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MBFIII - 1 – ENVIRONMENT MANAGEMENT

Unit III

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Purpose Only

PROGRAMME EDUCATIONAL OBJECTIVES: PEO

- Will be recognized as a creative and an enterprising team leader.
- Will be a flexible, adaptable and an ethical individual.
- Will have a holistic approach to problem solving in the dynamic business environment.

3T2 – Environnement Management

Course Outcomes

- CO1-Ability to explain the need and importance of sustainable development and design& utilize a calendar of environmental activities to create public awareness.
- CO2-Ability to analyse the problems associated with non renewable resources and proposes solutions for conservation of these resources.
- CO3-Ability to define the types of ecosystems and justify the importance of conservation of biodiversity.
- CO4-Ability to assess the impact of different types of pollution (Air, Soil, Water, Noise, Thermal & Nuclear Pollution) on health, environment and industry.
- CO5-Ability to predict the harmful effects of climate change and examine the roles of various (Central, State & Local) bodies in pollution control.
- CO6-Ability to determine the problems associated with human population explosion and social issues in environment protection. Recommend possible solutions to these problems.

UNIT III

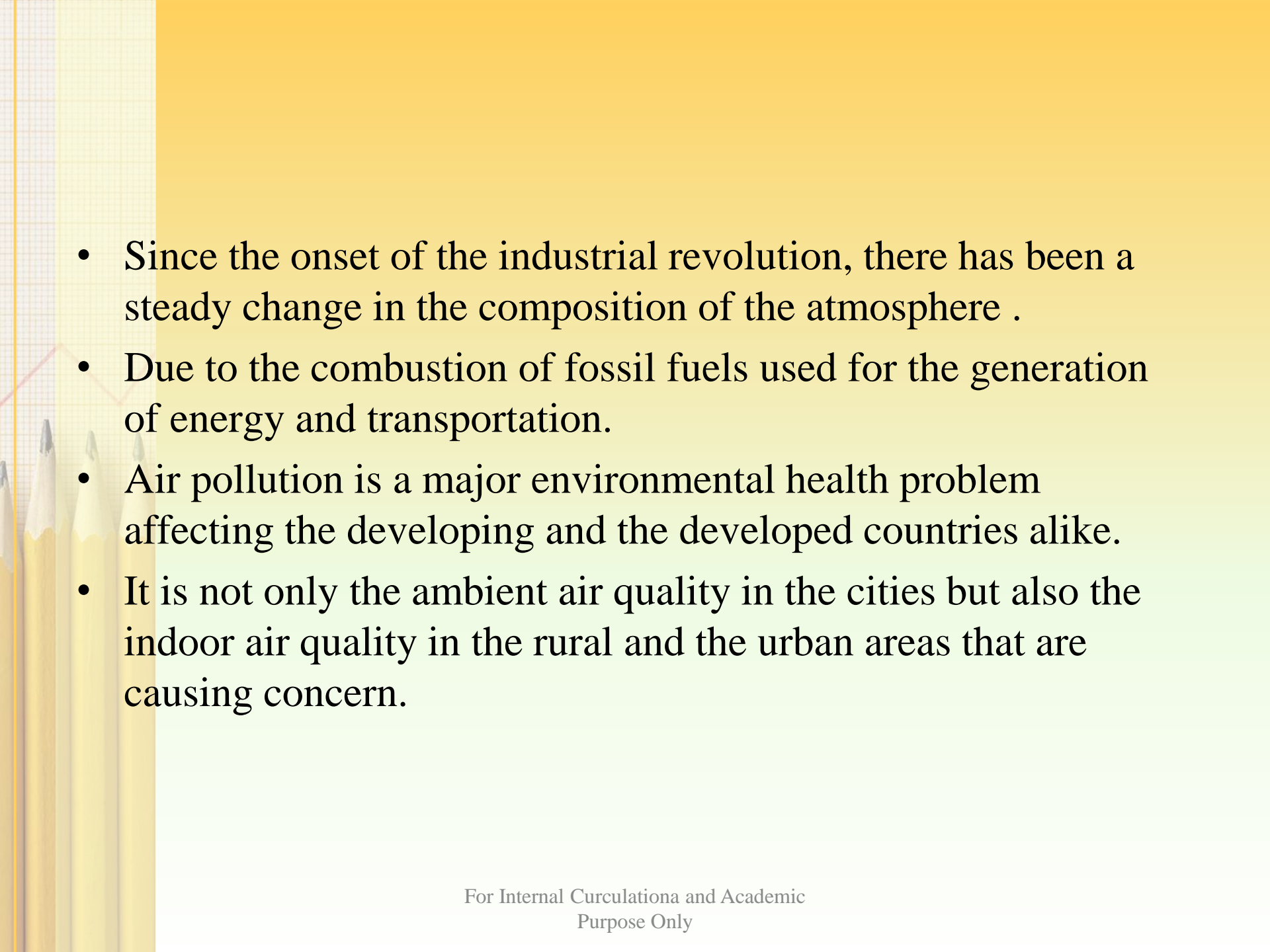
Unit III: Environment Pollution: Air, Soil, Water, Noise, Thermal & Nuclear Pollution-

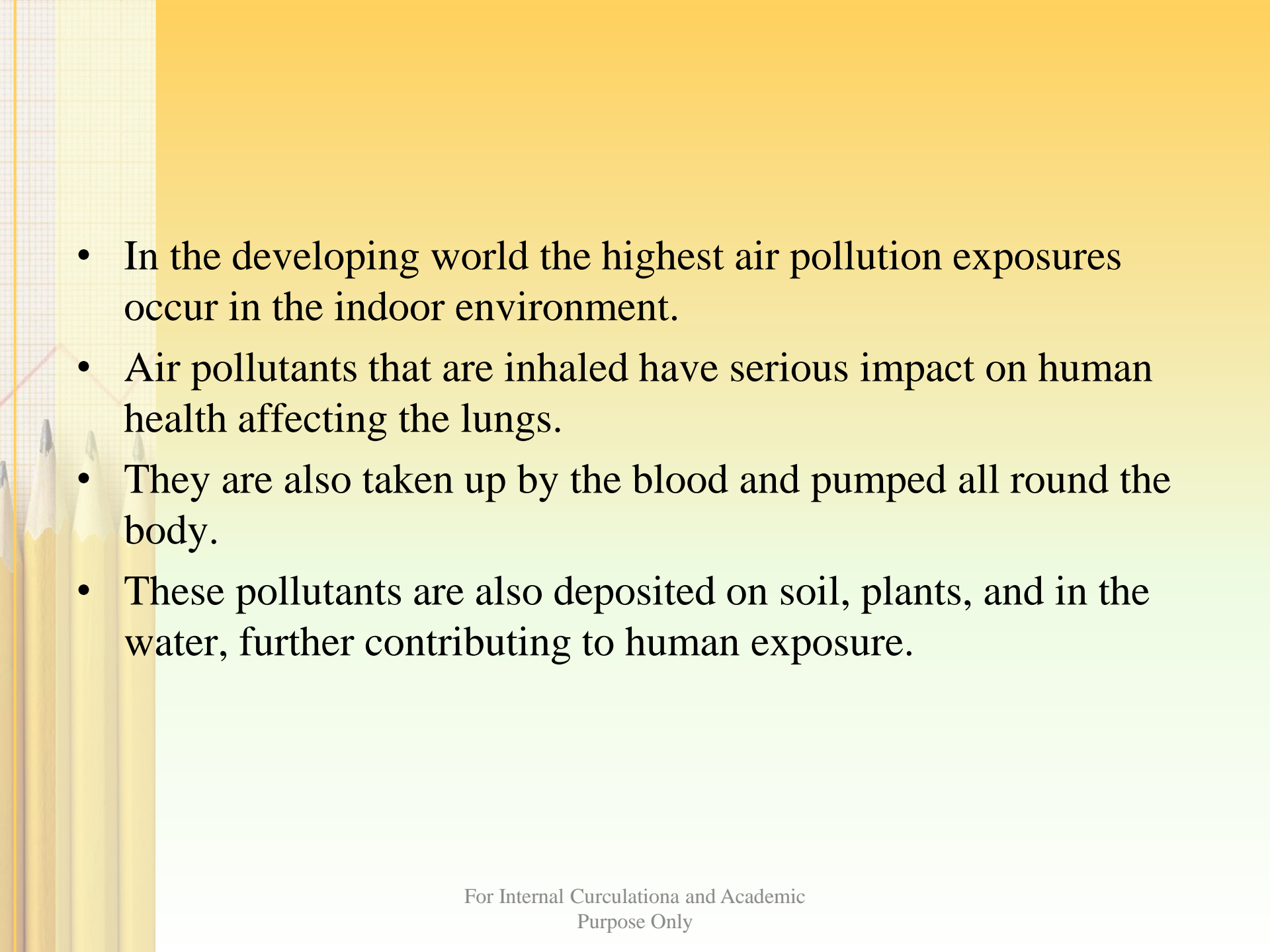
Introduction, causes, impact on health, environment and industry, measures of control, individual contribution. Climate change: Green House Effect, Global Warming, Acid Rain, Ozone Layer depletion, climate tipping points- Disruption of Indian Summer Monsoon. Institutions for controlling pollution- Ministry of Environment and Forest, Central Pollution Control Boards, State Pollution Control Boards, Local Bodies- their scopes, organizational and functional issues.

