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*(Research Article)*

# Assessment of The Effects of Noise Pollution on Students' Performance in Kano Metropolitan Local Government Areas

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**Abstract:** The main objective of this study is to assess the Effects of Noise Pollution on Students' Performance in Kano Metropolitan Local Government Areas. The study utilized descriptive research design. Multi-state sampling techniques were adopted where 377 respondents were involved using questionnaire as instrument for data collection. Percentage and frequency count were used in data analysis while table and charts were used in data analysis. So, research has the following findings:the main source of noise pollution around the school environment is automobiles while the least is religious activities the major impact of noise pollution based on the students' responses is effect hearing negatively while the least one is noise pollution cause deafness and the major ways to be follow in solving noise pollution around school environment are through public enlightenment followed by government effort where government should put more effort in law enactment and implementation perfectly and appropriately. The research recommends that a strict law concerning noise pollution in educational institutes should be made and implemented; the ministries of environment, land and education should revise policies regulating the location and maintenance of schools to ensure effective compliance and so on.
**Keywords:** Noise Pollution, Kano Metropolitan, student performance

## INTRODUCTION

Nowadays, both government and non-governmental organization have heeded their attention on how effective teaching and learning are to take place in Kano in particular and Nigeria at large. Physical and socio-economic development in the city create different activities such as production (boosting industrial activities), traffic, construction, religious activities, etc. this development is as a result of population growth. These activities will lead to noise pollution in particular and environmental pollution at large. And almost if no not all the schools in the city area are sited around the residential areas, industrial area, traffic and market places. Action must be taken in order to shun out such problems so as to have e to have conducive atmosphere for effective teaching and learning process.

Though, many researches were conducted on similar topic such as in different countries in the world[1]: noise pollution at school located in residential area, Malaysia;[2] noise pollution from traffic activities near school area in Valencia, Spain, etc. There arelimited researches conducted on this topic and in this study area; for that this research work was chosen so as to fill the gap of assessing the effects of noise pollution on students' performance in Kano metropolitan local government areas.

### *Objectives*

The followings are major objectives of this study

1. To ascertain the sources of noise pollution around secondary schools' environment
2. To identify the impacts of noise pollution to students in Kano Metropolitan local government areas

### *Scope and Delimitation*

This research work is scoped to impacts of noise pollution on students' academic performance in secondary schools within Kano Metropolitan local government areas. The study area is chosen from Kano Metropolitan local government areas which comprises eight local government areas (Dala, Fagge, Gwale, Kano Municipal, Kumbotso, Nassarawa, Tarauni and Ungoggo). As the research title indicated

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that Kano Metropolitan local government areas are the borderline of this research work. And this study covers only public schools which is secondary.

The delimitation of this research is all private schools are curved out. And also, junior secondary, primary and nursery are not among the sample. Similarly, both public and private Arabic secondary schools are delimited from this study.

## LITERATURE REVIEW

### *Effects of Noise Pollution on Students and Teachers*

The followings are the effects noise pollution which are extracted from the work of[1][3]

- Deteriorates the immunity in students (especially children), increases the risk of severe recurrent headache (migraines) in students (children) which directly declines their educational abilities, growth and hurts Shield their intellectually.
- It causes a 20% waste of working days to both teachers and students.
- Students found it too problematic to hear teachers' explanation and classroom discussions

### *Ways of Minimizing Noise Pollution around Schools*

The noise pollution can be minimized or curtailed at the source of generation itself by employing techniques like:

***Sound-absorbers are to be used in school walls:*** That is to say school walls must be lined with sound-absorber in order to prevent noise from coming into schools around schools located at busy locations.

***Reducing the noise levels from domestic sectors*:** The domestic noise coming from radio, tape recorders, television sets, mixers, washing machines, cooking operations can be minimized by their selective and judicious operation. By usage of carpets or any absorbing material, the noise generated from felling of items in house can be minimized.

***Maintenance of automobiles*:** Regular servicing and tuning of vehicles will reduce the noise levels. Fixing of silencers to automobiles, two wheelers etc., will reduce the noise levels.

***Low voice speaking*:** Speaking at low voices enough for communication reduces the excess noise levels at school and its environs.

***Prohibition on usage of loud speakers*:** By not permitting the usage of loudspeakers in the habitant zones especially school premises except for important meetings or functions.

