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THE DISTRICT'S LIVABILITY OF SURAKARTA CITY

Lintang Praharyaning Suryono[1*], Deva Fosterharoldas Swasto[1]

[1]*Department of Architecture and Planning, Faculty of Engineering, Universitas Gadjah Mada, Yogyakarta, Indonesia*

ABSTRACT

Livability is the ability of a place to provide a comfortable and healthy atmosphere for living, doing activities, or working, which is built through urban physical order, accessibility of city services, ease of mobility, an opportunity to participate, and protection of nature so that all residents have a good quality of life. In Indonesia, the city that has the best livability value is Surakarta. However, livability in this city does not seem available to all residents because the service facilities are not evenly distributed in some areas, and many people still live in slums. Therefore, this study was structured to measure the livability of the Surakarta City area using a quantitative deductive approach. The analysis technique used is geospatial data processing and scoring. As a result, the three observed areas have fairly good livability with different scores.

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[*]Corresponding Author

Lintang Praharyaning Suryono
Universitas Gadjah Mada
Email:
lintang.praharyaning@gmail.com

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1. Introduction

For the first time in the world's history, the city's population has become more than the countryside's. It raises many challenges and problems in the quality of life, such as the gap in service facilities and the emergence of slum settlements. In determining the appropriate action to improve the city's quality of life, the city's livability measurement is often carried out. (Shekar, 2018). Livability measurement is often interpreted as assessing a residence's good-bad or high-low quality of life using certain criteria. Livability is the ability of a city to create healthy and comfortable conditions for playing, living, working, and even aging, which is based on the accessibility of the reach of infrastructure services, ease of mobility, urban physical order, opportunities to participate in the development, and protection of nature so that the people in it can live prosperously. (Herrman and Lewis, 2018); (Hahlweg, 1997); (Timmer and Seymoar, 2006); (IAP, 2007).

In Indonesia, a livability assessment has been carried out by the Association of Planning Experts (IAP), an organization of expert planners in this country. In 2017, Surakarta City was chosen as the city with the highest livability index in Indonesia.

However, the label as the city with the highest livability is not properly assigned to the City of Surakarta. It is because, at the district level, basic facilities are not evenly distributed throughout the city (Suryono, 2020). In addition, an area of 359.55 hectares of settlements is still classified as a slum (Surat Keputusan Walikota Surakarta No. 413.21/38.3/1/2016). Whereas, as previously discussed, cities with good livability have accessibility to services as well as good physical order and are evenly distributed for the entire population.

This contradiction can result in the failure to increase the city's livability due to the misleading of government programs due to inappropriate programs based on the type or location of placement. Therefore, research was compiled to determine the livability of the district in Surakarta City, which was carried out on BWP I, BWP IV, and BWP V as the district that best represented the city's conditions.

2. Literature Review

A livable city is a city development concept that has many definitions. This term originally emerged as a Vancouver City election campaign around 1950 which was later translated by focusing on physical arrangements (buildings, roads, and blocks) that focused on creating beauty (Herrman and Lewis, 2018). The notion of a livable city then developed where the physical arrangement was no longer only through buildings and roads but also mixed-use land use and environmental density so that apart from being beautiful, humans in it had the convenience of social interaction (Jacobs, 1961). A livable city is also one where residents can have a healthy life and easy mobility (Hahlweg, 1997).

A livable city can also be interpreted as one that promotes equality, access, and opportunity between people from various walks of life. As Hahlweg (1997) stated in his article entitled "The City as a Family," a livable city is a city for all or a city for all. Cities must be attractive, useful, and safe not only for the people who make money and then leave or live outside the city but also for all its residents. In this regard, a livable city must provide good equality and accessibility to fulfill the needs of its inhabitants (housing, mobility, food, services, education, and work) and opportunities to participate in civil, economic, and cultural life.

So, livability is the ability of a place to provide a comfortable and healthy atmosphere for living, doing activities, or working, which is built through urban physical order, accessibility of city services, ease of mobility, an opportunity to participate, and protection of nature so that all residents have a good quality of life.

Livability can be assessed by taking into account the livability principle, livability elements, and their constituent aspects. Livability principles consist of equality, accessibility, participation (Timmer dan Seymoar, 2006), and spatial planning (Jacobs, 1961). In addition, the livability elements consist of the environment, the built physical, social, security, and economic (Dashora, 2009); (Leby dan Hashim, 2010); (Lowe et al., 2015).

