

Human Resource Management: Right to a Noise – Free Living: Noise Pollution, A Health Hazard Causing Audio -Related Diseases and on Impediment to a Holistic Development of the People of Tirunelveli City and its Neighbourhood,

Tamilnadu – A Case Study.

***Rev. Dr. M. Charles, S. J.,**

****Mr. S. Karthikeyan**

*Assistant Professor, St. Joseph's Institute of Management (JIM),

**Department of Management Studies, St. Joseph's College (Autonomous), Tiruchirapalli – 620 002, Tamil Nadu.

Abstract

All of us are aware of increasing environmental pollution like water, air and land degradation by pollutants of various kinds and their negative impact on the life of plant and animals. Among the major environmental pollutions, noise pollution, as important as the others, receives less attention and goes unnoticed by all. A simple survey was conducted in Tirunelveli Municipal Corporation (City) and its neighbourhood to ascertain the intensity of noise pollution and to suggest possible remedial measures to prevent further damage to the environment through noise pollution.

Key Words: Human Resource Management, Tirunelveli, Human Right, Noise Pollution, Health Hazard.

Introduction

Health is one of the most important concerns of every human being and even those who renounce the world for God are interested in good health. Yogies and saints prefer to be in the forests / mountains where there is silence and comparatively unpolluted environment. Those who have lived with nature in the past have had a healthy and long life and hence a good environment is necessary for a healthy life.

The environment today is highly polluted and is rampant in urban as well as in rural areas where excessive technological and developmental activities are at their peak. Pollution is defined as the effect of undesirable changes in our surroundings that have harmful effects on plants, animals including human beings. Pollution is a man-made problem, has many variants/kinds. Noise pollution, unlike water, air and land pollution, is one such phenomenon which goes unnoticed by all but has a very serious negative impact on the health of all life forms. Increase of population, establishment of newer industries, proliferation of motor vehicles, etc. are some of the causes for the high intensity of noise pollution.

Noise is defined as 'sound without value' or a wrong sound in a wrong place, at the wrong time. Sound is measured by several systems, but the best known unit of measurement is 'Decibel,' (dB) named after Sir Alfred Bell. The decibel measures a sound's intensity from 0 to 180 dB (Timmy Katyal & Stake, 1998).

In Julius Caesar's time, the clattering of chariots on the cobble stone streets was identified as noise pollution and led to the enactment of the first Roman law to control noise pollution (Trivedi, 1995). Robert Alex, for the first time, pointed out that noise had damaging physiological and psychological effect on human beings (Verma & Agarwal, 1992). Noise can cause stress and physiological disturbances such as mental, nervous and reproductive disorders in human beings and altering the predator-prey relationships in animals.

Scope

The study on noise pollution is a vast subject and has manifold aspects. The present investigation, a simple survey work, is limited to an area circumscribing the Tirunelveli Municipal Corporation (City) and its neighbourhood to study the level of noise increase in different zones, such as, Silent, Commercial, Traffic and Industrial zones within the said area as well as to estimate the impact of noise pollution on human beings in particular. Similar studies have been done in India and elsewhere in the world as one browses through the available literature on the subject.

Objectives

1. To identify the specific locations/places where there is a high intensity of noise (pollution);
2. To measure the noise intensity in terms of decibel (dB) units in the study area;
3. To ascertain the level of noise pollution prevailing at a study site is within the tolerable/permisible limits; and
4. To suggest remedial measures to control the noise pollution from further increase in those areas.

Materials & Methods

Study Area

The name **Tirunelveli** has been derived from three Tamil words: **Thiru-Nel-Veli** meaning 'sacred paddy with a hedge around.' The Tirunelveli District lies between 80° 10' and 90° 40' in the north latitude and 77° 21' and 77° 99' in the eastern longitude. The total geographical area of the district is 6816 sq.kms. The investigation of noise pollution had been carried out in Tirunelveli Municipal Corporation and its neighbourhood in 2006 – 2007 at different zones, namely, the silent, commercial, traffic and industrial zones. The noise level had been measured using a '**Sound Level Meter**.'

