

## Feasibility Study of Grouper Fishing Business Based on Sasi Traditional Law in The Ayau Islands, Raja Ampat Regency, East Indonesia

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### ABSTRACT

Grouper is an important commodity due to its role in ecological balancing and increasing the national economy through foreign exchange on export-import trade. In Ayau Island, grouper management is performed in customary law called Sasi which closes a fishing area during a certain period to improve the harvested yield in the future. Despite many previous studies investigating Sasi law, the financial implications of their application are still unreported. This study aimed to analyze the feasibility of the grouper fishing business in applying customary Sasi law in the Ayau Islands, Raja Ampat Regency, Indonesia. Primary data were obtained from 70 respondents interviewed to assess the financial and institutional aspects, while the direct fishing grounds investigation evaluated the operational and fishing technical side. Secondary data were obtained from literature review and related agencies. Feasibility analysis was determined based on NPV, ROI, IRR, BCR, and PP value. The findings showed that most fishermen are between the ages of 31 and 40, with the majority having a moderate level of formal education. Sasi was categorized into six groups based on factors such as location, commodity types, ceremonies, seasonal effects, communal ownership, and the duration of open-closed periods. All economic indicators suggest that the grouper fishing business is viable, with an NPV greater than 0, BCR greater than 1, a payback period shorter than the project life, and ROI and IRR exceeding the discount rate. Several assessment factors demonstrate that Sasi law is profitable for the local economy, and government support is needed to ensure its preservation.

### INTRODUCTION

Grouper is both an ecologically and economically important commodity. It creates jobs for coastal communities and plays a vital role as a predator in maintaining ecosystem balance. Indonesia is one of the leading suppliers of grouper, with a mean annual production of 117,959 tons over the last decade (**Food and Agriculture Organization,**

2021). Grouper is one of Indonesia's mainstay export commodities which helps national foreign exchange. In addition, grouper has a high international market value due to its high nutritional component and delicious taste (**Rimmer & Glamuzina, 2017**).

Indonesia is a significant producer of reef fish marketed food, particularly groupers (**Razi *et al.*, 2021**). Indonesian Central Bureau of Statistics (**BPS, 2019**) recorded grouper export value at 41.4 million dollars in 2018. The largest recipient countries were Hong Kong (91.73%), Malaysia (38.18%), Singapore (23.84%), China (24.22%), Taiwan (19.20%), United States (12.78%), and France (12.77%). According to **Fabinyi (2011)**, grouper plays a sociocultural role in special events such as business dinners and festivals. In addition, the rapid population growth will increase the high demand for fresh sea fish, especially grouper. Unfortunately, the management of both live and dead grouper fisheries is necessary due to the uncontrolled fishing pressure (**Khasanah *et al.*, 2019**).

Around 159 grouper species are found worldwide (**Heemstra & Randall, 1993**), and 49 are found in the Asia-Pacific region, which includes 39 species in Indonesian waters (**Razi *et al.*, 2021**). **Ariyanti and Farajallah (2019)** report around 8 species of grouper were found in the Raja Ampat, Southwestern Papua. Interestingly, the Ayau Islands communities use a customary law-based system called Sasi in managing marine products, including grouper. Local customary law seeks to preserve natural resources for future generations (**Lewerissa *et al.*, 2021**). This is achieved by prohibiting the utilization of natural resources such as marine and forest products for a certain period (**Djaiz *et al.*, 2019**; **Alvayedo & Erliyana, 2022**). More specifically, it is stated that the purpose of Sasi is to ensure that natural resources are used wisely and consistently by the current and next generations (**Sokoy, 2022**).

For many years, the local community of the Ayau Islands has known the Sasi custom as a sign of the initial and termination of the harvest season. Furthermore, the closing area for a certain period is expected to increase the yield harvest (**Annisa *et al.*, 2020**). Habitats for high-value marine organisms such as snapper, grouper, lobster, and sea cucumber are generally found in the Sasi application area (**Lewerissa *et al.*, 2021**). Moreover, the benefit of Sasi law is also used for community activities such as building public infrastructure and fulfilling the traditional events requirement (**Baranyanan *et al.*, 2019**). Traditional management is adopted to preserve the marine environment such as the coral reef quality in oceanic countries, help fish recruitment, and improve economic value (**Laffoley *et al.*, 2019**). For example, **Boli *et al.* (2014)** reported the increase in sea cucumber production after the Sasi law implementation in Raja Ampat Regency.