According to Dashora (2009), the livability assessment of district units emphasizes spatial planning that provides equality and accessibility of facility services. Therefore, accurate data is needed to show the reality of conditions and spatial elements in planning and evaluating at the regional level. In his opinion, evaluating or assessing regional scale livability is better using detailed data such as visualization of the distribution, condition, and range of facility services. Another opinion, according to Shekar (2018), regarding the assessment of livability at the district and community scale should be based on urban design (walkable, safe, accessible). Meanwhile, on a city scale, liability assessment can use existing urban performance standards.

3. Research Method

This research was conducted using a quantitative method, which was preceded by determining the variables that were thought to affect the liability based on related theories. This research was conducted by processing geospatial data to determine the extent of the facility coverage and land use area and then scoring based on indicators. The stages of this research can be seen in Figure 1.

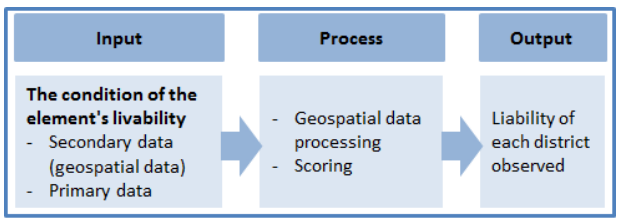

Figure 1. Stages of Research Analysis
Source: Author (2021)

3.1 Variables, Indicators, and Data Sources

This study has five variables and sixteen sub-variables determined based on a synthesis of various literature. The variables in this study are the elements of liability, namely the environment, physical construction, social, economic, and security. The sub-variables in this study are aspects of liability derived/composed of elements of livability. For analysis, data sources and classification of values/scores and variables have been arranged as presented in Table 1 below.

Table 1. Variables, Indicators, Data Sources, and Score Classification Based on Results

Variable	Indicators	Data	Score Classification
Environ-ment	Percentage of settlements >200m from the main road	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Percentage of settlements served by green open space	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
Built physical	Land diversity index	1)*	1: ≤1,5 | 2: ≤2 | 3: ≤2,5 | 4: ≤3
	Percentage of serviced settlements (non-slum)	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
Social	Percentage of settlements served by food facilities	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Percentage of settlements served by educational facilities	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Percentage of settlements served by health services	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Percentage of settlements served by recreational facilities	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Percentage of settlements served by transportation facilities	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Percentage of settlements served by electricity facilities	2)**	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Percentage of settlements served by drinking water facilities	2)**	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Average score based on the participation rate	2)**	1: ≤1,5 | 2: ≤2 | 3: ≤2,5 | 4: ≤3
Economic	Percent of non-built area	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Percentage of settlements served by economic zones	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
Security	Percentage of settlements served by security facilities	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
	Percentage of disaster-safe settlements	1)*	1: ≤25 | 2: ≤50 | 3: ≤75 | 4: >75
Data	1)*: Secondary data from BAPPEDA 2)**: Primary data from the community		

The community involved in this study were residents aged ≥ 17 years, residing at BWP I, IV, or V, and having lived at least three years at the address when surveyed. The number and location distribution of respondents in this study were determined using a spatial systematic sampling technique.

3.2. Geospatial Data Processing

Geospatial data processing in this research is used to measure the range of service facilities and to calculate the percentage of the coverage area of the facilities to settlements. The geospatial data of this research is in the form of points or polygons with location coordinates and a certain/ special identity. The processing technique uses the buffer analysis method. This geospatial analysis technique is assisted by the ArcGIS application.

3.3. Scoring Analysis

This research scoring technique is used to assess indicators in the city's livability elements so that the performance of the elements can be seen in supporting the district's livability. The score given for each assessment uses Likert scale of 1-4.

3.4 Determination of District Livability

The next stage is to determine the livability scores of each area of observation obtained by averaging the indicator scores of each area variable. It is done to determine the score of each element in each district. Furthermore, the livability elements in each area are averaged to determine the area's livability value. The district's livability values can be classified according to Table 2. This classification uses the formula for the maximum minus the minimum score, then divided by 4 (class).

