UNIT-4 :-

Current Environmental Issues of Importance

Current Environmental Issues of Importance

There are some current Environmental Issues of Importance :-

1. Air Pollution

   Harmful gases and particles in the air affecting health and environment.

2. Climate Change

   Long-term changes in temperature and weather patterns due to Global Warming.

3. Water Pollution

   Contamination of Rivers, Lakes and oceans by waste and chemicals.

4. Deforestation

   Cutting down forests leading to loss of wildlife and imbalance in nature.

5. Waste Management Problem

   Improper Disposal of Garbage causing land and water pollution.

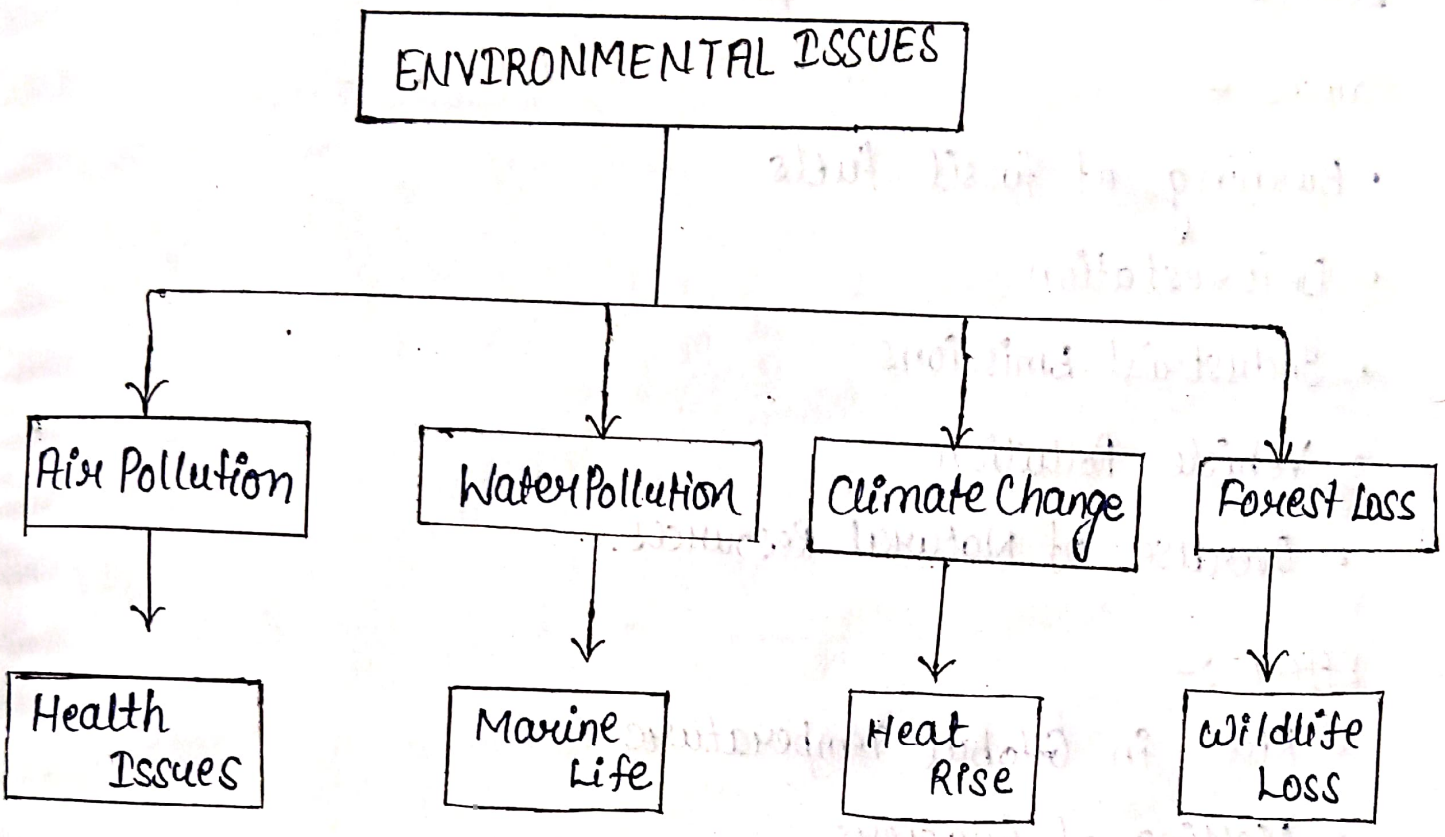
6. Loss of Biodiversity

   Extinction of plants and animals due to human activities.

7. Resource Depletion

   Overuse of natural resources like water, minerals and fossil fuels.

