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Regular Article

The social performance of the Green Open Space (GOS) in Karebosi Field Complex

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ABSTRACT

Green Open Space is an important element in a sustainable city-oriented urban model. This phenomenon is growing and developing and has been widely accepted by urban developers around the world in recent decades. The study of cities and their relation to green open spaces and their effects on the welfare, health, happiness, and satisfaction of city residents with their environment is a topic that has received a lot of attention. This study seeks to examine the social function of green open space which is termed "social performance", by measuring the level of intensity of utilization of the facilities in it. The measuring instrument used is the scalogram table. This research was conducted using a survey method with descriptive analysis. Data collection was carried out by observation and documentation techniques. The results showed that the social performance of green open spaces in the Karebosi Field Complex was 49 percent, still in the low category. Of the nine observed variables, it can be seen that the walking track has the highest performance rating, while the lowest are volleyball, softball, and non-sports facilities.

1. Introduction

The "Garden City", initiated by Ebenezer Howard of England in 1896, made the public aware of the importance of Green Open Spaces (GOS) in urban areas as the basis for modern urban development. This concept was introduced in the book "A Peaceful Path to Social Reform" and later republished in 1902 as "Garden City of Tomorrow" (Gallion & Eisner, 1992), (Clevenger & Andrews, 2017). Howard wanted to combat overcrowding and congestion in industrial cities by creating parks outside of developed areas. In another study, Mumford (1960) in (O'Sullivan, 2016) claims that the garden city was one of two important discoveries in the early 20th century. The concept of a garden city has been studied by several experts in understanding its essential parts (Parham, 2020), (Allmond, 2017), (Livesey, 2016), (Ernawati, 2016).

In America, Daniel Burnham also proposes a more specific city and (GOS) concept through the image of a "white city" as a contrast to the dark American industrial city, by using (GOS) and large squares and special roads for casual walks and open spaces on the shores of Lake Chicago. He has a motto that becomes a manifesto for city planners, namely *"Make no little plans, they have no magic to stir man's blood, Make big plans, for a noble document once recorded will never die"* (Catanese & Snyder, 1988), (Loren Kruger, 2010). Daniel's concept has been explored by several urban researchers, including (Vernon, 2014), the city of Manila and Baguio is an application of Daniel's concept (Morley, 2018).

When a city has well-planned and well-organized (GOS), social life in the city will be better and healthier (Anderson et al., 2017). This condition ensures healthy and positive mental growth for all ages. Children can play safely in GOS instead of on dangerous streets, teenagers can exercise and grow with a healthy mind and body (La Ode Anhusadar, 2019). City people can relax and restore freshness and fitness, as well as awaken creativity so they can work with enthusiasm for the welfare of their families. Humans manage the environment with (GOS), and the environment will provide support for the better benefit of human life (Dollah & Rasmawarni, 2018).

Urban GOS has also become an important part of the urban ecosystem, which has ecological, social, and economic functions. The social function of GOS is as a place of rest, recreation, and sports, as well as a means of communication between residents, both directly and indirectly (Yusmawar, 2016). GOS also provides aesthetic value, forms a

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more natural appearance of the city, and acts as a counterweight between the composition of buildings and elements of urban space. In general, GOS improves the quality of urban areas, which in turn leads to improving the health quality of urban residents, influencing lifestyles, values, and behavior, and increasing appreciation of the environment and urban stability (Dollah et al., 2014).

In an urban model that is oriented toward sustainable cities, GOS has become an important part of its development (Pauleit et al., 2019), (Mensah, 2016). This phenomenon has grown, developed, and been widely accepted by urban developers around the world in the last few decades (Franchino & Frettoloso, 2019), (Cariñanosa et al., 2014). This is due to increasing evidence that the natural environment provides benefits to urban residents, commonly known as ecosystem services (Bratman et al., 2019), (Pakzad & Osmond, 2016), (Lennon et al., 2016).

In addition, GOS is increasingly recognized for its health benefits, based on claims that such spaces and environments contribute to improving the health and well-being of urban residents (Reid et al., 2017), (Douglas et al., 2019), (Corkery, 2015),(Ward Thompson et al., 2010). In addition, green open spaces such as parks, green belts, and others that contain trees, grass, and other vegetation are increasingly considered locations for people to meet, socialize, and create the necessary relationships to build social capital in urban environments (G. A. Putra et al., 2019), (Gani, 2017), (Kaźmierczak, 2013).

Likewise, urban green space strengthens social order in the city, provides opportunities for residents and visitors to participate in activities and socialize with each other, thus eliminating social differences (Nail & Erazo, 2018), (ADEGBEHINGBE, 2018), used as a gathering place for various events community for city residents to strengthen the intimacy between communities (Suryana et al., 2017), (Novit, 2015), (R. T. Putra et al., 2018).

Several categories of urban communities use green areas as a means of recreation and sports according to their conditions and situations (H. Wang et al., 2019, pp. 1–12), (Sudagung, 2015), (Pokharel & Khanal, 2018) (Dahmann et al., 2010). The function of GOS recreation can be in the form of passive recreation and active recreation (Noer Aini et al., 2015). Those that are active usually involve facilities such as skateboards, tennis courts, swimming pools, rock climbing, and other sports facilities while those that are passive include activities such as accompanying children to play, chatting with friends, seeing wildlife, enjoying views of several flowering plants, reading, relaxing, and so on. interact with other visitors.

The study of green areas in urban areas based on Vosviewer's analysis can be grouped based on the brightness of the color and the size of the circle, as shown in Fig. 1, the research topic is represented by three main color groups, namely red, blue, and green. In the red color group, the main theme is GOS related to development, management, activity, form, community, performance, implementation, and policy, for the blue color with the main theme, is the city related to open space, function, change, urban form, planning, and achievement, while in green the main theme is open space and its relation to city green space, environment, impact, sustainability, quality of green space, temperature change, distance, and neighboring environment.

One of the functions of viosviewer analysis is to map research trends based on topics, the bigger the circle in the image, it means that the topic has been researched a lot, and vice versa, the smaller the circle in the picture, it means that the research theme is rarely carried out, and it provides opportunities for research. Fig. 1 shows that discussions about the performance of green open spaces still receive less attention than discussions about development, management, urban areas, environment, function, and health. Based on these conditions are one of the reasons this research was conducted.

If the discussion theme is as shown in Fig. 1, seen by cluster, then based on Vosviewer it consists of 4 clusters as shown in Table 1.

