

Study of Noise Pollution During Pre-Carnival, Carnival And Post-Carnival Festivals In Calabar Municipality, Calabar, Cross River State, South – South Nigeria

¹Aniefiok O. Akpan, ²Ubon E. Asuquo and ³Augustine A. Umoh

¹Department of Physics, Akwa Ibom State University, Nigeria, ²Department of Physics, University of Calabar, Cross River State, Nigeria.

³Department of Physics, University of Uyo, Uyo, Akwa Ibom State, Nigeria.
Corresponding Author: Aniefiok O. Akpan

Study of noise pollution during pre-carnival, carnival and post-carnival periods in Calabar Municipality has shown that the municipality is always highly polluted with noise from vehicles, facilities of transportation, drumming, trumpeting, shouts, knock-outs, firecrackers etc, during the carnival festival. Noise levels as high as 77.4 to 102.2 dB(A) which far exceed the 60 to 65dB(A) permissible out-door level have been recorded. Average noise levels of 94.9 dB(A) in the morning, 84.0 dB(A) in the afternoon and 96.1 dB(A) in the evening were obtained during the carnival period while 80.8, 75.9 and 82.1 dB(A), 80.7, 75.7 and 82.1dB(A) were average levels for morning, afternoon and evening of pre and post carnivals respectively. The lowest noise levels were in the afternoons when comparing these three investigating periods, 70.7 dB(A) at site 6 in pre-carnival, 77.4 dB(A) at site 10 in carnival and 70.5 dB(A) at site 6 at post-carnival. The number of vehicular and other human activities during the day time reduced tremendously. The citizenry who are made up of the youth, middle aged and the old stand the risk of endangering their health physically, psychologically or socially due to noise generated during this festival. The organisers of this festival are therefore advised not to look at the merriment and income generation aspect of this festival only but should also consider the damaging effect of noise on the well being of the people which includes temporary or permanent hearing loss. Alternative ways of organising the festival without excessive noise in the municipality should be sought for.

Key Words: Noise pollution, carnival, noise levels, health hazard, hearing loss.

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I. Introduction

Noise pollution is a significant environmental problem in many urban areas that has not been properly recognised despite the fact that it is steadily growing in developing countries (Jamrah et al., 2006). At present, noise pollution is considered as one of the key problems of urban communities that has numerous hazardous effects on the urban environment and may result in a great deal of costs on the society. (Martin et al., 2006; Chien, 2007).

There is no question that noise is both a public health hazard and an environmental pollutant as well. It is present in every human activity and is classified as either occupational noise i.e. Noise in workplace, or as environmental noise which includes noise in all other settings, whether at community, residential or domestic level when assessing its impact on human well-being (Concha-Barrientos et al., 2004). Vehicles, musical instruments, small scale industries, urbanization and human activities are the main sources of noise pollution. (Gangwar, 2006).

Traffic noise levels increase with increasing density of traffic composition, the road slope, width and surface structure distance to cross road (Williams and McCrae, 1995). Studies have also attributed vehicular noise pollution to large scale migration, increase in number of vehicles (Escap, 1990), traffic jams, defective roads and vehicles and above all the human factor which in our society is reflected by inherent impatience under social pressures giving rise to such acts as blowing of horns unnecessarily. (Sharikh and Rizvi, 1990; SEPA, 1994; Ahmed, 1994; Mehdi et al., 2002; Dev and Singh, 2011). These attributes are well pronounced during festive periods.

Table 1: Climate data for Calabar

Climate data for Calabar													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high °C (°F)	28 (83)	29 (85)	29 (85)	28 (83)	28 (82)	27 (80)	26 (78)	25 (77)	26 (78)	26 (79)	27 (81)	28 (83)	27.3 (81.2)
Average low °C (°F)	27 (80)	28 (83)	28 (83)	27 (81)	27 (80)	26 (78)	25 (77)	24 (76)	25 (77)	26 (78)	26 (79)	27 (80)	26.3 (79)
Precipitation mm (inches)	41 (1.6)	69 (2.7)	157 (6.2)	216 (8.5)	292 (11.5)	394 (15.5)	445 (17.5)	394 (15.5)	409 (16.1)	310 (12.2)	175 (6.9)	51 (2)	2,951 (116.2)