***Selection of machinery*:** Optimum selection of machinery tools or equipment reduces excess noise levels. For example, selection of chairs or selection of certain machinery/equipment which generate less noise (Sound) due to its superior technology etc. is also an important factor in noise minimization strategy.

***Maintenance of machines*:** Proper lubrication and maintenance of machines, vehicles etc. will reduce noise levels. For example, it is a common experience that, many parts of a vehicle will become loose while on a rugged path of journey. If these loose parts are not properly fitted, they will generate noise and cause annoyance to the driver/passenger. Similarly, it is the case of machines. Proper handling and regular maintenance are essential not only for noise control but also to improve the life of machine.

***Isolating machines that produce noise*:** Any machine that produces noise from school premises or nearby in order to produce quiet and healthy environment.

## EMPIRICAL STUDIES

[2] conducted their own research on noise pollution from traffic activities near school area. One of the findings states negative impact of noise pollution to the students' performance as well as teachers where two schools were sampled. However, [4]tested public school children in order to determine whether noise affect performance of the students or not; she divided noise into three with noisy (75-90 dBA), average

(55-70 dBA) and noiseless (45-55 dBA) classroom where her main finding was that students perform wonderfully right in quiet environment than average and noisy location. She also stated that male students are detrimentally affected than their counterpart female.
Similarly, many also researchers conducted their researches on measuring noise pollution in and around schools for example by: [5][6][7]. Correspondingly, [3][8][9]examined noise pollution and its effects on the students' success in the school.

Likewise, [5]conducted their research on effect of noise pollution in primary and secondary schools situated in Istanbul. They found that equivalent noise levels in schools during course hours ranged between 51 and 83.3 dB, and were 72.48 dB in average. In addition, they determined that the noise levels exposed to during break times, in which students were expected to "have a rest", varied between 76 and 89 dB in 84% of schools. They also stated that teachers generally thought that the noise generated in schools could not be prevented. Equally, [10] conducted a study in Izmir where he found out that the loudness in the school during a course hour was 50 dB, and the loudness in the corridors before and after the course hours varied between 80.75 dB and 87.25 dB.

## RESEARCH METHODS AND MATERIALS

### *Research Design*

The research design refers to the preparation of conditions for data collection and analysis in a style that aims to combine relevance to the research purpose with economy in procedure [11].This research is descriptive in nature where impacts of noise pollution on students' performance in Kano metropolitan local government areas were studied.The descriptive research describes ***what is*** i.e. it describes, record, analyze, and interpret conditions that exist.

### *Population of the Research*

without taking into consideration the percentage of population of the study area due to un-availability of the 2006 units population data which is still being on processing. Thus, the researcher used Kano Metropolitan local government areas population of 2006 as their research population. Kano Metropolitan local government areas had population of 418,777 as of 2006 Census(12NPC, 2006).

### *Sample Size*

A total of four hundred questionnaires were administered, the numbers of respondents were chosen. The respondents chosen would be from primary and secondary schools and could either be male or female. The sample represents a cross-section of different age groups, geographical locations, sex, and educational levels of respondents and therefore it could be treated as a representative sample for such an exploratory study.

### *Sampling Techniques*

The researchers used multi-stage sampling technique. At the first place stratify sampling technique was used where research population was divided into eight (based on eight local government areas chosen by this research; Dala, Fagge, Gwale, Kano Municipal, Kumbotso, Nassarawa, Tarauni and Ungoggo) stratum. Secondly, random sampling technique was adopted where fifty questionnaires were distributed in each stratum. Stratified sampling involves dividing (stratifying) the whole population into two or more separate, more homogeneous, groups and then sampling separately from within each of these groups (that is, after stratification, each group is treated like a population on its own). If the criteria chosen to divide the population into strata have been chosen wisely, a stratified sample will be more representative than a simple random sample[13][14]

### *Instrument Used in Data Collection*

Structured questionnaire was designed and distributed to the respondents. This questionnaire is divided into two parts; bio-data and subject matter. The questions are mixed of closed and open ended.

