

Exploring Marine Tourism for Sustainable Empowerment of Coastal Communities

ATIKAH NURHAYATI¹, WAHYUNIAR PAMUNGKAS¹, AHMAD PRAWIRA DHAHIYAT²

¹Faculty of Fisheries and Marine Science,

Universitas Padjadjaran,

Jatinangor, Sumedang Regency, West Java Province, Post Code: 45363,

INDONESIA

²Marine Tourism Vocational Program

Universitas Padjadjaran,

Jatinangor, Sumedang Regency, West Java Province, Post Code: 45363,

INDONESIA

Abstract: - Coastal areas are critical from an environmental and economic point of view because various human activities, especially coastal communities whose lives depend on the utilization of fisheries and marine resources, are experiencing a shift towards diversifying the business of marine tourism services. This research aims to analyze exploring marine tourism for the sustainable empowerment of coastal communities. This research was carried out in the southern coastal area of West Java Province. The method used is a quantitative description and the data used is primary and secondary, with 120 respondents. The tool used is a quantitative description with a non-parametric statistical approach. The research will be conducted from April 2023 – June 2024. Based on research results marine tourism is highly dependent on the quality of coastal ecosystems to attract tourists and is very vulnerable to climate change and loss of biodiversity. Coastal tourism is expected to stimulate new high-quality economic opportunities for coastal communities, restore the natural environment, and revitalize culture and heritage. Exploring marine tourism for sustainable empowerment of coastal communities is transforming coastal zones for sustainable marine tourism as a recovery effort: focus on policy, developing strategies to increase sustainable and resilient funding for conservation, integrating sustainability indicators, conducting value chain analysis to improve community welfare, and collaboration between stakeholders.

Key-Words: - coastal, community, empowerment, marine, tourism, sustainable, empowerment, socio-economic.

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1 Introduction

Tourism potential in Indonesia includes natural tourism, cultural tourism, tourism, history, culinary tourism, and artificial tourism. Marine tourism includes natural tourism which attracts tourists in coastal areas, [1]. Exploring marine tourism in coastal areas, particularly in Indonesia, is appealing due to its archipelago of 17,803 islands and the water area that connects them. The potential for developing marine tourism, which can combine the attractiveness of the sea surface, to carry out various tourist activities, such as swimming, fishing, canoeing with paddles, sailing, water surfing, windsurfing, and boating with parasites. The successful utilization of coastal regions for tourism purposes must assist residents, the majority of

whom work as fishermen. Integrated coastal management is carried out to benefit the community and reduce the negative impact of the operations. Integrated coastal area management is carried out to benefit the community and minimize the negative influence of the activities.

Coastal zone management must involve stakeholders in setting planning objectives, [2]. The Coastal zone is a transition area between land and ocean ecosystems that are influenced by changes in land and ocean as well as adjacent coastal waters. Coastal zones can utilize fisheries and marine resources, sea transportation, and marine tourism, [3]. The characteristics of coastal areas are very dynamic based on physical, chemical, biological, and geological conditions, [4]. Characteristics of diverse ecosystems include fishery resource

ecosystems, coral reefs, and mangrove forests. Natural ecosystems in coastal areas are utilized sustainably by paying attention to aspects of maximum environmental quality, [5]. Coastal zones are defined by open access resource ownership and complex interactions between marine fisheries resource ecosystems and users of Fisheries and Marine resources, necessitating coastal area governance, [6]. Integrated Coastal Management has been proposed as a more comprehensive approach to coastal management that overcomes the limitations and difficulties associated with sector approaches, particularly in coastal area utilization activities.

Many strategies have been implemented through economic development in coastal areas, including the expansion of the marine tourism sector. Coastal areas have the opportunity for fisheries and marine resources, as well as sea transportation and tourism, [7]. Marine tourism is a recreational activity carried out in coastal areas including watching the sunrise and sunset, fishing, swimming, diving, snorkeling, banana boat, jet skiing, ecotourism, cruise ships, yachting events, cultural events within the overall scope of marine tourism in the coastal zone, [8], [9], [10], [11].

