

# Improving Ecotourism Inclusion for People with Disabilities: Community-Based Strategies in Ternate, Indonesia

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## Abstract

*This study examines the effectiveness of a community-based intervention in enhancing public knowledge, attitudes, and behavior toward ecotourism accessibility for people with disabilities in Ternate, Indonesia. Grounded in participatory intervention and behavioral change theories, this research addresses public awareness gaps through educational programs and informational materials, aiming to foster more inclusive tourism experiences. Using a quasi-experimental design with a control group, the study involved 287 participants selected via Cluster Random Sampling from a population of 4,964 residents. The intervention was conducted at three major ecotourism destinations in Ternate: Sulamadaba Beach, Tolire Besar Lake, and Batu Angus Geotourism. Findings indicate a statistically significant improvement in community knowledge (N-Gain = 0.31,  $p < 0.05$ ) and moderate gains in attitudes and behavior (N-Gain = 0.07,  $p < 0.05$ ), with notable differences between experimental and control groups. These results underscore the role of participatory approaches in shaping inclusive tourism policies and practices, particularly in ecotourism settings. However, the limited impact on attitudes and behavior suggests the need for extended interventions, reinforcement strategies, and multi-stakeholder collaboration, including policymakers and tourism industry stakeholders. This study contributes to discussions on participatory interventions in tourism development and provides empirical insights for designing policies that integrate accessibility into sustainable ecotourism planning.*

**Keywords:** *Inclusive Tourism Policy, Ecotourism Accessibility, Community-Based Tourism, Public Knowledge, Attitudes, Behavior Change, Sustainable Tourism Development.*

## Introduction

Ensuring accessibility for people with disabilities in ecotourism and recreational tourism is not merely a matter of social justice (Wall-Reinius et al., 2023), but also a strategic approach to fostering inclusive and sustainable tourism (Fennell & Garrod, 2022). Accessibility in ecotourism encompasses physical infrastructure, services, and information that enable individuals with disabilities to fully participate in tourism activities (Fennell & Garrod, 2023). Moreover, inclusive ecotourism enhances visitor diversity, increases destination competitiveness, and strengthens local tourism economies (Nematpour et al., 2024), contributing to sustainable tourism development. However, achieving this vision remains challenging, as it requires an integrated approach involving public awareness, policy reform, and stakeholder collaboration.

In many developing countries, including Indonesia, barriers to accessible tourism hinder the participation of people with disabilities. These barriers include physical constraints, inadequate services (Darcy et al., 2020), and limited access to tourism-related information (Chao et al., 2024). Despite regulatory frameworks, such as Law Number 10 of 2009, which guarantees the rights of disabled individuals in tourism, implementation remains inconsistent (Sumiars & Nurcahyo, 2022). This gap persists due to weak governmental commitment (Cockburn et al., 2018), limited public awareness (Domínguez Vila, et al., 2024), and poor coordination among tourism stakeholders (Wondirad et al., 2020). Addressing these challenges requires comprehensive intervention models that integrate educational campaigns, policy enforcement, and infrastructure development to create an inclusive tourism environment.

The global accessible tourism market is substantial, with over one billion people living with disabilities worldwide (Domínguez Vila et al., 2017). In Indonesia, approximately 9.7% of the total population—or

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about 26 million individuals—have disabilities (TEMPO.CO, 2023). In North Maluku, the disabled population was recorded at 7,162 in 2020 (TimesIndonesia.Co.Id. 2022), including 1,450 individuals in Ternate City in 2021 (Brindonews.Com, 2022). Despite this market potential and the increasing global push for inclusive tourism, accessibility in Indonesia's ecotourism sector remains underdeveloped, highlighting the urgent need for targeted interventions.

To facilitate behavioral changes and promote accessibility in ecotourism, this study employs Social Cognitive Theory (SCT) (Bandura, 1986). SCT emphasizes the dynamic interaction between individual, environmental, and behavioral factors in shaping human actions (Cai & Shi, 2022). Unlike Experiential Learning Theory (ELT) (Kolb, 1984) and Theory of Planned Behavior (TPB) (Ajzen, 1991), which primarily focus on individual cognition, SCT incorporates social influences, observational learning, and reinforcement mechanisms (Ilyas et al., 2020) : (Gansser & Reich, 2023). This framework is particularly relevant to tourism accessibility, as it highlights how environmental barriers, policy shortcomings, and community attitudes shape behavior.

Furthermore, this study integrates policy perspectives with community engagement efforts, recognizing that sustainable accessibility improvements require strong collaboration between governments, the private sector, and civil society. This approach ensures that regulatory frameworks are effectively enforced, infrastructure is developed in line with accessibility standards, and inclusive tourism policies are systematically implemented. By combining behavioral change strategies with structural policy improvements, this study proposes a holistic intervention model that contributes to sustainable and inclusive tourism development.

## Research Objectives

- To assess the current level of community knowledge regarding the importance of inclusivity in ecotourism accessibility for people with disabilities.
- To evaluate the impact of community-based interventions on attitudes toward the inclusion of people with disabilities in tourism and recreation.
- To measure changes in community behavior in supporting and promoting accessible tourism following the implementation of the intervention model.
- To analyze the relationship between knowledge, attitudes, and behavior changes, integrating Social Cognitive Theory and policy perspectives for inclusive tourism.

This study aims to bridge the gap between community-based interventions and systemic policy measures, offering a comprehensive model for improving accessibility in ecotourism and recreational tourism. By addressing both behavioral and structural challenges, the research provides valuable insights for tourism policymakers, destination managers, and disability advocacy groups in Ternate and beyond. Additionally, while this study does not explicitly focus on rehabilitation or assistive technology, it acknowledges their role in enhancing tourism accessibility and suggests future research directions in these areas.

By emphasizing the significance of accessibility in ecotourism and the necessity of community-driven interventions, this study contributes to the growing body of research on sustainable and inclusive tourism. The findings have broader implications for policymakers, tourism stakeholders, and local communities seeking to develop more accessible tourism destinations while ensuring long-term sustainability.

## Research Methods

### *Research Design and Ethics*

Research Design and Ethics This study adopted a quasi-experimental design with a nonequivalent control group to assess the impact of community-based interventions on knowledge, attitudes, and behaviors regarding ecotourism accessibility for people with disabilities. A quasi-experimental approach was selected due to its suitability for evaluating interventions in real-world settings where randomization is impractical (Campbell & Stanley, 2015). The design included an experimental group receiving the intervention and a control group that did not, ensuring a comparative assessment of intervention effects (Purba, 2023). To minimize confounding factors such as socioeconomic status and prior exposure to disability issues, participants were matched based on demographic data, and baseline characteristics were assessed before the intervention.

The study was conducted from January to June 2024 at three major ecotourism sites in Ternate City: Sulamadaha Beach, Tolire Besar Lake, and Batu Angus Geopark. These locations were selected based on their popularity and lack of prior accessibility-focused studies. The intervention's impact is expected to inform inclusive tourism policies, influencing both tourism management and infrastructure development to accommodate visitors with disabilities. Ethical approval was obtained from the Health Research Ethics Commission of Dr. Moewardi Hospital (Approval No. 2.355/XII/HREC/2023). Informed consent was secured from all participants, ensuring voluntary participation and understanding of the study objectives. Additionally, individuals with disabilities were consulted during the intervention planning to ensure cultural and contextual relevance.

### *Sampling and Participant Recruitment*

This study employed the Cluster Random Sampling method to ensure the representativeness of the population within the study. The research population comprised 4,964 residents across three study areas: Sulamadaha, Takome, and Kulaba. This sampling technique was chosen because it allows for the random distribution of participants within each study area, which exhibits distinct social and economic characteristics.

