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Perceptions on Noise Pollution among the Residents of a Medium-Size Settlement in Southwestern Nigeria – A Preliminary Study

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Abstract

This study examines perception on the sources, effect and the mitigating strategies of neighborhood noise in Ile-Ife. Objectives of the study are; to examine the sources of noise pollution; assess the awareness of residents on noise and concerns for noise pollution; examine the perception of residents on effects of noise pollution; and investigate the coping strategies of residents to noise pollution. This was with the view to assessing the perception of residents in different land uses across Ile-Ife on noise pollution and mitigating measures. The study used both primary and secondary sources of data. The primary data source was a set of questionnaire used to extract information from adult (18 years and above) settlers in purposively selected land use areas (commercial/high density areas, low-medium density areas and institutional areas). The secondary data was the 1:25000 land use map from which sampling areas were delineated. Responses to questionnaire were coded and analyzed using SPSS (version 17) software. Results showed that the main sources of noise pollution in the study area were domestic pets, transport and religious activities, and their ranks vary significantly with land use ($p \leq 0.05$). Awareness of neighborhood noise was greater in the institutional and commercial areas than in the low-medium density areas. Majority (>90%) of the residents across the land use perceived that noise pollution disturbs them from relaxing and sleeping and at least 80% perceived that noise disturbs them from studying. Coping strategies to noise pollution were limited to turning away from the noise and creating another noise for distraction. The study concluded that although the people of Ile-Ife are very much aware of noise pollution and its effects, their coping strategies are inadequate and unhealthy.

Keywords: Neighbourhood noise; Noise pollution; Perceptions

Introduction

Noise comprises a single or mixture of sound waves of different sound levels that are produced by single or multiple sources [1]. Noise is usually described in terms of loudness (intensity) and pitch (frequency) and noise exposure is measured using a logarithmic decibel (dB) scale [2]. The threshold limit for tolerable noise is 45-65 dB [3,4]. Sound above 120 dB will cause pain to the ear [4]. Noise pollution is an audible unwanted sound that poses a threat to a person's health and well-being. It is environmental problem that increases very rapidly as a result of improvement in commercial, industrial and social activities ((Environment Protection Authority (EPA) 2011). Sources of noise are industrial and commercial activities, including operations of factories and workshops, transport activities, constructions activities and social activities in urban settlements, including market places, sports events and entertainments (Environmental Operations Unit, Northern Territory Environment Protection Authority, 2011). In residential areas, noise can be very distracting, and the type of noise in this environment is referred to as the neighborhood noise. Neighborhood noise consists of a range of individual households and family activities that generate noise that are audible further than and beyond the confines of the household [5]. Sources of neighborhood include noises from domestic pets, transport and domestic repairs and construction activities, religious activities and civil disruptions (Environmental Operations Unit, Northern Territory Environment Protection Authority 2011).

Studies have shown that noise above the tolerance limits can be associated with rising incidence of deafness among urban dwellers. The World Health Organization (1999, 2011) and other studies have linked noise pollution to hearing impairment, speech intelligibility, physiological dysfunction, mental illness, performance reduction, and cardiovascular diseases [2]. In India (Delhi and Calcutta), Singh and Mahajan [6] showed that the general level of urban noise was between 60 and 95 dB (higher than the tolerance level). Murli and Murthy [7] showed that transportation was the major cause of noise pollution in major parts of India, and these exhibited temporal variation (it is more intense in the morning and evening 'rush-hours'). In Europe, more than 90 million people suffer from unacceptable noise levels, and this necessitated the inauguration of the Environmental Noise Directive (END), 2002/49/EC for the region (European Commission News, 2005). Following a proposal by the commission adopted in 2000(1), the European Parliament and Council adopted END with the aims of defining a common approach intended to avoid, prevent or reduce on a prioritized basis the harmful effects, including annoyance, due to the exposure to environmental noise. Generally, in cities, noise is considered to be the third most hazardous type of pollution, right after air and water [8].

In many developing countries, including Nigeria, noise pollution is a typical attribute, probably because of poor awareness and poor public education [4]. Causes of noise pollution in Nigeria include transport activities such as automobiles, commercial motorcycles, recording houses, use of electricity generators, and religious activities [9]. Oyedepo and Saadu [10] in a typical Nigerian urban environment (Ilorin) linked urban and population growth to noise pollution. They also noted that litigations are few and legal provisions are either unknown to guide Nigerian residents on noise

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pollution. In addition, very few studies have been carried out on noise pollution in Nigeria.

