

**GOVERNMENT OF INDIA
ENVIRONMENT AND FORESTS
LOK SABHA**

STARRED QUESTION NO:398
ANSWERED ON:21.08.2000
NOISE POLLUTION
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Will the Minister of ENVIRONMENT AND FORESTS be pleased to state:

- (a) whether survey report of World Health Organisation has indicated that half of the population of some major cities in the country may go deaf if the present level of noise pollution in these cities increases by five decibel;
- (b) if so, the details thereof alongwith steps proposed to be taken in this regard, city-wise;
- (c) whether the Government propose to take concrete measures to check spread of noise pollution in the country; and
- (d) if so, the details thereof and if not, the reasons therefor?

Answer

MINISTER OF ENVIRONMENT AND FORESTS (SHRI T.R.BAALU)

(a), (b), (c)&(d) A statement is laid on the Table of the House.

STATEMENT REFERRED TO IN PART (a),(b),(c)&(d) OF LOK SABHA STARRED QUESTION NO.398 FOR REPLY ON 21.8.2000 REGARDING NOISE POLLUTION

(a) &(b) According to the World Health Organisation, no such study has been made.

(c)&(d) The Government have taken several measures to regulate and control noise pollution, including the following:-

(i) Noise pollution is regulated under the Air (Prevention & Control of Pollution) Act and the Environment (Protection) Act. Ambient noise standards have been prescribed under the Environment (Protection) Act.

(ii) Noise limits have been prescribed for automobiles, domestic appliances and construction equipment at the manufacturing stage. There are standards and guidelines for control of noise pollution from stationary diesel generator sets.

(iii) Recently, the following steps have been taken for controlling noise pollution under the Environment (Protection) Act:

(a) Standards for fire crackers have been notified in October, 1999.

(b) The Noise Pollution (Regulation & Control) Rules, 2000 have been notified in February, 2000.

NOTE FOR POSSIBLE SUPPLEMENTARIES TO THE LOK SABHA STARRED QUESTION NO.398 FOR REPLY ON 21.8.2000 REGARDING NOISE POLLUTION

1. DEFINITION

Noise is considered to be any unwanted sound that may adversely affect the health and well being of individuals or populations. Physically, sound is a mechanical disturbance propagated as a longitudinal wave motion in air and other elastic or mechanical media, such as water or steel. Its main features are sound intensity, measured as sound pressure, and frequency spectrum indicating the distribution of the total sound over high and low frequencies. The spectrum is important with respect to the effects of noise on people and with respect to the engineering costs to reduce the noise.

2. SOURCES OF NOISE POLLUTION

The main sources of noise pollution are automobiles, domestic appliances, construction equipments, reckless use of loud speakers, air craft operations and bursting of crackers during festivals. The Central Pollution Control Board has conducted surveys on the ambient noise levels at residential, commercial, industrial and other selected areas of major cities of the country from time to time.

3. INCIDENCE OF NOISE IN METRO CITIES OF INDIA

Noise pollution has reached a high level in most of the metropolitan cities. Studies carried out on noise pollution have revealed that average ambient noise levels in the residential, commercial areas and silence zones of all the major cities were found to be higher than the prescribed standards. The ambient noise levels recorded in four mega cities have been given in the Table-I.

TABLE-I

Average Noise Levels (in decibels) in various Metropolitan Cities

City	Day Night	(0600-2100 hrs/ 2100-0600 hrs)	Industrial Area	Commercial Area	Residential Zone	Silence Zone
Calcutta	Day Night	78 67	82 75	79 65	79 65	
Mumbai	Day Night	76 65	75 66	70 62	66 52	
Chennai	Day Night	71 66	78 71	66 48	63 49	
Bangalore	Day Night	78 53	76 57	67 50	67 NA	

Ambient noise standards (CPCB) are :

Industrial area - 75 (day)/70 (night);
 Commercial area - 65 (day)/55 (night);
 Residential area - 55 (day)/45 (night);
 Silence Zone - 50 (day)/40 (night).

Source : State of the Environment, 1995, MoEF.

