

Strategic Management of Sustainable Tourism Development in North Sumatra Province Through the Implementation of Attractions, Accessibility, Amenities, and Ancillary Services

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Abstract. This study aims to analyse sustainable tourism development strategies in North Sumatra Province through a quantitative approach that employs the Smart-PLS method. The research model tests the direct and indirect effects of amenities, accessibility, and ancillary services on sustainable tourism development strategies, both directly and through the mediating role of tourist attractions. Data were gathered via a survey of 100 respondents from various locations across the province. The outer-model analysis shows that all indicators are valid and reliable, with loading factors exceeding 0.7 and composite reliability values above 0.7. The inner model reveals that amenities, accessibility, and ancillary services significantly influence tourism development strategies, whereas tourist attractions exert no significant direct effect. R-square values of 0.778 for tourism development strategy and 0.663 for tourist attractions indicate strong predictive power for the model. Indirect-effect analysis demonstrates that the exogenous variables contribute to strategy formulation through the mediation of tourist attractions, even though attractions are not statistically significant in shaping the strategy. These findings highlight the need to prioritise the improvement of amenities, the upgrading of accessibility infrastructure, and the strengthening of supporting services within sustainable tourism policies. Overall, the results provide an empirical foundation for local governments to design measured, locally grounded tourism development strategies that enhance destination competitiveness both nationally and internationally.

Keywords: Smart-PLS; Development Strategy; Sustainable Tourism; North Sumatra

1. Introduction

Tourism is one of the strategic sectors in regional economic development, including in North Sumatra Province which has natural, cultural, and historical wealth. However, this great potential has not been fully managed properly. Various obstacles are still encountered, such as inadequate infrastructure, limited facilities, lack of supporting services, and low utilization of digital technology in the promotion of tourist destinations. This is in line with the findings of which show that some mangrove ecotourism areas in North Sumatra still require the development of tourist facilities to improve visitor comfort [1].

This condition has an impact on the stagnation of tourism sector growth, which is reflected in the Location Quotient (LQ) value of the accommodation and food and beverage sector in North Sumatra which tends to be below 1 during the 2019–2023 period. The low performance of this sector shows the need for a data-based development strategy so that the tourism sector is able to become the base sector of the regional economy. In line with the views of tourism development strategies in North Sumatra must be designed more adaptive and based on local competitiveness [2].

In addition to infrastructure issues, the quality of human resources (HR) in the tourism sector also still needs to be improved. The lack of skills and professionalism in the management of tourist destinations causes the low competitiveness of North Sumatra. This is in line with which emphasizes the importance of training and capacity building of tourist destination managers in improving the quality of services [3]. On the other hand, local people's awareness of the importance of sustainable tourism is also not optimal, so efforts to preserve the local environment and culture are often neglected, as found by in a case study in Tigaras Village, Simalungun Regency [4].

North Sumatra, which in the 1980s was known as one of the three main tourist destinations with Lake Toba as an icon, is now experiencing a decline in tourist visits. Medan as the provincial capital has also not been able to present a tourist experience that encourages tourists to linger for a long time. stated that the COVID-19 pandemic has further worsened this condition, where tourism recovery in Sumatra requires a different strategy compared to other provinces [5].

Recognizing these challenges, the study adopted the 4A (Attraction, Accessibility, Amenities, and Ancillary) framework as an analytical approach. This model allows the identification of the main factors that contribute to the development of sustainable tourism, as well as provides an empirical picture of the right strategy to strengthen the competitiveness of tourist destinations in North Sumatra. Referring to, these four components have been shown to have a significant effect on tourist satisfaction and loyalty [6].

With a quantitative approach based on Smart-PLS, this study aims to examine the direct and indirect influence of facility variables, accessibility, additional services, and tourism attractiveness on sustainable tourism development strategies. The results of the research are expected to make a theoretical contribution to the development of sustainable tourism literature [7][8][9], as well as offer practical recommendations for local governments, tourism industry players, and local communities in formulating policies and implementable strategies in the field.

2. Literature Review

2.1 Research Roadmap

This research is in line with the roadmap of the Faculty of Economics, State University of Medan and the Business Education Study Program, especially in the field of sustainable tourism strategy management and digital marketing based on data analytics. The focus of the research is directed at strengthening the tourism development strategy based on the 4A model (Attraction, Accessibility, Amenities, and Ancillary) to support the improvement of regional tourism competitiveness as shown in figure 1.