Source: Weatherbase

Study of noise pollution in Kolhapur city, India during Deepawali festival showed an average noise level of 74.24 dB(A), 62.52 dB(A), 58.88 dB(A), and 50.02 dB(A) at industrial, commercial, residential and silent zones respectively. The result showed that there was an enhanced pressure of noise at all sites due to increase in number of vehicles and facilities of transportation. All the sites under study showed higher sound levels than the prescribed limits of the Central Pollution Control Board (CPCB), (Mangalekar et al., 2012).

Noise levels of ten sites were found to be above permissible limit during Diwali festival weeks in Sangamner city in Maharashtra. The noise level was higher in the morning and evening but lower of noon. Pre-diwali showed 0.1% to 20.6%, Diwali revealed 2.7% and post-diwali showed 0.4% to 20.3% higher sound level limit. The combination of various types of vehicular noise was found to be minimum 70.2 (0.3 higher) and maximum 90.0 (29% higher). The contributions of individual levels were found to be more than the traffic noise limit of 70dB(A) and varied from vehicle to vehicle (Dhembare et al., 1999).

The blowing of horns increased alarmingly and was up to 30 – 35 dB(A) above the tolerance limits in Karachi, the largest city in Pakistan (SEPA, 1994). The most noticeable sources of noise pollution here are the auto rickshaws, trail motorbikes and fag horns of public transports (Zaidi, 1990). The problem caused by noise pollution is more aggravated during celebration, festival, marriage or religious functions (Vijayalakshmi et al., 2003). Noise from fire crackers is one of the most important environmental problems mainly during festive occasions.

Thirty seven sampling sites were selected to measure the noise levels at three main streets in Alexandria city. The minimum noise levels recorded at Elgishstreet, Horreya Avenue and Circular Highway were 58.4, 48.6 and 52.2 dB respectively while the maximum values were close to 101 dB. The noise levels exceeding 10% of the measured time (L_{10}) were 92, 88 and 97 dB at Elguish Street, Horreya Avenue and Circular Highway respectively. The noise levels exceeding 90% of the measured time (L_{90}) were 67, 62 and 57 dB at the same streets. The noise level at three streets in the day and evening times were higher than the permissible limits according to Egyptian Environmental Law 4/94. The levels at Horreya and Circular Highway at night time were lower than the permissible limits (Ghatass, 2009).

About the study area and the carnival festival

Calabar is the capital of Cross River State in the coastal South-Eastern Nigeria. For the purpose of administration, the city is divided into Calabar Municipality and Calabar South local government areas. Calabar has an Area of 406Km² and a population of 371022 as at 2006 census. Calabar Municipality is a local government area in Cross River State with it's headquarters in the city of Calabar. The municipality has an area of 331.551 km² and a population of 17931 at the 2006 census. It lies between latitude 04^o 15' and 5^o N and longitude 8^o 25' in the north and is bounded by Odukpani local government area in the north east and by the great Kwa River, it's southern shores are bounded by the Calabar River and Calabar South local government area.

The Cross River State annual Christmas festival which started in 2004 and since then holds every year attracts thousands within and beyond Nigeria. The festival which includes music performance from both local and international artists, the annual Calabar carnival, boat regatta, fashion shows, Christmas village activities, traditional dances and annual Ekpe festival is a yearly event that brings in thousands of tourists at that time of the year. The carnival which begins on every 1st of December and lasts till 31st December has boosted the cultural mosaic of Nigerian people while entertaining the millions of spectators within and outside the state and boosting industry for all stakeholders (<http://en.wiki/calabar>).

II. Materials and Methods

With digital sound level meter S-100 (Voltcraft product) set at fast time evaluation and frequency evaluation filter (weighting) set at A, sound level measurements were carried out at site location shown in table 2. The meter was set at fast time evaluation because the measured sound from horns, drums, human voices, knock-outs, etc were such that changed rapidly, the filter was set at A since this represents the characteristics

curve of the human ear. Measurements were done with meter set at Hi – range which for this meter is 60 to 130 dB.

