GLOBAL JOURNAL OF PURE AND APPLIED SCIENCES VOL. 13, NO. 2, 2007: 205 - 208

 1SSN 1118-0579

ENVIRONMENTAL NOISE POLLUTION PATTERN WITHIN WARRI METROPOLIS

A. RIM-RUKEH, P.A. OKOKOYO AND E. C. IGHERIGHE

(Received 27 January 2004; Revision Accepted 3 March 2004)

ABSTRACT

The paper reports the assessment of the environmental noise pollution pattern in Warri metropolis using a CEL precision integrated sound level meter. Noise level was measured at 10 selected sampling stations. The results indicate a mean highest level of 107dB(A) at Enerehen junction and a mean lowest level of 55dB(A) at Airport road junction and water resources road by Izakpa road. Identified sources of noise generation are, record sellers [mobile and stationary], indiscriminate use of vehicle-horn, power generators, automobile engines, siren from police/banks escort and loudspeakers fixed to mosques and churches. The measured noise levels were compared with the exposure limits of 90dB(A) and 80dB(A) recommended by FEPA and WHO respectively.

KEYWORDS: Noise, Pollution, Environment, level, decibels.

INTRODUCTION

The variables through which pollutants reach us include not only the air we breathe, the water we drink, the food we eat but also the sound we hear. Noise, an unwanted sound [Hawel, 1992] has been recognized as a polluting agent in the environment [Menkiti, 1994].

Excessive noise constitutes a serious threat to the quality of life enjoyed especially in the urban and industrialized environment. Studies in environmental noise show that the effects excessive noise range from interference with speech communication and sleep to psycho-social stress and loss of hearing [Rau et al 1980 and Bernard 1970]. A background noise of 45 – 60 dB can moderately interfere with speech while at 60 dB one has to shout to be heard. A noise intensity level of 35-40 dB can slightly interfere with sleep while that at 50 dB can make falling asleep a lengthy process. The ultimate effects of sleep interference are headache, fatigue and palpitations [Bernard, 1970]. Studies have shown that noise affects a worker's mind and output. It changes a worker's emotion and behaviour in a number of ways and tends to make him commit more errors [Cheremisionoff, 1978]. A noise level as low as 70 dB has been observed to produce vasoconstriction, leading to poor blood circulation in the human systems [Dix, 1981]. A noise level of 100dB can cause hearing loss if the individual is exposed to such noise eight hours a day for a period of five years. [Anthrop, 1973].

Ambient noise level is on the increase. Wesler [1972] has estimated that ambient city noise in many areas of the USA has doubled in 20 years. In the developed and industrialized world, extensive arrays of noise pollution studies in large cities are available [Wesler 1972 and Stathis 1981]. In Nigeria, very few reports of noise pollution studies are available [Onuu and Menkiti (1972), Abumere et al (1999) and Egunjobi, (1988)]. In Nigeria, noise pollution has not been seen as dangerous and having adverse effects on the life of the people [Egunjobi, 1988]. This probably explains why not much research work into environmental noise pollution has been carried out within Nigerian cities.

It is against this background that attempt is made in this study to investigate the environmental noise pollution pattern in Warri (Nigeria) metropolis.

STUDY AREA AND SAMPLING POINTS

Warri is situated in Warri-South Local Government Area of Delta State, and longitude 507' East. Warri is the home of major Oil Companies and numerous oil services.

The Sampling stations where noise levels were measured in the study are:

1. Airport Junction
2. Eneheren Junction
3. Estate Junction
4. Hausa Quarter
5. Warri Garage
6. Old NPA
7. Warri Market
8. Airport Road by Custom Barrack
9. Odibo Roundabout
10. Water Resources Road by Izakpa Road

METHODOLOGY

Noise level measurements where carried out using a CEL precision [+1dB] integrating sound level meter fitted with half-inch condenser microphone and windshield. The temperature range for the workability of the noise meter is – 100 C to 500C. The measurements were made using the A weighting response. The A weighting was used because it responds as the human ear. Consequently, all readings were written as dB(A) where dB stands for decibel and A for the A weighting. At every sampling station, the meter was hand held at a height of approximately 1.5m above ground and away from the body. The data were collected between 12.00 Noon to 2.00pm each time in order to maintain a uniform time frame

RESULTS AND DISCUSSION

The results obtained for the study are presented in Table 1.0. The mean [x] was computed for the sampling stations and compared against FEPA [1991] and WHO [1991] maximum allowable limits for eight hours exposure [Table 2.0]

A. Rim-Rukeh, Integrated Science Department, College of Education, P. M. B. 2090, Agbor, Delta State, Nigeria.
P. A. Okokoyo, Chemistry Department, College of Education, P. M. B 2090, Agbor, Delta State, Nigeria.
E. C. Igherighe, Physics Department, College of Education, P. M. B. 2090, Agbor, Delta State, Nigeria.