Coastal resources and small islands are precious resources that must be protected for current and future generations. Coastal areas provide biophysical and socio-economic opportunities to be utilized by the community, and coastal area management is to obtain a balanced benefit value between these uses based on a series of specific objectives, [12]. The marine tourism development strategy is part of increasing the role of coastal communities in managing coastal resources so that they have sustainable value for future generations, [13]. The rapid growth of the marine tourism industry carries risks that can threaten the balance of coastal ecosystems, such as the development of infrastructure, facilities, and the need for marine tourism, so governance and synergy between marine tourism business actors are needed. Coastal ecosystems include several biophysical components that are integrated with the socio-economic of coastal communities. Coastal ecosystems provide an environment that provides ecological and economic benefits. Facilities, and needs for marine tourism, so governance and synergy between marine tourism business actors are needed. Coastal ecosystems provide an environment that provides ecological and economic benefits, [12], [13].

Marine tourism is an important economic driver for coastal and island communities. Marine tourism is also an important source of livelihood for people

in coastal areas, most of whom make their living as fishermen. The challenge in managing coastal areas for marine tourism is integrating stakeholders including coastal communities, most of whom make their living as fishermen, and transforming the business of marine tourism products and services. Awareness of the importance of marine tourism which makes ecosystem, social, and economic contributions to coastal communities has led to aspects of sustainable marine tourism, [14]. Collaboration is key to sustaining the diversity and sustainability of coastal ecosystems. To maintain the diversity and sustainability of coastal ecosystems.

Collaboration with the government, communities, scientists, and environmental organizations is critical for preserving coastal ecosystem diversity and sustainability, [4]. With proper protection, we can ensure that these important coastal ecosystems remain sustainable and can be enjoyed by future generations. Coastal areas are the areas most visited by tourists who carry out activities to enjoy the natural beauty and have socio-economic activities. Marine tourism is relevant to business activities, facilities, and infrastructure for tourism activities such as tourism, accommodation, and creating job opportunities for coastal communities. The community's reliance on coastal and marine ecosystems for a living is influenced by various policies that frequently intersect with diverse sectors, [15].

Especially for beaches, the southern region of West Java is more varied than the northern region. These beaches also have unique characteristics and make tourists curious to go there. This research aims to analyze opportunities for transforming coastal zones for sustainable marine tourism Coastal area governance is a process that makes it possible to integrate marine tourism policies sustainability to maximize social and economic benefits and minimize the negative impacts of marine tourism on the coastal and marine environment.

2 Problem Formulation

2.1 Method

The survey method was used in this research. The survey method is critical observation or investigation to obtain good information regarding a particular problem in a location, [16]. This research was conducted from April 2023 - June 2024 in the southern coastal region of West Java Province. This research was carried out in several tourist area locations on the south coast of West Java, namely the Pangandaran Beach area, Batu Karas Beach,

Mandasari Beach, Palabuhanratu Beach, Santolo Beach, and Sayangheulang Beach. This is based on the potential of the marine tourism area on the southern coast of West Java.

This research method uses quantitative descriptions to test the validity and reliability of the data. The data used includes primary and secondary data. Secondary data, including the results of documentation held by marine tourism in southern West Java Province, literature studies, and the results of previous research (journals, papers, and information from the mass media). Primary data was obtained from interviews using questionnaires, and focus group discussions with respondents and informants to obtain qualitative and quantitative data.

2.2 Validity and Reliability Test

A validity test is the most important criterion for measuring what you want to measure. In tests with high validity, the items will be closely related to the primary focus of the test. The test criteria are if the correlation between items with a total score is more than 0.35 then the instrument is declared valid, or conversely if the correlation between items with a total score is less than 0.35 then the instrument is declared invalid. And if $r_{\text{count}} > r_{\text{table}}$ with $\alpha = 0.05$ then the correlation coefficient is significant. Items have a positive correlation with the criteria (total score) and a high correlation indicates that the item also has high validity. Usually, the minimum requirement to be considered eligible is if $r = 0.35$, [17].

