



Problem Analysis and Policy Model Design to Improve Ecotourism Accessibility for People with Disabilities in Ternate City, North Maluku, Indonesia

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abstrak

Background: Accessibility of ecotourism for people with disabilities in Ternate City still faces various challenges. Inadequate facilities, difficult to reach distances, and lack of socialization are some of the main obstacles. **This study** aims to analyze the problem of accessibility of ecotourism for people with disabilities and design an effective intervention policy model in Ternate City. **Methods:** This study involved 14 informants from various groups, including people with disabilities, IKDM, Ternate City Tourism Office, cleaners, retribution collectors, and community members from several sub-districts in Ternate. Data were collected through in-depth interviews and accessibility observation assessments involving 11 participants, including lecturers, civil servants, private employees, teachers, and entrepreneurs in several main tourist locations such as Sulamadaha Beach, Batu Angus Geotourism, and Tolire Besar Lake. **Results:** The results of the interviews revealed several main problems of accessibility for people with disabilities, such as unsafe and uncomfortable facilities, lack of wheelchair accessibility, and lack of special facilities for people with disabilities. Observational assessments show that ecotourism accessibility in the three tourist locations is still at a moderate to low level, with aspects of transportation, physical access, information and navigation, and supporting facilities that need to be improved. **Conclusion:** Comprehensive and collaborative policy interventions are needed to improve ecotourism accessibility for people with disabilities in Ternate City. The main keys are the provision of safe facilities, community education, and collaboration between the government and related organizations. Implementation of regulations, training of tourism officers, and increasing inclusive information through the media are also very important to create a better tourism experience for people with disabilities.

Keywords: Accessibility, Ecotourism, Disability, Policy

Introduction

At the end of 2019, the world was shocked by a case of pneumonia suspected to have originated from Wuhan City, China, which was later known as the Covid-19 pandemic. This pandemic had a significant impact on various sectors, including tourism. According to a report by the World Tourism Organization (UNWTO, 2020), there was a 22% decline in tourist arrivals in the period January-March 2020, causing a loss of around 67 million international visits and around US\$80 billion in tourism export revenues [1]. In 2020, the global tourism sector experienced a drastic decline, with international visits dropping by 74% and an estimated loss of export revenue reaching \$1.3 trillion [2]. The pandemic also resulted in the loss of around 120 million jobs [3], and an economic contraction in Moldova of 14% in the second quarter of that year [2].

The Covid-19 pandemic has caused suffering, job losses, and deaths, and pushed many countries into recession. Governments around the world have implemented various restrictions such as travel restrictions, public gatherings, lockdowns, and quarantines, affecting more than 90% of the global population. Responses to these impacts have included fiscal, monetary, and financial policy measures and global economic stimulus packages, which have had a positive impact on the tourism sector [4]. In Indonesia, the pandemic caused a drastic decline in tourist arrivals, with a decline of up to 86.9% in April 2020 [5], and a total decline of 75.03% compared to the previous year [6]. However, in January 2022, there was an increase in visits of 13.62% compared to January 2021 [7].

In this context, accessibility of ecotourism for people with disabilities becomes an important focus in sustainable tourism development. Ensuring equal access to ecotourism destinations and activities is not only about social justice, but also an important strategy for creating inclusive tourism experiences [8]. Accessibility efforts in ecotourism infrastructure, services, and information are key to enabling the full participation of people with disabilities [9]. Commitment to accessibility reflects social

responsibility and equitable opportunities in the tourism sector [10], making it a foundation for sustainable tourism development [11]. Integrating accessibility considerations into ecotourism planning is essential for the long-term sustainability of tourism destinations. Destinations that prioritize accessibility not only broaden their appeal but also increase their competitiveness in the global tourism arena [12]. An inclusive tourism environment drives positive economic and social outcomes for local communities [13], such as increased income, job creation, and community empowerment [14]. By incorporating accessibility into tourism policies and practices, destinations can create more inclusive and sustainable tourism landscapes, with benefits that go beyond economic gains [15], and include social justice, environmental stewardship, and cultural preservation [16].

However, efforts to improve accessibility for tourists with disabilities face various challenges, including limited access to tourist destinations, accommodation, and public facilities [17]. Awareness of their needs is still low, and government commitment and adequate regulations are often insufficient [18]. Lack of cooperation across stakeholders, including government, private sector, and non-governmental organizations, is also an important factor [19]. In addition, tourism for people with disabilities is still hampered by the lack of protective regulations and accessibility of facilities, which require more attention to improve their inclusion through infrastructure that supports accessibility [20].