The sample size was determined using Slovin's formula with a 5% margin of error, yielding a total of 287 participants, who were then proportionally allocated based on the population size in each area as follows:

$$n = \frac{(N * e^2)}{(N_c)}$$

where:

**N** = Total population

**e** = Margin of error (set at 5%)

a. Sulamadaha Subdistrict (10% of 1,926 residents) → 193 participants

In Sulamadaha Subdistrict, which consists of 1,926 residents, a 10% sample was selected, amounting to 193 participants. The geographical area of this subdistrict is presented in Figure 1, which illustrates the Sulamadaha Beach Tourist Attraction Area. The map utilizes data sourced from Jihan et al. (2022) and Google Maps (2024).



Figure. 1. Map of Sulamadaha Beach Tourist Attraction Area, Jihan et, al, 2022 & Google Map, 2024)

b. Takome Subdistrict (10% of 1,146 residents) → 115 participants

In Takome Subdistrict, which has a total population of 1,146 residents, a sample of 10% was selected, corresponding to 115 participants. The geographical context of this subdistrict is depicted in Figure 2, which shows the map of the Tolire Besar Lake tourist attraction area in Takome District, based on data from Google Maps (2024).

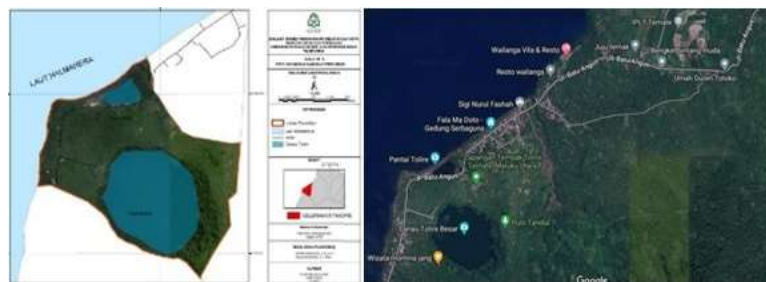


Figure .2 Map of the Tolire Besar Lake tourist attraction, Takome District, Google Map 2024

c. Kulaba Subdistrict (10% of 1,892 residents) → 189 participants

In Kulaba Subdistrict, with a total population of 1,892 residents, a sample of 10%—or 189 participants—was selected. The geographical area of Batu Angus Geotourism is presented in Figure 3. This map, sourced from Google Maps (2024), highlights the geotourism destination in Kulaba District.

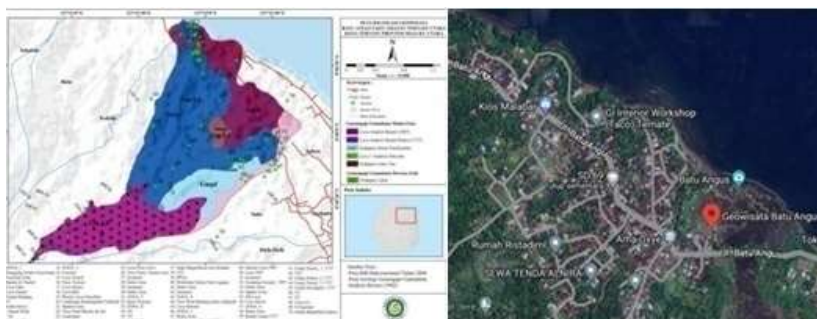


Figure. 3 Batu Angus Geotourism Map, Kulaba District, Geo Map, 2024

Once the sample size was established, individuals within each area were selected randomly, considering gender balance, age distribution, and educational background to minimize demographic bias. The inclusion criteria encompassed residents aged  $\geq 18$  years, possessing a basic understanding of ecotourism, and willing

to participate in the entire intervention process. Conversely, individuals with communication impairments or those unable to engage in the intervention were excluded from the study.

To ensure the validity of baseline data, a homogeneity test was conducted on the key demographic characteristics of both the experimental and control groups prior to the intervention. This was intended to identify any significant differences that could influence the study outcomes, thereby enhancing the accuracy of the analysis in evaluating the intervention's impact.

### *Intervention Design*

The intervention consisted of community-based educational activities and brochure distribution aimed at improving ecotourism accessibility awareness. Small community groups were formed, comprising local residents, tourism operators, and individuals with disabilities. These groups participated in bi-weekly 90-minute interactive sessions over five months (total: 10 sessions). Each session focused on:

- Knowledge Enhancement: Understanding accessibility infrastructure (e.g., ramps, signage) and its significance for inclusive tourism.
- Attitude Formation: Role-playing exercises to foster empathy and inclusivity in tourism service delivery.
- Behavioral Change: Strategies for assisting tourists with disabilities and improving accessibility in ecotourism sites.

Brochures reinforcing accessibility concepts were distributed in Bahasa Indonesia and placed in strategic locations within the research sites. The intervention was designed to directly contribute to the development of inclusive tourism policies and encourage the adoption of accessibility improvements in ecotourism destinations.

### *Questionnaire and Instrument Validation*

The survey instrument comprised 35 items measuring: Knowledge (15 items) – Understanding of ecotourism accessibility.

- Knowledge (15 items) – Understanding of ecotourism accessibility.
- Attitudes (10 items) – Openness and perceptions of inclusion.
- Behavior (10 items) – Actions supporting accessibility.

A 5-point Likert scale was used, ranging from Strongly Disagree (1) to Strongly Agree (5). The questionnaire was adapted from validated scales on accessibility and community intervention (Smith & Jones, 2022). The instrument underwent:

- Expert validation: Three accessibility and public health policy specialists evaluated content validity using Aiken's V formula ( $>0.8$  = highly valid) (Martínez & Fernández, 2020).
- Reliability testing: Cronbach's alpha ensured internal consistency ( $>0.7$  for all subscales).
- Pilot testing: 30 participants tested the questionnaire for clarity and effectiveness.

The results of this assessment were expected to provide empirical data supporting recommendations for policy improvements in inclusive tourism.

The instrument's validity and feasibility were analyzed qualitatively, with criteria outlined in **Table 1**.

**Table 1. Instrument Validity Criteria**

Average Index (V)	Validation Criteria
$V > 0.8$	Highly Valid
$0.4 \leq V \leq 0.8$	Valid
$V < 0.4$	Less Valid

Source: (Kalkbrenner, 2021).

#### *Data Collection and Control Group Monitoring*

- Data were collected daily from 5–10 respondents per session over five months (February–June 2024).
- Researchers and trained public health students conducted face-to-face surveys to minimize response bias.
- The control group was monitored to ensure participants were not exposed to intervention materials or external campaigns.
- Pre-test and post-test assessments were conducted to measure changes in knowledge, attitudes, and behaviors.

#### *Data Analysis Methods*

Data analysis was conducted progressively using a combination of descriptive and inferential statistical methods to evaluate the effectiveness of the intervention.

#### *Univariate Analysis (Descriptive Statistics)*

- Frequency distribution and central tendency measures (mean, median, and standard deviation) were employed to describe the demographic characteristics of participants and their responses in both the pre-test and post-test phases.
- The Kolmogorov-Smirnov/Shapiro-Wilk normality test was performed to determine whether the data followed a normal distribution before conducting inferential statistical tests.

#### *Bivariate Analysis (Pre- and Post-Intervention Comparisons)*

To assess the impact of the intervention on participants' knowledge, attitudes, and behaviors:

- Paired Sample t-Test was used to evaluate changes in pre-test and post-test scores within both the experimental and control groups separately. This test assessed whether there were significant differences in each variable before and after the intervention.
- Independent Sample t-Test was used to compare post-test scores between the experimental and control groups to determine the intervention's effectiveness.

