



Environmental effects of Noise Pollution

KRIKA VASHISTHA
MSC ENVIRONMENTAL SCIENCE
SEMESTER - 3RD
20001556007



Introduction

Noise and Noise pollution




Noise

Any unwanted sound in the environment which cause disturbance is known as noise .



Noise Pollution

Noise pollution is generally defined as regular exposure to elevated sound levels that may lead to adverse effects in humans or other living organisms.





Environmental effects of noise pollution

01

On humans

02

**On animals and
plants**

03

**On buildings and
monuments**



Effects on humans

Seven categories of adverse health effects

of noise pollution on humans



Hearing Impairment



Interference with Spoken Communication



Sleep Disturbances



Cardiovascular Disturbances



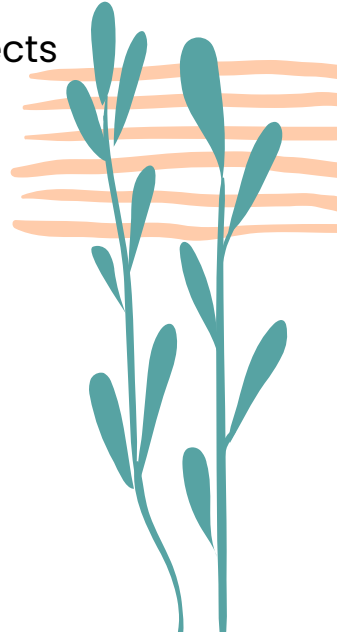
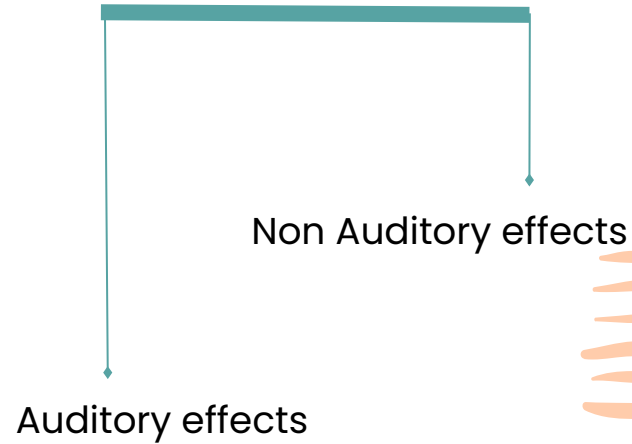
Disturbances in Mental Health



Impaired Task Performance



Negative Social Behavior and Annoyance Reactions






Auditory effects

When do loud noises damage our hearing ?

Damage =

Noise Level + Exposure Time



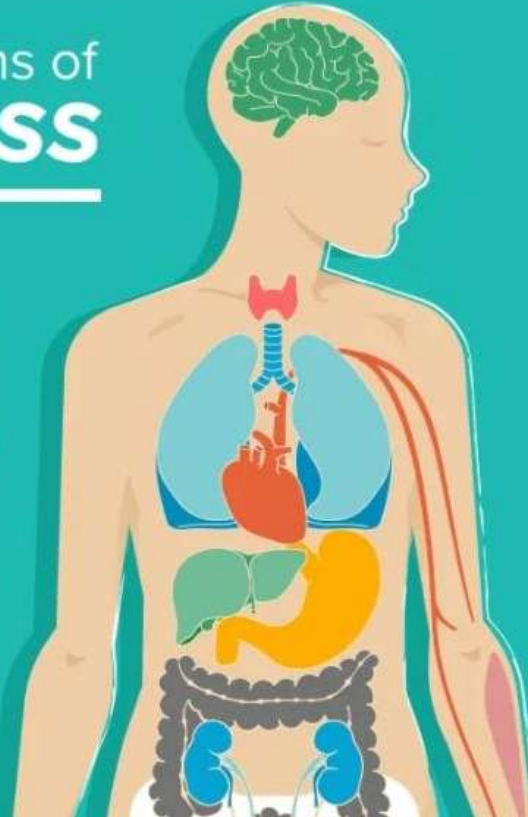
- Gradual deterioration of internal ear and subsequently hearing loss or deafness.
- It may be temporary or permanent.
- Explosions or other high intensity sounds can also cause immediate deafness by rupturing the ear drums or damaging the cochlea.
- Many time hearing loss is attributed to occupation.
- May cause auditory fatigue.