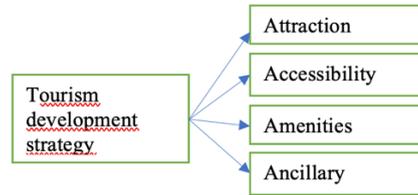


Figure 1. Research Road Map

2.2 Theoretical foundations

Tourism in Indonesia has long been recognized as a potential sector for community economic development, as stated in Law No. 9 of 1990 concerning Tourism [7]. Current tourism development emphasizes the principle of sustainability which includes the long-term use of natural and human resources [9]. In the context of sustainability, tourism social responsibility and community participation are decisive factors in maintaining social, economic, and environmental balance [10][11][12].

Several studies highlight that tourism sustainability is strongly influenced by community management, employment opportunities, environmental awareness, and social entrepreneurship innovation [11][12][13]. This shows that a tourism development strategy is not enough to focus only on natural or cultural attractions, but also requires the support of additional facilities, accessibility, and professionally managed services.

2.3 Relevant Research

Various previous studies confirm the importance of applying the 4A model in tourism development.) Stakeholder commitment and performance significantly affect the sustainability of tourism villages [14]. Aspects of safety and pleasure as important factors in cave geotourism [15]. Emphasized that facilities and accessibility are the main factors in supporting sustainable destinations [16].

Furthermore prove that attraction, accessibility, amenities, and ancillary affect visitor satisfaction and attitude loyalty [6]. Meanwhile the importance of tourism investment that is in line with the principles of environmental sustainability to avoid the effects of "pollution paradise" [17].

2.4 Conceptual framework

Based on a literature review, this study modeled the relationship between the variables of facilities (X1), accessibility (X2), additional services (X3), and tourist attraction (Z) to sustainable tourism development strategies (Y). The model was tested with **the Smart-PLS** approach to identify both direct and indirect influences, as well as to see the potential mediating role of tourist attractions.

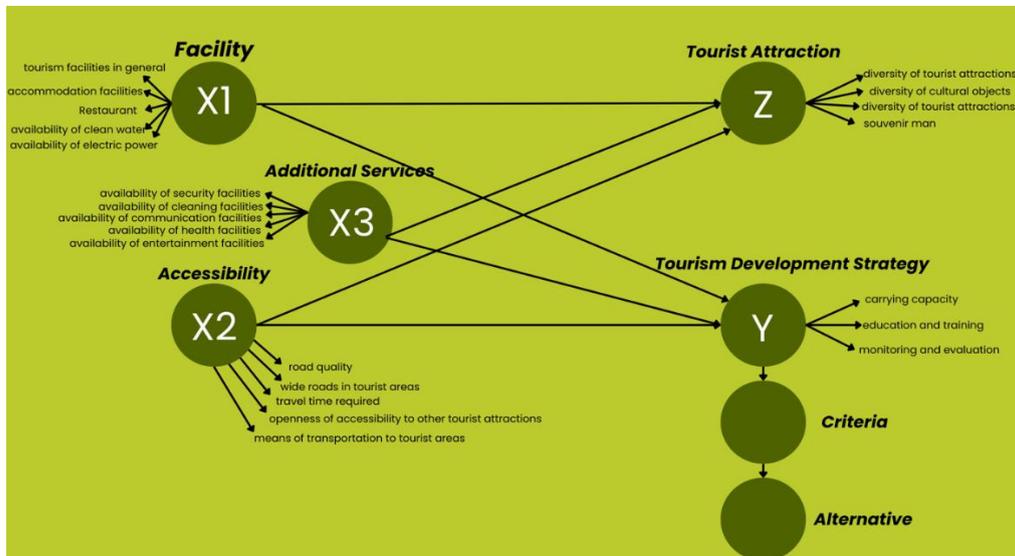


Figure 2. Conceptual Framework

Figure 2 illustrates the conceptual framework of this study. It shows how Facilities (X1), Accessibility (X2), and Additional Services (X3) act as independent variables that directly influence the Sustainable Tourism Strategy (Y). Additionally, Tourist Attraction (Z) serves as a mediating variable to test the indirect effects of these three factors. Overall, this framework simply explains how tourism infrastructure and services work together to support sustainable tourism development in North Sumatra.

