

An Overview of Noise Pollution

Dr Probal Chatterji, Professor

Department of ENT, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India

Email id- probalch@hotmail.com

ABSTRACT: *The term "noise pollution" refers to excessive noise that might disrupt human activity or equilibrium. The majority of noise is created by climatic vibration noise/occupational sound, that comprises manufacturing machinery, transport networks, and interior noise produced by machines (especially in specific workplaces), building operations, household appliances, and musician activities, among other things. Building and manufacturing machinery regularly exposes workers to harmful noise levels while also contributing significantly to neighborhood sound. Sound levels might not be high enough to cause hearing loss, but they do have a negative impact on human health. Transportation is a major source of noise in the environment. The governments of many nations have laws and regulations in place to combat dangerous noise sources, but enforcement seems to be lax. Noise regulations and rules vary considerably throughout the globe.*

KEYWORDS: *Atmospheric, Environmental, Health, Noise pollution, Occupational.*

1. INTRODUCTION

Noise pollution is described as disturbing noise that may interfere with human and animal physical and mental activities. Noise pollution has been a major issue in recent years. The purpose of this paper is to raise community consciousness amongst cultured folks and to provide accurate data regarding noise pollution (Morillas et al., 2018). Almost everywhere there is noise. Continuous noise is significantly louder in certain industrial sites. Transportation sources, most often aircraft and highway traffic, are the primary contributors of community noise. Public buildings and dwellings are additional sources of noise. There is no physical difference between sound and noise. Unwanted sound and any unnecessary disruption within a suitable frequency region are referred to as noise. Most of the world's outdoor/environmental noise is generated by industrial machines, transportation systems, and other similar systems, as well as indoor noise produced by machineries, construction actions, national appliances, and music

concerts, among other things (Slabbekoorn, 2019). Different nations have legislation and regulatory organizations in place to combat dangerous sound sources, but execution seems to be lax. Noise regulations and rules vary considerably throughout the globe.

1.1 Clases of noise realated noise pollution:

Noise is an undesirable sound and a waste of energy that is out by a vibrant body and generates the sensation of hearing via nerves when it reaches the human ear. There are no audible sounds created by all vibrating bodies. The audibility range is from 20 Hz to 20 kHz. Infrasonics are sounds with frequencies less than 20 Hz, whereas ultrasonics are sounds with frequencies more than 20 kHz (Kalawapudi et al., 2021).

Noise may be continuous or intermittent, and it can be of high or low frequency, both of which are undesirable for normal human hearing. The ability to distinguish between sound and noise is also influenced by the individual receiving it, the environmental circumstances, and the effect of the sound created during that period of time(He et al., 2021). Because noise is also a sound, the words noise and sound are interchangeable and are used throughout this article. Its pressure is measured in logarithmic units (dB) because the logarithmic scale allows a wide range of pressures to be expressed without using big numbers, and it also more accurately portrays the ear's nonlinear behavior (He et al., 2021). There are basically 3 Clases of noise realated noise pollution which are given below:

- *Atmospheric noise:*

Organic air processes produce atmospheric noise, which is a type of radio noise, most notably thunderstorm quick releases. The principal cause is cloud-to-ground lightning, since the current is significantly greater than cloud-to-cloud flashes. Every day, 3.5 billion lightning occurs throughout the world (Esmeray & Eren, 2021). This equates to around 40 lightning strikes each second.

- *Environmental noise:*

Noise interference from external causes is referred to as environment sound, which is primarily caused by transportation systems such as Buses, railways, trucks, vehicles, two- and three-wheelers, helicopters, boats, spaceships, and airplanes, as well as numerous leisure activity like sport and musical, are all examples of transportation (de Souza et al., 2020). This kind of noise may be found in all areas of human activity in some manner. Exposure to ambient noise may have a wide range of impacts in individuals, from emotional to physiological to psychological.

Environmental noise may have a wide range of consequences on individuals, from behavioral to physiological to psychological. Low-level noise isn't always hazardous. Noise exposure, on the other hand, may cause discomfort, sleep disturbances, anxiousness, hearing loss, and stress-related disorders (Khaiwal et al., 2016). Compress and contact in the air caused by the engine/exhaust and aerodynamics noise surrounding the body during motion are the sources of noise from transportation. Environmental noise also includes background noise such as alarms, people conversing, and bioacoustic noise from animals or birds.