If the data did not follow a normal distribution, non-parametric tests such as the Wilcoxon Signed-Rank Test (as an alternative to the Paired t-Test) and the Mann-Whitney U Test (as an alternative to the Independent t-Test) were utilized.

#### *Multivariate Analysis (Relationship Between Knowledge, Attitudes, and Behavior Variables)*

To understand how changes in knowledge and attitudes influenced behavior, the study employed : Multiple Linear Regression, which examined the relationship between increased knowledge and attitudes with behavioral changes post-intervention. The model controlled for confounding variables such as age, education level, and previous experiences interacting with individuals with disabilities.

Regression analysis was performed in three stages:

- Baseline model without control variables.
- Adjusted model incorporating demographic factors.
- Final model, accounting for interactions between knowledge and attitudes in influencing behavioral change.

Regression assumptions tested included:

- Multicollinearity test (Variance Inflation Factor, VIF < 10).
- Autocorrelation test (Durbin-Watson test, with values close to 2).
- Heteroscedasticity test (Glejser test or White test).

#### *Measuring Intervention Effectiveness Using N-Gain Score*

To quantify the degree of improvement in participants' knowledge, attitudes, and behaviors, the **Normalized Gain Score (N-Gain)** was calculated as follows:

$$\text{N-Gain} = \frac{\text{Post-test Score} - \text{Pre-Test Score}}{\text{Ideal Score} - \text{Pre-test Score}}$$

**Table 2. The Interpretation of the N-Gain Score is Categorized As Follows:**

<b>N-Gain Value</b>	<b>Interpretation</b>
$g > 0,7$	High Improvement
$0,3 \leq g \leq 0,7$	Moderate Improvement
$g < 0,3$	Low Improvement

N-Gain analysis enables a more detailed evaluation of the extent to which the intervention contributed to participants' improved understanding and behavioral changes.

#### *Sensitivity Analysis and Control of External Variables*

- Sensitivity Analysis was conducted to ensure that the results remained significant under varying scenarios, such as participant dropouts or fluctuations in participation levels.
- Analysis of Covariance (ANCOVA) was applied to assess whether there were differences in post-test scores between the experimental and control groups while controlling for confounding variables, such as education level and prior experience interacting with individuals with disabilities.

The significance threshold for all statistical analyses was set at  $p < 0.05$ , with Bonferroni correction ( $p < 0.025$ ) applied when necessary to minimize the risk of Type I errors in multiple comparisons (Sugiyono, 2022).

#### *Controlling for External Factors To ensure validity:*

- Baseline assessments established pre-existing knowledge and attitudes.
- Control group comparison minimized external influences.
- No concurrent disability awareness campaigns were active in the study areas

#### *Ethical Considerations*

- Informed consent : Participants voluntarily agreed after a detailed briefing.
- Disability inclusion : Intervention design incorporated input from people with disabilities.
- Confidentiality : Responses were anonymized to protect privacy.

## Results

#### *Expert Validation*

To ensure the content and construct validity of the developed instrument, expert validation was conducted by professionals with extensive knowledge and experience in ecotourism accessibility and community interventions. These experts evaluated the relevance, clarity, and adequacy of each item, and their feedback was analyzed to refine the final instrument, ensuring that it is both valid and reliable for assessing the impact of community interventions on improving ecotourism accessibility for people with disabilities through the variables of knowledge, attitudes, and behavior.

In this study, the content validity of the instrument was determined through expert consensus in evaluating both test and non-test instruments, ensuring their accuracy in measuring the intended constructs. When experts agreed that the instrument could effectively measure the desired capabilities, the Aiken's V index was applied to assess the level of agreement among experts. The expert panel included three evaluators:

- Dr. Apt. Hamidah Rahman, M.Si – Lecturer and Head of the Research Institute at Universitas Muhammadiyah Maluku Utara (UMMU)
- Dr. Sulfi Abdul Haji, SE, M.Si – Lecturer at Universitas Khairun Ternate
- Imran Ali Basalem, SH, M.Si – Civil Servant, Secretary of the Tourism Office of Ternate City

**Table 3. The Results of The Aiken's V Analysis Are Presented in Below**

Variable	Items	Evaluators	s1	s2	s3	$\sum s$	V	Validity
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		I	II	III				(r-lo)		
Knowledge	Butir 1-15	67	61	69	52	46	54	152	0.84	High Validity
Attitudes	Butir 1-10	46	44	46	36	34	36	106	0.88	High Validity
Behavior	Butir 1-10	45	39	45	35	29	35	99	0.83	High Validity

(Source: Primary Data, 2024)

"In Table 3, the results of the Aiken's V analysis for the study's instruments are presented. For the Knowledge domain (15 items), a total score of 152 was obtained, resulting in an Aiken's V of 0.84, which indicates high validity. Similarly, the Attitudes domain (10 items) achieved a total score of 106 with an Aiken's V of 0.88, and the Behavior domain (10 items) recorded a total score of 99 with an Aiken's V of 0.83, both reflecting high validity."

#### Sample Representativeness

The study sample was selected using cluster random sampling from three villages: Sulamadaha, Danau Tolire Besar, and Batu Angus, ensuring adequate representation of the population. These villages are known for their ecotourism potential and attract both local and international tourists. Understanding the characteristics of respondents from these locations is crucial for designing inclusive policies that support tourism accessibility. The distribution of respondents in terms of age, gender, education, and occupation is presented in Table 4.

Table 4. The Distribution of Respondents By Age, Gender, Education, and Occupation

Characteristics		
Experimental Group	Frequency	Percentage
<b>Age</b>		
< 25	10	33.3
26-45	15	50
>44	5	16.7
Total	<b>30</b>	<b>100</b>
<b>Gender</b>		
Male	10	33.3
Woman	20	66.7
Total	<b>30</b>	<b>100</b>
<b>Education</b>		
Primary School	3	10
Junior High School	5	16.7
Senior High School	19	63.3
Diploma	2	6.7
Bachelor's Degree	1	3.3
Total	<b>30</b>	<b>100</b>
<b>Occupation</b>		
Unemployed	4	13.3
Civil Servant	1	3.3
Entrepreneur	9	30
Farmer	10	33.3
Housewife	3	10

Private Employee	1	3.3
Contract Worker	1	3.3
Driver	1	3.3
<b>Total</b>	<b>30</b>	<b>100</b>

The respondent distribution by age in the experimental group shows that the highest proportion was aged 26-45 years (50%), while the oldest group (>45 years) accounted for only 16.7%. In terms of gender, woman respondents were the majority (66.7%). Regarding educational background, most respondents had a high school education (63.3%), while the lowest proportion held a bachelor's degree (3.3%). In terms of occupation, farmers constituted the largest group (33.3%), whereas civil servants, private employees, contract workers, and drivers each accounted for only 3.3%.

#### *Reliability Testing*

Although the study applied Aiken's V for content validity, the reliability of the instrument was not explicitly tested. Typically, Cronbach's Alpha is used to assess internal consistency. The absence of a reliability test may limit the credibility of findings; therefore, future research should incorporate reliability testing with a pilot study to ensure the consistency of responses.

#### *Model Validation Testing*

Model validation testing was carried out through limited trials to assess the reliability and effectiveness of the intervention model. The trial was conducted in Sulamadaha Village in February 2024 using a pre-experimental pretest-posttest design with 30 respondents. The intervention lasted one month, involving both individual and group sessions (5–10 respondents per group). The results of this validation serve as an empirical foundation for integrating community-based interventions into regional ecotourism policies, particularly in shaping strategies for inclusive tourism development.