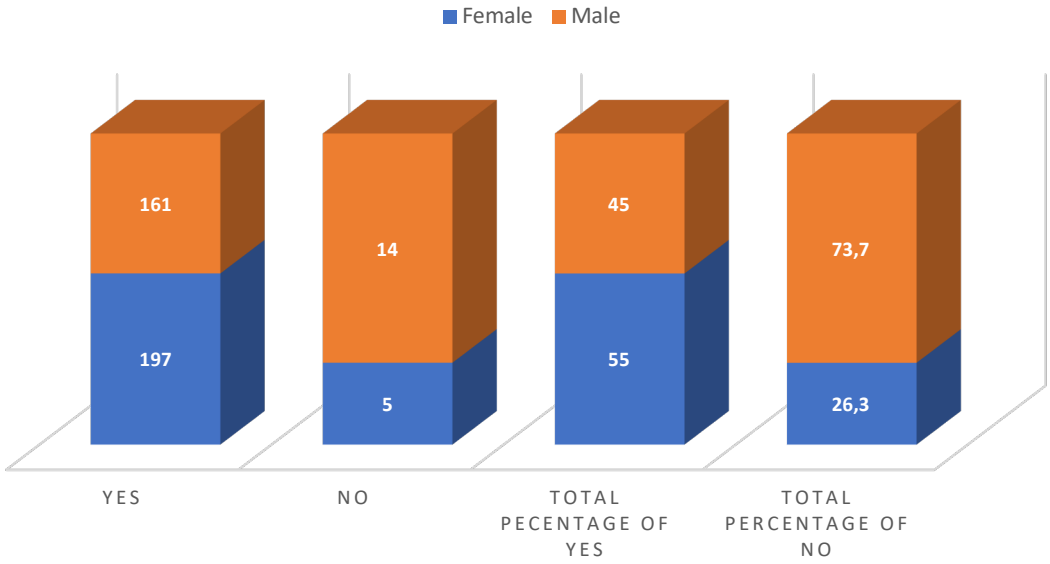
### *Data Analysis*

Data collected from the questionnaires are organized, sorted and analyzed. The analysis used for this research was simple statistical technique such as percentage and frequency counting. For the data presentation, table and bar chart were used

## RESULTS AND DISCUSSION

***What are the main sources of noise pollution around school environment in Kano metropolitan local government areas?***

Figure 2 below covers item 5 on the questionnaire which says, *is there any noise pollution at your school?* And also, this research question covers item 6 on the questionnaire and presented on table 2 below and asks *If yes, what is the source of noise pollution?* while figure 3 also fall under this research question which states *Do commercial activities around the school cause noise?* Item 7 also on the questionnaire falls under this research question




Source: Questionnaire, 2016

**Figure 1.** Showing response to question, is there any noise pollution at your school?

The figure 1 above states that total respondents that responded to *Yes* are 358 while those responded with No are 19 in number. Between female and male, 197 (53.6%) females responded that yes there is noise pollution in their schools whereas 161 (46.4%) are males with *Yes* as their responded. But contrary to the yes, males have higher response in answering *No* that there is no noise pollution in their schools. Fourteen (14) males responded to *No* that there is no noise pollution in their schools while only five (5) females responded to No.