8. Plastic Pollution :-
Excess plastic waste harming land, oceans and marine life.



1] Global Warming
Global Warming is the gradual increase in the Earth's average temperature due to accumulation of green house gases in the atmosphere.
Global warming is a major environmental issue caused mainly by human activities. Immediate action is needed to reduce its effects and protect the Earth for future Generation.

Explanations:-
Global Warming occurs when gases like carbon dioxide, methane, and nitrous oxide trap heat from the sun and prevent it from escaping back into space. This process

is known as the Greenhouse Effect.

As a result, the Earth's temperature rises, leading to serious environmental problems.

Causes :-

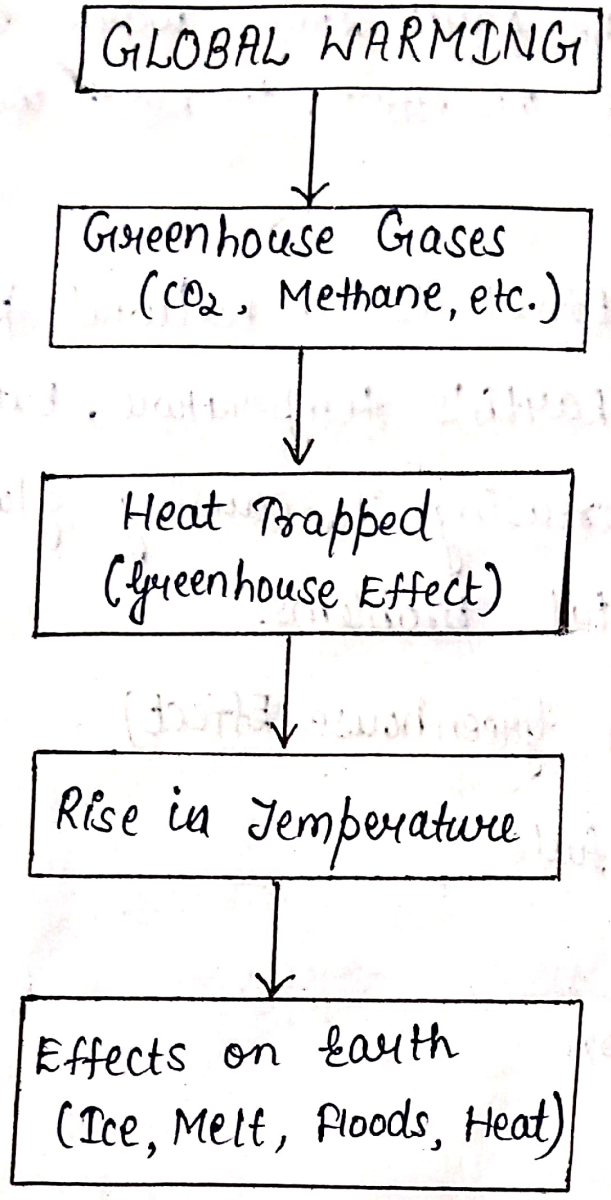
- Burning of fossil fuels
- Deforestation
- Industrial Emissions
- Vehicle Pollution
- Overuse of Natural Resources.

Effects :-

- Rise in Global Temperature
- Melting of Glaciers
- Increase in Sea-Level
- Extreme Weather (Floods, Droughts)
- Loss of Biodiversity
- Health problems in Humans.

Prevention and Control

- Plant more trees
- Use Renewable Energy Resources
- Reduce Pollution
- Save Energy and fuel
- Use Public Transport.



Greenhouse Effect

The Greenhouse Effect is the process by which certain gases in the Earth's atmosphere trap heat from the sun and keep the Earth warm.

When Sunlight reaches the earth, some of it absorbed and the rest is reflected back into space. Greenhouse gases like Carbon Dioxide (CO_2), methane and water vapour trap some of this heat and do not allow it to escape.

Because of this, the Earth stays warm enough for living beings. Without this effect, the Earth would be too cold to live on.

The Green house Effect is a natural process that helps maintain Earth's temperature, but human activities are increasing it, causing global warming and environmental problems.

Causes (Increase in greenhouse Effect)

- Burning of fossil fuels
- Deforestation
- Industrial Pollution
- Vehicle Emissions.

These activities increase Greenhouse gases, making the Earth hotter.