#### *Score Calculation and Weighting*

The calculation of scores for knowledge, attitudes, and behavior followed a standardized procedure:

- Knowledge was assessed using a 15-item multiple-choice test. Correct answers were scored 1, incorrect answers 0. The final score was a sum of correct responses, normalized to a 100-point scale.
- Attitudes were measured with a 10-item Likert-scale questionnaire (1 = strongly disagree to 5 = strongly agree). The total score was summed and converted into a scale from 0 to 100.
- Behavior was assessed through a 10-item self-reported behavioral questionnaire, scored similarly to attitudes.

The effectiveness of the community-based intervention is assessed through statistical analysis of knowledge, attitudes, and behavior changes, as detailed in the following analyses

#### *Descriptive Statistical Analysis*

The results of the descriptive statistical analysis for knowledge, attitudes, and behavior in the experimental group are presented in Table 5.

**Table 5. Descriptive Statistical Analysis Results for Knowledge, Attitudes, and Behavior in the Experimental Group.**

Variable
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Variable	N	Minimum	Maximum	Mean	Std. Deviation	Variance
<b>Knowledge</b>						
Pretest	30	40	62	53.8	4.852	23.545
Posttest	30	63	73	68.47	2.193	4.809
<b>Attitudes</b>						
Pretest	30	37	47	42.13	2.886	8.326
Posttest	30	43	49	46.2	1.669	2.786
<b>Behavior</b>						
Pretest	30	35	44	40.47	2.24	5.016
Posttest	30	41	48	44.63	1.691	2.861

The descriptive analysis indicates improvements in knowledge, attitudes, and behavior post-intervention. However, significance cannot be inferred from descriptive statistics alone. Thus, further statistical testing was conducted to confirm the intervention's effectiveness.

#### *Normality Test*

A normality test using the Shapiro-Wilk method was conducted to ensure that the data met the normality assumption for paired sample t-tests. The results are shown in Table 6.

**Table 6. Shapiro-Wilk Normality Test Results for Knowledge, Attitudes, and Behavior in the Experimental Group.**

Variable				
Variable		Shapiro-Wilk Statistic	Df	Sig.
<b>Knowledge</b>				
	Pretest	0.940	30	0.090
	Posttest	0.946	30	0.135
<b>Attitudes</b>				
	Pretest	0.950	30	0.167
	Posttest	0.941	30	0.095
<b>Behavior</b>				
	Pretest	0.944	30	0.120
	Posttest	0.940	30	0.093

Since all significance values (Sig.) are greater than  $\alpha = 0.05$ , the null hypothesis of normality cannot be rejected. This indicates that the data are normally distributed, fulfilling the assumption for conducting paired sample t-tests.

#### *Paired Sample T-Test*

The paired sample t-test was conducted to assess the significance of changes in knowledge, attitudes, and behavior before and after the intervention. The results are presented in Table 7.

**Table 7. Paired Sample T-Test Results for Knowledge, Attitudes, and Behavior in the Experimental Group.**

Variable	N	Mean Paired Differences	Std. Deviation	t- hitung	P-Value
<b>Knowledge</b>					
	30	-14.667	4.063	-19.773	<0.001

<b>Attitudes</b>						
		30	-4.067	2.664	-8.360	<0.001
<b>Behavior</b>						
		30	-3.900	2.023	-10.558	<0.001

The analysis confirms a statistically significant impact of the intervention, as all P-values are below 0.05. This suggests that the intervention effectively improved knowledge, attitudes, and behavior in the experimental group. These improvements indicate that increasing public awareness and education about ecotourism accessibility can influence local policy adaptations, encouraging destination managers and tourism authorities to prioritize inclusivity in their strategic plans.

#### *N-Gain Score Analysis*

To assess the effectiveness of the intervention, an N-Gain score analysis was performed. The results are presented in Table 8

**Table 8. N-Gain Score Analysis Results for Knowledge, Attitudes, and Behavior in the Experimental Group.**

Variable	N	Mean Score	Classification
Knowledge	30	0.31	Medium
Attitudes	30	0.07	Low
Behavior	30	0.07	Low

The intervention demonstrated a moderate effect on knowledge (N-Gain = 0.31) and a low effect on attitudes and behavior (N-Gain = 0.07). These findings suggest that while the intervention successfully enhanced participants' understanding of ecotourism accessibility, it had limited influence on shaping attitudes and behavioral changes. To achieve more substantial improvements, additional measures such as prolonged intervention periods, more engaging strategies, or reinforcement activities may be necessary.

Moreover, these results highlight the need for a structured policy framework that integrates continuous education and behavioral reinforcement in tourism development plans. Policymakers and tourism stakeholders can leverage these findings to design community engagement programs that not only raise awareness but also foster long-term behavioral change, ultimately contributing to more accessible and inclusive ecotourism destinations

#### *Model Effectiveness Testing*

The trial phase assessed the intervention model's effectiveness in achieving research objectives, identifying strengths and limitations, and explaining observed phenomena. Community-based interventions, including participatory education and brochure distribution, enhanced public knowledge, fostered inclusive attitudes, and encouraged behaviors supporting disability-friendly facilities. This initiative plays a crucial role in promoting inclusive tourism and shaping accessibility policies in ecotourism. Findings demonstrate increased awareness and a strong foundation for sustainable, inclusive tourism development. The observed improvements in knowledge, attitudes, and community behavior highlight the potential of community-based approaches to drive policy reforms for accessible ecotourism.

This analysis assesses the effectiveness of the community-based intervention by measuring its impact on knowledge, attitudes, and behaviors through a systematic statistical approach, as detailed in the following analysis.

#### *Respondent Characteristics*

Respondent characteristics encompass demographic attributes such as age, gender, education, and occupation. These characteristics provide a profile of the sample and facilitate an understanding of their potential influence on the research variables. The distribution of respondent characteristics is presented in Table 9

**Table 9. Distribution of Respondent Characteristics in the Experimental and Control Groups**

Variables		Experimental Group		Control Group	
		Frequency	Presentation	Frequency	Presentation
<b>Age</b>					
	<25	19	13.2	21	14.7
	26-45	65	45.1	74	51.7
	> 46	60	41.7	48	33.6
	<b>Total</b>	144	100	143	100
<b>Gender</b>					
	Man	55	38.2	58	40.6
	Woman	89	61.8	85	59.4
	<b>Total</b>	144	100	143	100
<b>Education</b>					
	Elementary/MI	19	13.2	8	5.6
	SMP/MTS	4	2.8	13	9.1
	SMA/SMK/MA	80	55.6	79	55.2
	Diploma (DI, DII, DIII, DIV)	14	9.7	26	18.2
	Bachelor degree)	26	18.1	17	11.9
	Masters (S2)	1	0.7	0	0
	<b>Total</b>	144	100	143	100
<b>Work</b>					
	Not Working	6	4.2	14	9.8
	Civil Servant	13	9	15	10.5
	Self-Employed	20	13.9	20	14
	Farmer	33	22.9	27	18.9
	Laborer	2	1.4	3	2.1
	Housewife	36	25	39	27.3
	Private Employee	2	1.4	0	0
	Honorary	15	10.4	11	7.7
	Harnessman	2	1.4	1	0.7
	Fisherman	3	2.1	2	1.4
	Students	5	3.5	3	2.1
	Freelancers	1	0.7	0	0
	PTT	5	3.5	0	0
	Ojek	1	0.7	4	2.8
	Security Guard	0	0	1	0.7
	TNI/POLRI	0	0	3	2.1
	<b>Total</b>	144	100	143	100

The data indicate that in both groups, the majority of respondents were aged 26–45 years (45.1% in the experimental group and 51.7% in the control group), while the lowest percentage belonged to the <25 age category. Regarding gender distribution, females constituted a higher proportion in both groups (61.8% in the experimental group and 59.4% in the control group). Education-wise, the majority of respondents had

completed senior high school (55.6% in the experimental group and 55.2% in the control group), with the lowest proportion having a junior high school education (2.8% in the experimental group and 9.1% in the control group). In terms of occupation, housewives formed the largest category (25% in the experimental group and 27.3% in the control group), while the lowest percentage was recorded for freelancers and harnessmen.