Instrument

The Sound Level Meter – Type SL 4001 is an electronic instrument consisting of a microphone fixed to an amplifier and terminating in a logarithmic indicator. The measurement is calibrated in decibels. It can sense from 30 dB to 140 dB in three ranges. The resolution is accurate up to 0.1 dB. Sounds with a frequency between 31.5 Hz and 8000 Hz can be measured. An electric condenser microphone at the top receives the sound pressure and can operate well under the temperature from 0° to 50° C. There are three levels of sound ranges: 30 to 50 dB; 51 to 80 dB and 81 to 140 dB. The instrument measures the sound level for every second. When the range indicator is 'ON' it means that the instrument is in search of accurate reading and when the range indicator is 'OFF' then it has reached the accurate sound level. The readings displayed on the screen are to be noted and tabulated.

In every site/locality selected for the current study, ten readings had been taken at regular intervals and during the day only. The average sound level had been calculated for every site and they had been compared with the Indian Ambient Air Quality Standard Value (IAAQSV). The differences had been computed for percentage.

Results & Discussion

The Indian Ambient Air Quality Standard Value (IAAQSV) with respect to noise as per the Environment Protection Rules, 1986, set by the Central Pollution Control Board has been given in Table 1. The noise levels measured at Silent, Commercial, Industrial and Traffic zones had been tabulated in the subsequent Tables. The measured values had

been compared with the standard value and the increase given in percentage for each category.

Silent Zones

Silent zones are Hospitals, Schools, Libraries and the like. The IAAQSV has standardized the sound level to 50 dB in silent zones (permissible level).

Hospitals

Of the five hospitals under the study, the Government Medical College Hospital had the highest sound level, 74.32 dB. It was due to the over-crowding of people and might cause disturbance to the patients admitted there and induce short temper in human beings (Bhatia & Sharma, 1991).

Libraries

A survey had been conducted in five libraries situated in close proximity. Of the five, the District Central Library had the highest noise level, 72.72 dB. The reason attributed to this increase in noise level was the vehicular traffic on the road outside.

Schools

Of the five schools examined for sound level, St. Xavier's Higher Secondary School had 79.67 dB the highest because of the heavy vehicular traffic on the National High Way adjacent to the school.

Auditoria/Seminar Halls

The five different auditoria/seminar halls within St. Xavier's College Campus surveyed for sound level, where academic programmes like Regional, National and International Conferences, cultural festivals, folk festivals and public debates, are held using the public address systems, the main auditorium in the College had the loud noise measuring 82.0 dB.

Calculation

$$\begin{aligned} \text{Maximum Tolerance of human ear} &= 180\text{dB} \\ \text{Standard value in silent zone} &= 50\text{dB} \\ \text{Silent zone in Tirunelveli} &= \frac{\text{Hospitals} + \text{Libraries} + \text{Schools} + \text{Auditoria}}{4} \\ &= \frac{72.30 + 65.84 + 75.89 + 78.9}{4} \\ &= 73.23 \\ \text{Increased noise level} &= 73.23 - 50 \\ &= 23.23 \\ \text{\% of increased Noise level} &= \frac{23.23 \times 100}{180} \\ &= \mathbf{12.90\%} \end{aligned}$$

In silent zone the noise level is 12.90% which is higher than the standard value for that locality.

Commercial Zones

Markets (malls/supermarkets) and Cinema Theatres come under this category. IAAQSV has fixed 65 dB as the permissible level of sound in these places.

Markets

Among the five markets in and around Tirunelveli and Palayamkottai, it had been found that the Subiksha Supermarket had the maximum noise level, 77.57 dB due to the traffic on the road nearby, insufficient space and over-crowding of customers. It is inferred that the cosmopolitan/metropolitan cities like Mumbai, Kolkotta, Delhi, Bangaluru & Chennai have become great source of noise pollution because of the crowded markets situated in these cities (Agrawal, 1996).

Cinema Theatres

Five different theatres in the city had been surveyed for noise pollution and all have been found to possess more or less the same intensity of noise. The Bombay Theatre was having a slightly higher intensity than the others, 93.09 dB. Theatres, dance halls, discotheques, circus and carnivals, religious and social festivals will cause loud noise and definitely be a nuisance to the nearby residents, especially late at night (Agrawal, 1996). Calculation had been done as cited above. The increase in noise level compared to the standard value was estimated as 9.51 %. Noise affects human body in a number of ways: Blood vessels get constricted, breathing rate increased, muscle tension changes and glandular reactions affected in 75 – 85 dB (Ambasht & Ambasht, 1999).

