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**Short Communication**

# THE EFFECT OF VIBRATION FROM ELECTRONIC DEVICE (COMPACT DISC) ON HUMAN AND THE ENVIRONMENT (BUILDING): A CASE STUDY OF PORT HARCOURT

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## Abstract

The activities of human beings for a better living condition have definitely constituted lots of negative impact in human and its environment. Man has made it an obligation to innovate amenities for his better living condition. The theory developed in years past state that "life is a continuity of change, that the only thing that cannot change is change." This theory has been the principles of man if we critically look at the environmental change, this can be seen from the facilities designed by man for a better living condition, these amenities has generated lots of negative impact, which is now a health hazard in man's life. The issue of electronic device viz., compact disc is a serious threat to human from its high level of vibration; it has serious and rapid effects on human life and the environment today. From the study area, the level of vibration are captured from the percentage of electronic device that constitute high level of vibration on building structures and the environment in general. Statistically it grouped into environmental settlement on human; it generates 70% of high density, 52.1% of medium density and 47% of low density. This validates the fact on growing level of vibration in general. There should be measures to drastically reduce or remove this threat on life from Compact disc that generate a lot of vibration as most people have it in their various residents in every part of Port Harcourt, these are found at a very high percent since it is affordable by every categories of human in the city of Port Harcourt, this generate a high level of percentage of people having access to it and therefore it generates a lot of vibration that affect human and the environment, which has definitely made human health status deteriorating as this constitute a lots of different type of ill health and unfriendly environment. 

**Keywords:** vibration, electronic devices, Environment and Building

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## 1. Introduction

Vibration is an oscillatory motion, which can be described in terms of the displacement velocity or acceleration. Vibration impact relate to annoyance and the potential for structural damage. No annoyance impact would occur inside building closer than (100 feet) that would exceed the damage risk criteria for extremely fragile building, criteria for new building would not exceed (25 feet), for pile driving closer than 400 feet would exceed the damage risk criteria for extremely fragile buildings. While on human it damages the good health status of human in so many ways, which generate a lot of sickness to human settle on area, that this vibration constantly occur. The issue of compact disc generating vibration is now peculiar to most people, because most people due to ignorance do not care the effect on human health as they continue to operate the device on a very high frequency generating high vibration that affect human health and the environment (Eluozo, 2005, Jan).

## 2. Characteristics of Vibration

Vibration is an oscillatory motion, which can be described in terms of displacement, velocity, or acceleration (Bhatia, 2001). Because the motion is oscillatory, there is no net movement of vibrating element and the average of any of the motion description to understand.
For a vibration floor, the displacement is simply the distance from a point on the floor, which moves away from the static position (Kelly, 1996). The velocity represents the instantaneous speed of the floor movement and acceleration is the rate of change of the speed (Kelly 1996).

### (a) Vibration Descriptors

One of the several different methods that are used to quantify vibrations amplitude is peak particle velocity (PPV), which is defined as the maximum instantaneous signal. PPV is often used in monitoring or vibration since it is related to the stresses that are experienced by building (Adeomoroti, 1996). Although peak particle velocity is appropriate for evaluating the potential of building damage, it is not suitable for evaluating human response; it is sometimes for the human body to respond to vibration signals. In a sense, the human body respond to an average vibrations amplitude, because the net average of vibration signal zero, the root mean square (rms) amplitude is used to describe the smooth vibration amplitude it acts to compress the range of number required to describe vibration. Vibration velocity level in decibels is defined as

$$Lv = 20\log(V/V_{ref})$$

Where, Lv is the velocity level in decibels,
V is the rms velocity amplitude,

and $V_{ref}$ is the reference velocity amplitude.
All vibration levels in this report are referenced to 1×106($10^6$?). Due to the constant operation of the compact disc in the settlement, the people experience vibration every day including the environmental amenities, which are structures simultaneously. Like passing traffic, which is very common source of environmental nuisance, the

problem of vibration from compact disc is now alarming to the maximum level, because the vibration from these electronic devices would damage the human health fast and affect the residential structure down to the foundation (Kelly, 1996).