Based on this grouping, it can be seen that the discussion on the social performance of green open spaces is in class one along with activities, capacities, communities, ecological functions, management, and

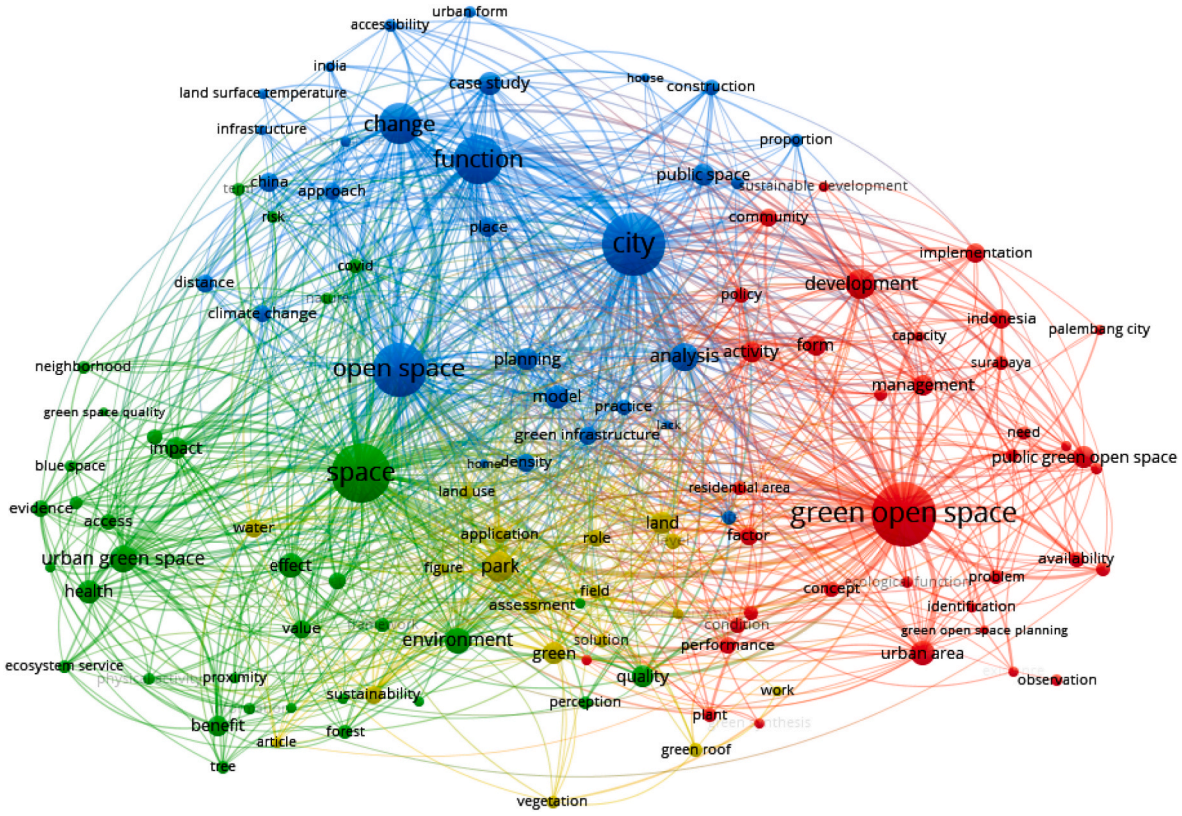

Fig. 1. Grouping of green open space study themes. (Source: Vosviewer analysis results and publish or perish). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

Table 1
Grouping of green open space studies based on class.

Cluster	Concept Name	Total
Cluster1	Aktivity, availability, building, capacity, community, consep, condition, development, ecological fungtion, effort, existence, factor, form, green open space, green open planning, green synthesis, identification, inplementation, Indonesia, Jakarta, management, need, observation, Palembang City, *performance* plan, policy, presence, private green open space, problem, public green open space, residential area, spatial planning, Surabaya, sustainable development, urban area, utilization.	37
Cluster 2	Acces, benefit, blue space, characteristic, covid, ecosystem service, effect, environment, evidence, forest, frame work, green space quality, health, human health, infact, inflication, influence, information, nature, nighboarhoot, perception, phisical activity, proximity, quality, relationship, risk, space, systematic review, term, tree, urban green space, urban open space, urban park, value	34
Cluster 3	Accessibility, analysis, approach, case study, change, china, chity, climate change, construction, density, distance, function, green infrastucture, home, house, India, infrastructure, lack, land surface temperature, life, model, open space, model, open space, planning, practise, proportion, provision, public space, urban form, urban space.	30
Cluster 4	Application, article, assesment, field, figure, green, green economi, green roof, land, land use, level, park, role, solution, sustainability, vegetation, water, work,	18

(Source: Vosviewer Analysis Results and Publish or Perish)

so on.

Karebosi Field Green Open Space is the largest green open space in Makassar City with an area of 73,000 m^2, which can be classified as urban green open space according to Minister of Public Works Regulation No. 5. since 2008 (Dollah & Rasmawarni, 2019). Its position is at the zero kilometer point and is one of the markers of the city of Makassar which is easily recognized as a city identity or as a landmark that forms the image of the city (Budiman et al., 2018), (Sayoko & Wikantiyoso, 2019), (Purwantiasning et al., 2013), (Lynch, 1981), (Zahnd, 1999).

The position of Karebosi Field Complex is located at the intersection of Jalan Jenderal Sudirman and Jalan Jenderal Ahmad Yani which serves as the orientation of city circulation and the location of important buildings as symbols of authority. This road is also a feature of the urban model with the axis style, which is a feature of the old city design model (Dollah et al., 2014), as shown in Fig. 2.

In accordance with the social function of green space as a means of interaction between city residents through recreational and sports activities and socializing among other city residents with various cultural expressions (Jennings & Bamkole, 2019), (Firmansyah et al., 2018), (Hendriani, 2016), so In this GOS complex, there are various sports facilities that can be used by city residents, such as a soccer field, tennis court, basketball court, volleyball court, softball field along with a jogging track and helicopter landing pad. and ceremonial stages. In detail, the situation of the Karebosi Field GOS Complex is shown in Fig. 3.

Of the various facilities contained in the RTH of the Karebosi Field Complex as mentioned above, the urban community has been actively utilized. The ability of existing facilities in green open spaces such as sports facilities and other facilities to serve human activities above is basically a social GOS performance. This social performance can be used as a basis and benchmark for assessing the social function of GOS (Sujarto, 1993), (Purwanto, 2014), (Jusnan Kelo, 2002), (Tudorie et al., 2020).

In line with the current development of urban development which is oriented towards sustainable cities, studies that provide insights to measure the social green space performance in urban areas are very important for the development of GOS and urban development in Indonesia. Studies that are developing in Indonesia are still limited to certain aspects that do not depart from the aspect of the performance of green space facilities and how to measure them. The purpose of this research is to examine the work intensity of the utilization of GOS facilities as the implementation of social functions carried out and also as a concrete manifestation of GOS services to city residents, through a measurement model that describes the social GOS performance.

There has not been much research on the intensity of green open space utilization by assessing activities carried out through measurement models to describe the social performance as shown by the information presented in Table 2.

It can be seen in Table 2, the research that has been carried out in relation to GOS has not yet led to research on the intensity of the physical services of GOS facilities for visitors, in this case it is called GOS social performance.

(Gobstet & Dickhut, 1995), states further research on how to utilize urban spaces that are considered narrow, wasted, considered lost, or forgotten to increase the area and optimize GOS and understand how the location, size, facilities, and number (Lo et al., 2003). The design, access, and management of GOS influence usage patterns, perceptions, and preferences of users. Likewise suggested by (Crowford et al., 2008), research is also needed to examine the relationship between GOS quality, as well as GOS features, and other key determinants, to understand the strength of the mutual relationship between GOS conditions and GOS users from the perspective of satisfaction, preferences, usage patterns of GOS users and user needs.

