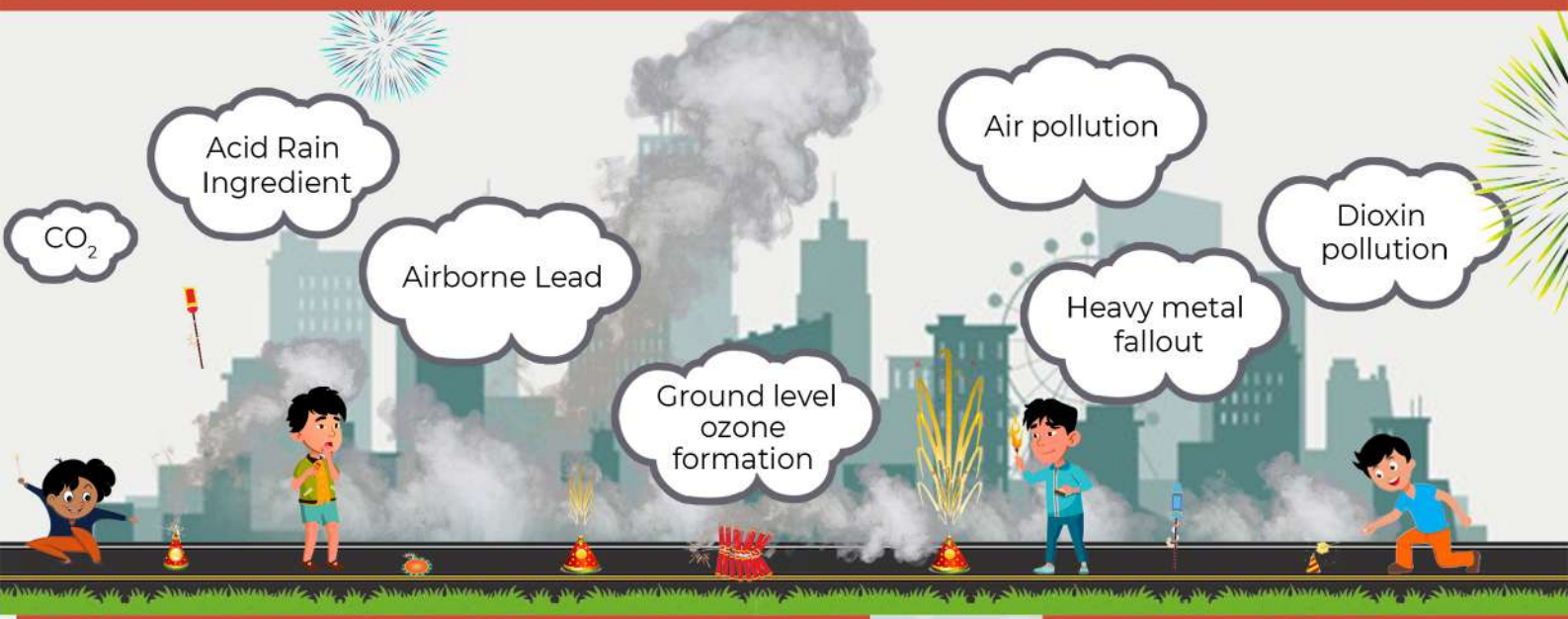
Black Carbon (90%)
Fine Particles(80%)
CO & CO_2 (20%)



