ENVIRONMENTAL POLLUTION AND CONTROL

NOISE POLLUTION

Sound, a normal feature of our life, is the means of communication and entertainment in most animals, including human beings. It is also a very effective alarm system. A low sound is pleasant whereas a loud sound is unpleasant and is commonly referred to as 'noise'. Noise can be defined as an unpleasant and unwanted sound.

Whether a given sound is as pleasant as music or as unpleasant as noise depends on its loudness, duration, rhythm and the mood of the person. But loudness is definitely the most significant criterion which converts sound into noise. Exposure to loud noise is indeed annoying and harmful too.

Noise is a physical form of pollution and is not directly harmful to the life supporting systems namely air, soil and water. Its effects are more directly on the receiver i.e. man. Noise pollution is the result of modern industrialized urban life and congestion due to over population. Noise is unwanted sound. Sound is a form of energy which is emitted by a vibrating body and on reaching the ear causes the sensation of hearing through nerves. Sounds produced by all vibrating bodies are not audible.

Even though noise pollution is not fatal to human life, yet its importance cannot be overlooked because repeated exposure to noise reduces the sleeping hours and productivity or efficiency of a human being. It affects the peace of mind and invades the privacy of a human being. The importance of noise pollution as environmental problem is being recognised as the ill effects of noise on human health and environment are becoming evident with each passing day.

NOISE UNITS

The frequency limits of audibility are from 20 HZ to 20,000 HZ. A noise problem generally consists of three inter-related elements- the source, the receiver and the transmission path. This

transmission path is usually the atmosphere through which the sound is propagated, but can include the structural materials of any building containing the receiver. Decibel represents the intensity and is defined as one tenth of a bel where one bel represents a difference in level between two intensities I,, I_0 where one is ten times greater than the other.

Sources of Noise Pollution:

Major sources of noise pollution are:

(i) Industrial Sources:

Progress in technology (industrialization) has resulted in creating noise pollution. Textile mills, printing presses, engineering establishments and metal works etc. contribute heavily towards noise pollution. In industrial cities like Kolkata, Ludhiana, Kanpur etc., often the industrial zones are not separated from the residential zones of the city especially in the case of small scale industries.

These operate from workshops located on the ground floors of the residential areas and cause annoyance, discomfort and irritation to the residents exposed to the noise that is inevitably produced. The situation is much better in modern planned cities like Chandigarh where the industrial area is kept away from the residential areas and both are separated from each other by a sufficiently wide green belt.

(ii) Transport Vehicles:

Automobile revolution in urban centers has proved to be a big source of noise pollution. Increasing traffic has given rise to traffic jams in congested areas where the repeated hooting of horns by impatient drivers pierce the ears of all road users.

Noise from airplanes constitutes an increasing serious problem in big cities like Delhi & Mumbai. Airport situated in the vicinity of population centres and the air planes pass over

residential areas. Heavy trucks, buses trains, jet-planes, motor-cycles, scooters, mopeds, jeeps— the list of vehicles is endless but the outcome is same — noise pollution.

(iii) Household:

The household is an industry in itself and is a source of many indoor noises such as the banging of doors, noise of playing children, crying of infants, moving of furniture, loud conversation of the inhabitants etc. Besides these are the entertainment equipment in the house, namely the radio, record-players and television sets. Domestic gadgets like the mixer-grinders, pressure cookers, desert coolers, air- conditioners, exhaust fans, vacuum cleaners, sewing and washing machines are all indoor sources of noise pollution.

(iv) Public Address System:

In India people need only the slightest of an excuse for using loud speakers. The reason may be a religious function, birth, death, marriage, elections, demonstration, or just commercial advertising. Public system, therefore, contributes in its own way towards noise pollution.

(v) Agricultural Machines:

Tractors, thrashers, harvesters, tube wells, powered tillers etc. have all made agriculture highly mechanical but at the same time highly noisy. Noise level 90 dB to 98 dB due to running of farm machines have been recorded in the state of Punjab.

(vi) Defence Equipment:

A lot of noise pollution is added to the atmosphere by artillery, tanks, launching of rockets, explosions, exercising of military airplanes and shooting practices. Screams of jet engines and sonic booms have a deafening impact on the ears and in extreme cases have been known to shatter the window panes and old dilapidated buildings.

(vii) Miscellaneous Sources:

The automobile repair shops, construction-works, blasting, bulldozing, stone crushing etc. are other sources of noise pollution.

Effects of Noise:

Noise is generally harmful and a serious health hazard. It has far-reaching consequences and has many physical, physiological as well as psychological effects on human beings.

(i) Physical Effects:

The physical manifestation of noise pollution is the effect on hearing ability. Repeated exposure to noise may result in temporary or permanent shifting of the hearing threshold of a person depending upon the level and duration of exposure. The immediate and acute effect of noise pollution is impairment of hearing (i.e. total deafness.)