Noise is increasingly becoming a norm for the Nigerian environment, and this is typical of most developing countries. While noise pollution is also a problem of many developed countries, the concerns for this source of pollution are very limited for most countries in the developing regions. In Nigeria, little or no concern has been raised for noise pollution, and only very few study are also available in this regards [11]. On the other hand, existing studies have described noise as a slow and subtle killer through its hazardous effects on humans [12,13].

The town Ile-Ife is an example of a typical Nigerian town with reference to household characteristic and environmental problems. Since noise pollution is rapidly increasing with improvement in technology and growth of urban centers, no standard measures have been taken in the study area to effectively control noise and its effect. Thus, there is the need for understanding the sources, effect and coping strategies of neighborhood noise pollution as well as the perception of individuals in the noise polluted areas, as this can play an important role in environmental improvement at the local level. Also, it can be instrumental in helping government officials and others determine what needs to be done to combat environmental problems at the domestic level. Furthermore, this study will contribute to the development of the town and most importantly to the academic knowledge. The aim of this study is to identify and assess the impact of noise pollution in the neighborhood of Ile-Ife. Specific objectives are to examine the sources of noise, and residents' perception on effects and coping strategies of noise pollution.

Study area

Ile-Ife, Osun State covers an area of approximately 350 square kilometers and lies between Latitudes 7°28'N and 7°34'N of the Equator, and Longitudes 4°30' E and 4°31'E of the Greenwich meridian (Figure 1). The town lies at the intersection of roads from Ibadan, Ilesha, and Ondo. According to 2006 population census, Ile-Ife has an estimated population of 355,341 inhabitants [14]. Ile-Ife is home to Obafemi Awolowo University and other industries in Ife including palm processing, sawmilling, trading, local arts, lumbering and many other important places like University Teaching Hospital Complex, Ife Museum of Antiquities, Opa Oranmiyan, Okemogun Shrine, Oduduwa Palace, Zoological Gardens and Odua Shrine.

The climate of the study area is of the humid subtropical type (Koppen climate classification). The climate is controlled by the major air masses: the tropical maritime air mass (Mt) and the tropical continental air mass (cT). The tropical maritime blows between March and October and brings the rainy season, the tropical continental air mass blows between November and February and brings the dry and harmattan seasons. Ile-Ife has a mean annual temperature of about 28°C and mean annual rainfall of between 1,200 and 1,500 mm, which can rise to above 1,800 mm during some very rainy years. The monthly rainfall pattern is bimodal, with peaks in July and September/ October. The dry season occurs between November and March. Relative humidity varies between 75.8 and 86% [15].

Data types and sources

Both primary and secondary sources of data were used for this study. The primary data were a set of close ended questionnaire that was administered to residents. The structure of the questionnaire is such that seeks to generate information on variables such as socio-economic characteristics, neighborhood noise awareness and sources, impact of neighborhood noise on other activities, the effect of noise and the coping strategies. Secondary data was a 1:25,000 land use map from the Ife Central LGA Town Planning Office, from which sampling areas were delineated.