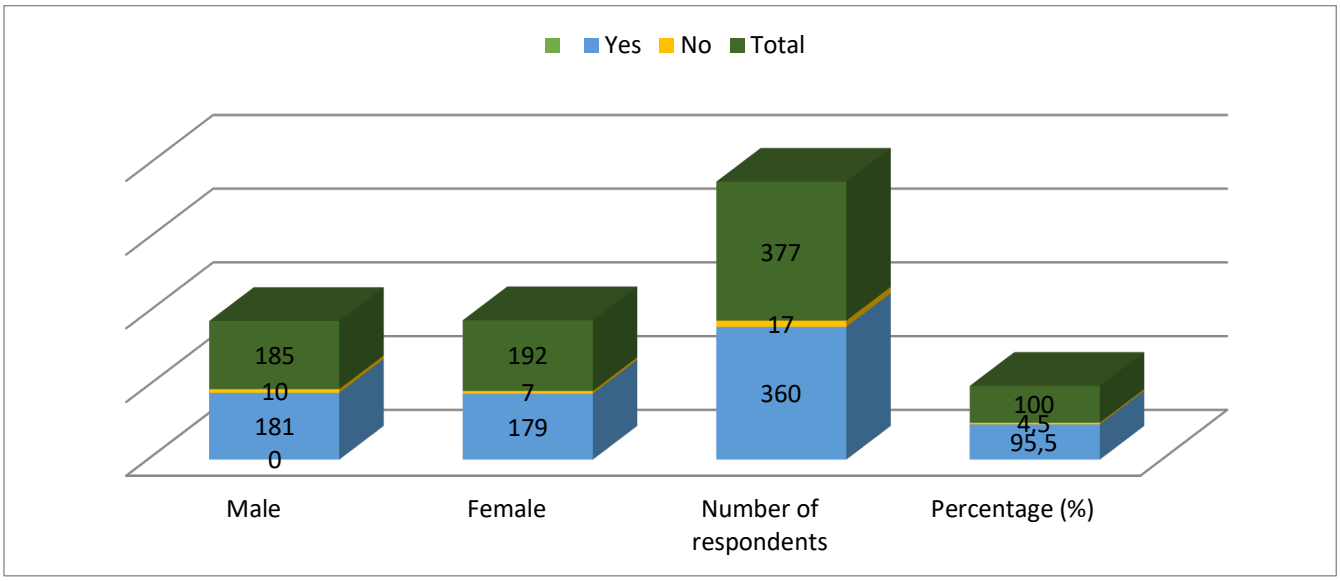
***Sources of the noise Pollution***

**Table 1.** Showing sources of noise pollution

| Source of Noise pollution | Male | Female | Total Number of the respondent | Percentage |
|---|---|---|---|---|
| | Gender | | | |
| Automobiles | 78 | 91 | 169 | 44.8 |
| Neighborhoods | 34 | 23 | 57 | 15.1 |
| Religious activities | 11 | 8 | 19 | 5 |
| Loud speaker | 16 | 15 | 31 | 8.2 |
| All of the above | 56 | 45 | 101 | 26.8 |
| **Total** | **195** | **182** | **377** | **100** |

Source: Questionnaire, 2016

The table 1 above indicates that the main source of noise pollution in the study area is automobiles which carries 44.8% which equivalence to 169 respondents (78 males and 91 females), followed by all of the above (i.e. combination of automobiles, neighborhoods, religious activities and loud speaker) with 101 respondents (56 males and 45 females, which is equivalence to 26.8%). Religious activities are the least in term of number of the respondents which has 19 respondents (with 11 males and 8 females which equals to 5.0%), followed by noise from loud speaker with 31 respondents (16 males and 15 females which equals to 8.2%); whereas neighborhood be at the middle with 57 respondents (with 34 males and 23 females which gives 15.1%).




Source: Questionnaire, 2016

**Figure 2.** Showing to respond to this question; Do commercial activities around the school cause noise

From the fig. 2 above, 181 male and 179 females responded that Yes commercial activities around the school cause noise. The sum up of male and female responded with Yes answer is 360. Only 17 respondents responded that *No*, commercial activities around school cause noise; with 10 male and 7 females.

**Research Question Two**

***What are the impacts of noise pollution on students' academic performance?***

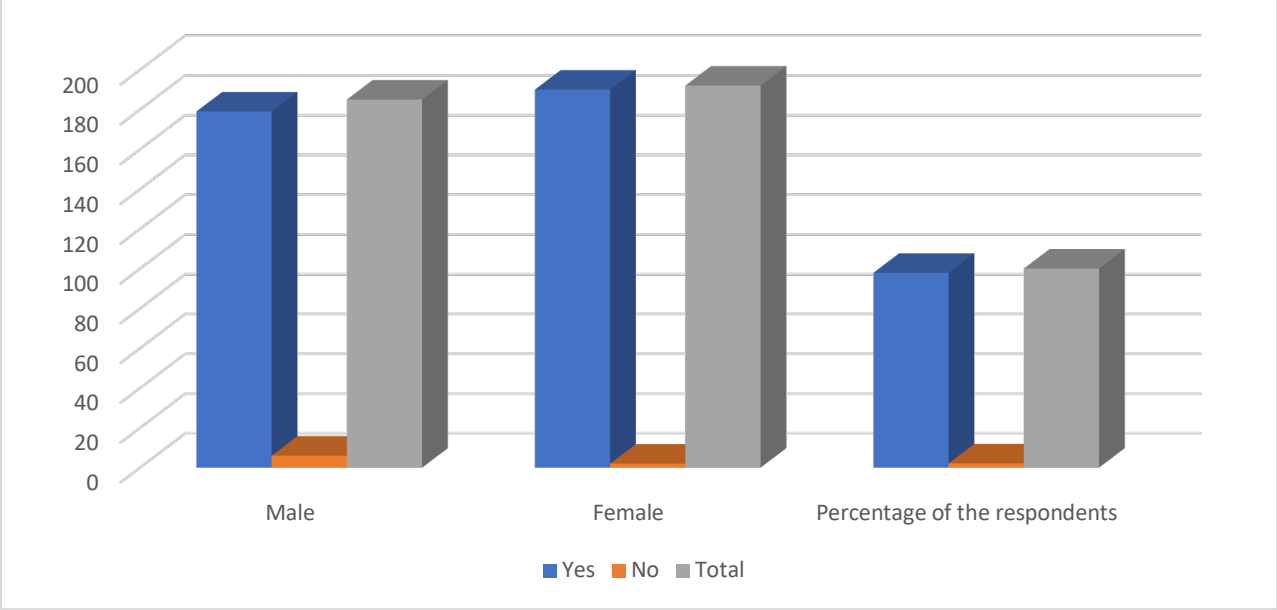
**Table 2.** Shows the impacts of noise pollution