- *Occupational noise:*

Occupational noise is noise that affects employees while they are doing their tasks and is caused by the conditions in which they must work and/or the technology they must use. The volume, frequency components, and homogeneity of industrial noise vary. It may have a frequency response that is nearly uniform and a level that is constant. This happens a lot when there are a lot of computers running at the same time (Di Franco et al., 2020). Other industrial or workplace noise has a constant background noise level of relatively low decibels with periodic bursts of higher decibels.

1.2 Noise pollution regulator technique:

Noise pollution control approaches are divided into three groups, each of which is addressed below.

- End-of-generation noise control

The following strategies may be used to mitigate noise emission of the environment:

- Household noise from a variety of sources, including radio, televisions sets, cooking appliances, and washing machine, and so on, may be decreased by using them carefully and sensibly.
- Vehicles that are serviced and maintained on a regular basis will produce less damaging noise. Silencers properly installed on autos, two-wheelers, and other vehicles will lower noise levels (Baloye & Palamuleni, 2015).
- Speaking in a low enough voice to communicate minimizes the amount of noise.
- Use of loud speakers is prohibited, with the exception of crucial meetings or events.
- Choosing particular machinery/equipment that produces less noise owing to better technology, for example, is also a significant aspect in noise reduction. Noise pollution management in enterprises requires proper handling and frequent maintenance.

(b) Noise reduction along the transmission line

- Noise levels may be reduced by erecting barriers between the noise source and the receiver. It should be located near to neither the source or the recipient.
- Noise levels will be reduced in the building by using appropriate noise absorbent materials for the walls, doors, windows, and ceilings (Monazzam et al., 2015).
- To lower noise levels at the receiver, a sound basis might be contained inside a paneled construction.
- The creation of a green belt helps reduce noise levels. The legislative restrictions require enterprises to build greenbelts that are four times the size of the built-up area in order to reduce various pollutants, including noise (Meza et al., 2021).

(c) Noise reduction via the use of protective gadgets

- Earmuffs, ear plugs, and other noise-cancelling equipment are often Auditory security is provided by this device. Ear-muffs provide varying degrees of reduction greatly according on their size, shape, seal material, and other factors.

1.3 Impact of noise pollution:

- *Hearing Problems:*

Any unpleasant sound that human ears are unable to filter might result in hearing loss. Man-made sounds such as traffic horns, airplanes, jackhammers, and others may be excessively loud for those with normal hearing ranges. Continuous exposure to high levels of noise may cause eardrum damage and, as a consequence, hearing loss. Furthermore, it has the potential to reduce the sensitivity of human ears to sound (The Phan et al., 2021).

- *Disorders of Sleeping:*

High amounts of sound may disrupt an individual's sleeping rhythm, resulting in unpleasant and bothersome conditions. Late-night parties, weddings with loud music, and other activities might disrupt a neighbor's night sleep. They may feel exhausted for the rest of the day. To limit the effects of sound pollution, it is vital to take proactive steps and maintain a healthy lifestyle.

- *Health Issues:*

Undoubtedly, excessive noise in working environments such as construction sites, companies, and even households may have a negative impact on psychological health. Excessive sound levels have been linked to sleep disturbances, hypertension, aggressive behavior, and stress. As a consequence, noise pollution may lead to long-term health problems. Heart and blood pressure problems: The high-intensity sound might induce an increase in heart rate and blood pressure. It's because loud music disrupts natural blood flow, increasing the risk of cardiovascular disease (Sharma et al., 2020).

1.3 Technical term related to noise pollution:

- *Baseline Audiogram:*

This is the audiogram that will be compared to future audiograms to determine whether there is a substantial threshold change (Singh et al., 2018). It is acquired by an audiometric assessment conducted before to employment or during the first 30 days of work, with at least 12 hours of stillness in between.

- *Nonstop Sound:*

Continuous noise is a Noise with only minor changes in volume across the observation time period.

- *Noise reduction rating (NRR):*

It's a single number that must be displayed on the tag of each hearing protection sold in the United States by law, and it shows the hearing protector's sound suppression abilities (in dB).

- *Derate:*

Estimate a worker's noise exposure while wearing hearing protection protection by using a percentage of the NRR.

