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1	2021	Prof. (Dr.) M. G. Londhe	Annabhau Sathe Janm Shatabdi Gourav Granth	1-2
2	2021	Dr. D. A. Gade	A comparative study of noise level during Ganesh festival in greater Mumbai	3-14
3	2021	Prof.Dr.Suvarna more	A Field Guide To Spiders of Western Ghats	15-16



  
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Padmabhushan Vasantrodada Patil  
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# अण्णा भाऊ साठे

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जन्मशताब्दी  
गौरव ग्रंथ  
— — —



संपादक : डॉ.मोहन लोंडे



अण्णा भाऊ साठे जन्मशताब्दी गौरव ग्रंथ  
संपादक - डॉ. मोहन लोंढे  
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**APPLICATION OF RESEARCH METHODS  
AND TECHNIQUES IN GEOGRAPHY**

**UPH**

## APPLICATION OF RESEARCH METHODS AND TECHNIQUES IN GEOGRAPHY

This book is based on contribution of papers received and deliberated during the National Level Workshop organized by the Department of Geography, University of Mumbai on December, 9-10, 2019 to mark the Golden Jubilee year celebration with a purpose of providing the insight and basic aspects involved in a research methodology study to young budding students and researchers. This book will definitely help and motivate the young minds into realm of research in higher education to enable to successfully complete their efforts with a focused view. Research papers contributed to this book by authors cut across various branches of physical, human and environmental geography using application of conventional and modern techniques of geospatial and spatial analytics.

The publication of this book is made possible from the financial grant received from University of Mumbai given on account of Golden Jubilee Celebration Year to The Department of Geography.

The authors deeply acknowledge each and everyone who have helped directly and indirectly in bringing this book in a published form which is just a humble beginning of the academic journey to serve the geographic community to the best of our ability. - Editors

**UPH**

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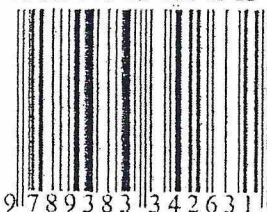
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# A Comparative Study of Noise Level during Ganesh Festival in Greater Mumbai, Maharashtra

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## Introduction

Noise pollution is one of the environmental problems in the urban areas in India. Environmental noise pollution is very harmful to human health and well-being. This is the gift of modern human lifestyle, industrialization and growth of urbanization. More than 20 cities in India have populations of over one million, and some of them including New Delhi, Mumbai, Chennai and Kolkata are among the world's most polluted. Assuming economic liberalization and increased urbanization, the damage to environment and health could be enormous. It adversely affects future generations by degrading residential, social, and learning environments with corresponding economic losses. The word noise is derived from Latin word "Nausea" implying unwanted sound or sound that is loud, unpleasant or unexpected. Noise is also defined as "wrong sound, in the wrong place at the wrong time"

The noise pollution is increased day by day, due to population growth, urbanization, and technological development. The major problems of noise pollution are as different kinds of disease like hearing impairment, interference with spoken communication, sleep disturbance, cardiovascular disturbance, annoyance, social handicap, reduced productivity, negative social behavior, absenteeism and accidents

## Study Area

Mumbai is located in the western seaboard of India. Majority part of Mumbai sits on the old Island of Salsette which lies at the mouth of Ulhas River. The latitudinal and

longitudinal extension of Mumbai is 19° 00' N to 19° 15' N latitude and 72° 45' E to 73° 0' E longitude. It covers an area about 603 sq. km. and height of Greater Mumbai is mean sea level. As per 2011 census the population of Mumbai is 12,442,373. Usually, it is referred to as three different geographic entities; these are: Mumbai city, Greater Mumbai and Mumbai metropolitan region. Mumbai city is the core of the old port city of Mumbai during the colonial period. Since then, its territory has expanded northward to cover the suburbs and extended suburbs. The Mumbai Island city plus the Mumbai suburban district comprise what is now called as Greater Mumbai.

