Tourism Sustainability Strategy Analysis of the Lembung Pamekasan Mangrove Ecotourism Object Using the Analytic Network Process Approach

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Info Article	Abstract
    	This research aims to analyze the priority of tourism sustainability strategies for the Pamekasan Lembung Mangrove Ecotourism object using the Analytic Network Process approach. The quantitative research approach with the ANP Super Decisions method is used to analyze the complexity of the problems of economic aspects, social aspects, environmental aspects, infrastructure aspects, and institutional aspects by measuring the priority level based on the ratio value, primary data obtained directly from expert respondents, academic experts, regulatory experts and practitioners. The results show that to create tourism sustainability, the most appropriate development strategy is the strategy of increasing the value of capital, investment and promotion with the highest priority value of 35%, as a solution to the problem of capital and tourist visits and focusing on economic aspects with a priority level of 27.9%, with implications for policy recommendations for the government in preparing regional development planning, especially for sustainable tourism development.

INTRODUCTION

Sustainability applied as a global development concept since 1972 and in 1992 popularized at *the Earth Summit in Rio de Janeiro* as a result of concerns about socioeconomic and environmental conditions. Sustainable Development in Indonesia is an app

Lied to various areas fields including the tourism sector with the concept of tourism sustainable development on the basis that its presence can provide a positive economic impact (This, 2018). The positive impact of tourism development cannot be separated from the role of tourism in creating economic multiplier effects (Dharma et al., 2021). Economic improvement, equality and poverty alleviation can be achieved through the development and development of tourism which is considered a symbol of sustainable development, the development agenda of the government and industry and is the hope of poor communities to obtain income through the use of visitor activities (Jørgensen & McKercher, 2019). However, on the other hand, the existence of tourism can hurt social and environmental conditions. The concept of sustainable tourism emerged as part of an effort to provide a solution, although sustainable tourism is still unsustainable, it is characterized by the phenomenon of human activity

accumulating in an area which can cause negative gas emissions and waste (Jørgensen & McKercher, 2019). So the concept of *tourism Sustainability* is presented as an effort to answer sustainability issues through three indicators, namely economic, social and environmental sustainability aspects.

The tourism sector is part of the thematic priority program for the regional development of Pamekasan Regency (Pamekasan Regency Regional Regulations, 2019). The government has made efforts to encourage the increase in new tourist destinations. However, it is suspected that the increase in tourism quantity was not balanced with optimal efforts to manage tourism sustainability so visitor enthusiasm only occurred in the early days of opening the tourist attraction. The Lembung Mangrove Ecotourism Object, which is located in Lembung Village, Galis District, has the advantage and uniqueness of mangrove cultivation activities as a source of information and education needed by the general public, especially in the context of scientific studies both in the environmental field and about the hopes of the surrounding community in meeting economic needs. There is also the potential for sustainability of nature and environmental sustainability and conservation activities. The development of mangrove conservation is part of an alternative strategy for developing sustainable tourist destinations (Wahyuni et al., 2015).

Sustainability can be interpreted as sustainable development (*sustainable development*) is a development concept that is implemented to meet the needs of the present while still paying attention to the potential of resources in meeting needs and achieving future development goals in the long term. (Yuliani et al., 2021). Munasinghe (1993) states that *sustainability* is development aimed at maximizing economic income accompanied by efforts to maintain resources in the long term, preserving aspects of the biological environment, as well as socio-cultural aspects which include equality and involving community participation. Basic concepts of sustainability consist of three main pillars which are indicators in implementing long-term sustainable development by paying attention to and maintaining the three aspects of economic sustainability, societal sustainability and environmental sustainability. Achievement of sustainable development goals to create resilience in the economic, social and environmental fields which are expected to improve community welfare, security and environmental sustainability can be seen through the alignment of development and measured through sustainable development indicators. which is relevant.

Tourism sustainability can be structured and assessed through five aspects (Cendrakasih et al., 2021), namely: 1) ecology, 2) economy, 3) social, 4) technology and infrastructure, and 5) law and institutions. The five indicators are assessed through each indicator or element that has a strong attachment to the tourist attraction. Index measurements are carried out for marine tourism development using attributes/indicators (Apdillah et al., 2020), namely the level of resource exploitation, waste pollution, area carrying capacity, resource biodiversity, suitability with RTRW, level of abrasion, water quality, ecosystem preservation or land conservation, tourist visits, level of formal education, knowledge and local wisdom, potential conflicts over tourism use, population growth, community participation, the role of the private sector, funding in marketing and promotion, contribution to

regional income, increased welfare and market potential, availability of management regulations, level of community compliance, formation of tourism management institutions, coordination between parties involved, implementation of monitoring and supervision of natural resources, government intervention, availability of clean water, supporting infrastructure, accessibility to the location.

