
ASSESSMENT OF NOISE LEVELS IN RUMUOKORO MOTOR PARK IN RIVERS STATE, NIGERIA

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ABSTRACT

The study was aimed at determining the level of noise pollution in a motor environment. Noise level in the Rumuokoro motor park was measured with a type II noise meter called Sound Level Meter GM1352. The study involved field noise Measurements which were carried out at five established points around Rumoukoro motor park during morning, afternoon and evening time periods. The minimum mean and maximum mean noise levels for morning time periods were between 74.8 dB(A) and 86.3 dB(A) respectively. The afternoon time periods showed a minimum mean noise level of 75.7 dB(A) and a maximum mean noise level of 82.7 dB(A); while the evening time periods mean noise levels were between 74.8 dB(A) and highest of 86.6 dB(A). Thus, noise levels in the morning and evening time periods recorded higher noise levels than the afternoon time periods. The result of this study showed that the measured level of noise exceeded the international standards (WHO and USEPA) and national standards (NESREA and FMENV) in monitoring noise level in the environment.

Keywords: Noise pollution, Noise Levels, Time periods, Rumuokoro, Motor Park, Port Harcourt.

1. INTRODUCTION

The motor parks environment in major urban centres constitutes hazards and risks to users. People in motor parks are exposed to noise pollution mostly from horns of vehicles, running automobile engine, use of generators, faulty exhaust pipes and from megaphone speakers used for soliciting commuters which pose a threat to those in the vicinity of the motor park directly or indirectly (Pathak et al., 2008). The level of environmental noise pollution over the years is alarming due to rapid increase in human activities such as urbanization, industrialization and transportation (Pathak et al., 2008; Hunashal and Patil, 2012). Noise is no doubt a normal phenomenon of life and is derived to be one of the most effective alarm systems in man's physical environment. However, it is continuously disturbing human peace and tranquility. Noise is inevitable, due to the fact that we face it in our everyday lives while driving, working and carrying out many routine activities (WHO, 2004). Noise, a by-product of urbanization and industrialization, is increasingly recognized as an environmental nuisance that affects human health and well-being (Mansouriet al., 2006; Eduket al., 2016). Mangelekaret al. (2012) reported noise as an unwanted sound that is unpleasant or unexpected.

Noise pollution is an environmental hazard which started long time ago since the beginning of

civilization till today. Noise pollution has been linked with human activities and persistent human interaction with the environment. Ayanlade and Oyegbade (2016) reported that noise pollution had gained increased attention over the past decades and studies had shown that noise pollution was one of the environmental hazards affecting humans, the effects of which ranged from annoyance to sleeping difficulty, which later resulted to high blood pressure. Noise constitutes a nuisance in many fast growing urban areas like Nigeria which impacts negatively on the social, physical and psychological well-being of man (Oyedepo, 2012). There are two types of noise pollution mainly from natural and anthropogenic sources. Natural sources include; weather through thunderstorms, noise from insects and animals like bees, birds, crickets, birds and frogs. Anthropogenic sources are classified as industrial and non-industrial noise. Industrial noise sources are noise from machines, welding operations, metal and fabrication works, forging, cutting and generator noise (Oyedepo, 2012).

In addition, non-industrial noise is the noise that is not from industries or factories which include noise from transportation via road, air and rail, residential noise from homes through noise from washing and blending machines, loud music, televisions and so on. Some of the sources of noise pollution are loud music, religious activities from mosques and churches, noise emitting generators (Ibhadodeet al., 2018), political rallies, road advertisement, traffic (Agarwal and Swami, 2010; Wani and Jaiswal, 2010; Oyedepo, 2013). Noise as nuisance continues to increase on a daily basis as a result of poor public awareness. People are ill informed of the dangers and public health implications of noise pollution. The issue is becoming alarming in most cities in Nigeria especially in Port Harcourt. A lot of people living in Port Harcourt are either not aware or not fully aware of the dangers of being exposed to high noise levels in their surroundings. Therefore, it is essential to ascertain areas with high noise level Rumuokoro motor park in Port-Harcourt, Rivers State, Nigeria. Measured noise levels were discussed in relation to environmental standards. Thus, the study measured noise levels around Rumuokoro motor park at different time periods (morning, afternoon and evening).

