

SOUNDSCAPE MAPPING IN HERITAGE AREA

(Case Study: 'Legi' Market, Kotagede, Yogyakarta, Indonesia)

Patricia P. Noviandri¹

¹Department of Architecture, Duta Wacana Christian University, Jl. Wahidin Sudirohusodo 5-25, Yogyakarta, Indonesia

patriciapahlevi@staff.ukdw.ac.id¹

ABSTRACT

District is one of the city-forming elements that are easy to find in urban areas. Every area in Yogyakarta has its own uniqueness and is usually included in the cultural heritage area. Problems arise when the city of Yogyakarta is starting toward a modern city. Preservation of cultural heritage areas is only a tangible culture. In the area of cultural preservation, tangible and intangible culture can not be separated. The past environment of the cultural heritage area should be maintained, so that people and tourists can feel the environment of the past. Conflict occurs when the sound that becomes one of the elements of the atmosphere of the city became neglected. The sound of the area is known as the soundscape. Soundscape of every location is different, so the soundscape is often the identity of an area. 'Legi' Market located in Kotagede area is one of the heritage areas in Yogyakarta that need to be preserved. It is the center of human activity that develops from time to time. Identity of Kotagede heritage area changed due to the changes of human activities living around. In general the soundscape heard in this area is the sound of motorcycles and cars. Soundscape in 'Legi' Market area is changed in 5 time periods. Early morning at 5am – 6am the noise is dominated by the sound of a milling machine (coconut and meat), between 7am – 8am it is dominated by the sound of birds, during the day at 10am-11am the noise heard is the sound of making silver and agate. Whereas in the afternoon at 3pm - 4pm the sound of cleaning market area can be heard, and at night (6pm-7pm) there is voice of child toys. 'Legi' Market area in Kotagede in which activities of the people never stop showing that this cultural heritage area has a strong identity. 'Legi' Market in Kotagede needs to be preserved as a cultural heritage area, so that the typical environment in this district is not covered by the noise of car and motorcycle. This can be done with traffic planning in the 'Legi' Market area, so that the voices that become the identity of this area are more heard by the people and tourists.

Keywords: *soundscape; heritage; tourism; mapping sound; legi market kotagede*

A. INTRODUCTION

The city-forming elements that are often included in regional planning are visual elements. Design of a region should be emphasized elements of the city forming, so that the region has an identity. In recognizing the identity of a region visually there are five important elements of the area namely paths, district, landmarks, nodes, and edges (Lynch, 1960). This city-forming element is easy to find in the city of Yogyakarta. One of the city-forming elements that have a distinctive character is district. District which has the identity are malioboro district, Ndjero Benteng district, Puro Pakualaman district, and kotagede district. Some districts in the city of Yogyakarta is generally a cultural heritage area. Problems arise when the city of Yogyakarta is starting toward a modern city. One of the issues of preservation of the area associated with urban elements is conflict between utilization and management (Rahardjo, 2013).

Conflict between utilization and management occurs when one aspect is emphasized. One of the conflicts lies in the Legi Market area of Kotagede.

Kotagede Legi Market is the oldest market in Yogyakarta and built in the 16th century. Kotagede Legi Market is located in Kotagede district which is one of the heritage districts in Yogyakarta that need to be preserved. Market is the center of economic activity as well as the place of interaction of residents so that all activities are in the region. This market is called Legi Market because the peak of the crowd is on the legi day on the Java calendar.

Legi market became one of the tourist destinations and became one of the landmarks of Kotagede. Kotagede Legi Market has a characteristic with the activities that exist when the legi day. The activity lasts from early morning until evening. Activities at Legi Market at the time of the legi day change at any time (from dawn to dusk). This became the identity of Kotagede Legi Market area.

Legi market area is used as a heritage area and economic area. Problems that often arise is a physical problem. Physical problems can be easily founded and become part of regional planning. Another problem that is often overlooked is the issue of identity in terms of audial (hearing).

Tourism heritage area always visually displays the past and not audial. As an economic area, Legi Market no longer raises the atmosphere of the past.

The voice that became one of the non-visual elements of the city was neglected. The sound is known as the soundscape. Soundscape is a person's perceptual construct of the acoustic environment of the place (Brown, 2016). In another sense, the soundscape is all the sounds / sounds that exist in a place that affect the perception and interaction of individuals and communities to their environment. Soundscape of every location is different, so the soundscape is often the identity of an area.

At this time the sound character in 'Legi' Market closed with sound coming from motor vehicles and traffic. The sound identity of legi market wasn't arise in this region. Management of cultural heritage areas generally pays attention to landscape while the soundscape is neglected.