The structural pattern of sustainability analysis is arranged based on the complexity of the problem and the objectives of the analysis from economic, social, environmental, infrastructure and institutional aspects (Purvis et al., 2019). Tourism sustainability in economic aspects can be assessed through several indicators (elements). (Cendrakasih et al., 2021), namely 1) Level of tourist visits, 2) Absorption of labour in the environment around tourism, 3) Contribution to regional income, 4) Increasing the welfare of the surrounding community, 5) Tourism market potential including local and national markets or international, 6) Average income of affected communities around tourism, 7) Funding for tourism marketing and promotion.

Development is carried out with the aim of social aspects creating prosperity and improving welfare for society. Community involvement and support are needed to achieve long-term development goals. Several indicators of social aspects, namely 1) The level of formal education of the community around the tourist attraction shows their ability in terms of knowledge and creativity in tourism management. Categories of education from elementary to tertiary education, 2) Local knowledge and wisdom, as a supporting factor in developing community participation, 3) Potential conflict over tourism use, 4) Population growth in tourist areas, showing the effectiveness of management, 5) Participation of the tourist community directly or indirect, 6) The role of private tourism business actors.

Environmental sustainability aspects carried out taking into account environmental sustainability (Purvis et al., 2019). Calculating the marine tourism sustainability index using indicators (Apdillah et al., 2020), namely: 1) The level of exploitation of tourist area resources that are used to obtain optimal results, 2) Biodiversity of tourist areas through the level of comfort and survival of surrounding living creatures, 3) Waste pollution in tourist areas due to activity humans, 4) Low level of beach abrasion indicates good beach control conditions; 5) Ecosystem preservation or land conservation around tourist attractions, high preservation with good conservation can have a positive effect on the survival of living things, 6) Water quality, good and bad, tends to be due to environmental pollution, 7) Availability of fresh water, a basic need for the public or visitors to marine or beach tourism, 8) The width of the tourist beach, which meets the requirements of the tourist beach criteria, is more than 15 meters wide.

Sustainability of infrastructure is the availability and ease of accessibility of facilities and infrastructure to tourist location points (Cendrakasih et al., 2021), The indicators for the sustainability attributes of tourism infrastructure are influenced by: 1) public infrastructure, 2) supporting infrastructure for tourism activities, and 3) supporting access to road infrastructure to tourist locations. (Abdullah et al 2020) So that indicators of the sustainability of tourism infrastructure can be prepared based on the following level of conditions: 1) Road access to tourism, 2) Parking infrastructure for two-wheeled vehicles, 3) Parking infrastructure for four-wheeled

vehicles, 4) *Tracking* infrastructure (flyover) tourism, 5) Public toilet facilities, 6) Public infrastructure for places of worship (musholla), 7) Gazebo (supporting) infrastructure, 8) Canteen (supporting) infrastructure.

An institution is an organization that cannot be separated, has the capability, functions as a manager maintains tourism sustainability and plays an important role in tourism management. (Mariati et al., 2022). Institutional sustainability is the formation of the strength of the structural system of community, private and government organizations involved in the tourism management process (Cendrakasih et al., 2021). The indicators for the sustainability of tourism institutions (Apdillah et al., 2020) consisting of: 1) Availability of management regulations, 2) Level of community compliance, 3) Formation of tourism management institutions, 4) Coordination between *stakeholders,* 5) Implementation, monitoring and supervision of natural resources, 6) Government intervention.

Sustainable development is expected to create long-term economic growth and form a social resilience system which can be seen from the high level of community collaboration, concern and solidarity (Chang & Pires, 2015). Integrated *tourism sustainability* is developed on the concept of five aspects of economic, social, environmental, infrastructure and business institutional *sustainability so that it can increase* employment opportunities for people's lives and have an impact on improving people's welfare, it requires strategies in the long-term tourism development (Chang & Pires, 2015; Hysa et al., 2020; Cendrakasih et al., 2021; Purvis et al., 2019; Apdillah et al., 2020) . Tourism sustainability strategies can be carried out by developing strategic priorities using the ANP method.