It is hoped that this study will help fill the gap described by (Bell et al., 2008), which states that more methods are needed to better assess the quality of GOS development. This study measures the social GOS performance of the Kareboshi Field Complex by observing the intensity

Fig. 2. The position of the Karebosi field complex in Makassar city. Source: Processed and modified from google maps.

Fig. 3. The Sports Facilities in the GOS of Karebosi Field Complex. Source: Processed and modified from Google Map 2019 satellite imagery.

Table 2
Research on the role of green open space in urban areas.

Study Aspect	Researcher
The Benefits of GOS Related to Creating Feelings of Pleasure, Relaxation, and Peace of Mind for users.	(Dewi et al., 2018), (Anderson et al., 2017), (Febriarto, 2019), (Rahayu, Y. et al., 2019), and some others that are similar.
Quantifying The Distribution of GOS in Cities Based on Satellite Imagery, Distribution and Distribution Structure of GOS in Urban Areas Based on The Hierarchy of Areas and The Size of per Capita Area.	(Z. B. Wang et al., 2017), (Yenİce, 2015), (Dollah, AS. et al., 2014), (Sinaga, SH,. et al. , 2018), (Andini et al., 2018) and some others that are similar
Perceptions of GOS Users on Health and Welfare Benefits, User Characteristics, Quality, and Management as well as Positive Perceptions about GOS as Predictors of Urban Environmental Quality.	(Nath et al., 2018a), (Lechner et al., 2018), (Douglas et al., 2019), (Artmann et al., 2019), (Yu et al., 2016), and some others that are similar
GOS related to temperature, urban environmental microclimate and oxygen supply	(Sunaryo, 2015). (F Xue et al., 2017), (Sulistyana, D., et al., 2017), (Santi et al., 2019), (Koc et al., 2016),(Fei Xue, 2017), and some others that are similar.

Source: Results of analysis

of visitor activity based on existing facilities. The importance of this study is to provide an overview of the potential performance of each facility within the GOS. This description can be used to identify the best and worst service performance of an existing system. The results of this study are expected to contribute to the development of urban GOS and existing facilities in general, particularly the development of GOS for the Karebosi Field Complex in the future. The development of a scalogram table as a model for measuring the success of evaluating the feasibility of GOS from a social perspective is also expected to contribute.

2. Research methodology

This research was conducted using a survey method with descriptive analysis. The research location is in Makassar City and the research took place from January 2019 to April 2019. The determination of the sample was carried out using a purposive sampling technique. Purposive sampling is a non-random sampling method, where researchers ensure that the sample objects have special characteristics that match the research objectives so that they are expected to be able to respond to the cases to be studied (Lenaini, 2021), another description by Arikunto (2013: 183) in (Meiliawati & Isharijadi, 2017) said purposive sampling is a sampling that is not based on strata, random or region but is based on a specific purpose.

Because the GOS for the Karebosi Field Complex is the most extensive GOS, has the most facilities, and has the most dynamic and continuous activities in Makassar City, besides that because the distribution of GOS is uneven throughout the city area, and based on research objectives which will measure social performance based on facilities, it is deliberately This GOS was chosen as the research sample.

Data collection was carried out by observing the activities that took place at each existing facility, documented through recording and photos and this was done every day for one month, then in the following two months, it was carried out periodically to validate the data that had been previously taken.

The data obtained were analyzed using the scalogram table technique which begins with filling in the cells of the scalogram table with positive values if they meet the criteria as stated in the indicator criteria and negative values if they do not meet the indicator criteria. Furthermore, the data that has been entered in the cells are sorted in the scalogram table based on the order in which the cell with the most positive values is placed at the top horizontally in descending order and from left to right vertically. Then calculate the COR (Coefficient Of Reproducibility) using the following formula.

COR = A/Q x 100
COR = Percentage coefficient of reproducibility
A = Number of filled cells
Q = Number of cells

The COR value obtained is an illustration of the social performance of the GOS. The COR percentage value that is close to 1 indicates that the social GOS performance is very good.

The scalogram analysis technique is one of the analytical tools commonly used to assess the hierarchical level of facilities within an environmental unit (Louis L. Guttman, 1974), (M. Maranell Gary, 2017), (M. Putra et al., 2017), (Ramadhan & Osly, 2019). It is widely applied by geographers, demographers, and planners to analyze the hierarchical level of availability of facilities in urban areas. This analysis places more emphasis on the unit of analysis of population services, therefore an analysis based on functional classification is used which is one of the

three methods proposed by Rondinelli (Rondinelli, 1985).

3. Findings and discussion

Field surveys conducted at the GOS Karebosi Field Complex showed activities taking place in various available facilities, as shown in Table 3.

In Table 3 it can be seen that the jogging track facility has the best performance, ranking first among all existing facilities by fulfilling 7 of the 8 indicators observed. Jogging activities are carried out once a day (X1), twice a day in the morning and evening (X2), once a week (X3), twice a week (X4), and three times a week (X5), carried out 6 times a week (X6) and 7 times a week (X7), which means that jogging activities meet the indicators carried out once a day (X1), carried out twice a day, morning and evening (X2), carried out once a week (X3), carried out twice a week (X4), carried out three times a week (X5), six times a week (X6), and seven times a week (X7).

The condition of these jogging activities bears resemblance to the characteristics of GOS visitors in Kuala Lumpur, Malaysia (Nath et al., 2018b), where 98 percent of respondents wanted the park to have jogging tracks and children's play facilities. Studies (Deelen et al., 2019), have shown that perceived environmental features, such as pathways shaded by living plants (Vich et al., 2019) and comfortable walking surfaces, affect the attractiveness and recreational capacity of runners, rather than motivation or attitudes. runner. The jogging track here is shaded by trambesi trees and forms a canopy along the track, so the athletes don't get overheated by the sun. The jogging track inside the GOS consists of two lanes, one lane for fast walkers and one lane for runners with a length of 750 m.

Jogging is the sport of choice that is popular with the community because it can be done anytime, anywhere, and is entertainment (Efendi, 2019). In addition, jogging helps you socialize and make more friends. Jogging can be done in the morning, afternoon, and evening. Jogging, a form of aerobic exercise that involves walking and running at speeds of less than 14 km/h, has been shown to provide several important health benefits, including weight loss and obesity prevention. Jogging for 30 min burns about 300 calories and strengthens your muscles. It helps the body respond to disease and immunity, is very good for the heart, maintains blood pressure, controls cholesterol, and tones the muscles in the legs, thighs, and back (Adi Santika, 2016), (Indrawan et al., 2019).

Another benefit is its ability to increase lung capacity and strengthen the muscles of the respiratory system, jogging tracks on gravel-covered tracks can treat strokes (Febrianti, 2018). The jogging situation in the GOS Karebosi Field Complex is shown in Fig. 4. The first and third pictures from left to right show a two-lane jogging track, while the middle image shows a jogging track for foot reflection with protruding gravel.