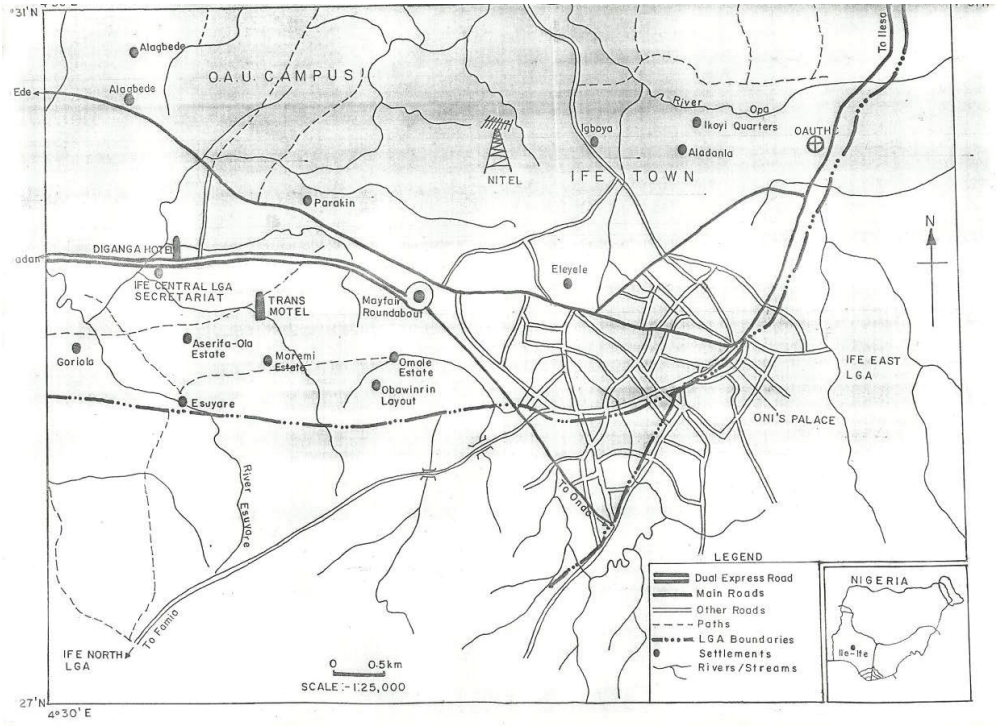

Figure 1: Ile-Ife Town in Nigeria. The insect map shows the location of Ile-Ife in Southern Nigeria.

Methodology

Sixty copies of questionnaire were distributed in three purposively selected areas of Ile-Ife. The areas include Sabo, representing commercial area; OAU, representing institutional area; and Ede road, representing a typified medium-low residential area. Sample population which were randomly selected consisted of students, civil servants, academics, artisans, business men and women, all who are 18 years and above because they are considered to be conscious of noise effect. Eighty (80) copies of questionnaire were distributed, only. The 1:25,000 scale land use map of Ile-Ife served as the basis for which the sampled areas were delineated.

Data analysis

Responses of residents to questionnaire from the different areas (Table 1) were coded into a statistical software package (Statistical Package for Social Sciences, SPSS version 17). Responses were analyzed using simple frequency percentage distribution to examine perception across the various land uses. Perceptions were also scored and ranked based on the percentage agreement on any issue by residents.

Results

Socio-economic and demographic characteristics of selected residents in Ile-Ife

Table 2 shows the demographic and socio-economic status of the respondents used for the study. 53.3% of the respondents were male and 46.7% were female. Majority of the respondents, 75%, aged between 18 and 30 years while 25% are above 30 years of age. About 73.3% of the respondents are single while 26.7% are married or living together. 78.3% of the total respondents had tertiary education, 20% had secondary school education, while only 1.7% of the respondents had primary education. 39.7% of the total respondents are employed while 59.3% are either unemployed or studying. The income group distribution shows that majority of the respondents, 46.7%, earn below N18, 000, while only 20% earn above N50, 000, 87.5% of the respondents had resided in their location for less than 10 years.

Perception of residents on sources of noise pollution in selected areas

This section explains the various activities that generate neighborhood noise in the sampled areas. Table 3 shows that in the low-medium residential areas, domestic pets (55%) and religious activities (55%), are the major sources of noise thereby generated the highest level of noise. In the institutional environment and in the commercial/ high density residential areas, transportation (95% and 100% respectively), is the major source of noise and therefore generated the highest level of noise.

Awareness of neighborhood noise

Table 4 shows that, 70% of those in low-medium density areas view neighborhood noise as a problem and 65% are annoyed by it. In the institutional environment, 90% see noise as a problem and 85% are annoyed by it, while in commercial/ high density areas, 85% see noise as a problem and are also annoyed by it. In the low-medium density areas, the major cause of annoyance is civil disruption (80%) and domestic repairs (57.3%), while in the institutional environment the major cause of annoyance is transport (95%) and construction activities (94.4%). In the commercial/high density area, the major cause of annoyance is transportation (77.8%) and civil disruption (66.6%).

Effect of neighborhood noise pollution

About 55% of those in the low-medium density areas agree that noise

Sample Areas	Number of Questionnaire administered
Sabo, Ile-Ife	20
Social Sciences, OAU, Ile-Ife	20
Ede Road, Ile-Ife	10
Omole Estate, Ile-Ife	10

Table 1: Sampling areas and the quantity of questionnaire administered.

Variables		Frequency	percentage
Sex	Male	32	53.3
	Female	28	46.7
Age	18-35 years	45	75
	36-59 years	12	20
	Above 59 years	3	5
Marital status	Single	44	73.3
	Married/living together	16	26.7
Educational	Primary	1	1.7
	Secondary	12	20
	Tertiary	47	78.3
Occupation	Civil Servant	9	15
	Self-employed	15	25
	Unemployed/student	35	58.3
Monthly income	Below 18.000	28	46.7
	18,001-50,00	12	20
	Above 50,00	12	20
Length of stay	10 years and below	49	87.5
	11 to 20 years	6	10
	Above 20 years	1	1.7

Table 2: Socio-economic and demographic characteristics of selected residents.