Human ears have sensory cells for hearing. If these cells are subjected to repeated sounds of high intensity before they have an opportunity to recover fully, they can become permanently damaged leading to impairment of hearing. Besides the sensory cells, the delicate tympanic membrane or the ear drum can also be permanently damaged by a sudden loud noise such as an explosion.

(ii) Physiological Effects:

The physiological manifestations of noise pollution are several as mentioned below:

(a) Headache by dilating blood vessels of the brain.

(b) Increase in the rate of heart-beat.

(c) Narrowing of arteries.

(d) Fluctuations in the arterial blood pressure by increasing the level of cholesterol in the blood.

(e) Decrease in heart output.

(f) Pain in the heart.

(g) Digestive spasms through anxiety and dilation of the pupil of the eye, thereby causing eye-strain.

(h) Impairment of night vision.

(i) Decrease in the rate of colour perception.

(j) Lowering of concentration and affect on memory,

(k) Muscular strain and nervous breakdown.

(l) Psychological Effect

The psychological manifestations of noise pollution are:

(a) Depression and fatigue which considerably reduces the efficiency of a person.

(b) Insomnia as a result of lack of undisturbed and refreshing sleep

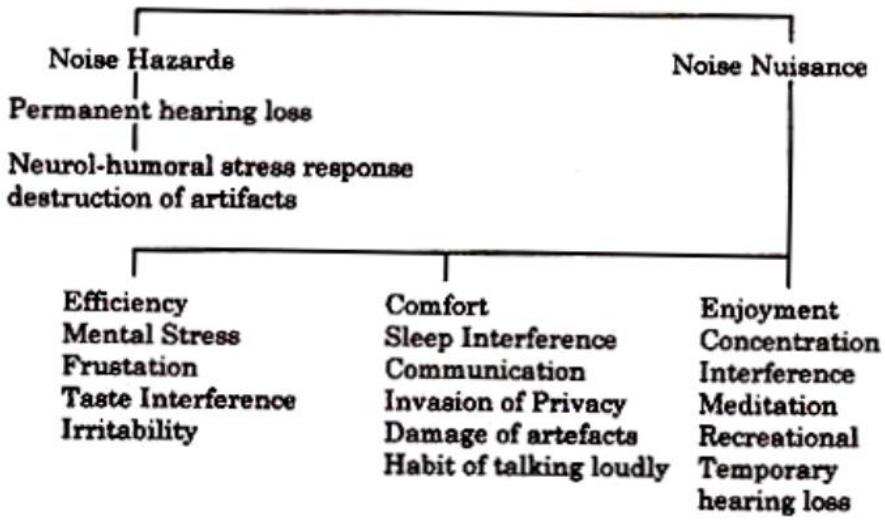
(c) Straining of senses and annoyance as a result of slow but persistent noise from motorcycles, alarm clocks, call bells, telephone rings etc.

(d) Affecting of psychomotor performance of a person by a sudden loud sound

(e) Emotional disturbance

For a talkative person, the most important effect of noise pollution would invariably be that noise interferes with our conservation. So, noise is annoying and the annoyance depends on many factors not merely the intensity of the sound but also repetition, because even a sound of small intensity (e.g. dripping tap or clicking of clock) may become annoying, simply by repetition.

Some of the well- known effects of noise on human beings and the relation of noise pollution level and its harmful effects are shown in Table



Noise Pollution Level and its Harmful Effects:

Level (in db)	Effects
up to 30	No disturbance
30—60	Stress, tension, psychological (illness, heart attact) effects especially at upper range.
60—90	Damage to health, psychological and vegetative (disturbance in stomach-gall function, pains in muscles, high blood pressure, disturbance in sleeping)
90—120	Damages to health and ontological (ear diseases) effects

Above 120	Painful effects in long run.

Effects of Noise Pollution on Human Beings

- Decreases the efficiency of a man-Regarding the impact of noise on human efficiency there are number of experiments which shows that human efficiency increases with noise reduction.
- Lack of concentration-For better quality of work there should be concentration , Noise causes lack ofconcentration. In big cities , mostly all the offices are on main road. The noise of traffic or theloud speakers of different types of horns divert the attention of the people working in offices.
- Fatigue:Because of Noise Pollution, people cannot concentrate on their work. Thus they have to give their more time for completing the work and they feel tiring.
- Abortion is caused-There should be cool and calm atmosphere during the pregnancy. Unpleasantsounds make a lady of irritative nature. Sudden Noise causes abortion in females.
- Causes Blood Pressure-Noise Pollution causes certain diseases in human. It attacks on the person's peace of mind. The noises are recognized as major contributing factors in accelerating the already existing tensions of modern living. These tensions result in certain disease like blood pressure or mental illness etc.
- Temporary of permanent Deafness-The effect of noise on audition is well recognized. Mechanics ,locomotive drivers, telephone operators etc. All have their hearing impairment as a result of noise at the place of work. Physicians & psychologists are of the view that continued exposure to noise level above. 80 to 100 db is unsafe, Loud noise causes temporary or permanent deafness.