The reliability test determines whether the data collection tool shows a level of accuracy stability or consistency in revealing certain symptoms [17], [18]. The reliability test uses the Cronbach's Alpha coefficient method, which is as follows:

$$r_{11} = \frac{k}{(k-1)} \left[1 - \frac{\sum \sigma_b^2}{\sigma_1^2} \right] \quad (1)$$

Description:

r_{11} : Reliability of Instrument

k : Number of questions

$\sum \sigma_b^2$ = Number of Item Variances

The decision criteria for reliability testing are as follows:

If $r_{11} > 0.60$, the instrument is reliable

If $r_{11} < 0.60$, the instrument is not reliable

2.3 Spearman Rank Correlation Test

The non-parametric statistical data analysis method in this research is the Spearman Rank correlation method, this technique is used because the data from

the research instrument uses a Likert scale. The Spearman Rank formula is as follows:

$$\rho = 1 - \frac{6 \sum b_i^2}{n(n^2-1)} \quad (2)$$

Description:

ρ = Spearman Rank Correlation Coefficient

b_i = Variable Data Ranking

n = Number of Respondent

Spearman Rank correlation analysis, then testing is carried out using the specified criteria, namely by comparing the calculated ρ value with the ρ table which is formulated as follows:

If $\rho_{\text{calculate}} = 0$, its meaning H_0 accepted and H_a rejected

If $\rho_{\text{calculate}} = 0$, its meaning H_0 accepted and H_a rejected

Coefficient of determination

The coefficient of determination is used to assess how much influence variable X has on Y, which is a correlation coefficient, that is usually expressed as a percentage of %. The following is the coefficient of determination formula:

$$CD = r_s^2 \times 100 \% \quad (3)$$

Description:

CD: Coefficient of Determination

r_s : Spearman Rank Coefficient

The results of the coefficient calculation can be interpreted based on Table 1 to see how strong the level of relationship is between the variables.

Table 1. Interpretation of response values r_s

r_s	Interpretation
0.00 – 0.199	Very Low
0.20 – 0.399	Low
0.40 – 0.599	Moderate
0.60 – 0.799	High
0.80 – 1.00	Very high

3 Problem Solution

3.1 Research Location

The marine tourism sector is in a strategic position to be developed in the southern coastal area of West Java Province is supported by the bio-ecoregional conditions which are an attraction for marine tourism. Marine tourism has experienced rapid growth after the Covid-19 pandemic. Along with the growth of the marine tourism industry, concerns about the impact of marine tourism on the

environment are increasing, so parameters are needed for sustainable marine tourism. The development of marine tourism in West Java Province is planned and developed in an environmentally friendly manner without depleting or damaging natural and social resources, but maintaining them for sustainable use. Sustainable marine tourism is a tourism activity that minimizes costs and maximizes the benefits of tourism for the natural environment and local communities and does not damage fisheries and marine resources.

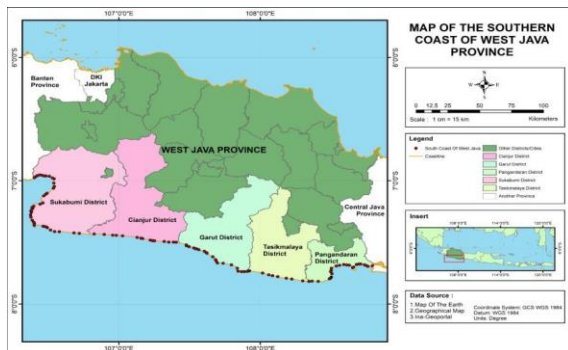


Fig. 1: Research Location

Figure 1, the research location in the southern coastal area of West Java Province, Indonesia has the potential to develop marine tourism. Marine tourism areas in the southern coastal areas of West Java in the southern part of Sukabumi Regency, the southern part of Cianjur, the southern part of Garut, the southern part of Tasikmalaya, and Pangandaran. The development of world-class tourist destinations in West Java Province is focused on the development of superior tourist areas. Still, it has a very complex relationship with the activities of coastal communities, which can cause pressure on coastal area resources. Coastal area management is based on the participation and involvement of all stakeholders in setting goals. Integrated management of coastal areas aims to balance ecological, economic, social, and cultural sustainability goals in the long term.

Marine tourism is an essential component of nature-based tourism in Southern West Java Province. It comprises attraction sport, conservation tourism, culinary food, cultural tourism, as cultural tourism, and fishing trips incorporating rent tools fishing. It is recognized as a growth industry that provides opportunities for a variety of passive and active recreational activities in the Pananjung nature reserve conservation area, Pangandaran Regency, and the sea turtle conservation area in Pagumbahan Sukabumi Regency, West Java Province. Marine tourism activities that will be developed must be adjusted to the potential of existing resources.