PM EMISSION TRADING



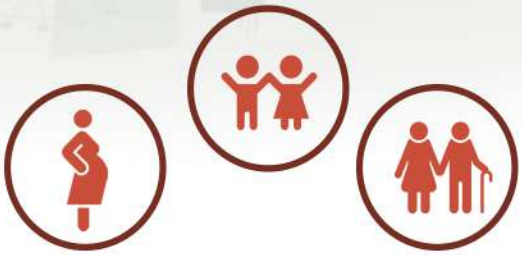
FIRE CRACKER & AIR POLLUTION



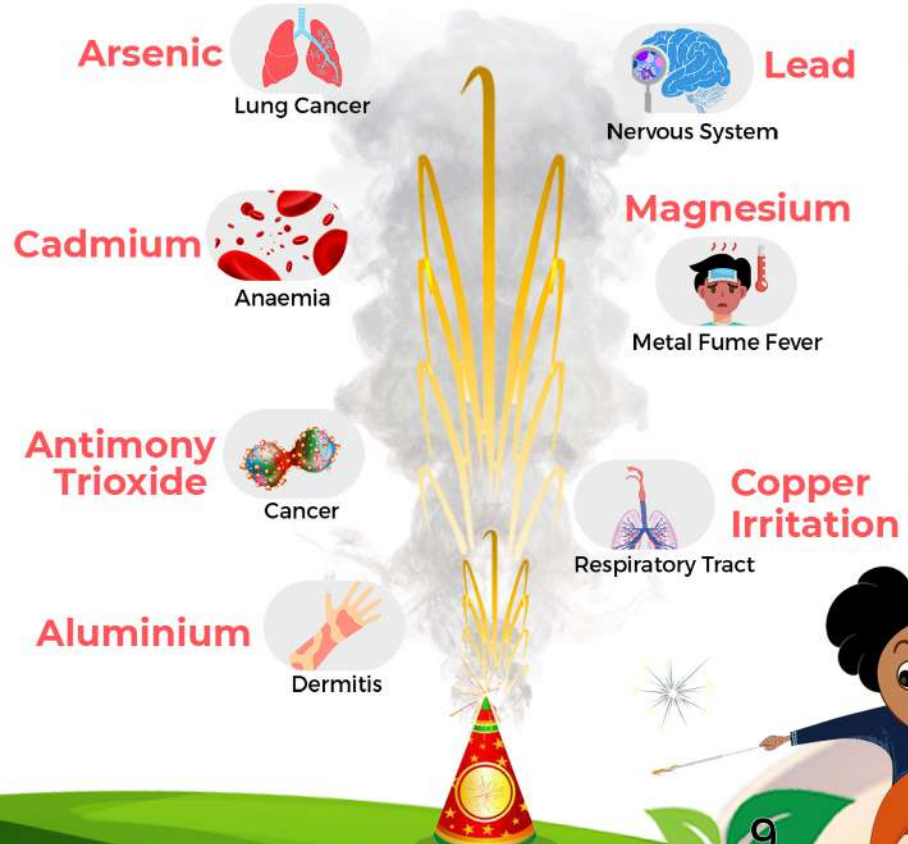
Adverse Impact of Fire Crackers

- **Air pollution: Causes smog, reduced visibility.**
- Noise pollution: More noise than allowed decibel levels.
- Animals: Loud noises can be traumatic to pets, induced fear.
- Fire hazards: Rockets can start fires.
- Ground level Ozone causes Inflamatory response to children, causing lung problems.
- The bright glare of burning firecrackers can also burn or permanently blind flying birds.