The GOS facility that is placed in second place is a soccer field. Soccer field facilities meet six indicators namely X1, X3, X4, X5, X2, and X6, which means that jogging activities meet the indicators carried out once a day (X1), carried out twice a day, morning and evening (X2), carried out once a week (X3), done twice a week (X4), done three times a week (X5), done six times a week (X6), and the only day observed with no football activity occurred on Monday because intended for field maintenance. There are three soccer fields in the Karebosi Field Complex with very heavy usage, used interchangeably, especially on Sundays.

Several football clubs in Makassar City use this facility for practice.

Table 3
Activities in the GOS Karebosi field complex.

No	Facility		Activities Indicator								Total Horizontal Cell	Total Horizontal Cell Filled	Ranking
			X1	X3	X4	X5	X2	X8	X6	X7			
1	Sport Activity	A	+	+	+	+	+	−	+	+	8	7	I
2		B	+	+	+	+	+	−	+	−	8	6	II
3		D	+	+	+	+	+	−	−	−	8	5	III
4		E	+	+	+	+	+	−	−	−	8	5	III
5		G	+	+	+	+	+	−	−	−	8	4	IV
6		C	+	−	−	−	−	+	−	−	8	2	V
7		F	+	−	−	−	−	+	−	−	8	2	V
8	Non Spt-Act	H	+	−	−	−	−	+	−	−	8	2	V
9		I	+	+	−	−	−	+	−	−	8	2	V
Total Vertical Cell			9	9	9	9	9	9	9	9			
Total Vertical Cell filled			9	6	5	5	4	3	2	1			
Total Cell filled = A			35										
Total Cell = Q			72										
Ranking			I	II	II	II	III	IV	IV	IV			
COR = (A/Q)x100%			49%										

Information.
+ = Fulfilled.
- = Unfulfilled.
A = Fast way track (jogging).
B = Soccer field.
C = Softball field.
D = Basketball court.
E = Tennis court.
F = Volleyball court.
G = Gymnastic.
H = Ceremony, exhibition, Religious activity, Start and Finish Walking and Bicycles.
I = Sitting and Relaxing with friends and family.
X1 = Activity frequency once a day.
X2 = Activity frequency twice a day.
X3 = Activity frequency once a week.
X4 = Activity frequency twice a week.
X5 = Activity frequency 3 times a week.
X6 = Activity frequency 6 times a week.
X7 = Activity frequency 7 times a week.
X8 = Frequency Incidental Activity.
Source: Analysis Results Data Primer 2019

Fig. 4. Jogging activities (source: Research documentation).

There are also several soccer school groups for children of various ages based on age group categories regulated by the Indonesian soccer organization. Some of the soccer participants at the Karebosi Field had the achievement of becoming Makassar Football Association (PSM) players and some even took part in the Indonesian Football Association (PSSI). Football is a very popular sport in Makassar and several Indonesian football legends originate from Makassar city. Soccer activity is shown in Fig. 5.

As seen in Fig. 5 from left to right the first and third images are the category of groups of children's football players while the picture in the middle is the category of adult groups.

Sports facilities in third place are tennis courts and basketball courts. This facility fulfills five indicators, namely X1, X3, X4, X5, and X2. This activity is carried out three times a week with a frequency of twice a day. In addition, tennis activities have play groups based on age ranging from children, and teenagers to adults. Activities on this tennis court are quite intense holding several championships such as local, regional, and national championships. The basketball court facilities are generally used in the morning by schoolchildren who attend schools around the field, while adults usually use them in the afternoon. This field is also often used for basketball championships among students throughout Makassar which are held during school holidays. Tennis and basketball activities are shown in Fig. 6. From left to right, sequences one and two are activities on the tennis court, while the third order is activities on the basketball court.

Gymnastics is ranked fourth in the level of social performance based on the fulfillment of four indicators, namely X1, X3, X5, and X4. This activity takes place three times a week with a frequency of once a day. There is no special place prepared for gymnastic activities like other sports activities. This activity is usually carried out using unused spaces around the jogging track. Communities that are active here are generally indigenous ethnic groups with participants consisting of several community groups. Gymnastic activities are also carried out at the helicopter landing area and the ceremonial stage, at this place mostly of Chinese ethnicity. It is important to note that the majority of gymnasts in the indigenous ethnic group are women whereas in the Chinese ethnic group, it is equally balanced between men and women. The exercise activity is shown in Fig. 7. The order of pictures one and two from left to right shows indigenous ethnic groups around the jogging track while in third place the Chinese ethnic group is in the helicopter landing area.

The fifth performance sequence is occupied by softball, volleyball, and activities classified in category H (ceremonies, exhibitions, religion, fun walks, and leisure bikes) and category I (sitting activities with friends and family) by fulfilling two indicators, namely X1 and X8,

Fig. 5. Football activities (source: Research documentation).

Fig. 6. Tennis & Basketball activities (Source: Research Documentation).

Fig. 7. Gymnastic activities (source: Research documentation).

which is interpreted as carrying out incidental activities once a day. The low performance for this sport is because Softball is not very popular in the city of Makassar, and the majority of enthusiasts are from certain segments of youth, namely the middle and upper economic groups. This sport is seen to have sufficient activity if there are leaders from both the government and the private sector in Makassar City who have a former athlete's background or have an emotional bond with this sport so they have special attention to developing it. The weakness of this condition is that if the leader who has the attention switches or moves, this sport will return to being passive. This condition also occurs in volleyball and other unpopular sports. The situation for gymnastic activities in the GOS Karebosi Field Complex is shown in Fig. 8. From left to right the Softball and Volly fields with weeds grow to indicate that there has never been activity on it according to its designation.

The low performance recorded in categories H and I was due to existing facilities not supporting their implementation properly. This is indicated by the lack of good seating facilities for people to sit comfortably and chat casually with family or friends, the plants also do not have an attraction to be enjoyed, besides that the facilities for sitting are around soccer sports activities which have a risk of being hit the ball from a kick that goes off the field. Sitting and chatting activity situations are presented in Fig. 9.

Fig. 8. Softball and Volleyball fields (Source: Research Documentation).

Fig. 9. Sitting activity (source: Research documentation).

Fig. 9 shows the seating facilities used on Sundays by visitors after finishing jogging. In the picture, from left to right, the first and third pictures are seats made of concrete, while in the second picture, visitors use a jogging track to sit, because they don't get a seat on the existing seats. The Schalogram table also shows that non-sporting activities have lower performance compared to sporting activities. This means that GOS is more dominated by sports activities, not for recreation related to relaxing with family and friends, less of an option.

There are significant differences in the use of GOS when compared to those in several big cities in the world as shown by Nichol and Blake (2010) in (Haq, 2011) that 80 percent of the UK population in urban areas use GOS as a place of recreation. The results of the study (Keeley & Benton-Short, 2019) stated that 42.2 percent of young people aged 15–24 years chose to visit green open spaces for sightseeing, relaxation, and recreation, as many as 20 percent aged 25–34 for the same reasons, to those aged over 35 years decreased sharply by 14.6 percent, while those aged over 55 years did not seem to like traveling and recreation to GOS with a percentage of 8.6 percent remaining. Another study in Helsinki showed 97 percent of urban residents use GOS for recreation. This means that green open space which is dominated by sports activities strengthens the understanding that this space can also function as a means to improve physical fitness (Mitchell, 2013),reduce cardiovascular indications and death from respiratory disorders (Richarson & et al, 2010),and reduce obesity (Blanck et al., 2012), (Toftager et al., 2011).

