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# The 6th International Symposium on Sustainable Urban Development (The 6th ISoSUD) 2023

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# The 6th INTERNATIONAL SYMPOSIUM ON SUSTAINABLE URBAN DEVELOPMENT (The 6th ISoSUD) 2023

The International Symposium on Sustainable Urban Development (ISoSUD) is a series of international activities organized by the Faculty of Landscape Architecture and Environmental Technology, Universitas Trisakti, Jakarta. The event is held once every 3 (three) years with themes related to current issues regarding sustainable urban development, in particular related to urban environmental management and environmental technologies. The activity aims to facilitate academics to publish their research results in order to enhance their scientific expertise as researchers.

The 6th ISoSUD in 2023 carried the theme "**From Recovery To Resilience: Building A Sustainable Future For A Better Life"** which means this symposium will focus on how we can recover from the difficult times caused by the COVID-19 pandemic and build a better future and sustainable. This theme also shows the importance of building resilience in facing future challenges, whether related to climate change, economic policies, or other social problems.

The COVID-19 pandemic that swept the world in the last four years has had a significant impact on human health, the global economy, and the daily lives of people around the world. It will take the concerted efforts of all countries and peoples to overcome this pandemic and rebuild the world after it. This pandemic underscores the need for global efforts to strengthen health systems, enhance societal resilience, strengthen international cooperation, and accelerate action to achieve sustainable development goals and combat climate change. This crisis provides an opportunity to make significant changes in the way we view and manage our economic and social activities and to create a world that is more sustainable and fairer for all people and our planet. Now is the time to make a difference, to make a profound systemic shift towards a more sustainable economy for the benefit of our people and our planet. In other words, now is the right time to undertake significant transformations in existing economic and social systems, which can help sustainably achieve the SDGs and fight climate change to ensure a better future for people and our planet. Overall, post-pandemic recovery must be based on the principles of sustainable development contained in the SDGs. By integrating the SDG goals into our recovery policies and actions, we can create a more sustainable, inclusive, and resilient future for our people and the world.

The 6th ISoSUD was held in the hybrid conference:

a. Day 1, on Wednesday, August 2nd, 2023, at Building M, 12th floor, Universitas Trisakti, Jakarta, Indonesia. There were 130 participants offline and 170 participants on the Zoom platform in the plenary session.

b. On day 2, on Thursday, August 3rd, 2023, using the Zoom meeting facility, 270 participants attended virtually on Day 2.

In this two-day International Symposium, experts, researchers, and academician shared their valuable insights and research findings. These esteemed presenters hail from 58 universities and institutions in Filipina, India, Indonesia, Iraq, Japan, Malaysia, Netherlands, Singapura, and Taiwan, reflecting the symposium's diverse and inclusive nature. The call paper system that has been used since the first ISoSUD in 2008 succeeded in inviting 165 manuscripts (more than 400 authors) that were presented offline and virtually. Then, 136 from 165 papers were selected further to be published in IOP Proceedings Indexed by Scopus. After another review process, 106 manuscripts were published in IOP EES. To improve the quality of the manuscripts, the organizing committee held a Coaching Clinic for Scientific Paper Writing on June 24th, 2023. Prof. Mohamad Ali Fulazzaky, Ph.D, delivered the coaching clinic.

The 6th ISoSUD 2023 involved co-host universities consisting of five from within the country and four from abroad: Universitas Jember (UNEJ), Jember, Indonesia; Universitas Islam Indonesia (UII), Yogyakarta, Indonesia; Universitas Pasundan (UNPAS), Bandung, Indonesia; Institut Teknologi Sepuluh November (ITS), Surabaya, Indonesia; Universitas Indonesia (UI), Jakarta, Indonesia; Universiti Teknologi Malaysia (UTM), Malaysia; Universiti Tun Hussein Onn Malaysia (UTHM), Malaysia; The University of Kitakyushu, Japan; Chung Yuan Christian University (CYCU), Taiwan. During the class presentation session, a presentation from the participants representing the 6th ISoSUD co-host was carried out. Besides that, The 6th ISoSUD 2023 was supported as well by the Indonesian Society of Sanitary and Environment Engineers (IATPI), which has continuously supported our symposium since 2008. And sponsored by PT Enviro Cipta Lestari.