UNIT III

POLLUTION

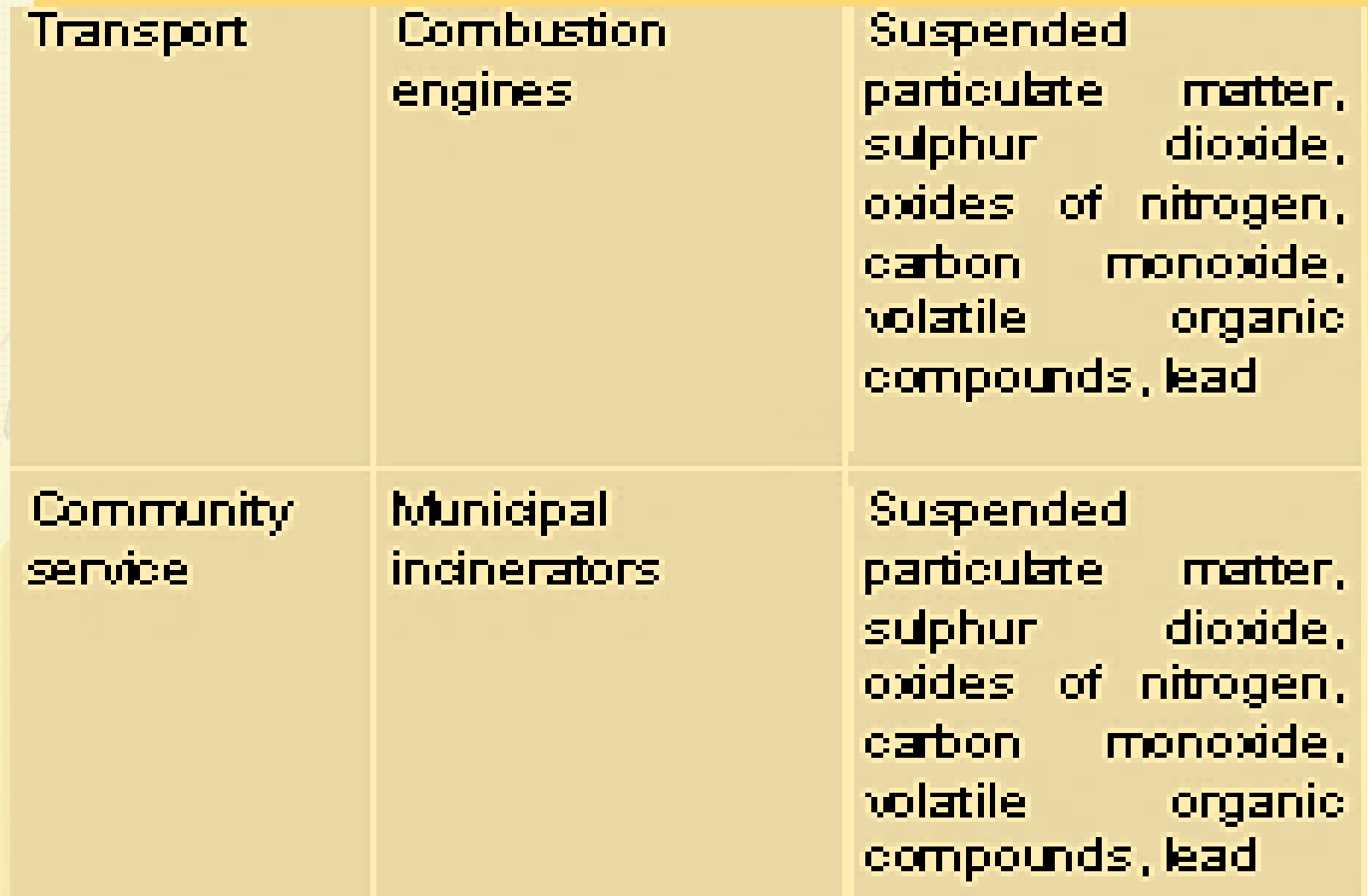
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- Since the onset of the industrial revolution, there has been a steady change in the composition of the atmosphere .
 - Due to the combustion of fossil fuels used for the generation of energy and transportation.
 - Air pollution is a major environmental health problem affecting the developing and the developed countries alike.
 - It is not only the ambient air quality in the cities but also the indoor air quality in the rural and the urban areas that are causing concern.


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- In the developing world the highest air pollution exposures occur in the indoor environment.
 - Air pollutants that are inhaled have serious impact on human health affecting the lungs.
 - They are also taken up by the blood and pumped all round the body.
 - These pollutants are also deposited on soil, plants, and in the water, further contributing to human exposure.

CONSTRUCTION SOURCE-SPECIFIC POLLUTANT SOURCES AND THEIR POLLUTANTS

Category	Source	Emitting pollutants
Agriculture	Open burning	Suspended particulate matter, carbon monoxide, volatile organic compounds
Mining and quarrying	Coal mining; crude oil and gas production; stone quarrying	Suspended particulate matter, sulphur dioxide, oxides of nitrogen, volatile organic compounds



Transport	Combustion engines	Suspended particulate matter, sulphur dioxide, oxides of nitrogen, carbon monoxide, volatile organic compounds, lead
Community service	Municipal incinerators	Suspended particulate matter, sulphur dioxide, oxides of nitrogen, carbon monoxide, volatile organic compounds, lead



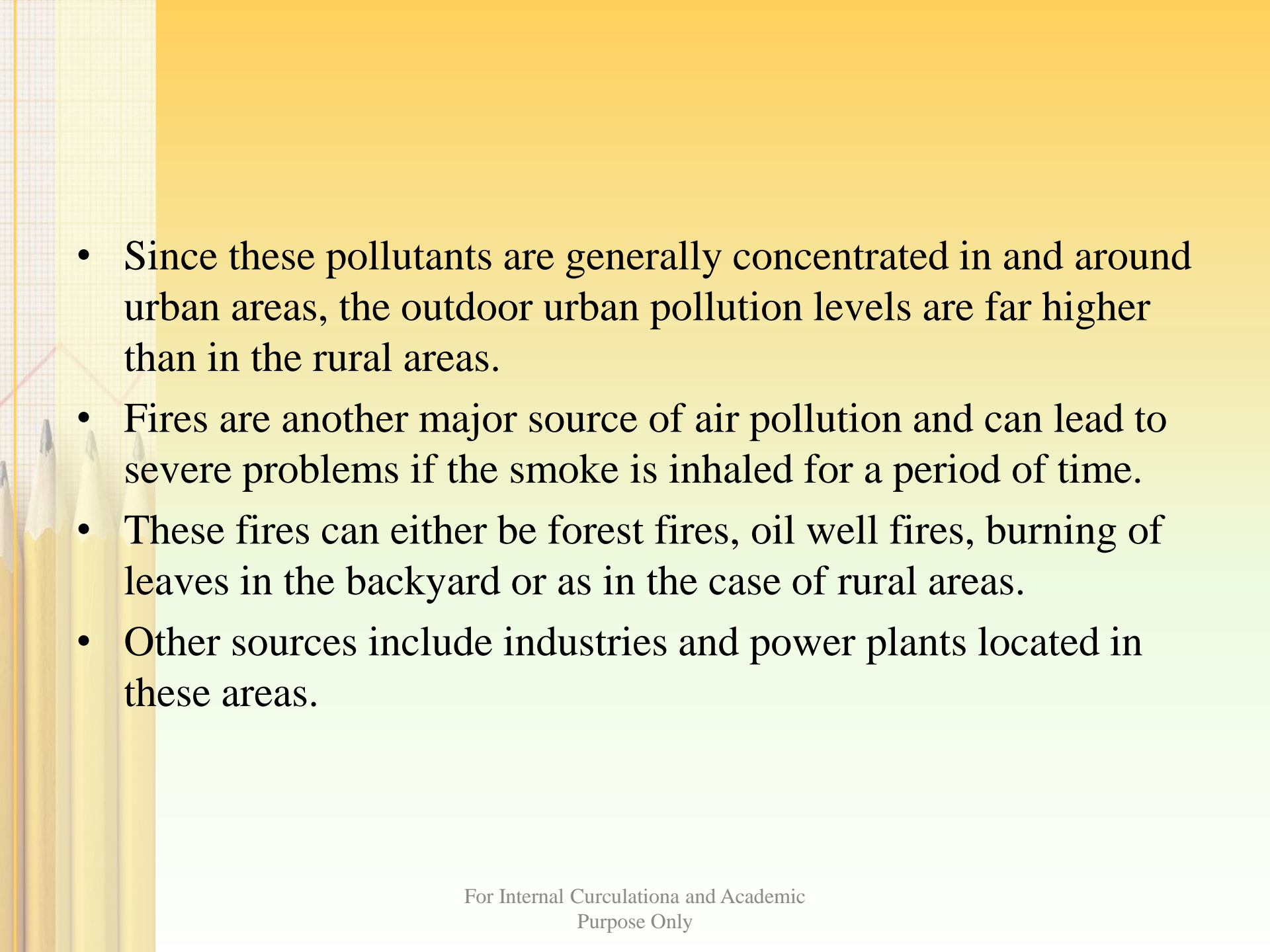
Power
generation

Electricity;
steam gas;