### *Descriptive Data Analysis*

Descriptive statistical analysis of public knowledge, attitudes, and behavior in the experimental and control groups is summarized in Table 10

**Table 10. Descriptive Statistics for Knowledge, Attitudes, and Behavior**

Variable	Group	N	Min	Max	Mean	Std. Dev	Variance
<b>Knowledge</b>							
	Pre-test Experimental	144	50	69	60.08	3.702	13.707
	Post-test Experimental	144	50	69	61.37	3.534	12.486
	Pre-test Control	143	50	69	58.98	3.834	14.697
	Post-test Control	143	50	69	59.78	4.088	16.710
<b>Attitude</b>							
	Pre-test Experimental	144	31	48	39.96	3.120	9.733
	Post-test Experimental	144	35	49	41.50	2.957	8.741
	Pre-test Control	143	33	46	39.83	2.758	7.605
	Post-test Control	143	34	47	40.29	2.874	8.262
<b>Behavior</b>							
	Pre-test Experimental	144	33	47	40.35	2.807	7.879
	Post-test Experimental	144	34	49	42.06	3.320	11.024
	Pre-test Control	143	33	48	40.37	2.780	7.728
	Post-test Control	143	34	49	40.59	2.844	8.088

The results indicate that in the experimental group, the mean knowledge score increased from 60.08 (SD = 3.702, Variance = 13.707) before the intervention to 61.37 post-intervention, whereas in the control group, the increase was from 58.98 (SD = 3.834, Variance = 14.697) to 59.78. Similarly, the mean attitude score in the experimental group improved from 39.96 (SD = 3.120, Variance = 9.733) to 41.50, while in the control group, the change was from 39.83 (SD = 2.758, Variance = 7.605) to 40.29. Regarding behavior, the mean score in the experimental group increased from 40.35 (SD = 2.807, Variance = 7.879) to 42.06, while in the control group, it increased from 40.37 (SD = 2.780, Variance = 7.728) to 40.59.

*Tests of Normality*

The normality of the data was assessed using the Kolmogorov-Smirnov test, as shown in Table 11.

**Table 11. Normality Test Results**

Variable	Group	Kolmogorov-Smirnov Statistic	df	Sig.
<b>Knowledge</b>	Pre-test Experimental	0.073	144	0.057
	Post-test Experimental	0.072	144	0.068
	Pre-test Control	0.073	143	0.058
	Post-test Control	0.073	143	0.063
<b>Attitude</b>	Pre-test Experimental	0.074	144	0.053
	Post-test Experimental	0.070	144	0.082
<b>Behavior</b>	Pre-test Experimental	0.073	144	0.056
	Post-test Experimental	0.069	144	0.091

All significance values exceeded 0.05, confirming that the data followed a normal distribution, justifying the use of parametric tests.

*Test of Homogeneity of Variance*

Homogeneity of variance was tested using Levene's test, with the results presented in Table 12.

**Table 12 Homogeneity of Variance Test Results**

Variable	Levene Statistic	df1	df2	Sig.
<b>Knowledge</b>	2.429	1	285	0.120
<b>Attitude</b>	0.172	1	285	0.679
<b>Behavior</b>	3.534	1	285	0.061

The results confirm that the assumption of homogeneity was met for knowledge and attitude variables, as their significance values exceeded 0.05. However, the behavior variable presented a marginally lower significance value (0.061), suggesting potential variance differences that may require further statistical adjustments.

*Independent Sample T-Test*

The effectiveness of the intervention was further examined using an Independent Sample T-Test, as shown in Table 13.

**Table 13. Independent Sample T-Test Results**

Variable	Mean Difference	Std. Deviation	t-value	P-Value
<b>Knowledge</b>	1.592	3.82	3.530	<0.001
<b>Attitude</b>	1.213	2.92	3.524	<0.001
<b>Behavior</b>	1.468	3.09	4.022	<0.001

The significant differences between the experimental and control groups underscore the intervention's impact in fostering an inclusive mindset within the community. The results provide empirical evidence supporting the argument that increased public awareness and positive attitudes towards accessibility can drive policy changes that require tourism operators and authorities to implement inclusive infrastructure in ecotourism destinations.

#### *N-Gain Score Analysis*

To assess the practical significance of the intervention, N-Gain scores were calculated, with results displayed in Table 14.

**Table 14. N-Gain Score Results**

Variable	Group	N	Mean N-Gain Score	Classification
<b>Knowledge</b>	Experimental	144	0.03	Low
	Control	143	0.01	Low
<b>Attitude</b>	Experimental	144	0.02	Low
	Control	143	0.01	Low
<b>Behavior</b>	Experimental	144	0.03	Low
	Control	143	0.01	Low

Although the N-Gain scores indicate a low classification, the findings suggest that sustained efforts in community-based education and policy advocacy could lead to long-term changes in ecotourism accessibility. The intervention serves as an initial step toward broader systemic reforms, reinforcing the need for local governments and tourism stakeholders to integrate inclusive tourism policies that ensure all visitors, regardless of ability, can experience ecotourism sites comfortably and equitably.

## **Discussion**

### *Community Knowledge*

This study delves into the critical role of community knowledge in shaping inclusive tourism policies and the sustainable management of ecotourism destinations. Public awareness and a deep understanding of accessibility are pivotal in influencing policy formulation, infrastructure development, and tourism governance (Goyal & Howlett, 2024). An informed and engaged community not only facilitates the implementation of accessibility standards but also fosters a cultural shift toward inclusivity, ensuring that tourism destinations accommodate diverse visitor needs. By actively participating in advocacy, policy



discussions, and on-the-ground initiatives, communities can drive systemic change, leading to the creation of sustainable, disability-friendly ecotourism environments that enhance social equity and economic opportunities for all stakeholders.

The findings reveal a substantial gap in public knowledge regarding accessibility in ecotourism prior to the intervention. Many community members were unaware of the fundamental principles of inclusive tourism, the specific needs of individuals with disabilities, and the critical infrastructure required to ensure accessibility. This deficiency not only restricted the community's capacity to advocate for inclusive tourism policies but also perpetuated barriers that hindered the participation of disabled individuals in ecotourism activities. Similar findings have been reported in previous research, such as by (Darcy et al., 2020), which emphasized that communities with low awareness levels often lack the motivation to support accessibility initiatives, leading to persistent exclusionary practices in tourism settings. The lack of awareness underscores the urgent need for targeted educational interventions aimed at enhancing public understanding, shifting attitudes, and fostering proactive engagement in accessibility initiatives (Hügel & Davies, 2020). Without structured awareness programs, misconceptions and passive attitudes toward inclusivity may persist, ultimately obstructing progress toward equitable tourism development. Addressing this knowledge gap through systematic educational outreach enables communities to become active agents in fostering an inclusive tourism environment, influencing policy decisions, and ensuring that accessibility is embedded as a fundamental component of sustainable ecotourism planning and management.