In the plenary session, some main speakers delivered more focused seminar themes; they were:

**Welcoming Speech:**

Prof. Dr. Kadarsah Suryadi DEA – Rector of Universitas Trisakti

**Opening Speech:**

Ir. Diana Kusumastuti, MT. - Director General of Human Settlements, Ministry of Public Works and Public Housing Indonesia

**Plenary Speakers:**

**Day-1**

1. Prof. Lin Chi Wang - Chung Yuan Christian University (CYCU), Taiwan
2. Prof. Ir. Joni Hermana M.Sc.ES., Ph.D – Institut Teknologi Sepuluh November (ITS), Indonesia

**Day 2**

3. Prof. Ts. Dr. Azmi Bin Aris - Universiti Teknologi Malaysia (UTM), Malaysia
4. Prof. Dr. Eng. Toru Matsumoto - University of Kitakyushu, Japan
5. Associate Prof. Victor R Savage – Nanyang Technological University (NTU), Singapore

We believe that this event will be able to facilitate good networking among researchers, scientists, engineers, and practitioners with common interests, especially in sharing the latest research results, ideas, development, and applications in Sustainable Urban Development. Hopefully, all participants enjoyed the seminar and found this experience inspiring and helpful in their professional field. Thank you for choosing the 6th ISoSUD as your symposium reference. Let us embrace the spirit of collaboration and innovation as we strive towards a sustainable future for a better life. We hope to have your pleasant support and participation in the next three years on The 7th ISoSUD 2026.

Sincerely,
Assoc. Prof. Ariani Dwi Astuti, ST., MT., PhD
Chairperson of The 6th International Symposium on Sustainable Urban Development (ISoSUD) 2023

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# Peer Review Statement

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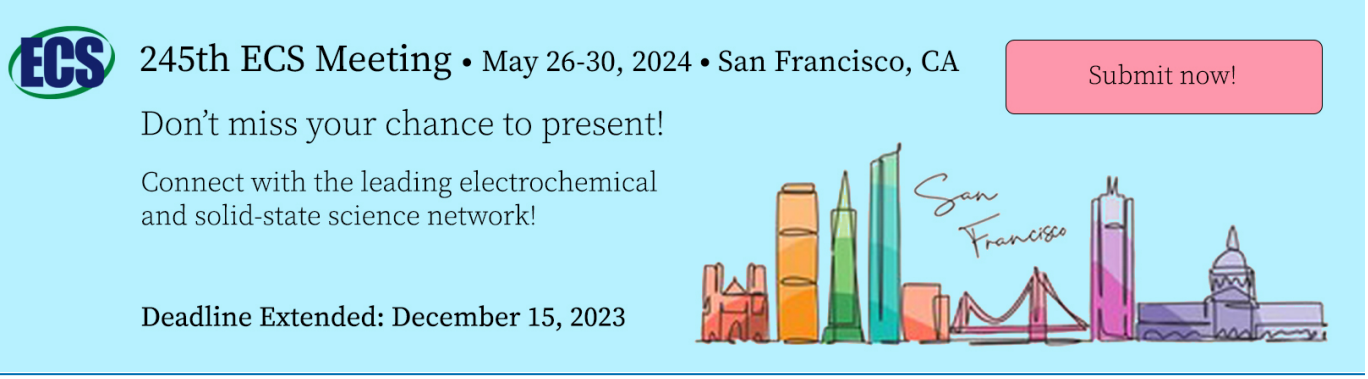
## Peer Review Statement

All papers published in this volume have been reviewed through processes administered by the Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.