### **Land Area**

Greater Mumbai, the area under the administration of Brihanmumbai Municipal Corporation (BMC), spans a total area of 437.71 sq km. Mumbai Island City located at the southern tip of Mumbai covers 67.79 sq km of land territory while the suburban district located north of the Island City covers 369 sq km of land. Greater Mumbai accounts for most of Mumbai's territory. Mumbai, as an urban entity however, spans a bigger total area of 603.4 sq km including some regions such as Defence lands, Mumbai Port Trust lands, and the Borivali National Park area, which are outside the administrative jurisdiction of MCGM. The bigger Mumbai Metropolitan Region covers an extensive area of about 4,355 sq km (Mumbai on the net, 2010)

### **Objectives:**

The objectives of the study are: To study the noise levels in various stations in Greater Mumbai region.

- i) To identify the noise level and intensity in study area.

### **Data Base and Methodology:**

This research work is based on secondary data sources. The secondary data is collected from the Maharashtra Pollution Control Board (MPCB). Total 25 stations in Greater Mumbai were considered for this research. The noise monitoring was carried out using calibrated Sound Level Meters (Type II) kept at the fast response mode keeping in view the quickly changing nature of noise levels, using 'A' filter. The data were processed, tabulated and presented with the proper maps and graphs. The maps and graphs used to present spatial distribution of noise level. The intensity of noise level (dB) map prepared after averaging of each station's data during the festival by using ArcGIS Ver.10.2.2 software applying Inverse Distance Weighted (IDW) tools in spatial analysis environment.

### **Physiography**

Mumbai is capital city of the state of Maharashtra was situated on seven small islands, over the centuries was connected by natural and man-made land reclamation. Today, it is a narrow strip of island that abuts the coastal belt of Konkan. Greater Mumbai is located

trading centre and a financial hub-of the country.

### Hills

There are three hill ranges in the city. The Ghatkopar hill is present near the station of Ghatkopar. The Powai hill is located in north of the city. The Borivali National Park occupies most of the region. The Vihar and Tulsi Lakes are present within the hills. The highest point of the metropolis, is located at 450 meters.

### Lakes

There are three lakes in the city. The Vihar Lake and the Tulsi Lake are present within the National Park and supply part of the city's drinking water. The Powai Lake is located south of these two lakes.

### Bay

Back Bay is the largest bay in the city. The coastline of Back Bay is an inverted C-shaped region 4 km in length, and Marine Drive is located along this stretch. North of Marine Drive is Worli Bay. In the centre of the bay is the tomb of Haji Ali. Mahim Bay is the second largest bay in the city. The Mithi River empties into the Mahim Creek which drains into the bay. The border between the city and its suburbs bisects the bay. To the north lies Bandra and to the south, Mahim.

### Creeks

Bombay has numerous creeks with nearly 71 km<sup>2</sup> of creeks and mangroves along its coastline. The Vasai Creek to the north and Thane Creek to the east separates Salsette Island from the mainland. Within the city the Malad (or Marve) Creek and the Gorai (or Manori) Creek inundate the suburban region. The Mahim Creek forms the border between the two districts. There are also the Mahul Creek and the Mahim Creek.

### Relief

Many parts of the city lie just above sea level, with elevations ranging from 10 to 15 meters. The city has an average elevation of 14 meters. Northern Mumbai (Salsette) has a hilly while the rest of the city is low lying and flat. Jambulmal' is considered as the highest point in Mumbai at the height of 468 meters from MSL.

### Geology

The underlying rock of the region is composed of black Deccan basalt flows, and their acidic and basic variants dating back to the late Cretaceous and early Eocene eras. Mumbai sits on a seismically active zone owing to the presence of 23 fault lines in the

vicinity. The area is classified as a Seismic Zone III region, which means an earthquake of up to magnitude 6.5 on the Richter-scale.

**Soil**

The soil cover in the city is predominantly sandy due to its proximity to the sea. In the suburbs, the soil cover is largely alluvial and loamy.

**Climate**

The city does not experience distinct seasons, but the climate can broadly be classified into two main seasons, the humid season and the dry season. Usually, the period between October to May is relatively dry. The city gets southwest monsoon rains beginning June to end September with peak rains occurring in July. Occasionally, northeast monsoon showers occur in October and November. The maximum annual rainfall ever recorded was 3,452 mm in 1954. The highest rainfall recorded in a single day was 944 mm on 26 July 2005. The average total annual rainfall is 146.6 mm in the Island City, and 2,457 mm in the suburbs. The average annual temperature is 27.2 °C

**Discussion and Analysis**

As per the noise pollution (regulation and control) rules, 2000, under the Environment (Protection) Act, 1986, we are abide to follow rules and regulations for the hormone. The present research paper is based on noise standards (Table 1) refer to the guideline of maintaining noise in our surrounding four category of the area. Ganesh pandal is mostly situated in residential area. Therefore noise level in day and night should be 55 dB and 45 dB respectively.

