



ENVIRONMENTAL POLLUTION

Course:
CEA1110



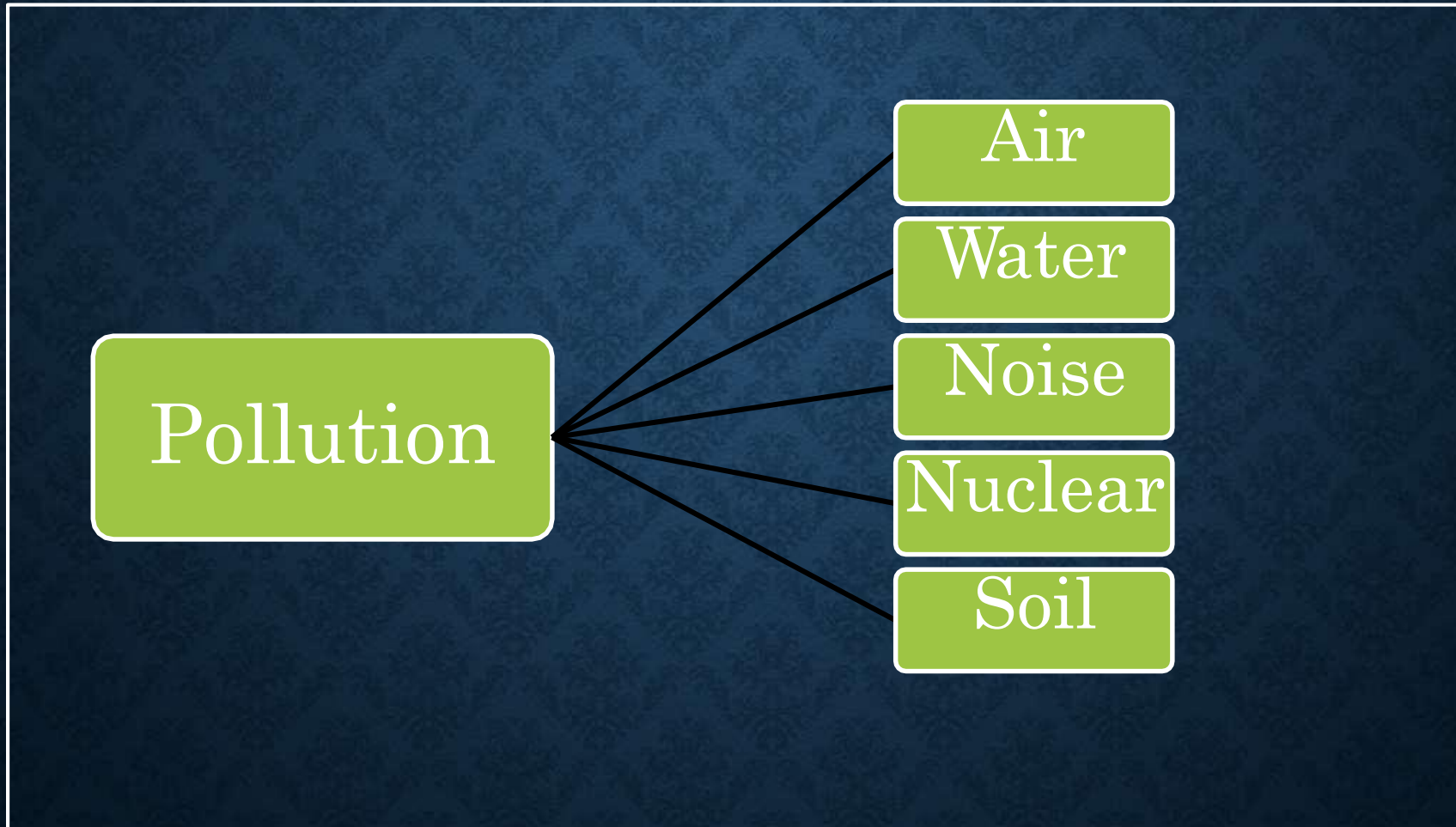
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DEFINITION OF POLLUTION

- Environmental Pollution can be defined as any undesirable change in physical, chemical, or biological characteristics to any components of the environment 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 can be called as the pollutant.