| Impacts of noise pollution | Number of Respondents | | Total | Percentage (%) |
|---|---|---|---|---|
| Gender | Male | Female | | |
| effect hearing negatively | 76 | 81 | 157 | 41.6 |
| Interfere with communication | 48 | 46 | 94 | 25 |
| Disturb sleep | 21 | 27 | 48 | 12.7 |
| Result in deafness | 11 | 3 | 14 | 3.7 |
| Cause annoyance | 10 | 18 | 28 | 7.4 |
| All of the above | 27 | 9 | 36 | 9.5 |

| | | | | |
|---|---|---|---|---|
| Other (specify)…… | 0 | 0 | 0 | 0 |
| **Total** | **193** | **184** | **377** | **100** |

Source: Questionnaire, 2016

From table2 above, 157 respondents (241.6%) responded that noise effects hearing negatively. Out of 157 respondents, 81 were female while 76 were male. This indicates that female has higher percentage than their counterpart male in this context. This might be as a result of that the female has higher sensitivity than male. Interfere with communication comes second in order of ranking; it has 94 respondents (25.0%). This also might be the same reason as mentioned instantaneously above. Contrarily, the one that has the lowest respondents is *that noise pollution cause deafness*. It has a total of 14 respondents which equivalence to 3.7%; with 11 and 3 male and female respondents respectively. This large difference between female and male perception might be due to the socialization that that exist between male and female is different. Male socialize with different people and at different time. This might make them know people that are deaf as a result of noise such as blacksmith. Neither male nor female responded that there is other effect of noise pollution.




Source: Questionnaire, 2016

**Figure 3.** Showing students' responses on if noise affects their attention during class hour

From figure 3 above, 185 male students responded by Yes that noise affect their attention during class hour whereas 192 female students responded the same by Yes. The total of those responded by Yes is 366 (97.9%). On contrary, six male students responded by No, that is noise does not affect their attention during class hour. Only two female students responded with No, noise does not affect her. The total responded with No answer is 8 (2.1%).

**Table 3.** Effects of noise pollution at class

| **Does noise affect your attention at class during school hour?** | **Male** | **Female** | **Number of Responses** | **Percentage (%)** |
|---|---|---|---|---|
| loosing attention | 106 | 111 | 217 | 57.7 |
| Interfere with communication | 27 | 29 | 56 | 14.9 |
| Disturbance | 19 | 21 | 40 | 10.6 |
| Make learning to become boring | 29 | 34 | 63 | 16.8 |
| **Total** | **181** | **195** | **376** | **100** |

Source: Questionnaire, 2016

The table 3 above shows that total of 217 (57.7%) participants responded that noise pollution causes losing attention during class hour (i.e. 106 male and 111 female students) 56 students (27 male and 29 female students) responded by saying that noise interfere with communication which equivalence to 14.9% of the total participants. Noise makes learning to become boring takes 16.8% which equivalence to 63 participants; with 40 (10.6%) respondents stated that noise pollution disturbs them.