**Table 1: Ambient Air Quality Standard of Noise Pollution**

Area Code	Category of Area Zone	Limits in dB (A) L eq*	
		Day Time	Night Time
A	Industrial area	75	70
B	Commercial area	65	55
C	Residential area	55	45
D	Silence zone	50	40

Note: Day time mean is from 6.00 a.m. to 10.00 p.m.; Night time mean is from 10.00 p.m. to 6.00 a.m. (Source: *cpcb.nic.in*)

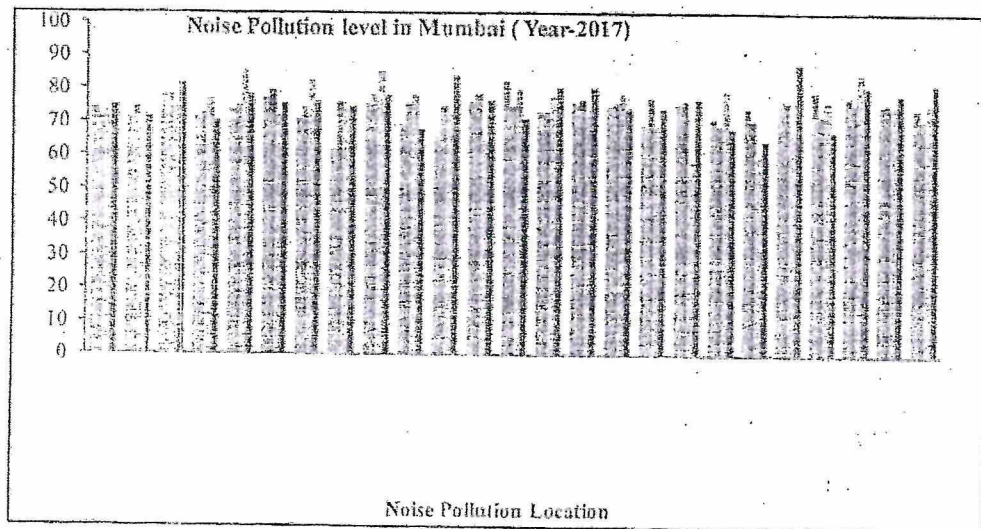
Maharashtra has a tradition to celebrate Ganesh festival every year. The Ganesh festival starts with Ganesh chaturthi and continuous for 11 days (some time 10 days) up to Anantchaturthi, The days to be followed are marked with every day morning and evening ceremonies and special events of singing religious songs, traditional dances and chanting prayers. Indian festivals are traditionally celebrated with song and dance in large groups, using musical instruments, drums etc. Bursting of fire crackers during celebrations produce

intermittent and high frequency 'impulse noise'. Every Ganesh Mandal are used different types of musical and electric instrument for making merry in their festival.

Table 2: Noise Levels during Ganesh Festival in different locations in Mumbai during 2017

	Locations	25/08/2017	26/08/2017	31/08/2017	05/09/2017
1	Andheri	73.9	71.5	75.6	74.9
2	Bandra	71.3	74.5	72.4	71.6
3	Bhandup	78.0	78.0	75.4	81.4
4	Borivali	71.3	72.4	76.6	70.2
5	Byculla	73.8	74.7	85.1	78.1
6	Chembur (East)	77.0	79.4	71.8	75.5
7	Chembur (West)	70.9	74.1	82.4	76.1
8	Chinchpokali (E)	61.4	76	73.7	74.4
9	Chinchpokali (W)	75.3	78.2	85.1	78
10	Dadar (East)	69.1	75.6	78.2	67.8
11	Dadar (West)	65.6	74.7	72.7	83.8
12	Elphinstone	76.0	78.3	64.3	76.5
13	Ghatkopar	82.3	75	79.9	71.2
14	Girgaon Chowpati	73.0	73.3	78	80.4
15	Grant Road	75.8	76.6	73.6	80.3
16	Juhu Chowpati	74.5	75.6	78.3	74.1
17	Kandivali (East)	69.0	77.2	68.9	74.1
18	Kandivali (W)	75.4	76.7	58.1	77.1
19	Khar	71.1	69.4	79.4	68.3
20	Mulund	74.4	70.6	60.3	64.5
21	Mumbai Central	75.7	76.1	66	87.7
22	Parel	79.2	72.4	76.5	67.5
23	Santa Cruz (East)	77.3	75.8	84.5	80.6
24	Vikhroli	75.1	75.8	75.3	78.5
25	Wadala	74.1	70.9	75.5	81.8