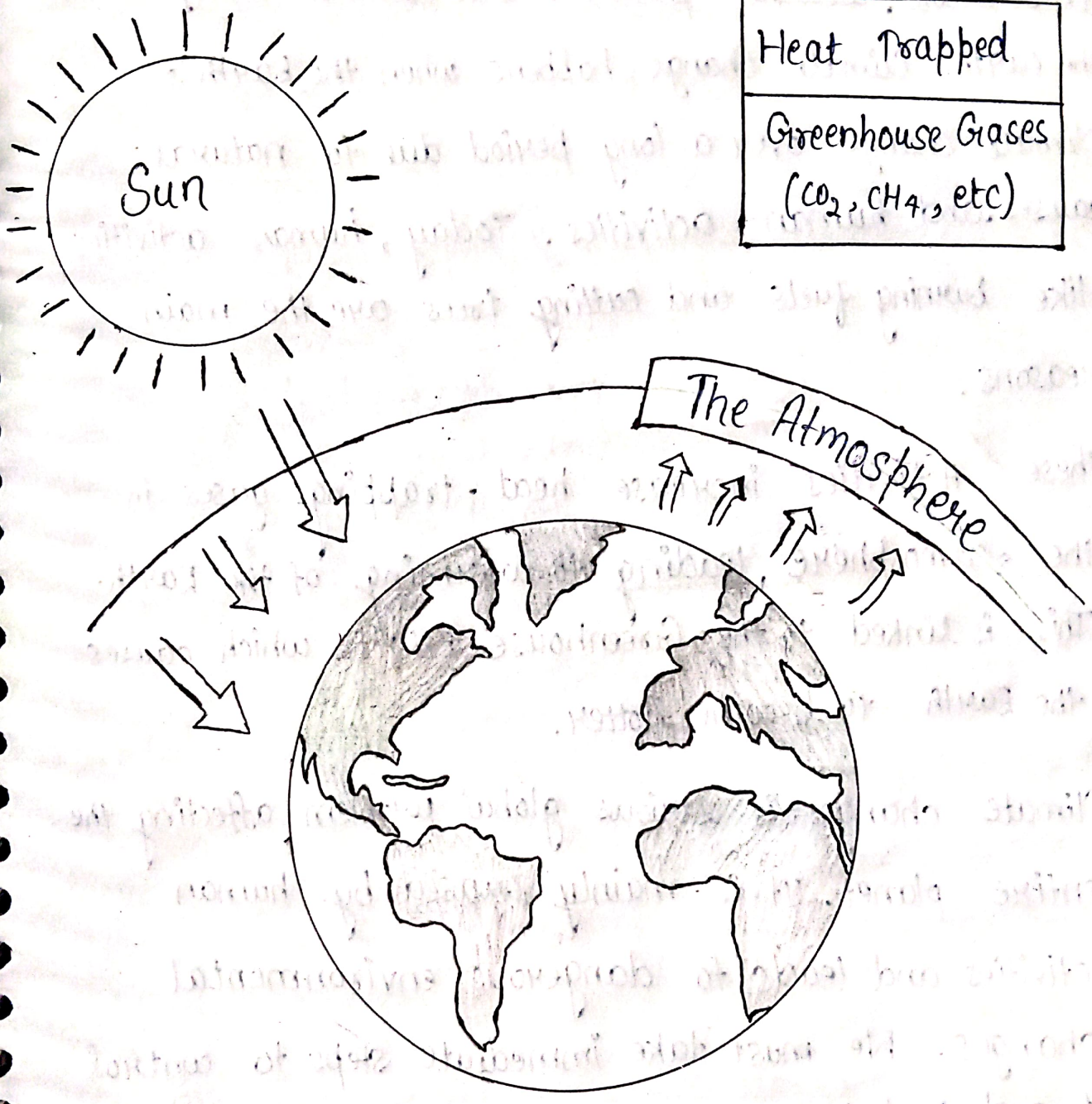
Effects

- Rise in Global Temperature
- Melting of Glaciers
- Rising sea levels.
- Climate change and extreme weather
- Harm to plants and animals.

Importance

The Greenhouse Effect is natural and necessary because it keeps the Earth warm. But too much of it leads to

global Warming.



Gases trap heat from the Sun and keep Earth warm

Climate Change

- Climate change refers to the long-term changes in temperature, weather patterns and climate conditions on the earth. Climate change happens when the Earth's climate change over a long period due to natural causes and human activities. Today, human activities like burning fuels and cutting trees are the main reasons.
- These Activities increase heat-trapping gases in the atmosphere, leading to warming of the Earth. This is linked to the Greenhouse Effect, which causes the Earth to become hotter.
- Climate change is serious global problem affecting the entire planet. It is mainly caused by human activities and leads to dangerous environmental changes. We must take immediate steps to control it and protect our Earth.

Causes of Climate Change

- Burning of fossil fuels
- Deforestation
- Industrial Pollution
- Vehicle Emissions

- Increase in Greenhouse gases.