3.2 Characteristics of Respondent

The characteristics of respondents in this research were carried out through internal and external approaches to the activities of coastal communities whose main livelihood is fishermen and who have diversified businesses in the field of marine tourism services. The characteristics of the respondents will provide an overview of how coastal communities utilize the potential of marine tourism to create jobs and generate income for local communities.

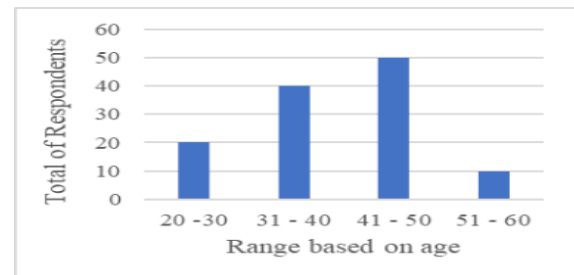


Fig. 2: Characteristics Respondent Based on Age

Figure 2 shows the characteristics of respondents based on age dominated by the age range 40 -50 years including the productive age category. Productive age has a strong capability for carrying out economically valuable activities. Productive age is capable of immediate and accurate decisions.

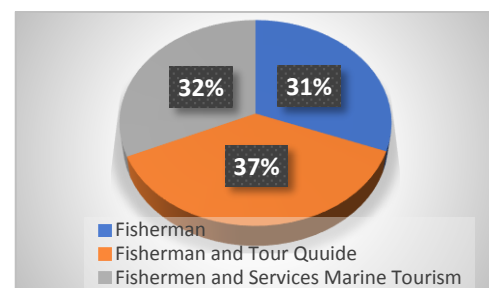


Fig. 3: Characteristics Respondent Based on Livelihood

Figure 3 shows the characteristics of respondents based on livelihood 37 % are fishermen and tour guides. The main livelihood of coastal communities is as fishermen, and diversifying their business into marine tourism guide services. Coastal communities' significant income contributor is fishing, with some connecting toward marine tourism guiding operations. Coastal community activities in providing marine tourism services can increase the resilience of fishing households.

Figure 4 shows the characteristics respondents based on education influence business opportunities, creating business ideas in the field of coastal area management and measurably capturing business

opportunities. The characteristics of respondents are dominated by elementary school graduates, so it is necessary to assist with business opportunities, especially tourist guide services based on regional characteristics.

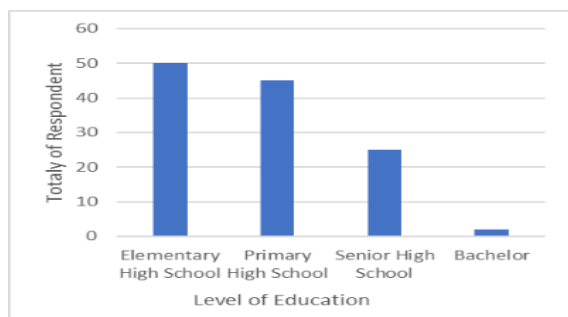


Fig. 4: Characteristics Respondent Based on Education



Fig. 5: Characteristic Respondent Based On Working Experience

Figure 5 characteristics respondents are also seen from the aspect of business experience, the higher a person's level of experience in the field they are working in, the higher their ability to obtain results and take advantage of business opportunities in the marine tourism sector. Socioeconomic indicators of respondent characteristics provide an understanding of the systemic response to coastal community empowerment. Business diversification for household resilience of coastal communities.

3.3 Relationship between Fisherman Community Responses for Sustainable Marine Tourism

Especially for fishermen is a strategic transformation towards a better life supported by an integrated government policy framework, [19]. The potential for empowering coastal communities motivates the use of natural resources to be managed wisely through local customary institutions which are expected to be able to improve the socio-economic status of coastal communities by balancing the socio-economic needs and local cultural rights of the community towards the environment, [20].