Analytic Network Process (ANP) is a data analysis method developed from the Analytical Hierarchy Process (AHP) method, both of which include the Multi-Criteria Decision Making (MCDM) decision-making method (Saaty & Vargas, 2006). ANP is used to analyze problems that are general and complex and cannot be arranged hierarchically because it considers dependencies between elements in the hierarchy. One of the advantages of ANP is a priority measurement model based on ratios and proportions to capture interactions and influences that are oriented towards accurate prediction results and very precise decision-making (Supriadi et al., 2018) . ANP can be used to solve problems that have dependencies between criteria or alternatives with each other. The appropriate form of the ANP network and by the complexity of the problem and the relationship between aspects or elements, namely the *Benefit Cosh Ratio* (BCR) analysis network,

Figure 1 . BCR Analysis Network

Positive Influence   Negative Influence
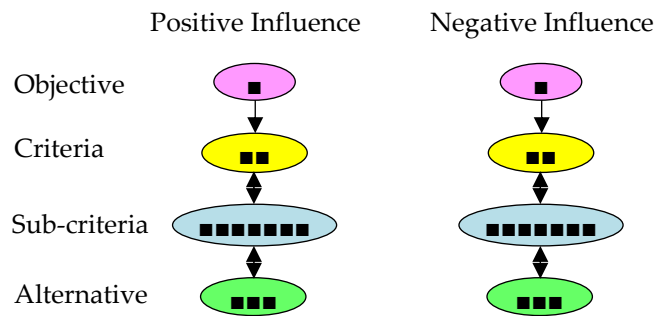
The problem of tourism sustainability at the Lembung Mangrove Ecotourism object has a dependency between criteria (alternatives) so the problem in economic, social, ecological, infrastructure & institutional aspects in this research is analyzed using the ANP method. ANP method with *software Super Decisions 3.2* is used to develop sustainable tourism development strategies by looking at the results of analysis of criteria or alternatives as priority development. There are two types of alternative linkages, namely *inner dependence* and *outer dependence. Inner dependence* is a type of relationship between criteria that occurs in one set of elements, while *Outer dependence* is a type of relationship that occurs in different elements. The combination of the two methods *of inner dependence* and *outer dependence* is the best way because these two methods can influence each other between *clusters* and between elements within a *cluster so* that they can be used for precise and accurate decision-making, becoming a strategic priority *as a* concept *for making* development policies*. sustainable.

The aim of analyzing tourism sustainability strategies for the Lembung Pamekasan mangrove ecotourism object is implemented using the ANP super decisions approach with concepts that can be arranged in an analytical framework consisting of development aspects 1) economic, 2) social, 3) environmental, 4) infrastructure, 5) institutional, with the classification of development problems: 1) economic problems; capital and tourist visits, 2) social problems; potential conflict & community support, 3) environmental problems; pollution & clean water sources, 4) infrastructure problems; accessibility and infrastructure, 5) institutional problems; coordination and the role of stakeholders, so that strategic priority options can be classified as consisting of 1) strategies for increasing capital value, investment and promotion, 2) strategies for developing infrastructure capacity, 3) strategies for increasing solidarity and coordination between stakeholders, 4) strategies involving business actors, academics , and media, all of which are interrelated.

RESEARCH METHODS

Quantitative methods with the ANP approach are used to measure the priority index level of tourism sustainability strategies in economic, social, environmental, infrastructure and institutional aspects (Saaty & Vargas, 2006). This research was conducted in 2023. Primary data was obtained directly from data sources, data collection using a questionnaire. Data sources in the form of expert respondents (experts) determined and chosen deliberately based on certain considerations (Noywuli et al., 2019). Hora (2004) Expert respondents are people who have

expertise based on their level of higher education (academic experts), positions in government (regulatory experts), or practitioners, namely direct actors who have expertise based on their work. (Noywuli et al., 2019). The minimum number of expert respondents required is 3 people and a maximum of 7 people, while the number of public respondents (general public) is 30 people (Noywuli et al., 2019).

The use of respondents in problem analysis, namely 7 expert respondents. The results of the questionnaire data were analyzed using the ANP method with *Super Decisions software* applied to obtain output data on ratio or index values. The resulting data output is used to determine and statistically analyze the problem of selecting priority tourism sustainability strategies for the Lembung Mangrove Ecotourism object.

The solution procedure applied in the ANP analysis process consists of 4 main steps or stages. The ANP procedure is: are as follows: 1) Creating a Model Framework by structuring the problem and creating a conceptual model by identifying important components with the top order (goal cluster), the second cluster can be criteria accompanied by elements (nodes), subcomponents to alternative clusters or the like. The process of compiling the ANP model is based on literature studies and initial observations through dept interviews with several people managing the Lembung Mangrove Ecotourism, 2) Developing a Pairwise Comparison Matrix based on a 1-9 ratio scale with the condition that the final data analysis (limiting supermatrix) of the calculated consistency ratio value is less than 0 .1 or 10% and can then be compiled into a questionnaire.

