ASSESSMENT AND COMPARISON OF NOISE POLLUTION IN COMMERCIAL AND RESIDENTIAL AREA IN LUCKNOW AND ITS IMPACT ON THE HEALTH/SURROUNDING ENVIRONMENT

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Abstract : The examination looks at the issue of sound contamination in the wake of its evil impact on the life of the general population (health) and the surrounding environment. A cross sectional review of the population in the world calls attention that the main sources of noise pollution are industrial, commercial, traffic and various public and private ceremonies using loud speakers in the residential zones .

This paper also describe the current standards and practices and some of the suggestion in literature to study the impact and comparison. The present study focuses on assessment and comparative effect of noise pollution of residential areas viz. Vikas Nagar, Indira Nagar, Aliganj and commercial area viz. Charbagh, Chowk, Aminabad in Lucknow with standard and its effect on the health.

The research also emphasizes the ten year data of noise poll. Noise is a prominent feature of the environment including that from sources such as transport, industry and neighborhood. Noise pollution is becoming more and more acute, and hence many researchers are studying the effect of noise pollution on people and its attenuation.

A questionnaire survey was conducted to know the health impact of population in residential and commercial areas in Lucknow.

IndexTerms **- noise pollution, commercial area, residential area**

I. INTRODUCTION

Sound which is unwanted or disrupts one's quality of life is called as noise. When there is lot of disrupt in the environment, it is termed as noise pollution. It became undesirable when it disturbs the normal activities such as working, sleeping, and during conversations. There are direct links between noise and health. Community noise or environmental noise, the most common pollutants. It is defined by World Health Organization as noise emitted from all sources, except noise at the industrial workplace. Community noise includes the primary sources of road, rail and air traffic, industries, construction and public works and the neighborhood. Noise pollution can damage physiological and psychological health. Sound is mechanical waves that can oscillation of pressure transmitted through a solid, liquid or gas composed of frequencies within the range of hearing or of a level sufficiently strong to be heard. It is produced by irregular vibrations. The unit of noise is decibel, one-tenth of a bell and denotes as dB. Vibration is a rapid to and fro motion of an object. Sound meter, Sonar for to find underwater objects, etc. Noise pollution which causes several health related problems like lack of sleep, hypertension, high blood pressure, anxiety etc. A person exposed to continuously loud sound may get temporary or permanent impairment of hearing. The noise from explosions, e.g., from a pile driver, punch press or gunshot, is called impulsive noise. When machinery operates in cycles, or when single vehicles or aeroplanes pass by, the noise level increases and decreases rapidly. Continuous noise is produced by machinery that operates without interruption in the same mode, example, blowers, pumps and processing equipment. Sources of noise pollution are industrial activity, construction activity, fire crackers, sound producing instruments, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices.

Table 1 : The noise pollution (regulation and control) Rules,2000

No.	Category of Area/Zone	Limits in dB (Day)	Limits in dB (Night)
1	Industrial Area	75	70
2	Commercial Area	65	55
3	Residential Area	55	45
4	Silence Zone	50	40

Source: cpcb.nic.in

AREA OF STUDY

Lucknow city

Lucknow is one of the metropolitan cities of India. It is the largest city of Uttar Pradesh, it is the administrative headquarters of the all Districts and Divisions. It is the capital of the state of Uttar Pradesh the largest state of India which also makes it important in terms of social, financial and cultural aspects. It is the second largest city in north and central India after New Delhi and the third largest city in north, east and central India after Delhi and Kolkata.

Geographical location, Lucknow

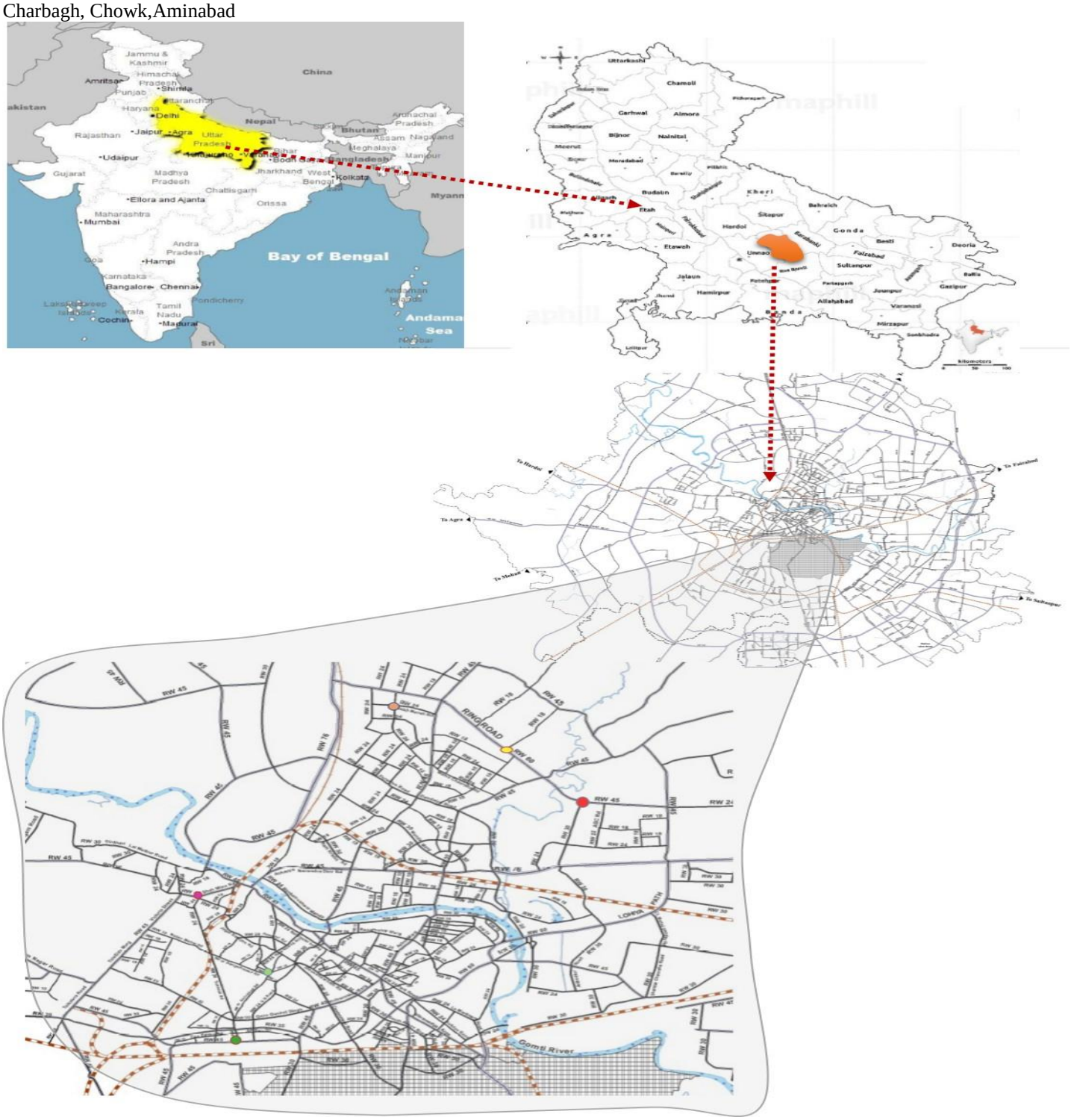
The city stands at an elevation of approximately 123 meters (404 ft.) above sea level and it lies in between 26° 30' to 27° 10' North latitude an 80°30' to 81° 13' East longitude. It covers an area of 2,528 sq. km. (976 sq. mi). Bounded on the east by the Barabanki, on the west by Unnao, on the south by Rae Bareli and in the north by Sitapur and Hardoi, Lucknow sits on the north western shore of the Gomti River.