Vulnerable Groups



Toxic Chemicals in Fire Crackers



Let us Promote Clean Environment & Blue Sky

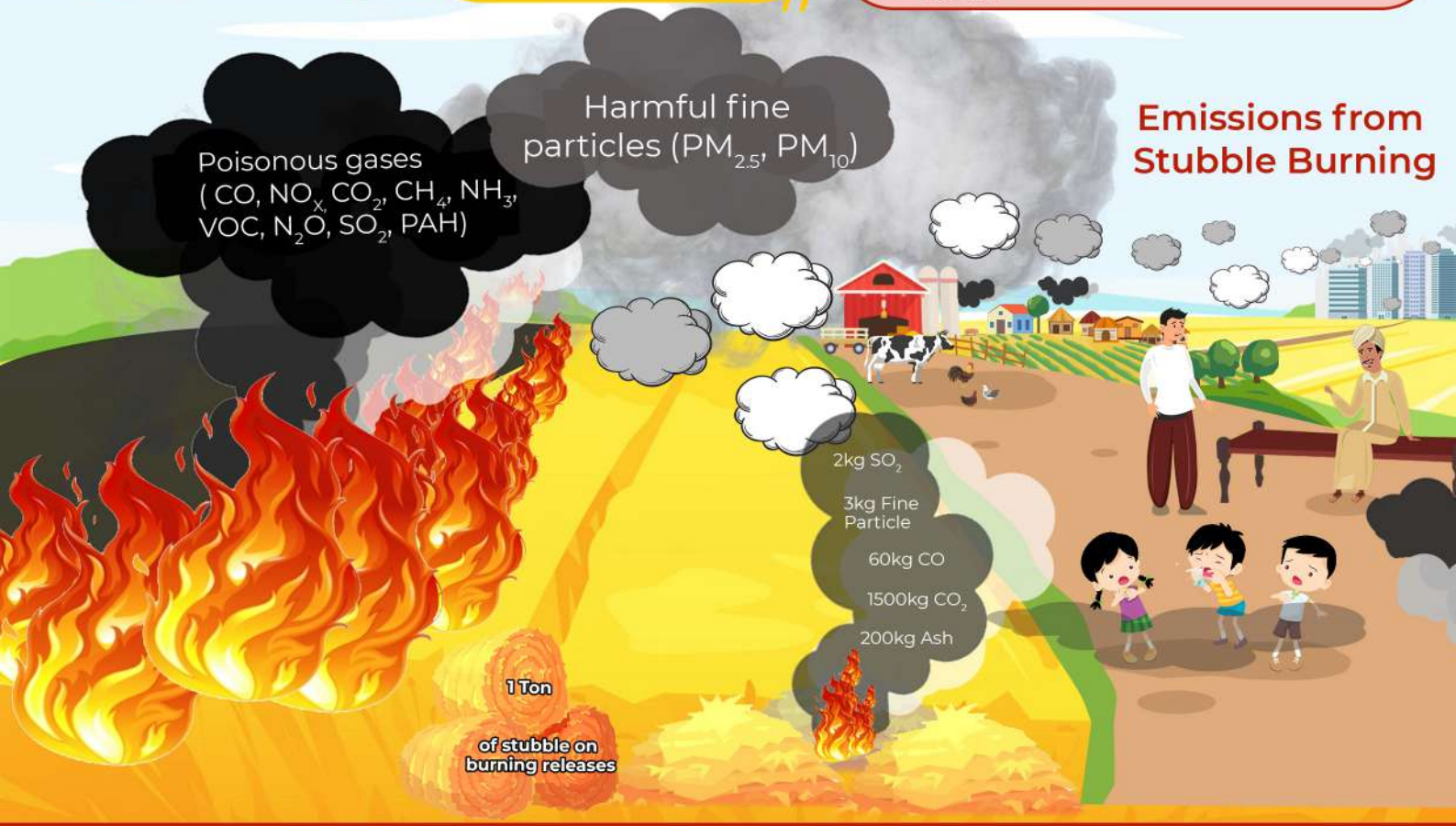
CROP RESIDUE BURNING

In India 500 Metric ton (Mt) of total crop residue is generated out of which 120 Mt of residue is burnt.

120 Mt of burnt residue emits 824 Gg of particulate matter ($PM_{2.5}$), 58 Gg of elemental carbon, 239 Gg of organic carbon & 211 Tg of CO_2 equivalent greenhouse gases.

Myths about Residue Burning

- Residue disposal is labor intensive.
- Short time period between harvesting of rice crop & sowing of wheat.
- Advanced agricultural machinery leave large amount of straw in the fields.



Crop Residue Burning Cause Harm


Increased levels of greenhouse gases


Loss of biodiversity


Climate Change


Increased levels of air pollutants

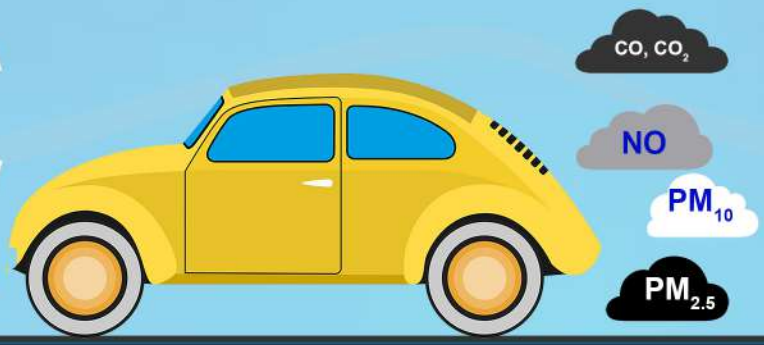

Deterioration & nutrient loss of soil fertility


Impact on Birds & Animals


Loss of soil microbes

PUC

POLLUTION UNDER CONTROL



- PUC is a certification mark that is provided to vehicle that undergoes pollution check test successfully.
- Pollution check monitors quantity of pollutants emitted from vehicle such as CO, CO_2 & hydrocarbons.

Is PUC mandatory?

According to Motor Vehicle (Amendment) Act 201 9, violation of PUC norm now invites a penalty of ₹10,000.

PUC Certification!

Required For?

All vehicles

Required When?

After one year of purchase of new vehicle.

Validity & Price of PUC Certificate

A PUC certificate is valid for 6 months. Test Price varies between rs 60 & rs 1 00 depending on the vehicle to be tested & fuel type of the vehicle.

Where PUC Conducted?

- Authorised PUC center.
- Most of the petrol pumps.

BENEFITS OF PUC

ENVIRONMENT
Controlled emissions of gases like CO, CO_2 etc. helps in preventing environmental pollution

VEHICLE
Improved vehicle life. Less fuel consumption

	Test Method	Test Procedure	Limits/Validity
PETROL	Gas Analyzer	Engine kept idle 1st reading is final reading	< 1.5% of norms = 6 month 1.5 % to 2.5% = 4 month 2.5 % to 3% = 2 month
DIESEL	Smoke Meter	Press accelerator continuously Average of 5 readings	SM*=Smoke Unit < 50 SM* = 6 month 50 to 60 SM = 4 month 60 to 65 SM = 2 month

MINIMIZE EMISSIONS FROM YOUR VEHICLES

AQI

AIR QUALITY INDEX

AQI?

Air Quality Index is a tool for effective communication of air quality status to general public. It transforms complex air quality data of various pollutants into a single number & colour.

DO YOU KNOW?

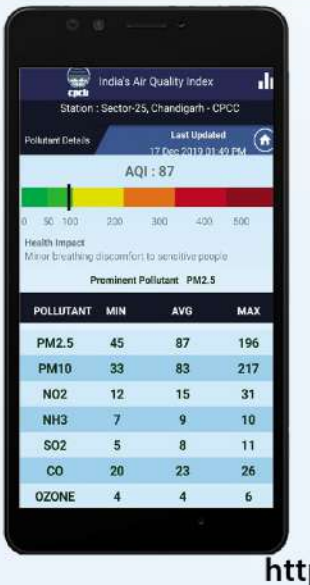
AQI categories are based on concentration of ambient air pollutants and their likely health impacts (known as health breakpoints.

In India AQI is based on six air quality categories ranging from 0-500.