Table 1.0: **Noise level values measured at various sampling locations**

NO	SAMPLING STATION	Noise levels (dB (A)						
		Days of the Week						
		Mon	Tues	Wed	Thur	Fri	Sat	Sun
1	Airport Junction	57	48	52	51	45	61	70
2	Enerhen Junction	98	112	118	106	120	114	78
3	Estate Junction	94	97	92	108	106	106	51
4	Hausa Quarter	79	80	84	77	90	94	67
5	Warri Garage	84	82	91	81	96	90	67
6	Old NPA	91	89	110	98	97	118	40
7	Warri Market	79	80	82	74	92	84	66
8	Airport Road by Customs Barrack	51	60	51	48	46	88	119
9	Odibo Roundabout	60	51	64	58	59	54	43
10	Warri Resources Rd by Izakpa	48	45	40	46	42	65	97

Table 2.0: Noise level acceptability [FEPA and WHO]

NO	SAMPLING STATION	MEAN LEVEL OF NOISE	LIMIT FOR 8 HR EXPOSURE dB (A)	
1	Airport Junction	55	90	80
2	Enerhen Junction	107	90	80
3	Estate Junction	95	90	80
4	Hausa Quarter	82	90	80
5	Warri Garage	82	90	80
6	Old NEPA	92	90	80
7	Warri Market	80	90	80
8	Airport Road by Customs Barracks	66	90	80
9	Odibo Roundabout	56	90	80
10	Water Resources Road by Izakpa	55	90	80

The noise levels recorded at sampling points [Airport Junction, Enerhen Junction, Estate Junction, Hausa Quarter, Warri Garage, Old NPA, Warri Market, Airport Road, Odibo Roundabout, and Water Resources Road] ranged between 45-70 dBA, 78-120 dBA, 57-108 dBA, 67-94 dBA, 48-96 dBA, 40-118 dBA, 66-92 dBA, 46-119 dBA, 43-64 dBA and 40-97 dBA respectively. Table 2.0 shows the mean noise levels measured in the range of a minimum 55 dBA to a maximum of 107 dBA. The area with the highest level of 107 dBA was at Enerehen junction while the lowest level was at Airport junction and water resources road at a value of 55 dBA. In addition figures 2 to 11 indicate the histograms for each of the sampling stations.