Residential Area:

Aliganj, Vikas Nagar, Indira Nagar

Commercial Area:

Charbagh, Chowk,Aminabad

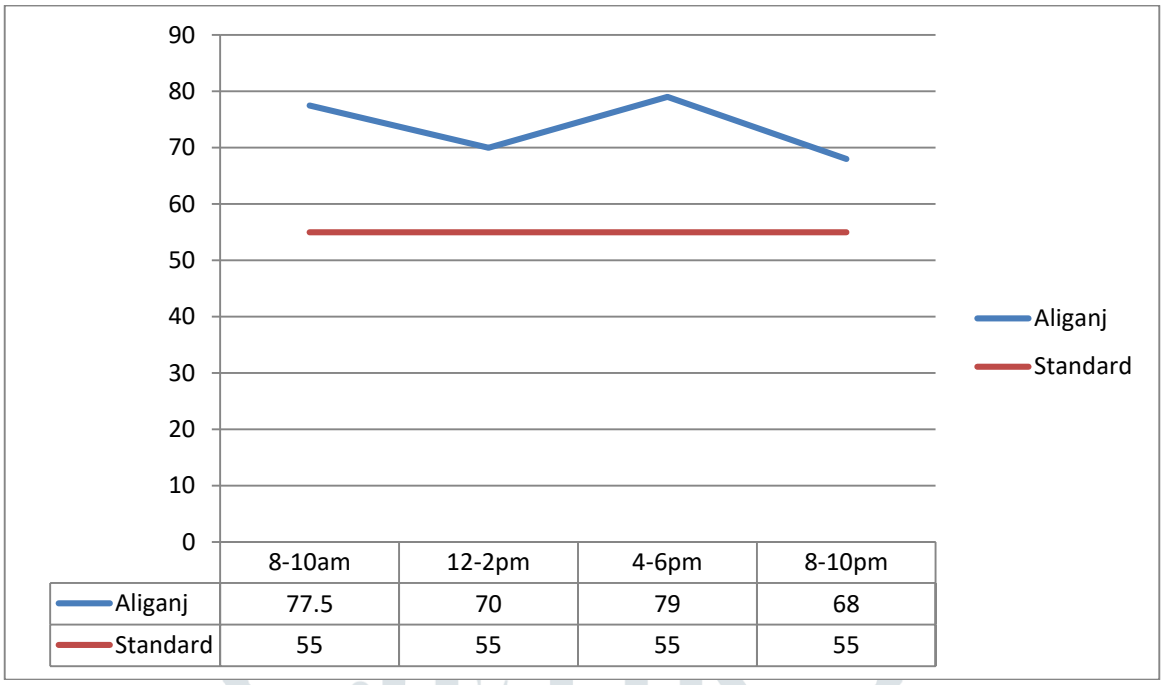


METHOD AND MATERIAL:

- The sampling station should be located at the ambient level i.e. away from the direct source, away from any vibration and any obstruction.
- Categorize the area with land use pattern (i.e. Industrial, Commercial, Residential & Silence Zone).
- **Positioning of the instrument:**
    - Microphone must be placed 1.2 -1.5m above the ground level.
    - In dry conditions with a wind speed of less than 5 m/s.
    - Noise measurements should not be made in fog and rain
    - Isolate the instrument from strong vibration and shock.
    - Considering upwind, downwind and crosswind in monitoring network
- **Record of measurement**
    - The date, time, location and duration of the measurement;
    - Preferable to have large number of data sets
    - L_{eq}, L_{max}, L_{min}
    - All predominant noise sources will be noted, which may include extraneous noise such as road traffic, aero-planes and other activity;
    - Weather conditions will be recorded including wind speed and approximate direction, cloud cover, rain and ground frost;
- **General Constraints**
    - Reconnaissance survey will be undertaken to identify the major noise generating sources
    - Different noise generating sources will be identified based on the activities
    - The noise levels at each location will be recorded for 24 hours.
    - 6am to 10pm - day time noise levels
    - 10pm to 6am – night time noise levels
    - Sound Pressure Level (SPL) measurements will be measured at all locations using sound level meter
- Quesionnaire
    - A questionnaire is preapared to know the impact of noise pollution on the health of the people in the selected area