AQI range	0-50	51-100	101-200	201-300	301-400	401-500
Air Quality Conditions	Good	Satisfactory	Moderate	Poor	Very Poor	Severe
Color Code						

Currently, AQI is developed having 8 air pollutants namely PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO, O_3, NH3, & Pb for which short-term (upto 24-hours) National Ambient Air Quality Standards are available.

HOW TO CHECK AQI OF YOUR CITY?



Check Places of Air Polution Display in Your City

Sameer App, CPCB Go to.....
https://app.cpcbccr.com/AQI_India

DO YOU KNOW?

AQI CATEGORIES

		Healthy People	Elderly, pregnant women, children	Person with chronic lung & her diseases
0 - 50 Good	Minimal impact.	Good Day to be Active outside.	Poses little or no health risk.	Poses little or no health risk.
51 - 100 Satisfactory	Minor breathing discomfort to sensitive people.	No precautions required.	Reduce prolonged or heavy exertion.	Reduce prolonged or heavy exertion.
101 - 200 Moderate	Breathing discomfort to the people with Asthma, lungs & heart diseases.	Limit Outdoor Activities.	Reduce prolonged or heavy exertion.	People with heart diseases avoid sources of PM, carbon monoxide, such as heavy traffic. reduce prolonged or heavy exertion.
201 - 300 Poor	Breathing discomfort to the people with Asthma, lungs & heart diseases.	Reduce prolonged or heavy exertion.	Children & outdoors active people should avoid prolonged or heavy exertion.	People with heart disease, such as angina should avoid air pollution source such as heavy traffic. avoid prolonged or heavy exertion.
301 - 400 Very Poor	Respiratory illness on prolonged exposure.	Avoid prolonged or heavy exertion.	Avoid all physical activities outdoors & should avoid air pollution sources such as heavy traffic.	People with heart or lung disease avoid all physical activities outdoors & should avoid air pollution sources such as heavy traffic.
401 - 500 Severe	Affects healthy people & seriously impacts those with existing diseases.	Serious health effects.	Serious health effects.	Serious health effects.

AQI
AIR QUALITY INDEX

HEALTH IMPACT OF AIR POLLUTION

Vulnerable Population

Pregnant Women → Children → Adults with underlying disease → Elderly

Prime Factors that Affect Human Health

Source
Emission/ Release hazardous agents
Source strength (Gases, Soilds Chemicals/solutes Energy)

Soil
Water
Air

Quality of Media
Concentration Load Magnitude etc

Exposure setting
Exposures Duration & Intensity of contact

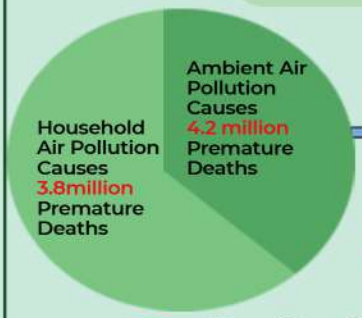
Indoor
Ambient
Occupational

Gender
Age
Genetic/Acquired Predisposition

Human Body
Dose Body burden, dose at target organ, effective dose
Health Effects Patho-physiological response, symptoms, Morbidity, Mortality

Social, cultural
Impact Policy deficits, Disease Burden, Social costs, Perceptions etc

Burden of Diseases



Household & ambient Air Pollution Caused an Estimated 7 million death

1 out of 9 deaths globally

Household Air Pollution		Ambient Air Pollution
27% Acute lower Respiratory infections in children.		Acute lower Respiratory infections in children. 18%
18% Stroke		Stroke 18%
27% Ischemic Heart Disease		Ischemic Heart Disease 38%
20% Chronic Obstructive Pulmonary Disease		Chronic Obstructive Pulmonary Disease 6%
8% Lung Cancer		Lung Cancer 2%

Exposure Pathway


Ingestion


Inhalation


Skin Contact


Skin Absorption

Health Impact of Air Pollution

SHORT TERM EFFCTS
- HEADACHE
- NOSE, THROAT, EYES INFLAMMATION
- COUGHING
- PNEUMONIA
- SKIN IRRITATION LONG TERM EFFCTS

LONG TERM EFFCTS
- AFFECTS CENTRAL NERVOUS SYSTEM
- CAROIO-VASCULAR DISEASES
- RESPIRATORY DISEASES
- IMPACT ON LIVER
- IMPACT ON REPRODUCTIVE SYSTEM

AIR POLLUTION AFFECTS EACH ORGAN


DON'T BURN, IF YOU WANT TO EARN
"A GOOD LIFE"


SAVE TREES
to Breath Clean

DON'T TEAR IT DOWN

Another life is hard to be found!

POLLUTION CAN LEAD TO

- DRY EYES
- EYE ALLERGIES
- INFLAMMATION

वायु प्रदूषण से गर्भस्थ शिशु पर प्रभाव पड़ सकता है!