Based on this scalogram analysis, it can be seen that the COR of the social performance of the GOS for the Karebosi field complex is 49 percent. If the measurement scale is categorized from 1 to 25 which is very low, 26–50 is low, 51–75 is sufficient and 76–100 is very sufficient, then the social performance of the Karebosi Field Complex's GOS is in the poor category. This condition is similar to the results of research (Sugiyanto & Sitohang, 2017), whose results show that the function of Green Open Spaces in Ayodia Park, South Jakarta City is not optimal because there are several factors that influence it, including park facilities that still need to be added and their quality improved. The higher the performance value of a facility, the higher the satisfaction level of the user (Purwanto, 2014). One of the elements of GOS that makes its performance more optimal, as research results (Purwantiasning, 2017), shows that the largest distribution of visitors to Tabebuya Park is in areas that have children's playgrounds with seating facilities that can meet the needs of parents while waiting for their children to play.

4. Conclusions and suggestions

The social performance of the GOS Karebosi Field Complex based on the Schalogram table of 49 percent is included in the low category. The first rank of existing sports facilities with the highest performance is jogging activity, while the second rank is football, tennis and basketball, which are ranked third. While the lowest performance is the softball field and volleyball field facilities.

The GOS of Karebosi Field Complex is included in the category of active green open spaces with dominant sports activities. It seems that this green open space is not the choice of city residents for leisurely recreation with the family because the facilities are not supportive.

Based on the social performance evaluation of these facilities, for the development of green open spaces in Makassar City in the future and in Indonesia in general, jogging track facilities are recommended facilities to be held in every green open space that will be built or optimized. In its development, it can be combined with basketball courts and tennis courts. The next recommendation is the soccer field, which must be developed separately.

It is necessary to increase non-sport facilities such as seating and planting, including attractive flowering plants, so that their use can be maximized. In particular, seats for GOS visitors should be made in accordance with the times, not only to meet the requirements as a seat, but also to pay attention to the comfort and beauty of the seats, and even better if there are facilities for children's games around the seating area. Future GOS research is needed to find out why the Karebosi Field Complex GOS is not desirable for non-sport recreational activities and why the softball and volleyball sports facilities are not being used. This GOS also needs to provide facilities for people with special needs because currently there are none.

The results of this study and its methodology cannot be generalized to urban green open space problems, but for green open space research with the same case it can be applied, for different studies especially those that require a measurement model, the scalogram table can be an alternative with some adjustments.

CRediT authorship contribution statement

Andi Mega Januarti Putri: Conceptualization, Methodology. **Nirwana:** Writing – review & editing. **Mursyid Mustafa:** Data curation, Writing – review & editing. **Mega Januartiputri:** Data curation, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Reference

Allmond, G. (2017). The first garden city? Environment and utopianism in an edwardian institution for the insane poor. *Journal of Historical Geography, 56*, 101–112. https://doi.org/10.1016/j.jhg.2017.03.004

Anderson, J., Ruggeri, K., Steemers, K., & Huppert, F. (2017). Lively social space, well-being activity, and urban design: Findings from a low-cost community-led public space intervention. *Environment and Behavior, 49*(6), 685–716. https://doi.org/10.1177/0013916516659108

Andini, W. S., Prasetyo, Y., & Sukmono, A. (2018). Analisis sebaran vegetasi dengan citra satelit sentinel menggunakan metode NDVI dan segmentasi (studi kasus; kabupaten demak). *Jurnal Geodesi Undip, 7*(1), 14–24.

Artmann, M., Inostroza, L., & Fan, P. (2019). Urban sprawl, compact urban development and green cities. How much do we know, how much do we agree? *Ecological Indicators, 96*, 3–9. https://doi.org/10.1016/j.ecolind.2018.10.059

Bell, H., Montarzino, R., & Travlou, A. (2008). *Greenspace and quality of life: A critical literature review*.

Blanck, H., Allen, D., Bashir, Z., Gordon, N., Goodman, A., Merriam, D., & Rutt, C. (2012). Let's go to the park today: The role of parks in obesity prevention and improving the public's health. *Childhood Obesity, 8*(5), 423–428. https://doi.org/10.1089/chi.2012.0085.blan

Bratman, G. N., Anderson, C. B., Berman, M. G., Cochran, B., de Vries, S., Flanders, J., Folke, C., Frumkin, H., Gross, J. J., Hartig, T., Kahn, P. H., Kuo, M., Lawler, J. J., Levin, P. S., Lindahl, T., Meyer-Lindenberg, A., Mitchell, R., Ouyang, Z., Roe, J., & Daily, G. C. (2019). Nature and mental health: An ecosystem service perspective. *Science Advances, 5*(7). https://doi.org/10.1126/sciadv.aax0903

Budiman, I. T. R., Rondonuwu, D. M., & Tungka, A. E. (2018). Analisis elemen-elemen pembentuk citra kota di kawasan perkotaan tahuna, kabupaten kepulauan sangihe. *Spasial, 5*(2), 190–199.

Cariñanosa, P., Casares, P., Quesada, J., & Rubiob. (2014). Estimating the allergenic potential of urban green spaces: A case-study in granada, Spain. *Landscape and Urban Planning, 123*, 134–144. https://doi.org/10.1016/j.landurbplan.2013.12.009

Catanese, A., & Snyder, J. (1988). In P. Erlangga (Ed.), *Perencaan kota (wahyudi dan tim* (2nd ed.) (Penerbit Erlangga).

Clevenger, S. M., & Andrews, D. L. (2017). 'A peaceful Path to' healthy bodies: The biopolitics of ebenezer howard's garden city. *Urban Planning, 2*(4), 141–145. https://doi.org/10.17645/up.v2i4.1251

Corkery, L. (2015). Beyond the fark: Linkin urban greenspace, human well-being and environmental health. In H. Barton, S. Thomson, & S. Burge (Eds.), *The routledge Handbook of planning for Health and well being: Shaping a Sustainable and healthy future*. Routledge. M. G. H. Barton, S. Thomson, S. Burgess (ed.)).

Crowford, T., Corti, G., Ball, K., Hume, C., & Roberts, R. (2008). Do features of public open spaces vary according to neighbourhood socio-economic status? *Health & Place, 14*(4), 889–893. https://doi.org/10.1016/j.healthplace.2007.11.002

Dahmann, N., Wolch, J., Joassart-Marcelli, P., Reynolds, K., & Jerrett, M. (2010). The active city? Disparities in provision of urban public recreation resources. *Health & Place, 16*(3), 431–445. https://doi.org/10.1016/j.healthplace.2009.11.005

Deelen, I., Janssen, M., Vos, S., Kamphuis, C. B. M., & Ettema, D. (2019). Attractive running environments for all? A cross-sectional study on physical environmental characteristics and runners' motives and attitudes, in relation to the experience of the running environment. *BMC Public Health, 19*(1), 1–15. https://doi.org/10.1186/s12889-019-6676-6

Dewi, O. C., Chairunnisa, I., Hidayat, T., Anggraini, M., & Napitupulu, A. (2018). Green open space: Awareness for health or sustainability? *IOP Conference Series: Earth and Environmental Science, 120*(1). https://doi.org/10.1088/1755-1315/120/1/012014

Dollah, A., Ardi, M., Mulyadi, Pertiwi, N., & D. Dirawan, G. (2014). Distribution analysis of green open space in Makassar. *International Journal of Academic Research*, *6*(4), 103–110. https://doi.org/10.7813/2075-4124.2014/6-4/a.13.