Data on noise pollution from selected locations of Delhi for 1999 indicates that noise levels in many commercial and residential areas as well as in silence zone are quite high compared to the prescribed ambient noise levels (Table-II). Noise levels are particularly high during the night-time which indicates that high levels of noise persists even during the sleeping hour.

TABLE-II

Average Noise Levels (in decibels) in various locations in Delhi for 1999

Location	Day Average	Night Average	Maximum	Minimum
ITO	74.73	71.1	84.7	62.7
Connaught Place	74.2		68.4	86.9
LNJP Hospital	64.23		59.1	70.8
AIIMS	74.67		71.3	82.2
Moolchand	63.1		60.8	73.0
New Friends Colony	58.8		53.1	69.9
Wazirpur	77.17		78.0	89.0
Ashok Vihar	70.57		66.6	81.8
Karol Bagh	74.4		64.2	85.0
Anand Pravat	73.27		62.3	90.1

4. STEPS TAKEN TO CONTROL NOISE POLLUTION

The Government have taken various measures to regulate and control noise pollution, which include the following:-

(i) Noise pollution has been included in the Air (Prevention & Control of Pollution) Act. Ambient standards in respect of noise for different categories of areas (residential, commercial, industrial and silence zones) have been notified under the Environment (Protection) Act, 1986.

(ii) Noise limits have also been prescribed for automobiles, domestic appliances and construction equipment at the manufacturing stage.

(iii) Standards and guidelines for control of noise pollution from stationary diesel generator sets have been evolved and notified in January, 1999.

(iv) A notification has also been issued specifying the standards for fire crackers in October, 1999.

(v) The Noise Pollution (Regulation & Control) Rules, 2000 has been notified on 14th February, 2000.

(vi) A code of practice has been evolved by the Central Pollution Control Board for control of noise.

5. NOISE STANDARDS

Ambient Air Quality Standards in respect of Noise

Noise pollution has been included in the amended Air (Prevention and Control of Pollution) Act, 1987. Ambient air quality standards in respect of noise for different categories of areas (industrial, commercial, residential and silence zones) have been notified under Environment (Protection) Act, 1986 as given in Table-I.

Table-1 :

Ambient Air Quality Standards in respect of Noise

Area	Category of Area	Limits in dB(A), Leq 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

Table-2 :

Noise Limits for Automobiles (Free Field at 7.5 metre in dB (A) at the manufacturing stage)

Category of Vehicle	Noise Limit in dB(A)
(a) Motorcycle, scooters & Three Wheelers	80
(b) Passenger Cars	82
(c) Passenger or Commercial Vehicles upto 4 MT	85
(d) Passenger or Commercial Vehicles above 4 MT and upto 12 MT	89
(e) Passenger or Commercial Vehicles exceeding 12 MT	91

Table-3 :

The noise limits for Domestic Appliances and Construction equipments at the Manufacturing Stage

Category of Domestic Appliances/Equipments Noise Limits Construction 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

The Urban noise level acceptable under international standards, as prescribed by the World Health Organisation (WHO)

Recommended Noise-Exposure Limits by WHO 1980

Environment Recommended maximum level

Industrial/Occupational 75 decibels

Community/Urban

Day-time 55 decibels
Night-time 45 decibels

Indoor/Domestic

Day-time 45 decibels
Night-time 35 decibels

A. Noise Standards for Fire-crackers

(i) The manufacture, sale or use of fire crackers generating noise level exceeding 125 dB(A) or 145 dB(C)pk at 4 meters distance from the point of bursting shall be prohibited.

(ii) For individual fire-cracker constituting the series (joined fire-crackers), the above mentioned limit be reduced by $5 \log_{10}(N)$ dB, where N= number of crackers joined together.

B. The broad requirements for measurement of noise from fire-crackers shall be -

(i) The measurements shall be made on a hard concrete surface of minimum 5 meter diameter or equivalent.

(ii) The measurements shall be made in free field conditions i.e., there shall not be any reflecting surface upto 15 meter distance from the point of bursting.

