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Strategy Of Bumdes Development Through Ecotourism In Madura Using Analytical Hierarchy Process (AHP)

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ABSTRACT

Madura has significant potential for fostering institutions rooted in local wisdom, particularly Village-Owned Enterprises (BUMDes). Strengthening the performance of BUMDes is crucial to enhancing their role as drivers of the tourism sector and creative economy in the region. Amidst increasing competition with other business entities, strategic planning is essential to position BUMDes favorably in the market, ensuring their sustainability and contribution to local economic growth. One effective approach to formulating these strategies is through the Analytical Hierarchy Process (AHP) method. This study aims to identify and analyze strategic priorities for developing BUMDes through ecotourism in Madura. Respondents in the study included stakeholders such as representatives from the Tourism Office, academics, BUMDes managers, and village heads. The research was conducted at two prominent tourist destinations: Labuhan Mangrove Beach Edu-tourism in Bangkalan Regency and Somber Raje Tourism in Sumenep Regency. The results indicate the following: 1. priority criteria for determining BUMDes development strategies are the optimization of village potential and the strengthening of institutional capacity; 2. priority strategies include mapping and leveraging village resources while revitalizing BUMDes institutions to improve their effectiveness and sustainability. These findings offer a structured framework for sustainable ecotourism development in Madura, emphasizing the integration of local resources and institutional empowerment to maximize the impact of BUMDes in fostering regional growth.

Keywords: BUMDes, Ecotourism, Development Strategy, Analytical Hierarchy Process

INTRODUCTION

BUMDes is an economic institution established in a village with the aim of improving community welfare (Arifin et al., 2020). As an effort to empower the economy of the community at the village level, BUMDes plays an important role after being regulated in Law Number 6 of 2014 concerning villages. The contribution of BUMDes is still relatively low, especially when compared to the potential in terms of number, distribution, and business opportunities. In England, in 2016, 3.5 million workers were absorbed in rural businesses (Phillipson et al., 2019). In China, BUMDes also made a significant contribution to improving community welfare (Arifin et al., 2020). Leung reported that by 2020, there were 20 million TVEs that absorbed 125.27 million workers. This number is equivalent to 19% of the workforce in China (Phillipson et al., 2019). Likewise in Thailand (Han et al., 2021), the Philippines (Farida & Fauziyah, 2020;

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Han et al., 2021), Ghana (Arifin et al., 2020; Han et al., 2021). In Indonesia, in 2021, there were 12,040 inactive BUMDes. This number is equivalent to 21% of the total BUMDes in Indonesia. Around 35% of active BUMDes, several findings indicate that there are various problems faced by BUMDes in carrying out their role in improving community welfare.

BUMDes is also a driving force of the economy in Madura (Choiruddin et al., 2023; Hasanah et al., 2021), but the contribution of BUMDes to village income is not large enough, due to the low managerial capabilities of managers (Aprillia et al., 2021; Choiruddin et al., 2023; Hasanah et al., 2021). Meanwhile, the success factors that influence BUMDes performance are communication patterns, information systems, human resources, and leadership style. As a business entity under political power, BUMDes is also greatly influenced by aspects of leadership at the local level. The role of the village head as a representative of local power is very large in BUMDes performance (Baidillah et al., 2022; Koho & Jaya, 2022; Yudanto, 2019). Based on various studies, it is necessary to realize that BUMDes is not merely a business entity so that it needs to be viewed from social, cultural, and political aspects (Ema Sasmita et al., 2022; Richter, 2019). Studies conducted by Sofyani (Aprillia et al., 2021; Hasanah et al., 2021) provide evidence that social capital has an important role in BUMDes performance. BUMDes also plays a role in tourism development (Mustofa et al., 2022; Tambajong et al., 2023). Madura has quite large tourism potential, both religious, cultural, nature, and adventure tourism. Several types of tourism in Madura are managed by BUMDes (Ababil & Yulistiyono, 2022)(Madura, 2019). One of the tourist attractions in Madura that is managed by the community in BumDes management is the Labuhan Bangkalan Beach Mangrove edu-tourism and the Somber Raje Sumenep Tourist Attraction.