3. Method

3.1 Types and Design of Research

This study uses a quantitative approach with an explanatory research design to test the causal relationship between variables. The analysis was carried out using the Partial Least Square – Structural Equation Modeling (PLS-SEM) method, which was considered suitable for analyzing models with many latent variables and indicators [18][19][20].

3.2 Research Location and Time

The research was conducted in North Sumatra Province in 2025, focusing on respondents who had visited one of the tourist destinations in 8 cities and 25 districts in the province.

3.3 Population and Sample

The research population amounted to 15,471,582 people, namely the entire population spread across 33 districts/cities in North Sumatra. The sampling technique was carried out by non-probability sampling type of accidental sampling. Using the Slovin formula with an error rate of 10%, a sample of 100 respondents was obtained.

3.4 Data Types and Data Collection Techniques

The data used consisted of:

1. Primary data: collected through field observations, in-depth interviews, focus group discussions (FGDs), and structured questionnaires.
2. Secondary data: obtained from literature, official government reports, and tourism-related publications in North Sumatra.

The research instrument is in the form of a questionnaire with a Likert scale of 1–5, including indicators of facilities, accessibility, additional services, tourist attractions, and sustainable tourism development strategies.

3.5 Research Variables

1) Facilities (X1)

The Facilities (X1) variable encompasses the essential physical infrastructure and amenities provided to meet the basic needs of tourists during their visit. In this study, this variable is measured through several key indicators, including the general availability of tourist facilities, the quality of accommodation, and the presence of restaurants. Furthermore, fundamental utilities such as the availability of clean water and reliable electricity are also critical components evaluated within this construct.

2) Accessibility (X2)

Accessibility (X2) refers to the ease with which visitors can reach, enter, and navigate the tourist destinations. This variable is assessed using indicators that measure the physical condition of the local infrastructure, specifically the road quality and road width within the tourist areas. Additionally, it evaluates the travel time required to reach the locations, the openness of connectivity to other tourist attractions, and the availability of adequate means of transportation.

3) Additional Services (X3)

Additional Services (X3), also known as ancillary services, represents the supplementary support systems that enhance the overall safety, comfort, and well-being of tourists. This construct is operationalized through indicators that evaluate the availability of entertainment options and security facilities. Moreover, it includes the provision of essential public services, specifically hygiene facilities, health facilities, and reliable communication networks, all of which contribute to a positive and secure tourist experience.

4) Tourist Attraction (Z)

The Tourist Attraction (Z) variable acts as a mediating construct in this research model and represents the core features and unique characteristics that draw visitors to a destination. It is measured by evaluating the diversity of activities available to tourists and the variety of local souvenirs provided. Furthermore, this variable captures the richness of the destination's heritage and natural beauty through the diversity of cultural objects and the variety of the tourist attractions themselves.

5) Sustainable Tourism Strategy (Y)

The Sustainable Tourism Strategy (Y) serves as the dependent variable, reflecting the

comprehensive and long-term approach required to manage and develop tourism responsibly. This variable is evaluated through indicators focusing on destination management, specifically understanding and maintaining the carrying capacity of the tourist areas. It also encompasses the implementation of continuous monitoring and evaluation mechanisms, alongside the provision of relevant education and training programs to ensure that human resources are equipped to support sustainable practices.

3.6 Data Analysis Techniques

Data analysis was carried out using Smart-PLS. Testing is carried out in several stages:

1. Outer Model: convergent validity test, discriminant validity, construct reliability [18].
2. Inner Model: determination test (R^2), fit model, and hypothesis evaluation through bootstrapping [19].
3. Effect Analysis: testing the direct *effects* and indirect effects between variables [20].

This approach was chosen because PLS-SEM is flexible for small to medium-sized data, and can handle both reflective and formative research models [18][19].

4. Results and Discussion

4.1. Evaluation of Measurement Models

External model **testing** showed that all indicators met the convergent validity criteria with a loading factor value above 0.7 (Table 1). This indicates that each indicator is able to represent a well-measured construct [18].