Existing activities in 'Legi' Market area is very unique and interesting to be learnt, because it is a market area that has activities for 18 hours. It can be sure that the 'Legi' market has a different soundscape in each period of time. Heritage tourism can be enjoyed optimally when all the human senses connected through the visual (sight) and auditory (hearing). Heritage tourisms will increasing they visitors.

There are several research question arise in terms discovering the sound identity of the 'Legi' Market. What is the sound source that created the soundscape of 'Legi' Market Area? What is the soundmark of the 'Legi' Market Area that needs to be preserved and developed? the purpose of this research is to support the sustainability and sense of hearing in the heritage tourism.

B. LITERATURE STUDY

Acoustic Study

Acoustic environment as a field study just as we can study the characteristics of a given landscape (Schafer, 1994). Environmental acoustics have a classification for the sound source category. This research is included in environmental acoustic urban (soundscape). The acoustic environment is a combination of all the acoustic resources within a particular area (natural sound and human-caused sound) that are modified by the environment. In the study The study of soundscape is included in the category of environmental acoustics.

Soundscape according to Brown, et al (2016) is a person's perceptual construct of the acoustic

environment of the place. Soundscape according to Payne, et al (2007) is the totality of sounds in one location with an emphasis on the relationship between perception, understanding, and the interaction of individuals or society to their sonic environments. According to Miller (2013), Soundscape means all sounds that can be heard at a specific location. Soundscape is a component of an acoustic environment that can be perceived by humans. Soundscape is ignored in development. Development only sees the visual elements of the city-forming. According to Lex Brown in Suriandjo (2013), Soundscapes Planning does not mean a calming or quality sound design, and is not always about low or silent sound design. Soundscapes, however, are what they hear about sounds in a place that leads to a "fit" between the landscape and the soundscapes (an area that produces natural and unadulterated sound).

Soundscape is more emphasized on understanding how soundscape in the right context affects its users. Factors of soundscape context considerations are as follows:

- 1) Spaces / functions include urban streets, open urban spaces, parks, schools, bus stations, common theme walks, street cycles, outdoor concerts, racing games, archeology sites, enclosed spaces, underground shopping streets, and various enclosed spaces.
- 2) Sound sources come from sources of noise including industrial noise, aircraft noise, road noise, wind turbines, and amplified music for positive sounds including natural sounds and baby crying.
- 3) Human are characteristics social and demographic that have been considered for various users, including certain groups, such as children, deaf, hearing disturbances, and blind people.

Sound sources in space or territory contribute to the creation of soundscape and environmental rejuvenation (Kamenicky, 2014). Sound sources in the creation of soundscapes are categorized into 3 (Schafer, 1994), namely:

1. Keynote Sound
 Characteristics : do not have to be listened to consciously, overheard but cannot be overlooked, become listening habits.
2. Signals
 Characteristics : foreground sounds and listened to consciously, acoustic warning devices, codes

permitting messages of considerable complexity.

3. Soundmark

Characteristics : landmark and refers to a community sound which is unique or possesses qualities, specially regarded or noticed by the people in that community, the sound which deserves to be protected.

Heritage Study

Cultural heritage can be as tangible culture and intangible culture. Tangible culture in the form of physical heritage, such as buildings, monuments, books, statues, artifacts. Intangible culture in the form of non-physical cultural heritage such as culture, folklore, tradition, custom, language, knowledge, natural heritage or natural-shaped cultural heritage, such as natural environment including rare flora and fauna, biodiversity, geological elements such as mineralogy, geomorphology, paleontology.

In terms of efforts to preserve the cultural heritage area, there are 4 conservation efforts (Burra Charter, 1981)

1. Preservation, heritage-managing efforts to extend the life of historic heritage areas by protecting, preserving, utilizing and or developing to maintain their sustainability, harmony and carrying capacity in responding to the dynamics of the age to build a life of excellence.
2. Protection, efforts to prevent and cope with any symptoms or effects of damage to the cultural heritage area either by human or nature by means of rescue, and security.
3. Maintenance, preservation of cultural heritage areas due to human or nature by restoration and utilization.
4. Management, preservation and utilization of cultural heritage areas through the policy of planning arrangement, protection, maintenance, restoration, utilization, and control.

In preserving the cultural heritage area it is not enough just to preserve the physical heritage (tangible culture) but also preserve the non-physical cultural heritage (intangible culture) which is also already attached to the area. Sound that gives environment and identity in cultural heritage area can be called as intangible culture. The interaction between acoustics and other physical environments is an important consideration. Significant

correlations have been found between the landscape and the acoustic environment, between visual and acoustics, as well as between appearance and calm in choosing the environment. In other words, the presence of visual and audial atmosphere in the cultural heritage area will provide a full-fledged experience for all the human senses in the region.