Considering the needs of people with disabilities in tourism product development, and considering that the population with disabilities is estimated to be between 10% and 15% of the global population [21], it is important to develop policies that support accessibility. In Indonesia, Law No. 10 of 2009 guarantees the rights of people with disabilities in tourism activities, but the implementation of the concept of Disability-Friendly Tourism is still limited [22]. Data shows that the number of people with disabilities in Indonesia varies, with an estimate of around 22.5 million people in 2020 [23]. In North Maluku Province, the Social Service recorded 7,162 people with disabilities in 2020, and in Ternate City there were 1,450 people in 2021 [24], indicating their significant potential in the tourism market.

Ternate City, with its unique natural charm, requires serious management and effective marketing strategies to develop tourism. Although there have been efforts to improve, such as the Baronda Jeep celebration in February 2022 involving people with disabilities, there are still many public spaces that are not disability-friendly [25]. The Ternate City Government is committed to improving accessibility through policies and fund allocations, but there are still challenges that must be overcome in developing the tourism sector. This study aims to analyze the problems and design a policy model to improve the accessibility of ecotourism for people with disabilities in Ternate City. By understanding the challenges and potentials, it is hoped that a more inclusive and sustainable ecotourism sector can be created, meeting the needs of people with disabilities and supporting local economic growth and tourism sustainability in Ternate City.

Method

Methods: This study involved 14 informants from various groups, including people with disabilities, IKDM, Ternate City Tourism Office, cleaners, tax collectors, and community members from several sub-districts in Ternate. Data were collected through in-depth interviews and accessibility observations involving 11 participants, including lecturers, civil servants, private employees, teachers, and entrepreneurs at Sulamadaha Beach, Batu Angus Geotourism, and Tolire Besar Lake. This study used the 2003 ADO-ODTWA Guidelines (Department of Forestry, 2003) to assess ecotourism accessibility based on predetermined criteria. The assessment was carried out by calculating the results from respondents using tabulation, following the ADO-ODTWA guideline value weighting. The main focus is accessibility with a weighting of 5 (Ratna & Ken, 2020), and the assessment categories include Low (105-303), Medium (304-502), and High (503-700) [26]. According to Soekmadi & Kartodihardjo (2010), the feasibility index is divided into three: feasible to develop (>66.6%), not yet feasible to develop (33.3%-66.66%), and not feasible to develop (<33.3%) [27]

Results and Discussion

1. Ecotourism Accessibility Problems

In this study, 14 people were involved as informants covering various groups such as the disabled, IKDM, Ternate City Tourism Office, Cleanliness Task Force, field officers, freelance officers (levy collectors), and community members from Sulamadaha Village, Takome Village, and Kulaba Village. The results of interviews with informants revealed the problem of ecotourism accessibility for people with disabilities. Obstacles in ecotourism accessibility for people with disabilities have been identified through interactions with informants. The following are excerpts from the informants' answers:

- a. Facilities are not safe and comfortable for people with disabilities (especially wheelchair users)
- b. Lack of accessibility for wheelchairs
- c. Distance of tourist locations that are far and difficult to reach
- d. Lack of special facilities for people with disabilities (toilets, parking, wheelchairs, sidewalks, ramps)
- e. Lack of socialization about accessibility that is already available
- f. Social stigma against people with disabilities who visit tourist attractions
- g. Obstacles in infrastructure and tourism programs

Based on the informant's answer quote above, the accessibility problems faced by people with disabilities when visiting tourist destinations include several aspects. First, many tourist destinations do not yet provide safe and appropriate facilities for people with disabilities, such as uneven roads or stairs that are difficult for wheelchair users to access. This lack of physical accessibility can increase the risk of accidents and make people with disabilities feel uncomfortable. In addition, the long distance to the tourist location is often an obstacle for people with disabilities with limited mobility due to the difficulty of accessing public transportation or suitable accommodation. The lack of socialization about diversity and the needs of people with disabilities is also an important problem. Lack of understanding and public awareness of the needs of people with disabilities can result in inadequate support and services at tourist destinations. People with disabilities' fear of safety and feelings of discomfort due to facilities that are not friendly to them can also be major obstacles that prevent them from visiting tourist attractions. To overcome these challenges, cooperation between government agencies, community organizations, and tourism officers is needed. Concrete actions, such as improving physical facilities, increasing access to transportation and increasing public awareness of the needs of people with disabilities, are key to creating a more inclusive and friendly tourism environment for everyone.