Suspended
particulate matter
sulphur dioxide
oxides of nitrogen
carbon monoxide
volatile organic
compounds, sulphur
trioxide, lead

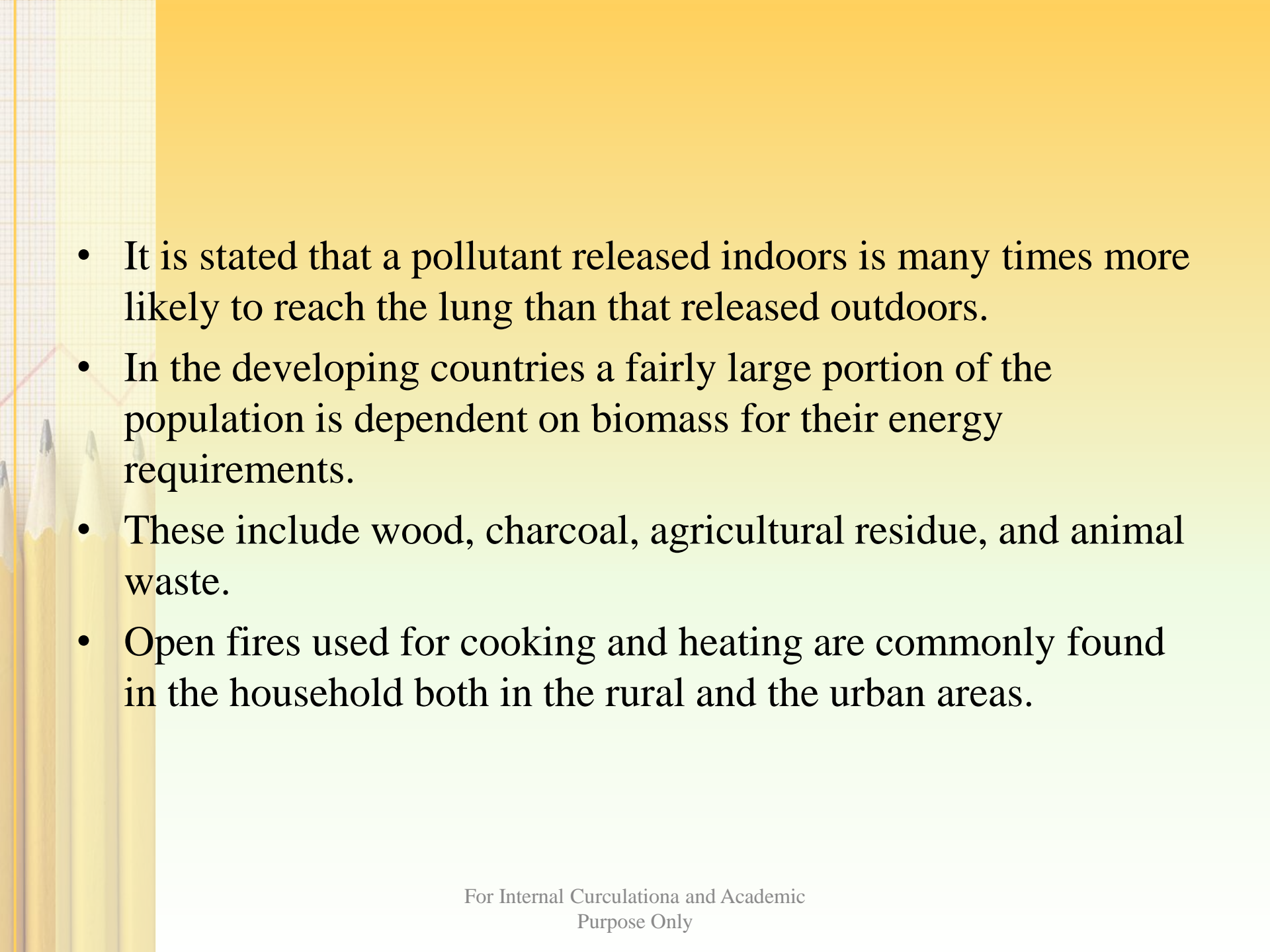
Sources of air pollution

- Air pollutants consist of gaseous pollutants, odors, and SPM, (suspended particulate matter) such as dust, fumes, mist, and smoke.
- The concentration of these in and near the urban areas causes severe pollution to the surroundings.
- The largest sources of human-created air pollution are energy generation, transportation, and industries that use a great deal of energy sources.

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- Since these pollutants are generally concentrated in and around urban areas, the outdoor urban pollution levels are far higher than in the rural areas.
 - Fires are another major source of air pollution and can lead to severe problems if the smoke is inhaled for a period of time.
 - These fires can either be forest fires, oil well fires, burning of leaves in the backyard or as in the case of rural areas.
 - Other sources include industries and power plants located in these areas.

Impact of air pollution on health

- The magnitude of the London fog of 1952, which affected such a large number of people, was the first incident that made people aware of the damage done to the atmosphere due to industrialization.
- The SPM levels increased manifold and resulted in over 4000 deaths.
- Indoor air pollution can be particularly hazardous to health as it is released in close proximity to people.

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- It is stated that a pollutant released indoors is many times more likely to reach the lung than that released outdoors.
 - In the developing countries a fairly large portion of the population is dependent on biomass for their energy requirements.
 - These include wood, charcoal, agricultural residue, and animal waste.
 - Open fires used for cooking and heating are commonly found in the household both in the rural and the urban areas.

- The stove is often at floor level, adding to the risk of accident and the hygiene factor. In addition, they are often not fitted with a chimney to remove the pollutants.
- In such households the children and women are most likely to be affected, as they are the group that spends more time indoors.
- The main pollutant in this environment is the SPM. In fact, deaths due to indoor air pollution, mainly particulate matters.
- Many of the deaths are due to acute respiratory infections in children.

- Others are due to cardiovascular diseases, lung cancer, and chronic respiratory diseases in adults.
- If emissions are high and ventilation is poor, household use of coal and biomass can severely affect the indoor air quality.
- Pollutant emissions per meal are also very high compared to those of other fuels.
- The most harmful of the gases and agents that are emitted are particulate matter, carbon dioxide, polycyclic organic matter, and formaldehyde.
- The indoor concentrations of these are far higher than the acceptable levels and are cause for concern in rural areas

Health impact of specific air pollutants

- Some of these gases can seriously and adversely affect the health of the population and should be given due attention by the concerned authority.
- The gases mentioned below are mainly outdoor air pollutants but some of them can and do occur indoor depending on the source and the circumstances.

- *Tobacco smoke*
- Tobacco smoke generates a wide range of harmful chemicals and is a major cause of ill health, as it is known to cause cancer.
- Not only to the smoker but affecting passive smokers too.
- It is well-known that smoking affects the passive smoker.
- Ranging from burning sensation in the eyes or nose, and throat irritation, to cancer, bronchitis, severe asthma, and a decrease in lung function.

- *Biological pollutants.*
- These are mostly allergens that can cause asthma, hay fever, and other allergic diseases.
- *Volatile organic compounds*
- Volatile compounds can cause irritation of the eye, nose and throat.
- In severe cases there may be headaches, nausea, and loss of coordination. In the longer run.
- some of them are suspected to cause damage to the liver and other parts of the body.

- ***Lead***
- Prolonged exposure can cause damage to the nervous system, digestive problems, and in some cases cause cancer.
- It is especially hazardous to small children.