2.MATERIALS AND METHODS

2.1 Study Area

Rumuokoro Motor Park is one of the busy motor parks in Port Harcourt, Rivers state due to the location of markets. Port Harcourt the capital of Rivers state is located geographically on latitude 40 45' 00''N and 40 55' 00''N and longitude 60 52' 30''E and 70 10' 00''E. Port Harcourt is the second largest commercial and agricultural center, and is home to the second busiest seaport in Nigeria. The presence of crude oil has made it the epi-center of the petroleum industry in Nigeria, with large number of Oil and Gas infrastructures, as well as other industrial and commercial interest. (Adeomo, 2013)

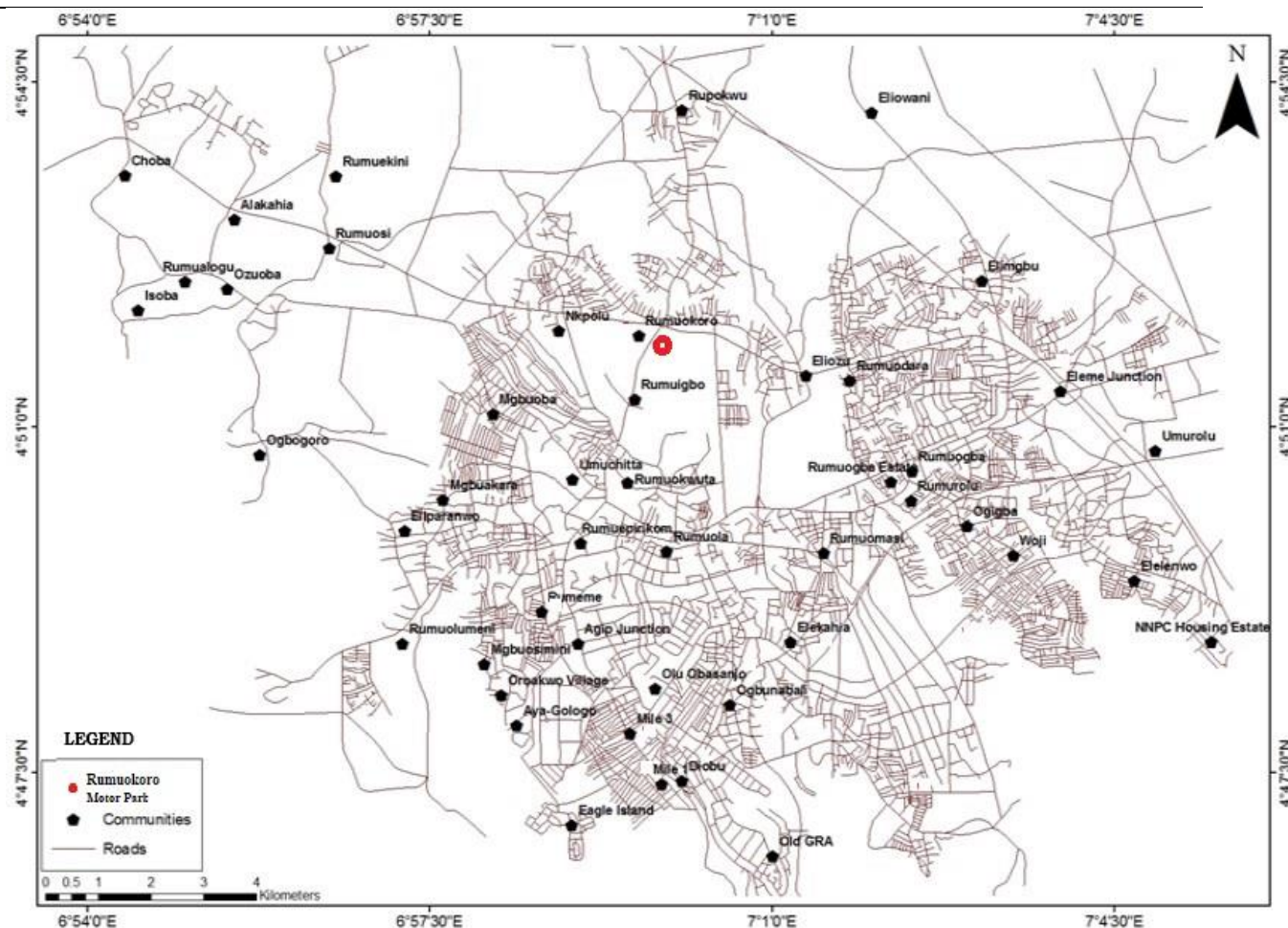


Figure 1: Port Harcourt metropolis showing Rumuokoro Motor Park

2.2 Noise levels Measurement

Noise level around Rumuokoro Motor Park was measured with a type II noise meter called Sound Level Meter GM1352. The sample was collected by placing the meter about 1.2 metres above the ground. Measurements were carried out at five points within the Rumoukoro motor park during morning, afternoon and evening time periods. The measurement of noise level was carried out in the morning time between 7.00 am and 10.00am, afternoon time was carried out between 12.00pm and 3pm, and during the evening time between 4.00 pm and 7.00 pm for a period of 7 days (Monday – Sunday) at the Rumoukoro Motor park. The sampling of noise levels was carried out at five (5) different points established randomly within the Rumuokoro Motor Park.