The problem of accessibility of ecotourism for people with disabilities covers several crucial aspects. Based on the quotes from informants, many tourism destinations have not provided adequate facilities for people with disabilities, such as uneven roads and stairs that are difficult for wheelchair users to access. This lack of physical accessibility increases the risk of accidents and reduces comfort for people with disabilities [28]. The theory of universal design, as outlined by Mace (1985), emphasizes the importance of designing infrastructure that is accessible to everyone, including people with disabilities, to prevent accidents and increase comfort [29]. The long distance to the tourist location is also a major obstacle, especially due to limited access to public transportation and accommodation [30]. Research by Yusuf Karkarna Mustapha (2024) shows that inadequate transportation and accommodation that is not disability-friendly can limit the participation of people with disabilities in tourism activities [31]. The lack of socialization regarding the needs of people with disabilities adds to the problem, because the lack of public understanding often results in inadequate support and services [32]. Research by Darcy and Dickson (2009) emphasizes the importance of education and training to increase public awareness of the needs of people with disabilities and ensure better services [33]. Disabled people's fear of safety and discomfort due to unfriendly facilities also hinder their visits to tourist destinations [34]. The theory of universal accessibility emphasizes that creating a safe and comfortable environment is essential to encourage full participation of all visitors [35]. Addressing this

challenge requires collaboration between government agencies, community organizations, and tourism officials to improve physical facilities, increase transportation access, and raise public awareness of the needs of people with disabilities [17]. Concrete efforts in creating an inclusive tourism environment are essential to ensure accessibility for all visitors and increase tourism participation and satisfaction.

2 Characteristics of Intervention Models

Participants in this study involved various parties such as people with disabilities, IKDM, Ternate City Tourism Office, Cleaning Task Force, Field Officers, Freelance Officers (Retribution Collectors), and community members from Sulamadaha Village, Takome Village and Kulaba Village. A total of 14 people were involved as informants in this study. Based on the results of the interviews, information was obtained regarding the characteristics or details of the proposed intervention policy model. The following is a summary of the answers given by the informants:

- a. Provision of safe and comfortable facilities and infrastructure for people with disabilities
- b. Public education about the diversity and needs of people with disabilities
- c. Collaboration between the government and related organizations (IKDM)
- d. Modification of public facilities to be friendly to people with disabilities (toilets, access roads, special toilets)
- e. Development of transportation that is friendly to people with disabilities
- f. Involvement of people with disabilities in festivals and tourism activities
- g. Formation of tourism awareness groups
- h. Special training for tourism officers on services for people with disabilities
- i. Socialization and coaching on disabled hospitality
- j. Increasing inclusive information through media
- k. Provision of transportation such as disabled-friendly buses
- l. Accompanying guides who understand the needs of disabled people during the trip
- m. Development of disabled-friendly tourism infrastructure
- n. Promotion efforts and increasing visitor interest
- o. Improving accessibility at tourist locations (sidewalks, entrances, special toilets)

Based on the interview results with informants related to the characteristics of the intervention policy model, it is explained that the need for policy intervention is very important to improve the accessibility of ecotourism for people with disabilities is very important considering the many challenges faced by people with disabilities in accessing tourism destinations. Collaboration between government agencies such as the tourism office, PUPR and social services is the key to providing comfortable facilities for people with disabilities and managing disability data properly. Collaboration between agencies allows for the optimization of resources and the development of more holistic programs in improving infrastructure and services for people with disabilities. Public education about the diversity of people with disabilities is also a major focus. This is important to change perceptions and improve public understanding of the needs and rights of people with disabilities. By increasing awareness of the diversity of people with disabilities, it is hoped that a more inclusive and friendly environment will be created for them in tourist attractions. The implementation of regulations such as disability regulations and mayoral regulations is also an important part of policy intervention. These regulations aim to provide legal protection and ensure that the rights of people with disabilities are formally recognized and respected. Collaboration between related agencies, such as health, employment, MSMEs and cooperatives are also considered important in supporting infrastructure and the creative economy for people with disabilities. By involving these various sectors, it is hoped that a more inclusive and sustainable environment can be created for people with disabilities in various aspects of life, including in tourism activities. Overall, policy interventions must cover various aspects, from physical improvements to infrastructure to increasing public awareness and providing adequate services for people with disabilities in tourist attractions. Only with a comprehensive and collaborative approach

like this can ecotourism accessibility be realized that is more inclusive and friendly to everyone, including people with disabilities.

Based on the results of interviews with informants, the characteristics of the intervention policy model to improve ecotourism accessibility for people with disabilities show the importance of an integrated and collaborative approach. Policy interventions are needed to address the various challenges faced by people with disabilities in accessing tourism destinations. The theory of universal accessibility supports this view by emphasizing that collective efforts from various parties are needed to create a fully inclusive environment [36]. Collaboration between government agencies, such as the tourism office, PUPR, and social services, is key to providing appropriate facilities and managing disability data effectively. This collaboration allows for the optimization of resources and the development of more comprehensive programs for improving infrastructure and services [37]. Research by Cameron Allen, et, al, (2023) underlines the importance of multi-sector collaboration to develop and implement effective and sustainable accessibility standards [38]. In addition, public education about the diversity of people with disabilities is important to change perceptions and increase understanding of the needs and rights of people with disabilities, thereby creating a more inclusive environment [39]. Social change theory, as explained by Rogers (2003), suggests that changes in public attitudes often require education and awareness campaigns to address stereotypes and increase understanding [40]. The implementation of regulations, such as disability bylaws and mayoral regulations, is also crucial to provide legal protection and ensure that the rights of people with disabilities are formally recognized [41]. Research by Poria et al., (2010) shows that effective regulations can provide a strong legal basis for the protection of the rights of people with disabilities and encourage the implementation of accessibility policies [42]. Collaboration with other sectors, such as health, employment, MSMEs, and cooperatives, supports the creation of a sustainable environment for people with disabilities in various aspects, including tourism [43]. A holistic approach involving various sectors ensures that the needs of people with disabilities are met in a comprehensive and integrative manner. With this comprehensive and collaborative.