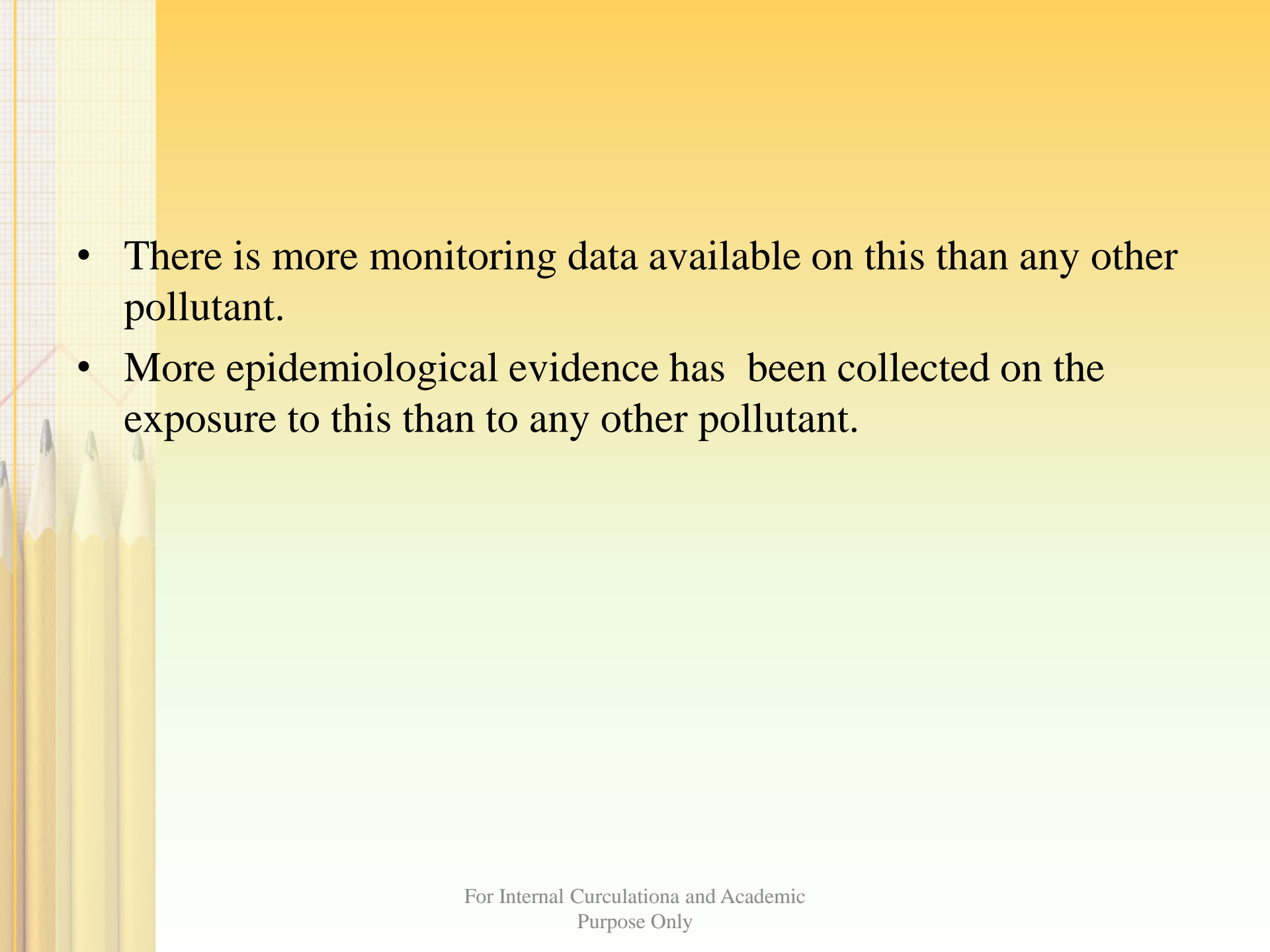
- ***Radon***
- A radioactive gas that can accumulate inside the house.
- It originates from the rocks and soil under the house and its level is dominated by the outdoor air and also to some extent the other gases being emitted indoors.

- Exposure to this gas increases the risk of lung cancer.
- *Ozone*
- Exposure to this gas makes our eyes itch, burn, and water and it has also been associated with increase in respiratory disorders such as asthma.
- It lowers our resistance to colds and pneumonia.

- *Oxides of nitrogen*
- This gas can make children susceptible to respiratory diseases in the winters.
- *Carbon monoxide*
- CO (carbon monoxide) combines with hemoglobin to lessen the amount of oxygen that enters our blood through our lungs.
- The binding with other haeme proteins causes changes in the function of the affected organs such as the brain and the cardiovascular system, and also the developing foetus.

- It can impair our concentration, slow our reflexes, and make us confused and sleepy.
- *Sulphur dioxide*
- SO₂ (sulphur dioxide) in the air is caused due to the rise in combustion of fossil fuels.
- It can oxidize and form sulphuric acid mist. SO₂ in the air leads to diseases of the lung and other lung disorders such as wheezing and shortness of breath.
- Long-term effects are more difficult to ascertain as SO₂ exposure is often combined with that of SPM.

- *SPM (suspended particulate matter)*
- Suspended matter consists of dust, fumes, mist and smoke.
- The main chemical component of SPM that is of major concern is lead, others being nickel, arsenic, and those present in diesel exhaust.
- These particles when breathed in, lodge in our lung tissues and cause lung damage and respiratory problems.
- It affects more people globally than any other pollutant on a continuing basis.

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- There is more monitoring data available on this than any other pollutant.
 - More epidemiological evidence has been collected on the exposure to this than to any other pollutant.



Green House Effect

Global Warming

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SOIL POLLUTION

- Pollution is a global problem.
- It has affected the lives of millions of people and caused several deaths and health problems.
- Land pollution is one of the types of pollution.
- Land pollution is pollution of our planet's land surface.

Causes of land pollution

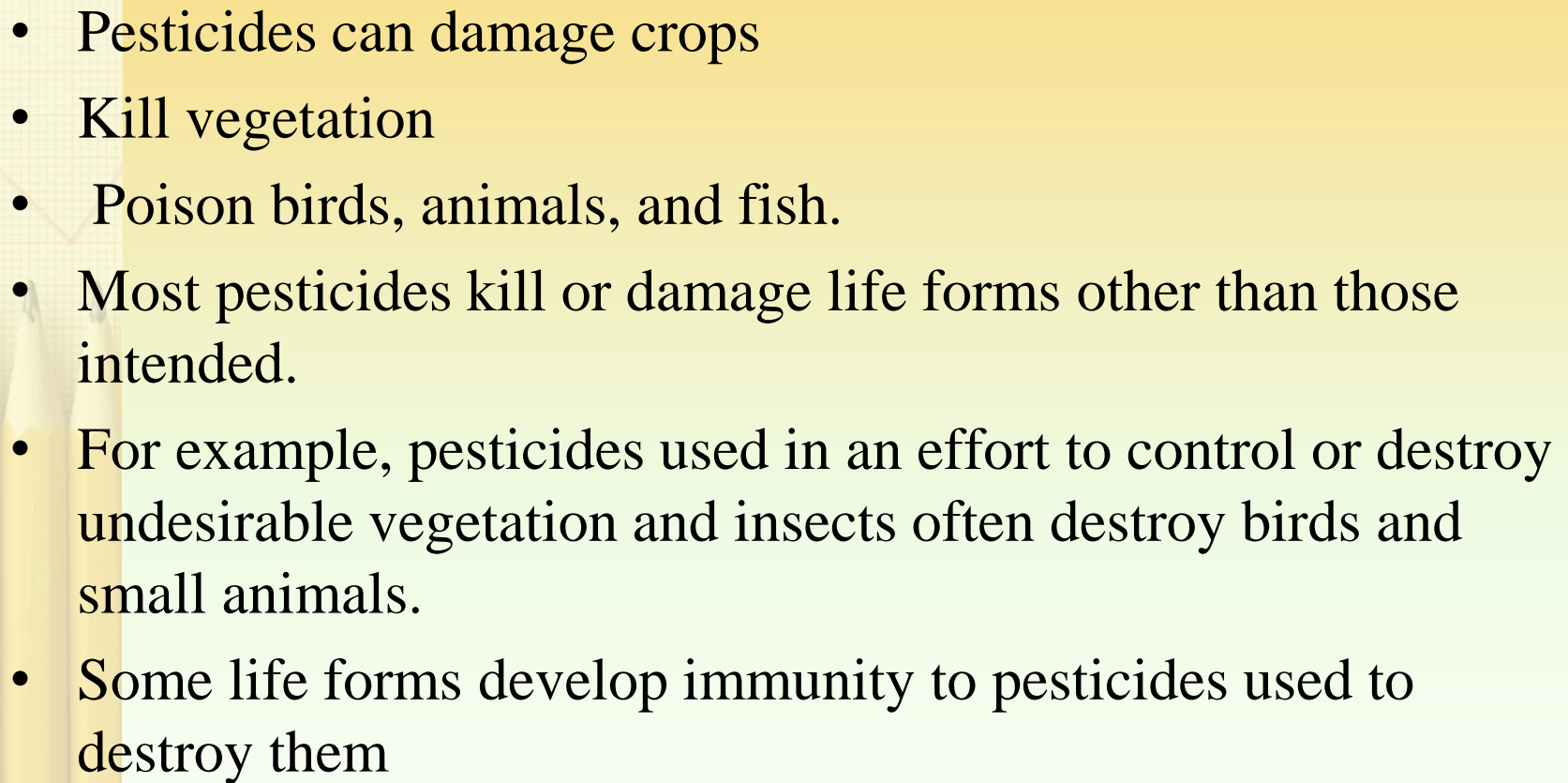
- Increase in urbanization
- Increase in agricultural land.
- Domestic waste.
- Agricultural activities.
- Industrial activities.

Reducing land Pollution

- We can take the following steps:-
- Encourage organic farming
- Proper garbage disposal
- Recycle garbage
- Reduce use of herbicides and pesticides
- Avoid over packaged items
- Efficient utilization of resources and reducing wastage

Effects of land pollution

- Exterminates wild life .
- Acid rain kills trees and other plants.
- Vegetation that provides food and shelter is destroyed.
- It can seriously disrupt the balance of nature, and, in extreme cases, can cause human fatalities.

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- Pesticides can damage crops
 - Kill vegetation
 - Poison birds, animals, and fish.
 - Most pesticides kill or damage life forms other than those intended.
 - For example, pesticides used in an effort to control or destroy undesirable vegetation and insects often destroy birds and small animals.
 - Some life forms develop immunity to pesticides used to destroy them

WASTELANDS

- Defined as the land which is degraded naturally or through human activity and is presently lying unutilized.
- Cultivable wasteland
- Uncultivable wasteland

- Cultivable wasteland
- Land which has the potential, with augmentation, for the development of vegetative cover and is not being used due to different constraints of varying degrees, is termed as *Cultivable wasteland*
- Uncultivable wasteland
- Lands that cannot be developed for vegetation cover are defined as *Uncultivated wastelands*.