### (b) Typical Vibration Level

In contrast to airborne noise, ground, borne vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 5O×dB(check this) or lower, well below the thresholds of perception for human, which is around (check this)65vdB.(Check the line spacing)

### (c) Effect of Vibration

Compact disc vibration in human and building structure have to be given a serious concern, because it is rapidly grown to the extent level of ground born vibration that occur during construction activities associated with any proposed project that is nearer to an existing structure, which definitely generates a lot of negative impact on the environment. It is for certainty looking at rapid growth level of compact disc vibration that it is now equivalent to the effect of ground borne vibration, which include freelabic movement of the building floors matching of windows, shaking of item and shelves or banging of walls and rumbling sounds, this is later discovered that the level of ground borne vibration can cause damage of building in this situation there should be a serious step to look at possible ways in which this effect from compact disc vibration can be controlled as it is rapidly generating ill health to the people which is not environmental friendly.

## 3. Methodology

Statistical application were used in the study area whereby sample data of number of people that have compact disc and there various level of operating their electronic device were also known through these analysis applied. Comparing it to the population of Port Harcourt city, these were done by grouping it according to the categories of settlement that is high, medium and low density (mention the range). These were done and percentage of each of these location were chosen , which will result knowing the mean of level of people that have access to compact disc including the way of operating that cause the generation of vibration which has a serious effect on human and the environment especially building structure.

## 4. Results and Discussion

In the study area the numbers of people that have access to compact disc are above average from different locations (of which part) as it can be seen in the tables below.

**Table 1: Electronic Device**

**High Density Area**

| Location | Population Growth | Population of Generating Set Owners | Percentage |
|---|---|---|---|
| Mile I | 322,000 | 225,000 | 70% |
| Mile II | 312,000 | 222,000 | 71% |
| Mile III | 317,000 | 232,000 | 73% |
| Mile IV | 257,000 | 210,000 | 81% |
| Mile V | 216,000 | 187,000 | 85.5% |
| Mile VI | 187,000 | 82,000 | 44% |
| | 1,169,000 | 1,149,000 | Mean = 70% |

**Table 2**

**MEDIUM DENSITY**

| Location | Population Growth | Population of Generating Set Owners | Percentage(%) |
|---|---|---|---|
| Port Harcourt Township | 352,000 | 252,000 | 7 1.4 |
| D/Line | 152,000 | 82,000 | 54.0 |
| Old G.R.A. | 102,000 | 32,000 | 3 1.3 |
| | 606,000 | 354,000 | Mean = 52. 1 |

**Table 3**

**LOW DENSITY**

| Location | Population Growth | Population of Generating Set Owners | Percentage (%) |
|---|---|---|---|
| Eagle Island | 102,000 | 37,000 | 36.2 |
| G.R.A. Phase I | 87,000 | 42,000 | 48.2 |
| G.R.A. Phase II | 112,000 | 62,000 | 55.3 |
| | 606,000 | 136,000 | Mean = 47 |

From the results, in all the locations of the study area, it was observed that high density is 60%, medium was 51.5% and low density as 45.5%; the fast growth of vibrations were as a result of the number of those with electronic device that generates the vibration. This indicates that, as the demand for electronics device grows high, so also the vibration will grow to a high degree. This calls for quick action, in order to stop this environmental hazard, which is unhealthy to man's environment.

## 4. Conclusion

The study has definitely express pressure from vibration on building structures; the study of vibration generated from compact disc has express the causes of vibration on human including the building structure were such level may not have consider in factor of safety mostly ancient designed structures, the percentage of compact disc that generate vibration that should affect human in the environment, there should stipulated regulation that will control vibration due to its serious effect on the environment.

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