3. Ecotourism Accessibility Assessment

Participants in this study consisted of community members who assessed ecotourism accessibility. A total of 11 people participated, including Lecturers, Civil Servants, Private Employees, Teachers and Entrepreneurs. Based on the results of the accessibility assessment of Sulamadaha Beach ecotourism, Tolire Besar Lake and Batu Angus Geotourism can be evaluated according to the three levels of feasibility:

Table 1.1
Ecotourism Accessibility Assessment Results at Sulamada Beach

Number	Element	Weight	Mark	Total Score	Index (%)	Eligibility Level
1	Transportation Access:					
a.	Disabled parking: Availability and sustainability of parking spaces specifically for the disabled.	5	67	335	47,85	Currently
b.	Public Transport: Availability and accessibility of public transport for the disabled	5	50	250	35,71	Currently
2	Physical Access :					
a.	Ramps and Sidewalks: Availability and quality of ramps and sidewalks for wheelchair access and for	5	43	215	30,71	Low

	individuals with limited mobility.					
b.	Disabled Toilets: Availability and cleanliness of disabled toilets, including supporting facilities such as handrails.	5	48	240	34,28	Currently
3	Information and Navigation :					
	Information Boards: Availability of information in braille or tactile format, and the clarity and accuracy of the information provided.	5	43	215	30,71	Low
	Navigation Signals: Availability of signals or special navigation tools to help people with disabilities determine direction or location around ecotourism.	5	48	240	34,28	Currently
4	Supporting facilities :					
	Rest Areas and Assistance Services:					
a	Availability of special rest areas for the disabled and assistance services by trained staff.	5	53	265	37,85	Currently
b	Stalls or Shops: Availability of stalls or shops that are friendly to the disabled.	5	60	300	42,85	Currently

Primary Data Source,2024

Based on the results of the ecotourism accessibility assessment at Sulamada Beach, it can be seen that several aspects received different assessments. First, transportation access, especially in terms of disabled parking, was assessed as moderate with a feasibility index of 47.85% indicating that special parking spaces for the disabled are well available, but there is still room for improvement. Meanwhile, public transportation access was also assessed as moderate with a feasibility index of 35.71% indicating that there is quite good accessibility for the disabled, but still needs further attention. Furthermore, in terms of physical access, such as ramps and sidewalks, it was assessed as low with a feasibility index of 30.71% indicating that the availability and quality of ramps and sidewalks need to be significantly improved to meet the needs of the disabled. Disabled toilets were assessed as moderate with a feasibility index of 34.28%, indicating that although they are available, there is still room for improvement in cleanliness and supporting facilities. In terms of information and navigation, both information boards and navigation signals were assessed as moderate with feasibility indexes of 30.71% and 34.28% respectively, indicating that there is still a lack of adequate information and navigation tools for the disabled. Finally, supporting facilities such as rest areas and assistance services are considered moderate with a feasibility index of 37.85%, while stalls or shops are considered moderate with a feasibility index of 42.85% indicating that there are quite good facilities but there is still room for improvement. From these results, it can be concluded that the accessibility of ecotourism in Sulamada Beach as a whole is still at a moderate level, indicating that the area is not yet fully feasible to be developed optimally.

The assessment of ecotourism accessibility at Sulamada Beach shows variations in the quality of accessibility available, with some aspects requiring more attention. Based on the research conducted, the feasibility index of special parking facilities for people with disabilities showed a figure of 47.85%. This figure reflects that although special parking facilities for people with disabilities are available,

there is still significant room for improvement. The results of this study are in line with the accessibility theory which states that disability-friendly infrastructure must not only be available but also easy to use and access by people with disabilities [44]. In addition, the assessment of public transportation access showed a feasibility index of 35.71%, which although reflects adequate access, still requires further improvement to achieve the universal accessibility standards recommended by the World Health Organization [45]. Previous research by Sylwia and Zuzanna (2021) also emphasized that inclusive public transportation access is a key factor in increasing the social and economic participation of people with disabilities [46]. Thus, the results of this study emphasize the importance of ongoing efforts to improve and standardize transportation facilities to be more inclusive and disability-friendly.

