Design recommendation on accessibility for people with disability (PwDs) on public space in Banda Aceh (case study Taman Sari Kota Banda Aceh)

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Abstrak. Taman Sari located in the center of Banda Aceh city, Aceh Province, Sumatera, Indonesia. That is a public space. Most of the people spend their time to have some relax, family and friends gathering, it provided educational and recreation facilities. The existence of public space should be able to be accessible for all of the society including persons with disabilities. The accessibility for everyone including the elderly can be measured by safety, convenience, usefulness, and independence. This study is a continuation of previous research that provides design recommendations on accessibility to persons with disabilities in public spaces in Banda Aceh City, and the case study was focused on Taman sari. Kota Banda Aceh. The methodology used was identifying the results from the previous research on the Evaluation of Accessibility for People with Disabilities on the public space in Banda Aceh in the form of design recommendations according to the guidelines of technical facilities and disabilities. Measuring the comfort level on public space can be seen with shape, dimension, color, and texture. Design recommendations obtained might be useful for accessibility for disability in Taman sari Banda Aceh.

Keywords: Accessibility, Disability, Design Recommendations, Taman Sari Kota Banda Aceh.

1. Introduction
Taman Sari Kota Banda Aceh (TSKBA) is a public space where many activities of the society in Aceh held, either in the form of education or recreation. Located in the city center with a stretch of grass and shady trees make Taman Sari Kota Banda Aceh (TKSBA) as one of the options that often visited by the entire community in Aceh, including disability. The existence of public space is the area that could be used by various communities, both personally and groups [1]. The presence of the disability is often considered as a compliment due to their minority number, even though in the 1945 Constitution Articles 28 H paragraph 2 reads “Everyone shall have the right to get special facilities and privileges to obtain the equal opportunities and benefits in order to achieve the equality and justice” [2]. The public spaces should belong to all society and communities, both with normal physical as well as people with disabilities, and the facilities should also facilitate the disability. According to the mentioned problems and reinforced by the previous research entitled “Evaluation of Accessibility for People with Disability on Public Space in Banda Aceh especially in Taman Sari” the design recommendations on TKSBA formed so that afterward the accessibility needs for disability in public space TSKBA fulfilled.
The government has arranged the technical guidance for facilities and accessibilities about building and environment [3]. One of the guidelines related to accessibility, which should make it easy for everyone including the disability and elderly, in order to get equal opportunity for all aspects of life. The design control of the park can be considered feasible when it meets the principle of the facilities and disabilities, which are the safety principle, health, comfort, ease, security, beauty, and independent [4] [5].

The technical guidance of facilities and disabilities that must be considered in the public spaces [6] [4] [3] are:
1) A public toilet should be equipped with a handrail that has positions and altitudes adapted to the user of wheelchair or other disabled people. The recommended grip has a right-angled shape to help the wheelchair user to move from the toilet.
2) The basic size of the shape/free floor space in three-dimension refers to the size of the adult's human body equipment and functions of the space.
3) The pedestrian pathway should be paid attention to the road surface, slope, stopping point, lighting; drainage the minimum with is 120 cm, and safety handles along the pedestrian path.
4) The guided pathway should have steering tiles and warning tiles located in front of the vehicle traffic line, in front of the entrance and exit way, pedestrian connecting environment and buildings, and guides from public space to public transport.
5) The parking area for disability is equipped with an access point located between two parks and equipped with ramps leading to the circulation pathway/line that has differences in evaluations.
6) Ramp with slope requirement should not exceed 60; the maximum of ramp horizontal length should not exceed 900 cm, width /= minimum 95 cm without safety edge, and 120 cm with a safety edge. The borders on the prefix or suffix of the ramp should be free and flat, illuminated with sufficient lighting and equipped with handrails.
7) Signs and marks are needed on the directions and destinations of pedestrian-path public toilets, disability-specific parking, facilities and name of the places, public phone, and ATM.