1. Type of peer review: Double anonymous
2. Conference submission management system: Morressier
3. Number of submissions received: 137
4. Number of submissions sent for review: 106 (by IOP Publisher)
5. Number of submissions accepted: 71
6. Acceptance Rate (Submissions Accepted / Submissions Received × 100): 66.98%
7. Average number of reviews per paper: 2.00
8. Total number of reviewers involved: 24
9. Contact person for queries:
   Name: Ariani Dwi Astuti
   Affiliation: Universitas Trisakti
   Email: ariani_da@trisakti.ac.id

# Alternative locations of older people-friendly city park in Bandung City, Indonesia





# Alternative locations of older people-friendly city park in Bandung City, Indonesia

**M F Soltip, A Ramadhani* and M N Luru**

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**Abstract.** City parks play a crucial role as essential public open spaces within urban areas. Consequently, a demand exists for city parks that can cater to a diverse range of activities and accommodate individuals from various age groups, genders, and social backgrounds, with particular emphasis on the older population. These parks serve as meeting points and outlets for physical fitness, contributing to the overall well-being of the older population. However, in practice, a substantial number of older population urban residents express discontent with the quality of their city parks. Within the city of Bandung, there are twenty parks that currently do not meet the criteria for being classified as older people-friendly parks. This study is focused on identifying the precise locations of urban parks within Bandung that meet the standards of being older people-friendly. The variables under consideration encompass aspects such as location, accessibility, vegetation, lighting, and available facilities. Data collection was carried out through a survey approach and subsequently subjected to analysis using a scoring technique. The study's findings indicate that out of the twenty parks examined, eight fulfill the criteria to be designated as older people-friendly city parks. These parks are: Cikapundung Terrace Park, Inclusion Park, Cibeunying Park, Cikapundung Riversport Park, Centrum Music Park, Tongkeng Park, City Hall Park, and Alun-Alun Ujungberug Park. Parks with scores ranging from 17 to 24 points are considered to have successfully met the senior-friendly park criteria.

## 1. Introduction

One of the vital facilities contributing to the well-being of the older population within urban areas is public green open space, manifested as city parks. These parks not only offer recreational spaces but also yield positive effects on the physical and spiritual health of urban dwellers [1]. Parks offer an array of benefits to the older population. Particularly for those who experience social isolation, parks can mitigate such isolation, foster intergenerational interactions, and cultivate a sense of belonging and attachment [2]. Thus, city parks stand as essential components of urban environments, nurturing the mental and physical well-being of the older population.

Parks confer significant physiological and psychological advantages to the older population, enhancing their overall quality of life. For seniors residing in compact apartments devoid of personal yards or open spaces, parks serve as retreats, providing opportunities to connect with nature, walk, and engage in exercises. Green open spaces signify a hallmark of age-friendly urban development [3]. Nevertheless, research [4] highlights that urban older people often express discontent with their local

parks and face barriers that hinder their utilization.

Consequently, the older people community requires city parks that cater to diverse functional activities and are accessible to individuals spanning various age groups, genders, and social strata, including the older population. An exemplar of a successful older people-friendly city park is the Temple of Heaven Park in Beijing, China. Encompassing three acres, this park serves as a gathering spot for diverse older people communities, hosting activities such as gymnastics, singing, dancing, calligraphy, and socializing through exercise [5].

The older population demographic within the city of Bandung is an active and engaged community. According to [6], their activity level and residence location have limited impact on their engagement in city activities. With a relatively substantial population of older people residents, the City of Bandung is mandated to provide public facilities catering to all age groups, especially seniors [7]. Given the unique physical and psychological needs of the older population, distinct from those of younger demographics, the city should offer specialized facilities. Presently, the presence of urban parks serves more as a formality rather than a means to provide tailored facilities for the older population, often falling short of recommended provisions [8]. The presence of older individuals is infrequent in the Bandung's city parks. These spaces predominantly attract teenagers for leisure and free internet access. The older population often does not feel accommodated in parks primarily designed for younger individuals.

Although the city of Bandung boasts 20 city parks, none of these spaces are truly accommodating for the older population. In accordance to this matter, the research aims to identify which parks within Bandung meet the criteria of being older people-friendly spaces.