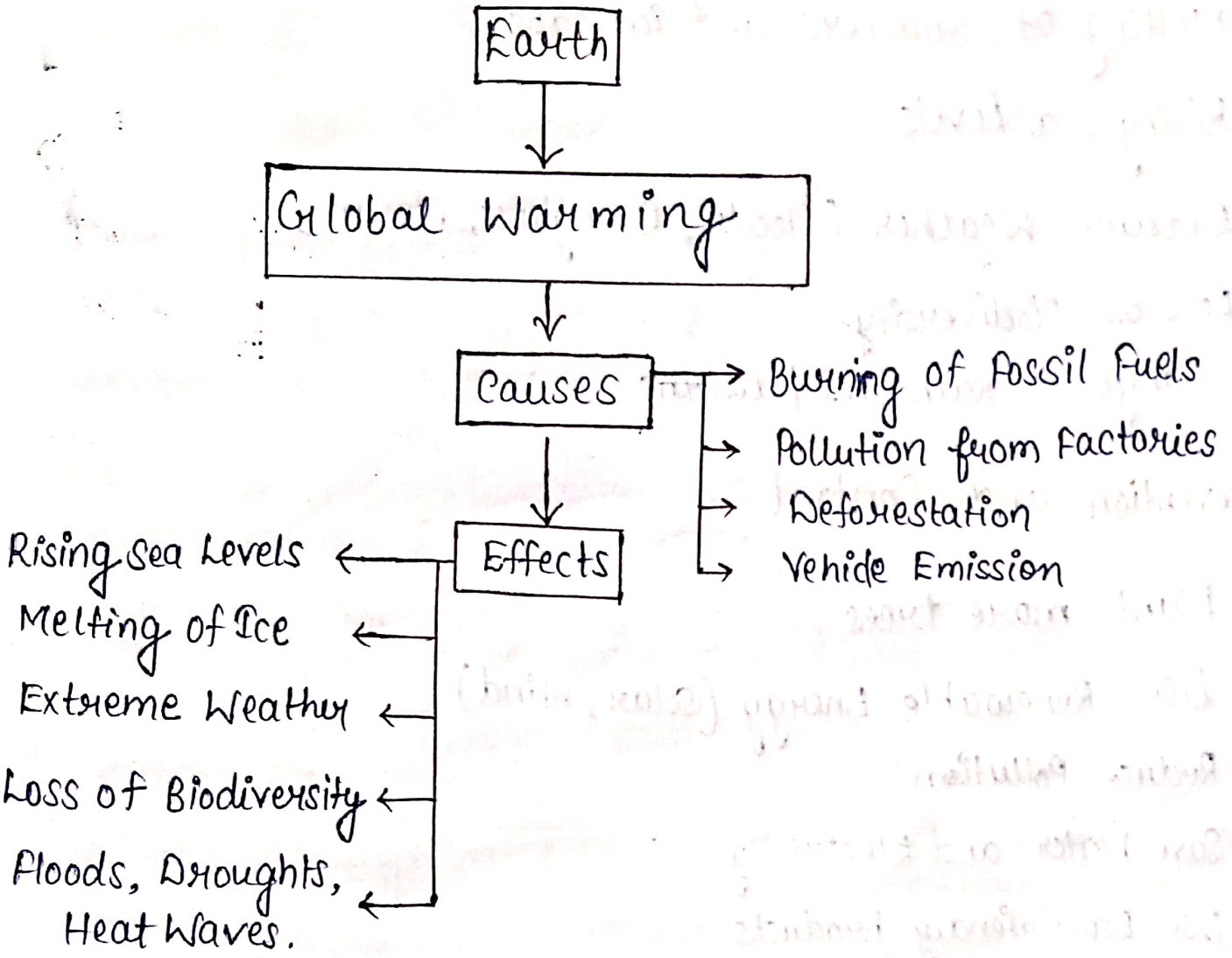
Effects of Climate Change

- Rise in Global Temperature
- Melting of Glaciers and ice caps
- Rising Sea Levels
- Extreme Weather (Floods, Droughts, Storms)
- Loss of Biodiversity
- Change in Rainfall patterns.

Prevention and Control

- Plant more trees
- Use Renewable Energy (Solar, Wind)
- Reduce Pollution
- Save Water and Electricity
- Use Eco-friendly products

Climate Change



Acid Rain

Acid Rain is rainfall that contains harmful acids formed from pollutants like sulphur dioxide (SO_2) and nitrogen oxides (NO_x) in the atmosphere.

Acid Rain occurs when the gases like sulphur dioxide and nitrogen oxides are released into the air from factories, vehicles and Burning of fossil fuels.

These gases react with water vapour in the atmosphere and form acids such as sulphuric acid and nitric acid.

These Acids then fall to the Earth in the form of rain, snow or fog. This is called Acid Rain

Acid Rain is a serious Environmental problem caused by air pollution. It harms plants, animals, humans and even buildings. Therefore, we must take proper steps to control pollution and protect our environment.