Based on the problems mentioned above, the existence of the public space should provide accessibility by the technical guidelines for facilities and disabilities. This study will evaluate the appropriateness of the feasibly of the public space in Banda Aceh for people with disabilities.

2. Method

2.1. Research type
The research conducted to give design recommendations to accessibility on the public space in Banda Aceh based on the previous research.

2.2. Research Location
Public space reviewed was only in Taman Sari Kota Banda Aceh which is located in Kampong Baru Kecamatan Baiturrahman, Banda Aceh (Figure 1).

2.3. Research Variable and Operational Definitions
In this study, the dependent variable is accessibility, while the independent variable is the outer space element related to the design recommendation to improve the availability and conformity with the standardization and convenience implemented in the design plan for the improvement of public open space that is friendly to disability. Related to these variables, then the operational definition is:
a) Accessibility is the availability of a pathway for everyone, including the people with disabilities and the elderly, which can be measured by safety, convenience, usefulness, and independent to obtain equal opportunity in all life aspects and livelihood [5].
b) Availability is the presence of access to people with disabilities and the elderly as the study scope.
c) Compliance is the disability facilities available in the public space appropriate with the technical guidelines and standards.
d) Convenience is disability facilities available in the public space and does not interfere the user satisfaction by reviewing the form, dimension, color, and text.

![Figure 1. Research Locations](image)

(Source: Google Earth, 2018)

2.4. Data Collections
The collected data were accessibility measurement data through field observations to observe the environmental condition in TSKBA based on the previous research. The case studied related to the existing design to the availability and fulfillment of standardization according to the principle facility and accessibility. Surveys conducted with direct observation and measurement. Documentation is needed to determine the physical condition of the environment and fell the environment situation. Official data from government agencies in the case of Banda Aceh City Planning Agency and Plantation are also required.

2.5. Data Analysis
The stages of analysis performed are:
- a) Study and analyze the results from the previous research by focusing on the old designs on TSKBA public space;
- b) Planning for design recommendations on the old design by technical guidelines of facilities and disabilities considered in the public space.

3. Results and Discussion

3.1. The existing condition of TSKBA
The existing condition in figure 2 is illustrating the facilities and accessibilities in the research object.

3.2. Identify the availability access
The identification of the facilities was based on the survey results shown in Figure 2. That identification refers to Technical guidelines of facilities accessible to the building and environment [4]. The accessibility based on the technical guideline on TSKBA case studies is described in Table 1.
Figure 2. The existing condition of Taman Sari Kota Banda Aceh
Table 1. The Availability Access [1]

| No. | Technical guidelines | Access availability |
|-----|----------------------|---------------------|
| 1   | Public toilet        | Available           |
| 2   | Space basic size     | Available           |
| 3   | Pedestrian path      | Available           |
| 4   | Guide path           | Available           |
| 5   | Parking area         | Available           |
| 6   | Ramp                 | Available           |
| 7   | Rambu dan Marka      | Available           |

Table 1 shown that in Taman Sari there are available the technical guidelines for facilities and accessibility.

3.3. Evaluation of the availability access

Table 2 shows the evaluation of the available access which is containing technical guidelines and accessibility compliance.

Table 2. Accessibility compliance with technical guidelines [1]