The Sasi concept is considered a natural resource management model that combines the knowledge and experience of local communities to protect ecosystem sustainability (**Subekti & Budiana, 2019**). This is demonstrated by the initiative to preserve social order in natural resource utilization by limiting fishing activity. Various previous research has discussed Sasi law in the Indo-Pacific region (**Wahyono, 2000**; **Caillaud, 2004**; **McLeod *et al.*, 2009**; **Mustaghfirin, 2012**; **Adhuri, 2013**; **Cohen & Foale, 2013**; **Boli**

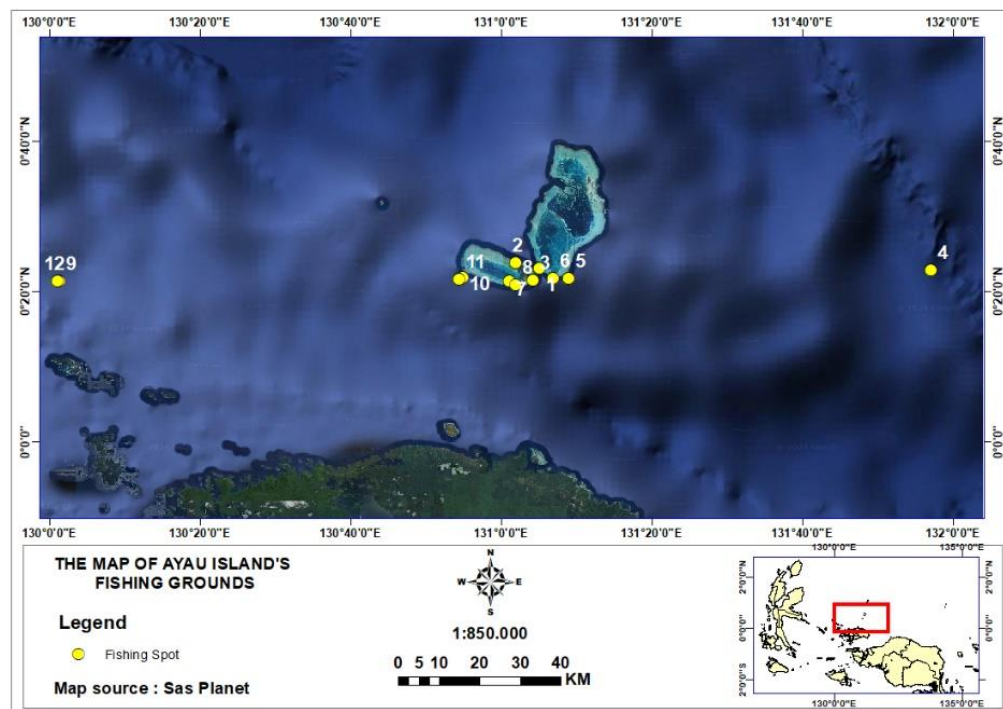
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*et al.*, 2014; Sumarsono & Wasa, 2018; Adiausti *et al.*, 2019; Putri *et al.*, 2020). However, the economic effect of the Sasi law application in exploiting marine resources is still unreported. Moreover, the country accepts millions of dollars from fishing activity and coastal recreation opportunities. Additionally, implementing different approaches to marine protection shows various benefits offered worldwide (Day *et al.*, 2015). For this reason, assessing the Sasi's effectiveness in preserving the economic stability of local communities is crucial. This study aimed to analyze the financial feasibility of the grouper fishing business by utilizing the Sasi law in the Ayau Islands, Raja Ampat Regency, Indonesia.