Table 2. Relationship between fisherman community responses (X) for sustainable marine tourism (Y) in the southern coastal region of West Java Province

No	Relationship between fisherman responses (X) for sustainable marine tourism (Y)	r_s	Categories
1.	Ecological for sustainability marine tourism opportunity activities (X ₁)	0.512	Moderate
2.	Economic for sustainability marine tourism opportunity activities (X ₂)	0.716	High
3.	Local Wisdom for Sustainability Marine Tourism opportunity activities (X ₃)	0.418	Moderate
4.	Technology information for sustainability marine tourism opportunity activities (X ₄)	0.471	Moderate

Based on Table 2, ecological for sustainable marine tourism opportunity activities (X₁) are included in the moderate category toward sustainable marine tourism (Y), with several indicators, namely range collapse, migratory range, discard bycatch, size of fish caught, explanatory status, climate change of coastal area, and biodiversity of the coastal zone.

In Figure 6, we can see climate change, in the coastal area has a high scoring value compared to other indicators. Climate change is a condition that is difficult to predict, especially for fishing and water sports attractions [21]. Ecological indicators for sustainable marine tourism are seen from the aspect of the utilization of fisheries and marine resources carried out with a conservation-based ecotourism approach for the utilization zone. Range collapse is a change in fishing areas in an ecosystem [22].

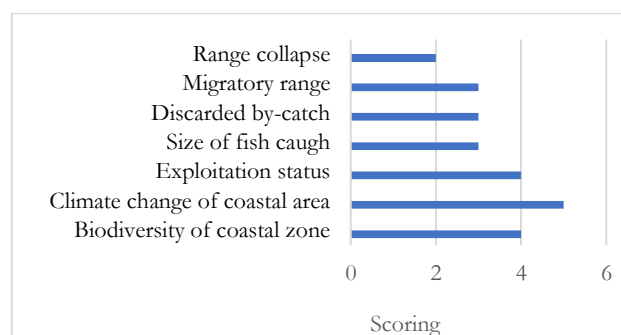


Fig. 6: Ecological for sustainability marine tourism opportunity activities (X₁)

The recommended management action to be taken to prevent the diversion of fishing grounds is

to regulate the fishing area zones in marine tourism areas by enforcing regulations on the opening and closing of fishing areas. The open-close fishing system is used to control the fishing time in such a way that it can be controlled to maintain the sustainability of fishery resources by providing recovery time for fish stocks.

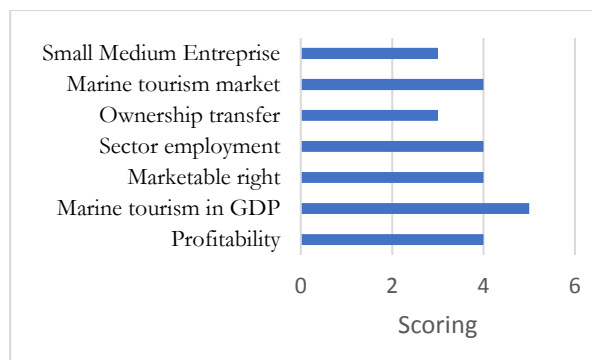


Fig. 7: Economic for sustainability marine tourism opportunity activities (X_2)

Economic for sustainability marine tourism opportunity activities (X_2) included in the high category toward sustainable marine tourism (Y), with several indicators, namely: small medium enterprise, marine, and tourism market, ownership transfer, sector employment, marketable right marine tourism in GDP, profitability. In Figure 7, we can see marine tourism in Gross Domestic Product (GDP) in the coastal area has a high scoring value compared to other indicators, because it provides a multiplier effect for the welfare of coastal communities, such as creating employment opportunities in the marine tourism sector, especially in the creative economy sector.

Additional income in the tourism sector can help reduce the dependence of fishing families on uncertain income from the fisheries sector. In addition, new skills acquired in the tourism sector can help improve knowledge and skills for fishing families, so that they have a competitive advantage in the labor market, [23], [24].

Local wisdom for sustainability marine tourism opportunity activities (X_3) is included in the moderate category toward sustainable marine tourism (Y), with several indicators, namely: rules from local communities, new entries into marine tourism, marine tourism income, kind participation in marine tourism, education level, socialization in marine tourism, environmental knowledge for conservation.

In Figure 8, we can see rules from the local community in the coastal area have a high scoring value compared to other indicators because local

wisdom can be an attraction for tourists to enjoy maritime tourism.