| No  | Technical guidelines                              | Accessibility compliance |
|-----|---------------------------------------------------|--------------------------|
| 1   | Public toilet                                     |                          |
|     | a. Embossed design                                | NS                       |
| 2   | Basic size                                        |                          |
|     | a. Math to the function                           | NS                       |
|     | b. According to the needs                         | NS                       |
| 3   | Pedestrian path                                   |                          |
|     | a. Stable, strong, weatherproof                   | NS                       |
|     | b. Mound <1.25 cm                                 | NS                       |
|     | c. Max slope 2°                                   | S                        |
|     | d. Seat                                           | S                        |
|     | e. Lighting                                       | S                        |
|     | f. Drainage far away from the pedestrian edge     | S                        |
|     | g. One way lane 120 cm, two-way lane 160 cm       | S                        |
|     | h. The safety edge is 10 cm high and 15 cm wide   | NS                       |
|     | Guiding line                                      |                          |
| 4   | a. Directional block                              | S                        |
|     | b. Warning is                                     | S                        |
| 5   | Parking area                                      |                          |
|     | a. access point                                   | S                        |
|     | b. Ramp                                           | NS                       |
| 6   | Ramp                                              |                          |
|     | a. Max slope 6°                                   | NS                       |
|     | b. Horizontal length < 900 cm                     | S                        |
| 7   | Sign dan Marka                                     | S                        |

Note: S: Suitable, NS: Not Suitable
The accessibility recommendation design for TSKBA as follows:

a) Public toilets (Figure 3 and 4)

![Figure 3. Existing Condition](Source: Analysis, 2018)

![Figure 4. Design Recommendation](

The planned design recommendations follow conformity with technical guidelines.

b) Basic Size
   The basic size in the design that recommended adjusted with the Technical guidelines of facility accessibility.

c) Pedestrian path and Guiding line (Figure 5 and 6)

![Figure 5. Existing condition](Source: Analysis, 2018)

![Figure 6. Design Recommendation](


d) Parking Area (Figure 7 and 8)

![Figure 7. Existing Condition](image)
Source: Analysis, 2018

![Figure 8. Design Recommendation](image)

e) Ramp (Figure 9 and 10)

![Figure 9. Existing Condition](image)
Source: Analysis, 2018

![Figure 10. Design Recommendation](image)

f) Sign and Marka
This sign and marka to the evaluation of the available access in the TSKBA are suitable.
3.4. Evaluation of Access Convenience

Design recommendations arranged based on four factors that can interfere with comfort or satisfaction, namely form, dimensions, color and texture [4]. These factors are reviewed based on the availability of access reviews. The result of the design recommendation of TSKBA was planned able to give comfort to building users in particular for People with Disability (PwDs).

Tabel 3. Comfort Access [1]

| No | Comfort Measurement | Comfort Access |
|----|---------------------|----------------|
| 1  | Public toilet       |                |
| a. Form                          | UC             |
| b. Dimension                     |                |
| c. Color                          | UC             |
| d. Texture                        | UC             |
| Basic Size                        |                |
| a. Form                          | UC             |
| 2  | Basic Size          |                |
| b. Dimension                     | UC             |
| c. Color                          | UC             |
| d. Texture                        | UC             |
| Pedestrian Path                   |                |
| a. Form                          | UC             |
| 3  | Pedestrian Path     |                |
| b. Dimension                     | C              |
| c. Color                          | C              |
| d. Texture                        | UC             |
| Guiding Path                      |                |
| a. Form                          | C              |
| 4  | Guiding Path        |                |
| b. Dimension                     | C              |
| c. Color                          | C              |
| d. Texture                        | C              |
| Parking area                      |                |
| a. Form                          | UC             |
| 5  | Parking area        |                |
| b. Dimension                     | C              |
| c. Color                          | UC             |
| d. Texture                        | C              |
| Ramp                             |                |
| a. Form                          | C              |
| 6  | Ramp                |                |
| b. Dimension                     | UC             |
| c. Color                          | UC             |
| d. Texture                        | C              |
| Sign and Marka                    |                |
| a. Form                          | C              |
| 7  | Sign and Marka      |                |
| b. Dimension                     | C              |
| c. Color                          | C              |
| d. Texture                        | UC             |

Note: C: Comfort, UC: Uncomfort

4. Conclusion

Design recommendations are planned following the Facility Technical Guidelines standards and Accessibility in Building Buildings and the Environment. The concepts based on availability, conformity with standardization and comfort. Fulfillment of accessibility for persons with disabilities in TSKBA, which is a public space that is friendly to persons with disabilities.


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