STOP
AIR POLLUTION
BE THE
SOLUTION
TO RUN OFF THE
POLLUTION

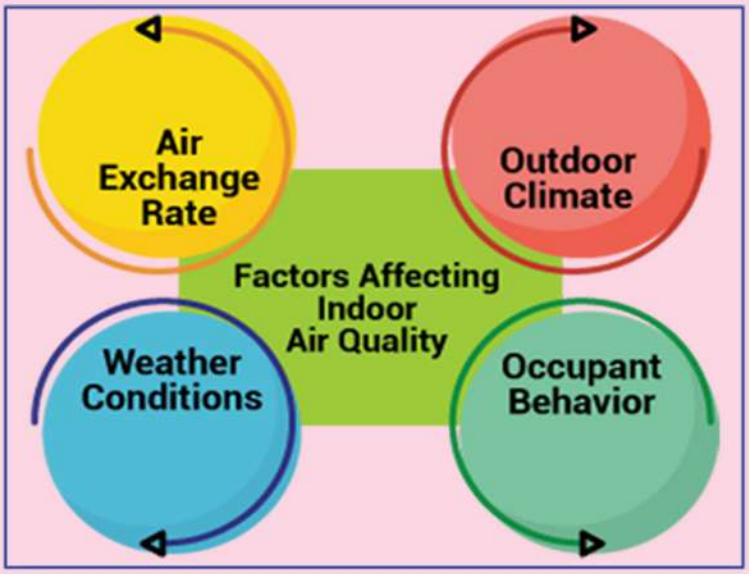
बहुत हुआ
पर्यावरण
पर अत्याचार

आओ मिलकर करें
प्रदूषण पर प्रहार

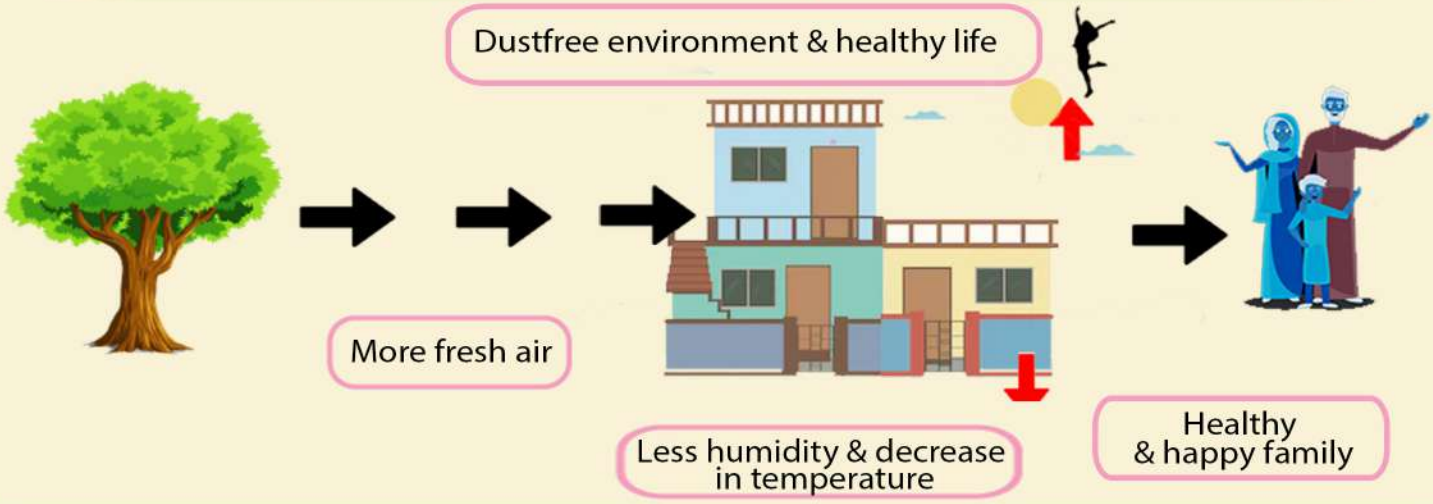
IMPROVE INDOOR AIR QUALITY

Minimizing Indoor Air Pollution

- Source Control
- Ventilation Improvement
- Air Cleaners/Purifiers
- Use of Indoor Plants



Adequate Ventilation: Key to Good Air Quality



How to improve your IAQ

MINIMIZING HOUSEHOLD AIR POLLUTION

Avoid cooking in enclosed environment using solid biomass fuel

If you need to cook, cook in a well-ventilated area or kitchen

While cooking make use of chimney or exhaust

Cooking with wet fuel create more emissions, hence more harmful to health

Schemes to Promote Clean Fuel

PRADHAN MANTRI UJJWALA YOJANA (PMUY)

#GiveItUp
Feel the Joy of Giving
GIVE IT UP

PAHAL
DIRECT BENEFIT TRANSFER FOR LPG (DBTL)

