Noise pollution

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The word noise is derived from the Latin word 'Nausea' which means sickness in which one feels the need to vomit. Noise is the unpleasant and undesirable sound which leads to discomfort in human beings.

* The intensity of sound is measured in decibles (dB).
* The faintest sound that the human ear can hear is 1 dB.

* Due to increasing noise around the civilization, noise pollution has became matter of concern.
* Some of its major causes are vehicles, crackers, etc.
* When used at hight volume, some other appliance also contribute to noise pollution, like television, transistor, radio etc.

Types of Noise pollution

- Transport Noise
- Neighbourhood Noise
- Industrial Noise

- Transport Noise

It mainly consists of traffic noise which has increased in recent years with the increase in the number of vehicles. The increase in noise pollution leads to deafening of older people, headache, hypertension etc.

- Neighbourhood Noise

The noise from gadgets, household utensils etc. Some of the main sources are musical instruments, transistors, loudspeakers etc.

- Industrial Noise

It is the high-intensity sound which is caused by heavy industrial machines.

According to many researches, industrial noise pollution damages the hearing ability to around 20%.

Causes and sources of noise pollution

- Industrialisation:- Industrialisation has led to an increase in noise pollution as the use of heavy machinery such as generators, mills, huge exhaust fan are used, resulting in the production of unwanted noise.

- Vehicles:- Increased number of vehicles on the roads are the second reason for noise pollution.

- Events:- Weddings, public gatherings involve loudspeakers to play music, resulting in the production of unwanted noise in the neighbourhood.

Example:-

- unnecessary usage of horns.
- using loudspeakers either for religious function or for political purpose.
- unnecessary usage of fireworks.
- Industrial noise
- Construction noise.

Effect of Noise pollution on Human-Health.

- Hypertension:- It is a direct result of noise pollution which is caused due to elevated blood levels for a longer duration.

- Hearing Loss:- Constant exposure of human ears to loud noise that are beyond the range of sound that human ~~earth~~ ears can ~~not~~ withstand damages the eardrums, resulting in loss of hearing.

- Sleeping disorders:- Lack of sleep might result in fatigue and low energy level throughout the day affecting everyday activities.

- Cardiovascular issue:- Heart-related problem such as blood pressure level, stress and cardiovascular diseases might come up in a normal person and a person suffering from any these diseases might feel a sudden shoot up in the level.

measurement of noise pollution level

Noise level is measured in decibles (dB). The louder the noise, the higher the decibles.
- Decibles can be adjusted to human hearing. Noise level is thus described in decibles A (dBA).

The unit of measurement of sound is an decibel:-
- Noise is measured by a sound meter.
- The unit of measurement of noise or sound level is the decible (dB).

* prevention of Noise pollution

- Honking in public places like teaching institutes, hospitals, etc. should be banned.
- In commercial, hospitals and industrial buildings, adequate soundproof system should be installed.
- musical instrument sound should be controlled to desirable limits.

- Dense tree covers is useful in noise pollution prevention.
- Explosives should not be used in forest, mountains and mining areas.

Noise pollution (Regulation and control) Rules, 2000

The noise pollution (Regulation and control) Rules, 2000 is a set of regulation introduced in India to manage and mitigate the adverse effect of noise pollution.
Here's an overview of its key provision:-

1. Objective :- The primary objective of the rules is to regulate and control noise pollution in India to protect human health and the environment from the harmful effects of excessive noise.

2. Scope:- The rules apply to all areas in India, including industrial, commercial, residential and silence zones.
They cover various sources of noise pollution including industrial activities, construction sites, vehicular traffic and public gatherings.

- Noise levels cannot exceed the ambient air quality standards for noise.
- Restriction on the use of loudspeaker, public address system, and sound-producing instrument.
- Restriction on the use of horns, sound emiting construction equipment and bursting of firecrackers.
- penalties for using loudspeaker at night without permission from a competent authority.
- Consquences for violating Silence zones.

Water and Soil

- **water pollution:-**
water pollution is defined as the addition of any organic, Inorganic, Biological or Radiological substance into water, which changes its natural qualities and make it unfit for use.

- **Causes / Sources of water pollution:-**

i) **Faulty Drainage System:-** In proper drainage system leads to water pollution due to mixing of sewage with drinking water. This result for the growth of Bacteria and fungi.

ii) **Biological pollutions:-**
Bacteria, virus and Human wastes released into water also causes of water pollution.

iii) **unhygienic practices:-** unhygienic practices like washing clothes, washing Animals and an other household Substance throwing in water can also causes of water pollution.

iv) Agriculture practices:- use of fertilizers and Insecticides are mixed in nearby water are also result of water pollution.

v) Oil pollution:- oil leakage into sea water during drilling and shipment polute the water.

vi) Industries wastes (effluents):- The waste and toxic material generated from factories and industries causes water pollution.