## 2. Methods

### *2.1 Research location*

The location of this research study was conducted in the urban area of Bandung City, West Java Province with an area of 167.29$km^2$. The unit of analysis in this study is urban parks which are scattered in several sub-districts in Bandung City including Coblong District, Bandung Wetan District, Sumur Bandung District, Lengkong District, Ujung Berung District, and Regol District [9].

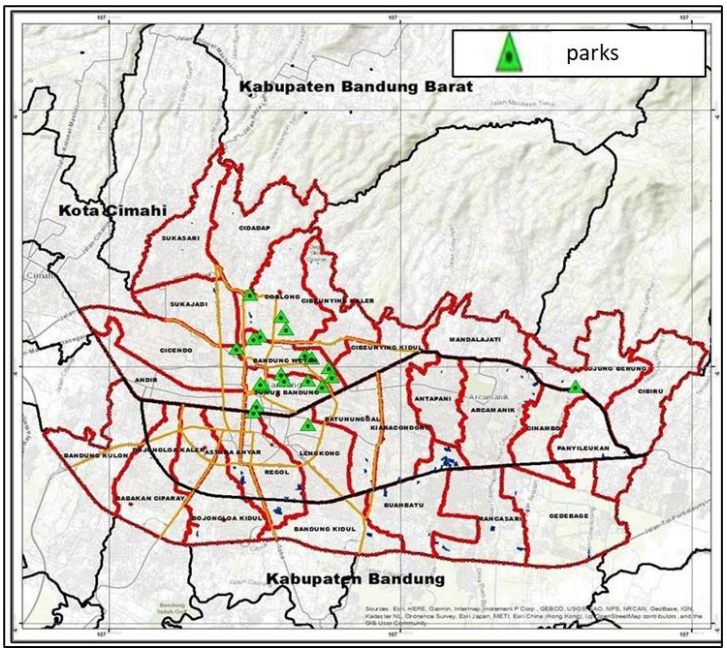


**Figure 1.** Research location map.

### *2.2 Data collection*

The method used are observation and questionnaires method in obtaining primary data needed in the research. The secondary data collection method was carried out using literature studies and surveys via the internet. The literature review is carried out by seeking theory or information about the Central Bureau of Statistics for the City of Bandung, studies, research, etc. Surveys on internet pages are carried out to obtain data such as articles, journals and other publications. In collecting primary data, it will be obtained through direct observation to 20 city parks in Bandung to assess the condition of the city park by going through the criteria of an older people-friendly city park, namely location, accessibility, vegetation, lighting, and facilities.

### *2.3 Data analysis method*

The purpose of this study is to find out city parks that are friendly to the older population in the city of Bandung as measured based on the criteria for an older people-friendly city park. In this study, data analysis uses mathematical calculations with classification scoring techniques. Before identifying the suitability of a park using the criteria for an older people-friendly city park, the data collected has several stages that need to be worked out. Scoring analysis was carried out by assessing the existingconditions against the criteria/indicators set by the researcher based on the theory regarding the older population-park which has been previously described. Assessment will be carried out with each indicator if stated "fulfilled" then given a value of 1, and if "not fulfilled" then the value is 0. Table 1 of research parameters corresponds to the scoring assessment on each research indicator:

**Table 1**. Scoring parameters on research indicators.

| Variable | Indicator | Scoring | |
|---|---|---|---|
| | | Fulfilled | Unfulfilled |
| Location | 1. The environment is close to public transportation modes (200-400m). | 1 | 0 |
| | 2. The park environment is far from noise (railways, traffic lights). | 1 | 0 |
| | 3. Safe environment (Security post available) | 1 | 0 |
| Accessibility | 1. Proximity of the entrance to the parking location. | 1 | 0 |
| | 2. The walking paths in the park are not slippery. | 1 | 0 |
| | 3. Walkways within the park are wide enough for a minimum wheelchair (2m) | 1 | 0 |
| | 4. There are no pedestrians on the sidewalk leading to the park. | 1 | 0 |
| | 5. The walkways to the park are wide enough for wheelchairs. | 1 | 0 |
| | 6. There is a ramp with an appropriate slope and a handrail | 1 | 0 |
| Vegetation | 1. There are shade trees. | 1 | 0 |
| | 2. There are directional plants along the way. | 1 | 0 |
| | 3. Vegetation does not cover planting activities. | 1 | 0 |
| | 4. There are variations in shape, pattern and color offlowers/ornamental plants. | 1 | 0 |
| Lighting | 1. Adequate lighting (not too dark or too dark). | 1 | 0 |
| | 2. Lighting lamps are available in various locations. | 1 | 0 |
| Facility | 1. Non-building facilities are available such as CCTVcameras. | 1 | 0 |