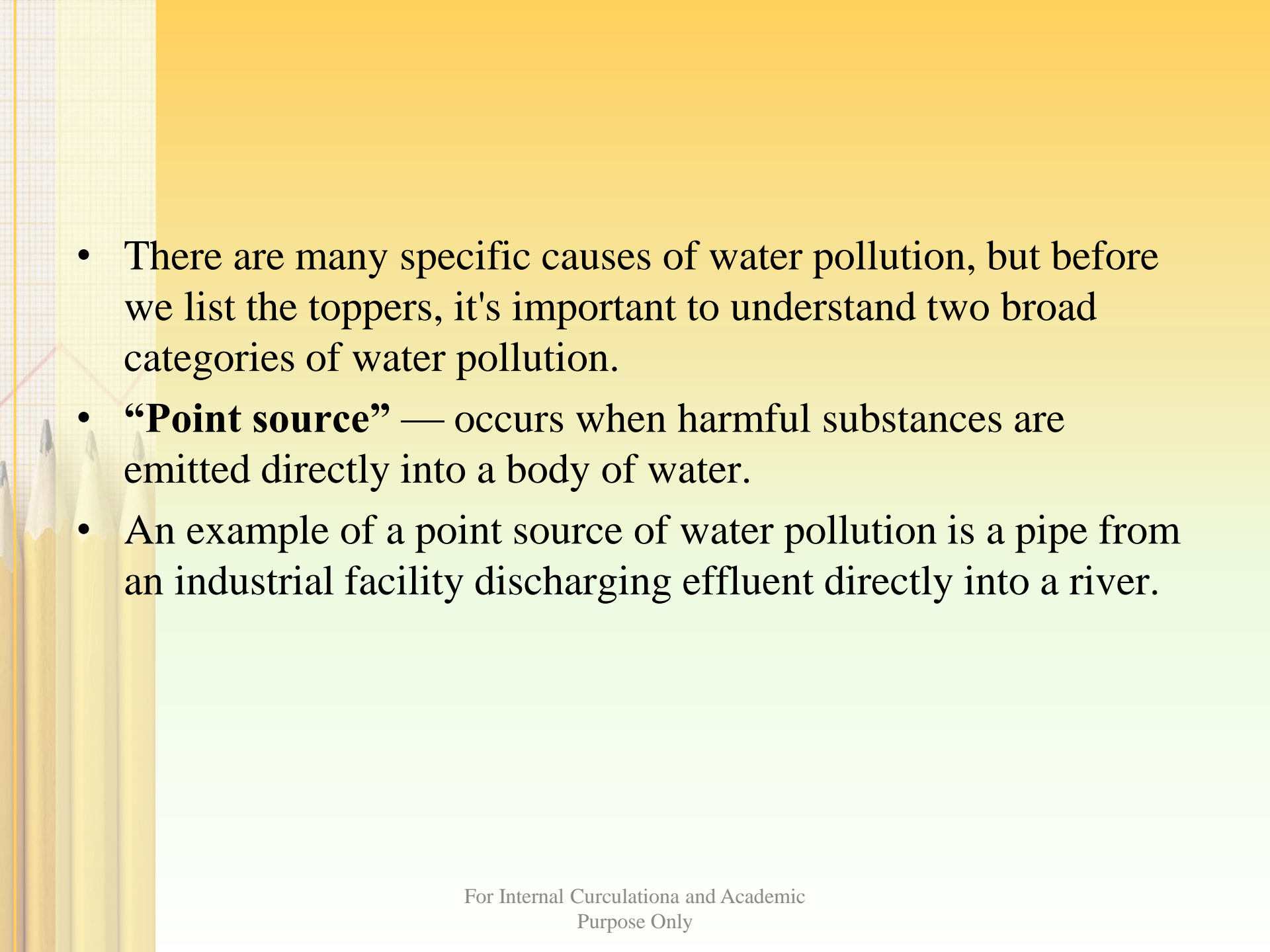
WASTELAND MANAGEMENT

- Major emphasis is laid on development of wastelands.
- Following basic features need to be considered in the management programs:
 - Skills Training
 - Forestry
 - Health Education
 - Animal Husbandry
 - Conservation
 - Agriculture Extension



Water & Marine Pollution

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- There are many specific causes of water pollution, but before we list the toppers, it's important to understand two broad categories of water pollution.
 - **“Point source”** — occurs when harmful substances are emitted directly into a body of water.
 - An example of a point source of water pollution is a pipe from an industrial facility discharging effluent directly into a river.

- **Nonpoint source**” — delivers pollutants indirectly through transport or environmental change.
- An example of a nonpoint-source of water pollution is when fertilizer from a farm field is carried into a stream by rain (i.e. run-off).
- Point-source pollution is usually monitored and regulated, at least in Western countries, though political factors may complicate how successful efforts are at true pollution control.

- Nonpoint sources are much more difficult to monitor and control, and today they account for the majority of contaminants in streams and lakes.

- WATER POLLUTION CAUSES — #1
- **Pesticides**
- WATER POLLUTION CAUSES — #2
- **Fertilizers / Nutrient Pollution**
- WATER POLLUTION CAUSES — #3
- **Oil, Gasoline and Additives**
- WATER POLLUTION CAUSES — #4
- **Mining**