## MATERIALS AND METHODS

### 1. General description

The research was performed in the Ayau Islands, Raja Ampat Regency, Southwest Papua Province (Fig. 1). Data were collected for 6 months from October 2023 to April 2024. The Ayau Islands are approximately  $\pm 140$ km from the capital provincial Sorong City and  $\pm 92$ km from the center of Raja Ampat Regency. The Ayau Islands cover around 12km of land and 5568km of sea. Astronomically, grouper fishing grounds are shown in Table (1).



**Fig. 1.** Study site in Ayau Island, Raja Ampat Regency, Southwestern Papua

### 2. Data collection

This research employs primary data and secondary data. Primary data were obtained through interviews, focus group discussions (FGD), and direct observation at grouper

fishing grounds. Interviews were applied to 70 active fishing respondents and assessed financial and institutional aspects, while the fishing grounds investigation assessed the operational and fishing technical side. Primary data include respondent identity, investment costs, operational costs, number of monthly trips, catch volume, fish selling price, and total revenue. On the other hand, secondary data were obtained through literature reviews such as bank interest rates and the Indonesian Central Bureau of Statistics for a general description of the study site.

**Table 1.** Coordinates of grouper fishing grounds in the Ayau Island, Raja Ampat Regency, Southwestern Papua

Location	Coordinate point	
	Latitude	Longitude
1	00°38'41.8"N	131°08'40.7"E
2	00°23'44.5"N	131°01'56.4"E
3	00°21'42.3"N	131°04'27.3"E
4	00°22'74.1"N	131°57'08.0"E
5	00°36'23.9"N	131°14'91.2"E
6	00°21'44.6"N	131°06'53.7"E
7	00°21'28.7"N	131°01'11.1"E
8	00°20'87.5"N	131°01'99.0"E
9	00°21'29.7"N	130°01'30.7"E
10	00°21'81.1"N	130°54'94.3"E
11	00°21'60.2"N	130°54'41.8"E
12	00°21'30.7"N	131°01'06.3"E

### 3. Data analysis

The data obtained were analyzed qualitatively using descriptive analysis. The feasibility analysis of a project utilizes the discount cash flow method which measures the investment growth prospects in the future. This study investigated economic feasibility utilizing the production, revenue, and expenditure approaches. The feasibility of the grouper fishing business is assessed based on several indicators including net present value (NPV), return on investment (ROI), internal rate of return (IRR), benefit-cost ratio (BCR), and payback period (PP). All assessment components are calculated using the formula by **Kadariah and Clive (2001)** as follows:

#### Total cost (TC), total revenue (TR), and benefit ( $\pi$ )

TC is an aggregation of fixed costs and recurring costs. TR represents gross income or the selling price multiplied by production volume.  $\pi$  is the result of reducing total income from total costs. TC, TR, and  $\pi$  are calculated using the formula as follows:

$$TC = FC + VC$$

Where, TC= Total cost; FC= Fixed cost or non-recurring cost; VC= Variable cost or recurring cost.

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$$TR = P \times Q$$

Where:

- TR = Total revenue;  
P = Fish price selling;  
Q = Production volum.

$$\pi = TR - TC$$

Where:

- $\pi$  = Benefit or profit;  
TR = Total revenue;  
TC = Total cost.

### Net present value (NPV)

NPV is the difference between net cash inflows and outflows in a certain period. This is the difference between the present value of benefits and the present value of costs. If  $NPV > 0$  then the grouper fishing business is feasible, whereas if  $NPV < 0$  then this business is not feasible. NPV was calculated using the following formula:

$$NPV = -I_0 + \sum_{t=1}^{n-1} \frac{CF_t}{(1+r)^t}$$

Where:

- NPV = Net present value;  
 $CF_t$  = Cash flow per year in period t;  
 $r$  = Interest rate;  
 $I_0$  = Investment value;  
 $t$  = Period;  
 $n$  = Number of periods (year).

### Return on investment (ROI)

ROI is used to measure the percentage of benefits generated by a project compared to the incurred costs. ROI was calculated using the following formula:

$$ROI = \frac{Cf}{I_0} \times 100\%$$

Where:

- ROI = Return on investment;  
Cf = Net cash inflow;  
 $I_0$  = Investment value.

