

# Stakeholder Engagements in Maintaining Marine Ecosystems in the Bali Sea, Indonesia

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## ABSTRACT

The Bali Sea has an important role in supporting the fishing and tourism industries. However, as with many other seas, exploitation of natural resources through economic and tourism activities in the Bali Sea may endanger marine ecology, which has brought various advantages to coastal populations. Thus, this study aims to examine how stakeholders participate in preserving the environment of the Bali Sea and encounter challenges. This study used a qualitative method by conducting in-depth interviews with stakeholders in Sapeken Island, Bali Island, Lombok Island, and Sumbawa Island. The collected data were analyzed to evaluate the strengths and interests of each stakeholder. The study revealed that traditional and religious leaders and the local governments had high power and importance in protecting marine ecosystems. In contrast, fishermen, fishermen's groups, family welfare activists, and Non-Government Organizations, although highly interested, had less power. Meanwhile, Community-Based Organizations, like youth organizations, had low interest and power as many of them were already part of the fishermen's groups. A major challenge faced by stakeholders in maintaining the marine ecosystem in the Bali Sea was the presence of fishing purse seine vessels from outside their area that could damage the ecosystem and harm local fishermen. This study concludes that the involvement of stakeholders, especially local communities, greatly contributes to maintaining the Bali Sea's marine ecosystems. They recognize that the sustainability of their lives depends on the preservation of the Bali Sea's marine ecosystem.

**Keywords:** Stakeholders/ Marine ecosystem sustainable development goals/ Fishermen/ Local community

## 1. INTRODUCTION

Coastal ecosystems offer social welfare to coastal communities [1]. The Bali Marine Ecosystem has a strategic position as a tourist area and sea transportation route that connects between islands. The sea, located north of Bali Island, is surrounded by several islands including Sapeken, Bali, Lombok, and Sumbawa. The existence of these four islands makes the Bali Sea ecosystem a source of life for the people in the region. Communities in the four regions are coastal communities that have special interests from a social and economic perspective [2]. The abundant natural resources of the Bali Sea and its beautiful natural conditions for tourism purposes are important elements in the growth of the blue economy [3] and local people's welfare.

Many countries, including Indonesia, have adopted the blue economy as part of their national development goal [4]. For this reason, the Government of Indonesia through the Coordinating Ministry for Maritime Affairs and Investment has issued Law Number 32 of 2014 concerning Maritime Affairs. The law aims to regulate the central and local governments in managing marine affairs to bring prosperity to the people through the utilization of marine resources with blue economy principles. Although there are laws governing marine affairs, in practice, the government is still unable to implement, monitor, and enforce them [5]. There are still many legal loopholes, environmental pollution, and a lack of collaboration and coordination with local communities as users of marine ecosystems [6].

Several cases related to marine ecosystem damage still occur frequently. As reported in Detik.com [7] on Monday, May 29, 2023, there was a reclamation on Bali's Melasti Beach, which allegedly caused environmental damage and marine biota ecosystems. In the same year, Detik.com [8], on Thursday, December 14, 2023, also reported that pollution in the Bali Sea caused several beaches in

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Bali to face a pollution crisis due to plastic waste from other regions. This negatively affects the beach tourism sector, especially Kuta Beach and Badung Beach.

Subsequently, the significance of marine ecosystems to the economy, along with a growth in marine-related activities without an efficient sustainable management system, is beginning to significantly damage physical and ecological conditions [9]. Some studies on the damage to marine ecosystems have resulted in the destruction of coral reefs and marine biota [10], extinction of fishery resources [11] due to overexploitation of fish [12], and microplastics impacting the survival of marine fauna [13].

The Bali Sea is a dynamic ecosystem giving rise to many interests [14]. This makes the Bali Sea potentially subject to natural damage related to activities carried out by humans such as the search for ornamental fish and coral reefs, oil exploration, and garbage as it is a sea traffic route that connects the surrounding islands. It is not uncommon for different interests in the Bali Sea to cause conflicts, both vertical, namely the community with the government or companies, and horizontal conflicts, namely the community with the community, which usually occurs between fellow fishermen.

Vertical conflicts between communities and the government, for instance, are related to vessel licenses and firm stances on violations [15]. Whereas, community-company conflicts are usually triggered by company activities that are considered to interfere with fishing activities by fishermen. Meanwhile, horizontal conflicts often occur between local fishermen and those from other regions or traditional and modern fishermen due to territorial struggles and differences in fishing gear [16], [17].

Therefore, this study aims to contribute to marine ecosystem conservation efforts by identifying characteristics, mapping functions, and stakeholder involvement around the Bali Sea. With the identification of stakeholder involvement, it is expected that there will be social justice in the conservation of the Bali Sea. According to Bennet et al. [18], marine conservation must consider the perspectives and needs of local communities to have a positive impact. In addition, the government has limitations in management, monitoring, and law enforcement, so the involvement of local stakeholders in the process of making and implementing marine policies is very important [19].

