

Soundscape Assessment Approach – A Case of Junction of Surat City

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Abstract - The world is quickly urbanizing, with cities now housing more than half of the world's population. Improving urban surroundings for the well-being of an ever-increasing number of urban residents is quickly becoming one of the century's most pressing issues. Many cities are known for being noisy, there are a number of useful strategies that may be implemented rapidly one of such strategy is soundscape is becoming a relevant topic in recent years in different areas as applied acoustics, health awareness, urban planning or cultural heritage. This paper reports an attempt to use soundscape assessment tools to investigate the impact of noise in a junction.

Key Words: Soundscape, Soundscape Assessment Approach, Urbanization, Noise Pollution, Junction, Surat City

1. INTRODUCTION

The rapid development of civilization around the world can be compared to a coin with two opposing faces, with a significant improvement in collective well-being and, at the same time, detrimental environmental repercussions such as pollution escalation. Noise pollution is one of its components that has a harmful impact on the environment. To manage noise one of the methods developed is soundscape approach. The "International Standard Organization" published a defined definition in 2014, defining soundscape as "the acoustic environment as perceived or experienced and/or understood by a person or people, in context". For successfully finding out the soundscape of particular area soundscape assessment approach is to be done.

2. Soundscape Assessment Approach

Soundscapes assessment approach is a combination of two approaches qualitative approach and quantitative approach in qualitative approach questionnaires surveys are filled and soundwalk is conducted to know the soundscape perception of location while in quantitative approach physical assessment of site is done through sound level meter to know about actual noise scenario at site.

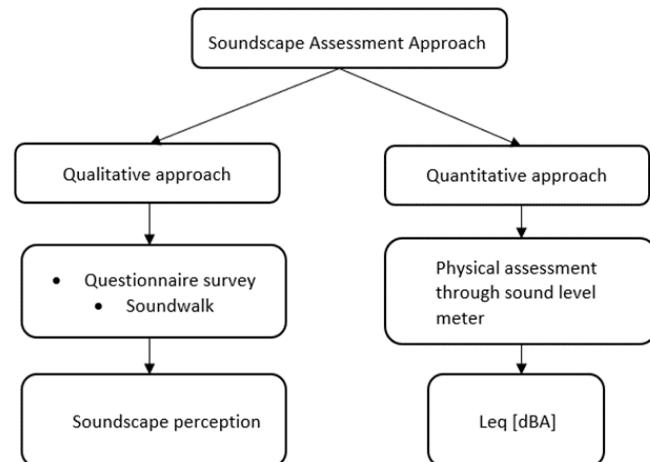


Figure -1: Soundscape Assessment Approach

3. Selection of appropriate location:

Junction named kabutar circle of Surat city has been selected as our study area. As it is highly noisy location and traffic is seen continuously from day to night. As it is on the main road it is more accessible to noise. Thus, soundscape assessment can be beneficial for the site as it will help in providing better solution by using soundscape approach. Buffer of 100 m radius is selected for proper assessment of junction.

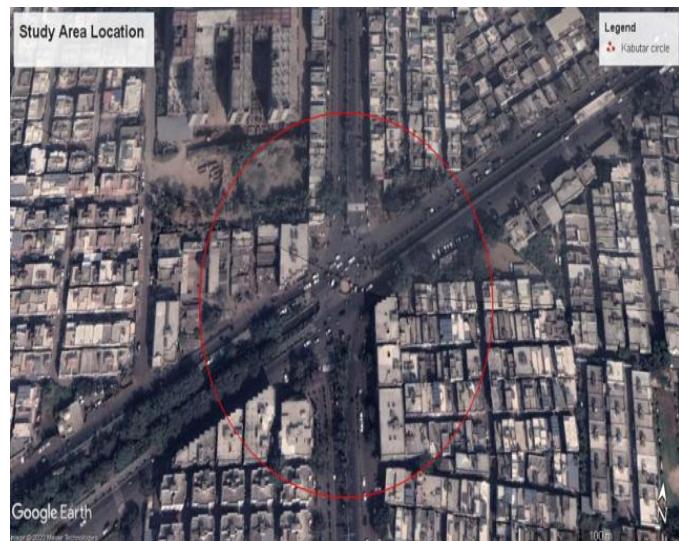


Figure -2: Study area location

4. Qualitative Approach:

The assessment of soundscapes was conducted in accordance with the principles of ISO 12913-2.

