

NOISE REDUCTION – AN APPROACH TOWARDS SUSTAINABLE GROWTH

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ABSTRACT

Environmental management is one of the basic component lead to sustainable growth. Reduction in health problems can lead towards sustainable growth. Due to rapid urbanization and the corresponding increase in the population there is increase in the number of vehicles on Indian roads. The population is increasing at an alarming rate in most of the Indian cities. Noise pollution effects the quality of the life and so can be thought of a social cost. Noise annoys, distracts, disturbs, and when exposure to its sufficient, noise can cause physiological effects leading deafness. Annoyance results from the interference with sleep and with speech. Noise control can be one of the component in achieving sustainable environment. The Vehicular traffic is one of the major Component influencing the level of noise. The nuisance is caused by the accumulation of sound of individual vehicles of the traffic stream into traffic noise. Present study attempt to encourage noise level measurement and to remedied the adverse effect of noise.

Keyword : Vehicular traffic, sustainable growth, Noise level.

1. Introduction

Sustainable growth of a town or a city can lead to sustainable growth of a country can be achieved. Sustainable development is one that meets the needs of the present without compromising the ability of future generations to meet their own needs. A sustainable city could be defined as a city in which the population enjoys a high quality of life, free from health problems and lesser social and environmental issues to future generations. ⁽¹⁾ The Vehicular traffic is one of the major Components influencing the level of noise. The nuisance is caused by the accumulation of sound of individual vehicles of the traffic stream into traffic noise, also poor vehicle maintenance and bad driving adds to noise levels ⁽²⁾ The socio-economic development and urban development is a cause for growing urban population. Due to rapid urbanization and the corresponding increase in the the population there is increase in the number of vehicles on Indian roads. The population is increasing at an alarming rate in most of the Indian metropolitan cities. The noise levels are showing an alarming rise and in fact the noise level exceeds the prescribed limits in most of the areas. The ambient noise standards being followed in India is presented in table 1.2 ⁽³⁾ Though the urban population is much more affected by such pollution, however small town/villages along side road or industries are also victim of this problem ⁽⁴⁾. Noise is derived from the Latin word “nausea” implying unwanted sound or Sound that a loud, unpleasant or unexpected.

1.2 SOURCES OF NOISE:

Sources of noise can be classified as transportation, industrial, and residential. Transportation sources of noise are comprised principally of automotive and aircraft noises; motorcycles, scooters, should also be considered. A main contributor to transportation noise is automotive traffic. At speeds in excess of 60 miles/h (mph), tire noises are most discernible, whereas at lower speeds, engine noises tend to dominate.

| AREA | Leq in dBA (day time) | Leq in dBA (Night time) |
|---------------------|--------------------------|----------------------------|
| INDUSTRIAL AREA | 75 | 70 |
| COMMERCIAL AREA | 65 | 55 |
| RESIDENTIAL AREA | 55 | 45 |
| SILENCE ZONE | 50 | 40 |

Table1.2: Ambient Noise Standards as per CPCB India⁽³⁾

2. IMPACTS OF NOISE:

| Sr.No. | Impact | Particulars |
|--------|-----------------------|---|
| 1 | Physiological effects | Vasoconstriction,=Gastrointestinal modification, Endocrine stimulation, Respiratory modification, Galvanic skin resistance alteration |
| 2 | Hearing Impairment | Permanent / temporary hearing loss |
| 3 | Task Interference | Reduced production, Increased error rate, Extended output |
| 4 | Sleep Interference | Electroencephalographic modification (EEG), Sleep stage alteration, Awakening. |
| 5 | Personal Behavior | Annoyance, Anxiety-nervousness, Fear, Misfeasance |

Table2. Various impacts due to noise⁽⁶⁾.

Noise annoys, distracts, noise can cause physiological effects leading deafness. Annoyance results from the interference with sleep and with speech. Noise within your home makes disturbance and loss of privacy. Distraction accompanies noise in the workplace with consequent reduction in productivity efficiency, assurance and safety. Prolonged exposure to intense noise causes permanent hearing loss. Very much lower noise levels, however, interference with normal conversation, hinder concentrated mental effort, stress cause reduction in efficiency at work, prevent sleep, brings about irritability, and interference with relaxation and recreation. Noise affects the

human health adversely. Noise may result in loss of hearing, stress, high blood pressure, loss of sleep. The effect of noise is difficult to quantify because tolerance levels among different populace and types of noise vary considerably. Indiscriminate use of horns by the vehicles are found to be one of the major contributors⁽⁵⁾. Noise can also disturb natural wild life and ecological system endangering the environmental sustainability. Various impacts due to noise are presented in Table 2.⁽⁶⁾.

2.1 Economic Impact Of Noise⁽⁷⁾:

- 1) Regular exposure to high levels of environmental noise can have harmful effects on human health and on well-being. Both effects have direct or indirect economic effects on society.
- 2) Noise related diseases generate a direct cost for the society that has to pay for medical treatments and an indirect cost through the absence of work of sick people. Increased mortality also has adverse effect on economy.

3. Noise Level Measurement:

Noise due to vehicular traffic also depends upon traffic volume. The equivalent noise level can be calculated by a direct objective measurement with an integral type of meter or from a sample record of time variation of noise during that period.^(8,9) The noise levels should be collected under suitable meteorological conditions. Most commonly adopted noise descriptors in environmental noise studies are, L_{10} , L_{50} and L_{90} and Leq . Leq is the equivalent sound level in dB (A). Noise level is extremely variable over time, going up and down continuously making it difficult to be evaluated. In order to make things easier equivalent sound level was defined as a continuous sound level that would produce the same effect on the human ear if compared to the actual noise observed during the measurement, with all the variable.

L_{10} are the noise level in dB (A) exceeding only 10 % of the time or peak sound level

L_{50} is the noise level in dB (A) exceeding only 50 % of the time or peak sound level or mean sound level.

L_{90} is the noise level in dB (A) exceeding only 90 % of the time or peak sound level or background noise level.

4. REMEDIAL MEASURES:

To minimize the noise levels at source, improvements in the design of engines, provision of suitable silencer system can be implemented. Identification and control on the movement of old and poorly maintained vehicles by the relevant authorities can minimize the noise levels. It is found that indiscriminate use of horns also leads to higher noise levels. To minimize the noise levels several other measures can be implemented such as,

1. Placement of Sign board along with specification of noise limit.
2. Introduction of alternate fuelled vehicles like CNG/LPG.
3. Provision of the speed bumps at the suitable distance⁽¹⁰⁾
4. Educating the people: public awareness of the hazards of noise should be aroused so that people should enjoy things like radios, tape recorder, T.V. etc., at such a volume which may not cause nuisance to the neighbors.
5. Irregular and unnecessary use of pressure horns by the drivers of truck, Bus and other automobiles should be checked.
6. Plantation should be encouraged in all areas.

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