TYPES OF POLLUTION



AIR POLLUTION

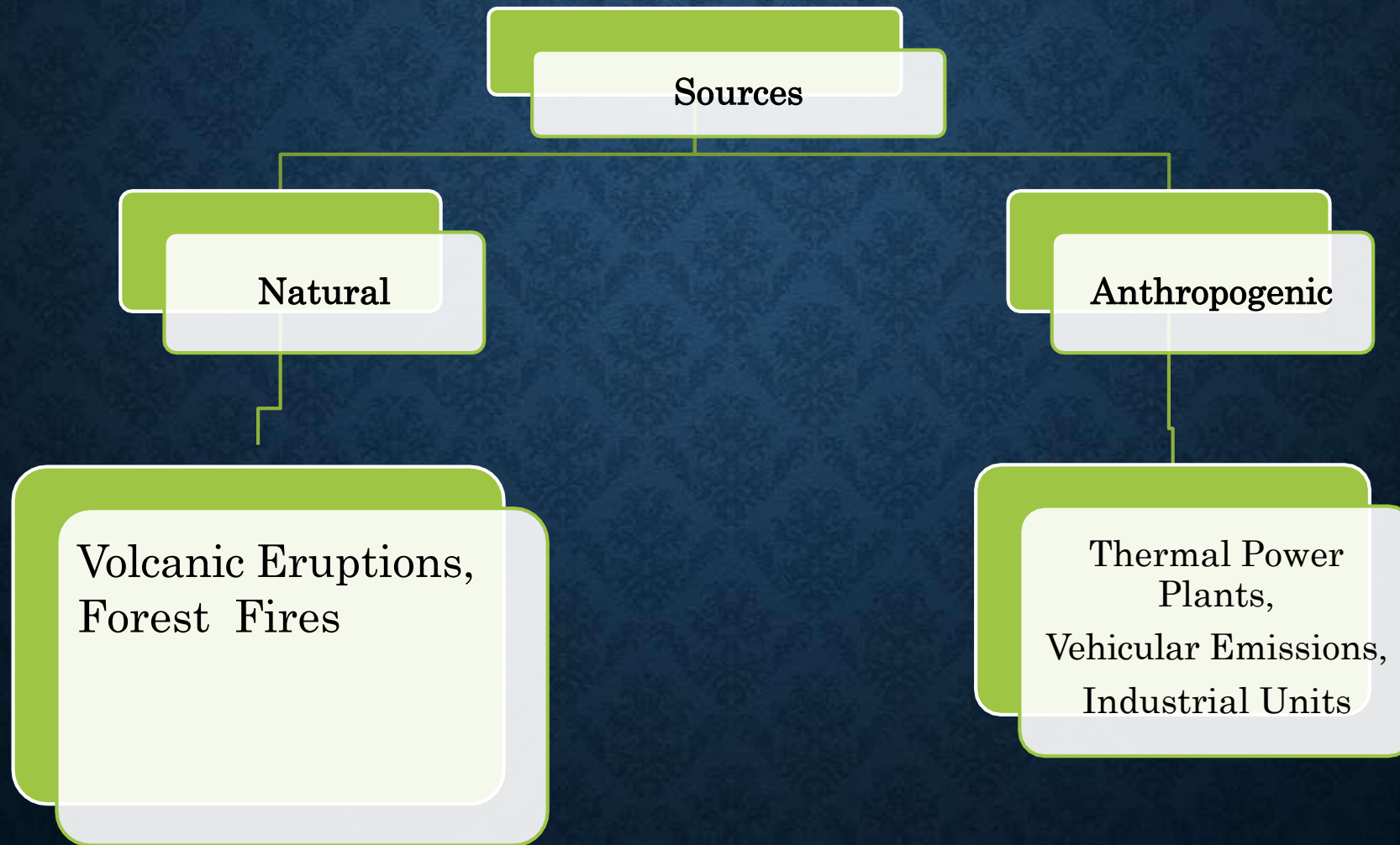


DEFINITION

- Air pollution is the introduction of any chemicals or particulate matter that cause harm/discomfort to humans or other living organisms, or cause damage to the natural environment .
- A substance in the air that can cause harm to humans and the environment is known as an air pollutant.



SOURCES OF AIR POLLUTION



CLASSIFICATION OF AIR POLLUTANTS

- Air pollutants may be particulate or gaseous. On the basis of origin they are divided as
- **Primary pollutants** ---- Are emitted directly from the pointsource.
e.g. : CO, NO₂, SO₂
- **Secondary pollutants** ---- formed by interaction of primary pollutants
e.g. : PAN (Peroxyacetyl nitrate), Smog, Ozone etc.

