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GIS APPLICATIONS FOR ANALYSIS OF NOISE POLLUTION LEVEL IN CHENNAI (MARINA BEACH COAST) INDIA

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Abstract

The prevalence of noise is increasing in magnitude and severity because of growing population and urbanization. Noise pollution leads to many chronic and socially significant impacts. This study analyzes the level of noise at different points in Chennai (near marina beach) – Noise comprises those sounds occurring around us that are not part of the environment under consideration. Noise is also a type of pollution and impacts on our health and wellness. As per Indian standards the desirable noise pollution in daytime is 56 db.A Noise levels were measured with an open source app (GPS Essentials, Wide Noise Plus) at 15 points within the study area in and around Chennai (marina beach coast) from 2.30 pm to 5.20 pm on (22/07/2022) Sunday.

Keywords: Noise pollution, GPS Essentials, population and urbanization, Wide Noise.

Introduction:

Field data collection is always a challenging task to investigators. Beyond field survey using Questionnaire, the investigator has to carry field equipment to capture Locational information (usually GPS) and other field measuring device. The questionnaire scheduled problem requires a number of paper prints after field work complaining data from paper for digital format is yet one more work. The word "noise" is derived from the Latin word "nausea," which means seasickness or a sensation of discomfort. Noise comprises sounds occurring that are not part of the environment under consideration. It is also a type of pollution and impacts on our health and wellness and the ability to do productive work. Sources of noise pollution include industries, traffic and vehicles, construction and domestic appliances. The effects of noise are both direct and indirect; they affect the health and make our living environment miserable. Now the reality is to explore Smartphone with their various apps to replace the paper prints. Survey equipment at the same time for quick appraisal of the field investigation.

Objectives of the Study:

It is proposed to undertake field work / survey exploring the application of Smartphone

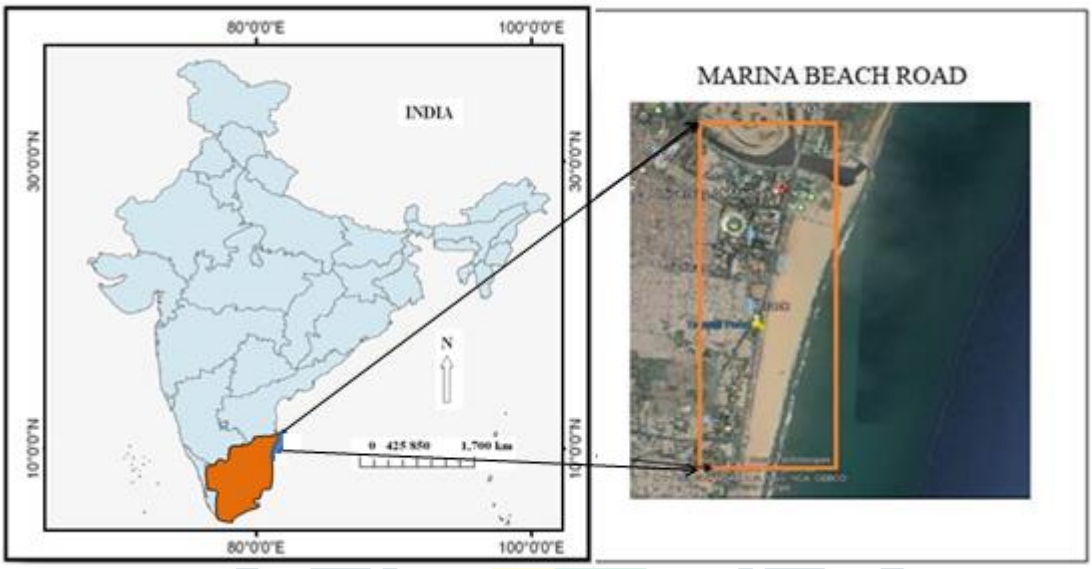
For generation of spatial data with various app by the following

1. A point data captured at selected location tagging the same with field photo and attribute table.
2. Assess the noise level at the field.
3. Conduct a tracking experiment to capture line / area data.

Study area

The present study area is present a coastline near marina beach in Chennai district is located between 13.069859°N to 80.284665°E and 13.037530°N to 80.278175° E. (3M Car Care to Coum River) It is located to the East by the Bay of Bengal in Tamil Nadu State. The layout of Chennai district above which is enclave within Tamil Nadu presents a peculiar picture of territorial jurisdiction perhaps the only one of its kind in the world.