C. METHODOLOGY

Methods of data retrieval performed for 5 time periods are:

1. L1 taken at 5am – 6am represent the time between 3am – 6am, the time is chosen because the start time of market activity.
2. L2 taken at 7am – 8am represent the time between 6am – 9am, Time is chosen because of the crowded market time.
3. L3 taken at 10am – 11am represent the time between 9am – 10am, time is chosen because it is a time of reduced market activity.
4. L4 taken at 3pm – 4pm represent the time between 2pm – 5pm, the time is chosen because it is the time the area changed activities.
5. L5 taken at 6pm – 7pm represent the time between 5pm – 10pm, time is chosen because it is the time of the crowded area at night.

The date chosen on the data collection is Legi market day. All samples will be taken on 6 spots in Kotagede Legi Market area (Figure 1.). The data taken are sound level, sound source identification, and visual and audial recording.

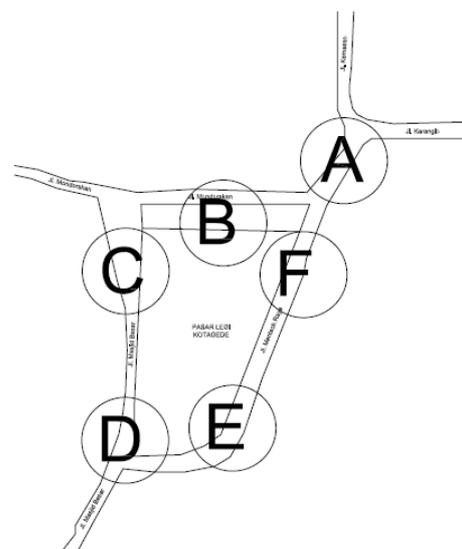


Figure 1. Point of Data Retrieval
 (source : author, 2017)

D. RESULTS AND DISCUSSION

1. Overview of Legi Market, Kotagede

Legi Market was originally named Sargedede market. The Legi Market was built in the 16th century. Until now the market has become the center of the people's economy. The market is not only an economic center of an area but also a gathering place for all people from lower to top (rich) level.



Figure 2. Legi Market, Kotagede

(source : https://travel.detik.com/dtravelers_stories/u-1844689/menelusuri-pasar-tertua-di-yogyakarta)

The region in the past has embraced the concept of the Catur Gatra Tunggal. This concept is the Javanese city planning concept and the rest of its existence can be seen until now. In a Javanese government there should be 4 adjacent things namely the Palace as the center of government, the square as a gathering place and culture, the mosque as a place of worship, and market as the economic center. 'Legi' Market - Kotagede became one of the important city-forming elements in Kotagede included in the concept of Catur Gatra Tunggal. Therefore, Legi Market existence needs to be maintained and preserved.

The past environment in 'Legi' Market is different from the current environment. This can be seen from a quote from Theresiana Ani Larasati on her paper entitled Kotagede Market.

"In the past in Pasar Gede there are still many trees covered with perindang. The image of the ancient market with traditional markets is now very much different. Transactions or buying and selling activities in the past were performed under shady trees, or under large umbrellas. The sellers sit on the ground. Most of the goods that are traded are agricultural products in the form of rice, vegetables, and fruits. The produce is brought to the market by being carried or carried from the village where the crops are grown. " Theresiana Ani Larasati

(bpad.jogjaprov.go.id/public/article/526/PASAR_KOTAGEDe.pdf)

From these quotations it can be seen clearly that the environment of Legi Market was very comfortable : many shady trees, sellers still organized, commodities sold are the original commodities from the village seller, and was not appear motorcycle. Traffic was quiet in front of the market. Traders transporting commodities by shouldered and picked up. Through observations in the field the current environment is more dominated by traffic density. The sound of the wind from the large trees in the Area is covered with the sound of motor vehicles. From time to time, the sound of motor vehicles in the area of Legi Market always dominates so that the original activities of the market are less audacious.

2. Activities in Legi Market area

Activities in Legi Market area from time to time have changed. Legi Market area has the peak of the crowd on the legi day. A typical activity is the bird trade. Birds sold have a variety of types and usually each type has a different sound. In terms of audial, these activities provide color for the Legi Market area which is different from other traditional markets.

Events at night more on the activities of street vendors in along Mondorakan street and Mentaok Raya. Street vendors with commodities of clothing, culinary / snacks, and toys. In terms of auditions, this child's toy makes an interesting experience in the area of Legi Market. Children's toys that are sold with sounds like odong-odong are music, small boats saying 'tek tek tek'.