Table 1. Rating Scale Definitions and Numerical

Definition	Intensity of Interest
Equally important	1
Low importance	2
Medium importance	3
Medium added value	4
Strong interests	5
Increase strong	6
Very strong	7
Very, very strong	8
Very important	9

Table 2. 5 Element Questionnaire Model in ANP Scale 1-9

	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	
Element A		Element B
Element A		Element C
Element A		Element D
Element A		Element E
Element B		Element C
Element B		Element D
Element B		Element E
Element C		Element D
Element C		Element E
Element D		Element E

The results of the questionnaire data that have been collected from all respondents are then tabulated using the *Pairwise Comparisons method* and compiling a data matrix to calculate *the Geometric Mean* (Geomean). Procedure 3) Calculate the Supermatrix with *Super Decisions software* via 3 stages, namely *Unweighted Supermatrix*, *Weighted Supermatrix*, and Supermatrix *limiting supermatrix,* 4) Weighting of interests of *clusters* and *nodes*. Supermatrix calculations and weighting are carried out using the following equation:

$$
W = \begin{array}{c}
\begin{array}{ccc} C_1 & C_2 & C_N \\ e_{11}e_{12}\cdots e_{1n_1} & e_{21}e_{22}\cdots e_{2n_2} & e_{N1}e_{N2}\cdots e_{Nn_N} \end{array} \\
\begin{array}{c} C_1 \\ C_2 \\ C_N \end{array}
\left[\begin{array}{cccc}
W_{11} & W_{12} & \cdots & W_{1N} \\
W_{21} & W_{22} & \cdots & W_{2N} \\
\vdots & \vdots & \cdots & \vdots \\
W_{N1} & W_{N2} & \cdots & W_{NN}
\end{array} \right]
\end{array}
$$

The eigenvector is each column Wij, showing the importance of the element in the i-th component of the network (network) of a node in the j-th component. If the Wijj value = 0 (zero) it means there is no interest in the element. These elements cannot be used in pairwise comparisons if Wijj - 0. So elements that produce non-zero importance can be used. *Supermatrix limiting* stability can be said to be achieved if all columns in *the supermatrix* have the same relevant values for each *node.*

RESULTS AND DISCUSSION

RESULTS
ANP Data Analysis Results

The ANP stages or procedures consist of 4 stages, namely 1) creating or compiling an ANP model, 2) compiling a pairwise comparison matrix 3) calculating the supermatrix, and 4) analyzing the importance weights of clusters and nodes.

Explanation of the 4 cluster ANP model, namely goal cluster (goal), criteria cluster (aspect), sub-criteria cluster (problem), and alternative cluster (strategy). The first cluster of objectives consists of 1 node (element) in the form of priority development strategies for sustainable tourism at the Lembung Mangrove Ecotourism object. The second cluster of criteria in the form of tourism sustainability aspects consists of 5 nodes, namely economic, social, environmental, infrastructure and institutional. The third cluster of sub-criteria is in the form of problems that have a feedback relationship to each aspect cluster, then complex tourism sustainability problems are arranged into simpler ones based on the level of urgency of the problem in each aspect of sustainability in the research.