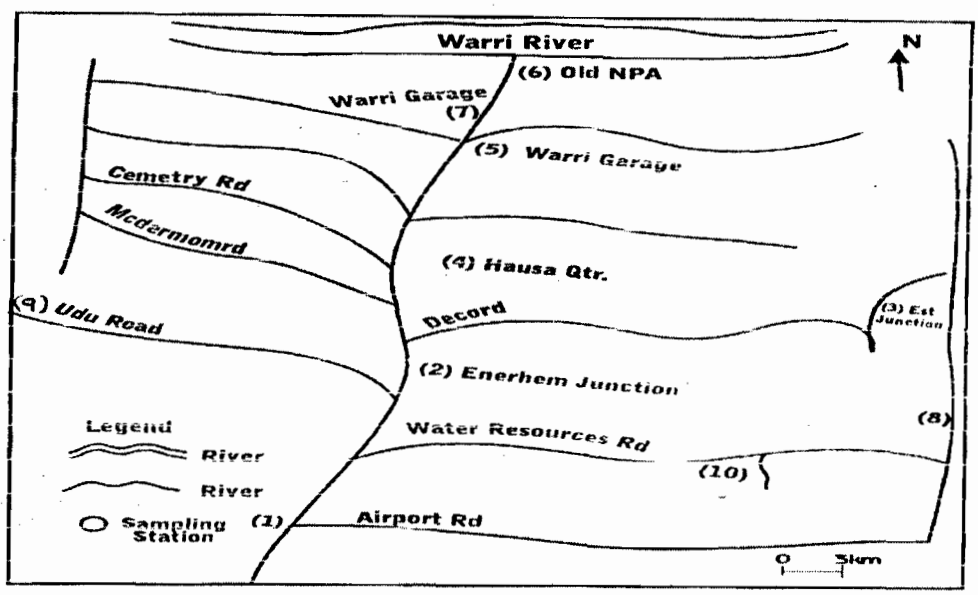

Fig. 1: Location of Sampling Stations in Warri Metropolis

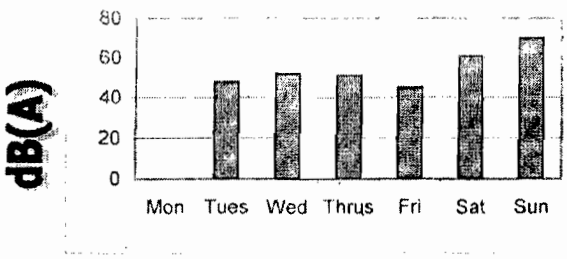

Fig 2. The Measured Noise level at Airport Junction

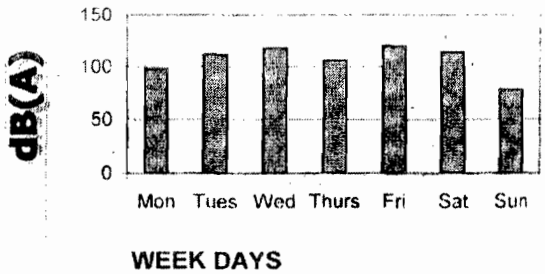

Fig. 3: The Measured Noise level at Enerhem Junction

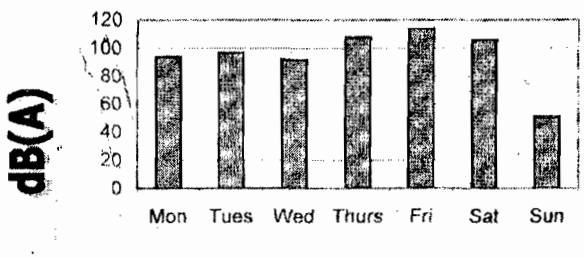

Fig. 4: The Measured Noise level at Estate Junction

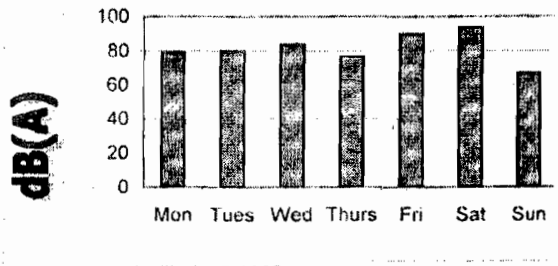

Fig. 5: The Measured Noise level at Hausa Quarter

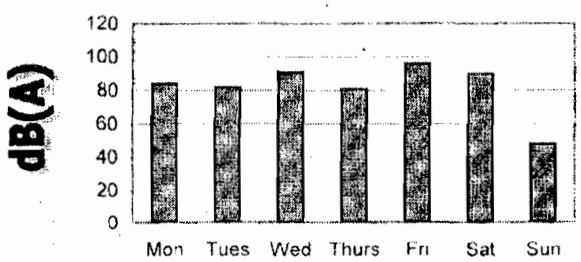

Fig. 6: The Measured Noise level at Warri Garage

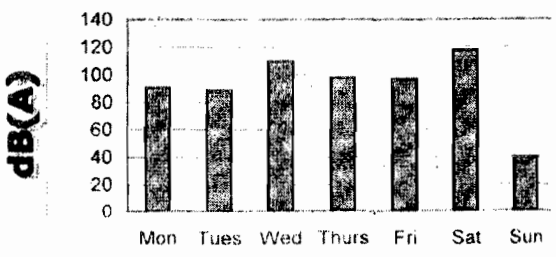

Fig. 7: The Measured Noise level at Old NPA

Studies of these observations reveal that the areas [Enerehen junction, Warri market, Hausa Quarter, Estate junction, Warri Garage, and Old NPA] with highest commercial activities had high level of noise. The positive correlation between commercial activities and increased noise level was collaborated by *Abumere et al* [1999] in their study on the environmental noise within Port-Harcourt metropolis. The major sources of noise were record sellers, who blast their new records at the highest pitch attainable in order to attract customers, indiscriminate use of vehicle – horn by drivers, power generators, automobile engines and siren from police escort. In addition there is not much commercial activities in areas (Odibo Roundabout, Airport by custom barracks, Water resources road by Izakpa road, and Airport junction) and hence the low noise levels of 55 - 