Causes of Acid Rain

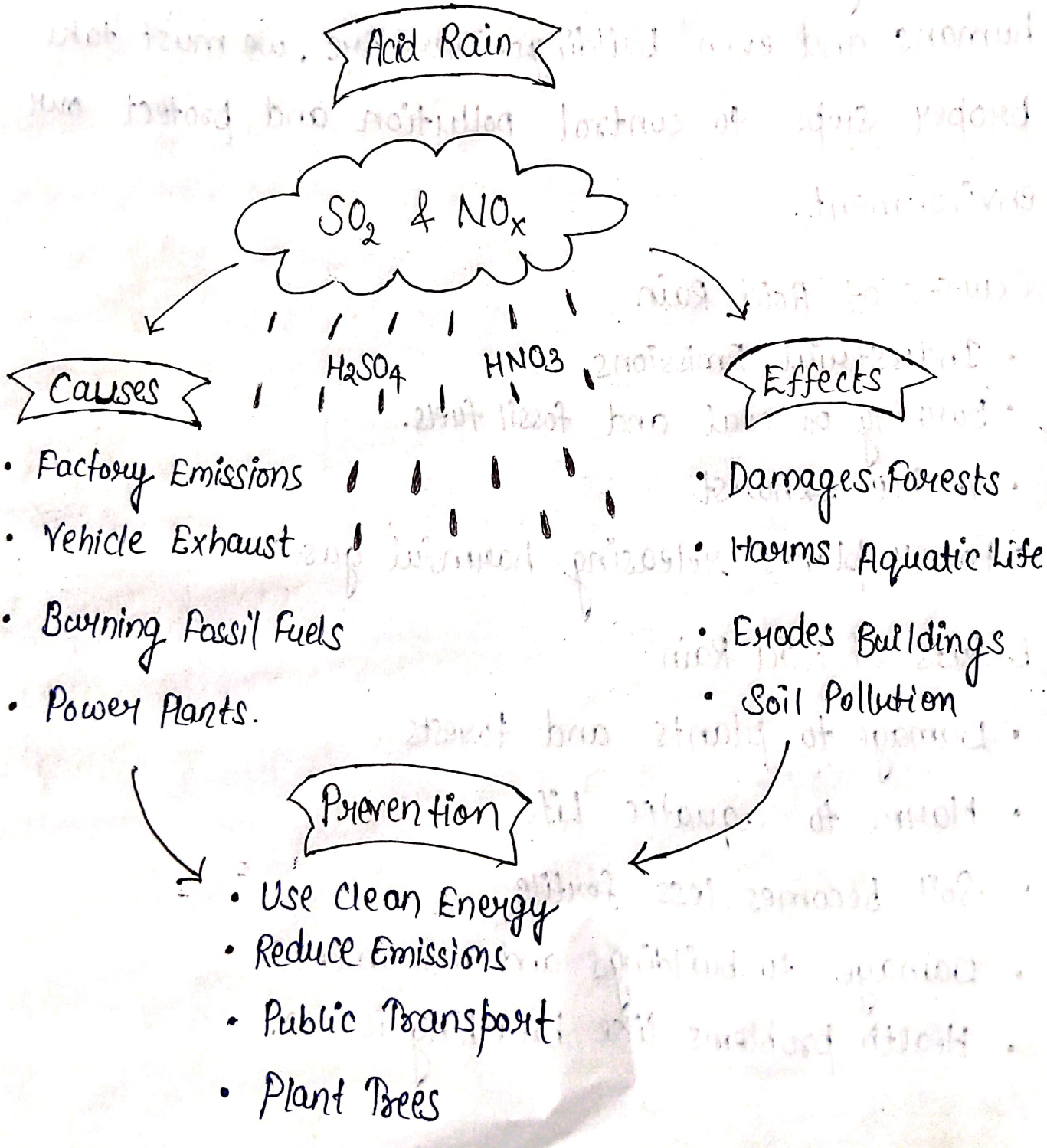
- Industrial Emissions
- Burning of coal and fossil fuels.
- Vehicle Exhaust
- Power plants releasing harmful gases

Effects of Acid Rain

- Damage to plants and forests
- Harm to aquatic Life
- Soil becomes less fertile
- Damage to buildings and monuments
- Health problems like breathing issues.

Prevention and Control

- Use clean and Renewable Energy
- Reduce use of fossil fuels
- Install filters in Factories
- Use of Public Transport
- Plant more trees.



Ozone Layer

The Ozone Layer is a thin layer of Ozone gas (O_3) present in the upper atmosphere (Stratosphere) that protects Earth from harmful ultraviolet (UV) rays of the sun.

The Ozone Layer is very important for live on Earth as it protects us from harmful UV rays. However, human activities are damaging it. Therefore, we must take steps to protect the ozone Layer and save our environment.

2) Formation of Ozone Layer

The formation of Ozone is a natural process that takes place in the atmosphere

Steps of formation:

(i) The Sun Emits Ultraviolet (UV) Rays.