Non Auditory effects

Physical Manifestations of **NOISE STRESS**

-  Delayed cognitive development in children
-  Psychological triggers for individuals with PTSD
-  Lower threshold for noise resulting in sleep disturbance
-  Increased heartrate
-  Changes in immune system



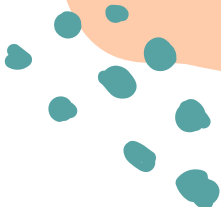
-  Anxiety
-  Annoyance, mood shifts
-  Elevation of cortisol production
-  Hypertension
-  Myocardial infarction
-  Vasoconstriction
-  Elevated blood pressure
-  Elevated adrenaline levels



FACT CHECK

22 million

Suffer chronic high
annoyance





6.5 million

Chronic high sleep
disturbance

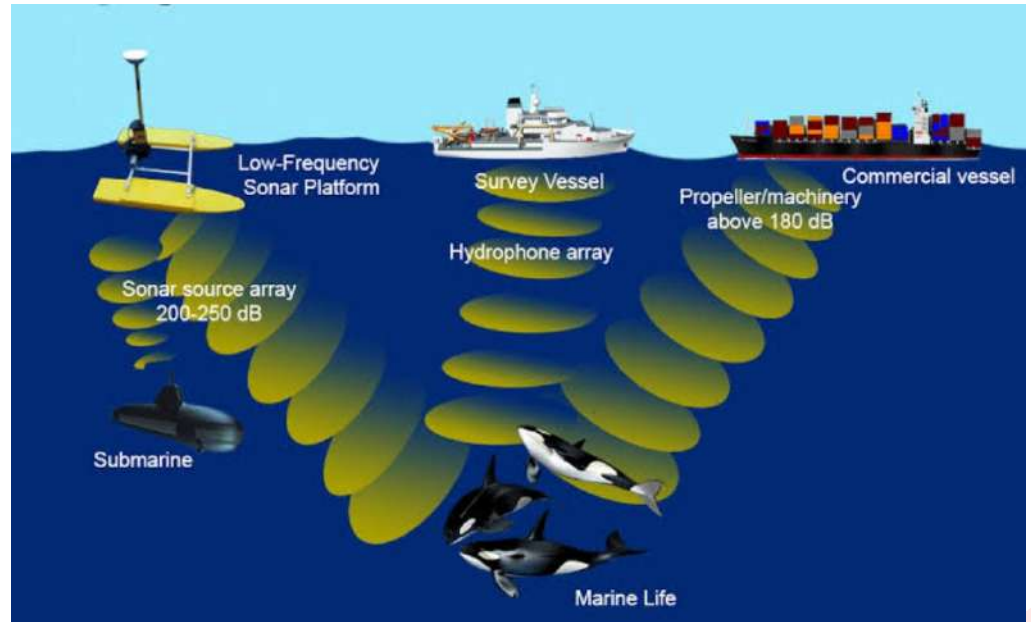
12,000

Premature deaths
every year

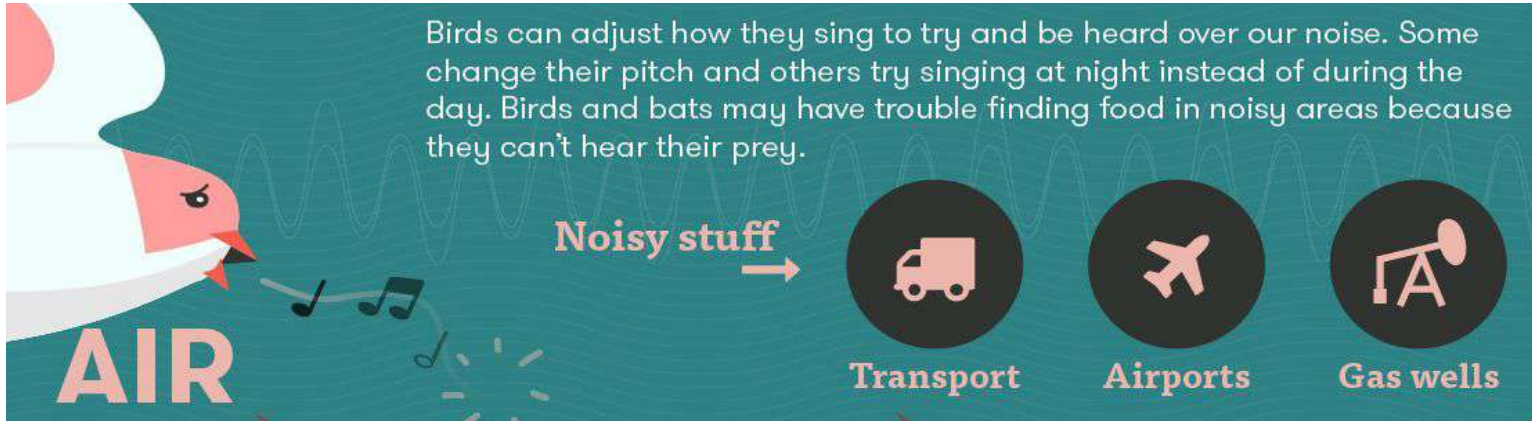


Effects on animals

- **COMMUNICATION**
- **FORAGING**
- **MATING**
- **NAVIGATION**



Birds can adjust how they sing to try and be heard over our noise. Some change their pitch and others try singing at night instead of during the day. Birds and bats may have trouble finding food in noisy areas because they can't hear their prey.



Erithacus rubecula

According to a study in 2007, the European Robbins have adjusted their time of singing from day to night as it is quieter at night. This led to behavior pattern change.

- The number of prairie dogs above the ground declined by 21%. Their social interaction and resting above the ground also decreased by 50%
- A study published in 2010 found that noise pollution affected the foraging efficiency of greater mouse eared bat (*Myotis myotis*). Their search time increased with areas near the highway.



This over all greatly affects the food web .



Australian pobblebonk frogs can usually hear each other up to 800 metres away, but in noisy areas this can be reduced to just 14 metres. In North America, noise from highway traffic makes it hard for prairie dogs to find food, hear predators, and communicate.

Noisy stuff →



Traffic



Construction



Cities





Hermit crab

Marine animals like hermit crab have shown to be less responsive to visual predators in high noise environments

