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Abstract

The dimensions used as measurements in this study are environmental dimensions, socio-cultural dimensions and economic dimensions. The dimensions and attributes used reflect the level of sustainability and are adjusted to the availability of information obtained from the research area. The data used to determine the sustainability status of Lariti Beach tourism is based on three dimensions of sustainability, namely environmental, economic, and socio-cultural dimensions. This dimension-based questionnaire was distributed to 100 respondents from purposive sampling which was then analyzed with Multidimensional Scaling (MDS)-Rapfish. The results of the analysis show that the sustainability status of Lariti beach tourism objects in the Environmental, Socio-Cultural and Economic dimensions is quite sustainable, with an average value of 74.40. The Environmental dimension is 73.85 (moderately sustainable), the economic dimension is 71.59 (moderately sustainable) and the socio-cultural dimension is 78.04 (sustainable).

Keywords: Coastal Tourism, Multidimensional Scaling Analysis, Sustainability Status

1. Introduction

Bima Regency has a sea water area of 3,572.31 Km2 with a coastline length of 775.32 Km. The proportion of sea water area of Bima Regency is 37.71% of the sea area of Sumbawa Island 9,970.96 Km2 or 29.26% of the sea area of West Nusa Tenggara Province 12,852.14

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Km2. The potential of the coastline is quite long, making Bima Regency an area that is quite rich in fisheries, marine and tourism potential. One of the beach tourism that has the potential to be developed in Bima Regency is Lariti Beach tourism. Lariti beach tourism is located in Soro Village, Lambu District.

The development of Lariti beach tourism is one of the efforts to improve the economy in the area. The development of Lariti Beach tourism can develop well and sustainably, with several policy strategies in its management. Sustainable beach tourism is complex and not an easy thing to do. The concept of sustainability itself cannot be interpreted as limited to the scope of environmental issues, such as protection of nature, but sustainability can have more meaning than that. The development of sustainable beach tourism will have a broad impact on various aspects. The impact can include various aspects such as the economy, local business, community engagement, job creation, infrastructure development, investment, and so on. Basically, the principle of sustainability is to pay attention to well-being in the present without reducing welfare for the future. Broadly speaking, beach tourism has three major impacts that can be categorized into environmental, economic and social aspects. The resulting impact on the economic aspect is generally positive, while the environmental impact is generally negative and the social impact is generally a combination of both (Shita, 2021).

The coastal tourism development strategy must be supported by scientific studies so that the results can be accounted for, measurable, and can be evaluated correctly. One analytical approach that can be developed to assess the sustainability of coastal tourism is Multidimensional Scaling (MDS)-Rapfish analysis. This analysis was carried out to determine the dimensions and attributes that affect the development of beach tourism. The dimensions used as measurements in this study are environmental dimensions, economic dimensions and socio-cultural dimensions. The dimensions and attributes used reflect the level of sustainability and are adjusted to the availability of information obtained from the research area.

This study aims to analyze the sustainability status of Lariti Beach tourism on the environmental, socio-cultural, and economic dimensions and analyze the most sensitive attributes in influencing the sustainability of each dimension.

2. Method

2.1. Study Area

Lariti Beach Tourism is part of the Komodo National Park coordination area, so it has the potential to be developed into sustainability-based beach tourism in order to meet the needs of the community while preserving the environment. The priorities for the development of the RPJMD(Regional Medium Term Development Plan)of Bima Regency are infrastructure, spatial planning, tourism and regional connectivity. In accordance with mission III, namely, increasing the progress and economic independence of the community, in the context of poverty and unemployment reduction supported by the availability of facilities and infrastructure based on spatial planning and environmental management (RIPPDA Bima Regency, 2017).

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The location used as a sample in the sustainability analysis on environmental, economic and socio-cultural dimensions is Lariti Beach. The location of this study can be seen in Figure 1 below.

Figure 1. Research Location (Lariti Beach, Bima Regency, West Nusa Tenggara)
Source: Research Design, 2022

2.2. Data Source

1.2.1 Sample of Population

The population in this study was also sampled.In this study, nothing was used as a snippet, all elements of facilities and infrastructure in Lariti beach tourism objects were used as elements of study. The sample of this study includes: 1) Physical aspects; in this study using saturated sampling techniques, because aspects that exist in Lariti beach tourism objects and all facilities and infrastructure owned are all considered in the study; 2) Non-physical aspects; in this study non-physical samples are communities around Lariti beach tourism and stakeholders with purposive sampling techniques of 100 people. Respondents who were used as informants to determine the sustainability status of Lariti beach tourism as elements of participants and experts / experts consisted of elements of government, academics, entrepreneurs.