Figure 2. ANP model in *Super Decisions Software*
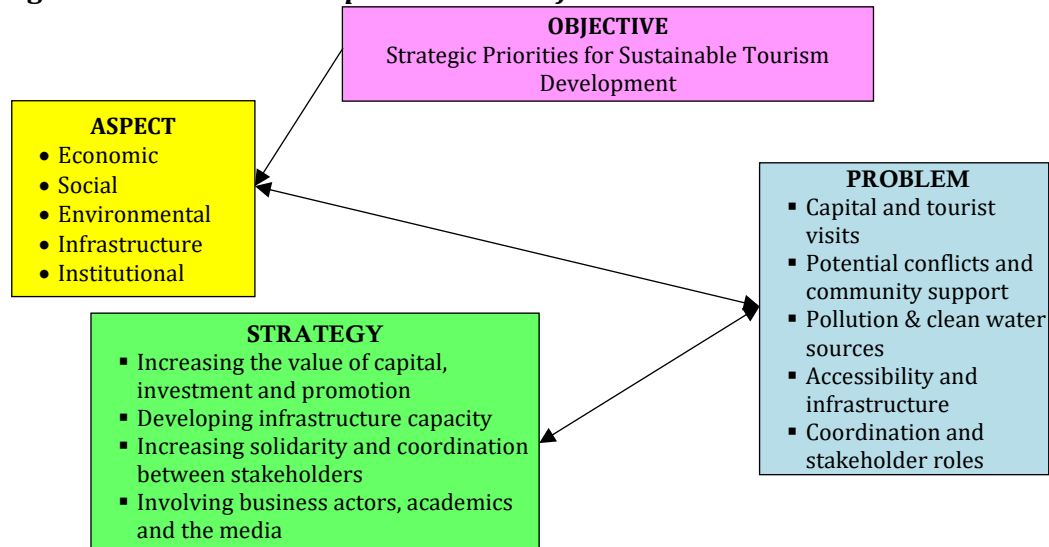
The problem *cluster nodes* are 1) Capital and tourist visits; 2) Potential conflict & community support; 3) Pollution & clean water sources; 4) Accessibility and infrastructure; 5) Coordination and role *of stakeholders*. The fourth alternative *cluster* is in the form of strategy, consisting of 4 strategy *nodes,* namely 1) Increasing the value of capital, investment & promotion; 2) Development of infrastructure capacity; 3) Increasing solidarity & coordination between *stakeholders;* and 4) Involving business, academic and media actors. The strategy chosen is based on literature studies and empirical studies all of which have *feedback* on *the nodes* in the problem *cluster*.

Preparation of comparison matrices between *nodes* in interrelated *clusters.* Application of a comparison matrix by providing an assessment of the level of importance by applying a scale of 1-9. Questionnaires are prepared and distributed to respondents or key persons applying a normal comparison matrix model without modification so that comparative assessments based on level of importance are automatically applied. *Supermatrix* calculations use 3 steps; *Unweighted Supermatrix, Weighted Supermatrix,* and *Limiting Supermatrix inconsistency* requirements of less than 0.1 (10%) are met. Weighting is done by determining the importance weight of the determining factors using the results of a limiting supermatrix *and* then the overall priority of each alternative is calculated through a synthesis process. For conceptual needs, the names of clusters and nodes need to be simplified in code form.

Table 3. Cluster and Node Codes

Name	Code	Name	Code
Clusters	Clu	Accessibility and infrastructure	Asa
Nodes	Nod	Coordination and role of stakeholders	Kps
Aspect	Ask	Pollution & clean water sources	Pab
Problem	Sir	Capital and tourist visits	Pkw
Strategy	Str	Potential conflict & community support	Pkm
Objective	Goal	Involving business actors, academics and media	Sis
Economy	Eco	Increasing stakeholder solidarity & coordination	Msk

Name	Code	Name	Code
Social	Sauce	Infrastructure capacity development	Pki
Environment	Lin	Increase in capital value, investment and promotion	PMI

| Infrastructure | Inf | Priority development strategies for tourism sustainability | PSP |
| Institutional | Ex | Rounding decimal numbers Table 4. Table 5. Table 6. | 2 |

Table 4. *Unweighted Supermatrix* Calculation Results

CLU	NOD	Eco	Inf	Ex	Lin	Sauce	Asa	Kps	Pen	Pkw	Pkm	Sis	Msk	Pki	PMI	Str
ASP	Eco	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1	0.00	0.00	0.00	0.00	0.00	0.14
	Inf	0.00	0.00	0.00	0.00	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
	Ex	0.00	0.00	0.00	0.00	0.00	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
	Lin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.27
	Sauce	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1	0.00	0.00	0.00	0.00	0.19
MAS	Axe	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.11	0.29	0.19	0.00
	Kps	0.00	0.00	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.20	0.09	0.12	0.00
	Pab	0.00	0.00	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.16	0.15	0.00
	Pkw	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.18	0.26	0.33	0.00
	Pkm	0.00	0.00	0.00	0.00	1	0.00	0.00	0.00	0.00	0.00	0.15	0.39	0.21	0.22	0.00
STR	Sis	0.00	0.00	0.00	0.00	0.00	0.08	0.12	0.09	0.21	0.16	0.00	0.00	0.00	0.00	0.00
	Msk	0.00	0.00	0.00	0.00	0.00	0.21	0.24	0.37	0.12	0.32	0.00	0.00	0.00	0.00	0.00
	Pki	0.00	0.00	0.00	0.00	0.00	0.39	0.32	0.28	0.18	0.24	0.00	0.00	0.00	0.00	0.00
	PMI	0.00	0.00	0.00	0.00	0.00	0.32	0.32	0.26	0.49	0.28	0.00	0.00	0.00	0.00	0.00
TUJ	Str	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 5. *Weighted Supermatrix* Calculation Results