**Table 1**. Scoring parameters on research indicators (cont.)

| Variable | Indicator | Scoring | |
|---|---|---|---|
| | | Fulfilled | Unfulfilled |
| Facility | 2. Safe seats for the older population (there are rain gutters). | 1 | 0 |
| | 3. There is a long seating area for gathering. | 1 | 0 |
| | 4. Toilets are available and toilets are not slippery andclean. | 1 | 0 |
| | 5. There are trash cans along every path in the park. | 1 | 0 |
| | 6. There are directions to the toilet/mushola. | 1 | 0 |
| | 7. There is information about the park. | 1 | 0 |
| | 8. There are sports facilities. | 1 | 0 |
| | 9. There are means for reflection | 1 | 0 |
| | 10. Good drainage. | 1 | 0 |
| | 11. There is a parking lot connected to the garden. | 1 | 0 |

To identify the suitability of the park using the criteria of an older people-friendly city park, it is necessary to classify the assessment using the class interval method using two categories, namely: Fulfilled, and Not Fulfilled. The formula determines the class interval as follows:

$$I = \frac{c - b}{k}$$

**Figure 2.** Interval class formula.

Information:

I = large interval distance
c = Total highest score
b = total lowest score
k = number of classes desired

Based on the calculation of class intervals with many classes, this study uses two classes in order to obtain a detailed assessment. The categories used are as follows:

**Table 2**. Garden condition classification.

| **Condition Classification** | |
|---|---|
| Fulfilled | 17-26 |
| Unfulfilled | 9-16 |

## 3. Results and Discussions

### *3.1 Analysis of city parks in the City of Bandung that meet the criteria for older population friendly*

The assessment of the suitability of city park elements in Bandung to the criteria for an older people-friendly city park is conducted through a scoring analysis. This analysis employs data obtained from observations encompassing both the conditions of research subjects and the park's attributes in the field. Presented in Table 3 are the observations' outcomes concerning urban parks in the city of Bandung, evaluated in accordance to the criteria for older people-friendly city parks:

**Table 3**. Observation results of city parks in the City of Bandung.

| No. | Park | Location | Accessibility | Vegetation | Lighting | Facility | Total |
|---|---|---|---|---|---|---|---|
| 1 | Gesture Park | 2 | 3 | 4 | 1 | 5 | 15 |
| 2 | Cikapundung Terrace Park | 3 | 4 | 3 | 2 | 7 | 19 |
| 3 | Fitness Park | 2 | 3 | 2 | 2 | 6 | 15 |
| 4 | Pasupati Park | 1 | 3 | 0 | 2 | 3 | 9 |
| 5 | Movie Park | 1 | 3 | 1 | 2 | 9 | 16 |
| 6 | Inclusion Park | 1 | 5 | 4 | 2 | 9 | 21 |
| 7 | Kandaga Puspa Park | 2 | 2 | 4 | 1 | 4 | 13 |
| 8 | Cibeunying Park | 2 | 5 | 4 | 2 | 8 | 21 |
| 9 | Older population Park | 2 | 2 | 3 | 1 | 6 | 14 |
| 10 | Persib Park | 2 | 3 | 2 | 2 | 5 | 14 |
| 11 | Cikapundung Riversport Park | 3 | 5 | 3 | 2 | 8 | 21 |
| 12 | Vanda Park | 1 | 4 | 4 | 2 | 3 | 14 |
| 13 | Centrum Music Park | 2 | 4 | 4 | 2 | 7 | 19 |
| 14 | Tongkeng Park | 1 | 5 | 4 | 2 | 7 | 19 |
| 15 | Super Hero Park | 1 | 5 | 3 | 2 | 5 | 16 |
| 16 | Photo Park | 1 | 5 | 4 | 2 | 4 | 16 |
| 17 | City Hall Park | 3 | 6 | 4 | 2 | 9 | 24 |
| 18 | Malabar Press Park | 2 | 3 | 3 | 2 | 4 | 14 |
| 19 | Ujung Berung Square Park | 3 | 5 | 2 | 2 | 9 | 21 |
| 20 | Bandung Square Park | 3 | 3 | 3 | 2 | 5 | 16 |