The statistical analysis reveals a significant difference between the experimental and control groups, as evidenced by a Sig. (2-tailed) value of 0.001 ( $< \alpha = 0.05$ ) and a t-value (3.530) exceeding the t-table value (1.968). These results confirm that the participatory approach was effective in enhancing public knowledge about accessibility in ecotourism. Furthermore, the N-Gain score analysis (0.31) indicates a moderate improvement in knowledge, suggesting that while the intervention yielded positive outcomes, its impact was not maximized. These findings are consistent with (Blichfeldt & Nicolaisen, 2021), who found that community-based awareness programs improve knowledge retention but require continuous reinforcement to sustain long-term impact. The moderate N-Gain score suggests the necessity of supplementary strategies to reinforce and expand knowledge retention, including long-term educational programs, periodic refresher sessions, and deeper community engagement to ensure that accessibility principles are internalized and translated into sustainable practices. Integrating experiential learning components such as interactive workshops and on-site assessments could further enhance the intervention's effectiveness by providing practical, hands-on experiences that solidify conceptual understanding.

Beyond individual knowledge improvement, these results present broader policy implications, highlighting the importance of strengthening collaboration between local governments, tourism operators, and community stakeholders. (Gurung et al., 2021), argue that multi-stakeholder involvement is critical in ensuring that inclusive tourism awareness is embedded into official training programs and policy initiatives. This approach aligns with findings from the present study, reinforcing the necessity of integrating accessibility education into tourism management frameworks. Embedding these educational initiatives into formal tourism training programs can enhance the long-term sustainability of accessibility improvements in ecotourism destinations.

The effectiveness of the intervention was driven by a well-structured educational framework that combined direct instruction with participatory learning methods, integrating three key components—interactive face-to-face sessions, strategic distribution of informational brochures, and community-driven engagement efforts—which collectively enhanced knowledge retention, encouraged critical discussions, and fostered a collective commitment to improving accessibility in ecotourism. Interactive face-to-face sessions facilitated direct engagement with facilitators and peers, promoting deeper comprehension through real-time clarification of misconceptions, case study analysis, and scenario-based problem-solving exercises. This method not only improved knowledge acquisition but also cultivated a shared responsibility for implementing inclusive tourism practices. (Herold et al., 2020), highlight that peer-driven discussions play a significant role in reinforcing accessibility knowledge and fostering social responsibility within communities. The strategic distribution of well-structured informational brochures served as a vital post-session reinforcement tool, providing participants with a reference for continuous learning through

practical guidelines and real-world examples, ensuring that accessibility awareness extended beyond the intervention period and fostering long-term retention of knowledge.

Community-driven engagement efforts further strengthened the intervention's impact by leveraging local networks to drive advocacy for inclusive tourism policies, fostering discussions among community leaders, tourism stakeholders, and local residents on integrating accessibility improvements into existing tourism infrastructures. This increased community ownership of the initiative and enhanced the likelihood of sustained policy support and practical implementation. Beyond the immediate knowledge gains, the broader impact of this intervention lies in its potential to influence structural and policy-level changes. The participatory nature of the sessions encouraged community members to recognize their role as key stakeholders in inclusive tourism development. (Scheyvens & Biddulph, 2022), suggest that bottom-up approaches, where community-driven insights inform policy formulation, result in more effective and sustainable tourism policies. Scaling up such interventions through integration into local government initiatives, partnerships with tourism operators, and continuous engagement strategies can solidify the long-term adoption of accessibility-focused tourism practices.

These findings reinforce existing research emphasizing the crucial role of community participation in shaping accessibility policies and driving sustainable change in tourism management. Public knowledge serves both as a catalyst and a foundation for long-term improvements, influencing individual attitudes, broader policy frameworks, and infrastructure development. (Burns et al., 2021), found that awareness campaigns significantly contribute to community-driven advocacy efforts, enabling residents to identify accessibility gaps and collaborate with policymakers. Raising awareness about accessibility in ecotourism not only enhances individual understanding but also strengthens collective advocacy efforts, empowering communities to engage in policy discussions and push for meaningful reforms. This participatory process fosters a bottom-up approach to policy development, where community-driven insights complement governmental and institutional planning, resulting in more contextually relevant, effective, and sustainable tourism policies that integrate accessibility as a fundamental principle.

For broader applicability, this intervention model should be tested across diverse ecotourism settings, encompassing both urban and rural areas, to assess its adaptability to varying socio-cultural and economic contexts. Comparative studies across multiple locations can identify contextual factors that influence the effectiveness of community education programs. Moreover, collaboration with local stakeholders such as tourism operators, environmental organizations, and disability advocacy groups can enhance community buy-in and ensure a more holistic implementation. Sustaining progress requires policymakers to institutionalize community education within national and regional tourism development strategies. Policy mandates requiring ecotourism operators to integrate accessibility awareness training, public-private partnerships facilitating funding, and digital knowledge platforms leveraging online learning modules, webinars, and mobile applications are all crucial strategies.

This study provides strong empirical evidence that community-based interventions are pivotal in bridging knowledge gaps and fostering inclusive tourism development. The necessity of combining community-driven advocacy with institutional support to drive long-term structural changes in ecotourism accessibility underscores the potential of this intervention model as a scalable and globally applicable blueprint for sustainable and inclusive tourism development.

### *Community Attitude*

Public attitudes toward ecotourism accessibility play a crucial role in shaping the formulation and implementation of inclusive tourism policies. These attitudes not only influence the demand for accessible infrastructure but also determine the extent to which local communities, policymakers, and tourism operators support inclusivity in ecotourism destinations. Prior to the intervention, limited awareness and engagement on accessibility issues created systemic barriers, as many community members perceived ecotourism as an experience primarily designed for able-bodied individuals. This perception resulted in a lack of advocacy and policy support for accessibility improvements a view deeply rooted in cultural norms, limited exposure to disability rights discourses, and inadequate policy enforcement (Burns et al., 2021) ;

(Darcy et al., 2020). Consequently, the absence of accessible infrastructure reinforced the belief that people with disabilities were not part of the target demographic for ecotourism, demonstrating that without active efforts to shift public attitudes, accessibility remains an overlooked yet essential aspect of sustainable tourism planning.

Addressing deeply ingrained perceptions requires more than passive policy recommendations; it demands targeted interventions that actively foster behavioral change through educational initiatives, participatory workshops, and collaborative discussions with tourism stakeholders. Similar studies have demonstrated that structured educational programs and direct engagement with people with disabilities significantly impact public attitudes toward accessibility in tourism (McIntosh & Harris, 2022) ; (Shi et al., 2023). In this study, public support emerged as a driving force behind policy innovation, as a well-informed community became an active participant in advocating for regulatory reforms and infrastructure improvements. This aligns with previous research indicating that inclusive tourism policies are most effective when they are supported by community engagement and widespread public endorsement (Blichfeldt & Nicolaisen, 2021). The findings of this study underscore the significant role that community-based interventions play in shaping public attitudes toward ecotourism accessibility. The statistical analysis confirms a measurable difference between the experimental and control groups, with a Sig. (2-tailed) value of 0.001 ( $< \alpha = 0.05$ ) and a t-value of 3.524 ( $> 1.968$ ), highlighting the effectiveness of participatory approaches in fostering awareness of accessibility issues. However, the N-Gain score analysis, which yielded a value of 0.07, indicates that while the intervention introduced the concept of inclusivity in ecotourism, its overall impact on attitudinal shifts remained relatively low. This finding is consistent with behavioral change theories, which emphasize that altering deeply ingrained attitudes requires continuous exposure, repeated messaging, and experiential learning (Ajzen, 1991) ; (Bandura, 1997).