Table 2: Measurement locations and codes

S/N	LOCATIONS	CODES
1	Eta Agbo by Goldie junction	SITE 1
2	Eta Agbo by Akim road junction	SITE 2
3	Akim Road by Marian road junction	SITE 3
4	Effio-ette junction	SITE 4
5	MCC by Calabar road junction	SITE 5
6	Stadium (Calabar road)	SITE 6
7	Mary Slessor by Calabar road junction	SITE 7
8	Mary Slessor by Marian road junction	SITE 8
9	Watt Market roundabout	SITE 9
10	Cultural Centre	SITE 10

The meter was hand held at 1.3 to 1.5m above the ground level and at a distance of 6m away from the road side. Sound level measurements were carried out for ten (10) days at intervals of two (2) day in a month in ten (10) different locations during the Pre-carnival (November, 2011), Carnival (December, 2011) and Post-carnival (January, 2012) periods.

These measurement were made between the hours 7.00am to 8.00am when people were busy going to work and carrying their children to school, 1.00pm to 2.00pm when the children were back from school and parents going on break and 7.30pm to 8.30pm when people were out to the city for relaxation, these were all busy hours. The measurement days in December included the day the carnival train sailed round the city, this is always accompanied by competing carnival bands operating at full blast on top of moving trucks round the city and followed by mammoth crowd all chanting and dancing. People with different types of cars and with different types of motorcycles form part of the moving carnival train. The five competing bands this time were seagull, Passion 4, Master Blaster, Bayside and Freedom bands. Apart from this day, noise measured were mostly from road traffic.

III. Results

Discussion of Results

The study of noise levels in Calabar municipality during pre-carnival, carnival and post-carnival periods was aimed at comparing the noise levels during these periods and to find out whether the noise levels are within the recommended standards. The Calabar carnival is the greatest festive period of the year that attracts many from far and near thereby increasing human activities in the Municipality during the period. Ten sites were selected for the measurements as shown in table 3.

It is observed that noise level of 87.1 dB(A) in the evening hours at the stadium (site 6) was the highest during the pre-carnival period as compared to 87.5 dB(A) obtained at Mary Slessor by Marian road junction (site 8) in the evening of the post-carnival period. Though this is slightly higher than that of the pre-carnival, the difference is not significant, these are all non festive periods. These two levels when compared to the highest noise level of 102.2 dB(A) obtained at Effiotte junction (site 4) during the carnival period really shows that there is a high increase in noise levels in the Municipality during this festive period. To further confirm this, one can see that the noise levels at each site and at the same measurement hours are higher during carnival periods than during pre and post-carnival periods.

This is in line with the findings of Mangalekar et al., (2012) in the study of noise pollution in Kolhapur city, India during Deepawali festival. This can be attributed to increase in human activities such as drumming, trumpeting and throwing of knock outs and shouting, increase in number of vehicle and facilities of transportation etc. During this period a lot of tourists visit the Municipality thereby increasing the population and vehicular movements. People are compelled to stay out-doors to witness the different activities that take place as compared to the non festive period.

The lowest noise levels were in the afternoons when comparing these three investigating periods, 70.7 dB(A) at site 6 in pre-carnival, 77.4 dB(A) at site 10 in carnival and 70.5 dB(A) at site 6 at post-carnival. The number of vehicular and other human activities during the day time reduced tremendously because parents retire to their offices for the days work after having dropped their children in school. Again transporters and many others get tired and retire home for relaxation in preparation for the evening outing. Figure 1 shows that the average noise levels in the Municipality during the carnival period was higher during pre and post carnival. Average noise levels of 94.9 dB(A) in the morning, 84.0 dB(A) in the afternoon and 96.1 dB(A) in the evening were for the carnival period while 80.8, 75.9 and 83.1 dB(A), 80.7, 75.7 and 82.1 dB(A) were average levels for morning afternoon and evening of pre and post carnivals respectively.