CLU	NOD	Eco	Inf	Ex	Lin	Sauce	Asa	Kps	Pen	Pkw	Pkm	Sis	Msk	Pki	PMI	Str
ASP	Eco	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.14
	Inf	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29
	Ex	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
	Lin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.27
	Sauce	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.19
MAS	Asa	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.11	0.29	0.19	0.00
	Kps	0.00	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.20	0.09	0.12	0.00
	Pen	0.00	0.00	0.00	1	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.16	0.15	0.00
	Pkw	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.18	0.26	0.33	0.00
	Pkm	0.00	0.00	0.00	0.00	1	0.00	0.00	0.00	0.00	0.00	0.15	0.39	0.21	0.22	0.00
STR	Sis	0.00	0.00	0.00	0.00	0.00	0.04	0.06	0.04	0.11	0.08	0.00	0.00	0.00	0.00	0.00
	Msk	0.00	0.00	0.00	0.00	0.00	0.11	0.12	0.18	0.06	0.16	0.00	0.00	0.00	0.00	0.00
	Pki	0.00	0.00	0.00	0.00	0.00	0.20	0.16	0.14	0.09	0.12	0.00	0.00	0.00	0.00	0.00
	PMI	0.00	0.00	0.00	0.00	0.00	0.16	0.16	0.13	0.24	0.14	0.00	0.00	0.00	0.00	0.00
TUJ	Str	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 6. *Limiting Supermatrix* Calculation Results

CLU	NOD	Eco	Inf	Ex	Lin	Sauce	Asa	Kps	Pen	Pkw	Pkm	Sis	Msk	Pki	PMI	Str
ASP	Eco	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	Inf	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Ex	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	Lin	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04

MAS	Sauce	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
	Asa	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
	Kps	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	Pen	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	Pkw	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	Pkm	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
STR	Sis	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	Msk	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
	Pki	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	PMI	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
TUJ	Str	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The results of the priority synthesis of main strategy choices can be seen in Table 7. Synthesis of Priorities Analytic Network Process.

Table 7. Synthesis of Priorities Analytic Network Process

Name of Clusters and Nodes	Normalized By Cluster	Limiting
Destination Cluster		
Priority development strategies for tourism sustainability		
Aspect Clusters		
Economy	0.279	0.070
Social	0.191	0.048
Environment	0.144	0.036
Infrastructure	0.140	0.035
Institutional	0.246	0.061
Problem Clusters		
Accessibility and infrastructure	0.191	0.095
Coordination and role of stakeholders	0.144	0.072
Pollution & clean water sources	0.140	0.070
Capital and tourist visits	0.279	0.140
Potential conflict & community support	0.246	0.123
Strategy Cluster		
Involving business actors, academics and media	0.142	0.035
Increase solidarity and coordination between stakeholders	0.237	0.059
Infrastructure capacity development	0.271	0.068
Increase in capital value, investment and promotion	0.350	0.087

Based on the ratio value produced by the synthesis process in selecting strategic (main) priorities, the alternative strategy selected is the strategy of increasing capital value, investment and promotion.

DISCUSSION

Tourism Sustainability Strategy Priorities

Preparation of tourism sustainability strategy priorities for the Lembung Mangrove Ecotourism object using the Analytic Network Process (ANP) method with Super Decisions 3.2 software. The use of the ANP method is based on the complexity

of tourism sustainability problems. The output of the synthesis analysis in Table 4.7 shows that the highest percentage weight value for strategy choices in the alternative cluster is the strategy of increasing the value of capital, investment and promotion by 0.350 or 35%, and the highest percentage value in the problem cluster is capital and tourist visits at 0.279 or 27. 9%, while the highest value in the selected aspect *cluster of nodes* or economic elements is 0.279 or 27.9%.

Alternative linkage patterns based on the results of the strategic priority index in the resulting ANP model can be presented through the following structure chart.

