An initiation to revive the unique sound of Indonesian cities

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ABSTRACT

As a large country with thousands of ethnic groups and cultures, it is hoped that every city in Indonesia will have its uniqueness. However, preliminary data collected from 10 major cities in Indonesia shows no identity. The most visited public places in these cities, i.e., parks and squares, which are ideally associated with nature's sound, are dominated by human noise and traffic noise. Surprisingly, a noisy acoustic environment is not considered a nuisance. The study reported here looks further at how the public place visitors perceived the acoustic environment during their visit. Also, to know whether the participants perceive unique sound that builds the sound environment of the public place. Due to the Covid-19 pandemic, an online questionnaire developed using a 5-point Likert scale was distributed to collect data. Five hundred and ninety-six respondents participated in the survey. A one-way ANOVA test was run to identify the mean point of the data gathered. At no surprise, it is again strengthened the former study, in which the participants perceived the urban environment in Indonesia as a busy environment. It is, again, caused mainly by traffic noise and human activity noise, and that no unique sound has emerged in the studied cities. The study's findings shall initiate a program to revive the unique sound of Indonesian cities as they were in the past.

1. INTRODUCTION

Being the 15th largest country globally by area, Indonesia is one of Asia's most populous countries. The populations primarily reside in urban areas that caused eleven cities of the country to be the most populated, which have surpassed one million [1]. These are not to mention hundreds of other towns with minimum populations of 100,000. These cities are scattered among 34 provinces. With hundreds of cities, large populations, and so many tribes living in these cities, it is expected that each city has its uniqueness both in visual and aural context. The current shape of Indonesian cities is a transformation from its initial traditional state. They transform from conventional to modern structures, both physically and in the conception of its citizens' urbanity, from the traditional-informal concept to the modern-formal concept [2]. Theoretically, Indonesia is not a homogeneous country with diversity that includes numerous cultural groups. Historically, its cities reflect this diversity [3].

However, over time overwhelmed with modernity, each city's visual and aural difference gradually disappears, leaving only a minimal feature of their identity in the visual context. While sound can provide unique characteristics for the urban environment [4,5] and positively affect the residents [4], these cities left almost no identity of their aural context. Indonesian cities are noisy [6], and it is ready to be observed in their public places, mostly in parks and squares. Indonesian parks and squares accommodate social activities, a typical urban dwellers' activity in Indonesia [7], rather than individual activity or peer but in a small group as those of other countries [8].

An initial study to map the most visited public places in Indonesian cities and the sound source that build the acoustic environment of the sites within the same series of the current study indicates noisy acoustic environment is not considered a nuisance [7]. The acoustic environment of public places in Indonesian cities, which ideally represent the uniqueness of each city, is dominated by human voices and music in line with their communal activities in the public place. The second dominant is traffic noise, which quickly penetrates public places because most areas are not large enough to provide natural noise reduction with distance [7]. Unique sounds have disappeared due to the loss of unique activities in each city, worsening by noise. Thus the acoustic environment is not specific in every place, making most public places in Indonesian cities are perceived similarly by visitors [7]. A step ahead of the initial study, the current study's objective is to investigate further how visitors perceived the acoustic environment during their visit. Also, to learn whether the visitors perceive unique sound that builds the sound environment of the public place. The finding will later be used to seek the possibility of reviving the uniqueness of the sound of Indonesian cities.

2. METHODS

The study was conducted empirically by collecting data from ten largest Indonesian cities, i.e., Medan, Palembang, Jakarta, Bandung, Yogyakarta, Surabaya, Banjarmasin, Makassar, Denpasar, and Kupang. All are capital cities of Provinces, which stretches from West to East Indonesia, i.e., Sumatera Utara, Sumatera Selatan, Daerah Khusus Ibukota, Jawa Barat, Daerah Istimewa Yogyakarta, Jawa Timur, Kalimantan Selatan, Sulawesi Selatan, Bali, and Nusa Tenggara Timur, respectively (Figure 1). Based on the existence of different ethnic groups with their local cultures, it is expected that the three most visited public places in each city [7] have a unique sound environment. A set of questionnaires was developed to collect the opinions of the city dwellers on whether the unique sound is still present in each city.

Figure 1. The location of ten Indonesian cities where responses of the questionnaire were collected.

