

Noise Pollution

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1. What is Noise Pollution?

Litter accumulated by the side of the roads or alleys, junk goods floating in the water bodies, and smokes spewing into the atmosphere from factory smokestacks are deemed to be obvious forms of **pollution**. There are other types of pollution that are not as obvious as mentioned earlier. **Noise pollution** is one such form. **Noise** is derived from the Latin word '**nausea**' implying '**unwanted sound**' or '**sound that is loud, unpleasant or unexpected**', which may adversely affect the health and well being of individuals or population. It is the wrong sound, in the wrong place, at the wrong time. Sound is defined as the perception of certain quality of mechanical vibration of substances, propagating through suitable medium (usually air) by human ear. Thus, it requires three elements in order to have a perception of sound.

- *A vibrating source for generation of sound*
- *A suitable medium for the transmission or propagation of sound*
- *A suitable receptor or recipient of sound*

2. Sources of Noise Pollution

The substances, which produce sound, are called generators or sound sources. Sources of noise pollution can be broadly categorized as:

- i) *Industrial machineries*
- ii) *Electrical and electronics appliances viz. television, music system and public address system*
- iii) *Construction activities viz. driving of piles, dismantling old structures etc.*
- iv) *Diesel Generator (DG) sets*
- v) *Transportation sources (Road traffic, locomotives, aircrafts etc.)*

Beside these major polluting sources, even we fall prey to the noise generated by different household equipments used in our day-to-day life. The noise level and exposure area depends on its source and its strength. Road noise, especially at some distance from the road can be described as a steady state noise that does not fluctuate much. But, rail and aircraft noise are characterized by high noise levels of relative short duration. Noise from industrial installations, construction sites and fixed recreation facilities radiates from a point source and the shape of the exposure area is generally a circle. The noise from various sources may either be steady for a long period or fluctuate over a specified period considerably.

3. Effects of Noise Pollution

Most of the people inhabiting metropolitan cities or big towns and those working in factories are susceptible to the adverse effects of noise. Characteristically, it affects the rich and the poor alike. The problem of noise pollution is less in small towns and villages. But, those residing in villages/towns along the national/state highways or close to railway tracks do bear the burnt of excessive noise. Indiscriminate use of horn by the vehicles and widespread use of loud speakers in Indian social and religious ceremonies cause several health hazards to the urban inhabitants. In general about 1 percent of the population suffers from noise-induced pollution.

The adverse effects of noise on human being can be summarized as follows:

- *Temporary Hearing Loss or Temporary Threshold Shift (TTS)*
- *Permanent Hearing Loss (ranging from slight impairment to total deafness)* (The sound produced by a bursting cracker, exceeding 150dB, can cause a ringing sensation called ‘tinnitus’ and can impair hearing permanently)
- *Psychological disorders (viz. nervous breakdown, annoyance due to rest and/or sleep interference).*
- *Physiological disorders (viz. digestive system disorder, cardio-vascular diseases, high blood pressure, head-aches, dizziness, inefficiency and insomnia)*

4. Sound Levels and Sound Level Meter

Sound is characterized in different ways, viz. the quality of sound by frequency, strength of sound by intensity etc. However, the audible range of afore-said parameters, i.e. frequency and sound intensity are considerably wide in the tune of **(20 to 16,000 Hertz)** and **(10^{-12} to 1.0 Watt/m²)** respectively, which necessitated development of a new scale based on the logarithm of the ratios of some measured quantities viz. sound pressure, intensity and power. Measurements taken in this scale is termed as sound levels, which are classified as sound intensity level (**L_I**), sound pressure level (**L_p**) and sound power level (**L_w**) respectively. Sound levels are expressed in terms of **bel** or more appropriately as **decibel (dB)**.

Sound levels are measured with the help of an instrument called ‘**sound level meter**’, which contains an accessory called ‘**calibrator**’, capable of generating reference sound.

5. Ambient Noise Standards

In our country as per **Environment (Protection) Act, 1986** as amended in 2002, the standards for noise for different categories of areas and during different time periods are depicted in the table below.

Table-1: Ambient Noise Standards

Area Code	Category of Area/ Zone	Limits in dB(A)*	Limits in dB(A)*
		Day Time	Night Time
(A)	Industrial Area	75	70
(B)	Commercial Area	65	55
(C)	Residential Area	55	45
(D)	Silence Zone	50	40

**(The limit in dB(A) denotes the time-weighted average of the level of sound in decibels on Scale A which is relatable to human hearing. Source: Environment (Protection) Act, 1986 as amended in 2002.)*

Day time – 6:00AM to 10:00PM, Night Time- 10:00PM to 6:00 AM.

Silence Zone- The area lying within 100m radius of academic institutions, health-care centres and courts.

6. Noise Pollution Control Strategies

The common strategies adopted in the sphere of community and industrial noise occurrences are summarized as follows:

- Enclosing the noise source or receptor
- Maintaining a suitable distance between the noise source and receptor
- Constructing barriers between the noise source and receptor as followed in the case of highways
- Avoiding construction in the zone of high level sound
- Positioning of openings away from noise sources
- Controlling noise at the point of generation by acoustics silencers and vibration isolators
- Ensuring proper maintenance of mechanical installations and machineries
- Substitution of old machines
- Use of personal safety measures viz. ear plug