1.2.2 Data Collection

Data collection was carried out to explore information and phenomena that occurred, researchers compiled a questionnaire consisting of dimensions related to the sustainability status of beach tourism in Bima Regency. There are three dimensions with each question component in this research questionnaire, namely Environmental variables (11 variables), Social Culture (12 variables), and Economy (8 variables). The variables in this study can be seen in Table 1 below.

Table 1. Research Variables

Dimension	Attribute
Environment	1. Control of the number of visitors is adjusted to the environmental

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	carrying capacity of coastal tourism objects
	2. The development of beach tourism does not damage the beach environment
	3. Availability of waste processing around public facilities for beach tourism
	4. Beach tourism objects developed in accordance with the suitability class of recreational tourism
	5. Suitability of coastal tourism development in accordance with spatial plans and other related regulations
	6. Activities in beach tourism the ecological environment is still natural and there are environmental management efforts
	7. There are efforts to maintain the structure of the flora environment in coastal tourism objects
	8. Efforts to maintain coastal ecosystems
	9. Waste management efforts***
	10. Beach garbage collection efforts***
	11. Preservation of flora and fauna at beach attractions
Socio-Cultural	1. Level of knowledge regarding the preservation of tourist attractions***
	2. Efforts to repair ecosystem damage***
	3. The role of local governments in tourist areas*
	4. Whether there is a conflict in the use of tourist sites*
	5. Level of formal education*
	6. The community is given the opportunity to sell tourism products and services that are in accordance with their environment***
	7. Efforts to improve people's entrepreneurial abilities***
	8. Community attitudes and participation to support the development of beach tourism**
	9. Criminal acts**
	10. Involving the community in planning, developing and managing tourist areas****
	11. The role of private institutions in tourist areas*
	12. Increased degree of public health***
Economics	1. Tourism market potential*
	2. Employment in tourist areas**
	3. Number of tourists visiting**
	4. Average income of people from tourist areas*
	5. Employment in tourist areas*
	6. Beach tourism activities contribute to the increase in Local Original Income*
	7. Dominance of tourism utilization (local residents or outside the region)**
	8. The existence of information and promotion media for tourists******

*Source: *Cendrakasih, dkk (2021)*
*** Rojana dan Muhsoni (2021)*
**** Patawari (2017)*

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**** *Tidar, dkk (2022)*
***** *Umar (2017)*
****** *Musaddun, skk (2013)*

After the attributes are determined, the next step is to score each attribute using the Likert scale, by measuring responses to a statement given to respondents, namely:

1. Strongly agree   Score 5
2. Agree   Score 4
3. Disagree Less   Score 3
4. Disagree   Score 2
5. Strongly disagree   Score 1

2.3. Analysis

According to (Pitcher and Preikshot, 2001; Putra, 2019) the results of measuring the sustainability of attributes from each dimension are mapped into two reference points which are bad-down and good-up. The classification of the sustainability status of beach tourism can be seen in Table 2.

Table 2. Classification of Sustainability Status of Beach Tourism

No	Dimension Value	Index	Category	Information
1	00,00 -24,99		Bad	Unsustainable
2	25,00 – 49,99		Less	Less sustainable
3	50,00 – 74,99		Enough	Quite sustainable
4	75,00 – 100,00		Good	Sustainable

Source: Picher dan Preikshot (2001); Putra (2019)

Furthermore, to test the validity of the error rate in the Rapfish analysis with MDS was carried out with the Monte Carlo analysis method with a confidence level of 95%. The results of this comparison if the difference is small, then it shows that the impact of scoring errors is relatively small, the impact of variations of multiple scoring on attributes is relatively small, repeated assessments of MDS become stable, data errors or data loss become relatively small. Comparing the results of Monte Carlo analysis and MDS analysis at a 95% confidence level or 5% error rate so that the difference in the value of the two analyses is greater (MC-MDS>5%) or smaller (MC-MDS<5%). If the difference between these two analyses is >5%, then the results of the MDS analysis are inadequate as an estimator of the value of the sustainability index, and if the selish value of the two analyses is <5%, then the results of the MDS analysis are sufficient to estimate the value of the sustainability index (Kavanagh and Pitcher, 2004; Son, 2019).