EFFECT ON HUMAN HEALTH

- Main problems are related to Respiratory Track – Asthma and other allergic diseases.
- Irritation of the eye, nose and throat. In severe cases there may be headaches and vomiting.
- Prolonged exposure can cause damage to the nervous system, digestive problems, and in some cases cause Lung cancer.
- CO has affinity towards Hemoglobin which cause disturbance in transportation of Oxygen and make us confused and sleepy.
- SO₂ in the air leads to diseases of the lung and other lung disorders such as shortness of breath.
- Chronic respiratory disease, lung cancer, heart disease, and even damage to the brain, liver, or kidneys.

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 etc.

EFFECT ON ANIMALS AND MATERIALS

- Corrosion of metal surfaces, fading
- SO_2 & water form H_2S – corrosion as well as defect of statues made up of limestone or Marble
- Air pollutants mix with rain water and increase acidity
 - Acid Rain



EFFECT ON ENVIRONMENT

- Visibility problem
- Pollutants in the presence of sunlight produce photochemical smog
 - Photochemical smog is a type of smog produced when ultraviolet light from the sun reacts with nitrogen oxides in the atmosphere. It is visible as a brown haze, and is most prominent during the morning and afternoon, especially in densely populated, warm cities
- Emission of Green House Gases tend to Global Warming
- CFC's cause Ozone Depletion

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 the occasions

WATER POLLUTION



DEFINITION

- Water Pollution can be defined as alteration in physical, chemical, or biological characteristics of water through natural or human activities and making it unsuitable for its designated usage.
- Fresh water present on the earth surface utilizes for drinking, domestic, municipal, agricultural, irrigation, industries, etc. The used water becomes contaminated and is called wastewater.

POLLUTION SOURCES

- Most of Water Pollution is man made. It may also occur naturally by addition of soil particles through erosion, animal wastes and leaching of minerals from rocks

The sources of water pollution can be classified as:

- Municipal Waste Water
- Industrial Waste
- Inorganic & Organic Pollutants
- Agricultural Wastes



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.
- It is large by volume and contains impurities such as organic materials and plant nutrients that tend to decay.
- Domestic sewage is also very likely to contain disease causing microbes.



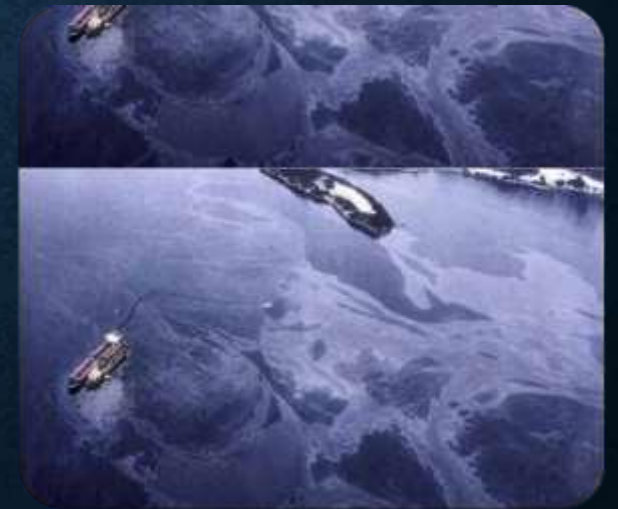
INDUSTRIAL EFFLUENTS

- Wastewater 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.



SYNTHETIC DETERGENTS AND OILS

- Added because of washing clothes, cleaning utensils.
- In industries for washing
- Add surfactants and soaps to water
- Toxic to fish, aquatic life.
- Oceans are polluted by oil on a daily basis from oil spills, routine shipping, runoffs and dumping.



AGRICULTURAL RUNOFF

- Chemical fertilizers and pesticides have become essential for present day high yielding crops.
- Consequently, they have become a potential source for water pollution.
- Causes Eutrophication and algal bloom.



EFFECTS

- Depletion of dissolved oxygen
- Eutrophication
- Pathogen....spreading diseases
- Bio-magnification
- Genetic deformities
- Blue baby Syndrome
- Minamata Disease

CONTROL OF WATER POLLUTION

- Treatment of water before leaving into water bodies.
- Restoration of polluted water bodies.
- Ganga Action Plan.
- River Water Monitoring.
- Effluents should not be discharged directly
- Strict law enforcement- regarding dumping of toxic & Hazardous wastes
- Minimum developmental activities on shore