(iii) The measurement shall be made with an approved sound level meter.

C. The Department of Explosives shall ensure implementation of these standards.

Note:- dB(A) : A- weighted impulse Sound Pressure Level in decibel dB(C) pk : C-weighted Peak Sound Pressure Level in decibel.

Standards/Guidelines for Control of Noise Pollution from Stationary Diesel Generator(DG) Sets.

(A) Noise Standards for DG Sets (15-500 KVA)

The total sound power level, L_w , of a DG set should be less than, $94 + 10 \log_{10}(KVA)$, dB(A), at the manufacturing stage, where, KVA is the nominal power rating of a DG set.

This level should fall by 5 dB(A) every five years, till 2007, i.e. in 2002 and then in 2007.

(B) Mandatory acoustic enclosure/acoustic treatment of room for stationary DG sets (5 KVA and above)

Noise from the DG set should be controlled by providing an acoustic enclosure or by treating the room acoustically.

The acoustic enclosure/acoustic treatment of the room should be designed for minimum 25 dB(A) Insertion Loss or for meeting the ambient noise standards, whichever is on the higher side (if the actual ambient noise is on the higher side, it may not be possible to check the performance of the acoustic enclosure/acoustic treatment. Under such circumstances the performance may be checked for noise reduction upto actual ambient noise level, preferably, in the night time). The measurement for Insertion Loss may be done at different points at 0.5 m from the acoustic enclosure/room, and then averaged.

The DG set should also be provided with proper exhaust muffler with Insertion Loss of minimum 25 dB(A).

(C) Guidelines for the manufacturers/users of DG sets(5 KVA and above)

1. The manufacturer should offer to the user a standard acoustic enclosure of 25 dB(A) Insertion Loss and also a suitable exhaust muffler with Insertion Loss of 25 dB(A).
2. The user should make efforts to bring down the noise levels due to the DG set, outside his premises, within the ambient noise requirements by proper siting and control measures.
3. The manufacturer should furnish noise power levels of the unsilenced DG sets as per standards prescribed under (A).
4. The total sound power level of a DG set, at the user's end, shall be within 2 dB(A) of the total sound power level of the DG set, at the manufacturing stage, as prescribed under (A).
5. Installation of a DG set must be strictly in compliance with the recommendations of the DG set manufacturer.
6. A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with the DG set manufacturer which would help prevent noise levels of the DG set from deteriorating with use.

Code of Practice for Controlling Noise from Sources other than industries and automobiles evolved by Central Pollution Control Board

Public Address System

- Licence must be obtained by all parties intending to use Loudspeakers or public address system for any occasion.
- Public address system and loudspeakers should not be used at night between 9 p.m. to 6 a.m. except in closed premises.
- Loudspeakers should be directed at the audiences and not away from audience (i.e. not towards the neighbourhood).
- Loudspeakers should not be allowed for advertisement and commercial activities.
- The permitted strength of the power amplifier should be just adequate to cover the audience, and noise level beyond the boundary limit of the noise source premises should not be increased by more than 5 dB(A) above the ambient noise level.

Aircraft Operations

- Aerodrome should be located away from the city and growth of the city should not be allowed to extend upto the Aerodrome.
- Aeroplanes should take off in direction radially away from the city.
- During boarding and unboarding operations the plane should be sufficiently away from the airport buildings.
- Night time operations of the aircraft should be minimised.

- During maintenance and repairs of the aeroplane, workers should use ear muffs.
- Portable silencers should be used in the plane intake as well as exhaust during idling period at the airport.

Railway Operations

- Erection of acoustic barrier, reducing speed and avoiding whistling within and along the municipal limits and habitation zones are recommended for adoption to the extent possible.

Construction Activities

- Acoustic barriers should be placed near construction sites.
- The maximum noise levels near the construction site should be limited to 75 dB(A) Leq. (5 Min) in industrial areas and to 65 dB(A) Leq. (5 Min) in other areas.
- There should be fencing around the construction site to prevent people coming near the site.
- Materials need to be stockpiled and unused equipment to be placed between noisy operating equipments and other areas.
- Constructing temporary earth bund around the site using soil etc. which normally is, hauled away from the construction site.