- *Dose:*

The difference between the quantity of real contact and the amount of authorized exposure, with 100 percent and higher indicating dangerous exposures.

- *Hypothesis of Equal Energy:*

A theory claiming that irrespective of the manner in which sound energy is spread across time, equal quantities of sound energy will result in equivalent amounts of hearing damage.

- *Excess risk:*

The proportion of people after subtracting the percentage of persons who would normally obtain it from various source in a community that isn't exposure to industrial noise, with significant auditory damage in an occupational-noise-exposed inhabitant.

- Conversation degree:

An increase in decibels that necessitates half the exposure period or a decrease in decibels that necessitates double the exposure time.

1.4 Natural causes of noise pollution:

- Birds:

Insects may be highly loud and therefore a natural kind of noise pollution, such as crickets cheeping on seasonal evenings or the massive swarms of Cicada that reside all over the globe, demonstrating that bugs can make a lot of noise.

- Climate

Climate, which is continuously changing around us, may be one of the most unpleasant noise pollution. Even if there is no danger, high breezes and tempests may drown out all various sounds and generate terror in individuals who are experiencing them.

- Birds

Birds are inherently loud animals, singing and chirping all the time, save when migrating to colder or warmer locations at different periods of the year. Due to their excessive noise, birds might put surrounding residents in an uncomfortable position.

- *Industries sound:*

Noise created by industries is referred to as industrial noise. In overall, fusing, beating, drilling, gusting, running machinery, engines, piece metallic work, lathe machine work, crane operation, crushing, rotating, riveting, constructing, forging, compressing, vaccumising, flouting, moulding, steaming, hot, cooling, heating, venting, painting, pumping, packing, transporting, and so on are all used in its production (Sinha et al.,

2012). It has a significant impact on workers as well as the general public, and it causes substantial large-scale noise concerns. When compared to established occupational noise exposure limits, noise levels at coal washeries, coal preparation facilities, open cast and undercover mining centers were very high.

- *Road noise:*

In all nations, highway traffic is the main common foundation of sound and the most common source of discomfort and interruption. It is proportionate to the number of vehicles on the road. The quantity of automobiles on the road increases in tandem with the inhabitants, results in increasing sound pollution. Emissions, inlet, The major causes of noise in automobiles are engines and air sound, as well as high-speed tires. With increasing speed, the noise production of all elements rises. Road traffic noise is affected by a number of variables, including road conditions, traffic clearing, vehicle condition, vehicle speed, and the people who live along the roadside highway.

- *Public noise:*

Public noise is one of the most common causes of disturbance for a significant number of residents. It happens as a result of numerous communal events such as religious festivals, fairs, weddings, or civic celebrations. The majority of public concerns stem from the following key sources: Folk's indecency behavior; amplified sound, such as loud speakers, public gatherings, and festivals; Rash driving using different types of horns / music in automobiles that isn't needed

2. DISCUSSION

Noise degradation has become a more hazardous kind of pollution in recent years. This pollutants is only worsening, resulting in a hazardous environment. Noise pollution occurs when the quantity of noise produced surpasses the acceptable limit. When noise levels exceed a particular level, it becoming dangerous to living creatures. Furthermore, these bothersome sounds cause a host of issues and damage the environment. At the exact moment as the world looks to technologies for convenience,

it is causing us harm. Businesses, no matter how big or little, contributes to noise pollutants. Noise is generated by compressor, air conditioners, turbines, and various devices they use.

Similarly, a growth in car use is a major source of pollution. It covers not just automobiles, but also airplanes, busses, motorcycles, trucks, and other forms of transportation. Excessive noise is created by people honking repeatedly in traffic and listening to loud music while driving. Furthermore, social events such as weddings, parties, and religious ceremonies performed in places like clubs, bars, temples, halls, and other venues upset residents. Building activities like as mines, the building of flyovers, bridges, and other constructions also cause noise.

3. CONCLUSION

Each one of us contributes to sound pollution these days, since most of our daily actions produce approximately level of sound. Sound pollution has a negative impact on humans, causing hearing loss and mental stress. Through this review article, efforts are attempted to increase knowledge of the basics of sound pollution and its harmful effects. The noise exposure limitations for humans have been established by statutory agencies. Appropriate noise control measures should be employed, as well as the intervention of statutory authorities. The technical jargon is helpful for analyzing and comprehending data on noise pollution.