1.1 Questionnaire survey:

Questionnaire survey was performed to know the perception of people in compliance with ISO/TS 12913-2 data collection methods for soundscape studies. Random sampling methods was used with the sample size of 23 participants. The analysis of the survey was done in compliance with ISO/TS 12913-3 which is analysis for soundscape methods. The result are as follows:

Sound source identification	
Traffic noise	Dominates Completely
Other noise	A lot
Sounds from human beings	Moderately
Natural sound	Not at all

Table -1: Sound source identification

Perceived affective quality	
Pleasant	Strongly Disagree
Chaotic	Agree
Vibrant	Disagree
Uneventful	Disagree
Calm	Strongly Disagree
Annoying	Agree
Eventful	Disagree
Monotonous	Agree

Table -2: Perceived affective quality

Assessment of surrounding environment	
Present surrounding sound environment	Bad
Present surrounding sound environment appropriateness	Moderately

Table -3: Assessment of surrounding environment

Assessment of the appropriateness	
Present surrounding sound environment influenced by overall environment	Very
Loudness	Very

Table -4: Assessment of the appropriateness

1.2 Soundwalk:

Soundwalks are the walks done to know the acoustic environment better, soundwalk of whole site is done to better understanding of the junctions and selection of points for physical assessment of the site.

5. Quantitative approach:

Physical assessment of sound level meter is used to know the actual condition of noise in site. Data of sound is collected using class 1 sound meter during peak hours for 5 mins for 5 days and average value of 5 days dB is done to prepare a noise map for selected site. For analysis of data ArcGIS pro software is used and IDW interpolation technique is used.



Figure -3: Location for quantitative Analysis

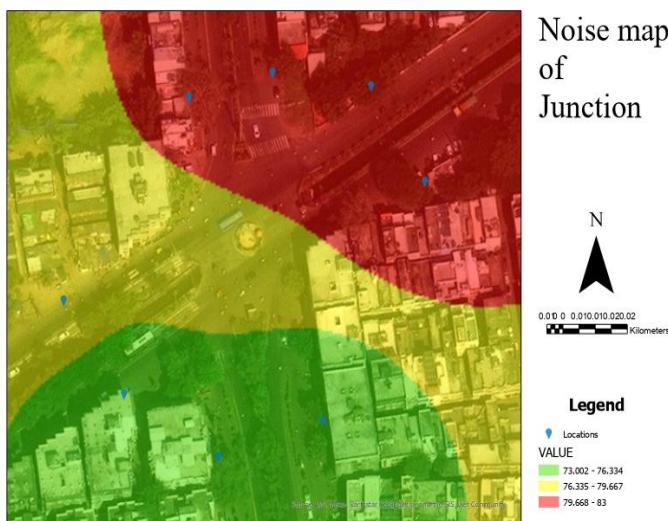


Figure -4: Noise map of junction

Thus by using qualitative approach and quantitative approach clear picture of current scenario of noise in junction can be seen.

6. CONCLUSIONS

Noise pollution is one of the world's most pressing issues today. In order to create a better acoustical urban environment, it is important to rethink areas utilizing different methodologies. Through Soundscape assessment approach clear scenario of noise can be seen and can be very helpful in planning accordingly. This paper analyses current scenario at kabutar junction using soundscape assessment approach.

Planning Interventions

The three types of planning interventions can be done to improve the soundscape of this site. The three main types of acoustical design interventions are discussed below:

1. decrease, buffer, or mitigate;
2. conserve and improve;
3. incorporate new acoustical components.

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