66dBA. Onuu and Menkiti [1972] have analysed the spectra of road traffic noise occasioned by indiscriminate use of vehicle horn by drivers to dominate the type of noise for parts of south-eastern Nigeria. Other source of environmental noise in this study is that generated from gigantic loudspeakers fixed to mosques and churches. The high noise level figures observed on Sunday can be accounted for by the presence of loud speakers mounted by churches. Their finding is consistent with that of Egunjobi [1983] in his study on the city of Ibadan.

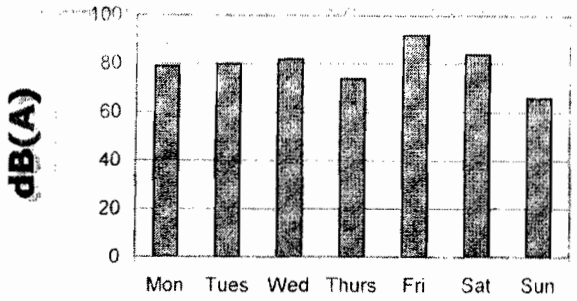

Fig. 8: The Measured Noise level at Warri Market

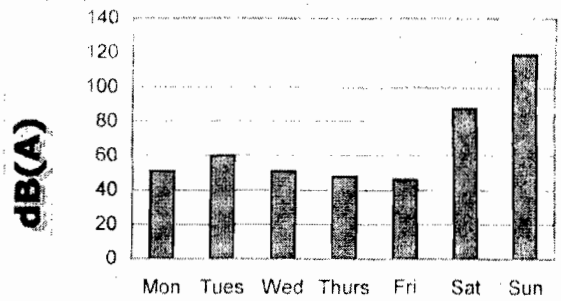

Fig. 9: The Measured Noise level at Airport Rd Customs Barrack

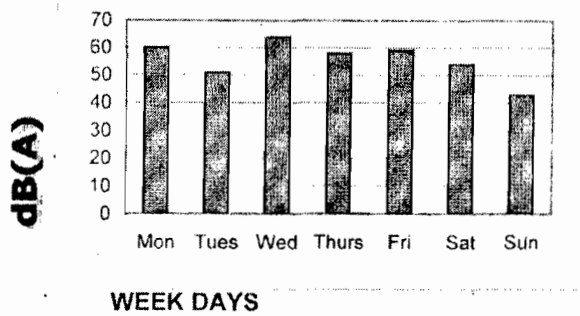

Fig. 10: The Measured Noise level at Odibo Roundabout

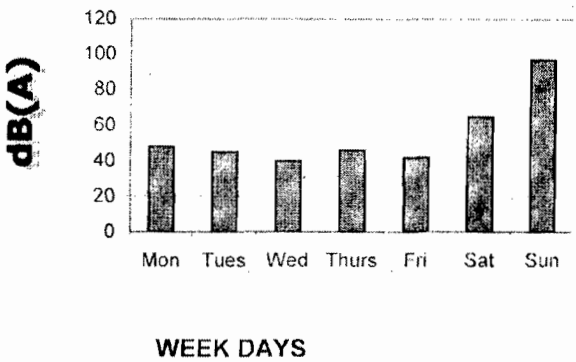

Fig. 11: The Measured Noise level at Water Resources Rd by Izakpa

CONCLUSION

The environmental noise pollution pattern of Warri metropolis has been studied and the noise level to which inhabitants are daily exposed to observed. This probably accounts for rising number of young boys and girls carrying envelopes with inscription 'deaf and dumb' begging for alms in our motor-parks and traffic junctions. Noise as a public health nuisance is on the increase and accordingly government should evolve a national environmental noise pollution with an appropriate programme to mitigate/control it.

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