Table 2. Category Grouping Based on Score

Variable	Livability Classification
<= 1.75	Bad
1.76 to <= 2.50	Somewhat Bad
2.51 to <= 3.25	Fairly Good
3.26 to <= 4.00	Fine

4. Overview

Surakarta is a city in Central Java Province which is geographically located between 110° 45' 55" east longitude - 110° 45' 35" east longitude and 7° 36' - 7° 56' latitude (southeast part of the province). Surakarta has an area of 4,404.06 ha with a north-south distance of ± 8 km and an east-west span of ±11 km, and a variety of land uses. This city is dominated by settlements (2,889.83 hectares or 65% of the total area) and has several typologies that can be differentiated based on their characteristics, density, affordability of basic facilities, as well as the success of the habitability program.

Surakarta City is divided into six Planning District Sections or "Bagian Wilayah Perencanaan" (BWP) based on the City Spatial Plan (RTRW Kota) 2011-2031. Each BWP has a development theme. The six BWP of Surakarta City are:

- BWP I is located in the city center and developed for tourism, trade in services, sports, and green open space.
- BPW II is located in the southwest of the city, which is developed as a tourism and sports / green open space.
- BWP III is located northwest of the city and developed as a settlement and trade service.
- BWP IV is located in the northeast of the city and is developed as a settlement and trade-in service.
- BWP V is located east of the city and is developed for settlement, trade in services, tourism, higher education, and industry.
- BWP VI is located in the south of the city and developed as a government area for tourism and trade.

Only BWP I, IV, and V were measured for livability in this study. These three BWPs were chosen as research locations because they were able to represent the overall condition of Surakarta's settlements.

BWP I represents traditional settlements, trade, and service settlements, tourism support settlements, riverbank settlements, and very high-density settlements and represents parts of the city where the redevelopment of settlements (slums become livable) is high with a low range of basic infrastructure services (only a small proportion of served).

BWP IV represents formal, medium, and low-density settlements, and parts of the city where settlement redevelopment changes (slums become livable) are low, but the range of basic services is high (the majority are served).

BWP V represents settlements that support educational activities and medium-density settlements and represents parts of the city where settlement redevelopment changes (slums become livable) are low, but the range of basic services is moderate (only half are served).

In addition, the following is an overview of the conditions of each research location.

4.1 Environment

The city's main roads have a high traffic density because they are the pathways for the movement and distribution of various people, goods, and services. This road causes noise, congestion, and pollution that threatens the health of residents. People living <200 meters from this road are vulnerable to noise stress and are at high risk of developing cancer and asthma due to exhaust gases and other emissions from passing vehicles. The greater the percentage value of settlements with a distance of > 200 meters, the better the liability. (AARP, 2018). The area of low air pollution settlements (measured by settlements located > 200 meters from the road) in BWP I is 434.77 ha; BWP IV is 326.83 ha; and BWP V is 235.74 ha.

A livable city provides convenience in meeting the various needs of the entire population, so the district must have a variety of land uses (mixed use) (Jacob, 1961). The greater the diversity of the land uses, the higher the level of livability. Public green open space on a district scale is a green space that residents can use, such as urban forests, fields, and parks. BWP I has 18.19 ha of open green space. BWP IV has 4.16 ha of open green space. BWP V has 32.7 ha of open green space.

4.2 Physical

Good quality settlements (environment) have an influence on the livability of cities. The density of occupancy characterizes this good quality. This density is closely related to the fulfillment of the need for fresh air and the stress level of its inhabitants. (Jacob, 1961). The three districts that became research locations were dominated by settlements. The three districts have various land uses. BWP I consists of 25 types of land use, BWP IV consists of 23 types of land use, and BWP V consists of 28 types of land use.

Creating quality/slum-free settlements can prevent the area from various endemic diseases from spreading throughout the city due to the lack of awareness of healthy living and inadequate facilities. BWP I also has the largest slum area of 110.65 ha. Then the slum area of BWP IV is 24.13 ha, and BWP V is 39.39 ha.

4.3 Social

As mentioned in the previous section, social services at BWP I, BWP IV, and BWP V have various conditions and are not equal in number.

Food fulfillment affects life expectancy, depression rates, mortality, and morbidity rates of urban residents. Good food service should be easily accessible (close) due to residents. Nutritious food choices will be more difficult to fulfill because they are still burdened with transportation costs, especially for low-income residents. Adequacy of food and easy access to food facilities impact urban residents' productivity, welfare, and quality of life. Surakarta City has various food facilities: traditional markets, supermarkets, stalls, and mobile vegetable sellers. BWP I has 102 food service facilities. BWP IV has 71 food service facilities. BWP V has 60 food service facilities.