	Low-medium		Institutional environment		Commercial/High density	
Variables	Frequency (%)	Rank	Frequency (%)	Rank	Frequency (%)	Rank
Domestic pest	55	1	10	6	30	6
Transportation	50	3	95	1	100	1
Domestic repairs	20	6	20	5	45	5
Construction activities	40	4	55	3	75	2
Religious activities	55	1	60	2	70	4
Civil disruption	40	4	25	4	75	2

Table 3: Sources of noise pollution in selected sample areas in Ile-Ife.

		Low-medium residential area	Institutional environment	Commercial/ high density
Neighborhood noise seen as a problem	Yes	70	90	85
Annoyed by neighborhood noise	Yes	65	85	85
Causes of annoyance	Domestic pet	43.2	33.3	11.8
	Transport	52.6	95	77.8
	Domestic repairs	57.3	68.8	39.4
	Construction activities	56.2	94.4	50
	Religious activities	56.3	68.8	40.2
	Civil disruption	80	58.9	66.6

Table 4: Perception on the awareness of neighborhood noise.

interferes with their daily activities, 80% of those in the institutional environment agrees that noise interferes with their daily activities, while 60% in the commercial/high density areas agree that noise interferes with their daily activities. Table 4 illustrates that in all three land uses- low-medium, institutional and commercial/high density areas, noise interferes with relaxation (100%). In the low-medium density areas, noise also interferes with studies (100%) and sleep (90%), in the institutional environment, noise interferes with studies (100%) and hearing (94.8%), while in the commercial/high density areas, noise also interferes with sleep (100%) and studies (83.3%) (Table 5).

Adaptation/Coping strategies

Table 6 shows the various coping strategies of residents in the three land uses. Those who just cope /adapt to the noise in the low-medium, institutional environment and commercial/high density areas are 40%, 25% and 50% respectively.

Discussion

This study aimed at identifying and assessing the impact of neighborhood noise pollution in Ile-Ife, Osun State. Major sources of noise pollution in Ile-Ife vary with the different land uses. The major sources of noise are domestic pet and religious activities (both 55%) in the low-medium residential area, transportation (95%) and religious activities (60%) in the institutional environment and transportation (100%) as well as construction activities and civil disruption (both 75%) in the commercial/high density areas. These sources of noise pollution are in line with the sources of similar studies. In terms of the awareness of neighborhood noise in Ile-Ife, more than 50% of the residents view neighborhood noise as a problem and are annoyed by it. This indicates that the residents of Ile-Ife are very much aware of noise. The study also shows the effects of neighborhood noise pollution as seen in the above results. Over 50% of the residents of Ile-Ife agree that noise interferes with their daily activities especially relaxation and the use of GSM. Other activities with which neighborhood noise interferes are hearing, speech, listening to radio, studies, watching T.V, sleep, in door conversation and task performance. This result is similar to studies that showed that noise can disturb people's rest, sleep, work and communication and it can damage hearing and manifest psychological, physiological and possible pathological reactions. Studies in Indian also showed that noise pollution was responsible for the rising cases of deafness of many people especially in Delhi and Calcutta [5].

This study has also shown that though the residents of Ile-Ife are aware of noise and its effects, they do not adopt appropriate coping strategies to noise pollution. Majority of the residents just cope with or adapt to the noise while others move away, ignore, close the windows or do not cope at all with the noise. Some residents cope with the noise by turning on their television, radio or music players to distract their attention from the noise. However in contradiction to the above result, coping strategies in noise polluted areas includes the use of heavy fabrics and curtains with sound-absorbing technology. Changing windows by replacing single pane with double-pane is also another coping strategy (Northern Territory Environment Protection Authority, 2011). Sound absorbing materials, drapes, curtains and carpets which deaden noise, quieter air-conditioners, ventilators and other household appliances, sound-insulated ceilings, walls, doors and windows all help to reduce unwanted noise.

		Low/ medium	Institutional environment	Commercial/ high
Neighborhood noise interferes with daily activities		55	80	60
Activities with which	Hearing	80	94.8	75
Neighborhood noise interferes	Speech	72.5	87.8	72.8
	Listening to radio	75	72.4	50
	Studies	100	100	83.3
	Watching T.V	83.3	57	75
	Sleep	90	93.8	100
	Indoor conversation	55.5	93.8	63.6
	Use of GSM	77.7	98	100
	Relaxation	100	100	100
	Task performance	70	93.8	36.4

Table 5: Perception on the effect of neighborhood noise.

	Low-medium	Institutional environment	Commercial/ high density
Turning on T.V/ radio/music player to distract attention from the noise	5	10	15
I do not cope	5	10	10
I just cope/adapt	40	25	50
I just ignore the noise	15	15	10
I move away from the noise	20	25	-
Closing the windows	10	-	15

Table 6: Adaptation Strategies of Residents.

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