Legi Market Condition 5am – 6am

At 5am to 6am, the legi market is getting crowded. In view of Figure 3. the environment of the crowded Legi market on Mondorakan street and Mentaok Raya street. To the road of the great mosque is still not too crowded. Seen in the picture of the absence of regularity of traffic that causes the sound of vehicles (brakes, horns, machines) becomes hard (up to 80 dB).



Figure 3. The Environment Legi Market at 5am to 6am
 (source : author, 2017)

Legi Market Condition 7am – 8am

At 7am to 8am, the legi market is crowded. The environment of a crowded legi market (figure 4.). All the roads that surround the market are already crowded. In the picture, the activity of the bird market becomes the main activity. In addition began to appear street vendor located on the east and west of Legi Market.



Figure 4. The Environment Legi Market at 7am – 8am
 (source : author, 2017)

Peak crowds occur in this time span until 11 o'clock. Traders in this time span are animal traders, culinary traders, vegetable sellers, culinary traders, toys traders, handicraft merchants, agate traders, florists, and clothing merchants. Some traders use speakers and TOA to promote their wares. This is what makes the environment interesting in Kotagede Legi Market Area.

Legi Market Condition at 10am – 11am

At 10am to 11am, the legi market is at the top of the crowd. The environment of the crowded Legi Market seen by all the streets surrounding the market are more crowded than in previous times. The trade of birds and poultry is the main activity. In this time span, many traders who sell at the location of Legi Market and visitors also swarming merchants, especially bird traders, poultry, *klitikan*, agate and clothing.



Figure 5. The Environment Legi Market at 10am – 11am
 (source : author, 2017)

Legi Market Condition 15am – 16am

From 3pm to 4pm, the legi market began to show reduced activity. In view of the picture 6. the legi market environment is reduced. At this time span, many traders or janitors of the legi market area are sweeping and clearing the area. Therefore at this time span the sound of broom road, the sound of pedestrians, the sound bell bell more dominant than the sound of motor vehicles.



Figure 6. The Environment Legi Market at 3pm – 4pm
 (source : author, 2017)

Legi Market Condition 6pm – 7pm

At 6 pm to 7 pm, the legi market is starting to show nighttime activities. In view of the picture 7 legi market environment again crowded even though not as in the afternoon. The emerging traders are children's toy traders, clothing merchants, and culinary traders. Audial environment that there is the sound of a child's toy.



Figure 7. The Environment Legi Market at 6pm – 7pm
 (source : author, 2017)

3. Noise Level of Legi Market Area

According to the Decree of State Minister of Environmental Health Number 48/1996, the standard of noise level for trade and service area is 70 dB. At Legi Market has an average noise level of 67 dB to 72 dB at the time of Legi market.

The average value of each time range in all locations has a value that matches the specified noise level standard. At the time of Legi Market, within 10am until 11am have value above standard noise level. However, the value is still acceptable because the difference between raw noises level only 2 dB.

Tabel 1. Noise Level of Regions Legi Market
 Kotagede at Legi Day

SPOT	5am – 6am	7am – 8am	10am – 11am	3pm- 4pm	6pm – 7pm
A	68.53	70.97	73.69	72.71	72.60
B	67.86	69.01	73.69	70.87	71.72
C	68.94	69.91	73.00	65.97	69.09
D	62.64	66.22	74.59	66.89	66.29
E	64.73	69.91	69.50	69.87	64.76
F	68.94	69.22	67.77	66.04	62.93
AVR	66.94	69.21	72.04	68.72	67.90

Source : author, 2017

At any given time, a high noise level (between 70 dB to 74 dB) will appear. This happens due to a sudden sound like a car / truck horn and a noisy motorcycle exhaust especially on the legi day.

4. Source of Sound in Legi Market Area

Sound sources in 'Legi' Market are dominated the emergence of the voice of the vehicle engine that stands out and sounds loud. The sound of this vehicle engine is generally, motor vehicle located around Legi Market. In analyzing the soundscape, it is necessary to find voices that are important to the identity of the region. The voices are seen from the identity of the sound, the kind of sound, and the dominance of the sound.