The limited impact of the intervention may be attributed to several key factors. First, the short duration of the intervention may have heightened awareness but was unlikely to induce lasting attitudinal shifts. Second, cultural and social norms that reinforce existing beliefs about disability and accessibility may have made immediate change difficult without ongoing reinforcement (Huang & Li, 2023). Third, the lack of direct engagement with people with disabilities could have limited the depth of attitudinal transformation, as studies suggest that personal interactions with affected groups foster empathy and more meaningful perception changes (Cai & Shi, 2022),

Given these findings, broader and more sustained strategies are essential to fostering lasting changes in public attitudes. This necessitates:

- Extended intervention periods, through long-term educational programs with multiple sessions to reinforce accessibility concepts;
- Community-driven advocacy, empowering local leaders and stakeholders to actively champion inclusivity in tourism planning and decision-making (Duignan et al., 2023)
- Experiential learning opportunities, where community members engage in direct interactions with individuals with disabilities in ecotourism settings, cultivating firsthand understanding of accessibility challenges (Giuntoli et al., 2024).
- Integration into policy frameworks, embedding accessibility education within local tourism policies and regulatory mechanisms to ensure continuous awareness and institutional commitment.

The success of the intervention can be attributed to key mechanisms that drive behavioral and attitudinal transformation, including:

- Active engagement and experiential learning, where participatory approaches enabled direct interaction, discussion, and reflection on accessibility barriers, fostering emotional and cognitive involvement (Kolb, 1984).

- Reflection and cognitive restructuring, where participants reassessed their perceptions through real-world case studies, testimonials, and scenarios, facilitating a deeper, empathy-driven shift in attitudes.
- Informational reinforcement through brochures, providing a lasting reference that enabled continued self-directed learning beyond the structured sessions.

These mechanisms align with Ajzen's *Theory of Planned Behavior* (1991), which explains attitude change through three key factors:

- Behavioral Beliefs, where participants developed positive perceptions of accessibility improvements after engaging in discussions and activities that highlighted their benefits.
- Normative Beliefs, where the intervention leveraged social influence through group discussions and shared experiences that reinforced inclusivity as a collective norm.
- Perceived Behavioral Control, where providing concrete information on how individuals and communities can contribute to accessibility improvements increased their sense of agency and motivation to take action.

Furthermore, the participatory nature of the intervention amplified the social reinforcement effect, aligning with previous research indicating that group-based learning fosters greater attitude change than individual learning (Burns et al., 2021). The findings also support Kolb's *Experiential Learning Theory* (1984), as participants engaged in interactive workshops, firsthand simulations of mobility challenges, and discussions with individuals with disabilities (*Concrete Experience*), followed by guided reflection sessions (*Reflective Observation*), connection of these insights to broader policy frameworks (*Abstract Conceptualization*), and translation of their learning into action (*Active Experimentation*). This structured experiential approach facilitated deep learning and emotional engagement, reinforcing previous studies indicating that experiential learning is more effective than passive information delivery in shaping public attitudes toward social inclusion (McConnell, 2018) ; (Ilyas et al., 2020)

To enhance the sustainability and scalability of attitudinal shifts, the study suggests three core approaches:

- Follow-up sessions and continued exposure, ensuring that interventions are not one-time events but part of an ongoing dialogue on accessibility in tourism.
- Firsthand experiences with individuals with disabilities, such as guided tours or collaborative planning workshops, to deepen understanding and foster long-term empathy.
- Policy and structural reinforcement, translating awareness into action by integrating accessibility education within tourism regulations and incentivizing inclusive tourism development.

Future research should explore the longitudinal effects of sustained community engagement on attitude transformation, assess the effectiveness of diverse educational formats (e.g., storytelling, participatory simulations, media campaigns) in shifting public perceptions, and analyze the role of policy enforcement and incentive mechanisms in promoting inclusive attitudes among tourism stakeholders. The findings of this study reinforce that structured, community-driven interventions are pivotal in fostering inclusive ecotourism policies. However, achieving sustainable and systemic change requires multi-stakeholder collaboration, continuous engagement, and policy reinforcement to ensure that ecotourism destinations evolve into truly accessible and inclusive spaces for all individuals, regardless of ability.

*Community Behavior*

Before the intervention, community behavior toward ecotourism accessibility for people with disabilities was largely uninformed, unstructured, and lacked proactive engagement, leading to minimal efforts in fostering an inclusive tourism environment. This condition reinforced accessibility barriers and restricted the participation of individuals with disabilities, a pattern consistent with findings from (Hall, 2019) and (Darcy et al., 2020), which highlight that community perceptions, social norms, and behavioral tendencies significantly influence the inclusivity of tourism policies and practices. The absence of foundational knowledge about accessibility needs resulted in a lack of collective responsibility among community members to create an inclusive tourism landscape, further exacerbating exclusionary practices (Packer et al., 2020).

The limited engagement and awareness of accessibility in ecotourism before the intervention were influenced by several interrelated factors:

- Lack of direct exposure to accessibility challenges, which resulted in low empathy and awareness among community members. Many had never witnessed the struggles faced by disabled visitors, reinforcing the assumption that ecotourism sites did not require modifications. This perspective aligns with Bandura's (1986) Social Cognitive Theory, which emphasizes learning through observation and direct experience.
- Normalization of inaccessibility, where ecotourism destinations were perceived as inherently designed for able-bodied visitors. This created a self-reinforcing cycle that discouraged disabled tourists and solidified the belief that accessibility improvements were unnecessary. Such collective societal beliefs are explained by Moscovici's (1984) Theory of Social Representation, which suggests that dominant social narratives shape community attitudes and behaviors (Levine & Karner, 2023)
- Knowledge gaps on inclusive tourism and policy guidelines, as many tourism operators and local businesses were unaware of best practices for accessible tourism, hindering structured efforts to implement inclusive policies. This gap is well-documented in (Skrobotova et al., 2023), who emphasize education as a key driver of behavioral change in tourism sustainability.
- Weak institutional support and policy implementation, where, despite some community willingness to improve accessibility, the absence of structured policy enforcement led to inconsistent efforts. Local governments and tourism authorities had not prioritized accessibility in infrastructure planning, training programs, or funding allocations. This underscores the need for a multi-stakeholder approach (Huttunen et al., 2022) to ensure systemic and sustainable accessibility improvements.

These behavioral and systemic shortcomings resulted in persistent accessibility challenges, including:

- Physical barriers: Inaccessible pathways, steep terrains, and the absence of ramps made navigation difficult for individuals with mobility impairments.
- Social and attitudinal barriers: Misconceptions that accessibility modifications were either too costly or unnecessary limited community willingness to assist disabled visitors.
- Economic and policy barriers: Many businesses failed to recognize the economic potential of accessible tourism, while local policies lacked concrete implementation strategies. This aligns with (Scheyvens & Biddulph, 2018), who argue that without institutional enforcement, accessibility remains an afterthought in tourism development.

Given these ingrained norms and structural barriers, community-based interventions were essential in shifting public behavior toward a more inclusive approach to ecotourism accessibility. The study's findings indicate that educational programs, participatory workshops, and experiential learning approaches played a

crucial role in fostering attitudinal and behavioral change. (Darcy et al., 2020), highlight that awareness campaigns and direct engagement with disabled individuals are among the most effective strategies for long-term behavioral transformation.

Statistical analysis demonstrated a significant difference between the experimental and control groups (Sig. (2-tailed) = 0.001 <  $\alpha$  = 0.05, t-value = 4.022 > 1.968), confirming the effectiveness of the participatory approach in influencing community behavior toward inclusive ecotourism. However, the N-Gain score analysis (0.07) indicated that the intervention had a low impact on behavioral change, suggesting that while some adaptation occurred, long-term transformation remained limited. These findings highlight the need for more sustained interventions, reinforcement strategies, and community engagement efforts to ensure long-term behavioral shifts.