Figure 3. ANP Model Priority Index in Preparing Development Strategy Priorities for Lembung Mangrove Ecotourism Objects
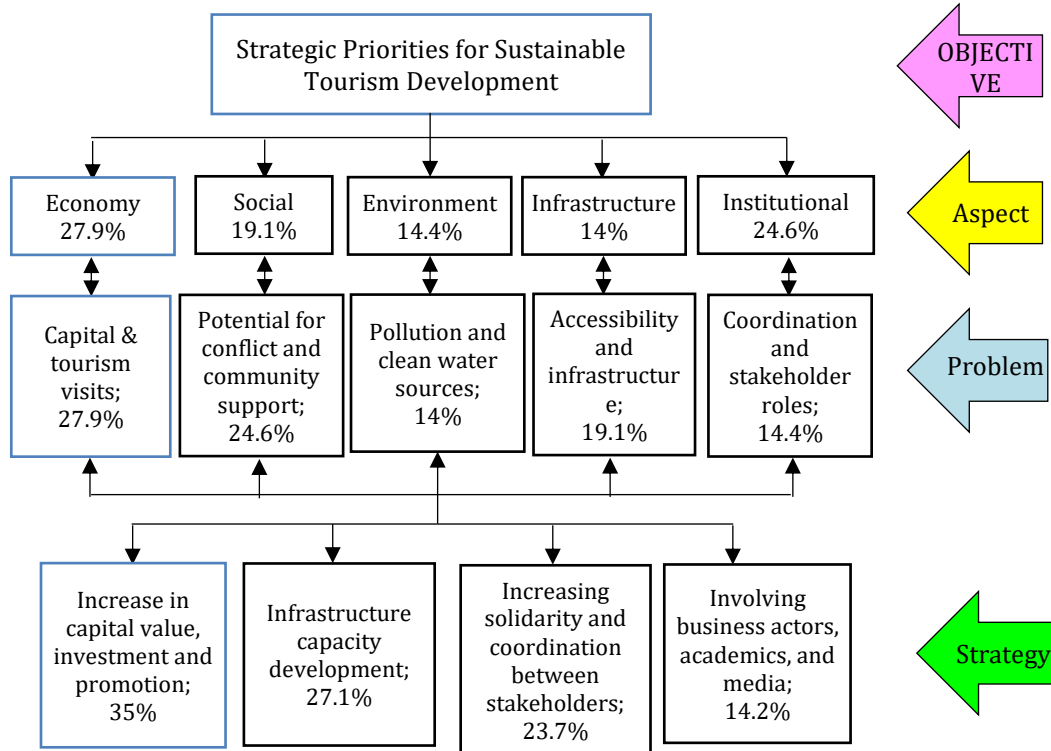
Based on the results of the ANP model analysis, it can be concluded that the priority strategy for sustainability of tourism for the Lembung Mangrove Ecotourism object, a strategic priority option was obtained, namely the strategy of increasing capital value, investment and promotion; This is influenced by capital issues and tourist visits, while the priority (alternative) aspect that influences it is the economic aspect. The influence and relationships that occur between elements in one *cluster and other cluster* elements is the best alternative linkage model because it is a combination of two types of linkages, *inner dependence* and *outer dependence* so that it can be used for precise and accurate decision making, becoming a strategic priority and concept for developing sustainable development policies. (Girsang et al., 2019).

The selection of the economic aspect as a priority for sustainable development that must be improved, shows that basically, the main goal of society, government, business and industry is to develop tourism to obtain income and economic profits to meet living needs. (Jørgensen & McKercher, 2019). This is relevant to income.

Munasinghe (1993) stated that basically, the aim of implementing the concept of *sustainability* or *sustainable development* is to maximize economic income accompanied by efforts to maintain resources in the long term both in social aspects, environmental aspects or other aspects that have a relationship or influence with The economic aspect is the basic goal of development (Purvis et al., 2019).

economic aspects of development can be done by overcoming the main problems. The main problem that must be resolved is the problem of capital & tourist visits. So, to generate economic improvements and overcome *capital & tourist visit problems*, strategic priorities can be used in the form of *increasing the value of capital, investment and promotion*. The results of the strategy selection analysis (Girsang et al., 2018) show that the use of the ANP method to analyze the problem of priority proposals for sustainable tourism development strategies results in a choice of priority strategies for tourism development proposals in the infrastructure aspect through increasing the value of capital & investment.

The implementation of tourism development involves the government, community, business people, media and academics as part of potential alternative strategies. Academics are one of the sustainable development actors who can make contributions based on the suitability of their scientific fields (Noy w uli et al., 2019). Academics can play an optimal role by assisting tourism development as facilitators starting from the process of identification, planning, preparation, implementation, to supervision. In addition, academics, whether teaching staff or researchers, based on their expertise, can be a source of information on an object that has relevance to their field of expertise and profession. (Noywuli et al., 2019). The involvement of academics and other parties in tourism development is basically to achieve sustainable development goals. The actors involved contribute according to their fields and capacities in the planning, implementation and development process as fundamental stakeholders to optimize the tourism sustainability process (Chamidah et al., 2020)

The good economic sustainability of coastal tourism objects generally has a high level of tourist visits. Lembung Mangrove Ecotourism has decreased since 2019-2022. The decline in the number of tourist visitors is due to low tourist attraction due to low tourism market potential and community capital. This condition can be overcome by increasing visitor interest which has a positive impact on increasing tourists and can contribute to sustainable economic growth in the community. In 2021 the Government has disbursed funds for infrastructure development. Developing tourism capacity certainly requires large funding sources. So promotion is needed to attract the interest of capital investors. Through a strategy that focuses on economic aspects, the problem of limited funding in the tourism development process can be overcome by utilizing funding sources from the government and private.