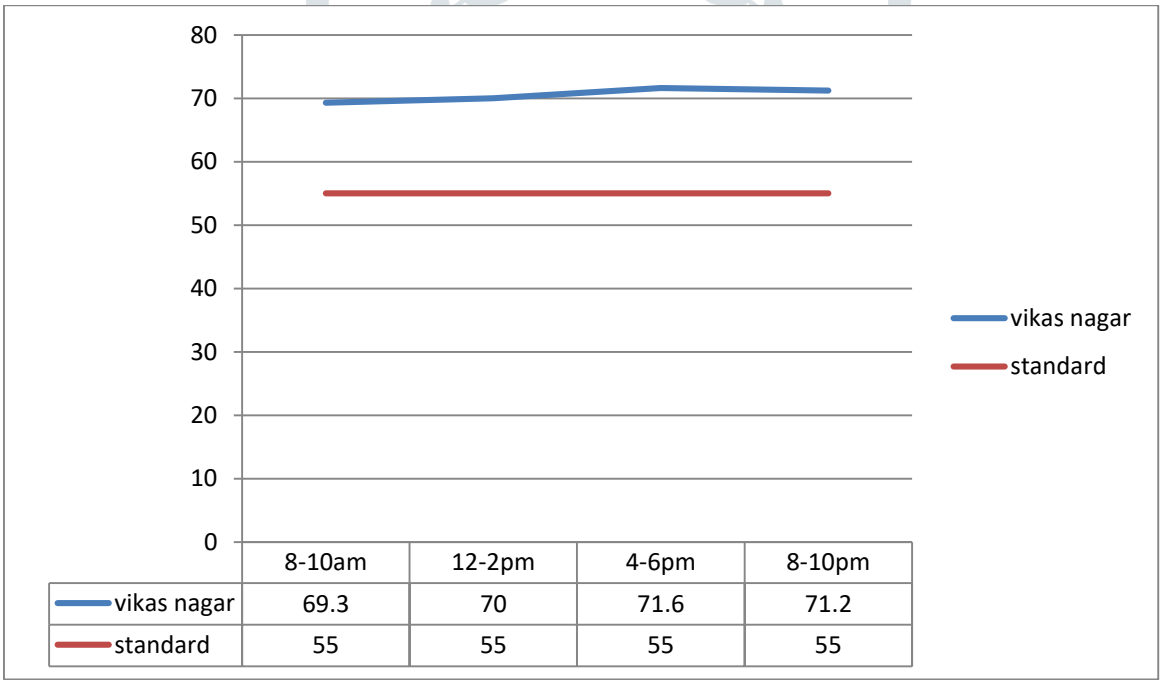
RESULT:

RESIDENTIAL AREA



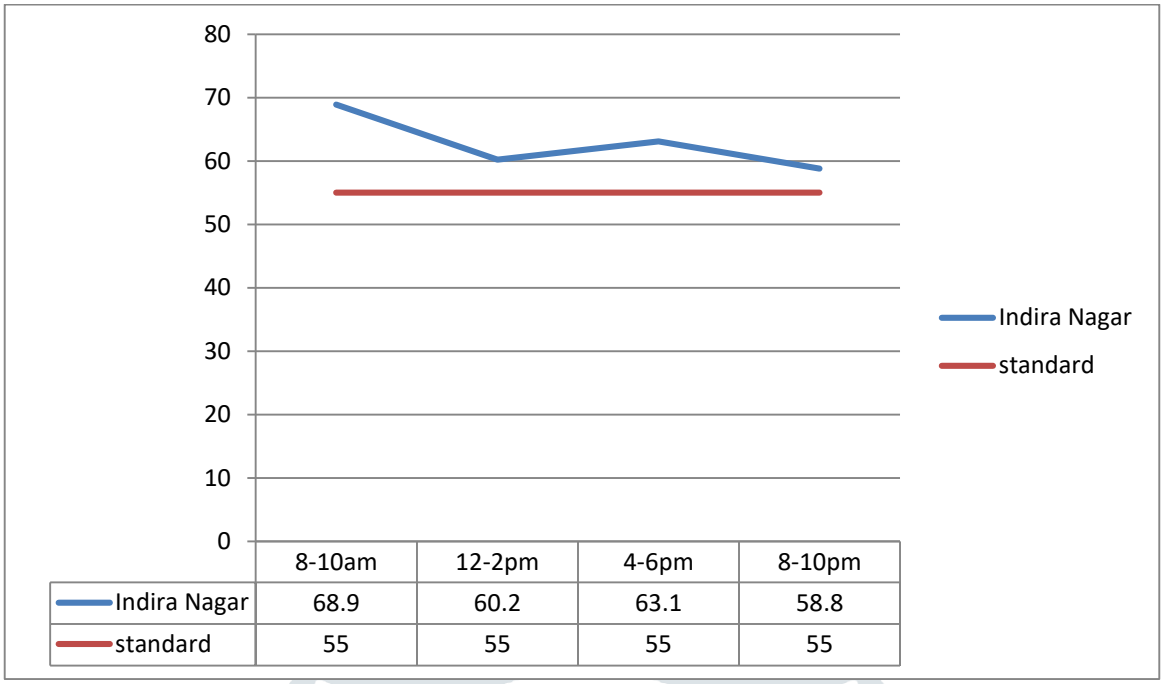
	8-10am	12-2pm	4-6pm	8-10pm
Aliganj	77.5	70	79	68
Standard	55	55	55	55