### Internal rate of return (IRR)

IRR is an interest rate that shows the NPV is equal to the total investment costs of the project. This indicator assesses the efficiency level of an investment. IRR was calculated using the following calculation formula:

$$IRR = i_1 + \left( \frac{NPV_1}{NPV_1 - NPV_2} \right) (i_2 - i_1)$$

Where:

IRR = Internal rate of return;

$i_1$  = Discount rate that produces positive NPV;

$i_2$  = Discount rate that produces negative NPV;

NPV1 = Net present value is positive;

NPV2 = Net present value is negative.

### Benefit-cost ratio

BCR is a comparison between the relative benefits and costs of a project. If the BCR value is  $>1$ , this indicates that the grouper fishing business is feasible. Conversely, if  $<1$ , the project is unworthy. BCR was calculated using the following formula:

$$BCR = \frac{\pi}{TC}$$

Where:

BCR = Benefit cost ratio;

$\pi$  = Benefit or profit;

TC = Total cost.

### Payback period (PP)

PP is assessed to determine the period required to recover initial investment costs based on annual cash flow estimates. The payback period was calculated using the following formula:

$$PP = \frac{\text{Net cash investment}}{\text{Net cash inflow}}$$

### Assumptions

The feasibility analysis measures the investment growth prospects in the future with the applied assumptions of the study. Several assumptions were used to assess the economic feasibility of grouper fishing business, including:

- a. In a year, the implementation of open-closed Sasi is around 6 months and the productive duration of grouper fishing also 6 months;
- b. The grouper fishing business is privately owned with an implementation period of around 10 years;
- c. Salvage value is an estimate of the investment component's value exhausted at the end of its economic life;
- d. Maintenance of investment component only once in project life;
- e. The applicable Indonesian People's Bank interest at the end of 2023 when this study was conducted was  $\pm 9\%$ ;
- f. All of the assumption values were used in the method of feasibility assessment;

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- g. The depreciation value is the reduction of purchase value with the salvage value divided by the economic life. Depreciation is assessed using the following formula:

$$D = \frac{PV - SV}{EL}$$

Where:

D = Depreciation value (IDR);

PV = Purchase value (IDR);

SV = Salvage value (IDR);

EL = Economic life (year).

## RESULTS

### 1. Respondent characteristics

The results show the identity of the respondents through several variables including age group, education level, and marital status. The characteristics of the respondents are shown in Table (2). In addition, the catch grouper and fishing boat in Ayau Islands are presented in Fig. (2).

**Table 2.** Respondents characteristics in Ayau Islands, Raja Ampat Regency, Southwestern Papua

Variable	Category	Percentage (%)
Age (year)	21-30	01.47
	31-40	41.18
	41-50	36.76
	>50	20.59
Total		100
Formal education	Elementary	25.00
	Middle	38.24
	High	32.35
	Bachelor	04.41
Total		100
Marital status	Married	98.53
	Unmarried	00.00
	Widowers	01.47
Total		100



**Fig. 2.** A) Fishing boats and catch of grouper in the Ayau Islands, Raja Ampat Regency, Southwestern Papua Province.

The respondent data show that the largest age group of fishermen is 31-40 years, making up 41.18%, followed by the 41-50 years group at 36.76%, those over 50 years at 20.59%, and the smallest group being 21-30 years at 1.47%. In terms of education, a small percentage of fishermen have higher education (4.41%), while 25% have elementary education, 38.24% have middle school education, and 32.35% have high school education. This indicates that most fishermen have a moderate level of formal education. Regarding marital status, nearly all respondents are married (98.53%), with a small portion being widowed (1.47%). Interviews also revealed that fishermen use two types of fishing gear: arrows and hooks. Arrows are the most commonly used (32.39%), followed by fishing hooks (5.63%), while 61.97% of fishermen use both types of gear.

## **2. Variety of Sasi in the Ayau Islands, Raja Ampat Regency, Southwestern Papua**

Results show a variety of Sasi in the Ayau Islands, Raja Ampat Regency. Each Sasi was differentiated based on location, type of commodity, the institution performed ceremony, and the duration of open-close Sasi. The type of Sasi is presented in Table (3).



