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Environmental Pollution





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Environmental Pollution: Defined as any undesirable change in physical, chemical, or biological characteristics of any component of the environment i.e. air, water, soil which can cause harmful effects on various forms of life or property.

Pollution: The term pollution can be defined as influence of any substance causing nuisance, harmful effects, and uneasiness to the organisms

Pollutant:- Any substance causing nuisance or harmful effects or uneasiness to the organisms, then that particular substance may be called as the pollutant.



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Some Facts & Figures

Distribution of Pollution-Related Complaints Received at the Ministry of Environment in 2014

New Environmental Complaints





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Types of pollution

There are 6 types of pollution-

- ✘ Air pollution
- ✘ Soil pollution
- ✘ Water pollution
- ✘ Noise pollution
- ✘ Thermal pollution



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Air pollution





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What is Air Pollution?

An atmospheric condition in which certain substances (including normal constituents in excess) are present in concentrations which can cause undesirable effects on man and his environment.

- A substance in the air that can cause harm to humans and the environment is known as an air pollutant.

Air....



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Air supplies us with *oxygen* which is essential for our bodies to live.

Air is a mixture of nitrogen, oxygen, water vapor, carbon dioxide and inert gases.

Human activities can release substances into the air, some of which can cause problems to humans, plants, and animals.

Natural Composition of Gases

Dry Air Expressed in Volumes	
● Nitrogen (N ₂)	78.1%
● Oxygen (O ₂)	20.9%
● Argon (A)	0.9%
● Carbon dioxide (CO ₂)	0.035%
● Others	0.065%

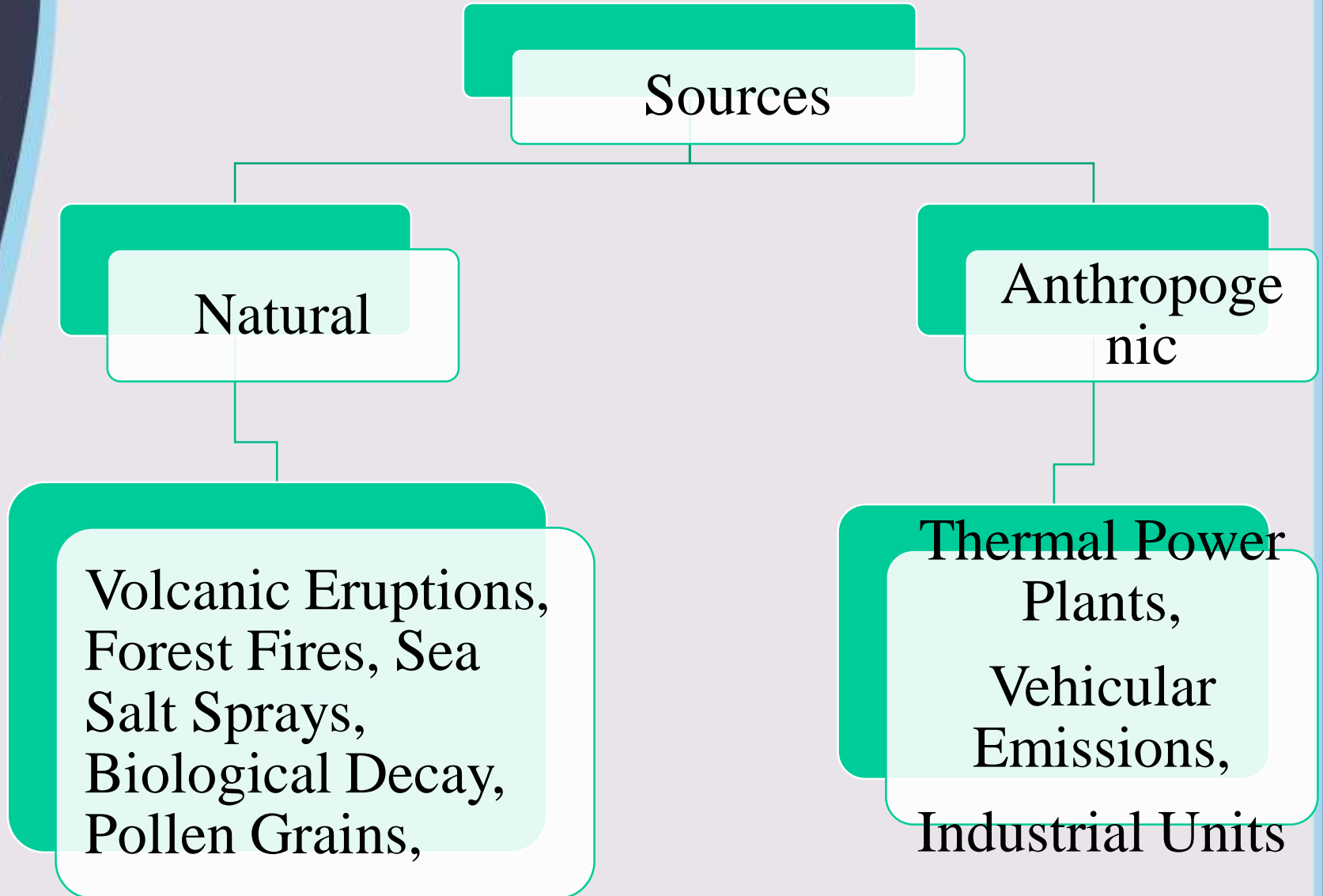
Others : Neon (Ne)
Helium (He)
Krypton (Kr)
Hydrogen (H₂)
Xenon (Xe)
Ozone (O₃)
Radon (Rn)