(ii) These Rays split Oxygen Molecules (O_2) into Single Oxygen atoms (O)

(iii) These Oxygen atoms combine with O_2 to form Ozone (O_3)

In Simple Words:

Oxygen + UV rays $\longrightarrow$ Ozone

3.) Importance of Ozone Layer

- Protects Earth from harmful UV radiation
- Prevents skin diseases and eye damage.
- Protects plants and animals.
- Maintains environmental Balance

4.) Ozone Layer Depletion

Ozone Depletion means the thining of the ozone Layer is due to harmful Chemicals.

5.) Causes of Ozone Depletion

- Use of CFCs (Chlorofluorocarbons) in refrigerators and AC
- Aerosol Sprays
- Industrial Emissions
- Pollution from vehicles

These chemicals release Chlorine, which destroys ozone molecules.

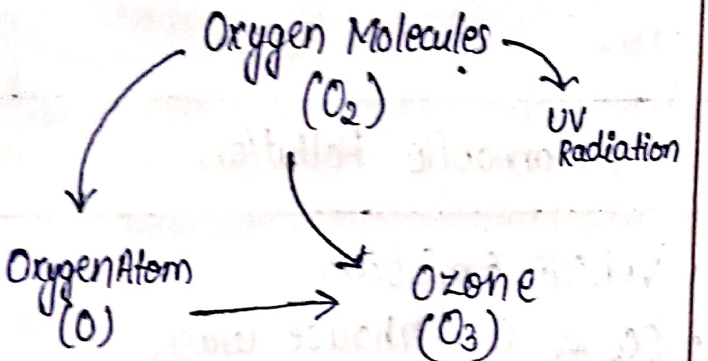
6.) Effects of Ozone Depletion

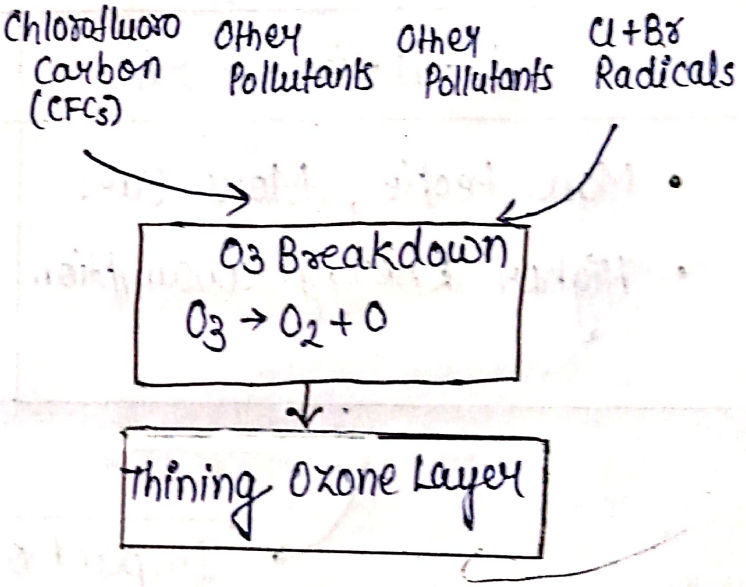
- Increased UV radiation reaching Earth
- Skin Cancer and eye problems
- Damage to crops and plants
- Harm to marine life
- Global Warming and Climate Imbalance

7] Prevention and Control

- Avoid use of CFCs
- Use eco-friendly products
- Reduce Pollution
- Follow Environmental Laws
- Speed awareness

Ozone Layer Formation	Ozone Layer Depletion
O_2 & UV Radiation	Pollutants & CFCs





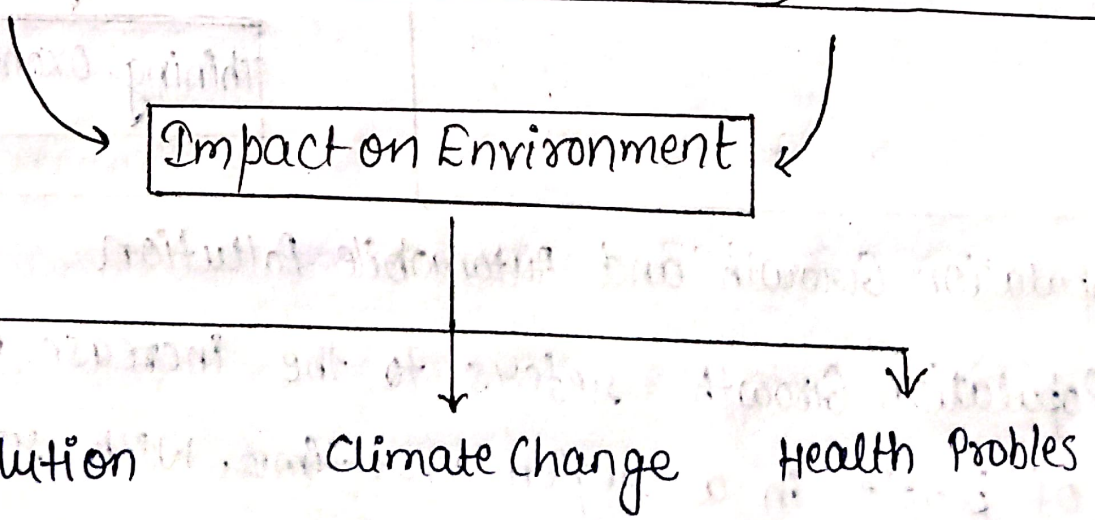
Population Growth and Automobile Pollution