The questionnaire was grouped into two sections. The first part was the demographic question consist of multiple choices, which were closed by a 5-point Likert scale question of how well they know the place. Meanwhile, the second part asked participants to describe the sound they experienced at the public place using a 5-point Likert scale (Table 1). The 5-point are 1= strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree. In the second part, similar questions were asked several times using different vocabulary or terminology to check the answers' consistency. The questionnaire was designed using an online mode for ease of distribution during the Covid-19 pandemic and gathering as many responses as possible. It was shared using the WhatsApp application, both through private and group communications. It was still uneasy about collecting responses during the shocking first quarter of the pandemic. It might be caused by the fact that people were still adapting to working and schooling from home.

The questionnaire was distributed to city dwellers in each city who were most likely are native to the town because, in the first quarter of the pandemic (March to June 2020), Indonesians were strictly forced to stay at home. During that period, employees worked, and students studied from home, and there is almost no outside public activity conducted. Indonesian cities were far quieter than they are during the regular situation. The participants recall their memory of the public place to fill in the questionnaire shared.

Questionnaire responses collected using a Likert scale are categorised as ordinal data, i.e., non-parametric data. With this type of data, the mean point is suggested to be tested using a non-parametric statistical method such as Kruskal Wallis. However, since the number of the data gathered was large enough, a one-way analysis of variance (ANOVA) was employed to process the data. Furthermore, ANOVA is also a commonly used tool to analyse Likert scale data [9].

Table 1. The questionnaire

Sections	Question topics	Type of questions
1 Demographic	sex	multiple choice
	age	multiple choice
	favourite public place	multiple choice
	last time of visit	multiple choice
	how well knowing the place	Likert scale
2 Environment	general perception	open question
	preferred sound source	open question
	disturbing sound source	open question
	dominant sound	open question
	reason of visit	open question
	type of activity	open question
	important sound	open question
	unique sound	open question
	suggestion for improvement	open question
	traffic noise	Likert scale
	human activity	Likert scale
	nature	Likert scale
	music	Likert scale
	other (construction/industrial noise)	Likert scale
	perception of fun	Likert scale
	perception of noisy	Likert scale
	perception of excited	Likert scale
	perception of quiet	Likert scale
	perception of calming	Likert scale
	perception of disturbing	Likert scale
	perception of crowded	Likert scale
	perception of boring	Likert scale
	level of noise	Likert scale
	perception of sound in general	Likert scale
	suitability of sound	Likert scale

3. RESULTS AND DISCUSSION

The online questionnaire distributed to the ten cities' residents gathered 596 responses. The distribution of responses and demographic data are tabulated in Table 1 and Table 2. Here, we see that the number of responses returned by the deadline was not even. A significant difference occurred in Makassar (only 37 replies were collected) and Denpasar (131 replies were collected). It might be caused by the pandemic of Covid-19 condition and the slightly complicated questionnaire for laypeople. A Likert scale style question is easy to construct but has a significant disadvantage because it takes longer to complete than other styles [10], mainly when more points are used.

Responses were primarily collected from those aged 21 to 40 years with a randomly distributed questionnaire, inadvertently. It would benefit the validity of further analysis of public places' visitors because Mean and Tims indicated that this age range is a frequent visitor of public places, especially parks [11]. The terminology of 'frequent visitor' is supported by the time of visit, in which 476 participants visit the selected public site less than one year. Based on Carr's [12] classifications of public places of a city, the demographic data shows that places classified as parks were the most favourite public place. It strengthened the earlier study of the same series that parks were the most visited [7].

Table 2. Distribution of participants (N=596)

Medan	Palembang	Jakarta	Bandung	Yogyakarta	Surabaya	Banjarmasin	Makassar	Denpasar	Kupang
46	56	47	48	69	59	43	37	131	60

Table 3. Demographic data (N=596)

Sex	male	323
	female	273
Age	≤ 20	89
	21-30	276
	31-40	126
	41-50	57
	>50	48
Favourite public place	park	282
	street	86
	waterfront	82
	square, Plaza	71
	memorial site	40
	shopping centre	35
Last time of visit	< 1 year ago	476
	1-2 years ago	73
	2-3 years ago	21
	> 3 years ago	26

In the earlier study, in which the questionnaire was built using data provided by ten local urban experts, the sound source in Indonesian cities' public places was classified as human activity (e.g., voice, children playing, seller, sport), road traffic, nature (e.g., wind, bird, sea wave, water stream, water fountain), machinery (i.e., boats, light trains, and workshop), and other sources (e.g., whistle, crossing sign, mosque speaker) [7]. In this study, the sound source was modified into human activity, traffic, nature, music, and other sources. Music was removed from the human activity classification because it was found quite dominant in this classification, and it was identified as playback music, not live music performances.