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**Table 3.** Sasi types in the Ayau Islands, Raja Ampat Regency, Southwestern Papua

Aspect	Type
Location	Marine and land Sasi
Sasi commodities	Coconut, clove, sago, cacao, orange, Siri, <i>Trochus</i> , shrimp, lobster, sea cucumber, seaweed, coral, and demersal fish
Ceremonial	Traditional and church Sasi
Influence of the season	Monsoon Sasi
Communal ownership	Family and village Sasi
Open-closed duration	Temporal and permanent Sasi

The investigation results indicate that, based on resource location, Sasi is divided into land Sasi and sea Sasi. Additionally, other types of Sasi are closely associated with valuable commodities. For local communities that rely on seafood such as lobsters, coconuts, trochus, sea cucumbers, and other economically significant demersal fish, the name of Sasi is modified to reflect the specific commodity. Furthermore, Sasi is categorized as church Sasi when it is associated with a church ceremony, and customary Sasi when it is based on a traditional ceremony.

Due to the influence of seasonal changes, mastery of customs, and implementation duration, Ayau Island has different forms of Sasi. For several months, the Raja Ampat region experiences unfavorable weather conditions, including strong winds, which prevent fishermen from engaging in fishing activities. This period is known as the Sasi season, lasting until the inclement weather subsides. According to the traditional control system, Sasi is classified into family Sasi and village Sasi. Regarding duration, Sasi is further divided into two categories: temporary Sasi and permanent Sasi. Temporary Sasi typically lasts from 3 to 24 months, while permanent Sasi is applied over a longer period or in areas, without a designated harvest season.

***The financial implications of applied Sasi in the Ayau Islands***

The financial analysis of the grouper fishing business is evaluated using several indicators, including NPV, ROI, IRR, BCR, and PP. The components analyzed include investment value, cash flow, total costs, annual revenue, and annual benefits. Tables (4, 5, and 6) present the investment costs, depreciation value, and maintenance costs for the investment components. The total investment value for the boat and machine amounts to IDR 525,000,000, with a total depreciation value of IDR 31,500,000. The cash inflow for the grouper fishing business also includes the salvage value of previously invested assets that are unused at the end of the business's life. The residual value of the business is IDR 210,000,000.

**Table 4.** Investment cost of grouper fishing business in the Ayau Islands, Raja Ampat Regency, Southwestern Papua

No.	Investment component	Amount	Price/unit (IDR)	Total (IDR)	Depreciaton value (IDR)
1	Boat	70	5,000,000	350,000,000	21,000,000
2	Machine	70	2,500,000	175,000,000	10,500,000
Total				525,000,000	31,500,000

**Table 5.** Maintenance cost of investment component

No.	Component	Amount	Cost/unit (IDR)	Total (IDR)
1	Boat	70	250,000	17,500,000
2	Machine	70	450,000	31,500,000
Total				49,000,000

**Table 6.** Residual value of grouper fishing business in Ayau Island, Raja Ampat Regency, Southwestern Papua

No.	Investment component	Economic life (year)	Acquisition value (IDR)	Salvage value (IDR)
1	Boat	10	350,000,000	140,000,000
2	Machine	10	175,000,000	70,000,000
Total			525,000,000	210,000,000

Furthermore, the annual operational components of the grouper fishing business consist of recurring and fixed costs totaling IDR 782,730,000. The revenue of this business is IDR 2,166,300,000, while the benefit is IDR 1,383,570,000, annually. Details of operational costs, annual revenues, and annual benefits are shown in Table (7).