Population Growth refers to the increase in the number of people in a region over time. With rapid population growth, especially in developing countries like India, there is a significant rise in demands for transportation

This leads to an increase in the number of automobiles, which contribute heavily to environmental pollution.

Population Growth and automobile pollution are closely interconnected problems. Rapid Increase in population leads to higher demand for vehicles, which in turn causes severe environmental pollution. Effective population control and sustainable transportation systems are essentials to reduce pollution and protect the environment.

Population Growth	Automobile Pollution
• More People, More Cars • Higher Energy Consumption	• Vehicle Emission • CO_2 & Greenhouse Gases • Smog & Particulate



1) Population Growth

Population growth occurs due to:

- High Birth rate
- Decline in death rate
- Improved medical facilities
- Increased life expectancy

Effects of Population Growth

- Increased demand for resources (food, water, energy)
- Urbanization and overcrowding
- More Vehicles on Roads
- Pressure on infrastructure

2) Automobile Pollution

Automobile pollution is the pollution caused by vehicles such as cars, buses, trucks and motorcycles.

Major Pollutants Released

- Carbon Monoxide (CO) – harmful gas reducing oxygen supply in the body
- Carbon Dioxide (CO_2) - contributes to global warming
- Nitrogen Oxides (NO_x) - cause acid rain and respiratory problems.
- Hydrocarbons (HC) – lead to smog formation

- Particulate Matter (PM) - causes lung diseases.

3. Link b/w Population Growth and Automobile Pollution

Population growth directly increases automobile pollution in the following ways:

a) Increased Vehicle Demand

More People → More Need for transportation → More Vehicles

b) Urbanization

Growing population leads to expansion of cities, increasing daily commuting distances and traffic congestion

c) Traffic Congestion

More vehicles cause traffic jams, leading to:

- Fuel Wastage
- Higher Emission levels

d) Industrial Growth

Population growth increases industrial activities, which also increases transport of goods, adding to vehicular pollution.

4. Environmental Impacts

- Air pollution → respiratory diseases like asthma
- Global Warming → due to greenhouse gases
- Smog Formation → reduces visibility
- Acid Rain → damages crops and buildings.

5. Health Impacts

- Lung diseases
- Heart problems
- Eye irritation
- Reduced life expectancy

6. Control Measures

a) Population Control

- Family planning problems
- Education and awareness

b) Reduce in Automobile Pollution

- Use of Public Transport
- Promotion of Electric Vehicles.
- Carpooling
- Regular Vehicle Maintenance
- Use of Cleaner fuels (CNG, LPG)