3. Result and Discussion

The sustainability status of Lariti Beach tourism is known through Multidimensional Scaling (MDS) analysis which can provide an overview of the region's ability to run beach tourism without neglecting its sustainability in terms of environment, economy and socio-culture of the community. This sustainability is sought to ensure the availability and sustainability of the environment for present and future needs. Sustainability status assessment is carried out

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as an evaluation so that it can be found what factors can be improved or maintained. These factors can later be considered for the development model to be formulated. Based on the results of the sustainability index assessment, the results listed in Table 3 are obtained.

Table 3. Index analysis results and sustainability status

Dimension	Index Value	Categories Sustainability
Environment	73,85	Quite Sustainable
Economics	71,59	Quite Sustainable
Socio-Cultural	78,04	Sustainable

Source: Field Data Processed, 2023

The overall sustainability status showed an average result of 74.40, which is categorized as quite sustainable. This means that Lariti Beach tourism still has to be improved to be sustainable. The results of the kite image of the sustainability of Lariti Beach tourism are shown in the following picture:
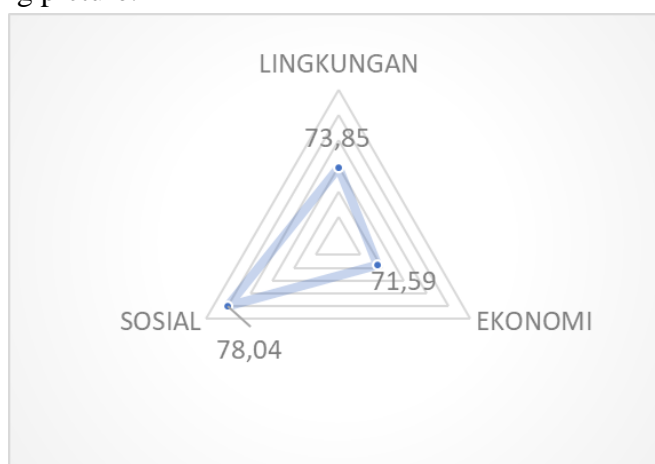

Figure 2. Results of Lariti Beach tourism sustainability analysis
Source: Analysis Results, 2023

Based on Table 3, the index values generated from the environmental and economic dimensions through Rapfish show the category of "moderately sustainable", as it is in the range of 50.01-75.00. Therefore, an improvement strategy is still needed so that its status becomes very sustainable through Laverage analysis. As for the socio-cultural dimension, it is already in the "sustainable" category because it has a score of 78.04 (>75.00) so what is needed is a strategy to maintain its sustainability. Economic and socio-cultural factors have an influence in the realization of sustainable tourism. Economic factors are related to the availability of funds in meeting tourism needs and socio-cultural factors are related to the perspective of the community in tourist areas (Suyitno, 2001 in Julianto and Marta, 2019).

Based on the diagram above, the development of Lariti Beach tourism from 3 dimensions of sustainability shows that the three dimensions have a balanced value (almost the same) which is above 70 so that it is included in the category of sustainable enough to sustainable.

Table 4. Differences in MDS Analysis Sustainability Index Values with Monte Carlo

Dimension	Sustainability Index Value		Difference
	Rapfish	Monte Carlo	

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Environment	73,85	73,85	0,00
Economics	71,59	71,59	0,00
Socio-Cultural	78,04	78,04	0,00

Source: Analysis Results, 2023

The difference between the values of Rapfish and Monte Carlo in Table 4 shows no difference in all dimensions. The difference between the two shows that the value of the Lariti beach tourism sustainability index to be developed at a 95% confidence level has a small error value in the analysis process (Pratama and Iswandi, 2020). The difference between MDS and monte carlo whose difference is less than 1 shows that the calculation of MDS values reflects the true value with a high level of precision (Maharani et al, 2017).

3.1. Environmental Dimension Sustainability Index

The results of the MDS analysis resulted in a sustainability index of 73.85 which based on Table 3 is included in the category that is quite sustainable because it has a score between 50.01-75.00, while the target needed is to achieve sustainable conditions (>75.00).