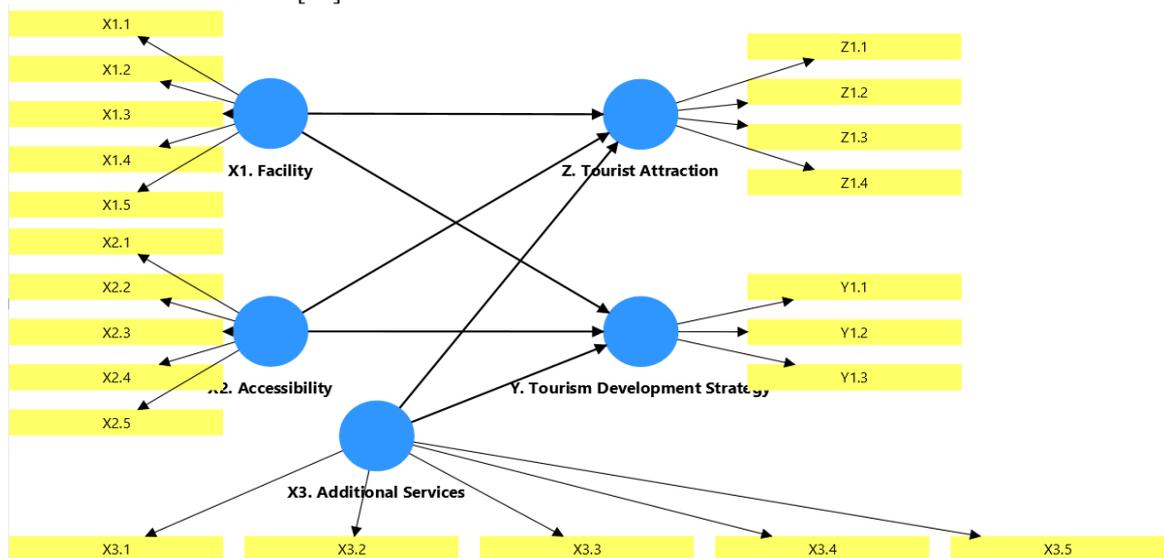


Figure 3. Research Model in Smart-PLS

Figure 3 presents the conceptual research model constructed and visualized using the Smart-PLS software. This model comprehensively illustrates the two primary components in Partial

Least Squares (PLS) analysis: the outer model (measurement model) and the inner model (structural model). Within the outer model, the figure demonstrates how each indicator is reflectively connected to measure its respective latent construct. Meanwhile, the inner model is represented by directional arrows that map the hypothesized research paths, encompassing both the direct effects of the exogenous variables namely Facilities (X1), Accessibility (X2), and Additional Services (X3) on the Sustainable Tourism Strategy (Y), as well as their indirect effects mediated by the Tourist Attraction (Z) variable. Overall, this visualization serves as the foundational structural framework that will be further evaluated to test the validity, reliability, and significance of each path relationship between the variables in this study.

4.1.1 Outer Model Testing

A. Convergent Validity

Convergent Validity is performed by looking at the item reliability indicated by the loading factor value which shows the correlation between a question item and the constraint indicator that measures the constraint indicator. The convergent validity in this study was tested through the loading factor value using the Smart-PLS 4.0 application, with the reference that an indicator is declared valid if it has a loading factor value above 0.7.

Table 1. Results of Convergent Validity Literacy Model

Indicators	Outer Loadings	Information
X1. Availability of Clean Water	0.743	Meet
X1. Availability of Electricity	0.704	Meet
X1. Restaurant	0.744	Meet
X1. Accommodation Facilities	0.769	Meet
X1. Tourist Facilities in General	0.780	Meet
X2. Openness of accessibility to other tourism	0.881	Meet
X2. Highway Quality	0.803	Meet
X2. Road Width in Tourist Areas	0.916	Meet
X2. Transportation Facilities to Tourist Areas	0.920	Meet
X2. Travel Time Required	0.923	Meet
X3. Availability of Entertainment Facilities	0.865	Meet
X3. Availability of Security Means	0.891	Meet
X3. Availability of Hygiene Facilities	0.774	Meet
X3. Availability of Health Facilities	0.764	Meet
X3. Availability of Communication Facilities	0.844	Meet
Y. Carrying Capacity	0.851	Meet
Y. Monitoring & Evaluation	0.847	Meet
Y. Education & Training	0.843	Meet
Z. Diversity of Tourism Activities	0.830	Meet
Z. Variety of souvenirs provided	0.808	Meet
Z. Diversity of Cultural Objects	0.850	Meet
Z. Diversity of Tourist Attractions	0.832	Meet