Effects of water pollution:-

i) water pollution directly effects the life and health of living being are:-

- Due to polluted water causes some diseases like Typhoid, Cholera, Diarrhoea, and Skin diseases etc.
- The presence of organic wasts in water reduces the dissolved oxygen due to this aquatic animal die.
- Radioactive pollutant in water responsible for various genetic disorders.

ii) Effects of water - pollutions on Non- living things:-

- polluted - water disturbs the equilibrium in ecosystem.
- polluted water decreases the fertility of soil by killing bacteria in the soil.
- Groundwater sources, such as aquifers, can become contaminated, affecting, can become contaminated, affecting the quality of water used for drinking.
- water pollution can cause corrosion of building materials, such as concrete, steel and wood, leading to structural damage and decay.
- water pollution can damage coral reefs, salt marshes, and other coastal ecosystems.

Control methods of water pollution:-

i) Control over Unhygenic practices:-
Unhygenic practices like washing clothes, washing Animal should be avoid.

ii) Treatment of Industrial- wastes
Industrial effulents must be treated before released into water by using common effluent treatment plant.

iii) use of Modern Techniques:-
Modern techniques like Reverse osmosis, Adsorption, Ion exchange method, ectrolysis etc. are used to remove pollutants.

iv) Good-Drainage System
A good Drainage system prevents mixing of polluted water with drinking water.

v) Stabilization of Ecosystem:-
Stabilization of eco-system can be achieved by decreasing pollutant from water bodies.
e.g- plants like "Chloronella".

Types of water pollutants:-

There are various types of water pollutants are categorized as:-

a) organic pollutants:-
organic compound consists of carbon, hydrogen, oxygen, nitrogen and sulphur. organic compound emitted from sewage

urban waste water, industrial wastewater and agriculture waste.

b) Radioactive Substance:-
pollutant from nuclear power plants, medical facilities and natural sources that can have long-lasting harmful effects on the environment and human health.

c) Thermal pollution:-
Discharge of heated water from industrial process or power plants, which can alter the temperature of water bodies, affecting aquatic ecosystem.

d) Industrial waste:-
This include a variety of pollutant like solvents oils heavy metal and other hazardous chemical released from industrial process.

e) Heavy metals:- metals such as lead, mercury, cadmium and arsenic that can be toxic to both aquatic life and humans.

f) pathogens:- Disease causing micro-organism such as bacteria viruses and protozoa. Common source include sewage, animal

waste and agricultural run off.

(v) Nutrients
vi) Chemicals (pesticides, herbicides) etc.

Characteristics of water pollution

i) Toxicity :- water pollutant can be poisonous to humans, animals and aquatic life, causing illness, injury or even death.

ii) Biodegradability :- some water pollutant like organic matter can break down naturally through biological process, while other like heavy metals, cannot be biodegraded by living organisms.

iii) Volatility :- some water pollutants like volatile organic compound can evaporate quickly from water into the air.

iv) persistence :- some water pollutant like PCB or DDT can persist in the environment for long periods, causing long-term ecological harm.

v) particulate nature:- Some water pollutants like sediment or suspended solids can be made up of small particles that affect water clarity, habit quality or aquatic life.

vi) Chemical Reactivity:- water pollutants reacts with other substances in water, leading to the formation of new compound or the degradation of existing ones.

Defination and list unit operation in water and wastewater:-

Defination

unit Operation in water and wastewater treatment refer to the fundamental physical process used to remove contaminants from water to meet quality standards for safe consumption, industrial use or safe discharge into environment. Each unit operation target specific contaminants or impurities using various methods, including separation, filtration chemical reaction and biological process.

List of unit operation four water and waste water treatment process are:—

1. Screening:— Removal of large solids and debris from water using screen or sieves.

2. Sedimentation:— Separation of suspended particles from which by gravity setting.

3. Flotation:— Removal of suspended solids by introducing fine air bubbles, which attach to particles and float them to the surface for removal.

4. Coagulation and Flocculation:— Addition of chemical (coagulum) to destabilize suspended particles and facilities their aggregation into layer particulate which can be more easily removal.

5. Filtration:— Passing water through porous media (sand, gravel, or membranes) to remove remaining suspended solids and some dissolved substances.

6) Adsorption :— Removal of contaminants by accumulating them on the surface of a solid material.

7) Disinfection :— Killing or inactivating pathogens using chemicals (chlorine, ozone) or physical methods (UV radiation).

8) Electrolysis :— use of electric potential to drive the movement of ions through selective membranes, separating them from water.

9) Ion Exchange
10) Membrane process
11) Activated sludge process
12) Rotating Biological Contactors
13) Sludge Dewatering
14) Chemical precipitation
15) Desalination.

* Water (prevention and control of pollution) Act 1974 :—

The Water (prevention and control of pollution) Act 1974 is a key piece of legislation in India aimed at protecting the country

water resources.
Here is the same of its purpose and key features:-

The aim is to prevent and control pollution of water bodies like rivers, lakes and groundwater.
Maintain or restore the wholesomeness of water for various uses.

Key features:-

- Central and state pollution control Board:-
Establish a central Board for oversight and State board for local implementation.