Leverage analysis is carried out to see which attributes are sensitive to affect the sustainability index of the environmental dimension (ecology). The most sensitive attribute seen from Figure 3 is the suitability of tourism development with a spatial plan with an RMS (Root Mean Square) value of 1.91, and the nearest waste collection location (RMS 1.80) so that to realize the sustainability of the environmental dimension, it can improve the compatibility between regional regulations that have been made with those at tourist sites so that sustainability can be improved.
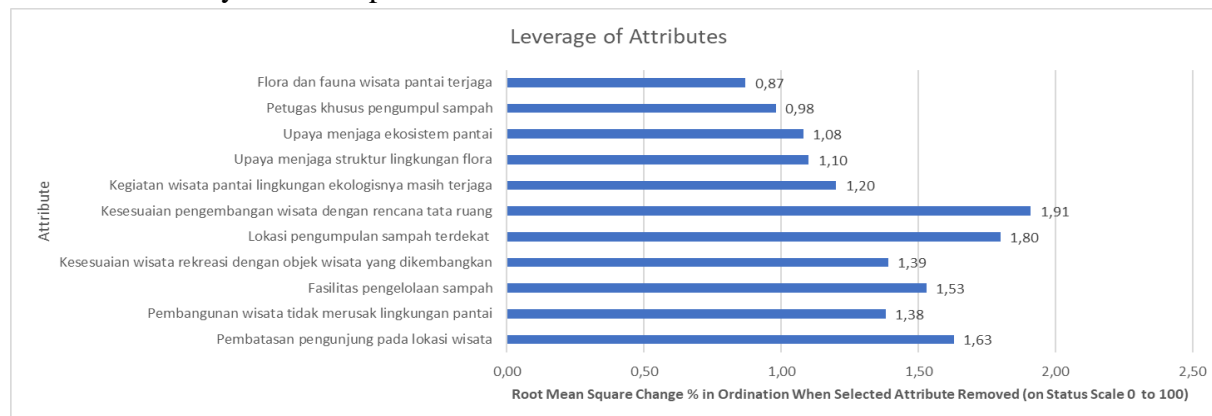

Figure 3. Attributes that are sensitive in influencing the sustainability of environmental dimensions

Source: Analysis Results, 2023

3.2. Economic Dimension Sustainability Index

MDS analysis for this dimension shows a sustainability value of 71.59 which is categorized as quite sustainable. The most sensitive indicator in influencing the economic dimension in Figure 4 is the utilization of tourist areas by residents outside the region (private). This shows that the utilization from outside the region (private) is still very minimal so it is necessary to increase the role of the private sector in the management of Lariti Beach tourism because it affects its economic dimension.

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The use of tourist areas by residents outside the area is related to the use of tourist attractions as a driver of the community's economy. The use of tourist areas by residents outside the intended area is a private party. The existence of tourist attractions provides business opportunities for traders, tour guides, private companies and fishermen to increase their income (Meutia and Rizal, 2022). One way to attract private investment in tourist areas is to promote the potential of areas that have the opportunity to be developed. The existence of investment from the private sector allows to increase employment which has a high impact on increasing regional economic turnover and reducing unemployment (Mustika, 2007).
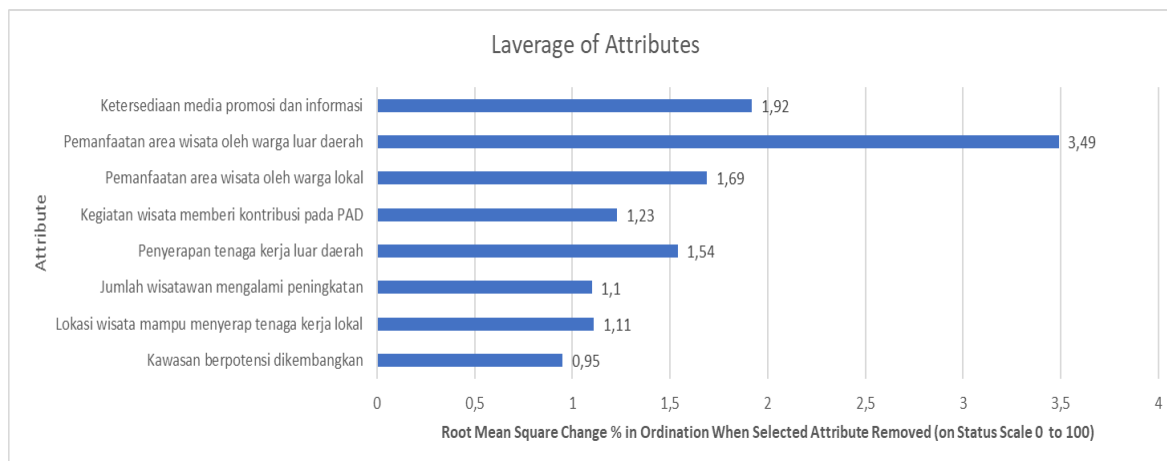