3. RESULTS

The mean noise levels at Rumuokoro Motor Park at different time periods are presented on Table 1 while Table 2 displays the descriptive statistics of the data. The minimum mean and maximum mean noise levels for morning time periods were between 74.8 dB(A) and 86.3 dB(A) respectively. The afternoon time periods showed a minimum mean noise level of 75.7 dB(A) and a maximum mean noise level of 82.7 dB(A). In the evening time periods, mean noise levels were between the lowest of 74.8 dB(A) and highest of 86.6 dB(A). Thus, noise levels in the morning and evening time periods recorded higher noise levels than the afternoon time periods at the Rumuokoro Motor Park. The result of the study revealed that the distribution of noise levels varied among sampled points from days study. The noise levels were higher in the morning and evening periods compared to the afternoon period. This can be attributed to peak and off peak time periods of the day. The increase in noise levels during the peak periods are characterized by commercial activity during this period and heavy traffic flow in Port Harcourt. The peak periods in the study area are usually characterized by traffic congestion and several slow vehicular movements which many times lead to buzzing of vehicle horns. Also, coupled with several business and socio-economic activities, the sampled points around each selected Motor Parks were clear indications of high commercial activities all round.

Consequently, descriptive statistics information on Figure 2 further revealed that the highest column mean value obtained across time periods on Friday was 84.3 dB(A) which is higher than the international and national standards of environmental noise limit of 65 dB(A) for commercial centres. Higher noise levels can be injurious to public health. As regards the health implications of this high noise levels to the people, the study discovered that since the Motor Parks are zones of commercial activities whereby people gather at different time periods of the day engaging in one activity or the other mean that individual's level of exposure may vary depending on the length of exposure.

Table 1: Mean Noise Levels at Rumuokoro Motor Park at different time periods

Time Periods	Points	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
		Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Morning (7-11am)	1	82.2±3.3	84.9±3.2	84.3±3.8	85.7±2.9	84.3±2.3	83.3±2.8	74.8±6.7
	2	78.3±4.8	86.2±1	83.8±3.4	83.8±1.8	83.1±2.4	81.6±2.8	79±7.8
	3	79.5±3.3	82.3±3.1	82.3±2.0	81.3±1.2	86.3±2.1	80.8±2.3	75.99±7.1
	4	80.9±0.4	82.7±3.6	80.5±2.5	84.99±3.3	82.1±1.8	78.7±5.5	73.1±3.0
	5	80.4±5.1	85.7±2.1	80.5±3.8	81.9±2.8	85.6±2.3	78.1±2.1	79.5±2.3
Afternoon (12-3pm)	1	76.5±5.6	80.8±4.8	79.3±0.8	78.8±1.6	80.2±4.1	79.3±0.8	77±2.2
	2	79±1.4	79±1.3	82.4±3.4	82.5±4.9	80±1.0	82.7±3.8	78.5±7.9
	3	82±1.5	75.9±5.1	80.7±2.0	81.3±2.9	81.8±1.5	80±3.1	79.2±1.4
	4	75.7±6.2	76.9±5.4	79.8±4.2	74.9±4.0	79.1±1.5	74.9±6.9	79±5.2
	5	79.2±0.9	72.8±4.7	79.2±0.6	81.6±3.1	79.2±2.0	76.1±5.5	76.4±8.4
Evening (4-7pm)	1	83.2±1.3	85.4±2.6	81.4±2.3	82.6±1.7	84.4±2.4	81.8±2.0	80±5.6
	2	79.5±0.8	82.2±2.7	80.9±2.2	82.5±2.3	86.6±1.8	79.3±2.4	80.5±5.0
	3	78±0.8	80.9±1.2	80.1±2.7	80.5±1.7	81.5±1.1	81.8±3.5	82±4.7
	4	78.6±3.4	79.2±1.3	81.6±1.9	84.4±4.0	79.3±1.0	82.4±1.5	79.5±7.0
	5	75.7±7.7	81.5±0.9	76.9±7.4	79.7±3.7	82.6±1.9	80.5±3.1	74.8±6.51