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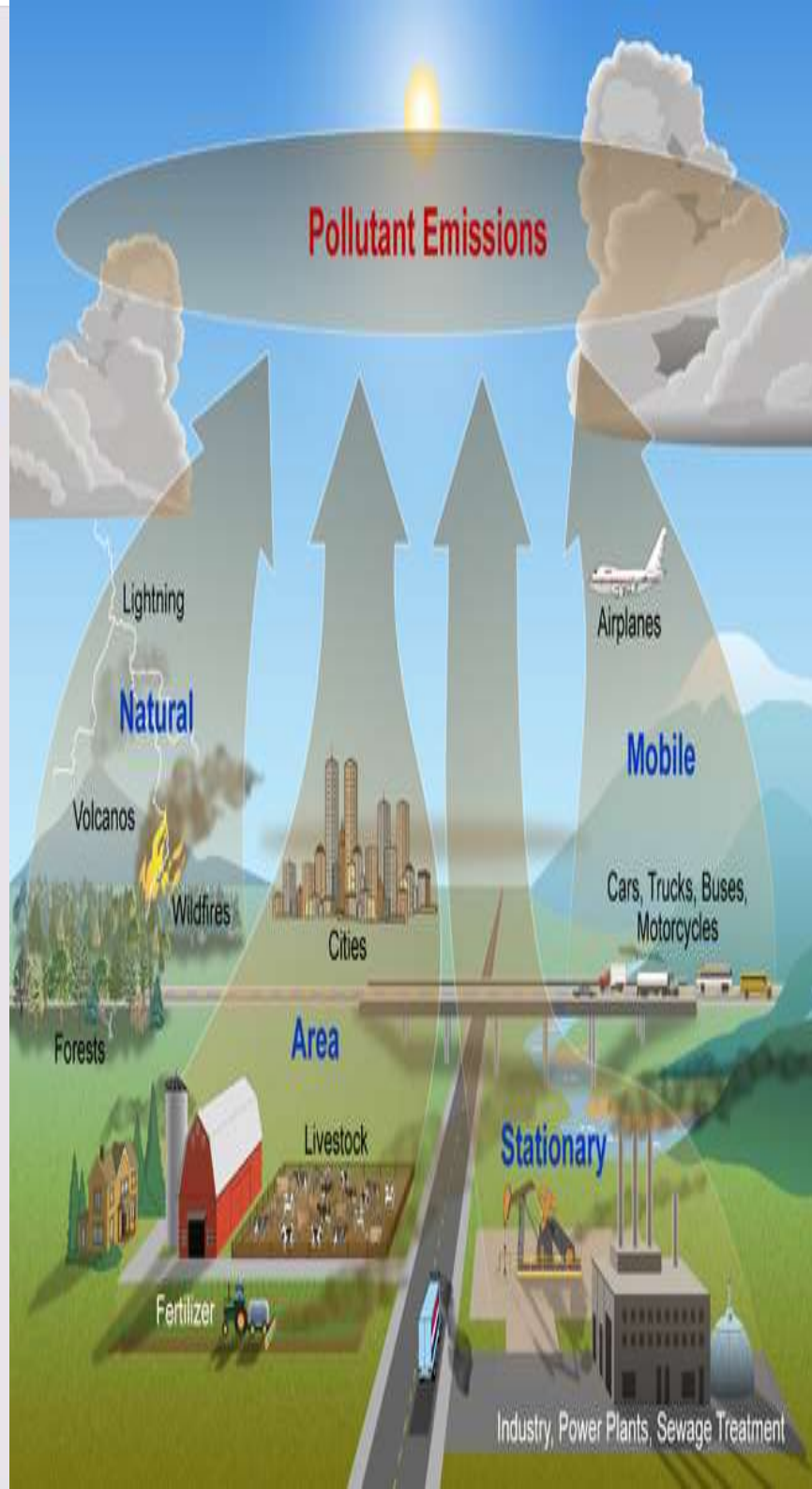
Sources of Air Pollution