REFERENCES

- Baloye, D. O., & Palamuleni, L. G. (2015). A comparative land use-based analysis of noise pollution levels in selected urban centers of Nigeria. *International Journal of Environmental Research and Public Health*. <https://doi.org/10.3390/ijerph121012225>
- de Souza, T. B., Alberto, K. C., & Barbosa, S. A. (2020). Evaluation of noise pollution related to human perception in a university campus in Brazil. *Applied Acoustics*. <https://doi.org/10.1016/j.apacoust.2019.107023>

Di Franco, E., Pierson, P., Di Iorio, L., Calò, A., Cottalorda, J. M., Derijard, B., Di Franco, A., Galvé, A., Guibbolini, M., Lebrun, J., Micheli, F., Priouzeau, F., Risso-de Faverney, C., Rossi, F., Sabourault, C., Spennato, G., Verrando, P., & Guidetti, P. (2020). Effects of marine noise pollution on Mediterranean fishes and invertebrates: A review. In *Marine Pollution Bulletin*. <https://doi.org/10.1016/j.marpolbul.2020.111450>

Esmeray, E., & Eren, S. (2021). GIS-based mapping and assessment of noise pollution in Safranbolu, Karabuk, Turkey. *Environment, Development and Sustainability*. <https://doi.org/10.1007/s10668-021-01303-5>

He, S., Shao, W., & Han, J. (2021). Have artificial lighting and noise pollution caused zoonosis and the COVID-19 pandemic? A review. In *Environmental Chemistry Letters*. <https://doi.org/10.1007/s10311-021-01291-y>

Kalawapudi, K., Singh, T., Vijay, R., Goyal, N., & Kumar, R. (2021). Effects of COVID-19 pandemic on festival celebrations and noise pollution levels. *Noise Mapping*. <https://doi.org/10.1515/noise-2021-0006>

Khaiwal, R., Singh, T., Tripathy, J. P., Mor, S., Munjal, S., Patro, B., & Panda, N. (2016). Assessment of noise pollution in and around a sensitive zone in North India and its non-auditory impacts. *Science of the Total Environment*. <https://doi.org/10.1016/j.scitotenv.2016.05.070>

Meza, C. S. R., Kashif, M., Jain, V., Guerrero, J. W. G., Roopchund, R., Niedbala, G., & Phan The, C. (2021). Stock markets dynamics and environmental pollution: emerging issues and policy options in Asia. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-021-15116-6>

Monazzam, M. R., Karimi, E., Abbaspour, M., Nassiri, P., & Taghavi, L. (2015). Spatial traffic noise pollution assessment - A case study. *International Journal of Occupational Medicine and Environmental Health*. <https://doi.org/10.13075/ijomeh.1896.00103>

Morillas, J. M. B., Gozalo, G. R., González, D. M., Moraga, P. A., & Vílchez-Gómez, R. (2018). Noise Pollution and Urban Planning. In Current Pollution Reports. <https://doi.org/10.1007/s40726-018-0095-7>

Sharma, R., Kumar, R., Satapathy, S. C., Al-Ansari, N., Singh, K. K., Mahapatra, R. P., Agarwal, A. K., Le, H. Van, & Pham, B. T. (2020). Analysis of Water Pollution Using Different Physicochemical Parameters: A Study of Yamuna River. *Frontiers in Environmental Science*. <https://doi.org/10.3389/fenvs.2020.581591>

Singh, B. K., Singh, A. K., & Singh, V. K. (2018). Exposure assessment of traffic-related air pollution on human health - a case study of a metropolitan city. *Environmental Engineering and Management Journal*. <https://doi.org/10.30638/eemj.2018.035>

Sinha, D. K., Ram, R., & Kumar, N. (2012). Quantitative assessment of Kali river water pollution. *International Journal of Chemical Sciences*.

Slabbekoorn, H. (2019). Noise pollution. In *Current Biology*. <https://doi.org/10.1016/j.cub.2019.07.018>

The Phan, C., Jain, V., Purnomo, E. P., Islam, M. M., Mughal, N., Guerrero, J. W. G., & Ullah, S. (2021). Controlling environmental pollution: dynamic role of fiscal decentralization in CO2 emission in Asian economies. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-021-15256-9>