- WATER POLLUTION CAUSES — #5

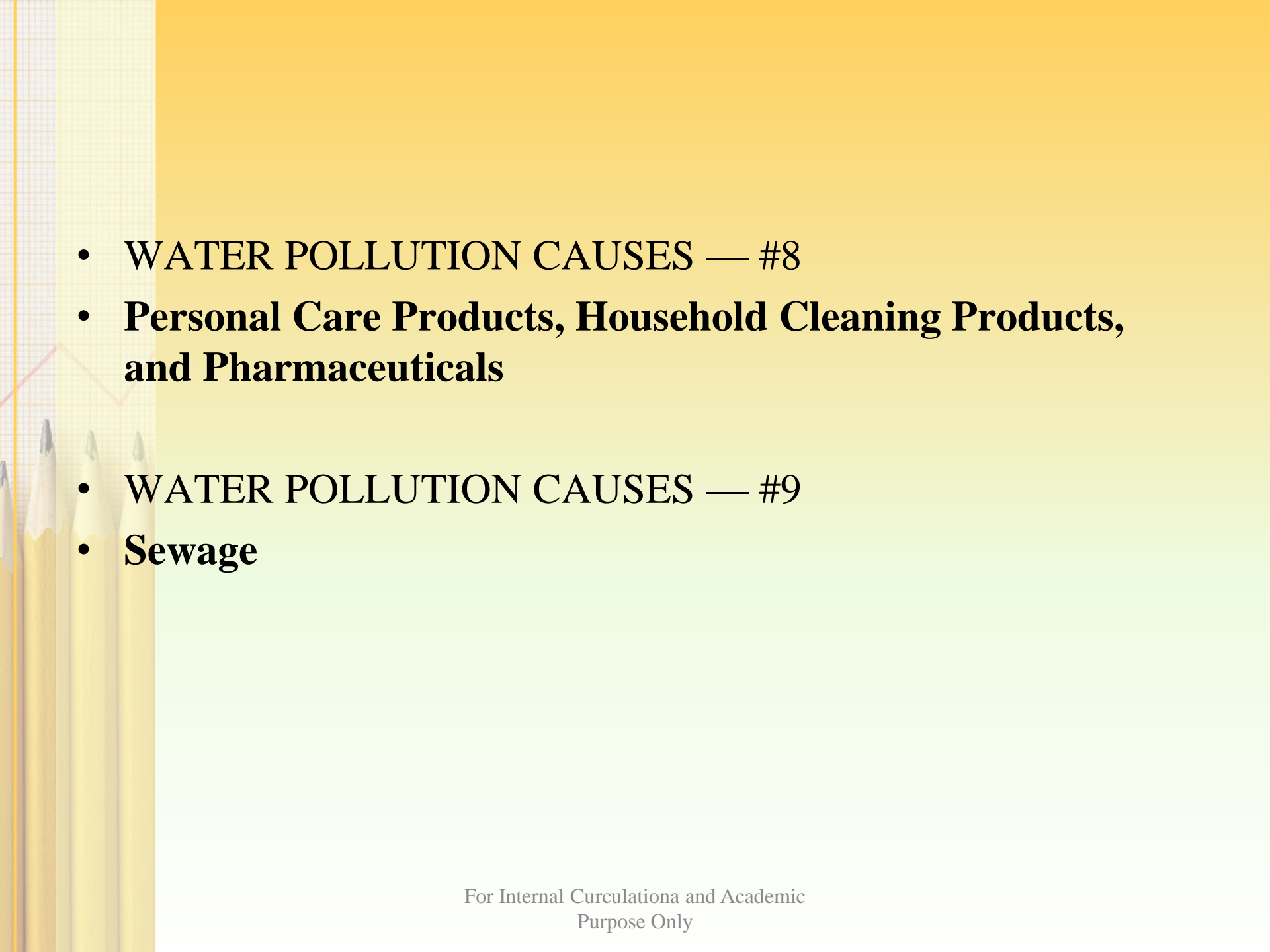
- **Sediment**

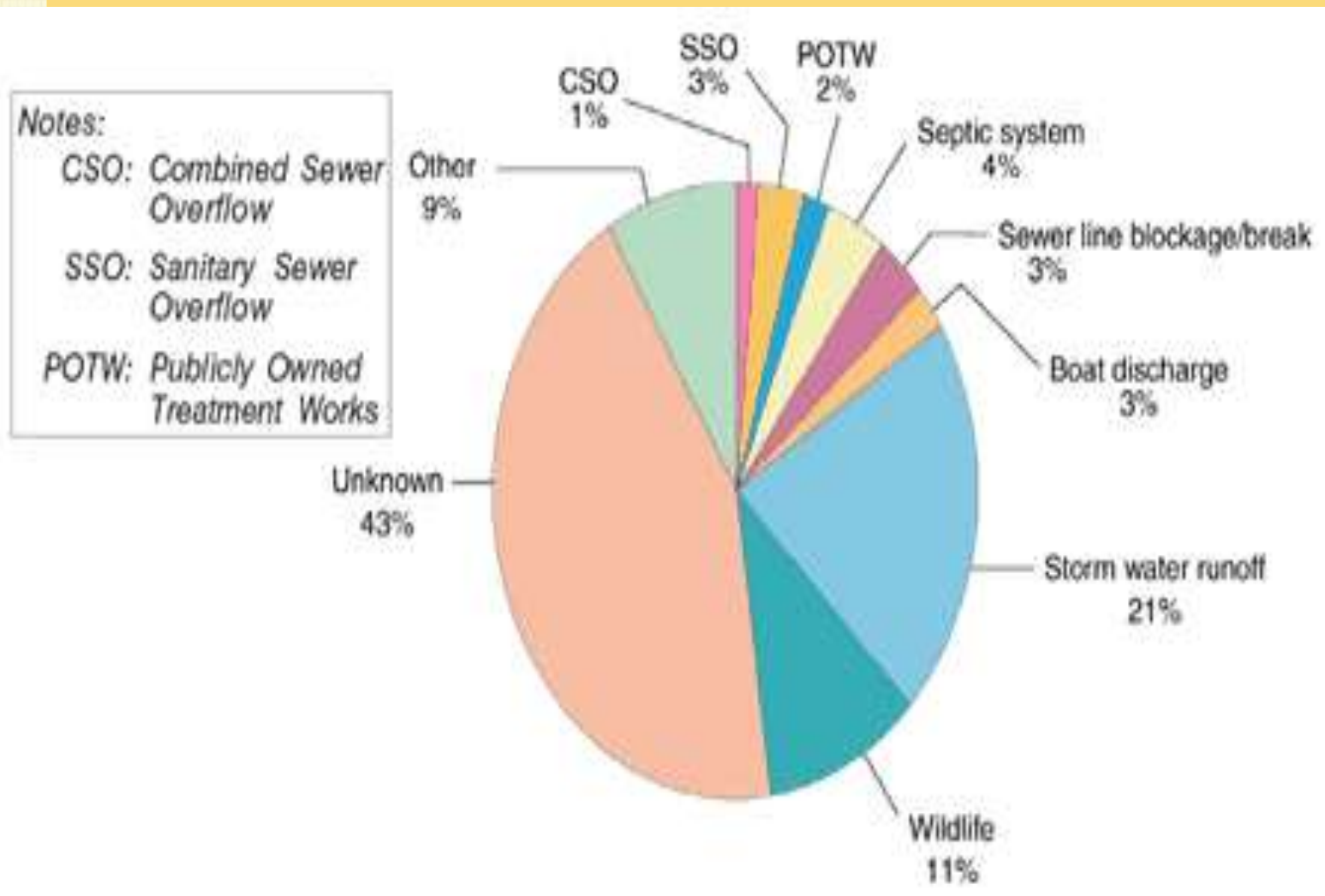
- WATER POLLUTION CAUSES — #6

- **Chemical and Industrial Processes**

- WATER POLLUTION CAUSES — #7

- **Plastic**

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- WATER POLLUTION CAUSES — #8
 - **Personal Care Products, Household Cleaning Products, and Pharmaceuticals**
 - WATER POLLUTION CAUSES — #9
 - **Sewage**

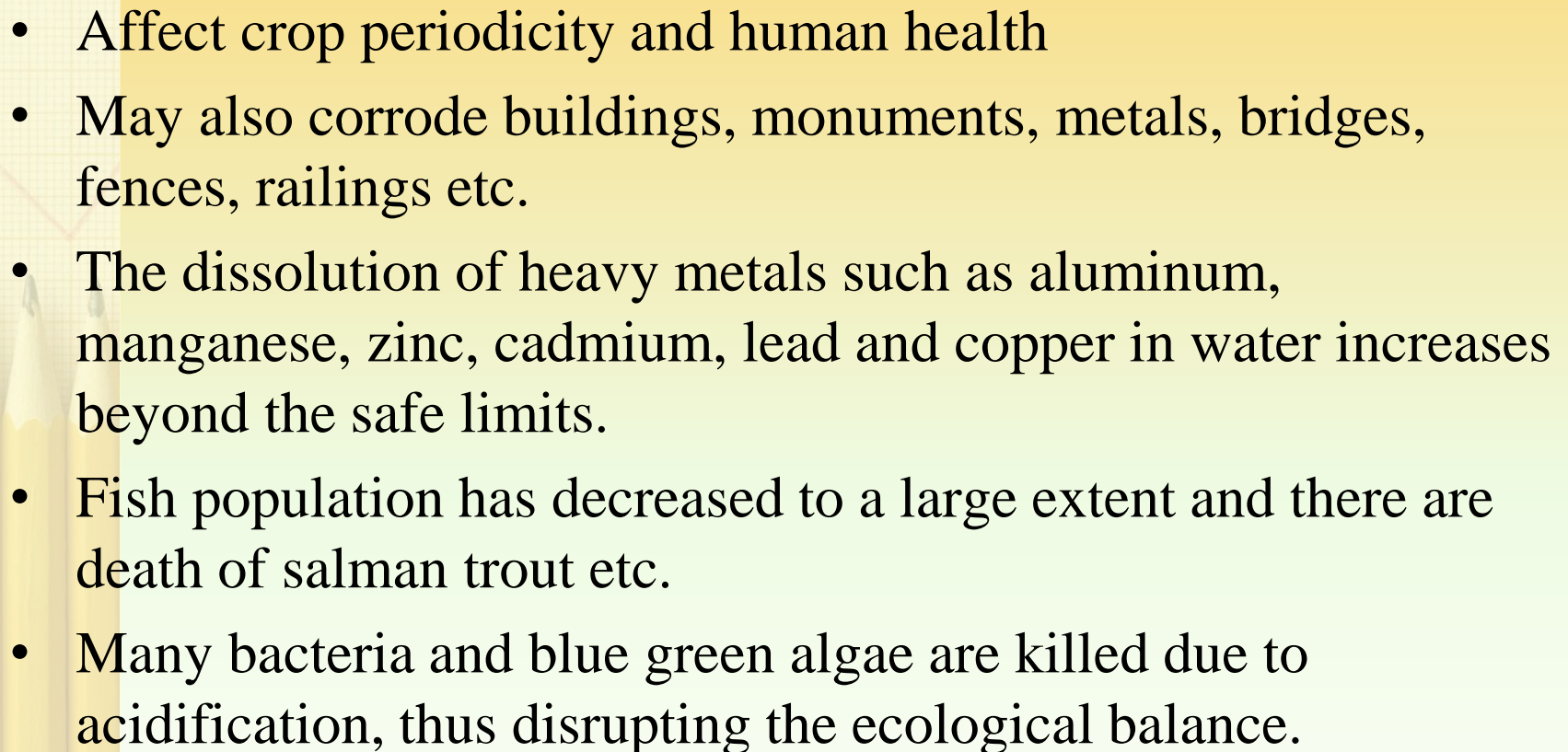


- WATER POLLUTION CAUSES — #10
- Air Pollution
- WATER POLLUTION CAUSES — #11
- **Carbon Dioxide**
- WATER POLLUTION CAUSES — #12
- **Heat**