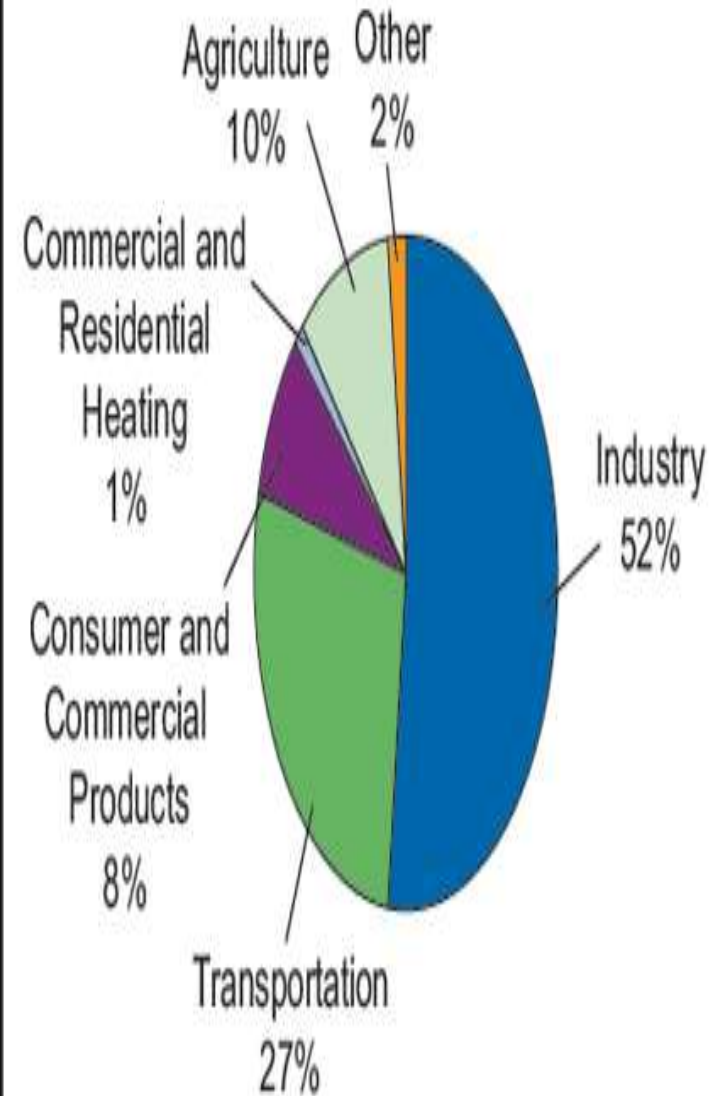


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Sources of Emissions of Air Pollutants





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Effects of Air Pollution

Air Pollution affects???

Human health

Animals

Plants

Materials

Environment

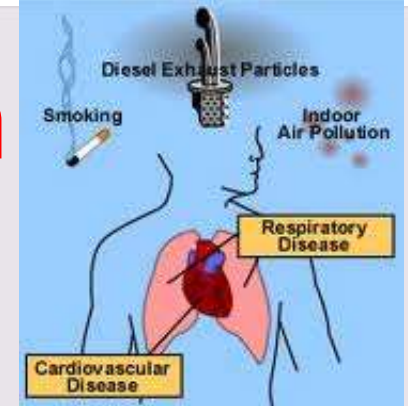




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Effect on Human health



- Main problems are related to Respiratory Track - Asthma, hay fever, and other allergic diseases.
- Irritation of the eye, nose and throat.
- Prolonged exposure can cause damage to the nervous system, digestive problems, and in some cases cause Lung cancer.
- SO₂ in the air leads to diseases of the lung and other lung disorders such as wheezing and shortness of breath.
- Chronic respiratory disease, lung cancer, heart disease, and even damage to the brain, nerves, liver, or kidneys.



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Effect on Plants

- Pollutants enter through stomata
- Destroy chlorophyll and Affect photosynthesis
- Cuticle(Wax Layer on Leaves) is lost
- Necrosis – Damage to Leaf Structure
- Chlorosis - Loss/ reduction of Chlorophyll
- Abscission - Dropping of leaf
- Epinasty – Downward curling of Leaf



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Effect on Animals and materials

Corrosion of metal surfaces

Air pollutants mix with rain water and increase acidity (Acid Rain) of water body and kill fish.