6. EFFECTS OF NOISE POLLUTION

There are two types of effects of Noise Pollution: Auditory effects as well as Non-auditory effects.

(a) Auditory Effects:

i) Auditory Fatigue:-

A person entering a very noisy area may experience a measurable loss in hearing sensitivity but will recover some time after returning to a quiet environment. This phenomenon can be measured as a shift in audio-metric thresholds and is called a noise-induced temporary threshold shift. Recovery depends on the extent of the hearing shift, individual susceptibility, and the type of exposure. If recovery is not complete before the next noise exposure, it is possible that some of the loss will become permanent.

ii) Hearing Impairment:-

In the normal auditory process, sound vibrations in the air travel through the ear canal and cause the eardrum to vibrate. The vibrations are then transmitted by the bones of the middle ear to the sensory organ of the inner ear, the cochlea. Here they are transduced by hair cells into nerve impulses and transmitted to the brain.

Blasts and other intense or explosive sounds can rupture the ear drum or cause immediate damage to the structures of the middle and inner ear. Hearing loss due to prolonged noise exposure is generally associated with destruction of the hair cells in the inner ear and, as such a loss is of a neural type, irreversible injury is caused to the inner ear.

b. Non-Auditory Effects

i) Speech Interference:-

The interference of noise with speech communication occurs when one of two simultaneous sounds renders the other inaudible. In occupational as well as leisure situations the failure of individuals to hear warning shouts or signals may lead to injury. For 100% speech intelligibility, the speech level should exceed the noise level by at least 10 dB. Measurements indicate that, during relaxed conversation indoors, the speech level at 1 metre's distance from the speaker is approximately 55 dB(A). However, owing to the reverberations off the walls, floor, ceiling and objects in a room, there is no simple formula that will predict speech interference indoors. On the basis of the average noise levels that have been found acceptable, a background noise level of less than 45 dB(A) is required for 100% speech intelligibility.

ii) Sleep Disturbance:-

Noise intrusion can cause difficulties in falling asleep and can wake people who are asleep. Studies have indicated that disturbance of sleep becomes increasingly apparent as ambient noise levels exceed about 35 dB(A). Individuals who sleep well at 35 dB(A) average sound pressure level (Leq) complain about sleep disturbance and have difficulty in falling asleep at 50 dB(A) Leq. Weak stimuli can interfere with sleep if they are unexpected. It has been found that the probability of sleeping persons being awakened by a peak sound level of 40 dB(A) is 5%, increasing to 30% at 70 dB(A). Within a population, differences in sensibility to noise are related to such factors as age and sex. Adaptation has been observed only when noise stimuli are of low intensity. On the basis of the limited data available, a level of less than 35 dB(A) is recommended to preserve the essential and restorative process of sleep.

iii) Stress Reaction :-

Exposure to noise has been reported to evoke several kinds of reflex response which are part of a response pattern commonly

named the stress reaction. The heart, blood vessels, intestines and endocrine glands are all organs in which noise associated changes have been observed. However, more studies are required to evaluate the long term health risks due to the action of noise on the autonomic nervous system. Social and cultural factors may need to be taken into account in assessing noise-induced strains that lead directly or indirectly to the development of fatigue and non-specific health disorders. Annoyance reactions reflect the individual reactions to the same noise. On the basis of surveys of aircraft and road traffic noise in residential areas, it appears that few people will be seriously annoyed by day time community noise exposure below 55 dB(A).

iv) Efficiency at Work :-

The disruptive or distracting effects of noise on manual or mental productivity or performance of tasks are not well understood. Noise can change the individual's state of alertness and may increase or decrease efficiency. Performance of tasks involving motor or monotonous activities is not always degraded by noise but mental activities involving vigilance, information gathering, and analytical processes appear to be particularly sensitive to noise. However, no generalized criteria relating task efficiency with the level or duration of noise can be stated.