Based on the test results, all indicators in each variable show the value of the loading factor that meets these criteria. Thus, all indicators are declared valid in measuring their constructs

consistently, and the model used has qualified convergent validity to be used at the next stage of analysis.

Table 1 presents the results of the convergent validity test, which evaluates the reliability of the measurement model by examining the correlation between individual indicator items and their respective latent constructs. In this study, the evaluation was conducted using the Smart-PLS 4.0 application, utilizing a standard threshold where an indicator is deemed valid and highly reliable if its outer loading factor exceeds 0.70. The statistical output reveals that all indicators across the five research variables Facilities (X1), Accessibility (X2), Additional Services (X3), Sustainable Tourism Strategy (Y), and Tourist Attraction (Z) successfully meet and exceed this criterion. Specifically, the loading factors range from a minimum value of 0.704 for the availability of electricity indicator (X1) to a maximum value of 0.923 for the travel time required indicator (X2).

Because every measurement item yielded an outer loading value greater than the 0.70 threshold, all indicators are formally declared valid. This indicates that the indicators consistently and accurately measure their intended underlying constructs. For instance, all items under the Accessibility (X2) construct demonstrated exceptionally strong validity, with four out of five indicators scoring above 0.800. Consequently, it can be concluded that the measurement model possesses robust convergent validity, fulfilling the necessary prerequisites to be utilized in the subsequent stages of structural model evaluation and hypothesis testing.

B. Construct Reliability And Validity

The next evaluation is to compare the root value of AVE (*Aggregate Variance Extracted*) with the correlation between constraints where the root value of AVE must be higher than the correlation between constraints. The literacy model will have *better discriminant validity* if the square root of AVE for each constructor is greater than the correlation between the two constructors in the model. A good AVE value has a value greater than 0.5.

Table 2. AVE Value Results

Variable	Extracted Variance (AVE)
(X1) Facilities	0.560
(X2) Accessibility	0.792
(X3) Additional Services	0.687
(Y) Tourism Development Strategy	0.718
(Z) Tourist Attractions	0.689

Table 2 presents the Average Variance Extracted (AVE) results used to evaluate the model's reliability and validity. As shown in the table, all variables successfully exceed the minimum requirement of 0.50. Specifically, the AVE values are 0.560 for Facilities, 0.792 for Accessibility, 0.687 for Additional Services, 0.718 for Tourism Development Strategy, and 0.689 for Tourist Attractions. Because all values are greater than 0.50, it means the measurement indicators perfectly represent their respective variables. Consequently, both convergent and discriminant validity are fully accepted, proving that the measurement model is highly valid and ready for the next testing stage.

4.1.2. Inner Model Testing

A. *Analysis of Variance (R Square)*

The results of the variance analysis (R^2) showed that the research model had a strong predictive ability. The R^2 value for the Tourism Development Strategy (Y) variable is 0.778, which means that 77.8% of the variation in the tourism development strategy can be explained by the variables of facilities, accessibility, additional services, and tourist attractions. The remaining 22.2% was influenced by other factors outside of this research model. Meanwhile, the R^2 value for the Tourist Attraction (Z) variable was 0.663, which indicates that 66.3% of the variation in tourist attraction can be explained by the variables of facilities, accessibility, and additional services, while the remaining 33.7% is explained by other factors. Thus, both tourism development strategies and tourist attractions are in a strong category, so that the model used in this study is able to predict the relationship between the variables studied

B. *F-Square Analysis*

The analysis of the F-Square value was carried out to see the magnitude of the effects between variables in the research model. The results of the analysis showed that the Facility variable (X1) had a major effect on the Tourism Development Strategy (Y) with an F Square value of 0.191, which exceeded the threshold of 0.15. This confirms that facilities are the dominant factor that actually encourages the sustainable tourism development strategy in North Sumatra. Furthermore, the Accessibility variable (X2) showed a small effect on the tourism development strategy with an F Square value of 0.145, and a small effect on Tourist Attraction (Z) with a value of 0.038. This means that although accessibility is important in improving the comfort of travelers, its influence on tourism strategies and attractions is not as big as facilities.