Fig 1: Study area



(**Source:** Created by researcher)

Database and Methodology:

The present study is based on the various apps which are inbuilt in Smartphone. WAP is Smartphone capable of field data collection with sufficient RAM and storage support (Storage can be external with OTG support Thumb Drive) Mobile Apps.

- **Wide noise plus:** There are various kinds of pollution that often get on the first page of newspapers. Yet, noise pollution is rarely cited. Wide Noise will help to understand the sounds cape around.

- **GPS Essentials:** The most complete GPS tool available for navigation, manage waypoints, tracks, routes. This shows navigation values such as: Accuracy, Altitude, Speed, Battery, Bearing, Climb, Course, Date, Declination, Distance, ETA, Latitude, Longitude, Max Speed, Min Speed, Actual Speed, True Speed, Sunrise, Sunset, Moonset, Moonrise, Moon Phase, Target, Time, TTG, and Turn. Its supports Google Maps, MapQuest, Open Street Map.

How to collect the data? GPS Essentials

1. From the main menu, select Satellites.
2. If there are at least four satellites used in the fix, then you may start using the GPS Essentials features.

➢ **Creating way points**

1. From the main menu, select Waypoints.
2. Select the Add tool to create the waypoint.
3. It will start recording 1st waypoint. Change the attributes of the waypoint (Wide Noise Plus) and then press Back to get back to the list.
4. Similarly, the other waypoints are recorded in which the description is the noise data which are collected from the other app (Wide Noise Plus)

➢ **Wide noise Plus**

1. Similarly, this app is also installed
2. Click "Take Noise Sample" and then note the reading in db.A and note down in the description of GPS essentials.

➢ **Geo tagging Photo**

1. From the main menu, select Camera.
2. Take a picture of the desired area for geo tagging.
3. The photo taken will serve as a waypoint and automatically be saved on the Portable Maps and Google Maps.

Table 1 : Collection of samples From 3M Car area, Madras University Guest house to Cooum River

Sr. no	Place	Lat	Long	Noise
1.	3M Car Care	13.0376	80.2781	52
2.	Marina Police Station	13.0403	80.2790	54
3.	Mahatma Gandhi Station	13.0437	80.2799	56
4.	police Head Quarter	13.0450	80.2801	59
5.	Swami Vivekananda House	13.0481	80.2805	62
6.	Slum cultural Board	13.0514	80.2808	63
7.	University Guest House	13.0540	80.2812	65
8.	Bharat Court road	13.0560	80.2816	65
9.	College	13.0583	80.2821	61
10.	Residency Colony	13.0598	80.2828	62
11.	Department Madras University	13.0638	80.2832	54
12.	Central Arch	13.0624	80.2829	59
13.	PwD Department	13.0603	80.2825	59
14.	Madras University	13.0656	80.2836	69
15.	Cooum River	13.0695	80.2846	43

(**Source**: Data Collected by researcher)