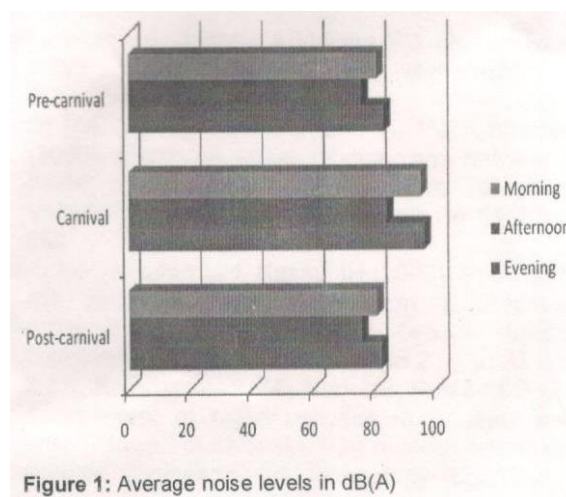
Though the festive period is time of merriment and income is being generated through foreign exchange from tourists, how healthy is the noise generated during this period to the well being of the people? In Nigeria, noise regulations usually specify a minimum out-door noise level of 60 to 65 dB(A) (Agbo et. al., 2012). Noise levels during the carnival period far exceed the maximum outdoor permissible level (Table 3).

Vidyasagar and Rao (2006) observed that noise has adverse effects on citizens, auditory disorders are on the rise among city dwellers and considered noise as a major threat to human wellbeing. It has been scientifically proven that noise more than 85 dB(A) can cause hearing impairment (Ogbo, 2012). The multi-dimensional concept of quality of life which include aspects of emotional, functional, physical, mental and social well being as perceived by individuals offer wide possibility to look at health related outcome of noise (Akpan et al., 2012).

Health includes physical, psychological and social well being of an individual (WHO, 2011).

Table 3: Noise levels in dB(A)

S/N	Measurement Locations	Pre-carnival Period			Carnival Period			Post-carnival Period		
		Morning	Afternoon	Evening	Morning	Afternoon	Evening	Morning	Afternoon	Evening
1	Site 1	84.2	80.3	84.9	92.3	87.6	95.4	85.2	81.2	83.5
2	Site 2	82.5	75.9	86.1	94.1	85.2	96.8	77.5	76.4	81.6
3	Site 3	77.4	72.7	78.3	96.5	81.5	95.6	76.9	72.5	76.5
4	Site 4	84.5	81.5	83.2	96.2	90.2	102.2	85.5	80.1	86.6
5	Site 5	80.1	77.2	85.1	92.6	89.5	98.5	84.1	76.1	83.2
6	Site 6	83.5	70.7	97.1	94.5	79.6	89.8	77.2	70.5	79.9
7	Site 7	80.0	73.2	83.5	98.1	81.8	97.6	74.5	71.2	78.2
8	Site 8	81.5	82.6	85.2	95.5	87.1	96.5	86.9	80.5	87.5
9	Site 9	75.9	74.1	77.8	97.2	80.1	99.1	79.1	72.8	79.8
10	Site 10	78.5	71.2	80.1	92.4	77.4	89.4	80.5	75.4	81.6



The organisers of this yearly carnival in Calabar municipality should not therefore look at merriment and income generation only but should also look at the damaging effects of the noise on the citizenry after the festival who may be ignorant of this problem.

IV. Conclusion

Study of noise pollution during pre-carnival, carnival and post-carnival festival in Calabar municipality has been investigated. This study has shown that the noise level in the municipality during the carnival period is higher than the pre and post-carnival periods and far exceed the recommended 60 to 65 dB(A) permissible outdoor noise level. Though this is a time of merriment and income generation, the people stand the risk of endangering their health physically, psychologically and socially due to excessive noise.

V. Recommendation

The organisers of this festival are therefore advised not to look at the merriment and income generation aspect of this festival only but should also consider the damaging effect of noise generated during this period on the well being of the people which includes hearing loss. Alternative ways of organising the festival without excessive noise in the municipality should be sought for.

VI. Acknowledgement

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