The sustainability of tourism is demonstrated by the solidarity and concern of the community for tourist attractions. The Lembung Mangrove Ecotourism Object often receives visits from educational institutions ranging from elementary school to tertiary level, this shows that the tourist attraction is getting attention from the general public to visit. To optimize resource utilization, community participation and local wisdom, to be able to produce high-quality products as an alternative bridge in

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Zaini,
Sutikno,
Kristina

realizing increased community welfare in the tourism development process, the presence of the government and the involvement of other institutional actors is needed (Subhan & Hidayat, 2021). So priority strategies that are related to various problems can be implemented to achieve the goals of sustainable tourism development. The presence of actors in the construction and development of a tourist attraction that is oriented towards economic growth is very important because it will be able to form a strong force so it requires an important role for actors in a sustainable development process. (Rozikin, 2019)

The presence of tourism development actors becomes a *support system* in forming optimal strength because various forms of decisions and strategies in achieving goals are implemented jointly (Chamidah et al., 2020). Although the involvement of actors in the development and development process of the Lembung Mangrove Ecotourism object is still suspected to cause the impact of cross-sectoral and institutional conflicts based on personal ego and sectoral ego and can be resolved through strategic priorities that have been chosen jointly. Lembung Mangrove Ecotourism has a high potential attraction, showing natural panoramas and beautiful scenic nuances offering a wealth of local culture, mangrove cultivation activities through seeding, planting, maintenance, mangrove coffee and tea production are managed periodically. The environmental problem of waste can be overcome through appropriate control and management strategies related to priority strategies for increasing capital value, investment and tourism promotion for sustainable development. (Apdillah et al., 2020; Husamah & Hudha, 2018; Girsang et al., 2018).

There are six indicators of the success of sustainable development (Yuliani et al., 2021), namely: In favor of job creation, development has a positive impact on demographic conditions, there is employment absorption by developing and creating new businesses in the surrounding environment; Taking sides with the poor, can be seen through activities and efforts to give special attention to the poor due to low levels of education, health, income and competitiveness as well as the need for access to capital to develop businesses; Taking sides with the environment, demonstrated through water, air quality conditions and environmental planning models in ensuring sustainability, determining whether or not the government cares about development in the long term; In favor of gender equality, there is the involvement of women with a balanced level of participation; Providing anti-corruption, collusion and nepotism, avoiding financially detrimental behavior so that the development process runs according to goals and targets; In favor of the Republic of Indonesia, it can be seen from development activities, there is no misappropriation of development funds and does not interfere with sovereignty.

Sustainability analysis was also carried out on case studies of name shrimp cultivation activities in terms of the similarities in the dimensions used, namely environmental ecology, socio-economics, technology infrastructure and institutions. The difference lies in the method used by MDS Rapfish, showing the results that vaname shrimp cultivation is classified as sustainable with location conditions suitable for achieving successful business development and is expected to increase income (Lusiana et al., 2018). Tourism is believed to be a booster of economic growth

with research results showing that in the long term, the variables studied are related to the economy and tourism influences economic growth. (Hariyani, 2018)

Strategies for increasing capital value, investment and tourism promotion in general can be a solution to five problems: economic aspects, social aspects, environmental aspects, infrastructure aspects and institutional aspects. So it can be interpreted that the results of the analysis provide recommendations for overcoming the complexity of sustainable tourism development problems that must start with overcoming capital & tourist arrival problems. So that the basic objective of developing the Lembung Mangrove Ecotourism object can be achieved and have an impact on increasing economic income and community welfare sustainably.

CONCLUSION

The conclusion of the priority of tourism development strategies for the sustainability of the Lembung Mangrove Ecotourism object results in the main choice of strategies for increasing capital value, investment and promotion with a priority level of 35%, which can be used to solve the main problems in the form of capital and tourist visits with a priority level of 27.9%, and focuses on economic aspects of tourism development with a priority level of 27.9%, meaning that the implications of the results of the analysis in this research can provide policy recommendations for the government in formulating development planning into a regional development policy, especially for sustainable tourism development.

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