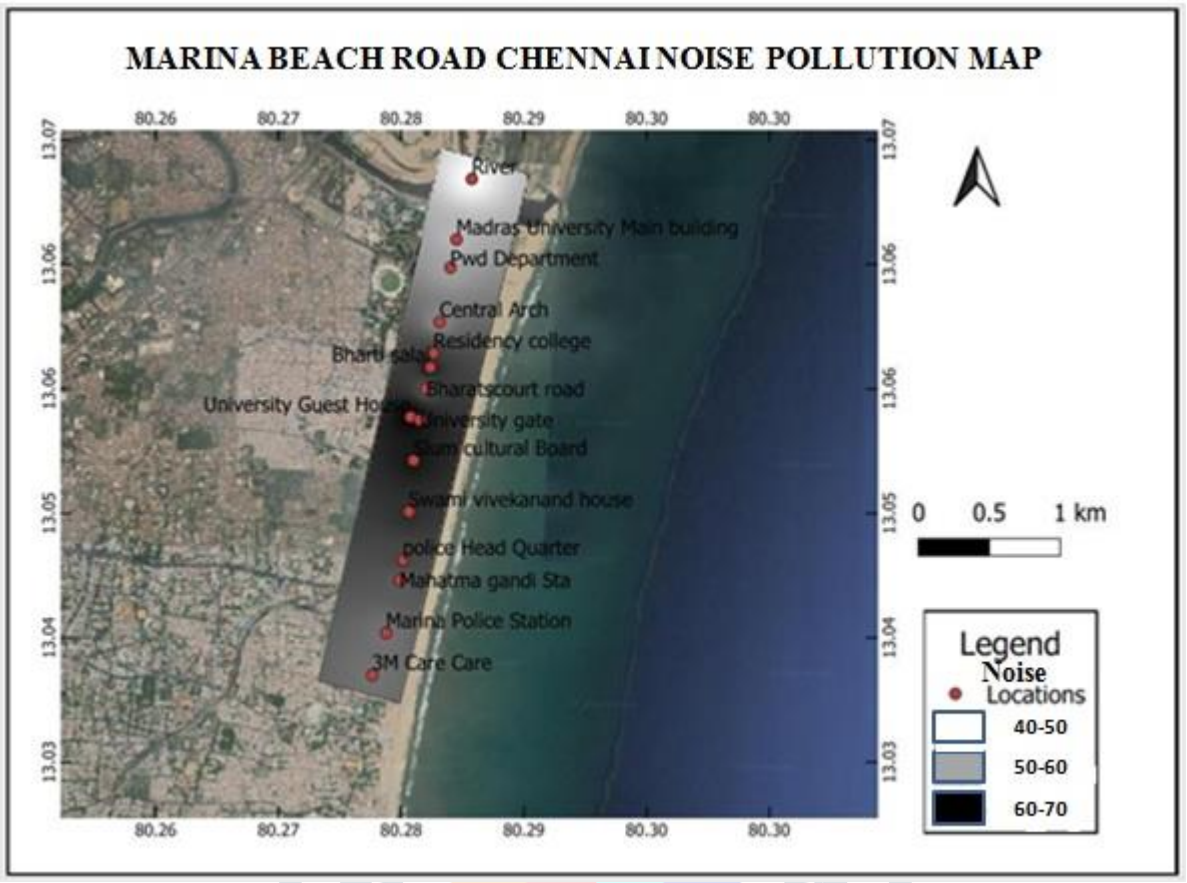
The above data collected from Madras University Guest house, 3M Car area to Cooum River in this research paper data collect the Noise intensity (in db.A), Latitude and Longitude data with the help of GPS Essential app and Wide noise Plus app.

Fig 2 : Track Covered During Survey

(**Source:** Data collected and map created by researcher)

The above fig 2: shows the track covered area of a costal line near marina beach in Chennai district. It is located between 13.069859°N to 80.284665°E and 13.037530°N to 80.278175° E. Data collected in 15 locations that is 1.3M Car Care, 2.Marina Police Station, 3. Mahatma Gandhi Station, 4. police Head Quarter, 5.Swami Vivekananda House, 6. Slum cultural Board, 7. University Guest House, 8. Bharat Court road, 9. College, 10.Residency Colony, 11.Department Madras University, 12.Central Arch, 13.PwD Department, 14.Madras University, 15.Cooum River. (3M Car Care to Cooum River).

Fig 3: Noise Pollution Trend Analysis



(**Source:** Data collected and map created by researcher)

The above map indicates that the black region has high produced noise (Near university Guest House and Bharat court road) due to multiple reasons, The study also claims to find the highly effected noisy region in and around the noise occurrence. In above figure two zone is highly noise polluted and the overall other region is moderately polluted due to tourist place. Most of the tourist visited the Marina beach and thus the air pollution and noise pollution are linked together due the vehicles and other human activities, air pollution data was considered as a secondary data for analysis. The study area is linear and small so the survey was not collected for all the points but on a point since there will not be any change in any parameters with respect to spatial area.

ANALYSIS AND RESULTS

The waypoints are collected from the GPS Essentials with the Noise data from Wide Noise Plus that are exported in kml and then converted into shape file for further analysis. The survey points (waypoints) are recorded in such a way that the data apparently covers the study area. Inverse distance weighted analysis is performed to know the noise trend analysis in the study area. Since Sunday is considered to be the busiest day of Chennai the survey is initiated on 17/.07.2022 between 2:30pm to 5pm and it is always noisy because of Busses and the crowed of people. The complete Marina beach Road road is always noisy as the Sunday. The end of the street there are fast food shops were there are too much crowd and due to congestion, they are more noise produced in the peak hours.

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