Based on Table 3, it can be calculated from the highest indicator value - the lowest indicator value and then divided by the desired number of classes in order to get an interval or distance in determining the criteria for an older people-friendly city park. The results of city parks that meet the criteria for older population friendly parks are 7.5 which are rounded up to 8. To determine city parks with appropriate criteria, the value of the lowest indicator is taken to the highest. For more details can be seen in Table 4.

**Table 4**. Classification of city parks for older population friendly.

| Classification of City Parks for Older population Friendly | |
|---|---|
| **Mark** | **Park Criteria** |
| 9-16 | Suitable |
| 17-24 | unsuitable |

Derived from the field analysis conducted in accordance with the criteria for an older people-friendly city park, involving five variables and twenty-six indicators utilizing the scoring method, the assigned weights are categorized as "suitable" with a score range of 17-24, and "unsuitable" (0) within a score

range of 9-16. In the context of the city of Bandung, which encompasses twenty parks, a noteworthy observation is that eight among them fulfill the criteria for being designated as older people-friendly city parks. These parks include:

1. Cikapundung Terraced Gardens (19)
2. Inclusion Park (21)
3. Cibeunying Park (21)
4. Cikapundung Riverspot Park (21)
5. Centrum Music Park (19)
6. Tongeng Garden (19)
7. City Hall Park (24)
8. Ujungberung Square Park (21)

*3.2 Discussions*

Based on the results of the previous analysis, here are the elements that defining an ideal older people-friendly city parks for the older population in the City of Bandung.

*3.2.1. Location.* Location holds immense significance in the establishment of an older people-friendly city park, ideally positioned to provide convenient access to all citizens in Bandung, particularly the older population. Among the city parks in Bandung, some fail to align with the prerequisites of an older people-friendly environment, primarily in terms of safety. Security considerations play a pivotal role in selecting an appropriate location for a park tailored for the older population.

According to [10], the older population demographic is especially attuned to safety concerns within public spaces, necessitating careful attention to security provisions in both public areas and transportation modes. Stakeholders involved must prioritize creating a sense of security, enhancing park management with security measures, and offering facilities that preemptively address potential safety issues. Hence, the selection of a well-populated location with a low crime rate becomes integral in the decision-making process for an older people-friendly park. Moreover, the city park's location should ensure proximity to readily accessible public transportation. Ideally, city parks should be reachable via public transit, private vehicles, and even on foot.

*3.2.2. Accessibility*. In the process of developing older people-friendly city parks, ensuring good accessibility becomes imperative to create an environment conducive for the older population. The aim is to enhance the quality of existing city parks, particularly those meeting the criteria for Older people-friendly City Parks. In this regard, parks that satisfy the criteria must focus on improving their attributes, particularly related to safe accessibility for the older population.

However, within the city of Bandung, several parks fall short of meeting the criteria for an older people-friendly environment due to inadequate accessibility features. A noteworthy example is the absence of ramps with suitable slopes for the older population to enter comfortably. Government Regulation [11] mandates that all parks or recreation areas should offer assistive devices, such as ramps with gentle slopes for wheelchair users.