Industrial Zones

Industrial zones included the minor and medium industries in the city area. The IAAQSV has standardized 75 dB as the highest tolerable noise for the industrial zones. Among the five minor industries, Arunachallum Mill stood first in having high level noise of 100 dB. The two medium industries in Tirunelveli neighbourhood, the survey had not been conducted because permission to do the survey was refused but standing near the main entrance to the cotton mills the noise level was measured and found to be 90 dB. Sharma (2003) stated that enormously increasing industrial noise pollution had damaged the hearing about 20 % workers in Chennai. Calculation for the increase of noise pollution in industrial units done as cited above and the value arrived at was 9.37 %, which may cause tympanic membrane of the ear to contract because of aural reflex action (Sharma & Kaur, 1997).

TRAFFIC ZONES

The traffic zones included mainly railway stations, bus stands and places where vehicular traffic was heavy. The IAAQSV has standardized 70 dB as the optimal/tolerant noise level for traffic zones.

Railway Stations

Of the two railway stations in Tirunelveli, the main Railway Junction had the high intensity noise level, 88.52 dB. High speed trains generate very high intensity noise (Nalin & Shastree, 1997).

Bus Stands

Of the four bus stands in Tirunelveli examined, the Palayamkottai Bus stand was louder than the others, 83.16 dB. The reason for this high intensity noise was caused by all kinds of 3-wheelers/autos besides the regular buses plying through this bus

stand. The noise level was measured on working days and holidays, during peak hours and non-peak hours.

Crowded Areas

A survey had been conducted in three crowded areas of Tirunelveli of which Vannarapettai had registered the highest intensity of noise, 85.44 dB. The survey was carried out on working days and holidays, during peak hours and non-peak hours. The reason for the increase in noise level was due to congestion of moving vehicles in and around these crowded places. The calculation for the increase in noise level was done as cited above, 7.6 %. The traffic noise may lead to insomnia in many (Agrawal, 1996). Exposure to road traffic noise was linearly associated with the increase in episodic memory loss (Standfield, 2005).

Conclusion

On the basis of the above data, it may be concluded that noise pollution poses a great threat to all aspects of life. Increase in the noise level in all zones may cause hearing loss, stress, high blood pressure, sleep loss, productivity loss and a reduction in the quality of life as a whole for all the population of the city and the neighbourhood which is a violation of the Human Right for a health hazard-free living. There are several ways to reduce noise pollution through physical, legal and educational awareness. Increasing the green cover and reforestation even in city areas may reduce the noise level to about 6 – 10 dB. Workers in the industrial areas should use ear protecting aids at work.

A global consensus has to be developed at all levels, political, social and economic spheres and discover ways and means to tackle noise pollution which is in an alarming rate today. This will definitely improve the health conditions of all life forms on the earth.

References

1. **Agrawal, K.C.** (1996). Environmental Biology, Agro-Botanical Publishers. New Delhi. pp: 382-412.
2. **Ambasht, R.S.** and **Ambasht, N.K.** (1999). A Text Book of Plant Ecology. CBB Publishers and Distributors, New Delhi. pp: 325-328.
3. **Bhatia, K.N.** and **Sharma, K.K.** (1991). A Treatise on Plant Ecology. Pradeep publications, Jalandhar. pp: 391-393.
4. **Nalin, K.** and **Shastree.** (1997). Environmental Resource Management. Anmol publication, New Delhi. pp: 173-216.
5. **Sharma, B.K.** (2003). Environmental Chemistry. Krishna prakashan media (P) Ltd. pp: 13-28.
6. **Sharma, B.K.** and **Kaur, H.** (1997). An Introduction to Environmental Pollution. Krishna prakashan media .pp:462-469.
7. **Stansfeld, S.A. et al.** (2005). Aircraft and Road Traffic Noise and Children's Cognition and Health a Cross-National Study. **Lancet**. V.365 (9475):1942-1949.
8. **Timmy Katyal** and **Satake, M.** (1998). Environmental Pollution. Anmol Publications Pvt. Ltd., New Delhi. pp: 219-231.
9. **Trivedi, P.R.** (1995). A Text Book of Environmental Science. Anmol publication Pvt. Ltd, New Delhi. pp: 242-249.
10. **Verma, P. S.** and **Agarwal, V.K** (1992). Principles of Ecology. S.Chand and Company Ltd, New Delhi. pp: 515-517.