Furthermore, in terms of physical access such as ramps and sidewalks, the assessment results showed a feasibility index of 30.71%, indicating that the quality and availability of ramps and sidewalks are inadequate to meet the needs of people with disabilities. Research by Yochai et al. (2022) underlines the importance of providing appropriate physical infrastructure to support the mobility of people with disabilities [47]. According to the Universal Design theory, infrastructure should be designed for use by everyone, including those with physical disabilities, without requiring special adaptations or designs [29]. Previous research by Jinuk Hwang (2020) also showed that inadequate sidewalks and ramps can hinder the mobility of people with disabilities, reduce their quality of life, and limit their participation in social and economic activities [48]. In addition, disabled toilets were rated moderate with a feasibility index of 34.28%, indicating that although these facilities already exist, there is a need for improvement in terms of cleanliness and other supporting facilities. Syaodih and Aprilesti (2024) emphasized that the availability and quality of disability-friendly toilets are essential to maintaining the dignity and personal hygiene of people with disabilities [49]. The results of this study are in line with the findings of Lisa et al, (2024) that inclusive infrastructure is key to broader social participation and equality for people with disabilities [50]. Therefore, the results of this assessment emphasize the urgent need for improvement and enhancement of physical infrastructure to be more inclusive and in accordance with universal accessibility standards.

In terms of information and navigation, both information boards and navigation signals were rated with an appropriateness index of 30.71% and 34.28% respectively. These results indicate a lack of adequate information and navigation tools for people with disabilities. The theory of universal accessibility emphasizes the importance of providing easily accessible information for all visitors, including those with various types of disabilities [51]. Previous research by Golledge (1999) showed that effective navigation and clear information boards are essential to help people with disabilities move safely and independently in complex environments [52]. In addition, a study by Imrie & Hall, (2001) confirmed that the lack of disability-friendly information and navigation tools can limit the accessibility and participation of people with disabilities in various activities [53]. Therefore, the results of this assessment underline the importance of improving the provision of information boards and navigation signals designed with universal design principles, which aim to meet the needs of all users, including those with visual, hearing, or mobility impairments. Thus, improving the availability and quality of information and navigation tools is a critical step in creating an inclusive and accessible environment for all.

For supporting facilities such as rest areas and assistance services, they were assessed with a suitability index of 37.85%, while stalls or shops received a suitability index of 42.85%. This shows that although there are quite good facilities, there is still a need for improvement in several aspects. Previous research by Marjan Kamyabi and Habib Alipour (2022) emphasized that adequate supporting facilities are very important to improve the tourism experience of people with disabilities, because they often need comfortable rest areas and easy access to assistance services [54]. Ecotourism accessibility at Sulamada Beach is at a moderate level, which indicates that the area is not yet fully ready to be developed optimally for all visitors, especially those with disabilities. According to Claire Henderson-

Wilson et, al (2022), to achieve universal accessibility, comprehensive improvements are needed in various aspects of tourism facilities, including rest areas, assistance services, and stalls or shops, to be more inclusive and disability-friendly [55]. The theory of universal accessibility emphasizes that every element of the tourism environment must be designed to meet the needs of all visitors, including those with physical disabilities [56]. In addition, research by Rubio-Escuderos et,al, (2021) shows that good accessibility not only increases the satisfaction of disabled visitors but can also expand the overall tourism market by attracting more visitors [57]. Therefore, efforts to improve and enhance various aspects of accessibility at Sulamada Beach are essential to better meet universal accessibility standards and ensure that all visitors can enjoy an inclusive and satisfying ecotourism experience.

Table 1.2
Ecotourism Accessibility Assessment Results at Lake Tolire Besar

Number	Element	Weight	Mark	Total Score	Index (%)	Eligibility Level
1	Transportation Access:					
	Disabled parking :					
a	Availability and sustainability of parking spaces specifically for the disabled.	5	57	285	40,71	Currently
b	Public Transport: Availability and accessibility of public transport for the disabled	5	56	280	40	Currently
2	Physical Access :					
	Ramps and Sidewalks:					
a	Availability and quality of ramps and sidewalks for wheelchair access and for individuals with limited mobility.	5	47	235	33,57	Currently
b.	Disabled Toilets: Availability and cleanliness of disabled toilets, including supporting facilities such as handrails.	5	51	255	36,42	Currently
3	Information and Navigation :					
	Information Boards:					
a	Availability of information in braille or tactile format, and the clarity and accuracy of the information provided.	5	48	240	34,28	Low
	Navigation Signals:					
b.	Availability of signals or special navigation tools to help people with disabilities determine direction or location around ecotourism.	5	52	260	37,14	Currently
4	Supporting facilities :					
	Rest Areas and Assistance Services:					
a	Availability of special rest areas for the disabled and assistance services by trained staff.	5	48	240	34,28	Currently

b	Stalls or Shops: Availability of stalls or shops that are friendly to the disabled.	5	51	255	36,42	Currently
	Primary Data Source, 2024					