Noise Level Reading at Aliganj on 15 Feb- 2019



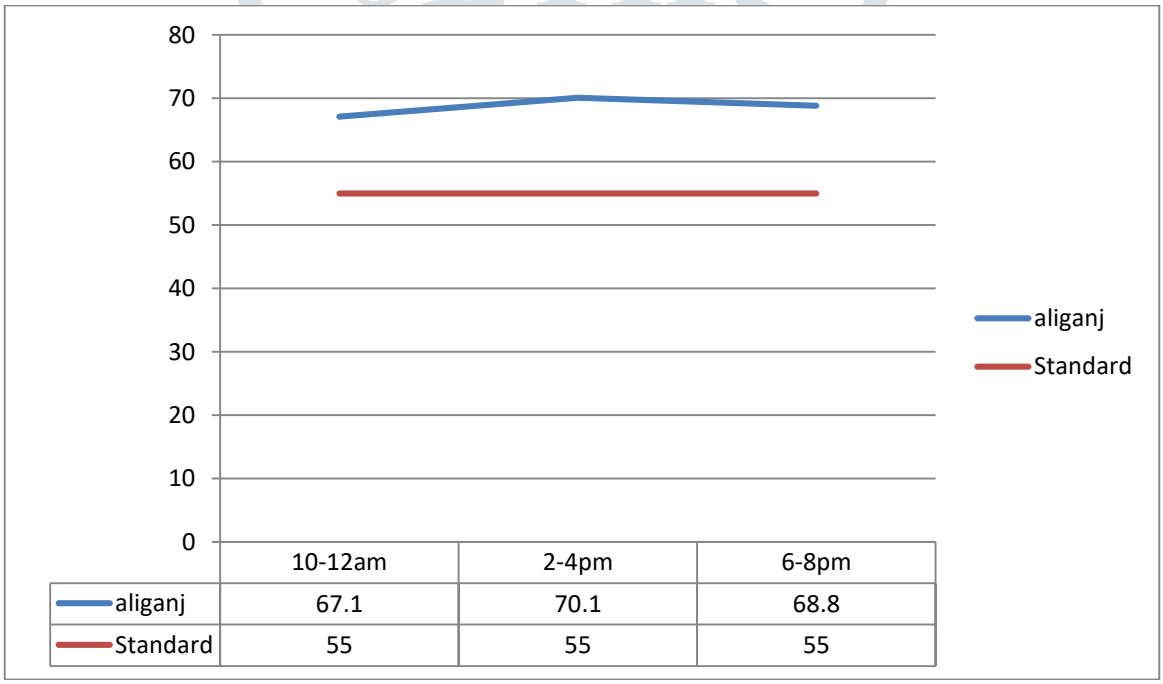
	8-10am	12-2pm	4-6pm	8-10pm
vikas nagar	69.3	70	71.6	71.2
standard	55	55	55	55

Noise Level Reading at Vikas Nagar on 16Feb2019



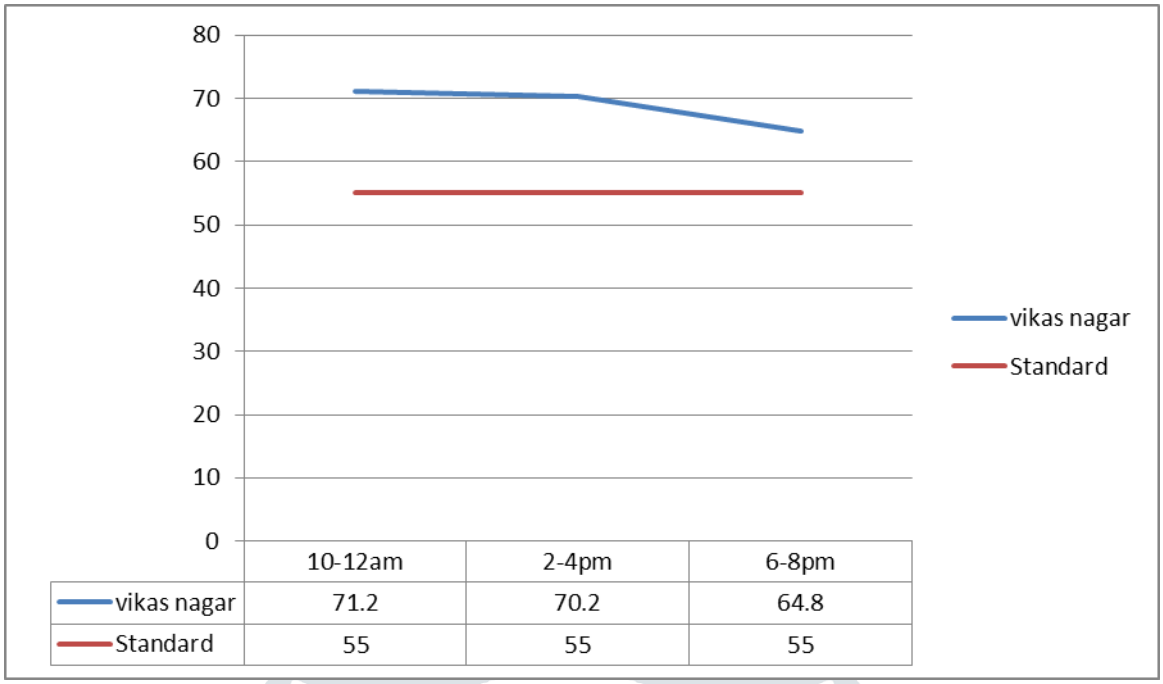
	8-10am	12-2pm	4-6pm	8-10pm
Indira Nagar	68.9	60.2	63.1	58.8
standard	55	55	55	55