Figure 1

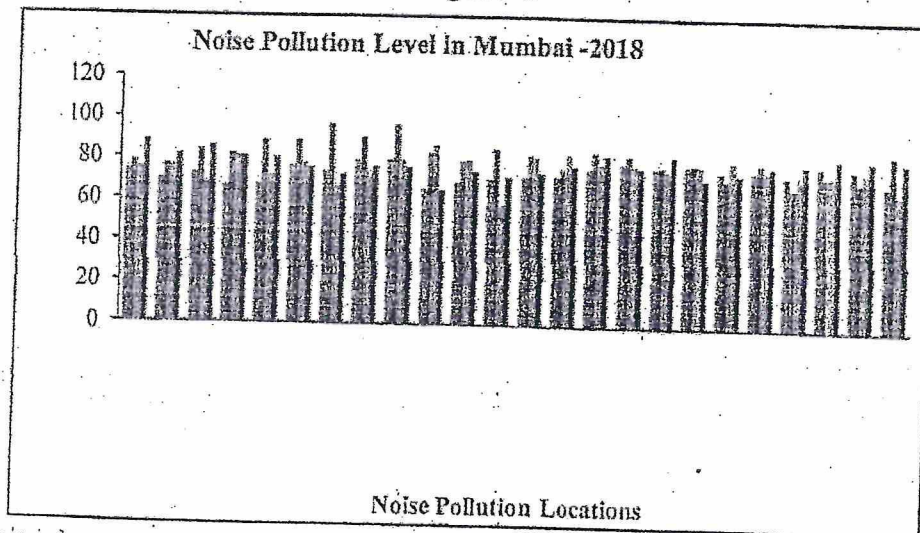


(Source: cpcb.nic.in)

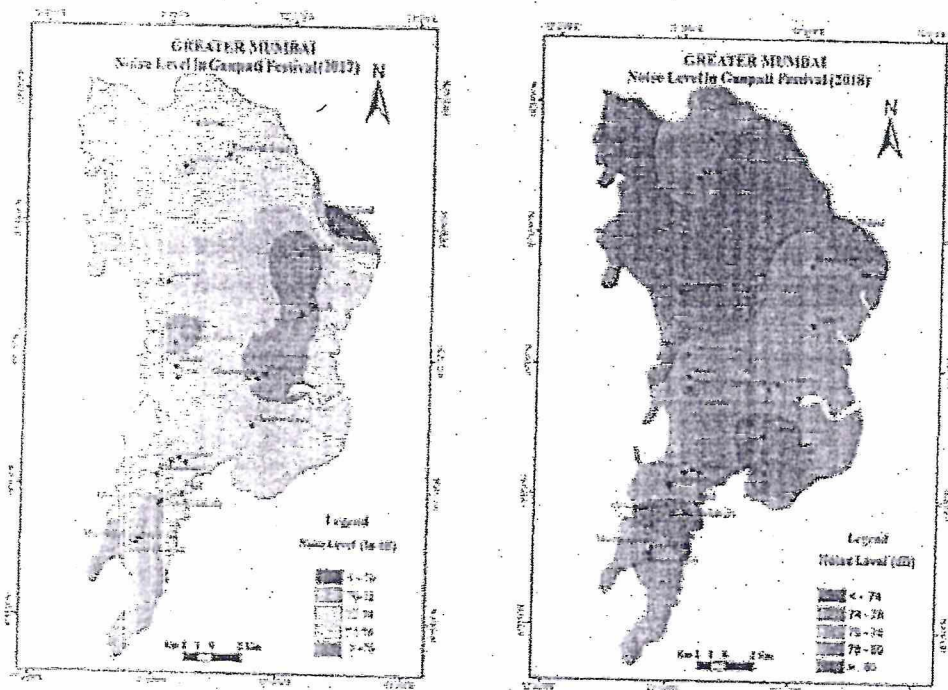
**Table 3: Noise Levels during Ganesh Festival for years-2018 in different locations in Mumbai during 2018**