Strengthening BUMDes institutions is the keyword to increase the contribution of BUMDes as a driver of the tourism and creative economy sectors in Madura. Appropriate strategy design is needed, one of which is through the Analytical Hierarchy Process (AHP) method (Oktaviana & Rum, 2023b). The AHP method is considered effective in the decision-making process for tourism development (Kurniawan et al., 2022; Yanto et al., 2017), because it provides alternative strategies based on criteria that have been validated by experts in the fields of tourism and the creative economy (Andika & Subanu, 2023; Bagus et al., 2024; Rahman et al., 2023; Susilo, Joko Hadi., Noor, Fauzian.,Fatmawati, Dewi., Safitri, 2020).

Several studies have identified problems faced by BUMDes managers in driving the tourism and creative economy sectors (Ababil & Yulistiyono, 2022; Aprillia et al., 2021; Choiruddin et al., 2023; Ema Sasmita et al., 2022; Hasanah et al., 2021; Muslimah et al., 2021; Mustofa et al., 2022; Siswanda & Meirinawati, 2021; Tambajong et al., 2023; Yudanto, 2019), including: a). lack of skilled and knowledgeable workers in the tourism and creative economy sectors; b). lack of training and skills development for local residents to improve the quality of tourism and creative economy services and products; c). inadequate infrastructure; d). poor road conditions and inadequate transportation make it difficult to access tourist locations; e). basic facilities such as electricity, clean water, and telecommunications are often inadequate, hampering the development of tourist destinations; f). limited access to funding sources and capital to develop tourism and creative economy businesses; g). dependence on village funds which may not be sufficient for large projects; h). lack of strategy.

Based on the background and problems in the development of BUMDes in Madura, the objectives of this study are: 1. to determine the priority criteria in formulating BUMDes development strategies through ecotourism in Madura; 2. to analyze the priority strategies for developing BUMDes through ecotourism in Madura.

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RESEARCH METHOD

This study uses a quantitative approach. The respondents of this study consist of: 1). Head of the Culture and Tourism Office of Bangkalan Regency; 2). Head of the Tourism, Culture, Youth, and Sports Office of Sumenep Regency; 3). academics from Trunojoyo University, Madura; 4). Head of BumDes, and 5). Village Head.

The analysis method in this study uses the Analytical Hierarchy Process (AHP). AHP can be used as a decision-making system for determining BUMDes development strategies (Oktaviana & Rum, 2023a; Rum et al., 2019).

Table 1
Criteria and Alternative Strategies for Developing Bumdes Through Ecotourism in Madura

Criteria (K)	Alternative Strategy (A)
Village potential (K1)(Arfah et al., 2021; Cover, 2022; Djamhuri, 2012; Kania et al., 2021; Prasetya et al., 2023; Purbadharmaja et al., 2023)	1. Mapping village potential 2. Improving product and service quality 3. Revitalizing BUMDes institutions 4. Strengthening BumDes networking and networks with stakeholders 5. Developing domestic and international market access 6. Increasing access to BUMDes business capital 7. Digitalization of BumDes
Village needs (K2)(Alfirdausi & Riyanto, 2019)	
Institutions (K3)(Cover, 2022; Huruta et al., 2020; Pradini, 2020)	
Marketing aspects (K4)(Arfah et al., 2021; Pradini, 2020; Prasetya et al., 2023)	
Capital aspects (K5)(Prasetya et al., 2023)	
Innovation and technology (K6)(Beckmann et al., 2021; Prasetya et al., 2023)	

The hierarchical structure consists of goals, criteria, and alternative strategies. Figure 1. presents the decision to choose a BUMDes development strategy through Labuhan Bangkalan Beach Mangrove Eduwisata and Somber Raje Sumenep.

The steps of the AHP method in determining the BUMDes development strategy through Labuhan Bangkalan Beach Mangrove Eduwisata and Somber Raje Sumenep are as follows:

a) Determining the goal, namely choosing a BUMDes development strategy through ecotourism in Madura.
b) Determining the criteria, consisting of village potential, village needs, institutions, marketing, capital, innovation and technology.
c) Determining alternative strategies, consisting
d) Conducting an assessment of the paired comparison matrix by experts, using a scale of 1 to 9.
e) Conduct AHP analysis using expert choice software, to obtain: 1). consistency index (CI); 2). consistency ratio (CR); 3). priority criteria and strategies with the highest weight value.