ANOVA indicates that the sound source dominance ratings in ten cities are significantly different, as shown in Table 4. Further analysis was done based on the mean value of the rating, which shows that different cities have various dominant sound sources consisting of human activity, music, traffic, nature, and other noise classified in the questionnaire. However, the rating of traffic noise and other noise (Figure 2) seems to be consistent and perceived similarly by participants among the nine cities surveyed besides Surabaya. The terminology of 'other noise' source, which consists of construction and industrial noise, was found the highest in Jakarta. The domination of traffic, construction, and industrial noise in urban public places' acoustic environment describe how busy Indonesian cities are. It strengthens an earlier finding of Columbijn's study [6] that Indonesian cities were noisy. It also supports earlier studies, which indicated that Surabaya parks and streets are noisy [13,14].

Nonetheless, there is an anomaly in Surabaya. The data shows a considerably low rating of traffic noise and other noise due to the indoor urban area that represented Surabaya, i.e., a shopping mall. Parks and other outdoor public places could be noisy predominantly by traffic. However, traffic, construction, and industrial noise were not detected in the shopping mall by Surabayans, but human activity noise instead (Figure 2). It strengthens another former study, which showed that even without the penetration of outdoor noise, visitors perceived the acoustic environment of shopping malls as noisy caused by the activity within the malls [15]. Besides the uniformity of sound, the study also indicated the uniqueness of the urban regions in different cities, represented by human activity, nature's sound, and music (Figure 2).