Noise level Reading at Indira Nagar on 17Feb2019



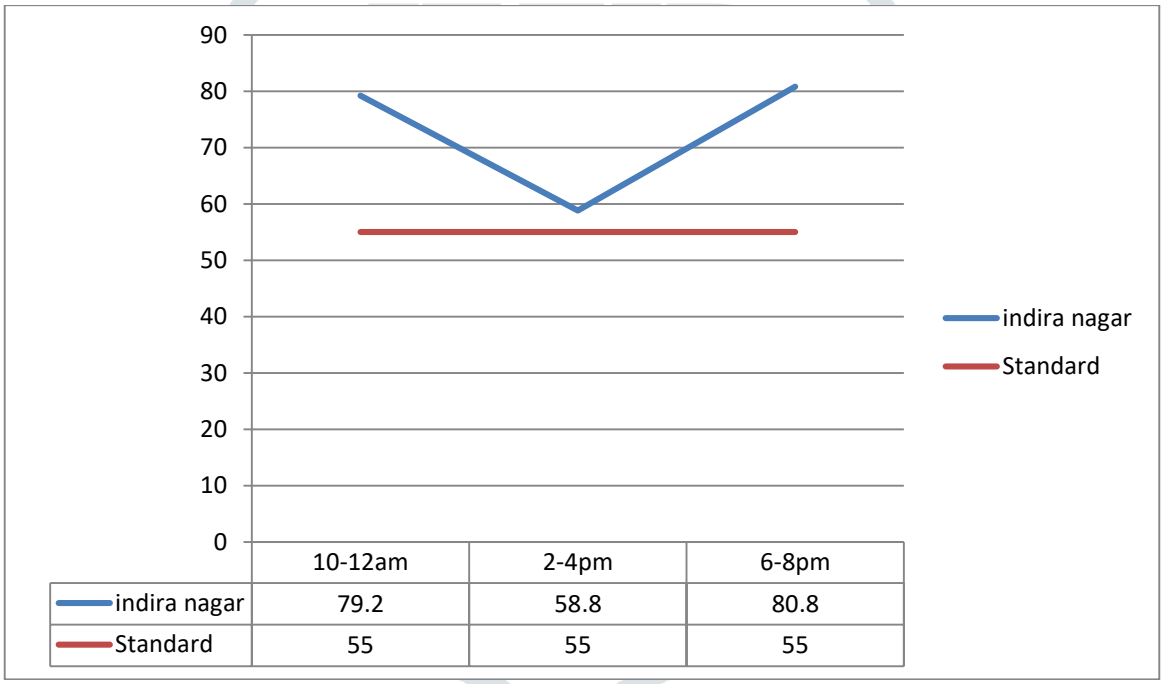
	10-12am	2-4pm	6-8pm
aliganj	67.1	70.1	68.8
Standard	55	55	55

Noise Level Reading at Aliganj on 18Feb2019



	10-12am	2-4pm	6-8pm
vikas nagar	71.2	70.2	64.8
Standard	55	55	55

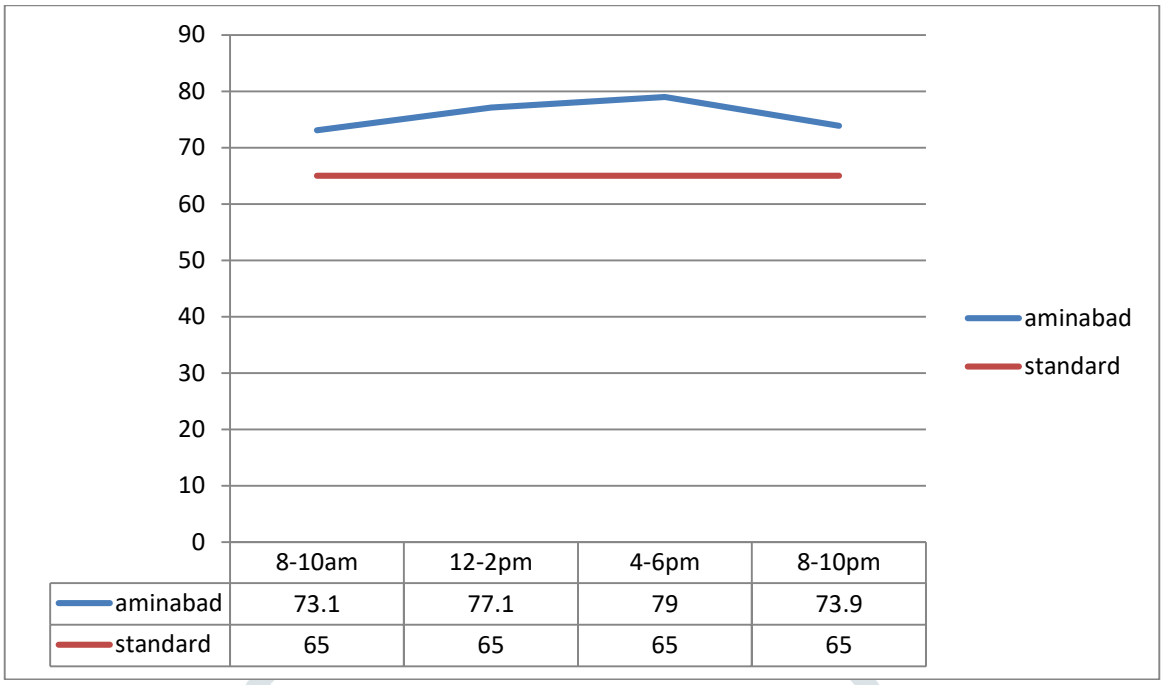
Noise level reading at Vikas Nagar on 19Feb2019