TABLE 1: Indian Ambient Air Quality Standards with respect to noise

Area code	Zones	Limit in dB during the day
A	Silent zone	50
B	Commercial zone	65
C	Industrial zone	75
D	Traffic zone	70

Source: Reports of Central Pollution Control Board and Orissa Control Board (Kurian Joseph and Nagendran, 2004).

TABLE 2: Average Noise Level (dB) recorded in five Hospitals (Silent Zone)

S.No.	Area	Hospitals *				
		A	B	C	D	E
1	Lobby	77.21	73.56	73.60	81.46	76.87
2	Registration hall	76.21	75.62	68.30	70.40	61.64
3	Waiting hall	70.24	72.07	67.54	76.10	73.98
4	Pharmacy	78.00	73.26	74.20	74.90	61.64
5	Private ward	63.43	70.17	65.30	–	62.30
6	General ward	74.58	73.92	70.49	72.04	64.10
7	Parking area	80.60	81.18	70.55	82.30	80.10
8	Intensive Care Unit	–	–	–	70.58	–
9	Infectious Disease Section	–	–	–	66.80	–
	Average for each Hospital	74.32	74.25	69.99	74.32	68.66

A. Jayaraj Annapackiam Hospital **B.** Krishna Hospital **C.** Pushpalatha Hospital
D. Government Hospital Tirunelveli **E.** C.S.I Bell Pin Indrani Chelladhurai Mission Hospital

* Average made from 10 Readings

TABLE 3: Average Noise Level (dB) recorded in five Libraries (Silent Zone)

S.No.	Area	Libraries *				
		A	B	C	D	E
1	Counter	62.69	70.9	68.34	59.58	65.66
2	Reference Section	61.72	69.53	66.98	62.23	64.33
3	Reading Section	64.76	77.74	67.57	63.17	66.58
4	Internet Lab	65.66	–	59.53	61.80	–
	Average for each Hospital	63.70	72.72	65.60	61.69	65.52

A. St.John’s College Library **B.** District Central Library Tirunelveli
C. St.Santiago Library, St. Xavier’s College **D.** St. Xavier’s College of Education
E. Ignatius College of Education * Average made from 10 Readings

TABLE 4: Average Noise Level (dB) recorded in five Schools (Silent Zone)

S.No.	Area	Schools *				
		A	B	C	D	E
1	Assembly	73.73	75.30	70.10	84.15	75.47
2	Class room	75.61	77.89	69.39	72.55	73.05
3	Lunch break	71.31	80.35	71.4	82.03	74.30
4	Play ground	77.22	78.30	74.95	79.95	80.86
	Average for each School	74.46	77.96	71.46	79.67	75.92

A. Clarinda Nursery and Primary School **B.** Christhu Raja Higher Secondary School
C. Rose Mary Matric Higher Secondary School **D.** St. Xavier’s Higher Secondary School
E. Ignatius Convent Higher Secondary School * Average made from 10 Readings

TABLE 5: Average Noise Level (dB) recorded in five Academic areas at St. Xavier’s College (Silent Zone)

S.No.	Area	Noise Level(dB) *
1	Loyala Hall (Ph.D. Viva Voce)	79.85
2	Lebeau Auditorium	82.77
3	Loyala hall (Seminar)	73.29
4	Loyala hall (Debate)	82.17
5	Loyola hall (Quiz Competition)	76.42
Average for St. Xavier’s College		78.90

* Average made from 10 Readings

TABLE 6: Average Noise Level (dB) recorded in five markets (Commercial Zone)