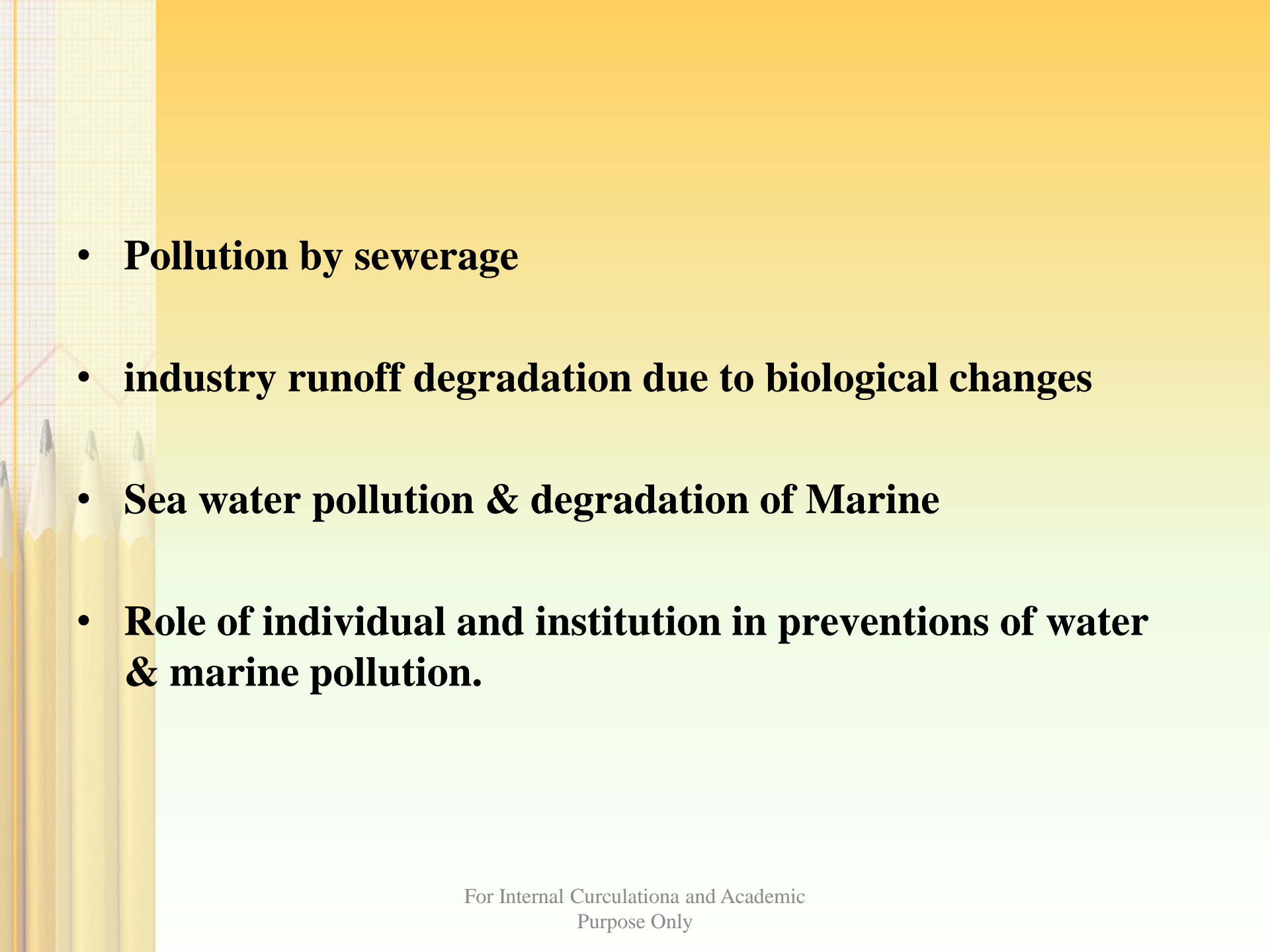
- WATER POLLUTION CAUSES — #13
- **Noise**
- *Water Pollution Causes Wrap-Up*

Acid Rains

- Acidification of environment is a man made phenomenon.
- Mixture of H_2SO_4 and HNO_3
- On an average 60 %– 70% is H_2SO_4 and 30%-40% is HNO_3
- Acid rain creates complex problems.
- They increase soil acidity, thus affecting land
- Causes acidification of lakes and streams thus affecting aquatic life

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- Affect crop periodicity and human health
 - May also corrode buildings, monuments, metals, bridges, fences, railings etc.
 - The dissolution of heavy metals such as aluminum, manganese, zinc, cadmium, lead and copper in water increases beyond the safe limits.
 - Fish population has decreased to a large extent and there are death of salmon trout etc.
 - Many bacteria and blue green algae are killed due to acidification, thus disrupting the ecological balance.

- The acidic gaseous oxides are produced at one place but affects else where by turning into acids.

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- **Pollution by sewerage**
 - **industry runoff degradation due to biological changes**
 - **Sea water pollution & degradation of Marine**
 - **Role of individual and institution in preventions of water & marine pollution.**



NOISE, THERMAL

&

**NUCLEAR
POLLUTION**

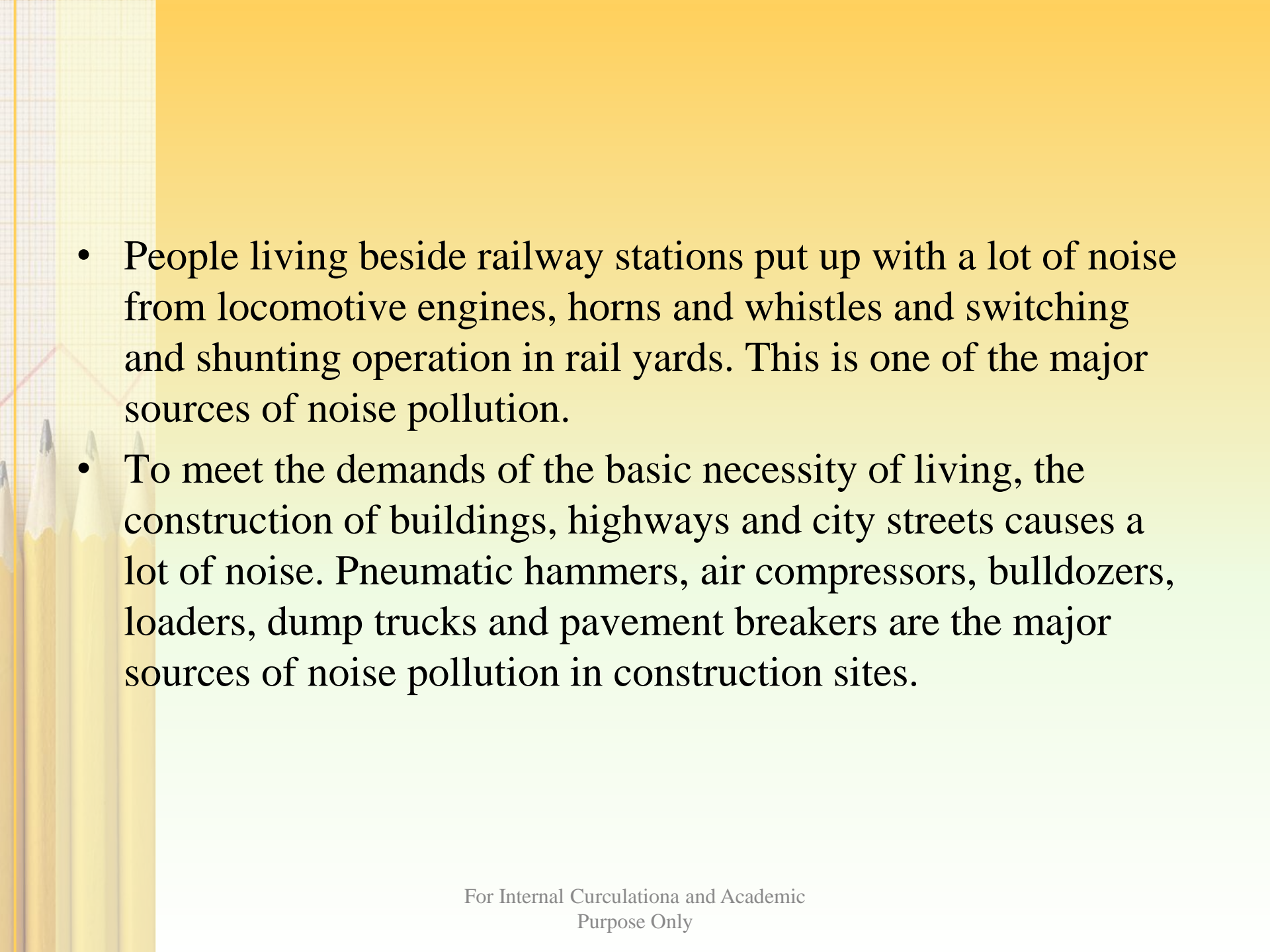
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NOISE POLLUTION

- “Noise can be defined as an unwanted undesired sound”.
- Decibel is the standard unit for measurement of sound. Usually **80 db** is the level at which sound becomes physically painful.
- Humans, animals, plants and even inert objects like buildings and bridges have been victims of the increasing noise pollution caused in the world.

- Traffic dons the cap of being the largest noise maker throughout the world.