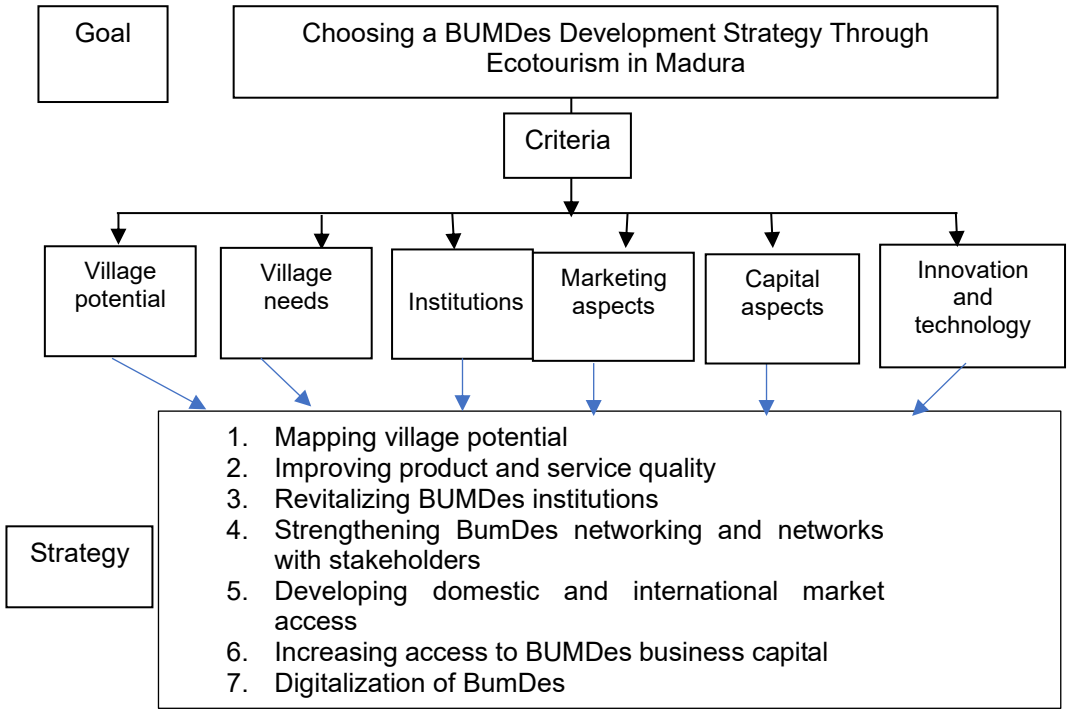


Figure 1
Hierarchical Structure for Determining BumDes Development Strategy Through Ecotourism

Table 2
Paired Comparison Scale

Important Level	Information
1	Both elements are equally important
3	Element A is slightly more important than element B
5	Element A is more important than element B
7	Element A is much more important than element B
9	Element A is absolutely more important than element B
2,4,6,8	The value between two elements has a consideration value close to each other
The opposite	If element B has a higher importance or absolute value than element A

Source: Saaty (1991)

RESULTS AND DISCUSSION

Paired Comparison Analysis.

Pairwise comparison analysis is an analysis conducted by comparing criteria, sub-criteria, and alternatives in decision making. There is a comparison matrix of criteria and alternatives in the pairwise comparison analysis. The results of this analysis are the priority weights of the criteria and alternatives in decision making for selecting a BUMDes development strategy through ecotourism in Madura, namely the Labuhan

Bangkalan Beach Mangrove edu-tourism and Somber Raje Sumenep.

Criteria Evaluation Results.

There are six criteria in selecting a BUMDes development strategy through ecotourism in Madura, namely: village potential, village needs, institutions, marketing, capital, and innovation and technology.

The determination of the four criteria for selecting BUMDes business units was obtained from a literature review of several previous studies and analysis of field conditions. The results of the combination of expert assessment criteria obtained the priority criteria presented in Figure 2. Based on the results of the AHP analysis test using the assistance of expert choice 11 software, it was obtained that the main priority criteria for selecting a BUMDes development strategy through Labuhan Bangkalan Beach Mangrove edutourism were village potential with a weight of 0.490. Then followed by institutional criteria, and capital.

The main priority criteria for selecting a BUMDes development strategy through Somber Raje Sumenep tourism were village potential with a weight of 0.402. Then followed by institutional criteria, innovation and technology.