Education is an important aspect of human development. Good education is essential to face and compete in the world of career/work so that the population's welfare can be improved. The number of basic education facilities / elementary schools in this city can be said to be unbalanced. It can be seen in the distribution of elementary schools in the study locations. BWP I has 90 elementary school units. Meanwhile, BWP IV only has 17 units of elementary schools, and BWP V only has 20.

Good health services affect the quality of life of the population. The better the service, the better the life expectancy and the better the district's livability. District health facilities consist of Community Health Centers and Sub-Health Health Centers. BWP I has five units of health facilities. BWP IV has 1 unit of health facility. Meanwhile, BWP V has seven units of health facilities.

Recreation is an important aspect of supporting the livability of the city because it can contribute to the health of citizens and the vitality of the city. (ISO 37120, 2018). Good recreational services support cities to be livable by supporting population resilience to the pressures of urban life and being a catalyst for economic development. The number of recreational facilities at the study location is also unequal. The number of recreational facilities in BWP I is 27 units, and BWP IV is 38 units. In comparison, the number of recreational facilities in BWP V is 12 units.

Good transportation services make it easier for residents to reach the facilities they need. The easier the population movement, the easier it is to meet their needs and the better the regional responsibility. Surakarta City public transportation routes, consist of seven bus and eight feeder routes. BWP I is passed by five bus routes and four feeder routes. BWP IV is only passed by two feeder routes. BWP V is passed by five bus routes and two feeder routes.

Electricity services describe the condition of a city's sustainability, resilience, economic productivity, and health, especially for cities in developing countries. If the district can meet electricity needs, it can fulfill basic city services and create good district obligations. City electricity facilities are provided by the Perusahaan Listrik Negara (PLN) or National Electrical Company. Facilities have covered all BWP I, BWP IV, and BWP V areas.

Drinking water services also describe the condition of resilience, economic productivity, and health of a city and affect the city's responsibilities. Drinking clean, healthy, and free water from harmful elements is a vital human need for survival. If the water service is bad, district livability will also be bad. Based on the data collected by the author, almost all areas of the city have drinking water channels provided by the Perusahaan Air Minum Daerah (PDAM) or Regional Drinking Water Company. Residents who do not install PDAM drinking water pipes use wells or bottled drinking water because where they live, the quality and quantity of drinking water provided are not good. In BWP I, 97 samples used PDAM as a source of drinking water, and five samples used water sources other than PDAM. In BWP IV, 63 samples used PDAM as a source of drinking water, and eight samples were used other than PDAM. In BWP V, 60 samples (all samples) use PDAM as a source of drinking water.

Participation can affect responsibility because it can foster a strong sense of togetherness and a sense of comfort living in a location. Participation in development also makes the environment comfortable to live in because it suits the population's needs. The most common participation practices in all observed districts are Justification/Tokenism and No Participation. The following is data on the type of participation based on the sample at the research location:

Table 3. Type of Participation Based on the Sample at the Research Location

No	Districts	No Participation	Justification/ Tokenism	Citizen Power
1	BWP I	37	45	20
2	BWP IV	23	41	7
3	BWP V	24	29	8

4.4 Economics

Areas with good livability provide housing opportunities for people of all ages, incomes, and abilities and allow everyone to live in quality neighborhoods regardless of their circumstances (Lowe et al., 2015 AND AARP, 2018). BWP I is the district with the lowest chance of owning a house because the undeveloped land is only 4.99 ha. BWP IV has the highest chance of owning a house compared to the other two districts because it has 113.66 ha of undeveloped land. At the same time, BWP V is between the two, with a non-built-up area of 14.78 ha.

Being close to the city's economic area means close to employment, which means it can minimize expenses, such as transportation costs. The distance to employment is calculated based on the distance from trade areas and industrial services to housing. The more this economic area covers the whole area, the better the area's responsibility. (AARP, 2018). Trade is the largest use of economic land in BWP I, BWP IV, and BWP V. The second largest use for economic activity after the trade is the industry in BWP IV and BWP V and offices in BWP I. This difference is because BWP I is the central business district of Surakarta.