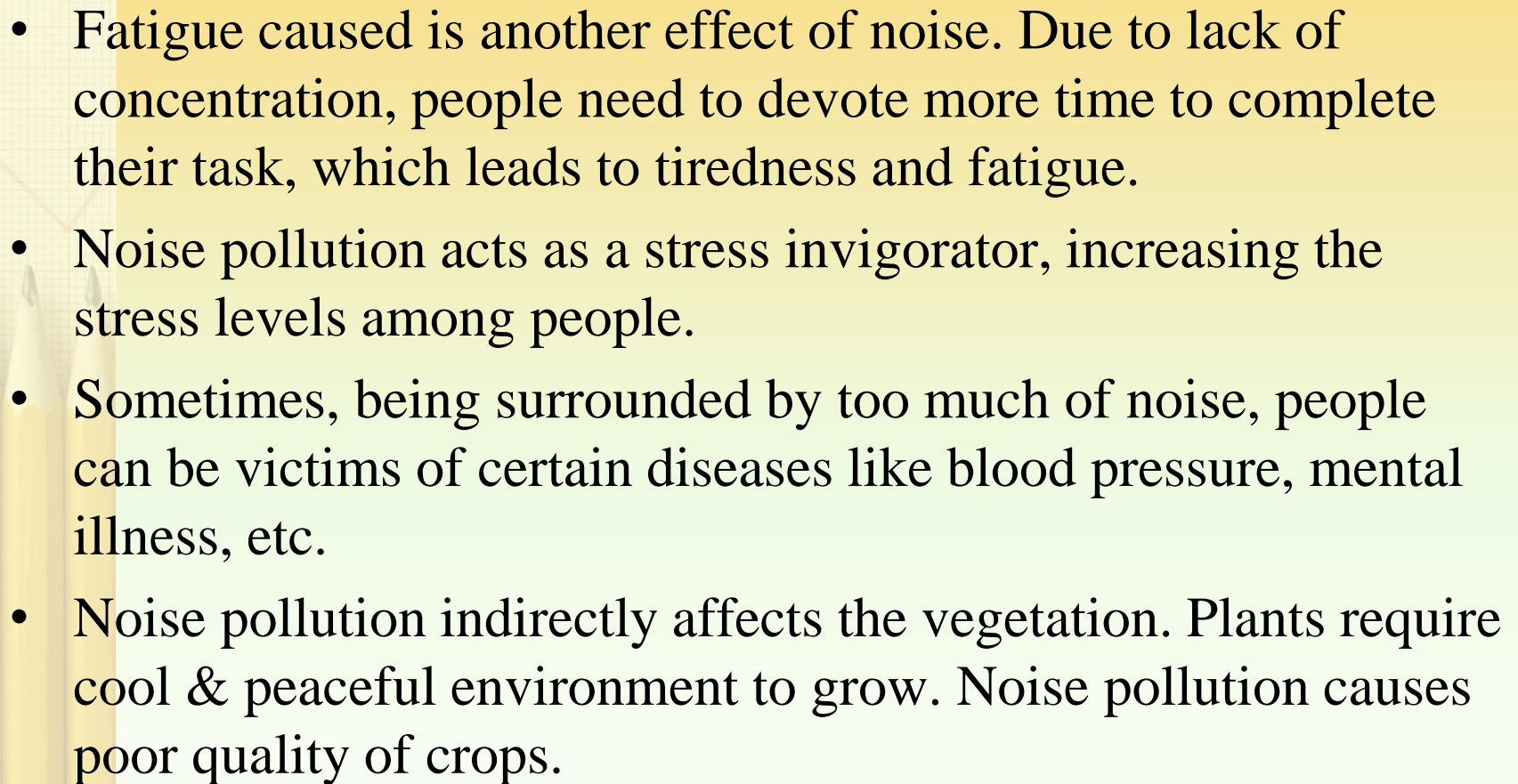
- Some of the causes and effects of noise pollution.
- Traffic noise is the main source of noise pollution caused in urban areas. With the ever-increasing number of vehicles on road, the sound caused by the cars and exhaust system of autos, trucks, buses and motorcycles is the chief reason for noise pollution.
- With the low flying military aircrafts soaring over the national parks, wasteland and other vacant areas, the level of noise pollution has drastically increased in these previously unaffected zones.

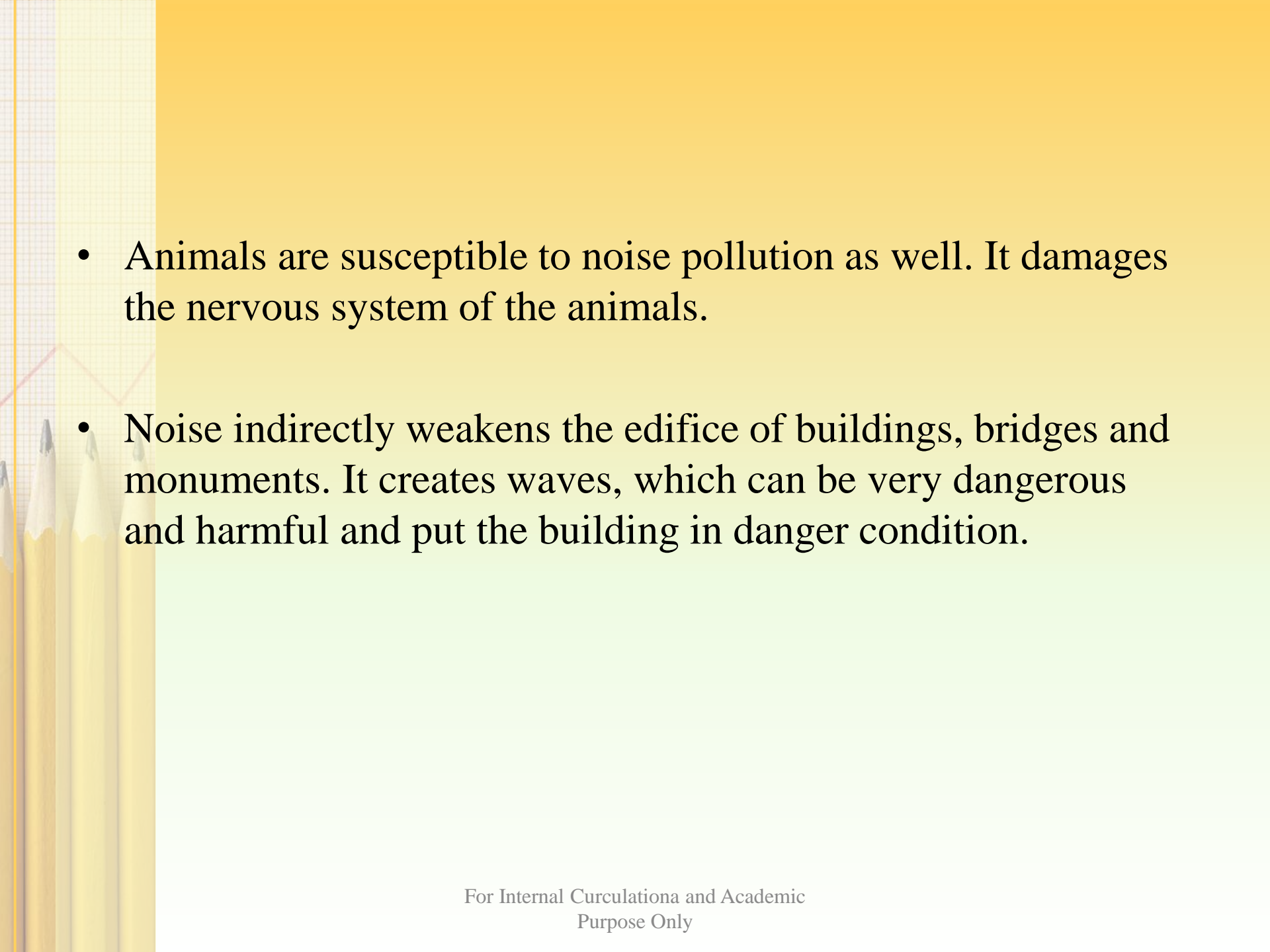
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- People living beside railway stations put up with a lot of noise from locomotive engines, horns and whistles and switching and shunting operation in rail yards. This is one of the major sources of noise pollution.
 - To meet the demands of the basic necessity of living, the construction of buildings, highways and city streets causes a lot of noise. Pneumatic hammers, air compressors, bulldozers, loaders, dump trucks and pavement breakers are the major sources of noise pollution in construction sites.


- Though not a prime reason, industrial noise adds to the noise pollution. Machinery, motors and compressors used in the industries create a lot of noise which adds to the already detrimental state of noise pollution.
- Plumbing, boilers, generators, air conditioners and fans create a lot of noise in the buildings and add to the prevailing noise pollution.
- Household equipments, such as vacuum cleaners, mixers and some kitchen appliances are noisemakers of the house. Though they do not cause too much of problem, their effect cannot be neglected.

- **Effects Of Noise Pollution**

- Deafness, temporary or permanent, is one of the most prevalent effects of noise pollution. Mechanics, locomotive drivers, telephone operators etc all have their hearing impairment.
- The first and foremost effect of noise is a decrease in the efficiency in working. Research has proved the fact that human efficiency increases with noise reduction
- Too much of noise disturbs the rhythms of working, thereby affecting the concentration required for doing a work. Noise of traffic or the loud speakers or different types of horns divert the attention, thus causing harm in the working standard

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- Fatigue caused is another effect of noise. Due to lack of concentration, people need to devote more time to complete their task, which leads to tiredness and fatigue.
 - Noise pollution acts as a stress invigorator, increasing the stress levels among people.
 - Sometimes, being surrounded by too much of noise, people can be victims of certain diseases like blood pressure, mental illness, etc.
 - Noise pollution indirectly affects the vegetation. Plants require cool & peaceful environment to grow. Noise pollution causes poor quality of crops.

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- Animals are susceptible to noise pollution as well. It damages the nervous system of the animals.
 - Noise indirectly weakens the edifice of buildings, bridges and monuments. It creates waves, which can be very dangerous and harmful and put the building in danger condition.



THERMAL POLLUTION & NUCLEAR POLLUTION ASSIGNMENT

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