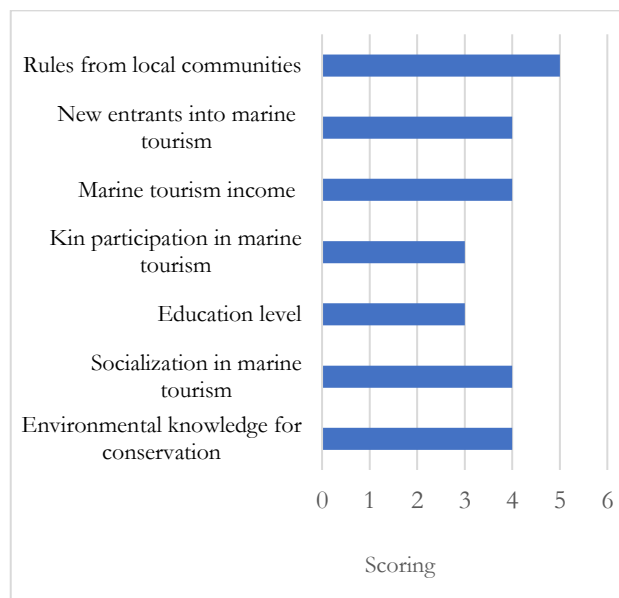


Fig. 8: Local Wisdom for Sustainability Marine Tourism Opportunity activities (X_3)

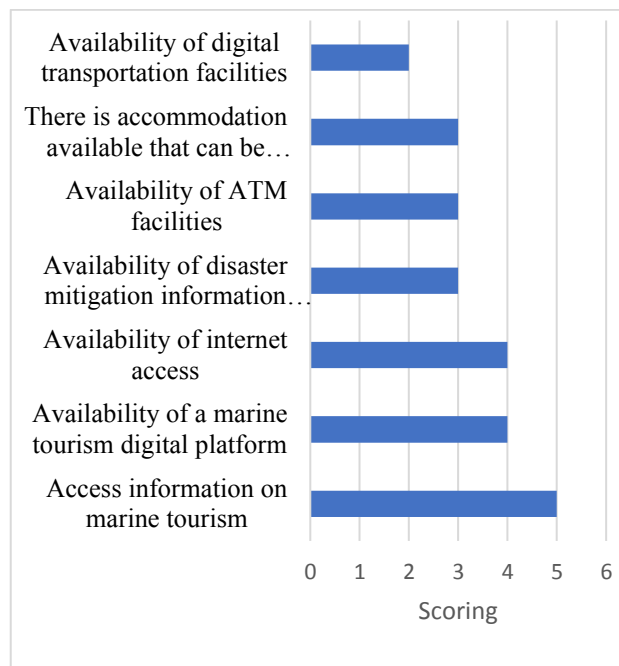


Fig. 9: Technology information for sustainability marine tourism opportunity activities (X_4)

Technology information for sustainability marine tourism opportunity activities (X_4) is included in the moderate category toward sustainable marine tourism (Y), with several indicators, namely; availability of digital transportation facilities, there is accommodation available that can be booked digitally, availability of ATM facilities, availability of disaster mitigation information in coastal zone, availability of internet

access, availability of marine tourism digital platform, access information on marine tourism. In Figure 9 we can see access information on marine tourism has a high scoring value compared to other indicators because to develop marine tourism potential, an information system is needed for physical environmental factors, safety, and comfort for tourists. Tourism information centers must be managed well and provide convenience for tourists with accurate information.

3.4 Discussion

Marine tourism destinations continue to develop in Indonesia, including on the southern coast of West Java Province. Marine tourism is an engine of economic growth on the southern coast of West Java Province, Indonesia. Maritime tourism enjoys the unique beauty of coastal and marine areas as well as aquatic tourist attraction activities. Based on the results of research in the field exploring marine tourism in the southern coastal area of West Java includes Pangandaran Beach area, Batu Karas Beach, Mandasari Beach, Palabuhanratu Beach, Santolo Beach, and Sayangheulang has the suitability of a coastal tourist area for tourists. Exploring marine tourism relationship between fisherman community responses for sustainable marine tourism in the southern coastal region of West Java Province, based on: (1) Ecological for sustainability marine tourism opportunity activities; (2) Economic for sustainability; (3) Local Wisdom for Sustainability marine tourism opportunity activities y marine tourism opportunity activities; (4) Technology information for sustainability marine tourism opportunity activities.