- Standards and Regulations:-
Sets Standards for effluent discharge from industries and other sources to minimise pollution.

- Consent mechanism:-
Industries need consent from the state Board to discharge any effluents.

Monitoring and Instruction:-
The Boards have the authority to monitor water quality, take samples and inspect industrial plants.

- Prohibitions:-
The Act prohibits practices like dumping untreated sewage or harmful substance into water bodies.

* Water Conservation:-
Conservation of water mainly refer to protect presence and control the usage of water and its resources. It is the system introduced to manage freshwater, reduce the ~~wo~~ wastage and protect the water and the resources in order to reduce and to avoid the ~~Sacrifi~~ scarcity to meet the current and future human demand.

There are several ways to conserve water are:-
- Check for the opening or leaks in water distribution.

- It is the system introduced to manage freshwater reduce the wastage and protect the water and the resources in order to reduce and to avoid the S

- Do not run more water than necessary while washing and cleaning clothes, utensils etc.

- Keeping the tap closed when not in use.

- Rainwater harvesting is one of the best method used for conserving water.

Rain water Harvesting:-

Rain water harvesting is the simple process or technology used to conserve rainwater by collecting storing, conveying and purifying of rainwater that runs off from rooftops, parks, roads, open ground etc. for future or later use.

Importance of Rainwater Harvesting:-

i) It reduces the use of groundwater.
ii) Rainwater is used for irrigation, washing cloths and various exto activities.
iii) It can prevent stormwater pollution.
iv) It prevent water scarcity in future days.
v) It reduces the frequency of flooding around the area.
vi) It maintain the level of ground water.
vii) It decreases or reduce the soil eyosion; which helps maintain the integrity of landscapes and agricultural fields.
viii) It improved water quality by reducing load on stormwater system.
ix) It reduces the demand on rivers and lakes preserving these natural habitats and supporting biodersity.
x) Rainwater harvesting prevent from droughts and water shortages during dry periods.

Soil pollution

Soil pollution refers to the contamination of soil with harmful substance that can adversely affect the health of plants animals and humans. These pollution can degrade the quality of the soil, disrupt ecosystem and lead to the accumulation of toxic substance in the food chain.

Causes of soil pollution:—

- Due to use of fertilizers:—
  Excessive use of chemical fertilizers can lead to nutrient imbalances in the soil. affecting plant growth. Some fertilizers contain heavy metals like Cadmium and lead, which can accumulate in the soil and enter the food chain.

- Due to use of Insecticides and pesticides:—
  Insecticides and pesticides leave behind toxic residue that can remain in the soil four long period. These chemicals can harm non-target organism, including beneficial insects earthworms and soil microorganism

and also harmful to human health plant and wildlife organism.

- Improper disposal of higher toxic industrial / chemical waste can severely pollute the soil.
- underground mining activities can cause the contamination of land with heavy metals.

Effect of soil pollution:-

→ Due to use of fertilizers, Insecticides and pesticides:-

- Continuous use of chemical fertilizers can degrade soil structure and reduce its natural fertility.
- Overuse of nitrogen-based fertilizers can lower the PH value of soil, making it more acidic and less suitable for growing crops.
- It can also contribute to Acid rain by releasing huge quantities of ammonia into the atmosphere.
- Harm to plant and animal Health.
- Contamination of food and water supplies.
- Negative and bad impacts on human

on human health, including respiratory issues, skin diseases, Headache, vomiting Caughing, pain in the chest.

- Irritation of the skin and the eyes.
- Fatigue and weakness.
- Higher risk of developing Cancer.
- Damage to vital organs such as the kidney & liver.
- Excess nutrient and chemicals can leach into groundwater or run off into surface water bodies, leading to contamination of drinking water sources.
- pesticides and insecticides can harm beneficial insects like (bees and butterflies), birds and other wildlife, leading to reduced biodiversity.
- long term: soil degradation can lead to reduced agricultural productivity, impacting food security and economic stability.

Prevention measures of soil pollution:-

- Reducing the use of chemical fertilizers, insecticides and pesticides for agricultural practices.
- chemical fertilizers and pesticides should be replaced by organic fertilizer and pesticides.
- By planting more trees.
- By avoiding deforestation and promoting afforestation.
- Ban encouraging social and agroforestry programmes.
- Recycling paper plastics and other materials
- Adopt sustainable land use planning to minimize habitat destruction and soil degradation.
- Enforce strict environmental laws and regulation to control pollution.
- Control over industrial chemical and wastes material.
- Encourage recycling and reuse of material to reduce waste generation/toxic substance.
- Ensure proper disposal of hazardous waste to prevent contamination.

- promote organic farming practices that avoid synthetic chemicals.
- practice rotating different types of crops in the same field to protect from pest and disease and improve soil fertility.
- Educate farmers on the proper use and application rates of fertilizers and pesticides.
- Promote awareness about the environmental impact of excessive use of chemical and sustainable alternatives.