- Even on exposure to low intensity noise frequency sounds, animals like squids and cephalopods have shown disturbance in their balance system.
 - A study conducted in 2011 collected 87 wild cephalopods across four species and exposed them to short bursts of low-intensity, low frequency sound for a period of two hours. The animals were then dissected to examine. The results were disturbing, **every animal had damage to its statocyst, including ruptured and missing hair, swollen nerve cells** and even legions and holes in the statocyst's sensory surface.
- Larval fish and invertebrates are moving away from their traditional habitats



OCEAN

Human noises can cause hearing loss in dolphins, porpoises and whales. They can interfere with animals' sonar and navigation systems, and their ability to communicate and find food. Octopuses and squid can lose their sense of balance, affecting their ability to hunt. Marine ecosystems can be disrupted as animals move to quieter areas.

Noisy stuff →



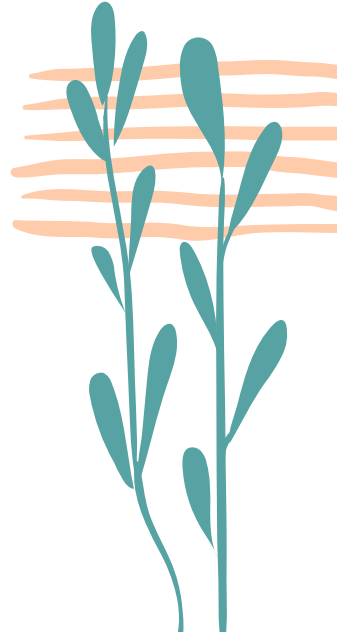
Ships



Oil & gas
exploration



Sonar





Effects on Plants



Many plants and trees rely on birds and other animals to deliver pollen from one flower or tree to the next, or to disperse their seeds, but many animals are adapting to the noise by changing their behavior or moving to quieter locales.

EXAMPLE :

In normal conditions, the birds collect and bury pine seeds in preparation for winter. The birds fail to collect all the seeds they bury, and these become the next generation of trees.

In the areas near the noise source, without jays to plant the seeds, the pines are disappearing.


This could have long-term effects on ecosystem diversity and structure.



Scrub jays



Effects on building and monuments

- Loud noise is very dangerous to buildings, bridges and monuments.
 - It creates waves which struck the walls and put the building in danger condition.
 - It weakens the edifice of buildings.
- 





Thanks

Does anyone have any questions?