Exploring marine tourism relationships between fisherman community responses for sustainable marine tourism in the southern coastal region of West Java Province, based on: ecological for sustainability marine tourism opportunity activities, consists of several indicators that have a direct influence on fishing businesses and fishing tourism attractions that is range collapse, migratory range, discard bycatch, and size of fish catch, exploitation status, climate change of coastal areas, biodiversity if coastal zone. Climate change includes changes in air temperature, air pressure, wind, air humidity, and rainfall, which occur gradually over a long period. [23], [24]. Climate change will impact changes in natural cycles caused by global warming, especially in temperature, sea level, precipitation, and natural disasters. Climate change will influence tourist visit patterns as well as tourists' perceptions and preferences for their tourist destinations. Climate change in marine tourism destinations on the

southern coast of West Java Province from the supply variable identified changes in the bio-physical conditions of marine tourism attractions, while from the demand side the influence of climate change on changes in tourist visit patterns, perceptions and preferences of tourists related to climate change occurring in the southern coastal region of Java West, Indonesia.

Exploring marine tourism relationships between fisherman community responses for sustainable marine tourism in the southern coastal region of West Java Province, based on Economic for sustainability marine tourism opportunity activities. Marine tourism is one sector that can stimulate economic growth in the southern coastal region of West Java after experiencing the blow of the COVID-19 pandemic. Marine tourism has a positive influence on long-term economic growth as a source of local revenue, and state income that can encourage investment in three main factors, namely labor, capital, and technology. Marine tourism activities can provide a source of income for coastal communities, open employment opportunities for coastal communities, and open up micro, small, and medium business opportunities for coastal communities.

Exploring marine tourism relationships between fisherman community responses for sustainable marine tourism in the southern coastal region of West Java Province, based on local wisdom for sustainability marine tourism opportunity activities. Local wisdom of coastal communities is cultural customs and knowledge along with certain values and norms that originate from the results of adaptation and life experience of a coastal community group which provides a certain form of thought and action patterns as a way to live in balance with nature in harmony with the environment and cultural order. coastal communities.

Exploring marine tourism relationships between fisherman community responses for sustainable marine tourism in the southern coastal region of West Java Province, based on Technology information for sustainability marine tourism opportunity activities. The development of marine tourism is closely related to the provision of information because marine tourism objects will be known to the wider community if information about marine tourism objects is known to the wider community, especially tourists. The process of identifying information needs is a management process that aims to ensure that relevant information institutions can carry out their role in serving all levels of society without exception, and can fulfill

the fundamental concept of tourism marketing, namely focusing on tourist preferences.

Coastal community-based marine tourism is the development of natural resource management based on local wisdom, preserving culture and the environment, minimizing the negative impacts of tourism activities, and generating alternative income for coastal communities. Partnerships with the tourism industry will be effective if they focus on the sustainability of the natural ecosystem, tourism marketing, the use of appropriate information technology, and local community participation.

4 Conclusion

Exploring marine tourism relationships between fisherman community responses for sustainable marine tourism in the southern coastal region of West Java Provinces a recovery effort must be focused on policy, developing strategies to increase funding for sustainable and resilient conservation, integrating sustainability indicators, conducting value chain analysis to improve community welfare, and collaboration between stakeholders. Based on this research exploring marine tourism relationship between fisherman community responses for sustainable marine tourism in the southern coastal region of West Java Province, based on this research relationship between fisherman community responses for transforming coastal zone (X) for sustainable marine tourism (Y) in the southern coastal region of West Java Province is ecological for sustainability marine tourism opportunity activities (X_1) is moderate category value, economic for sustainability marine tourism opportunity activities (X_2) is high category value, local wisdom for sustainability marine tourism opportunity value, technology information for sustainability marine tourism opportunity activities (X_4) is moderate category value. Management of coastal areas and small islands should be able to increase the income of local communities. Exploration of coastal areas for marine tourism is expected to find factors that support marine tourism's long-term viability

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Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

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Conflict of Interest

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