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Effect on Environment

Visibility

Pollutants in the presence of sunlight produce photochemical Smog

Emission of Green House Gases tend to Global Warming



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Control Of Air Pollution

- ✓ Proper air pollution control devices in industries
- ✓ Using low sulphur coal
- ✓ Regular engine tune up, replacement of old more polluting vehicles
- ✓ Using mass transport system, bicycles etc
- ✓ Shifting to less polluting fuels
- ✓ Planting more trees
- ✓ No to FIRE CRACKERS in Diwali and other occasions



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Water Pollution

The Contamination of water with undesirable substances which make it unfit for usage is termed water Pollution.





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Pollution Sources

Point sources are direct discharges to a single point;

examples include discharges from sewage treatment plants, injection wells and some industrial sources.

Non-point sources are diffused across a broad area and their contamination cannot be traced to a single discharge point.

Examples include runoff of excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas; oil, grease, and toxic chemicals from urban runoff and energy production; and sediment from improperly managed construction sites, crop and forest lands, and eroding stream banks.



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Surface Water Pollution

- Sewage
- Industrial effluents
- Synthetic detergents
- Agrochemicals
- Oil



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Domestic Sewage

Refers to waste water that is discarded from households. Also referred to as sanitary sewage, such water contains a wide variety of dissolved and suspended impurities.

The main organic materials are food and vegetable waste, plant nutrient come from chemical soaps, washing powders, etc.

Domestic sewage is also very likely to contain disease-causing microbes.



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Industrial Effluents

Waste water from manufacturing or chemical processes in industries

Industrial waste water usually contains specific and readily identifiable chemical compounds.

Mainly in the form of toxic wastes and organic pollutants.

Chromium, mercury, lead, copper, cadmium etc



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Synthetic Detergents And Oils

Added because of washing clothes, cleaning utensils.

In industries for washing

Oceans are polluted by oil on a daily basis from oil spills, routine shipping, run-offs and dumping.

Oil spills make up about 12% of the oil that enters the ocean. The rest come from shipping travel, drains and dumping.



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Agricultural Run Off

Routine applications of fertilizers and pesticides for agriculture and uncontrolled run off in water bodies.

Adds Nitrogen and Phosphorus to water

Causes Eutrophication and algal blooms.

Nitrate concentration is above the permissible level of 45 ppm in 11 states, covering 95 districts.



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Ground Water Pollution

- Septic tanks
- Mining
- Deep well injection
- Presence of heavy metals like Arsenic , Nitrate, Fluoride

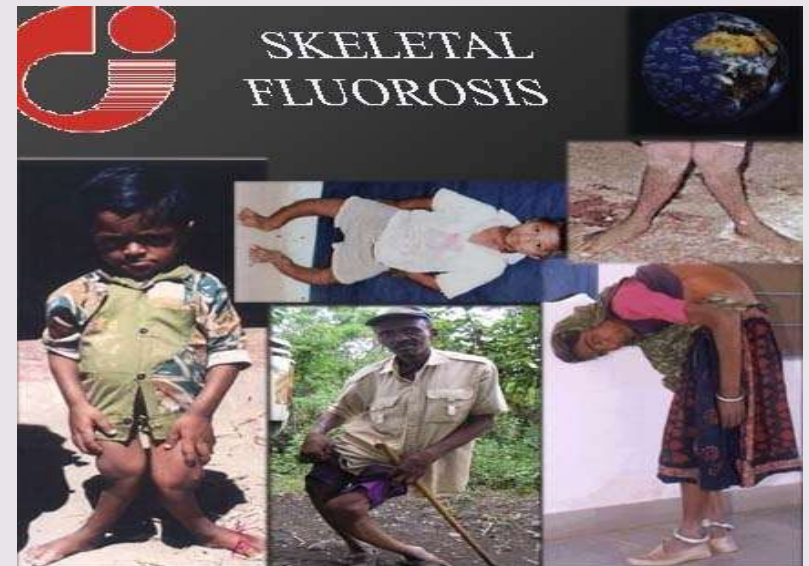


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Fluoride Poisoning

The incidence of fluoride above permissible levels of 1.5ppm occur in 14 Indian states.

Some other estimates find that 65 per cent of India's villages are exposed to fluoride risk.





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Arsenic Poisoning

High levels of arsenic above the permissible levels of 50 parts per billion (ppb) are found in the alluvial plains of Ganges covering six districts of West Bengal.

Arsenic contamination of drinking water causes a disease called arsenicosis, for which there is no effective treatment.

Arsenic contamination is by far the biggest mass poisoning case in the world putting 20 million people from West Bengal and Bangladesh at risk though some other estimates put the figure at 36 million people.





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Effects

- Depletion of dissolved oxygen
- Eutrophication
- Pathogen....spreading diseases
- Blue baby Syndrome
- Mina-mata disease



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Control of Water Pollution

Treatment of water before leaving in water bodies.

Restoration of polluted water bodies.

Ganga Action Plan

River Water Monitoring