Dollah, A., & Rasmawarni, R. (2019). Struktur Sebaran Ruang Terbuka Hijau di Kota Makassar. *Jurnal Linears, 2*(1), 8–17. https://doi.org/10.26618/j-linears.v2i1.3023.

Dollah, A., & Rasmawarni,. (2018). Analisis Ruang Terbuka Hijau (RTH) Dari Aspek Keterlaksanaan Fungsi Sosial Di Kota Makassar. *Jurnal Linears*, *1(2)*(Environment Architecture), 62–71. unismuh.ac.id.

Douglas, O., Russell, P., & Scott, M. (2019). Positive perceptions of green and open space as predictors of neighbourhood quality of life: Implications for urban planning across the city region. *Journal of Environmental Planning and Management, 62*(4), 626–646. https://doi.org/10.1080/09640568.2018.1439573

Dwi Sulistyana, M. I. C., Yuwono, S. B., & Rusita, R. (2017). Kenyamanan hutan kota linara berbasis kerapatan vegetasi, iklim mikro dan persepsi masyarakat di kota metro. *Jurnal Sylva Lestari, 5*(2), 78. https://doi.org/10.23960/jsl2578-87

Efendi, H. (2019). Perubahan denyut nadi pada remaja setelah jogging dengan jarak 2 Km di taman cadika medan johor. *Jurnal Penelitian Kesmasy, 2*(1), 58–63. https://doi.org/10.36656/jpksy.v2i1.160

Ernawati, R. (2016). Optimalisasi fungsi ekologis ruang terbuka hijau publik di Kota surabaya. *EMARA: Indonesian Journal of Architecture, 1*(2), 60–68. https://doi.org/10.29080/emara.v1i2.8

Febrianti, H. (2018). PERSPEKTIF MASYARAKAT TERHADAP KEBERADAAN TAMAN KOTA SEBAGAI RUANG TERBUKA HIJAU DI KOTA JAMBI (studi kasus: Pedestrian jomblo, taman perumnas dan taman arena remaja). *Journal V-Tech (Vision Technology), 1*(2), 37–41. https://doi.org/10.35141/jvt.v1i2.95

Febriarto, P. (2019). Kualitas fungsi sosial terhadap keberadaan taman kota publik di kota surakarta. *Sustainable, Planning and Culture (SPACE) : Jurnal Perencanaan Wilayah Dan Kota, 1*(1), 10–15. https://doi.org/10.32795/space.v1i1.259

Firmansyah, Soeriaatmadja, A. R., & Wulanningsih, R. (2018). A set of sustainable urban landscape indicators and parameters to evaluate urban green open space in Bandung City. *IOP Conference Series: Earth and Environmental Science, 179*(1). https://doi.org/10.1088/1755-1315/179/1/012016

Franchino, R., & Frettoloso, C. (2019). Urban greening: From the social value to environmental quality. *Next Places, Next Spaces, October*, 339.

Gallion, A., & Eisner, S. (1992). In P. Indarto (Ed.), *Pengantar perancangan kota* (1st ed.). Penerbit Erlangga.

Gani, R. (2017). Taman kota sebagai modal sosial dan interaksi masyarakat kota bandung. *Jurnal Signal Unswagati Cirebon, 5*(1), 1–11.

M. Maranell Gary. (2017). Scaling. In M. M. Gary (Ed.), *Scaling (25 october)*. Routledge. https://doi.org/10.4324/9781315128948.

Gobstet, P. H., & Dickhut, K. E. (1995). Exploring interspace : Open space opportunities in dense urban areas. *Inside Urban Ecosvstems Proceedings of the 7th National Urban Forestry Conference*, 70–73. http://www.ncrs.fs.fed.us/pubs/4864.

Guttman, L. L. (1974). *The basis for scalogram analysis* (1st Editio). Routledge.

Haq, S. M. A. (2011). Urban green spaces and an integrative approach to sustainable environment. *Journal of Environmental Protection, 2*(5), 601–608. https://doi.org/10.4236/jep.2011.25069

Hendriani, A. S. (2016). Ruang terbuka hijau sebagai infrastruktur hijau kota pada ruang publik kota (studi kasus: Alun-alun wonosobo. *Jurnal Penelitian Dan Pengabdian Kepada Masyarakat, 2*, 74–81. https://ojs.unsiq.ac.id/index.php/ppkm/article/view/340/171.

Indrawan, S., Yudiarti, D., Lansia, T., & Olahraga, F. (2019). PERANCANGAN FASILITAS UNTUK AKTIVITAS FISIK BAGI LANSIA DI TAMAN LANSIA BERDASARKAN ASPEK ERGONOMI designing facilities for physical activity for the elderly in. *The Taman Lansia Based On Ergonomic Aspects Abstrak Bandung merupakan salah satu kota yang men, 6*(2), 2887–2895.

Jennings, V., & Bamkole, O. (2019). The relationship between social cohesion and urban green space: An avenue for health promotion. International Journal of Environmental Research. Int. J. Environ. Res. Public Health **2019**, 16(3), 452; https://doi.org/10.3390/ijerph16030452. https://www.mdpi.com/406896.

Kaźmierczak, A. (2013). The contribution of local parks to neighbourhood social ties. *Landscape and Urban Planning, 109*(1), 31–44. https://doi.org/10.1016/j.landurbplan.2012.05.007

Keeley, M., & Benton-Short, L. (2019). Urban green space. In *Urban sustainability in the US* (pp. 239–279). Springer International Publishing. https://doi.org/10.1007/978-3-319-93296-5_8.

Kelo, J. (2002). *Kinerja spasial lingkungan permukiman rumah susun dan damfaknya terhadap kehidupan penghuni*. Universitas Diponegoro Semarang.

Koc, C. B., Osmond, P., & Peters, A. (2016). A green infrastructure typology matrix to support urban microclimate studies. *Procedia Engineering, 169*(2), 183–190. https://doi.org/10.1016/j.proeng.2016.10.022

Kruger, L. (2010). Our future metropolis: Mr. Daniel H. Burnham presents a plain talk for the development of chicago (review). *Theatre Journal, 62*(2), 265–267. https://doi.org/10.1353/tj.0.0349

La Ode Anhusadar, I. (2019). Taman layak anak usia dini di Kota kendari. *Jurnal obsesi. Jurnal Pendidikan Anak Usia Dini, 3*(1), 117–126. https://doi.org/10.31004/obsesi.v3i1.106

Lechner, A. M., Chan, F. K. S., & Campos-Arceiz, A. (2018). Biodiversity conservation should be a core value of China's Belt and Road Initiative. *Nature Ecology & Evolution, 2*(3), 408–409. https://doi.org/10.1038/s41559-017-0452-8

Lenaini, I. (2021). Teknik pengambilan sampel purposive dan snowball sampling. *Jurnal Kajian, Penelitian & Pengembangan Pendidikan Sejarah, 6*(1), 33–39. p-ISSN 2549-7332 %7C e-ISSN 2614-1167%0D.