The Additional Services variable (X3) also had a small effect on both tourism development strategies (0.111) and tourist attractions (0.122). These results show that additional services contribute to improving the traveller experience, but the scale is relatively smaller than that of facilities. Meanwhile, the relationship between the variable of Tourist Attraction (Z) and the Tourism Development Strategy (Y) showed an F Square value of 0.004, which is classified as very weak and negligible. These findings reinforce the results of previous testing that tourism attractions do not have a significant direct influence on tourism development strategies, but rather function as basic capital that needs the support of other factors to have a real impact.

C. *Hypothesis Testing*

Hypothesis testing was carried out based on the results of the internal test of the Model which included *r-square output*, parameter coefficients and t-statistics. To see whether a hypothesis is acceptable or not, among other things, by paying attention to the significance values between contracts, t-statistics and p-values. The hypothesis test of this study is seen from the results of *bootstrapping* with a statistical t-value ratio must be greater than 1.96 with a significance level of p-value of 5% and a beta coefficient of positive value.

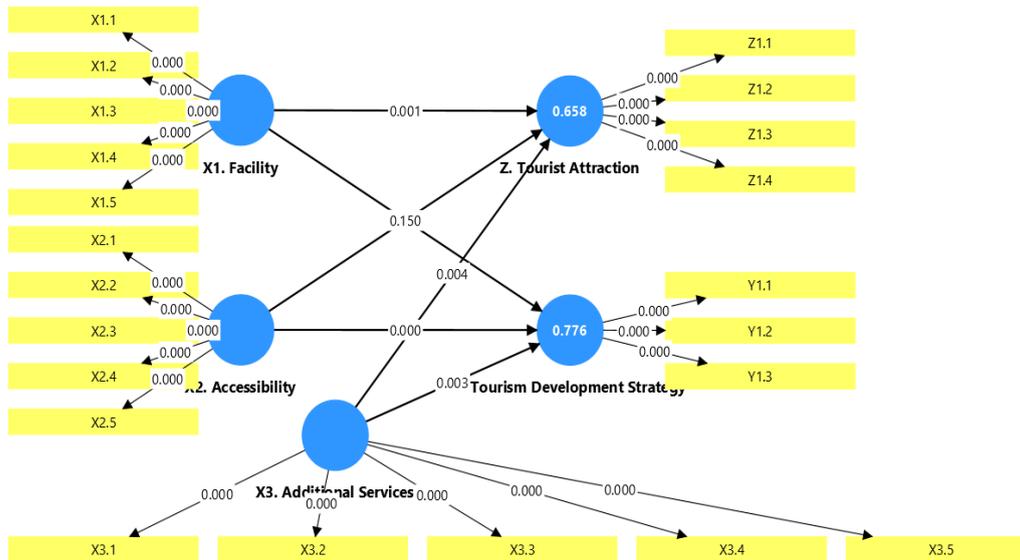


Figure 4. Bootstrapping Value Results

Based on the figure, it shows that all variables consisting of Facilities, Accessibility, Additional Services and Tourist Attraction have *p-values* of less than 0.05 to the variables of the Tourism Development Strategy.

Figure 4 presents the bootstrapping value results from the inner model testing, which visually demonstrates the significance of the causal relationships between the research constructs. The bootstrapping procedure is utilized to evaluate the structural model's hypotheses by calculating the parameter coefficients, t-statistics, and p-values for each structural path. In this analysis, a relationship is considered statistically significant and the corresponding hypothesis is accepted if the generated t-statistic is greater than 1.96 and the p-value is less than the 0.05 (5%) significance level. Consequently, this figure illustrates the statistical foundation used to determine the impact of Facilities, Accessibility, Additional Services, and Tourist Attraction on the Tourism Development Strategy, guiding the final conclusions of the proposed model.