	10-12am	2-4pm	6-8pm
indira nagar	79.2	58.8	80.8
Standard	55	55	55

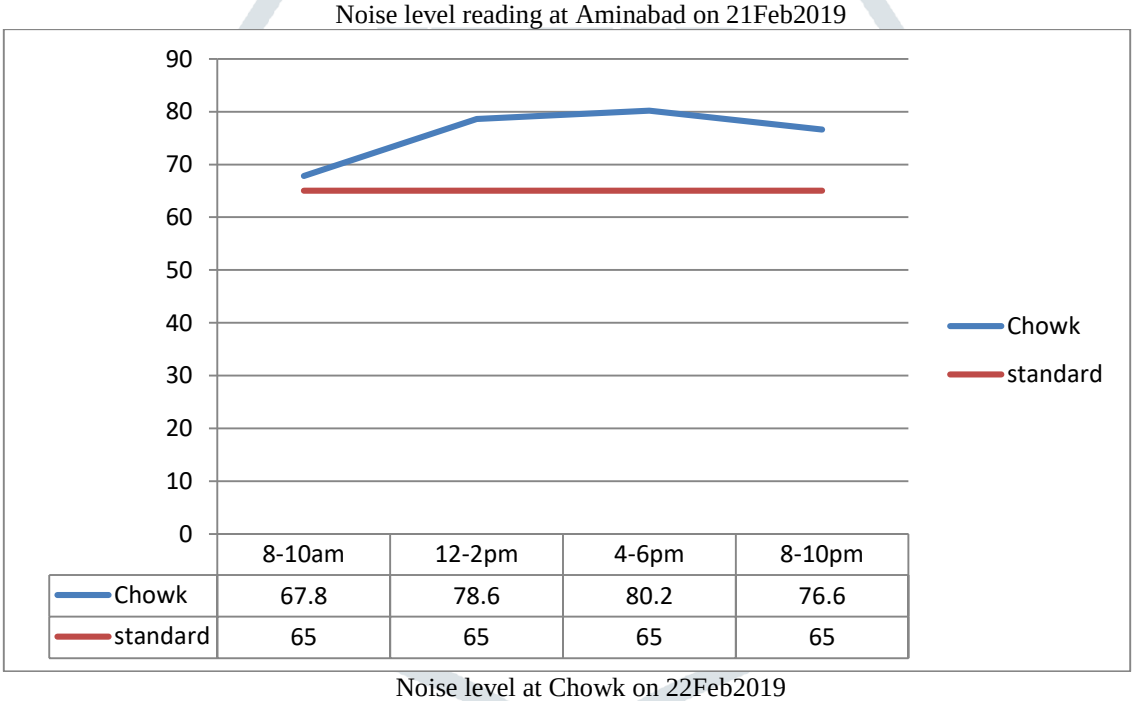
Noise level reading at Indira Nagar on 20Feb2019

COMMERCIAL AREA



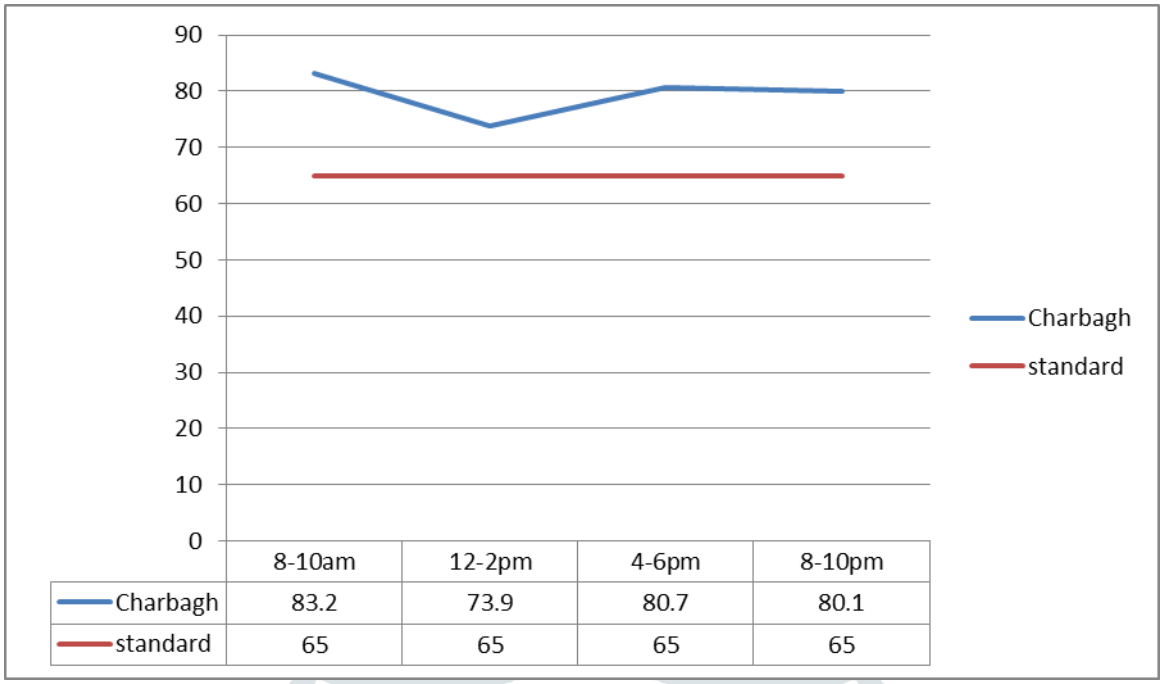
	8-10am	12-2pm	4-6pm	8-10pm
aminabad	73.1	77.1	79	73.9
standard	65	65	65	65