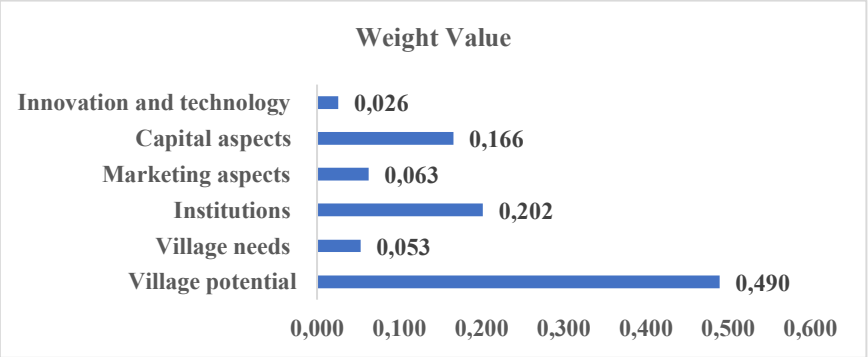


Figure 2
Weighting Value Between Criteria for Selecting BumDes Development Strategy Through Labuhan Bangkalan Beach Mangrove Edutourism

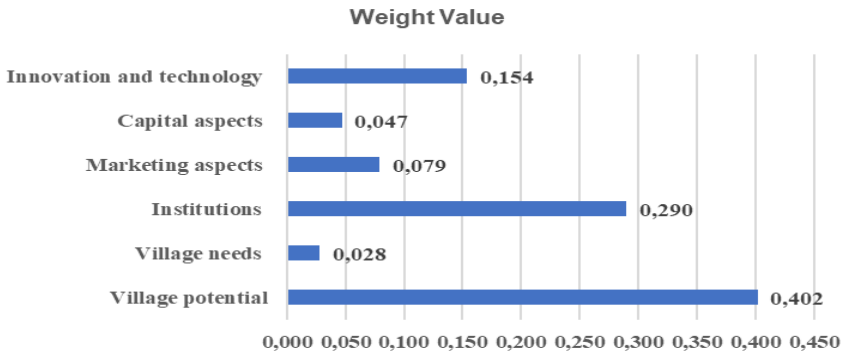


Figure 3
Weighting Value Between Criteria for Selecting BumDes Development Strategy Through Somber Raje Sumenep Tourism

These results show that village potential and institutions are the criteria most considered by respondents in making decisions on selecting BUMDes development strategies through ecotourism in Madura.

Strategy Evaluation

Results There are seven alternative strategies in making decisions on selecting BUMDes development strategies through ecotourism in Madura, namely: (1). mapping village potential, (2). improving product and service quality, (3). revitalizing BUMDes institutions, (4). strengthening BumDes networking and networks with stakeholders, (5). developing domestic and international market access, and (6). increasing access to BUMDes business capital, (7). BumDes digitalization. Labuhan Bangkalan Beach Mangrove Edu-tourism Development Strategy Evaluation Results The results of the Labuhan Bangkalan Beach Mangrove Edu-tourism development strategy evaluation with three priority criteria are presented in Figure 4.

Based on the village potential criteria, the priority strategy for developing Labuhan Bangkalan Beach Mangrove Edu-tourism is mapping village potential with a weight value of 0.41, and improving product and service quality with a weight value of 0.40. Based on institutional criteria, the priority strategy for developing Labuhan Bangkalan Beach Mangrove edu-tourism is mapping village potential with a weight value of 0.34, and revitalizing BUMDes institutions with a weight value of 0.27.

Based on capital criteria, the priority strategy for developing Labuhan Bangkalan Beach Mangrove edu-tourism is increasing BUMDes capital access with a weight value of 0.36, and revitalizing BUMDes institutions with a weight value of 0.26. The results of the evaluation of the Labuhan Bangkalan Beach Mangrove edu-tourism development strategy, a combination of the six criteria, are presented in Figure 5. Village potential mapping obtained a weight value of 0.318, which is the first strategic priority chosen by the expert. While the second strategic priority is revitalizing BumDes institutions with a weight value of 0.235.

Mapping village potential involves local government. Development of tourism infrastructure requires Pentahelix involvement. Increasing community involvement by developing new tourist attractions is needed to increase tourist visits. (Cover, 2022) . Some steps that can be taken in mapping village potential include: identifying village potential, SWOT analysis, analyzing BUMDes institutional capabilities in tourism management, and developing tourism products.

Revitalization of BUMDes institutions is carried out to increase institutional capacity and effectiveness in order to be able to provide significant contributions to village economic development, especially through the management of Labuhan Bangkalan Beach Mangrove edu-tourism. Several work programs carried out by BUMDes management include: increasing the capacity of Management and Human Resources (MSDM) through training and workshops, improving the Articles of Association (AD) and Household Budget (AD-ART), increasing capital and access to funding, increasing community participation, developing business models through community partnerships, and periodic program evaluations.