Another pivotal aspect to consider in terms of accessibility pertains to the prevalence of sidewalks in Bandung's city parks occupied by traders or street vendors selling their goods. It is crucial that sidewalks leading to the park are reserved for pedestrians. Local authorities must take the initiative to enhance and uphold the condition of these sidewalks, ensuring they are secure for the older population. Additionally, allocating a designated space for street vendors will help maintain the comfort of city park visitors without causing disruption. By addressing and improving the accessibility aspects mentioned above, the overall score of a park's older population-friendliness can be elevated, contributing to its status as an ideal older people-friendly city park.

*3.2.3. Vegetation*. The inclusion of vegetation criteria is pivotal in the development of older people-friendly city parks. These criteria encompass indicators that serve as important support elements. One notable aspect within the vegetation criteria is the incorporation of directional plants. Interestingly, this particular indicator remains absent in the majority of parks falling under the category of older people-friendly city parks within Bandung. Directional plants serve as a unique form of signage, offering valuable information about various locations and pathways. This feature significantly aids the older population in adjusting and navigating through the park with ease. The utilization of directional plants as a form of sign language is a remarkable innovation, enhancing accessibility for older individuals. In the pursuit of creating a city park that is both soothing and beneficial to the health of the older population, the presence of well-planned vegetation is indispensable. Moreover, the integration of directional plants not only serves as a navigational tool but also contributes to the aesthetic appeal of the garden area.

*3.2.4. Lighting*. Generally, the lighting in the parks throughout the city of Bandung is commendably satisfactory. The lighting conditions within these parks stand out as an enticing factor for those who wish to visit. Among the eight parks meeting the criteria for an older people-friendly city park, adequate lighting is already in place. However, there is room for improvement, particularly in augmenting the quantity of lighting facilities to facilitate nighttime activities. Additionally, stakeholders should take notice of shaded areas covered by plants that can obscure sunlight during the day, leading to a somewhat dim appearance within the city park. To address this, stakeholders should consistently conduct maintenance and consider adding further lighting elements to enhance illumination.

*3.2.5. Facility*. The subsequent aspect of consideration pertains to the facility criteria. Numerous urban parks in the city of Bandung fall short in the security aspect, primarily due to the absence of CCTV cameras. This security concern is crucial as fear of violence and street crime deters older population individuals from venturing outside their homes [12]. Additionally, the availability of secure seating areas is essential, accompanied by adequate shading that encourages conversation among the older population and other park visitors. This factor significantly impacts the safety of older population patrons, in line with [13], which notes that seats positioned near the park entrance provide a sense of security due to increased foot traffic. It is imperative to increase the quantity of seating facilities to accommodate visitors seeking rest and relaxation. Ensuring security beyond the confines of homes becomes a pivotal consideration in designing city parks for the older population.

Furthermore, essential facilities that must be incorporated within the city park precinct include sports amenities and contemplative spaces distributed across the park area. Parks play a pivotal role for the older population, functioning as spaces for exercise, well-being, and relaxation [14-16]. As such, the forthcoming city park should offer opportunities for light exercise, fostering a setting that enables older population individuals to engage in physical activities collectively and engage in interactions with one another.

## 4. Conclusion

The analysis results reveal that among the 20 parks within the City of Bandung, 8 of them adhere to the criteria of an older people-friendly city park as established by the indicators employed in this study. The fulfilled value class for the criteria of an older people-friendly park falls within the range of 17-24 points. These eight parks that satisfy these criteria are Cikapundung Terrace Park, Inclusion Park, Cibeunying Park, Cikapundung Riversport Park, Centrum Music Park, Tongkeng Park, City Hall Park, and Ujungberung Square Park. Each of these city parks boasts variables including proximity to public transportation modes (within 200-400 meters), distance from noise sources (railways, traffic lights), the presence of elongated seating for gatherings, clear indications for restrooms/prayer spaces, efficient drainage systems, wide-ranging lighting throughout various areas, integrated parking facilities within the garden premises, and diverse floral arrangements in terms of shape, pattern, and color.

However, it's important to note that these city parks also have their share of shortcomings. These include the absence of security posts, sidewalks within the parks crowded with street vendors, lack of

directional plants, unavailability of ramps, and inadequate maintenance of sports and relaxation facilities.

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