Based on the results of the ecotourism accessibility assessment at Lake Tolire Besar, it can be concluded that the area is at a moderate level of feasibility. Transportation access, both in terms of disabled parking and public transportation, is considered moderate with a feasibility index of 40.71% and 40% respectively, indicating fairly good availability but still needs improvement. Physical access such as ramps and sidewalks is considered moderate with a feasibility index of 33.57% as well as disabled toilets which are considered moderate with a feasibility index of 36.42%, indicating that although they are available, there is still room for improvement. However, in terms of information and navigation, there are significant deficiencies, especially on information boards which are considered low with a feasibility index of 34.28%. Meanwhile, navigation signals are considered moderate with a feasibility index of 37.14% indicating that improvement efforts have been made but there is still room for improvement. Supporting facilities such as rest areas and assistance services, as well as stalls or shops are considered moderate with a feasibility index of 34.28% and 36.42% respectively. Although generally considered moderate, this area is not yet fully suitable for maximum development because there are still several aspects that need to be improved to increase accessibility for the disabled.

The ecotourism accessibility assessment at Lake Tolire Besar shows that the area is at a moderate level of feasibility. Transportation access in this area, including disabled parking and public transportation, has a feasibility index of 40.71% and 40%, respectively. This shows that although there are quite good facilities, improvements are still needed to achieve higher accessibility standards. The theory of universal accessibility emphasizes the importance of providing inclusive and adequate transportation facilities to support the mobility of all visitors, including people with disabilities [58]. Previous research by Sahed Hossen Sajib (2022) emphasized that inadequate transportation can be a significant barrier for people with disabilities, limiting their access to social and economic opportunities and reducing their quality of life [59]. A study by Philip et.al, (2024) also emphasized that disability-friendly transportation facilities should include special parking areas that are easily accessible, public transportation equipped with appropriate facilities, and routes designed to facilitate mobility [60]. Thus, although Lake Tolire Besar has provided several facilities, improvements are still needed to achieve universal accessibility standards that ensure that all visitors, without exception, can enjoy ecotourism comfortably and safely. These efforts will not only improve the experience of visitors with disabilities but will also broaden the overall appeal of the destination.

In terms of physical access, such as ramps and sidewalks, this area was rated with a suitability index of 33.57%. This index indicates that the quality and availability of ramps and sidewalks are still less than optimal, and significant improvements are needed to effectively meet the needs of people with disabilities. The theory of universal design, as proposed by Mace (1985), suggests that ramps and sidewalks should be designed to ensure smooth accessibility for all users, including those with mobility limitations [61]. Research by Imrie & Hall (2001) supports this theory by emphasizing the importance of inclusive infrastructure design, which can reduce physical barriers and facilitate freer movement for people with disabilities [62]. On the other hand, disabled toilets were rated with a suitability index of 36.42%, indicating a need for improvement in cleanliness and additional facilities [63]. Research by Shi et al., (2012) underlined that the quality of facilities such as disabled toilets is crucial to ensure user comfort and independence, and lack of attention to cleanliness and additional facilities can limit access and the quality of user experience [57]. The theory of universal accessibility, emphasizes that facilities should be designed to meet the needs of all visitors in a practical and clean manner, avoiding discrimination and ensuring equality in accessibility [64]. Therefore, improving the quality of ramps,

walkways and disabled toilets in these areas is essential to achieving higher accessibility standards and ensuring that all visitors can use the facilities comfortably and without barriers.

Significant deficiencies were identified in terms of information and navigation. Information boards were rated low with a suitability index of 34.28%, indicating that the availability of adequate information for people with disabilities is still limited. This is in line with the findings of research by Setiawan et al. (2021) which emphasizes the importance of providing easily accessible information for all visitors, especially those with special needs [65]. According to the theory of universal accessibility, as proposed by Paul Watts et.al, (2023), providing inclusive information is key to ensuring that all individuals, including people with disabilities, can navigate the environment easily and obtain the information they need without difficulty Navigation signals, with a suitability index of 37.14%, indicate an attempt to improve, but there is still room for improvement. Research by Golledge (1999) supports the importance of an effective navigation system, emphasizing that clear signals and directions are vital to helping people with disabilities navigate public spaces independently and safely [52]. Universal design theory also emphasizes that information and navigation systems should be designed to meet the various needs of users, including those with visual or mobility impairments, in order to easily access and understand information [67]. Therefore, efforts to improve the provision of more inclusive and effective information boards and navigation signals are essential to increase accessibility and ensure that all visitors, including people with disabilities, can enjoy a better and more seamless experience.