4.5 Security

Poor security services make people feel insecure and isolated. As a result, there is a feeling of worry about developing one's abilities, business, or assets. It ultimately reduces the responsibility of the city or region. Lowe et al. (2015) Leby and Hasyim (2010). The number of security facilities in BWP I, BWP IV, and BWP V is vast and unequal. Area security facilities in BWP I totaled 23 units; in BWP IV, there was only one unit, and in BWP V, only five units.

Almost all settlements in the city of Surakarta are vulnerable to disasters. BWP I is an area prone to fire disasters but only has eight fire hydrants. BWP IV is vulnerable to floods and fires but only has one pump house and three fire hydrants. BWP V is vulnerable to floods and fires but only has one pump house and ten fire hydrants.

5. Results and Discussions

5.1 Result

BWP is a part or district of a city, which is a grouping of zoning units in a city district according to the similarity of functions, the existence of its center, ease of accessibility, and boundaries (physical and administrative).

Based on this study's results, BWP I, BWP IV, and BWP V do not have optimal livability because their values show a fairly good level. BWP V's livability score is the best, with 3.13 points. They were then followed by BWP I, which has a livability score of 3.03 points. Moreover, BWP IV has a livability score of 2.75 points. BWP V and BWP I have a livability score close to good livability, while BWP IV has a livability score close to rather bad. The following table briefly shows information about district livability scores in Surakarta City.

Table 4. The Livability of Three Districts Observe

Elements of Livability	BWP I	BWP IV	BWP V
Environment	3,50	3,50	4,00
Physical	3,50	3,50	4,00
Social	3,63	3,25	3,63
Economic	2,50	2,50	2,50
Security	2,00	1,00	1,50
District Livability	**3,03**	**2,75**	**3,13**

It is in accordance with research by Zhan et al. (2018), which states that dimensions of city livability such as environment, public facilities, and transportation, natural environment, sociocultural environment, urban security have a significant and positive impact on urban livability. If these dimensions give good quality, the city's livability will also be good, and vice versa.

5.2 Discussions

The three observed districts have livability scores that are not yet optimal. It is due to the low value of the economic and security elements. The district's economic elements can show better performance because the district's work opportunities are already promising. However, as a result of the poor opportunity to have a place to live, which is characterized by the low of non-built areas, the economic element is included in the rather poor category. The limited land area in the city causes land prices to be very high and ultimately makes the opportunity to own a house very difficult. The difficulty of having a place to live will affect the productivity and welfare of the population. While the security element still has a bad score due to the lack of numbers and the uneven distribution of crime security facilities and disaster security facilities.

These conditions are in line with that stated by Lynott et al. (2018), who state that a livable community refers to a safe and protected environment with affordable and suitable housing options, along with supportive community amenities and services. Affordable housing opportunities positively impact community livability by promoting economic stability, social diversity, and community engagement, reducing commute times, providing access to amenities, and ensuring neighborhood stability.

In addition, the difference in the livability values of BWP I, BWP IV, and BWP V is mainly due to unequal access to facility services. BWP I is a city center that has good complete facilities. BWP V is an area of education, health, and tourism, so it grows facilities and supporting activities for the area that is quite complete. Meanwhile, BWP IV is an area farthest from the city center and has recently developed in Surakarta, so its facilities are incomplete. In addition, the government's uneven policy in distributing facilities also causes this area to have the least facilities.

Proximity to the city center is associated with higher levels of livability. This is due to improved access to amenities, services (Kyttä et al., 2016), and cultural activities (Florida et al., 2013). It also results in shorter commute times, better access to public transportation, and a vibrant urban environment, all of which contribute to enhanced social interactions and economics (Mouratidis and Yiannakou, 2022).

The district livability score in this study, when compared with the results of the 2017 MCLI index, will show similar livability conditions. Based on the MCLI, the livability score of Surakarta City is 66.9 out of 100, and if it is categorized into four classes with a minimum value of zero, then the Surakarta City MCLI index also belongs to the fairly good category. Thus, the city label with the highest livability index or value does not guarantee good livability.

The similarity in this livability category occurs because the three observed districts are BWP which represents the condition of Surakarta City. It supports the statement that states that the livability of an area can affect the whole area and even a wider area (National Research Council, 2002). However, it should be noted that the district in this research is an area with similar conditions or represents the condition of the city or a wider area being compared. The district livability that does not represent the condition of the city or the district livability of the city with a high development gap between districts cannot be ascertained to match the statement above. Therefore, the development of future research is necessary to explore this further.