Table 2: Descriptive Statistics

Time periods	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Morning	35	81.669	3.2114	.5428	80.565	82.772	73.1	86.3
Afternoon	35	78.909	2.4235	.4096	78.076	79.741	72.8	82.7
Evening	35	80.909	2.4755	.4184	80.058	81.759	74.8	86.6
Total	105	80.495	2.9433	.2872	79.926	81.065	72.8	86.6

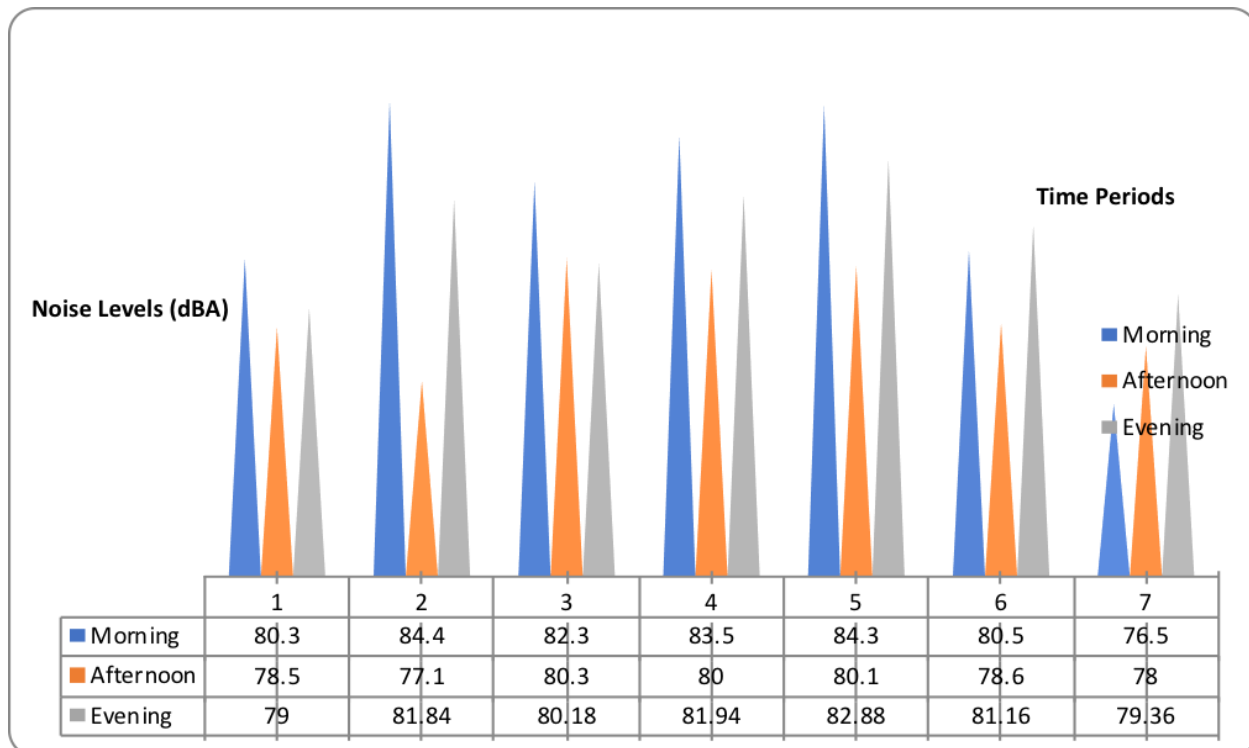


Figure 2: Column Mean Analysis of Noise Levels across Time Periods in Rumuokoro Motor Park

4. DISCUSSION

Rumuokoro Motor park is a busy park in the commercial city of Port Harcourt because of its proximity to one of the major markets of the state hence, it serves as the spot converging different persons from different parts of the state and from outside the state for economic activities. The continuous noise from generating plants from different shops within the park also adds to the noise from the vehicular movement. The noise levels were higher in the morning and evening periods compared to the afternoon period. This finding agrees with the findings of Riyad et al., (2020) who studied noise pollution by traffic during peak and off peak periods in Dhaka city. The study discovered that high noise levels were recorded at commercial roads especially during the peak periods of the day