Figure 4. Attributes that are sensitive in influencing the sustainability of the economic dimension

Source: Analysis Results, 2023

3.3. Socio-Cultural Dimension Sustainability Index

The result of the MDS analysis from the Socio-Cultural Dimension is 78.04 or falls into the sustainable category. The sustainable category shows that the socio-cultural conditions in the Lariti Beach tourist area have supported sustainable tourism. Tourism sustainability in a socio-cultural perspective means that community welfare is guaranteed, maintaining cultural heritage, meeting visitor expectations, and involving the community in its management. From the Leverage Analysis in Figure 5, it can be seen that the level of education is a factor that needs to be considered in maintaining or increasing the value of the sustainability index.
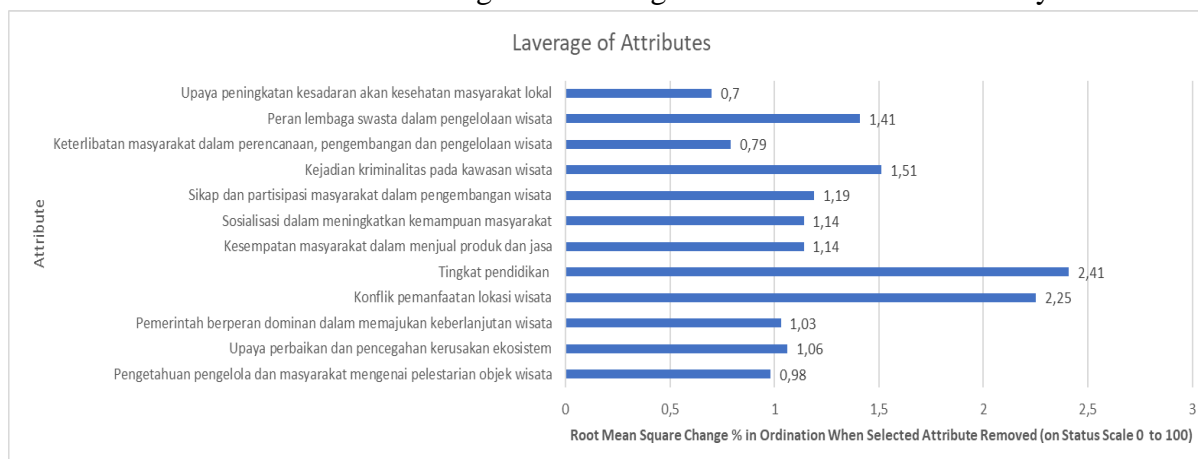
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Figure 5. Sensitive attributes in influencing the sustainability of the socio-cultural dimension
Source: Analysis Results, 2023

4. Conclusion

Lariti Beach is one of the tourism objects that can be developed to support the economic improvement of the people of Bima regency, so it is necessary to know its sustainability status. Researchers use three dimensions of sustainability which include environmental, socio-cultural, and economic. To support researchers in understanding existing phenomena, the analysis method used is Multidimensional Scaling (MDS) - Rapfsih.

The results of the analysis show that the sustainability status of Lariti beach tourism objects in the Environmental, Socio-Cultural and Economic dimensions is quite sustainable, the most sensitive attribute affecting sustainability in the Environmental dimension is the suitability of tourism development with spatial plans. In the socio-cultural dimension, the attribute of education level is a factor that needs to be considered in maintaining or increasing the value of the sustainability index. While the most sensitive attribute affecting sustainability in the economic dimension is the use of tourist areas by residents outside the region (private).

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