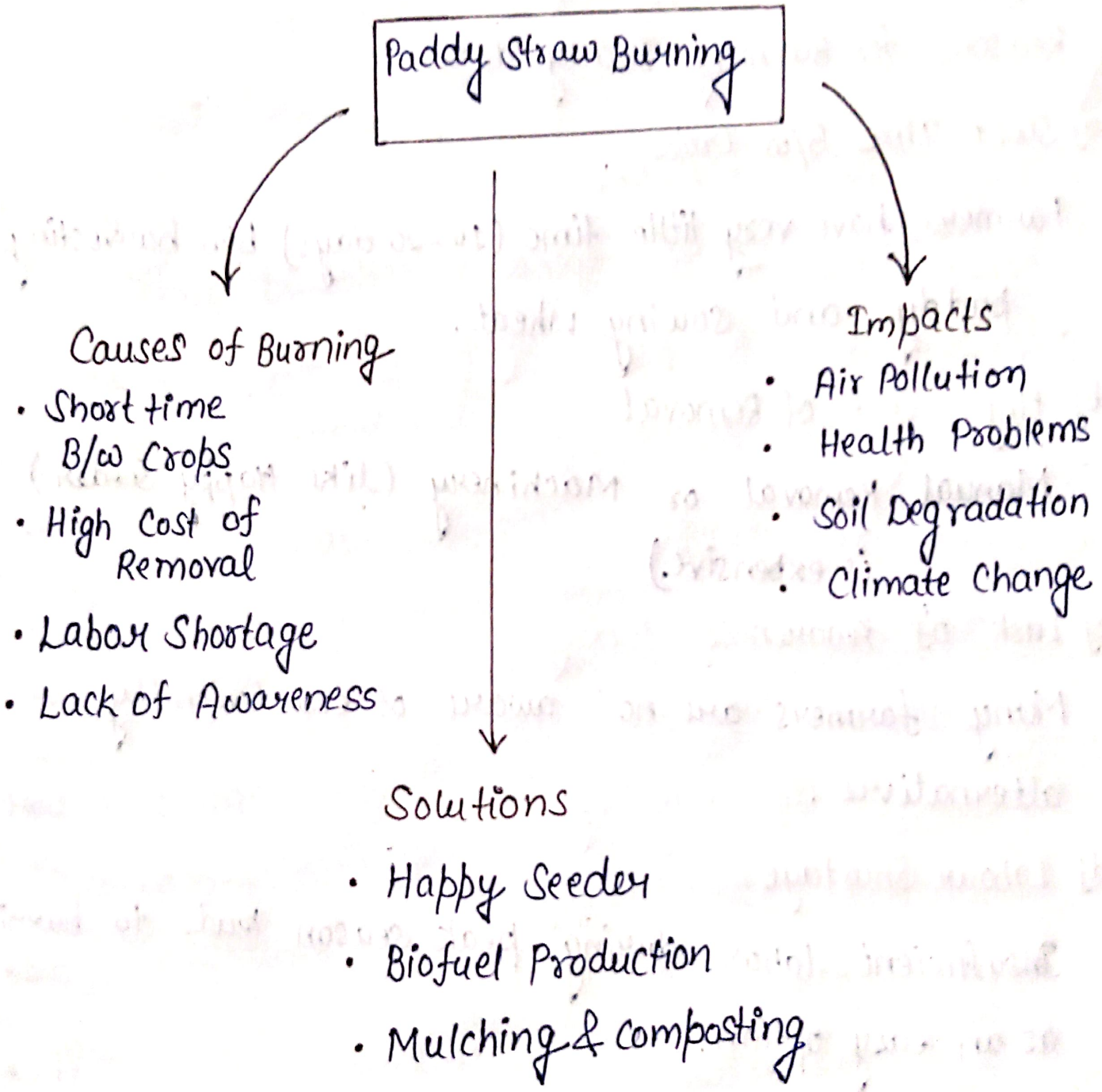
c) Government Measures

- Emission norms (like BS-VI in India)
- Traffic management systems
- Development of Metro and rail Networks

1. Burning of Paddy Straw

Paddy straw burning, also known as stubble burning, is the practice of setting fire to the leftover crop residue after harvesting paddy (rice). It is commonly observed in states like Punjab, Haryana and western Uttar Pradesh. Farmers burn the straw to quickly clear the fields for the next crop.

Burning of Paddy Straw is a serious environmental and health issue caused by agriculture practices and economic constraints. Sustainable solutions like advanced machinery, awareness, and government support are necessary to control this problem and protect both the environment and human health



2. What is Paddy Straw?

Paddy Straw is the dry stalk left behind after harvesting rice. It is different from wheat straw because:

- It has high silica content
- It is less suitable as animal fodder
- It decomposes slowly

3. Reasons for Burning Paddy Straw

a) Short Time B/w Crops

Farmers have very little time (10-20 days) b/w harvesting paddy and sowing wheat.

b) High Cost of Removal

Manual Removal or Machinery (like Happy Seeder) is expensive.

c) Lack of Awareness

Many farmers are not aware of eco-friendly alternatives.

d) Labour Shortage

Insufficient labor during peak season leads to burning as an easy option.

4. Process of Burning

After harvesting with combine harvesters:

- 20-30 cm stubble remains in the field
- Farmers set fire to the residue
- Fire spreads quickly and clears the land

5. Environmental Impacts

(i) Air Pollution

- Releases harmful gases: CO_2, CO, NO_x, SO_2
- Produces particulate matter (PM2.5, PM10)
- Causes Smog formation

(ii) Soil Degradation

- Destroys beneficial microorganisms
- Reduces soil fertility
- Loss of essential nutrients (Nitrogen, Phosphorus, Potassium)

(iii) Climate Change

- Increases greenhouse gases
- Contributes to global Warming

6 Health Impacts

- Respiratory Diseases
- Eye irritation
- Heart and lung problem
- Increased risk for children and elderly.

Economic Impact

- Loss of Valuable Organic Matter
- Increased need for chemical fertilizers
- Reduced crop productivity over time

8 Control Measure

a) Alternative Technologies

- Happy Seeder – Sows wheat without removing straw
- Super Straw Management System (SMS)
- Mulching and composting

b) Government Initiatives

- Subsidies on machinery
- Awareness programs
- Penalties for Burning
- Promotion of Bio-Energy plants

c) Use of Straw

- Biofuel Production
- Animal Bedding
- Paper and packaging industries.