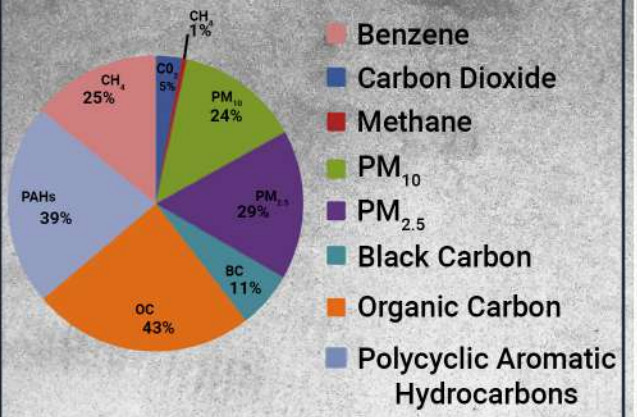
For Healty Life & Clean Environment

Benefits of Clean Fuel

WASTE BURNING-BE A PART OF SOLUTION

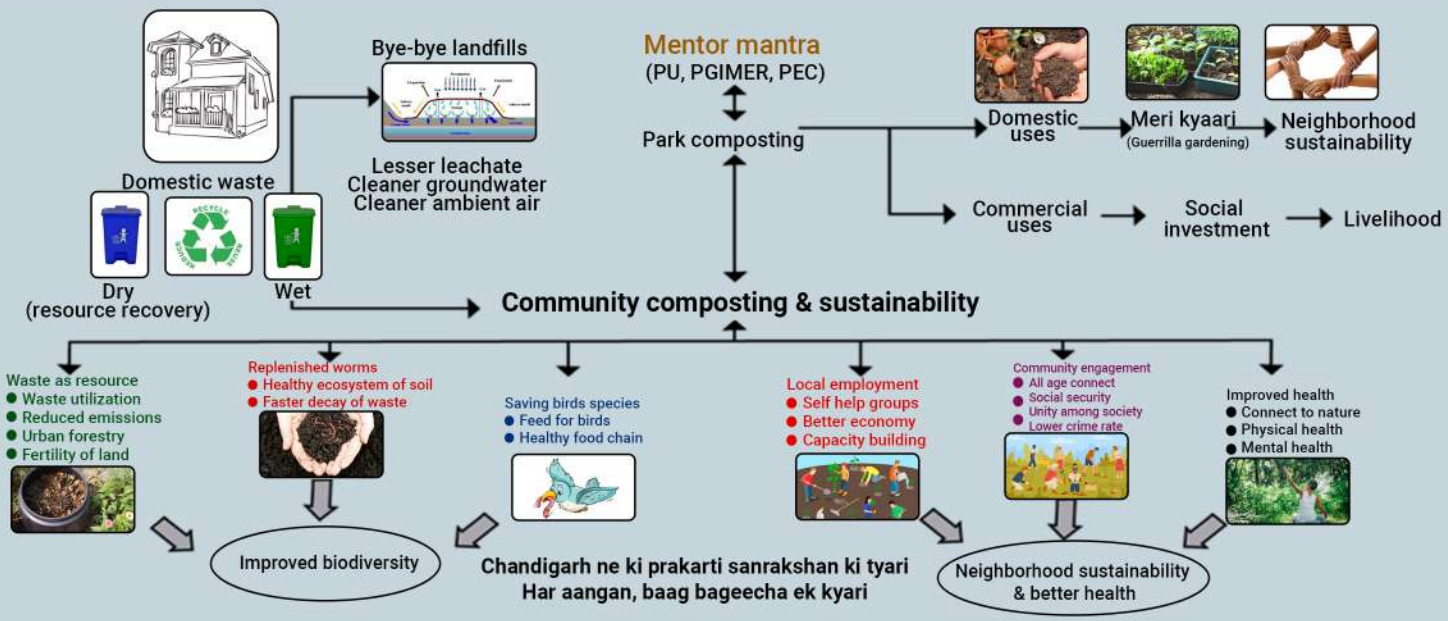
Waste generation & burned in India (million metric tons/ year):

Global Emissions of Pollutants from Open burning of waste (in%)



Community Initiative for Transformation & Innovative Solutions for Neighbourhood Sustainability-CITISOL

Proposed by PU, PGI, Chandigarh



Penalty for Violation of Waste Management Rules

Failure of Storage/ Segregation/Handover:
Residential: Rs. 200
Party hall, clubs (<5000 sqm): Rs. 10000

Failure of Handling Sanitary, Garden waste
Residential: Rs. 200
Non-residential: Rs. 500

Failure of handling C&D waste:
Residential: Rs. 1000
Non-residential:Rs. 5000
Street vender: Rs. 500

Open Burning & Bury in streets/roads etc.
Rs. 5000
Gathering of more than 100 without informing: Rs. 20000

THE LESS YOU BURN, THE MORE YOU EARN

Initiatives taken by Government

- Ban on burning of waste & leafs
- Promoting use of compost
- Promotion of waste to energy
- Awareness among safai karamcharis for dumping leaves
- Segregation at source
- Collect back scheme for packaging waste

GREENING INDUSTRIAL EMISSIONS

The industry shall be established at least 1 km from human dwelling

Away from catchment area of drinking water source

Solid waste management

Use of water sprinklers for fugitive dust emission

Work area shall be asphalted or concreted including the roads that surround the factory

Green belt should be built along industry roads & boundary lines

Sustainable Manufacturing & Promote Eco-Innovations

Be a Part of Green Economy

Environmental Compliance

Minimize Emissions & Waste

Industrial Symbiosis

Greening Industrial Emissions

Increase Energy Efficiency

Increasing Resource Efficiency

Optimization of Processing & Technique

Industrial Pollution Control Methods

Awareness among local population

Involve citizens to visit industry

Regular health check-ups of workers & their families

Monitoring Air quality at impacted region

SUSTAINABLE MANAGEMENT OF CROP RESIDUE

Burning of residue is not a solution, increase crop yield & income through composting