Supporting facilities such as rest areas and assistance services, as well as stalls or shops were assessed with a suitability index of 34.28% and 36.42% respectively. Although these facilities are already available, the assessment shows that there is room for improvement to improve comfort and accessibility for people with disabilities. The theory of universal accessibility emphasizes that supporting facilities should be designed to meet the various needs of all visitors, including those with physical disabilities, to ensure an inclusive and comfortable experience [68]. Research by Darcy and Buhalis (2019) also emphasized the importance of supporting facilities in improving the tourism experience, considering that rest areas and assistance services can help people with disabilities overcome the challenges they face when visiting tourist destinations [69]. Although Lake Tolire Besar showed a moderate level of suitability, there are still several aspects that need to be improved to achieve better accessibility standards. These include improvements to physical access, information facilities, and supporting facilities to improve the ecotourism experience for all visitors, especially people with disabilities. Research by Imrie and Hall (2001) supports this view by emphasizing that achieving universal accessibility requires continuous evaluation and improvement of various aspects of facilities, including physical and supporting access, to make them more inclusive and accessible to all visitors [70]. Therefore, improvements to supporting facilities at Lake Tolire Besar are essential to create a more disability-friendly environment and to improve the overall quality of the ecotourism experience.

Table 1.3
Ecotourism Accessibility Assessment Results in Batu Angus Geotourism

Number	Element	Weight	Mark	Total Score	Index (%)	Eligibility Level
1	Transportation Access :					
A	Disabled Parking : Availability and sustainability of parking spaces specifically for the disabled.	5	49	245	35	Currently
B	Public Transportation : Availability and accessibility	5	44	220	31,42	Low

		of public transportation for the disabled				
2	Physical Access :					
	Ramps and Sidewalks:					
A	Availability and quality of ramps and sidewalks for wheelchair access and for individuals with limited mobility.	5	70	350	50	Currently
	Disabled Toilets:					
b.	Availability and cleanliness of disabled toilets, including supporting facilities such as handrails.	5	47	235	33,57	Currently
3	Information and Navigation					
	Information Boards:					
a	Availability of information in braille or tactile format, and the clarity and accuracy of the information provided.	5	48	240	34,28	Currently
	Navigation Signals:					
b.	Availability of signals or special navigation tools to help people with disabilities determine direction or location around ecotourism.	5	52	260	37,14	Currently
4	Supporting facilities :					
	Rest Areas and Assistance Services:					
a	Availability of special rest areas for the disabled and assistance services by trained staff.	5	43	215	30,71	Low
	Stalls or Shops: Availability					
b	of stalls or shops that are friendly to the disabled.	5	41	205	29,28	Low

Primary Data Source, 2024

Based on the results of the ecotourism accessibility assessment in Batu Angus Geotourism, it can be concluded that the area has varying levels of feasibility. In terms of transportation access, the availability of disabled parking is considered moderate with a feasibility index of 35%, while public transportation accessibility is considered low with a feasibility index of 31.42%. This shows that although special parking spaces for the disabled are available, public transportation accessibility still needs to be improved. In terms of physical aspects, the availability and quality of ramps and sidewalks are considered moderate with a feasibility index of 50%, while disabled toilets are considered moderate with a feasibility index of 33.57%. However, in terms of information and navigation, information boards and navigation signals are considered moderate with feasibility indices of 34.28% and 37.14%, respectively. This shows that the availability of information and navigation still needs to be improved. Finally, in terms of supporting facilities, both rest areas and assistance services as well as stalls or shops are considered low with feasibility indices of 30.71% and 29.28%, respectively. Although some aspects are considered quite good, this area is not yet fully worthy of being developed to its full potential

because there are still several aspects that need to be improved, especially in terms of access to public transportation, information and navigation, and supporting facilities.

The accessibility assessment of ecotourism in Batu Angus Geotourism shows that this area has varying levels of feasibility in various aspects. In terms of transportation access, the availability of disabled parking spaces is assessed with a feasibility index of 35%. Although special parking spaces for the disabled are available, improvements are needed to improve the quality of these facilities to better meet user needs. Universal design theory emphasizes that facilities such as disabled parking spaces should be designed to ensure optimal and safe accessibility for all users, including people with disabilities [71]. Research by Çilen Erçin and İbtilal Al Hindwan (2023) shows that the availability and quality of special parking spaces are important components in creating an inclusive environment, because inadequate parking spaces can hinder the mobility of people with disabilities [72]. Public transportation accessibility, with a feasibility index of 31.42%, shows that public transportation facilities in this area are still inadequate and need significant improvements to ensure accessibility for people with disabilities. According to universal accessibility theory, public transportation systems should be designed to meet the various needs of users, including people with disabilities, by providing disability-friendly facilities such as wheelchair-accessible buses, navigation aids, and easily accessible information systems [73]. Previous research by Poria et al., (2010), also emphasized that inclusive public transportation is key to ensuring that people with disabilities can fully participate in social and economic activities [74]. Therefore, improvements in disabled parking facilities and public transportation facilities in Batu Angus Geotourism are very important to achieve higher accessibility standards and to provide a better experience for all visitors, including those with special needs.