The institutional revitalization strategy of BUMDes is also carried out in the development of tourism in Dongko Village, Trenggalek Regency. The strategies carried out include improving the skills and management of BUMDes administrators, collaborating with other villages to manage tour packages together, and optimizing the role of social media as a means of promotion. (Prihatiningtyas et al., 2024)

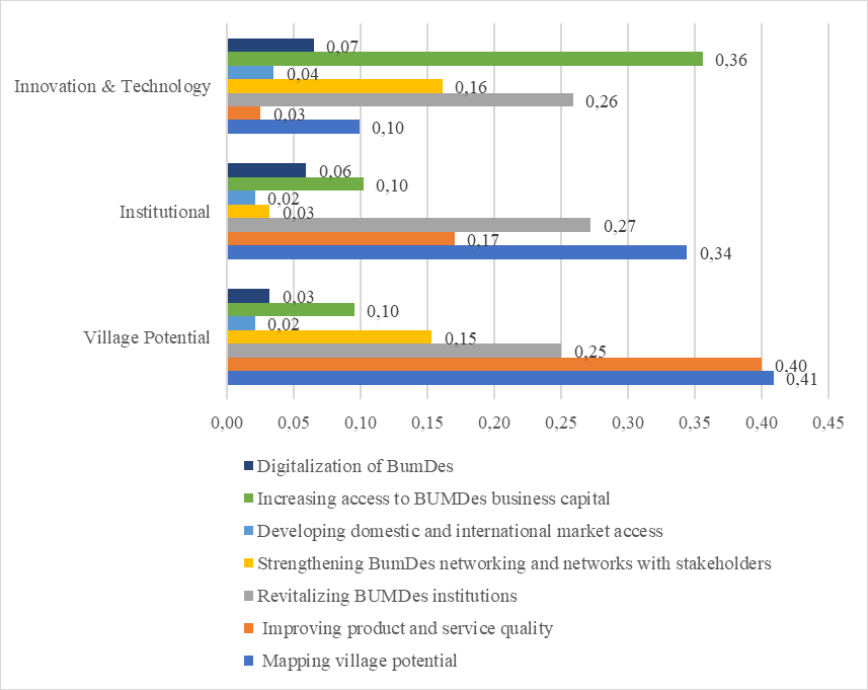


Figure 4
Alternative Strategies for Developing Mangrove Edu-tourism at Labuhan Bangkalan Beach Based on Village Potential, Institutional, and Capital Criteria

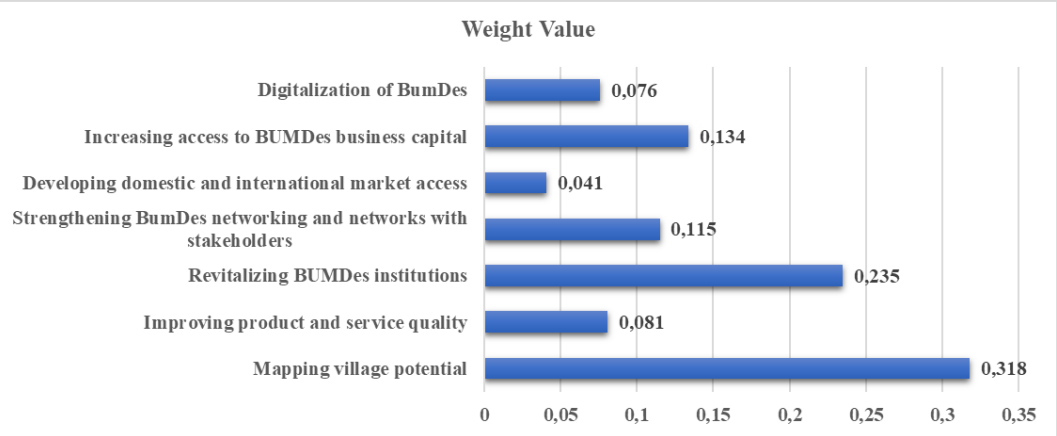


Figure 5
Priority Strategy for Developing Mangrove Edutourism at Labuhan Bangkalan Beach Based on a Combination of Criteria

Evaluation Results of Somber Raje Sumenep Tourism Development Strategy

The evaluation results of the Somber Raje Sumenep tourism development strategy based on three priority criteria are presented in Figure 6. The results of the expert assessment show that the priority of the Somber Raje Sumenep tourism development strategy based on the village potential criteria is village potential mapping with a weight value of 0.42, and in second place is BumDes institutional revitalization with a weight value of 0.26. Based on institutional criteria, the priority strategy

chosen by the expert is village potential mapping with a weight value of 0.34, while in second place is BumDes institutional revitalization with a weight value of 0.27. Based on the innovation and technology criteria, the priority strategy chosen by the expert is BUMDes digitalization with a weight value of 0.37, and the second priority is developing domestic and foreign market access.