**Research Question Three**

***Which ways are to follow in order to minimize the effect of noise pollution in the study areas?***

**Table 4.** Views of the respondents on whether noise pollution can be prevented at school or not

| Can noise pollution be prevented at school? | Male | Female | Number of respondents | Percentage (%) |
|---|---|---|---|---|
| | Gender | | | |
| Yes | 173 | 185 | 358 | 95 |
| No | 12 | 7 | 19 | 5 |
| **Total** | **185** | **192** | **377** | **100** |

Source: Questionnaire, 2016

Based on the above table 4, 358 respondents (95%) believe that noise pollution can be prevented at school while 19 respondents (5%) have the view that noise pollution cannot be prevented at the high level of the school. With 173 respondents from male side and 185 respondents are female who responded by '*yes'* that noise pollution can be prevented while 12 and 7 male and female respectively responded by '*no'* that noise pollution cannot be prevented.

**Table 5.** Showing suggestions on how to control noise pollution in public places

| How to control noise pollution | Gender | | Total no. of respondents | Percentage (%) |
|---|---|---|---|---|
| | Male | Female | | |
| Government efforts | 44 | 47 | 91 | 24.1 |
| Public enlightenment | 43 | 51 | 94 | 24.9 |
| Involving NGOs | 42 | 29 | 71 | 18.8 |
| Authorizing Civil authorities | 23 | 21 | 44 | 11.7 |
| Empowering police | 17 | 21 | 38 | 10.1 |
| All of the above | 22 | 17 | 39 | 10.3 |
| others (specify) | 0 | 0 | 0 | 0 |
| **Total** | **191** | **186** | **377** | **100** |

Source: Questionnaire, 2016

The above table5, indicates that using public enlightenment will solve the problem of noise pollution which has 94 respondents (24.9%), 91 respondents (24.1%) responded that government effort can solve the problem of noise pollution, involving NGOs has 71 respondents which is equivalence to 18.8%. While all the above solutions if put them together will solve the problem and has 39 respondents (10.3%), empowering police into the matter will also solve the problem as 38 respondents (10.1%) responded with while authorizing civil authorities carries 44 respondents (11.7%).

**DISCUSSION OF THE RESULT**

The major objective of this research work is to determine the impact of noise pollution on students' performance in Kano metropolitan local government areas. There is difference in terms of response between male and female students on noise pollution with 87 females responded by yes and 77 male

students. Similarly, the study indicates that based on the responses, male students are less affected by noise in the class compare to their partners female students. As the research showed that female students are affected more by noise during class hour than their counterpart male students; the research opposes the finding of [4]which stated that male students are detrimentally affected than their counterpart female. On the other hand, this study shows that both male and female students are affected negatively by noise pollution in and outside the class which back up the work of [2]whose one of the findings states there is negative impact of noise pollution to the students' performance. This might be as a result of high sensitivity female has than male students. And also, day-to-day activities are done by male in Nigeria especially northern part where Kano State is located. This might make male students to familiar with high or moderate sound. Moreover, another finding of this work indicates that noise pollution can be prevented from school premises and classes. This contradicted the work of [5] which stated that teachers as well as students generally thought that the noise generated in schools could not be prevented.
However, the result shows that almost all of the respondents believed that noise effects health such as negative effect on hearing, disturbing sleeping, resulting in deafness, causing annoyance, etc; which corroborate with what[15][16] found out in their researches.

## CONCLUSION AND RECOMMENDATIONS

From the findings of this research work and in view of its limitations, the following conclusions are drawn: setting of public schools in Kano metropolis is done sometime without seeing that in the future houses and markets might submerge the schools. The money spent for building schools are not enough to build standard class which will not allow sound to trespass. There is negligence of school administrators for allowing hawkers and trespassers to trespass into their schools.
Following measures need to be taken to tackle the situation:

1. A strict law concerning noise pollution in educational institutes should be made and implemented. Kano Road Traffic Agency (KAROTA), HISBAH and other civil defense should be used to ban using of horns in around sensitive areas like schools, hospitals, etc.Whoever violate the rules should be severely punished.
2. The ministries of environment, land and education should revise policies regulating the location and maintenance of schools to ensure effective compliance.
3. Planting of recommended plant species to absorb noise around the area.
4. The implementation of the technical measures for noise levels should be adopted.
5. Parent teachers' associations (PTA) of different schools, School administrators like headteachers and principals as well as non-governmental organizations (NGOs) should help to promote a good and conducive atmosphere for teaching and learning by fencing the school compounds so as to make them inaccessible to trespassers like football clubs, hawkers, churches etc. during the school hours.

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