Lennon, M., Scott, M., & O'Neill. (2016). Urban design and adapting to flood risk: The role of green infrastructure. *Journal of Urban Design*, 1–317. https://doi.org/10.4324/9781315713373

Livesey, G. (2016). Innovation, the agricultural belt, and the early Garden City. *Berkeley Planning Journal, 28*(1), 148–163. https://doi.org/10.5070/bp328133865

Lo, S. M., Yiu, C. Y., & Lo, A. (2003). An analysis of attributes affecting urban open space design and their environmental implications. *Management of Environmental Quality, 14*(5), 604–614. https://doi.org/10.1108/14777830310495759

Lynch, K. (1981). *A theory of good city form*. The MIT Press.

Meiliawati, A., & Isharijadi, I. (2017). Analisis perbandingan model springate dan altman Z score terhadap potensi financial distress (studi kasus pada perusahaan sektor kosmetik yang terdaftar di bursa efek Indonesia). *The Asset: Jurnal Akuntansi Dan Pendidikan, 5*(1), 15. https://doi.org/10.25273/jap.v5i1.1183

Mensah, C. A. (2016). The state of green spaces in Kumasi city (Ghana): Lessons for other African cities. Journal of Urban and Regional Analysis. https://search.proquest.com/openview/506a05269b552fecb77e586972d9727f/1?pq-origsite=gscholar%5C&cbl=506347.

Mitchell, R. (2013). Is physical activity in natural environments better for mental health than physical activity in other environments? *Social Science & Medicine, 91*, 130–134. https://doi.org/10.1016/j.socscimed.2012.04.012

Morley, I. (2018). The first Filipino City Beautiful plans. *Planning Perspectives, 33*(3), 433–447. https://doi.org/10.1080/02665433.2018.1423639

Nail, S., & Erazo, L. (2018). Waving the green flag for peace. Public spaces as peacebuilding places in Colombian cities. *Opera-Colombia, 22*, 83–102.

Nath, T. K., Zhe Han, S. S., & Lechner, A. M. (2018a). Urban green space and well-being in Kuala Lumpur, Malaysia. *Urban Forestry and Urban Greening, 36*, 34–41. https://doi.org/10.1016/j.ufug.2018.09.013

Nath, T. K., Zhe Han, S. S., & Lechner, A. M. (2018b). Urban green space and well-being in Kuala Lumpur, Malaysia. *Urban Forestry and Urban Greening, 36*, 34–41. https://doi.org/10.1016/j.ufug.2018.09.013

Noer Aini, L., Heri Isnawan, B., & Ridwan Saleh, E. (2015). Evaluasi ruang terbuka hijau di Kota pekanbaru. *Planta Tropika: Journal of Agro Science, 3*(1), 41–51. https://doi.org/10.18196/pt.2015.038.41-51

Novit, H. (2015). Penyediaan hutan kota dan taman kota sebagai ruang. *RUANG, 1*(3), 101–110. https://doi.org/10.14710/ruang.1.4.101-110

O'Sullivan, K. (2016). LETCHWORTH: The first garden CITY'S economic function TRANTRANSCRIBED from theory to practice. *Berkeley Planning Journal*. https://search.ebscohost.com/login.aspx?direct=true%5C&profile=ehost%5C&scope=site%5C&authtype=crawler%5C&jrnl=10475192%5C&AN=125216481%5C&h=tfbPXKKTKBIOClRDAYlBZ%2FqSHPO8QZkVVE5LugpjiKFXdedLKPMBb2vJjvlafPpFuuXg9h%2FxVUJSu%2Fe4jUMMaA%3D%3D%5C&crl=c.

Pakzad, P., & Osmond, P. (2016). Corrigendum to developing a sustainability indicator set for measuring green infrastructure performance. *Procedia - Social and Behavioral Sciences, 216*, 1006. https://doi.org/10.1016/j.sbspro.2016.02.001 (July 2016).

Parham, S. (2020). Food and welwyn garden city: Prescribing a sociable future? *Town and Country Planning Association Journal*. http://hdl.handle.net/2299/23286.

Pauleit, S., Ambrose-Oji, B., Andersson, E., Anton, B., Buijs, A., Haase, D., Elands, B., Hansen, R., Kowarik, I., Kronenberg, J., Mattijssen, T., Stahl Olafsson, A., Rall, E., van der Jagt, A. P. N., & Konijnendijk van den Bosch, C. (2019). Advancing urban green infrastructure in Europe: Outcomes and reflections from the GREEN SURGE project. *Urban Forestry and Urban Greening, 40*, 4–16. https://doi.org/10.1016/j.ufug.2018.10.006

Pokharel, R. P., & Khanal, N. R. (2018). Open space: Typology and distribution in pokhara lekhnath metropolitan city. *Geographical Journal of Nepal, 11*, 25–44. https://doi.org/10.3126/gjn.v11i0.19547

Purwantiasning, A. W. (2017). Optimalisasi fungsi ruang terbuka hijau dengan melihat pola sebaran pengunjung. *National Academic Journal of Architecture, 4*(2), 121–127.

Purwantiasning, A. W., Masruroh, F., & Nurhidayah, N. K. (2013). Analisa kawasan boat quay berdasarkan teori kevin lynch. *NALARs, 12*(1), 59–72.

Purwanto, E. (2014). KORELASI KINERJA SPASIAL Peru MAHAN DENGAN KEPUASAN PENGHUNI Peru MAHAN MEGA RESIDENCE SEMARANG (the correlation of housing spatial performance to occupant's satisfaction in mega residence housing semarang). In *tesa arsitektur*. *Journal of Architectural Discourses, 12*(1), 43. http://journal.unika.ac.id/index.php/tesa/article/view/94.

Putra, M., Giyarsih, S. R., & Kurniawan, A. (2017). Sektor unggulan dan interaksi antarwilayah pada kawasan strategis nasional perkotaan MEBIDANGRO. *Jurnal Wilayah Dan Lingkungan, 5*(3), 181. https://doi.org/10.14710/jwl.5.3.181-187

Putra, R. T., Radnawati, D., Syahadat, R. M., Trie, P., & Thoifur, D. M. (2018). Evaluasi taman JANGKRIK sebagai rtra di CIGANJUR. *Prosiding Semnastek*, 1–8.

Putra, G. A., Triwahyono, D., & Zahro, H. Z. (2019). Kajian ruang publik sebagai modal sosial pembentuk kohesi sosial sebagai respon era industri 4.0. *Prosiding SEMSINA*, 125–130. https://ejournal.itn.ac.id/index.php/semsina/article/download/2209/1929.

Ramadhan, F., & Osly, P. J. (2019). ANALISIS KETERSEDIAAN RUANG TERBUKA HIJAU DAN KECUKUPANNYA DI KOTA DEPOK (analysis of the availability of green open space and its adequacy in depok city). *J.Infras, 5*(1), 7–11.