The relatively low N-Gain score suggests several factors contributed to the limited long-term impact:

- Short duration of the intervention, which introduced the concept of inclusivity but did not provide sufficient reinforcement for habit formation or deep-rooted attitudinal shifts. This is consistent with the Transtheoretical Model of Behavioral Change (Prochaska & DiClemente, 1983), which posits that behavioral change is a gradual process requiring multiple stages of reinforcement.
- Persistence of social and cultural norms, as deeply ingrained societal attitudes toward disability inclusion may have limited the intervention's long-term impact. According to (Ajzen, 1991). Theory of Planned Behavior, behavioral change often regresses to pre-existing norms without broader social reinforcement.
- Limited opportunities for practical application and reinforcement mechanisms, as the intervention focused on theoretical knowledge but lacked continuous real-world practice. This aligns with Kolb's (1984) Experiential Learning Framework, which emphasizes that sustained behavioral change is more likely when individuals repeatedly engage in applied learning experiences (Huttunen et al., 2022).

Given the intervention's limited impact on long-term behavioral adaptation, several strategies are necessary to enhance and sustain community engagement:

#### *Extending the duration of interventions*

- Implement longitudinal and multi-phase interventions that reinforce behavioral change through periodic refresher training and structured monitoring.
- Integrate behavioral reinforcement strategies such as role-based learning, where tourism operators and community leaders model inclusive behaviors (Bandura, 1986).

#### *Strengthening policy and institutional support*

- Ensure that local governments integrate community-based accessibility programs into tourism development policies.
- Foster multi-stakeholder collaboration to align behavioral change efforts with broader institutional frameworks, creating a foundation for long-term systemic transformation.

#### *Enhancing experiential learning opportunities*

- Expand the use of simulations and role-playing exercises, allowing participants to experience accessibility challenges firsthand (Cai & Shi, 2022),

- Encourage community-led accessibility projects, such as modifying tourism facilities, to reinforce practical implementation and ownership of accessibility improvements.

#### *Policy-driven reinforcement*

- Embed accessibility training mandates for tourism stakeholders (guides, operators, hospitality staff).
- Establish regulatory frameworks enforcing accessibility standards in ecotourism destinations.
- Promote public-private partnerships to fund and sustain community-based accessibility initiatives (Packer et al., 2020).

Sustaining behavioral change toward inclusive ecotourism requires continuous reinforcement through extended engagement, experiential learning, and policy-driven support (Lai & Cole, 2020). Research on behavioral psychology (Skinner, 1953) and habit formation (Lally et al., 2010), suggests that individuals require prolonged engagement to transition from awareness to sustained behavior change.

To ensure that inclusive tourism policies are deeply rooted in community participation, it is crucial to bridge grassroots initiatives with policy frameworks. This includes:

- Integrating community-based interventions into tourism development plans to ensure accessibility programs become structural priorities rather than temporary initiatives.
- Fostering collaborative decision-making by adopting a multi-stakeholder approach, where government agencies, private sector actors, and local communities co-develop policies.
- Implementing incentive-based compliance strategies, such as financial incentives for businesses implementing accessibility measures, recognition programs for inclusive ecotourism operators, and community grants supporting accessibility initiatives.

By reinforcing behavioral interventions with policy frameworks and long-term strategies, community-driven interventions can serve as catalysts for systemic change, embedding inclusive tourism practices into local governance and tourism management, ensuring that ecotourism remains equitable, sustainable, and accessible to all visitors.

#### *Policy Implications for Inclusive Ecotourism*

The insights gained from this study provide a strong foundation for policymakers and tourism stakeholders to refine their approaches to inclusive ecotourism development. The intervention's impact on knowledge, attitudes, and behavior highlights the potential for community-driven initiatives to complement formal policy efforts in making ecotourism more accessible. The following policy recommendations emerge from the findings:

- **Integration of Accessibility Education in Tourism Training Programs:** Tourism operators, guides, and service providers should receive training on best practices for accommodating travelers with disabilities, ensuring that inclusivity becomes a core component of service delivery.
- **Incorporation of Inclusive Infrastructure in Ecotourism Planning:** Governments and local authorities should prioritize the development of accessible facilities, including pathways, rest areas, and signage, in protected natural areas and other ecotourism sites.

- Expansion of Community-Based Awareness Campaigns: Long-term sustainability of inclusive tourism policies requires continuous community engagement through interactive campaigns, stakeholder collaborations, and participatory planning processes.
- Implementation of Incentives for Inclusive Tourism Practices: Financial or regulatory incentives could be introduced to encourage tourism businesses to adopt accessibility standards, making inclusive tourism a competitive advantage rather than a compliance requirement.

## Conclusion

This study provides empirical evidence on the effectiveness of community-based interventions in promoting inclusive ecotourism by enhancing public awareness, fostering positive attitudes, and encouraging behavioral changes toward accessibility. The findings highlight that while the interventions were successful in initiating shifts in knowledge, attitudes, and behaviors, sustained efforts are required to ensure long-term transformation and policy integration. The key results are as follows:

### Community Knowledge

The intervention significantly improved public understanding of the importance of accessibility in ecotourism. Participants demonstrated increased awareness of the challenges faced by individuals with disabilities and recognized the necessity of inclusive infrastructure and services at tourism destinations. However, gaps remain in translating this knowledge into concrete action, underscoring the need for continuous education and engagement strategies.

### Community Attitudes

There was a noticeable positive shift in public attitudes toward ecotourism accessibility, with increasing acceptance of inclusivity as a fundamental principle of sustainable tourism. Nevertheless, while short-term attitudinal changes were evident, long-term commitment remains fragile. Deep-seated social norms and pre-existing misconceptions about disability continue to pose challenges, emphasizing the need for reinforcement through policy support, community participation, and stakeholder collaboration.

### Community Behavior

Behavioral improvements were observed, particularly in increased willingness to support accessibility initiatives and assist disabled tourists. However, practical implementation remains limited due to structural and institutional barriers. The intervention's relatively low impact on sustained behavioral change suggests that additional measures—such as policy-driven reinforcements, extended training programs, and stronger institutional commitments—are essential for embedding inclusivity into ecotourism management practices.

### Author Contributions

Hairudin La Patilaiya, Ari Natalia Probandari, Hartono, and Sunarto all contributed as authors in data analysis, result interpretation, manuscript preparation, and the creation of all maps and figures.

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### **Conflict of Interest**

There is no potential conflict of interest with the authors.

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### **Disclosure Statement**

The authors declare that there is no conflict of interest regarding the publication of this paper. All procedures performed in the study were in accordance with the ethical standards of the institutional and national research committee. Informed consent was obtained from all individual participants involved in the study. No external funding was received for this research.

### **Ethical Approval Statement**

Ethical approval for this study was obtained from the Health Research Ethics Commission of Dr. Moewardi Hospital (Approval No. 2.355/XII/HREC/2023). This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki, ensuring the protection of human participants' rights, safety, and well-being.

### **Informed Consent Statement**

Informed consent for participation in this study was obtained from all participants before their involvement. Participants were provided with a detailed explanation of the study objectives, research procedures, potential risks, and benefits. Written informed consent was obtained to ensure clarity and compliance with ethical research standards.

For participants who were minors, informed consent was secured from their legal guardians, who were fully informed about the study before providing approval. Additionally, assent was obtained from the minors themselves to confirm their willingness to participate, following ethical research guidelines.

This study adheres to the ethical principles outlined in the Declaration of Helsinki, ensuring the protection of participants' rights, safety, and well-being.

### **Data Availability Statement**

A separate data availability statement has been included at the end of the article, explaining how the data may be accessed and any restrictions due to ethical or privacy concerns. The data was obtained based on Research Recommendation No. 00092/02/BKBP/2024 issued by the Government of Ternate City, the National Unity and Political Agency, and Research Permit No. 0352/UN27.20.4.1/D'I/2023 issued by the Ministry of Education, Culture, Research, and Technology, Universitas Sebelas Maret, School of Postgraduate Studies, Doctoral Program in Environmental Science.

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