Table 3. Hypothetical Results

	The Original L (O)	Sample average (M)	Standard deviation (STDEV)	T statistics (O/STDEV Düssel)	P value (P values)
(X1) Facilities -> (Y) Strategy Tourism Development	0.405	0.417	0.106	3.814	0.000
(X1) Facilities -> (Z) Attraction Tour	0.404	0.419	0.113	3.566	0.000
(X2) Accessibility -> (Y) Strategy Tourism Development	0.254	0.255	0.073	3.488	0.000
(X2) Accessibility -> (Z) Power Attraction	0.158	0.140	0.100	1.589	0.112

(X3) Additional Services -> (Y) Tourism Development Strategy	0.274	0.270	0.101	2.727	0.006
(X3) Additional Services -> (Z) Tourist Attractions	0.333	0.338	0.114	2.916	0.004
(Z) Tourist Attraction -> (Y) Tourism Development Strategy	0.052	0.045	0.069	0.750	0.453

The first to the seventh hypotheses, as presented in Table 3, test whether each variable of Facilities, Accessibility, Additional Services, and Tourist Attraction has a positive and significant effect on the Tourism Development Strategy, as follows:

- a. The first hypothesis is that there is a significant positive influence shown by the value of the beta coefficient X1 to Y of 0.405 and the statistical t of 3.814 so that it has a P value of 0.000 which is smaller than the alpha value of 5%.
- b. The second hypothesis has a significant positive influence shown by the value of the beta coefficient X2 against Y of 0.254 and the statistical t of 3.488 so that it has a P value of 0.000 which is smaller than the alpha value of 5%.
- c. The third hypothesis has a significant positive influence shown by the value of the beta coefficient X3 to Y of 0.274 and the statistical t of 2.727 so that it has a P value of 0.006 which is smaller than the alpha value of 5%.
- d. The fourth hypothesis is that there is a negative influence that is not significant, shown by the value of the beta coefficient of Z to Y of 0.052 and the statistical t of 0.750 so that it has a P value of 0.453 which is greater than the alpha value of 5%.
- e. The fifth hypothesis has a significant positive influence shown by the value of beta coefficient X1 to Z of 0.404 and statistical t of 3.566 so that it has a P value of 0.000 which is smaller than the alpha value of 5%.
- f. The sixth hypothesis has a negative influence that is not significant, shown by the value of the beta coefficient X2 to Z of 0.158 and the statistical t of 1.589 so that it has a P value of 0.112 which is greater than the alpha value of 5%.
- g. The seventh hypothesis has a significant positive influence shown by the value of beta coefficient X3 to Z of 0.333 and statistical t of 2.916 so that it has P values of 0.004 which is smaller than the alpha value of 5%.

4.1.3. Research Model Analysis

A. Direct Effects

In PLS SEM analysis, direct effects are called path coefficients. Path coefficients are measured between constructs to see the significance and strength of the relationship and to test hypotheses. The value of path coefficients ranges from -1 to 1. The closer it is to 1, the stronger the relationship between the constructs; the closer it is to -1, the more negative it is (Sarstedt et al. 2020).

As presented in Table 4, the results of the direct effects for this research model detail the specific path coefficients for each hypothesized relationship. This table outlines the statistical outcomes used to determine the exact strength and direction of the impact that variables such as Facilities, Accessibility, Additional Services, and Tourist Attraction have on the Tourism Development Strategy. Based on these calculated values, the significance of each construct's influence can be clearly assessed to validate the proposed hypotheses, as follows:

Table 4. Direct Effects Value Results

	(X1)	(X2)	(X3)	(Y)	(Z)
(X1) Facilities				0.405	0.404
(X2) Accessibility				0.254	0.158
(X3) Additional Services				0.274	0.333
(Y) Tourism Development Strategy					
(Z) Tourist Attractions					0.052

1. The direct influence of the X1 variable on the Z variable is 0.404, which indicates that when the X1 variable increases, the Z variable also increases significantly.
2. The direct influence of the X1 variable on the Y variable is 0.405, which indicates that when the X1 variable increases, the Y variable also increases significantly.
3. The direct influence of the X2 variable on the Z variable is 0.158, which indicates that when the X2 variable increases, the Z variable also increases significantly.
4. The direct influence of the X2 variable on the Y variable is 0.254, which indicates that when the X2 variable increases, the Y variable also increases significantly.
5. The direct influence of the X3 variable on the Z variable is 0.333, which indicates that when the X3 variable increases, the Z variable also increases significantly.
6. The direct influence of the X3 variable on the Y variable is 0.274, which indicates that when the X3 variable increases, the Y variable also increases significantly.
7. The direct influence of the Z variable on the Y variable is 0.052, which indicates that when the Z variable increases, the Y variable also increases significantly.