According to Schafer (1994), the categories of soundscape themes can be divided into 3 (three) parts: keynote sounds, signals, and soundmarks. The results of the research sound sources change from time to time that show changes in activities in one location the same.

a. Keynote Sounds

The identification of the keynote sound in the Legi Market area that dominates at every observation spot is the sound of birds and motor vehicles in the morning until noon and the sound of broom on the street in the afternoon. Keynote Sound in the form of the sound of this motor vehicle sounds very loud beat the other voices.

b. Signals

Identification of Signals in Legi Market that dominate is the sound of horn, vehicle brake, parking whistle. This shows that the area is very heavy traffic and irregular so that vehicles passing also need to provide a voice warning or brake the vehicle in a sudden. The sound of the parking attendant whistle that appears at 6 spots of observation. It shows that the parking lot of the vehicle is spread all over the location, thus increasing the traffic density of the area.

c. Soundmark

The identification of soundmarks on the Legi Market area that dominates at every observation spot is the sound of birds, bicycles sound, clearing roads, children's toys, the sound of friction making silverware, the sound of the mill and the cleavage of coconut, the sound of the mosque, and the footsteps. The sounds are there but do not sound loud because they are covered

with the noise of vehicles. The sound will appear louder if the area begins to desert. Therefore, these voices are sounds that need to be preserved for being a regional marker in auditions.

5. Soundscape Mapping

From identification keynote sounds, signals, dan soundmark it can be mapped soundscape that can provide audition identity in maintaining and preserving the area of Kotagede heritage region. A voice that is often heard is the sound coming from a motor vehicle. In the past, motor vehicles did not exist today.

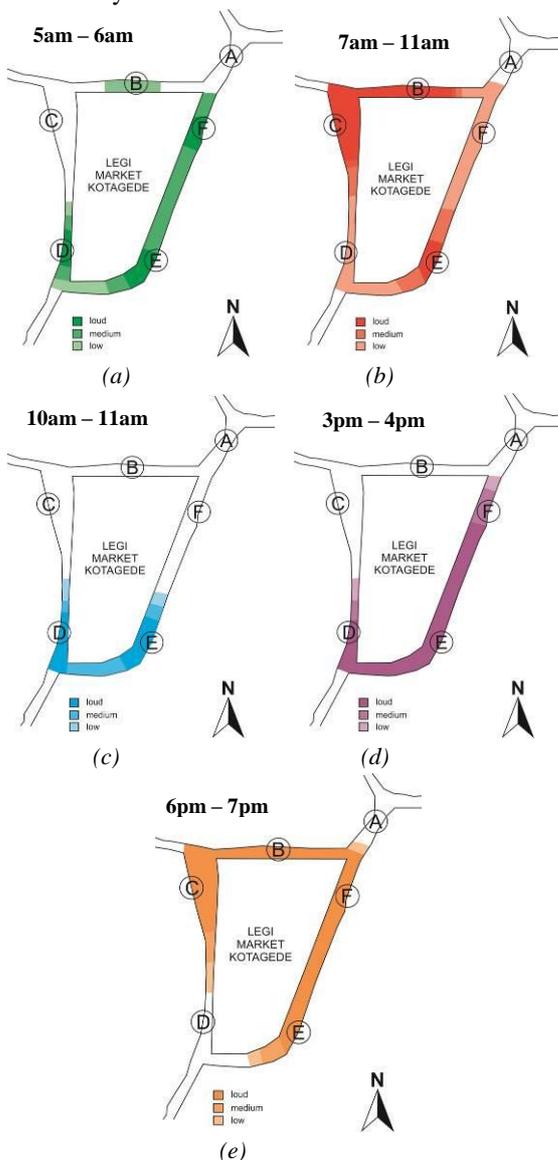


Figure 8. (a) Distribution of Milling Machine sound (b) Distribution of Bird Sound (c) Distribution of silver handcraft and agate sound (d) Distribution of clearing market area sound (e) Distribution of children toys sound

(source : author, 2017)

Therefore in this analysis, the sound coming from a motor vehicle is removed to get the original sound from the legi market. From previous explanations, the dominant voice in the legi market area is the sound of milling machines, bird sounds, silver and agate crafts, street cleaning legi market area, and the sound of toys at night. These voices when observed provide a different environment from time to time (figure 8.).

E. CONCLUSION

A cultural heritage area always has an intangible culture that needs attention. Preservation of cultural heritage area is not only for tangible culture but also itangible culture. Legi Market area as a cultural heritage area has its own physical and auditable identity. Auditorily, the identity of this area that can be developed in the form of bird sounds, and sound objects (milling machines, making silver and agate, area cleaning, and sound of toys). The sound creates a different soundscape area with other markets. So it is necessary to maintain its existence through permissible activities in the legi market area.

In providing a past environment in the Kotagede Legi Market area, it is recommended to make the path or change the vehicle path in front of the legi market. This works so that the soundscape in the legi market area is no longer the dominant traffic but the voice of economic activity in the Legi Market that became the tourist attraction. In addition, there needs to be an increase in traders with commodities that support the soundmark of the region.

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