Reid, C. E., Clougherty, J. E., Shmool, J. L. C., & Kubzansky, L. D. (2017). Is all urban green space the same? A comparison of the health benefits of trees and grass in New York city. *International Journal of Environmental Research and Public Health, 14*(11). https://doi.org/10.3390/ijerph14111411

Richarson, E., et al. (2010). The association between green space and cause-specific mortality in urban New Zealand: An ecological analysis of green space utility. *BMC Public Health, 10(1), 240*. https://doi.org/10.1186/1471-2458-10-240

Rondinelli, D. (1985). *Applied methods of regional analysis the spatial dimensions of development policy*. Taylor & Francis.

Adegbehingbe, T. G. A. E. I. O.. (2018). Evaluation of maintenance of green open spaces in urban areas: A case study of the federal university of technology akure, Nigeria. A. B. U. DEPARTMENT OF ARCHITECTURE (Eds.). In M. L. SAGADA, A. B. U. DEPARTMENT OF ARCHITECTURE, & J. J. MAINA (Eds.), *Association of architectural educators in Nigeria proceedings of the 2018 AARCHES national conference* (pp. 189–206). SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIANIGERIA. Academia.edu.

Santi, S., Belinda, S., & Rianty, H. (2019). Identifikasi iklim mikro dan kenyaman termal ruang terbuka hijau di kendari. *NALARs, 18*(1), 23. https://doi.org/10.24853/nalars.18.1.23-34

Santika, A. (2016). Pengukuran tingkat kadar lemak tubuh melalui joging selama 30 menit mahasiswa putra semester IV FPOK FPOK IKIP PGRI bali. kdar lemak *Jurnal Pendidikan Kesehatan Rekreasi, 1*, 89–98. ISSN : 2337 – 9561.

Sayoko, J., & Wikantiyoso, R. (2019). Kajian citra kota dalam branding city beautiful malang. *Mintakat: Jurnal Arsitektur, 20*(1). https://doi.org/10.26905/mj.v20i1.3796

Sinaga, S. H., & Andri Suprayogi, H. (2018). Analisis ketersediaan ruang terbuka hijau dengan metode normalized difference vegetation index dan soil adjusted vegetation index menggunakan citra satelit sentinel-2a (studi kasus : Kabupaten demak). *Jurnal Geodesi Undip, 7*(1), 202–211.

Sudagung, Y. B. (2015). Kawasan olahraga rekreasi pada ruang terbuka hijau di kota pontianak. *JMARS: Jurnal Mosaik Arsitektur, 3*(1), 125–140. https://jurnal.untan.ac.id/index.php/jmarsitek/article/view/10179.

Sugiyanto, E., & Sitohang, C. A. V. (2017). Optimalisasi fungsi ruang terbuka hijau sebagai ruang publik di taman Ayodia Kota Jakarta Selatan. *Jurnal Sosial Dan Humaniora*. http://journal.unas.ac.id/populis/article/view/238.

Sujarto, D. (1993). *Kinerja dan dampak tata ruang dalam pembangunan kota baru: Studi kasus kota terpadu bumi bekasi baru*. Institut Teknologi Bandung.

Sunaryo, D. K. (2015). Studi hubungan ruang terbuka hijau, temperatur lingkungan perkotaan dan kebutuhan konsumsi oksigen dengan sistem informasi geografis. *Spectra*. http://eprints.itn.ac.id/id/eprint/2840.

Suryana, A., Iskandar, A., & Hernawan, D. (2017). Implementasi kebijakan ruang terbuka hijau publik oleh dinas kebersihan dan pertamanan kota bogor. *Jurnal Governansi, 2*(1), 1–12. https://doi.org/10.30997/jgs.v2i1.196

Toftager, M., Ekholm, O., Schipperijn, J., Stigsdotter, U., Bentsen, P., Grønbæk, M., Randrup, T., & Kamper-Jørgensen, F. (2011). Distance to green space and physical activity: A Danish national representative survey. *Physical Activity and Health, 8*(6), 741–749. https://doi.org/10.1123/jpah.8.6.741

Tudorie, C. M., Vallés-Planells, M., Gielen, E., & Galiana, F. (2020). Assessing the performance of urban green infrastructure: The case study of benicalap district, valencia, Spain. *WIT Transactions on Ecology and the Environment, 243*, 83–95. https://doi.org/10.2495/UA200081

Vernon, C. (2014). Daniel hudson Burnham and the American city imperial. *Thesis Eleven, 123*(1), 80–105. https://doi.org/10.1177/0725513614543434

Vich, G., Marquet, O., & Miralles-Guasch, C. (2019). Green streetscape and walking: Exploring active mobility patterns in dense and compact cities. *Journal of Transport & Health, 12*, 50–59. https://doi.org/10.1016/j.jth.2018.11.003

Wang, H., Dai, X., Wu, J., Wu, X., & Nie, X. (2019). *Influence of urban green open space on residents ' physical activity in China*.

Wang, Z. B., Zhang, L. J., Zhao, X. L., Du, H. Y., Yang, D. Y., & Cai, Y. L. (2017). Analysis on landscape pattern of urban green space in Shanghai. *In Journal of Environmental Protection and Ecology, 18*(2), 788–801.

Ward Thompson, C., Aspinall, P., & Bell, S. (2010). *Innovative approaches to researching landscape and health*. Routledge. https://doi.org/10.4324/9780203853252

Xue, F., Gou, Z., & Lau, S. (2017). Green open space in high-dense Asian cities: Site configurations, microclimates and users' perceptions. *Sustainable Cities and Society, 34*, 114–125. https://doi.org/10.1016/j.scs.2017.06.014

Yenİce, M. S. (2015). *A Method for Evaluation of the Efficiency of Urban Green Spaces ; Aksaray, Turkey, 3*(2), 54–65.

Yulistia Rahayu, V., Frinaldi, A., & Khaidir, A. (2019). The influence of green open space and tourism-conscious work culture on the happiness of the people in Solok Regency. In *IOP conference series: Earth and environmental science*. https://doi.org/10.1088/1755-1315/314/1/012053, 314(1).

Yusmawar. (2016). Manfaat ruang terbuka hijau bagi masyarakat perkotaan ditinjau Dari aspek sosial ekonomi kota banda aceh. *Jurnal Ilmiah Mahasiswa (JIM) Ekonomi Pembangunan Fakultas Ekonomi Dan Bisnis Unsyiah, 1*(1), 290–298. http://jim.unsyiah.ac.id/EKP/article/view/703.

Yu, S., Yu, B., Song, W., Wu, B., Zhou, J., Huang, Y., Wu, J., Zhao, F., & Mao, W. (2016). View-based greenery: A three-dimensional assessment of city buildings' green visibility using floor green view index. *Landscape and Urban Planning, 152*, 13–26. https://doi.org/10.1016/j.landurbplan.2016.04.004

Zahnd, M. (1999). *Perancangan kota secara terpadu: Teori perancangan kota dan penerapannya*, 07 ed. In (Heinz Frick (Ed.). Penerbit Kanisius dan Soegijapranata University Press www.kanisiusmedia.com.