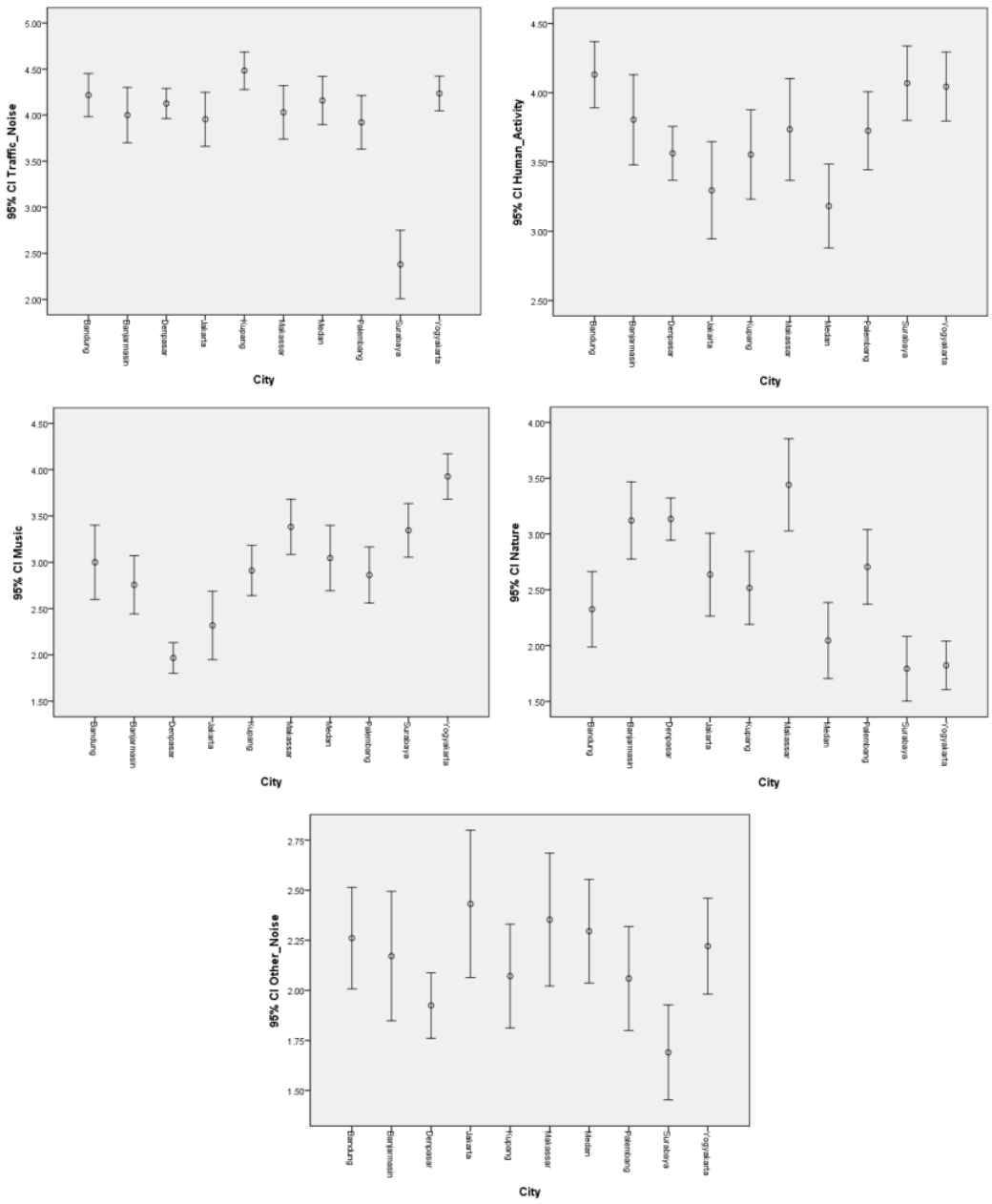

Figure 2: The sound source profiles of ten Indonesian cities are classified as traffic, human activity, music, nature and other noise.

The fact that the urban acoustic environment in the ten cities is uniformly noisy caused by traffic, construction, and industrial noise are ironic. When the most visited public place is the park, the dominant acoustic environment should be nature's sound. The domination of traffic noise in Indonesian parks is because the parks are generally small, so they cannot withstand traffic noise intrusion in the vicinity. With considerably small sizes, parks in Indonesia hardly produce quietness to boost nature's sound, which mainly can be obtained only in the middle of the park [16]. Meanwhile,

residents of Makassar and Banjarmasin consider nature's sound is still present in their public places. Their favourite places are waterfronts, where the roaring sea wave and water streams seem loud enough to be heard in conjunction with traffic and human activity noise. In Denpasar, where the three favourite places are all parks, nature's sound still presents because the top-visited park is quite large, namely 'Lapangan Niti Mandala', 140,000 sqm. The park is also located alongside less-crowded streets compared to commonly major streets in Denpasar.

Table 4. ANOVA test (N=596)

		Sum of Squares	df	Mean Square	F	Sig.
Traffic noise	Between Groups	173.713	9	19.301	21.561	.000
	Within Groups	493.260	551	.895		
	Total	666.973	560			
Other noise	Between Groups	24.648	9	2.739	3.010	.002
	Within Groups	501.356	551	.910		
	Total	526.004	560			
Human activity noise	Between Groups	47.375	9	5.264	4.803	.000
	Within Groups	603.844	551	1.096		
	Total	651.219	560			
Nature	Between Groups	165.213	9	18.357	14.989	.000
	Within Groups	674.791	551	1.225		
	Total	840.004	560			
Music	Between Groups	211.192	9	23.466	20.948	.000
	Within Groups	617.239	551	1.120		
	Total	828.431	560			

Interestingly, music was found to dominate the public place of Yogyakarta in conjunction with traffic, human activity, and other noise. The participants select Malioboro street as the top public place since it is the most historical and the most visited site. Malioboro street is lined with shops and street vendors at the left and right, mainly selling souvenirs, where many cultural activities are regularly held. It is a valuable indication to revive the unique sound of a city with a high culture like Yogyakarta using music. The idea of using music to restore the unique sound seems to be in line with the young generation as the significant visitors of the public place. They are suspected of not knowing the remarkable sound of the past.

Designing a visually and aurally unique city is essential in the uniform modern environment, especially for Indonesian cities. It is not only for the good of Indonesians in general but also for blind Indonesians because they rely mainly on sound to know their surrounding. Indonesia is a country with a large population of visually impaired people [15]. These people need a built environment empathically designed for them, an urban environment that profoundly understands their needs [17].

4. CONCLUSIONS

The online questionnaire shared with ten Indonesian cities' residents collected 596 responses. Because different ethnicities with their respective cultures can still be found living in the ten cities, it is expected that each city has a unique sound just as they were in the past. However, the data shows traffic, construction, and industrial noise dominate each city's acoustic environment. It shows that, in general, different urban environments in Indonesia tend to produce uniform perceptions. Yet, there is reason and hope for reviving the unique sound of the past in the urban area based on the finding in Yogyakarta, where the favourite public place brings music as dominant as traffic and human activity noise. This study is a stepping stone for a further study to recreate unique sounds of ten Indonesian cities in which, later, be referred to by other Indonesian cities.

5. ACKNOWLEDGEMENTS

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