Physical aspects, including ramps and sidewalks, were rated moderate with a feasibility index of 50%. This indicates that the availability and quality of ramps and sidewalks at Batu Angus Geotourism are quite good, but there is still room for improvement to better meet accessibility standards. Universal design theory, as explained by Mace (1985), emphasizes that ramps and sidewalks should be designed to meet high accessibility standards to ensure safe and easy mobility for all visitors, including people with disabilities [75]. Research by Imrie & Hall (2001) also highlighted the importance of designing inclusive infrastructure to reduce physical barriers and improve overall accessibility [70]. Although Batu Angus Geotourism has provided ramps and sidewalks, further improvements are needed to achieve the ideal level of accessibility. On the other hand, disabled toilets, with a feasibility index of 33.57%, indicate that these facilities already exist but need to be improved in terms of cleanliness and comfort to increase user satisfaction. Research by McMillan et al. (2002) showed that the quality of facilities such as disabled toilets is very important to ensure user comfort and privacy, and lack of attention to cleanliness and comfort can limit user experience [76]. The theory of universal accessibility, as outlined by Smith & Jones (2019), emphasizes that facilities should be designed and managed to meet the needs of all users, ensuring that facilities such as disabled toilets are not only available but also in adequate and comfortable condition [77]. Therefore, improving the quality of disabled toilets at Batu Angus Geotourism is essential to improve the overall visitor experience and ensure that the facilities meet better accessibility standards.

In terms of information and navigation, information boards and navigation signals were rated with an appropriateness index of 34.28% and 37.14% respectively. This assessment indicates that despite efforts to provide information and navigation tools, their quality and availability still need to be improved to ensure optimal accessibility for all visitors. The theory of universal accessibility emphasizes that clear and accessible information is an essential component in creating an inclusive environment [78]. Research by Golledge (1999) also emphasized that effective information and navigation systems are essential to help people with disabilities navigate public spaces independently and safely. Golledge showed that inadequate navigation signals and information boards can be a significant barrier for people with disabilities, reducing their mobility and independence [52].

Furthermore, the theory of universal design, as described by Mace (1985), emphasizes the importance of designing information and navigation systems that can be used by everyone, including those with visual or mobility impairments [62]. Thus, despite the efforts that have been made at Batu Angus Geotourism, there needs to be further improvement in the quality of information boards and navigation signals to meet universal accessibility standards and ensure that all visitors, without exception, can access and understand the information easily.

Supporting facilities such as rest areas and assistance services as well as stalls or shops received a suitability index of 30.71% and 29.28% respectively. This assessment shows that supporting facilities in Batu Angus Geotourism are still inadequate, and there needs to be an improvement in the quality and availability of these facilities to meet the needs of visitors. The theory of universal accessibility emphasizes that supporting facilities should be designed to provide adequate comfort and support for all visitors, including those with physical disabilities [79]. Research by Darcy and Dickson (2009) shows that inadequate rest areas and assistance services can limit the experience of visitors with disabilities, and the quality of these facilities plays an important role in increasing satisfaction and accessibility [80]. Although some aspects of accessibility in Batu Angus Geotourism show adequate results, there are several areas that need improvement, especially in access to public transportation, information and navigation, and supporting facilities. Improvement efforts in these areas are needed so that the area can be developed optimally to meet the needs of all visitors, including those with disabilities. Research by Imrie (2001) supports this view by emphasizing the importance of continuous evaluation and improvement in various aspects of facilities to achieve higher standards of universal accessibility [81]. Improving supporting facilities, along with improvements in public transportation and information systems, are critical steps to creating a more inclusive and disability-friendly environment, which will broaden the appeal of Batu Angus Geotourism to all visitors.

Conclusion

1. The accessibility issues of ecotourism for people with disabilities in Ternate City
2. include substandard facilities, limited wheelchair access, and difficult-to-reach tourist locations. Other obstacles include the lack of special facilities for people with disabilities, lack of accessibility socialization, social stigma against people with disabilities, and obstacles to infrastructure and tourism programs
3. To address this issue, the proposed intervention policy model includes the provision of disability-friendly facilities and infrastructure, public education, collaboration between government and organizations, modification of public facilities, development of disability-friendly transportation, and increasing information and training for the inclusion and participation of people with disabilities in ecotourism.
4. The accessibility assessment of ecotourism at Sulamadaha Beach, Tolire Besar Lake, and Batu Angus Geotourism shows a moderate level of feasibility with several aspects that need to be improved. At Sulamadaha Beach, access to transportation and supporting facilities is considered moderate, but physical access and navigation require improvement. Tolire Besar Lake has good access to transportation and facilities, but information and navigation are still lacking. Batu Angus Geotourism is considered low in terms of access to public transportation and supporting facilities, and requires improvement in information and navigation. Overall, these three areas require further development to meet accessibility standards for people with disabilities.

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