S.No.	Name of Markets	Area	Noise Level (dB) *	Average
1	Punitha Super Market	Packing Section	71.22	68.54
		Dress Section	65.02	
		Case Counter	69.38	
2	Gandhi Palayamkottai Market	–	73.66	73.66
3	Subiksha Super Market	–	77.57	77.57
4	Ulavar Palayamkottai Santhai,	Vegetable Section	71.26	70.59
		Flower Section	69.93	
5	Kavins Super Market	Packing Section	73.16	72.14
		Case Counter	71.13	

* Average made from 10 Readings

TABLE 7: Average Noise Level (dB) recorded in five Theatres (Commercial Zone)

S.No.	Area	Theatres *				
		A	B	C	D	E
1	Opening Scenes	96.27	98.33	98.29	97.15	91.93
2	Stunt Scenes	105.24	105.82	105.44	105.83	103.46
3	Comedy Scenes	84.96	84.71	85.64	82.69	82.55
4	Song Sequences	106.25	103.57	103.62	106.63	104.80
5	Dialogue	87.93	85.19	84.44	83.71	83.07
6	Interval	77.92	74.93	74.06	74.11	73.82
	Average for each Theatre	93.09	92.09	91.91	91.69	89.93

A. Bombay Theatre **B.** Sri Retna Theatre **C.** Sri Ganesh Theatre **D.** Ram Theatre

E. Sri Senthilvel Theatre * Average made from 10 Readings

TABLE 8: Average Noise Level (dB) recorded in five Minor Industries (Industrial Zone)

S.No.	Name of industries	Noise Level (dB)(Average)*
1	Arunachallum Plaining Mill	100.54
2	Flour Mill	93.96
3	Sudalaimuthu Chemical Factory	93.91
4	St.Xavier's College Rice Mill	89.29
5	Sri. Ramalekshmi Saw Mill	88.34

* Average made from 10 Readings

TABLE 9: Average Noise Level (dB) recorded in five Medium Industries (Industrial Zone)

S.No.	Name of Industries	Area	Noise Level (dB)(Average) *	
1	Ganapathi Spining Mills	Blower room	96.39	
		Mixing room	70.61	
		Carding	94.26	
		Roving	Breaker	88.42
			Finisher	86.78
			Machine spinning	91.93
		Spinning	Polyester	101.22
			Cotton	99.04
		Winding	Cotton	90.85
			Doubling	95.20
		Cease winding	88.36	
Reeling section	85.58			
Packing	81.84			
2	Subburaj Spining Mills	Spinning section	97.99	
		Auto coner	90.25	
		Blower room	94.63	
		Outside the Campus	81.50	

* Average made from 10 Readings

TABLE10: Average Noise Level (dB) recorded in two Railway Stations (Traffic zone)

S.No.	Area	Railway Stations *	
		A	B
1	Ticket Counter	76.89	64.85
2	Platform	81.05	68.85
3	Rail track	106.41	95.78
4	Train Departing	89.76	92.02
	Average for each station	88.52	80.36

A. Tirunelveli Railway Station **B.** Palayamkottai Railway Station * Average made from 10 Readings

TABLE 11: Average Noise Level (dB) recorded in four places in Tirunelveli Bus Stand (Traffic zone)

S.No.	Name of Bus Stand	Working day *		Holiday *		Average for each Session
		Peak hours (8.30-10.30)	Non-Peak hours (10.30-12.30)	Peak hours (8.30-10.30)	Non-Peak hours (10.30-12.30)	
1	New Bus Stand	82.03	79.28	80.40	79.17	80.22
2	Junction Bus Stand	84.02	81.87	82.90	81.60	82.59
3	High Ground Roundana	81.14	79.96	81.55	80.18	80.70
4	Palay Bus Stand	83.77	83.05	83.12	82.73	83.16

* Average made from 10 Reading

TABLE 12: Average Noise Level (dB) recorded in four places in Tirunelveli Town (Traffic zone)

S.No	Locality	Working day *		Holiday *		Average for each Locality
		Peak hours (8.30-10.30)	Non-Peak hours(10.30-12.30)	Peak hours (8.30-10.30)	Non-Peak hours(10.30-12.30)	
1	Vannarapetai	87.27	84.86	86.11	83.52	85.44
2	Murugankurichi	84.99	82.38	84.56	82.42	83.58
3	Tamirabarani bridge	86.87	84.18	84.32	83.54	84.72

* Average made from 10 Readings