4.2. Discussion

The results of this study provide a clear picture of the determining factors in the sustainable tourism development strategy in North Sumatra Province. First, facilities have been proven to have a positive and significant effect on tourism development strategies. These findings confirm that the availability of facilities such as accommodation, restaurants, clean water, and electricity not only supports tourism activities, but also increases the comfort and satisfaction of visitors.

In the context of sustainability, adequate facilities can reduce the environmental burden through environmentally friendly infrastructure planning, as well as strengthen the competitiveness of destinations at the national and international levels [6][16].

Second, **accessibility** also has a significant effect on tourism development strategies. This shows that the quality of highways, transportation facilities, and ease of connectivity to tourist destinations are important factors in increasing the number of tourist visits. However, the results of the mediation test showed that accessibility did not significantly increase tourist attraction. Thus, the role of accessibility is stronger in facilitating the mobility of tourists than in shaping the perception of the uniqueness of the destination [18][16].

Third, **additional services** have a positive and significant influence on tourism development strategies, as well as contribute to increasing tourist attraction. Additional services such as entertainment, security, health, hygiene, and communication create a safer, more comfortable, and enjoyable travel experience. This is in line with the principles of sustainable tourism which emphasize the importance of social aspects and the well-being of tourists [6][13].

On the other hand, **tourist attractions** do not have a significant direct effect on tourism development strategies. This result is quite interesting, considering that North Sumatra has great natural and cultural potential, such as Lake Toba and Batak cultural heritage. However, this potential has not been optimal to improve development strategies because it is not supported by adequate facilities, accessibility, and additional services. Thus, tourism attractions play a more role as basic capital that requires the support of supporting factors in order to be able to have a significant impact on development strategies [6][7].

Overall, this study confirms that **supporting factors (facilities, accessibility, and additional services) are more determinative of the success of sustainable tourism than relying solely on tourist attractions**. This has important implications for local governments and tourism stakeholders, namely the need to place infrastructure development, service strengthening, and improving the quality of facilities as top priorities in destination development strategies.

5. Conclusions and Suggestions

5.1 Conclusion

This study aimed to analyze the influence of amenities, accessibility, ancillary services, and tourist attractions on sustainable tourism development strategies in North Sumatra Province using the Smart-PLS approach. The empirical results reveal that while amenities, accessibility, and ancillary services exhibit a positive and significant effect on sustainable tourism development strategies, tourist attractions surprisingly do not have a significant direct impact. These findings indicate that the strategic development of tourism in this region is driven more by the robustness of supporting infrastructure and services rather than merely the inherent appeal of the attractions themselves. Consequently, this study reinforces the perspective that the success of sustainable tourism relies not solely on natural or cultural beauty, but on the comprehensive quality and comfort of the overall tourist experience.

Despite tourist attractions being the primary capital of North Sumatra's tourism, their relatively insignificant direct effect highlights a critical need for strategic optimization. To address this

gap, destination management must focus on rebranding efforts through aggressive digital promotion and the utilization of local culture-based storytelling. Furthermore, it is essential to develop innovative, integrated tour packages that seamlessly connect these core attractions with the highly impactful facilities, accessibility, and additional services. By linking the natural and cultural capital with superior supporting infrastructure, stakeholders can significantly enhance the holistic value proposition offered to visitors.

Finally, the successful implementation of these sustainable strategies requires a strong commitment to human resource capacity building and collaborative governance. Continuous training programs are vital for tourism managers, MSME actors, and local communities to elevate their professional service skills and to foster community-based empowerment in preserving both the environment and local heritage. Moreover, realizing these goals necessitates a robust synergy among academia, government, and tourism industry players. This collaborative framework will ensure that these research findings translate into effective, evidence-based policymaking, supported by periodic monitoring and evaluation to guarantee the long-term sustainability of the tourism sector.

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