Farmer

Source of fodder for dairy animals

Cultivation of mushroom

Crop diversification

Industry

Making products such as amorphous nano silica

Produce biochar

Current biomass power - 1.46% & potential - 17%

Government

Establishment of marketplace for crop residue

Awareness campaign for farmers

Empowering farmer & stake holders

Reduce the chemical load

More crop per drop

SUSTAINABLE PRACTICE : Paddy Residue Management

Reduce the weather risks

Improve the soil health

Lower costs & higher profits

Lower GHGs emissions

CLEAN AIR FOR CHILDREN'S HEALTH

Children are More Susceptible to Air Pollution Exposure Because:

- Developing respiratory system
- Breathe more air per kg of body weight
- More likely to be active outdoors
- Due to their height children are most exposed than adults

School for Clean Air

Establish anti-idling zones for all vehicles.

Facilitate carpooling clubs to support parents for drop off & pick up.

Develop & implement tobacco-free campus.

Locate pickup & drop off areas away from school.

Setup adequate infilteration & ventilation.

Join hands with community for air pollution reduction

Limit outdoor activities during highly polluted days.

Walk on the far side of the pavement, edge of the road.

Prefer walking or cycling whenever possible.

Keep the window closed during morning hours.

Encourage carpooling & park cars away from school.

Ask school authorities to reduce the number of items made of cloth in classroom.

Parents can help school in planting green barriers around the school.

Educate yourself & children with right information.

PHYSICIANS FOR CLEAN AIR

DOCTORS: ADVOCATE FOR CLEAN AIR
Explain, How Air Pollution Can Affect Your Health?

Every breathe you take provides an opportunity for dirty air & allergens to enter your lungs

IS YOUR AIR CLEAN?

Anyone smoke in your house?

Avoid smoking or going to places where people smoke

Are you involved in Agricultural Activities?

Fumes from Nitrogen rich fertilizers & animal waste combine in air with combustion emission to form harmful solid particles in the air

Do you burn fuelwood?

Avoid burning fuel wood which leads to the production of harmful emissions (CO) in the air

Do you use Air Freshener?

Air fresheners have been found to contain formaldehyde & harmful chemicals, these are dangerous for health

Is there park/vegetation near your house?

Vegetation/trees carrying pollens, dust leads to allergy, wheezing in many individuals

Do you know about Biological Contaminants?

Bacteria, mold, dust many of them grow in damp or warm environment & brought in from outside in environment

Industries around you?

Industries emit various hazardous chemicals & toxic substances which are harmful for your health

Do you own a pet?

Your pet leaves skin flakes known as dander (allergen)

DO YOU KNOW ?

9 out of 10 people worldwide breathe polluted air (WHO).

SO LETS ACT TO REDUCE AIR POLLUTION & SAVE LIVES..

IMPROVING HEALTH & WELLNESS

Know your city's Air Pollution level

Stay indoors if air pollution level is high

Wear mask, air pollution is high

KNOW YOUR AQI

Air Quality Index - Particulate Matter	
301–500	Hazardous
201–300	Very Unhealthy
151–200	Unhealthy
101–150	Unhealthy for Sensitive Groups
51–100	Moderate
0–50	Good

COOL TO POOL

Reduce green house gas emissions

Switch off engine at red light

Follow lane drive & speed limit

Eat healthy to improve your immunity & minimize the impact of air pollutants

Do regular exercise & yoga. If outdoor pollution is high prefer mild activities indoor like yoga

Check pollution & avoid walking near major roads

Increase consumption of food rich in Vitamin A

GOOD SOURCES- Carrots, Sweet Potato

Each food rich in vitamin C (strengthen blood vessels)

GOOD SOURCES- Oranges, Papaya

Get plenty of vitamin E in your diet (increase oxygen supply to body cells.)

Improve selenium content in your diet (protect against liver damage)

Eat onions, garlic, fish, etc.

Green leafy vegetable oils are vitamin E sources

ROLE OF COMMUNITIES FOR AIR POLLUTION REDUCTION

Car-Pooling

Reduce traffic-based air pollution & congestion by initiating car pool .

Burning Waste

Burning of leaves, old tyres or any items in the open area is a punishable offence.

Promote Non-Motorized Transport

Mark out bicycle lanes in residential colonies as well as on all roads to encourage safe travel by bicycles.

Solar Power

Installation of solar panels should be encouraged at homes, office buildings & commercial establishments.

Build Green

Build energy efficient infrastructure & improve energy efficiency.

Public Transport

Encourage greater use of public transport by supporting bus service.

Go Green & Minimize your Waste

Compost your waste at home & encourage reduce, reuse & recycling of your household waste.