**Table 7.** Annual operation cost, revenue, and benefit of grouper fishing business in the Ayau Islands, Raja Ampat Regency, Southwestern Papua

No.	Cost component	Total
Recurring cost		
1.	Fuel	IDR 555,600,000
2.	Provision	IDR 221,880,000
Non-recurring cost		
1.	Fishing equipment	IDR 5,250,000
Total cost		IDR 782,730,000
Annual revenue		IDR 2,166,300,000
Annual benefit		IDR 1,383,570,000

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**Tabel 8.** Financial feasibility of grouper fishing business in the Ayau Islands, Raja Ampat Regency, Southwestern Papua

No.	Variable	Unit	Total	Indicator
1	NPV	IDR	1,204,701,193	Greater than 0
2	ROI	%	65.65	Greater than discount rate (9%)
3	IRR	%	176.76	Greater than discount rate (9%)
4	BCR		1.76	Greater than 1
5	PP	Year	0.60	Less than project life (10 years)

The economic feasibility analysis reveals an NPV of IDR 1,204,701,193, ROI of 65.65%, IRR of 176.76%, BCR of 1.76, and PP of 0.6 years. All indicators indicate the grouper fishing business is feasible. Details of feasibility indicators are shown in Table (8).

## DISCUSSION

Concerning the social characteristics of fishermen, **Huliselan et al. (2017)** conducted socio-economic research on grouper fishermen and found that around 80% of them were productive fishermen aged between 18 and 55 years. In addition, the education level is considered to affect the success of fishing businesses. According to the report, around 60% of grouper fishermen in eastern Indonesia have completed elementary school. **Permana and Mursidi (2020)** explained the effect of education on a person's mindset and analytical abilities when facing various problems. This contributes to the adaptability of the social and economic changes of fishermen. In terms of family life, fishing households have unique characteristics, such as risky fishing activities that are only carried out by men. This means that fishermen are often associated with poor communities. According to socio-economic research, fishermen whose work relies on fishing will only earn enough income to meet their daily needs (**Lola et al., 2023**). According to **Hakim (2019)**, fishermen believe that God has naturally regulated their income from marine products and this is a resignation. As a result, this assumption will make coastal communities reluctant to improve the quality of their resources such as through education. This reduces the educational level of fishermen from generation to generation, thereby affecting the well-being of fishermen in the future.

Interviews with traditional elders and fishermen revealed that the ancestors of the Ayau Islands people have long practiced the traditional Sasi law as part of a ceremony, known as customary Sasi, since the 1970s. In the 1990s, church Sasi was introduced and performed by certain congregations. Traditional elders described customary Sasi as being focused solely on the relationship between humans and nature, while church Sasi was seen as a supplementary practice, emphasizing the relationship between humans and the Creator. The establishment of church Sasi was also prompted by numerous violations of traditional Sasi rules by the community.

In their research, **Boli *et al.* (2014)** stated that the Tomolol custom declaration in 2003 marked the beginning of Raja Ampat Regency's efforts to incorporate Sasi into its marine natural resource management approach. In 2008, Regulation Number 27 was enacted, designating six areas of Raja Ampat Regency—Ayau-Asia, Kawe, Dampier Strait, Mayalibit Bay, Kofiau-Boo Islands, and Southeast Misool—as marine protected areas. Local fishermen reported that after being abandoned for nearly ten years, the practice of Sasi was reintroduced in 2017.

Previous studies have reported a similar local regulation for natural resources in the Indo-Pacific area as well (**McLeod *et al.*, 2009; Cohen & Foale, 2013; Boli *et al.*, 2014; Sumarsono & Wasa, 2018; Adiastuti *et al.*, 2019; Putri *et al.*, 2020**). Further, a social institution called Sasi was created to protect the use of natural resources by forbidding locals from utilizing marine or forest products in a specific area for a certain period (**Adhuri, 2013**). Harvesting marine resources with increased yields while producing significant financial income is the main aim of Sasi implementation for Raja Ampat's local communities (**Boli *et al.*, 2014**). Every Raja Ampat ethnic group has a unique term for Sasi. The Maya people in the Dampier Strait identify it as Kabus and the Matbat people in Misool Island recognize it as Samson. According to **Wahyono (2000)**, they identify it as Chassisen in Jayapura while in Maluku, the term "sasi" is widely used in natural resource management. Sasi management is also referred to as Tabus in Vanuatu (**Caillaud, 2004**) and Tambu in the Solomon Islands and Papua New Guinea (**Foale & Manele, 2004**). The implementation of Sasi is similar to the traditional version of the marine protected area concept. Similar ideas have long been introduced globally. For example, the Royal National Park in Australia was founded in 1879 and is the location of the country's first marine conservation area. However, the Fort Jefferson National Monument in Florida, United States, through the World National Parks Congress in 1965, is considered the first conservation area that uses an ecosystem-based approach (**Laffoley *et al.*, 2019**). On the economic side, the country receives millions of dollars from the ocean in addition to food and recreation opportunities (**Day *et al.*, 2015**).