Noise level reading at Aminabad on 21Feb2019



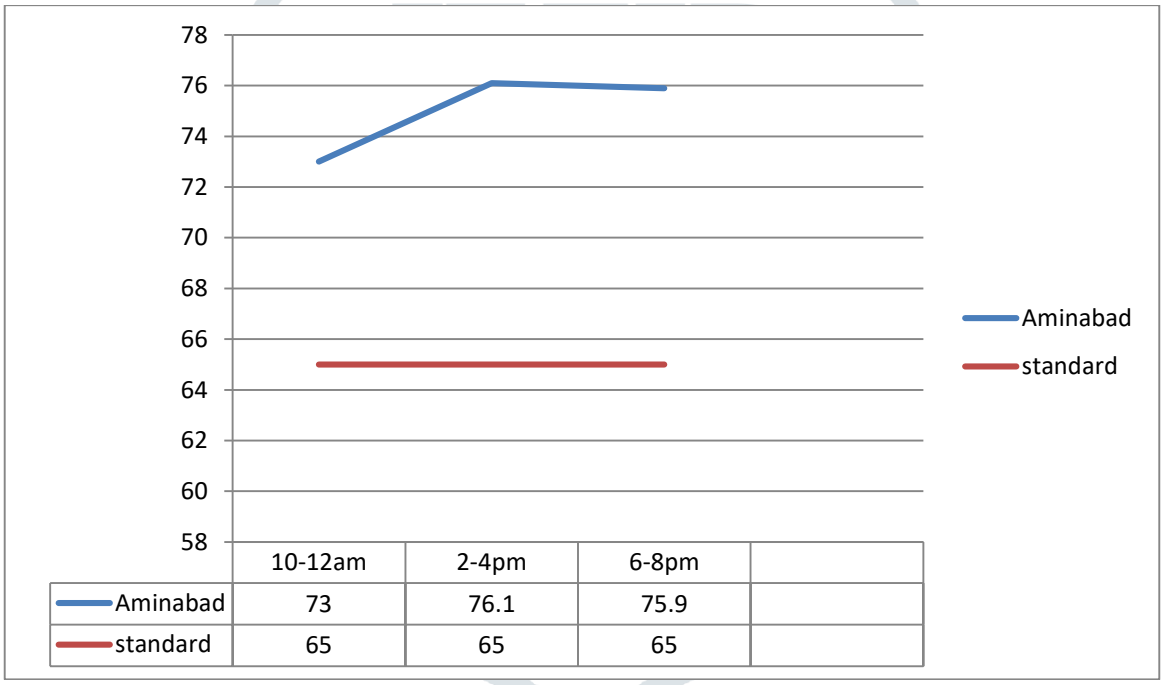
	8-10am	12-2pm	4-6pm	8-10pm
Chowk	67.8	78.6	80.2	76.6
standard	65	65	65	65

Noise level at Chowk on 22Feb2019



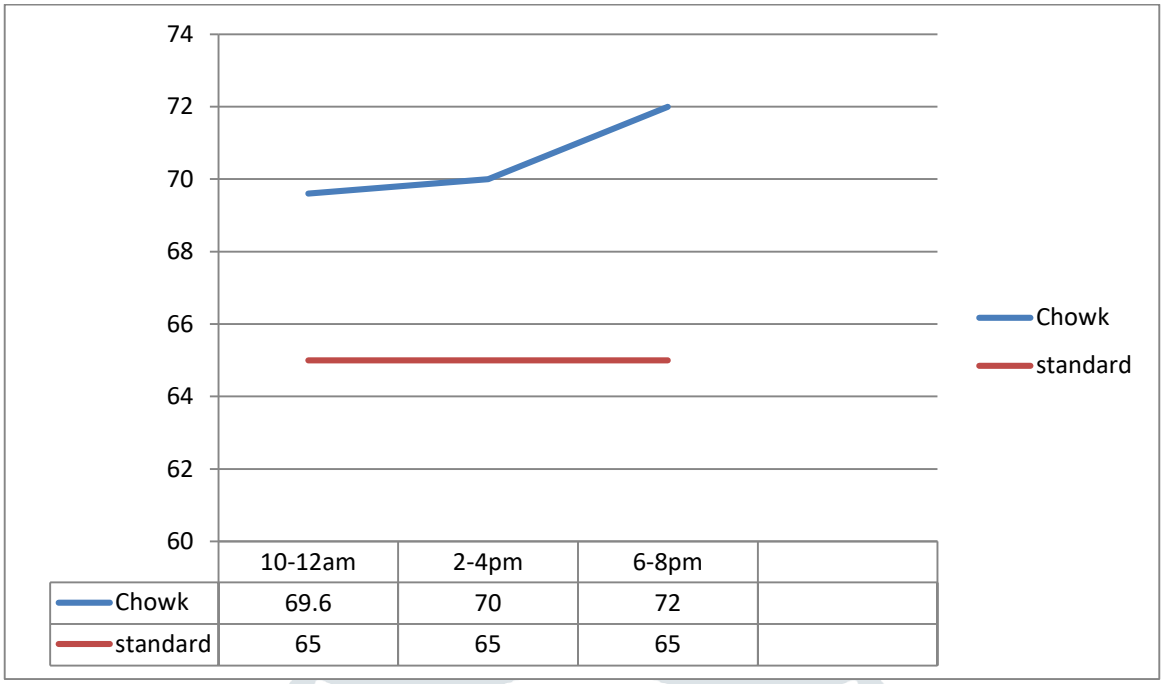
	8-10am	12-2pm	4-6pm	8-10pm
Charbagh	83.2	73.9	80.7	80.1
standard	65	65	65	65