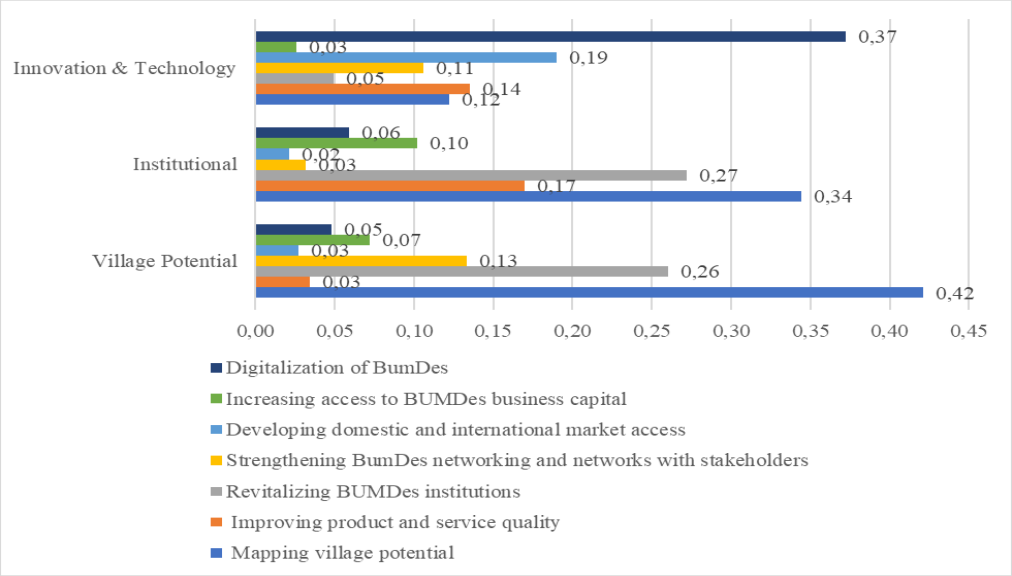


Figure 6
Alternative Strategy for Developing Somber Raje Sumenep Tourism Based on Village Potential, Institutional, and Innovation & Technology Criteria

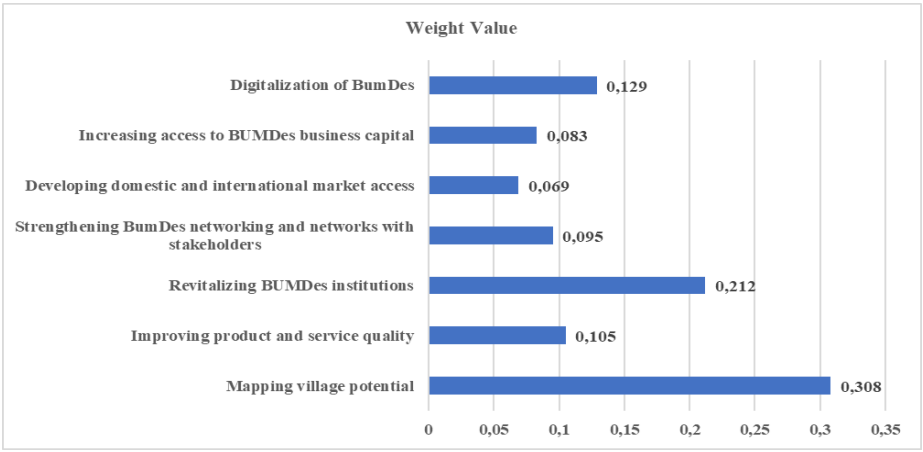


Figure 7
Priority Strategy for Somber Raje Tourism Development Based on Combination of Criteria

The results of the evaluation of the Somber Raje Sumenep tourism development strategy based on a combination of the six criteria are presented in Figure 7.Based on Figure 7, experts choose village potential mapping

as a strategic priority in developing Somber Raje Sumenep tourism, while revitalizing BUMDes institutions as the second priority, and BUMDes digitalization as the third priority. BUMDes digitalization in tourism management aims to increase attractiveness, operational efficiency, and income through the use of digital technology. Some BUMDes digitalization strategies in developing Somber Raje Sumenep tourism include: developing a digital platform, digital marketing through social media, and an online reservation and payment system.