6. Conclusion

District livability in Surakarta City is not optimal because it is still in the fairly good category. Although environmental elements, built physical elements, and social elements have good livability, the livability of this district is not yet optimal due to the low value of economic and security elements. The gap in access to facilities affects the livability in each district. Districts with equitable regional accessibility have better livability than those with uneven

districts. In addition, slum settlements do not affect the livability of the district, a note that it is not dominant in the size of the city, and the level of slums is severe. The results of the district livability assessment in this study were similar to the Most Livable City Index of Surakarta City, which, if classified, was included in the reasonably good category. Thus, the city label with the highest livability index or value does not guarantee good livability either. Livability in the district as a whole is also similar to livability in BWP I, BWP IV, and BWP V. This is because these three districts are areas that represent the overall condition of the city, and the quality of service facilities is not much different even though there are gaps in service access. Based on this research, it is still possible to develop an assessment of regional livability, namely measuring the livability of areas that have different conditions from the city average or measuring regional livability in cities with high development gaps.

7. References

Dashora, L. K. (2009). *Visualisation of urban quality of life at neighborhood level in Enschede*. Netherlands: ITC.

Florida, Richard, Charlotta Mellander, and Peter J. Rentfrow. (2013). The happiness of cities. *Regional studies, 47*(4), 613-627.

Hahlweg, D. (1997). The City as a Family. In Lennard, S. H., S von Ungern Sternberg, H. L. Lennard (Eds.), *Making Cities Livable*. International Making Cities Livable Conferences. California: Gondolier Press.

Herrman, T. and Lewis, R. (2018). *What is Livability?* Sustainable Cities Initiative.

Ikatan Ahli Perencanaan. (2017). *Indonesia Most Livable City Index*.

Jacobs, J. (1961). *The Death and Life of Great American Cities*. New York: Random House.

Kashef, M. (2016). Urban livability across disciplinary and professional boundaries. *Frontiers of Architectural Research, 5*, 239–253

Kyttä, Marketta, et al. (2016). Urban happiness: context-sensitive study of the social sustainability of urban settings. *Environment and Planning B: Planning and Design, 43*(1), 34-57.

Leby, L. J. & Hashim, H. A. (2010). Liveability Dimensions and Attributes: Their Relative Importance in the Eyes of Neighbourhood Residents. *Journal of Construction in Developing Countries, 15*(1).

Lowe, M. et al. (2015). *Liveable, Healthy, Sustainable: What Are the Key Indicators for Melbourne Neighbourhoods?* Place, Health and Liveability Research Program.

Lynott, J., Harrell, R., Guzman, S., & Gudzinas, B. (2018). *The livability index 2018: Transforming communities for all ages*. AARP Public Policy Institute.

Mouratidis, K., & Yiannakou, A. (2022). What makes cities livable? Determinants of neighborhood satisfaction and neighborhood happiness in different contexts. *Land Use Policy, 112*(105855).

National Research Council. (2002). *Community and Quality of Life: Data Needs for Informed Decision Making*. Washington, DC: The National Academies Press.

Shekhar, R. (2018). Measuring Liveability: A Critique. *Sree Journal of Spatial Perspectives, 2*, 35–41.

Surat Keputusan Walikota Surakarta Nomor 413.21/38/3/1/2016 Penetapan Lokasi Kawasan Lingkungan Perumahan dan Permukiman Kumuh di Kota Surakarta.

Suryono, T. A. et al. (2020). Tingkat Kesiapan Kota Surakarta sebagai Kota Nyaman Bersepeda. *Desa-Kota: Jurnal Perencanaan Wilayah, Kota, dan Permukiman, 2*, 100–116.

Timmer, V. and Seymoar, N. K. (2005). *The Liveable City. The World Urban Forum 2006, Vancouver Working Group Discussion Paper*. International Centre for Sustainable Cities.

Zhan, Dongsheng. Po Kwan, Mei. Wenzhong, Zhang. Fan, Jie. Yu, Jianhui. Dang, Yunxiao. (2018). Assessment and determinants of satisfaction with urban livability in China. *Cities, 79*, 92-101.