Further, Sasi law's economic implication is classified as feasible if NPV >0, IRR value >discount rate, and PP value <project life (**Fadilla *et al.*, 2024**), the BCR value is >1 (**Mishan & Euston 2020; Ragananda *et al.*, 2023**) and ROI value >discount rate (**Huda & Hakim, 2019**). Based on the assessment of these indicators, the grouper fishing business is considered feasible, as shown in Table (8). We believe the Sasi application affected the grouper fishing business in the Ayau Islands, Raja Ampat Regency. According to **Ernaningsih *et al.* (2019)**, fishing practices based on season affect population dynamics and exploitation rates of grouper fish. In this case, Sasi law is crucial in limiting fishing activities in certain periods. The establishment of marine protected areas has become a global focus and initiative in recent decades. Awareness must be increased in managing the use of the marine environment to ensure sustainability and improve the economy (**Amkieltiela *et al.*, 2022**). Indonesia's marine ecosystem

supports human well-being by offering resources and financial benefits. Therefore, protecting marine biodiversity in coastal and offshore areas requires management strategies based on customary law (**Estradivari et al., 2022; Widayanti et al., 2022**). Further, anthropogenic and climate affect the marine environment, so sustainable management practices are required. This will guarantee the benefits of marine resources are still utilized.

According to **Adhuri (2013)**, the community should take the initiative to participate in area-based management. For instance, the sustainability of grouper in the Spermonde Islands was found to be lower (**Najamuddin et al., 2016**), raising serious concerns about the role of social factors, institutions, customary law, and social aspects. Referring to **Berdej and Armitage (2016)**, **Williams et al. (2019)** and **Domondon et al. (2021)**, area-based environmental management approaches offer an alternative for biodiversity conservation. These approaches are often used to conserve biodiversity in marine environments, which are rapidly changing due to human activities and climate change (**Estradivari et al., 2022**).

The application of Sasi also plays a key role in restoring coral reefs over a specific period, allowing grouper, as a reef fish, to grow optimally. **Ernaningsih et al. (2022)** explain the relationship between coral reef cover and grouper populations in the Central Indonesian archipelago. Various conservation strategies have been implemented to reduce these pressures, with area-based management being the most widely used method for preserving marine resources (**Wells et al., 2016**). This highlights that a healthy marine area provides benefits for biodiversity, ecosystem health, and human well-being (**Strain et al., 2019; Roberts et al., 2017**).

**Suraji (2014)** and **Boli et al. (2014)** reported an increase in local community income due to the implementation of Sasi law. As a long-term requirement, the implementation of conservation through Sasi law has become a necessary demand, ensuring the balance of conservation and resource management for the future. However, various challenges in implementing Sasi law remain, including increasing community needs that drive continued fishing. The involvement of the government and traditional elders is essential to educating local communities on the importance of Sasi law through effective socialization. This is also a recommendation for policymakers to maintain marine resources for future generations (**Saimima & Unitly, 2023**).

## CONCLUSION

This study highlights the application of Sasi law and the role of local communities in managing marine ecosystems. Through detailed and robust methods, the results of the study reveal that Sasi law can improve the lives of local fishermen. All financial analysis criteria indicate the grouper fishing business is feasible and crucial to develop. This research also demonstrates a substantial effect of Sasi law on marine resource

sustainability and the life of coastal communities. Government and related stakeholders are expected to take a role in promoting this approach for the preservation of natural resources through regulation of opening and closing fishing areas. These findings illustrate how the influence of Sasi law can improve the local economy in the next 10 years, although the research is limited to the implementation of Sasi in an annual cycle. Further research to assess the comprehensive implications of Sasi law on the lives of local communities is required.

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