Similarly, all contributing factors like continuous noise from generating plants from different shops within the park and also the noise from the vehicular movement increases noise levels around the Motor Parks at different time periods. The implication of this is the fact that commercial areas are points and locations of noise pollution from different sources. In a similar study by the United State Department of Transportation (2020), it was discovered that commercial centres generate a lot of environmental noise because of traffic influencing events and demands from time to time. Various authors in their studies have found that sound levels are

mainly related to road traffic characteristics, and especially traffic volume, vehicle horns, rolling stock and tires, unmuffled vehicles, etc. (Oyedepo, 2012)

The findings of the study as regards the high levels of measured noise have several health implications. This is in line with the findings of Kumar et al., (2011) which stated that level of effect of noise on the health of people depends on the distance between the noise source and the distance the noise has to travel before reaching people close to it. This is a description of the source, pathway and the receiver concept as explained from source of noise pollution to its receiver by the study. It is also obvious as observed by the study that majority of people may not be aware of the dangers of being exposed to high noise on a day to day basis especially those people who utilizes these Motor Parks on a daily basis. This agrees with the findings of Owojori (2017) on people and their level of awareness of the potential dangers of high noise levels and its health implications overtime.

5.CONCLUSION

The health of the populace is very important and is influenced by different factors one of which is the noise level within the environment. The result of this study showed that the measured level of noise exceeded the international standards (WHO and USEPA) and national standards (NESREA and FMENV) in monitoring noise level in the environment hence the result of this study revealed that the over busied Rumuokoro Motor park to be harmful to human health particularly in the case of exposure to high noise level. The government can help to sensitize the people and the management officers around Motor Parks about the need to reduce activities that lead to increased noise level and also to decongest the environment.

REFERENCES

- Adeomo, A. (2013). History and development of Port Harcourt. www.ecologyandsociety.org/voll2iss1/art13
- Agarwal, S. and Swami, B. L. (2010). Status of Ambient Noise levels in Jaipur City. *Environment Conservation Journals*, 11 (1&2), 105-108.
- Ayanlade, A. and Oyegbade, E. F. (2016). Influences of wind speed and direction on atmospheric particle concentrations and industrially induced noise. *Springer Plus*, 5(1), 1-13.
- Eduk, A.R., Osuji, L.C., and Thomas, B.F. (2016). Ambient air quality and noise pollution monitoring in Uyo Metropolis, Akwa Ibom State, Nigeria. *International Journal for Innovative Research in Multidisciplinary Field*, 2(10), 528-536
- Hunashal, R. B. and Patil, Y. B. (2012). Assessment of noise pollution indices in the city of Kolhapur, India. *Procedia Social and Behavioural Science*, 37: 448-457.
- Kumar, I. V. K. Katiyar, Parida, I.M, and Rawa, K (2011). *Mathematical Modeling of Road Traffic Noise Prediction* Department of Mathematics, IIT Roorkee, India-247667. Centre for Transportation, Department of Civil Engineering, IIT Roorkee, India-247667
- Mangelekar, S. B., Jadhav, A. S. and Raut, P. D. (2012). Study of Noise pollution in Kolhapur City, Maharashtra, India. *Universal Journal of Environmental Research and Technology*, 2(1), 65-69
- Mansouri, N., Pourmahabadian, M. and Ghasemkhani, M. (2006). Road traffic noise in down

town area of Tehran Iran Journal of Environmental Health Science and Engineering, 3(4), 267–273.

Oyedepo, S. O. (2012). 'Noise Map: Tool for Abating Noise Pollution in Urban Areas', Scientific Reports (Omics), 1(3), 1 – 7.

Oyedepo, S. O. (2013). Development of noise map for Ilorin metropolis, Nigeria. International journal of environmental studies, 70(4): 503-514.

Owojori, A. A. (2017). Assessment of noise level and its effects on teaching and learning process in primary and secondary schools in Zaria Metropolis, Nigeria. M.Sc. Dissertation, Ahmadu Bello University

Pathak, V., Tripathi, B. D. and Mishra, V. K. (2008). Evaluation of traffic noise pollution and attitudes of exposed individuals in working place. Atmospheric Environment, 42 (16): 3892-3898.

Riyad, R. H., Amin Al, Mazumder, M. (2020). A study of noise pollution by traffic during peak and off peak hour in Dhaka City. Journal of Innovations in Civil Engineering and Technology 2(2), 43-53

Wani, K. A. and Jaiswal, Y. K. (2010). Assessment of Noise Pollution in Gwalior M. P. India, Advance in BioResearch, 1(1), 54-60.