Fuel-Efficient Vehicles

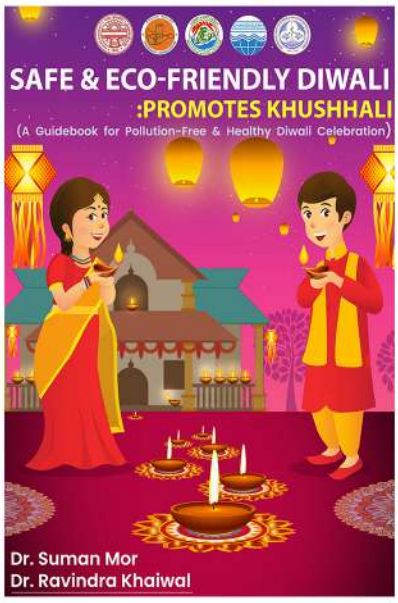
Use fuel-efficient vehicles with better mileage per litre.

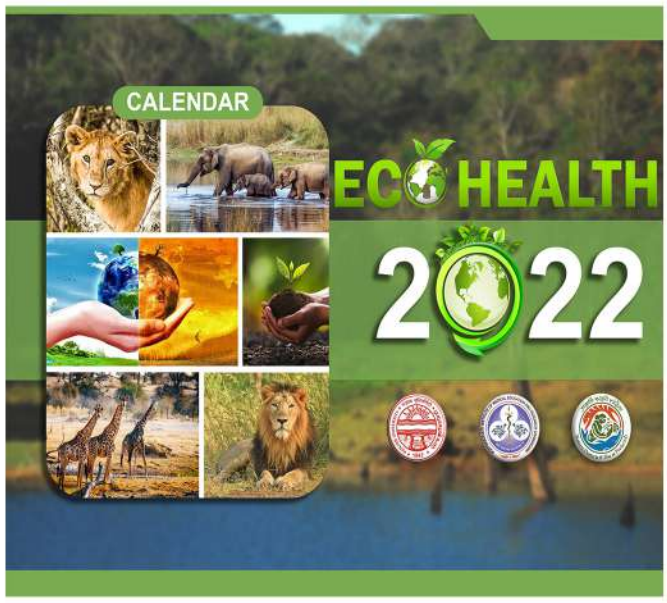
Power Backup

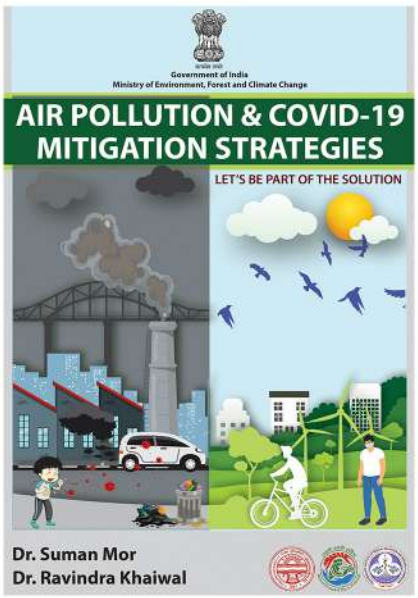
Inverters should be encouraged for backup power supply & diesel generator sets should not be promoted.

COMMUNITY ENVIRONMENTAL EMPOWERMENT PROGRAM (CEEP)

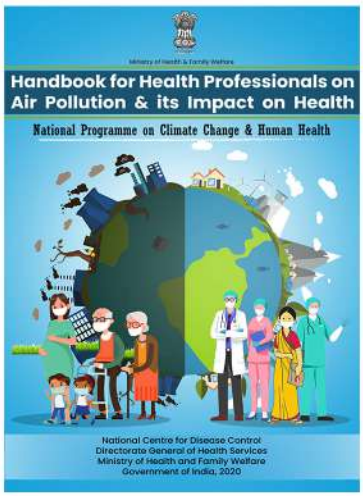
: LET'S BUILD A BETTER WORLD FOR THE WELL-BEING OF ALL

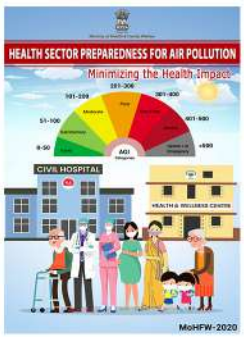


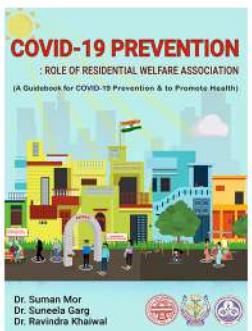


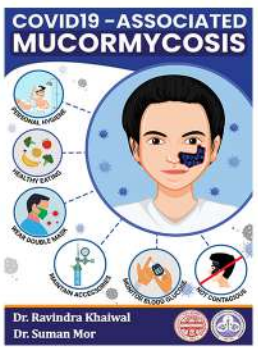


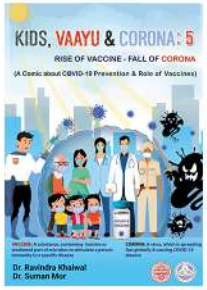
Download from-www.care4cleanair.com or Scan











MOBILIZING COMMUNITY FOR CLEAN AIR & BETTER HEALTH

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