Noise Pollution

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What is noise pollution?

- Production of unwanted sounds that are annoying, distracting and causes irritation to one's ears which comes from an external source.

- Sound becomes undesirable when it disturbs the normal activities.

- World Health Organization stated that "noise must be recognized as a major threat to human well-being."

Sources, Types, measurement and indices

- **Major sources of noise are:**
- **Traffic junctions**
- **Railways**
- **Construction works**
- **Industrial productions**
- **Aircraft noise**
- **Household noise (Grinder, Air cooler, TV sets, dance, Radio, practices etc.)**
- **Air conditioners**
- **DG Sets in Markets etc.**
- **Many More activities…..**

Classifications of noise pollution:

- Mainly of Two types of noise pollution.

1. Community noise pollution/ Non-industrial noise pollution:

- **The noise produced from non-industrial sources i.e. all possible sources which includes noise from air and road traffic, construction noise and domestic sources viz. household.**
- **Some of the major community noise pollution of concern are aircraft noise pollution, roadways noise pollution and underwater noise pollution.**

2. Occupational/Industrial noise pollution:

- **The varied sources of noise that includes industrial machinery an processes generate occupational noise pollution viz. crushing, blasting impact processes, equipment etc.**

Measurement of noise pollution:

- A decibel(dB) is the main unit to measure the intensity of loudness of sound.
- Normal human ear can detect sound between 0 dB to 140 dB
- But, anything between 120 to 150 dB cause pain and problem.

Source	Decibels(dB)
Turbo jet airplane	150
Truck without muffler	90
Noisy class, alarm clock, police whistle	80
Average residence	40
Quiet room	20
Lowest audible sound	0

The Committee recommended Noise Standards for ambient air and for automobiles, domestic appliances and construction equipment's, which were later notified in Environment (Protection) Rules,1986 as given below:-

Code		Day time	Night time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence Zone	50	40

Note: 1. Day time is reckoned in between 6 a.m. and 9 p.m.

2.Night time is reckoned in between 9 p.m. and 6 a.m.

3.Silence zone is referred as areas up to 100 meters around such premises as hospitals, educational institutions and courts. The Silence zones are to be declared by the Competent Authority. Use of vehicular horns, loudspeakers and bursting of crackers shall be banned in these zones.

4.Mixed categories of areas should be declared as one of the four above mentioned categories by the Competent Authority and the corresponding standards shall apply.

Noise standards for automobiles, domestic appliances and construction equipment's have been notified in Part 'E', Schedule-VI of Environment (Protection) Rules,1986,as amended on 19th May,1993,as given in the Tables below.

Category of Vehicle	Noise limit in dB(A)
(a)Motorcycle, scooters and three wheelers.	80
(b)Passenger Cars	82
(c)Passenger or commercial vehicles up to 4 MT	85
(d)Passenger or commercial vehicles above 4 MT and up to 12 MT	89
(e)Passenger or commercial vehicles exceeding 12 MT	91

Category of Domestic Appliances/ Construction Equipment	Noise limits in dB(A)
(a)Window air conditioners of 1 tonne to 1.5 tonne	68
(b)Air Coolers	60
(c)Refrigerators	46
(d)Diesel Generator for domestic purposes	85 - 90
(e)Compactors (rollers),Front loaders, Concrete mixers, Cranes(movable), Vibrators and Saws	75

Noise pollution indices:

- Indexing of all the criteria during noise pollution measurement of various sources.

- are the statistical analysis of noise.

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- L_{10} is the noise level exceeded for 10% of the time of the measurement duration. This is often used to give an indication of the upper limit of fluctuation of noise e.g. noise from road traffic.

- L_{50} is the noise level exceeded for 50% of the measurement duration.

- L_{90} is the ambient or background noise level.

$$\textit{Traffic Noise Index} = 4(L_{10} - L90) + L90 - 30$$

Percentile Noise Levels Road traffic noises are strongly time dependent. Their distribution function is determined by analyzing noise level data with some form of statistical analysis using the following parameters:

L10 : ten percentile time exceeding noise level, is the one which exceeds 10% of the total observation time. It indicates peak levels of intruding noise.

L50 : fifty percentile time exceeding noise level, is the one which exceeds 50% of the total observation time. It indicates average noise level.

L90 : ninety percentile time exceeding noise level, is the one which exceeds 90% of the total observation time. It indicates background noise level.

Impacts of noise pollution on Human:

- Hearing impairment
- Decrease in efficiency
- Fatigue
- Sleep disturbance
- Cardiovascular disease
- Lack of concentrations
- Temporary or permanent deafness

Effects on animal:

- Damages nervous system
- Creates problem in navigation.
- Reduction of usable habitat.
- Obnoxious behaviour
- Genetic and evolutionary disorders.
- Death of certain species.

Effects on environment

- **Breakage of earth barrier.**
- **Weakens the premises of buildings.**
- **Crop quality decreases.**
- **Marine invertebrates, such as crabs, have also been shown to be negatively affected by ship noise.**
- **Anthropogenic noise reduced the species richness of birds.**

Control of noise pollution:

- Major control measures that are taken have been discussed.
- Control at source
- Control in transmission path
- Major noise control techniques

Control at source:

- Maintenance of automobiles.
- Use of economic instruments.
- Noise level reduction from domestic sectors.
- Machinery selection.
- Control over vibrations.
- Prohibition on use of loudspeakers.

Control in transmission path:

- Installation of barriers.
- Installation of panels and enclosures.

Major noise control techniques:

- Sound insulation
- Sound absorption
- Vibration dumping
- Urban planning
- Public awareness

THANK YOU