BUMDes digitalization will drive performance towards a digital village. The use of websites has been widely used by villages as a promotional and information media. BUMDes digitalization can be used as a strategy to increase branding of superior village products (Hartanto et al., 2024). BUMDes digitalization can be utilized by tourist villages in the marketing process, providing services to making it easier for tourists to access information about tourist villages. The application of digitalization in managing tourist attractions, for example, through the use of social media, websites, Capcut, Tiktok, Lightroom Mobile, and Pixella (Andari & Yuniawati, 2023)

Consistency Ratio.

Based on the results of the AHP analysis test using the assistance of expert choice 11 software, it is known that the consistency ratio for all pairwise comparisons between criteria and alternatives obtained an inconsistency value of ≤ 10% (0.1) which is presented in Table 3. This value indicates that the respondent's assessment is at the level of inconsistency allowed in the AHP analysis. Therefore, the respondent's assessment can be said to be consistent.

Table 3
Consistency Ratio

Pairwise Comparison Matrix	Eduwisata Mangrove Labuhan Bangkalan	Wisata Somber Raje Sumenep
Pairwise comparison matrix between criteria	0,07	0,05
Comparison matrix of alternative strategies for selecting BumDes development through ecotourism from the following criteria:		
Village Potential	0,09	0,07
Village Needs	0,08	0,03
Institutions	0,07	0,06
Marketing	0,07	0,07
Capital	0,04	0,03
Innovation and technology	0,08	0,08
Comparison matrix of alternative strategies for selecting BumDes development through ecotourism from a combination of all criteria	0,07	0,06

Source: Processed Primary Data (2024); Expert Choice Output

Sensitivity Analysis

Expert choice 11 software can be used to perform sensitivity analysis through the Sensitivity Analysis icon. Sensitivity analysis is used to determine the level of influence of changes in the criteria weight value on the priority order of alternatives. Based on this analysis, it

can be seen which criteria have the highest level of sensitivity so that they affect changes in alternative priorities.

Based on the results of the sensitivity analysis, it can be seen that the most sensitive criteria to changes in weight so that they can change the priority order of alternative strategies are village potential criteria with a weight of 49%. Meanwhile, the criteria with the lowest sensitivity in changing the priority order of alternatives are innovation and technology with a weight of 2.6%. This means that changes in the weight of the village potential criteria will affect the order of six alternatives for selecting BUMDes development strategies through Labuhan Bangkalan Beach Mangrove edu-tourism.

Based on the results of the sensitivity analysis, it can be seen that the most sensitive criteria to changes in weight so that they can change the priority order of alternative strategies are village potential criteria with a weight of 40.2%. Meanwhile, the criteria with the lowest sensitivity in changing the priority order of alternatives are village needs with a weight of 2.8%. This means that changes in the weight of the village potential criteria will affect the order of six alternatives for selecting BUMDes development strategies through Somber Raje Sumenep tourism.

CONCLUSION

The conclusion of this study is as follows:

1. The priority criteria in determining the BUMDes development strategy through Labuhan Beach Mangrove and Somber Raje Sumenep educational tourism are village potential and institutions.
2. The priority strategy for developing BUMDes through Labuhan Beach Mangrove educational tourism is: (1). mapping village potential; (2). revitalizing BumDes institutions; (3). increasing access to BumDes business capital; (4) strengthening BumDes networking and networks with stakeholders.
3. The priority strategy for developing BUMDes through Somber Raje Sumenep tourism is: 1). mapping village potential; (2). revitalizing BumDes institutions; (3). digitalizing BumDes businesses; (4). improving product and service quality.

The suggestions submitted to BumDes managers and stakeholders in developing the tourism sector in Madura are through the following strategies: (1). mapping village potential; (2). revitalizing BumDes institutions; (3). increasing access to capital for BumDes businesses; (4) strengthening networking and BumDes networks with stakeholders; and (5). digitalizing BumDes businesses. For further research, it should be combined with qualitative analysis, so that the description of each strategy produced is more detailed.

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