Noise level reading at Charbagh on 23Feb2019

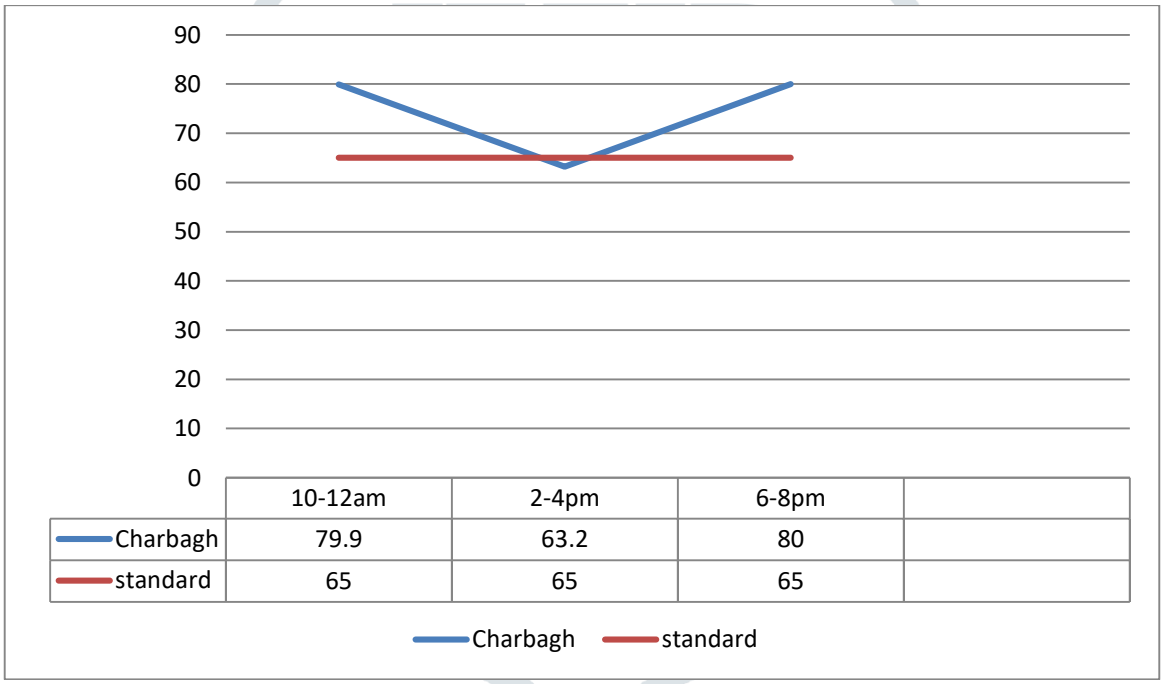


	10-12am	2-4pm	6-8pm	
Aminabad	73	76.1	75.9	
standard	65	65	65	

Noise level at Aminabad on 24Feb2019



Noise level reading at Chowk on 25Feb2019



Noise level reading at Charbagh on 26Feb2019

		8-10am	12-2pm	4-6pm	8-10pm	Standard	Remark
Aliganj	15-2-2019	77.5	70	79	68	55	Noise level is maximum at 4-6pm
Vikas Nagar	16-2-2019	68.9	60.2	63.1	58.8	55	Noise level is maximum at 8-10am
Indira Nagar	17-2-2019	69.3	70	71.6	71.2	55	Noise level is maximum at 4-6pm
Aminabad	18-2-2019	73.1	77.1	79	73.9	65	Noise level is maximum at 4-6pm
Chowk	19-2-2019	67.8	78.6	80.2	76.6	65	Noise level is maximum at 4-6pm

Charbagh	20-2-2019	83.2	73.9	80.7	80.1	65	Noise level is maximum at 8-10pm

		10-12am	2-4pm	6-8pm	Standard	Remark
Aliganj	21-2-2019	67.1	70.1	68.8	55	Noise level is maximum at 2-4pm
Vikas Nagar	22-2-2019	71.2	70.2	64.8	55	Noise level is maximum at 10-12am
Indira Nagar	23-2-2019	79.2	58.8	80.8	55	Noise level is maximum at 6-8pm
Aminabad	24-2-2019	73	76.1	75.9	65	Noise level is maximum at 2-4pm
Chowk	25-2-2019	69.6	70	72	65	Noise level is maximum at 6-8pm
Charbagh	26-2-2019	79.9	63.2	80	65	Noise level is maximum at 6-8pm

According to the questionnaire report, 45% population in lucknow are aware of the noise pollution,30% have hearing issue,45% suffers from insomnia due to noise, people in residential and commercial area. Moreover they are suffering from headache, hypertension, anxiety and different health issues.

CONCLUSION

From the present study, it can be confirmed that the increased use of vehicles is the main cause of increased noise level in the Lucknow city. There is a requirement to increase awareness among people including the Government officials to prevent the long-term health risks associated with noise pollution. From the research carried out in this thesis the following conclusions are drawn. Knowingly or unknowingly everyone contributes to noise pollution, because most of the day-by-day activities of human beings generate some noise. If neglected, noise pollution had an adverse effect on the human being leading to irritation, loss of concentration, loss of hearing.

- One have to identify the sources of noise pollution. Once identified, the reason(s) for increased noise levels are to be assessed.
- It is generally found that the people feel much pain in their ears and migraine during duty hours as well as after duty hours due to increase in noise level.
- The findings of this study also indicated that the high density residential area like OMR is affected by noise pollution.
- Indeed some control measures and proper planning has to be implemented to overcome the adverse effects from noise pollution and for the wellbeing of the residents.
- This thesis explores the sources, effects, reactions and suggestions for controlling the excessive noise generated from road traffic.
- Exposure to noise pollution exceeding 75 decibels for more than eight hours daily for a long period of time can cause health hazards.

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