Locations	13/09/2018	14/09/2018	17/09/2018	19/09/2018
Andheri	74.0	78.3	75.1	88.6
Bandra	70.1	76.9	76.4	81.7
Bhandup	72.9	83.9	69.1	85.7
Borivali	66.7	82.3	80.8	81.1
Byculla	67.6	88.9	72.3	80.4
Chembur (East)	76.6	88.9	78.2	75.9
Chembur (West)	73.6	96.8	67	72.5
Chinchpokali (E)	79.5	90.8	73.6	76.6
Chinchpokali (W)	80.3	96.5	79.9	76.6
Dadar (East)	65.6	83.7	86.9	64.8
Dadar (West)	69.4	79.4	80.4	74.6
Elphinstone	71.3	85.5	58.7	72
Ghatkopar	72.1	82.7	81.6	74.1
Girgaon Chowpati	72.5	76.3	83.3	77.7
Grant Road	76.6	84.6	79.7	83.2
Juhu Chowpati	79.3	83.2	78.4	77.1
Kandivali (East)	77.2	77.9	75.9	83.0
Kandivali (W)	78.6	79.3	78.7	72.2
Khar	75.8	72.0	80.6	74.6
Mulund	76.4	80.2	76.7	78.7
Mumbai Central	74.3	68.3	74.9	79.9
Parel	79.0	74.4	75.2	82.8
Santacruz (East)	78.0	71.9	76.4	82.5
Vikhroli	70.8	85.8	66.8	81.9
Vadala	78.8	87.9	71.3	77.4

**Figure 2**



(Source: cpcb.nic.in).



**Figure 3: Noise Level During Ganapati Festival in 2017 and 2018**

The noise level during the day and night time at 25 stations from Greater Mumbai is noted. The details of number noise monitoring locations in different locations of Greater Mumbai as given in Table 2 & 3 and Figure 1 & 2

While celebrating Ganesh Festival people generally ignore environmental impact of pollution on Air, Water, Noise, solid Waste, etc caused by various activities performed in puja. During this festival, fireworks and crackers are used in abundance by the devotees for expressing their happiness. This leads to Air pollution, as harmful gases and toxic substances like Barium, Cadmium, Sodium, Mercury, Nitrate and Nitrite are released into atmosphere and Repairable Suspended Particulate Matter (RSPM) level goes high in this season as small particles are released into the environment by these fire crackers. Traffic congestion also takes place due to the crowds of Ganesh visarjan which in turn increases air pollutants, which are released into the atmosphere by vehicles.

Colors used in decoration of idols contain harmful chemicals containing mercury, lead which leaks into water as idol dissolves. It increases acid content, Total Dissolved solids (TDS) and Heavy metals in water. It kills aquatic plants and marine life, damaging ecosystem under water. Along with Ganesh idols people dump other accessories like thermocol, plastics, etc. as well adding to the level of water pollution. Devotees celebrate the prestigious festival with all possible means of loud music like listening to bhajjans, kirtans and songs using massive speakers. During Anant Chaturdashi, which is the final day of the auspicious Ganesh festival, there are witness heavy traffic on the roads, which leads to an increase in Air and Noise pollution.

## Conclusion

In Mumbai a total of 25 location where monitored. The highest noise level was observed at Ghatkoper with 82.3 dB(A)-Figure 3. The noise level was moderate on the first day at all locations as there was no visarjan on the same day. The increase in noise level was mainly due to the prayers and other programmes taken place at various pandals, apartments etc during 2017. In Mumbai a total of 25 locations were monitored. The highest noise level in the 5 days monitored was observed at Juhu Chowpati on 23<sup>rd</sup> September 2018 and the main reason of increase in noise was because Juhu Chowpati was one of the main visarjan location and noise level was about 103.8 dB(A). On 13th, 14th, 17th, 19th September the highest noise level was observed at Chinchpokali west, Chembur West, Dadar East and Andheri with 80.3 dB(A), 96.8 dB(A) 86.9 dB(A) and 88.6 dB(A), respectively(Figure 3)

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**A Field Guide to**  
**Spiders**  
**of Western Ghats**  
**(India)**



A Field Guide to

## Spiders of Western Ghats (India)

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