## 2. METHODOLOGY

The study was focused on nearby Bali Sea locations, including Sapeken, Bali, Lombok, and Sumbawa Islands. This study used a qualitative analysis to map stakeholders. Researchers used the snowball sampling technique to reach hard-to-reach research subjects such as marine ecosystem stakeholders [20]. To reach all informants, the researchers set the local government as the key informant. The local government then helped the researchers to find other relevant stakeholders. Data were collected by conducting in-depth interviews with informants, including village/local government, community leaders, fishermen leaders, local NGOs, local entrepreneurs, collectors, boat owners, cooperative leaders, and souvenir trader associations spread across four islands namely Sapeken, Lombok, Sumbawa, and Bali. Table 1 portrays the research subjects as informants involved in this study.

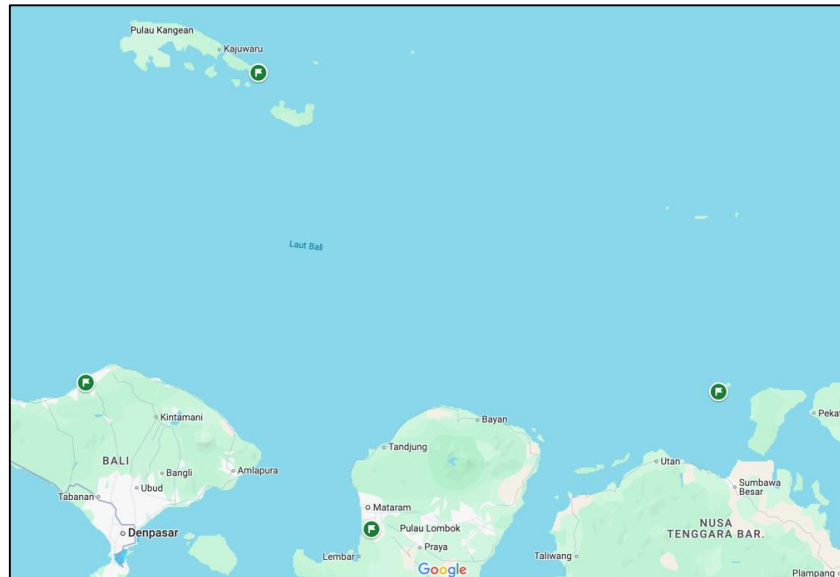
The interviews with stakeholders aimed to understand the role and influence of key actors, forums for community discussions, community vulnerabilities, fisheries sector activities, and social perceptions in the village. Key questions focused on identifying influential community and religious leaders who represent local interests, including both popular and lesser-known actors who are respected. The interviews explored the actors' backing and support networks, their ability to mobilize supporters, and the extent of their engagement with social media. Additionally, the study examined the actors' stances on industrialization, their relationships with formal village leaders, and any cooperation or conflict among them.

The interviews also sought insights into the forums used by villagers to discuss their needs and interests, the role of social institutions, and the actors who facilitate these discussions. Understanding the regularity of these meetings and their typical attendance was also a focus. The study further investigated the vulnerabilities within the community, identifying groups at risk—such as single parents

or those who lost assets—and examined the underlying causes of their vulnerability, including their susceptibility to exploitative practices.

**Table 1.** Informants and Number of Informants

Island	Category	Total
Sapeken	Village/local government	2
	Community leaders	1
	Fishermen leaders	1
	Local NGOs	1
	Local entrepreneurs	2
Lombok	Village/local government	2
	Community leaders	3
	Cooperative leaders	2
	Fishermen leaders	1
	Fishermen	1
	Collectors	1
Sumbawa	Village/local government	4
	Community leaders	2
	Fishermen leaders	1
	Capital owner	1
Bali	Village/local government	2
	Community leaders	5
	Lovina Beach Souvenir trader organization	1
Total		33



**Figure 1.** Map of Study Area (Source: <https://www.google.com/maps>)

In the fisheries sector, questions were aimed at identifying key fishing communities, understanding the market dynamics for their catch, and exploring the role of intermediaries (tengkulak). The study also gathered information on government and corporate social responsibility (CSR) programs that have been implemented for fisherfolk, as well as any challenges encountered in distributing these aids. Finally, the study explored the community’s perceptions regarding the presence of oil and gas companies in the area, if any, and their impact on local life.

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In addition to the obtained interview data, researchers also collected secondary data from the internet and previous studies related to the role of NGOs and marine environmental issues to enrich the data. Data analysis included: first, stakeholder identification based on Crosby [21] which categorized stakeholders according to primary, supporting, and key stakeholders. Second, stakeholder mapping and functions were undertaken by referring to Bryson [22] which included stakeholder subjects, players, context setters, and crowd.

### **3. RESULTS AND DISCUSSION**

#### ***3.1 Stakeholder identification***

According to Crosby [21], stakeholder identification was based on three characteristics, namely primary, supporting, and key stakeholders. Primary stakeholders referred to those who are directly affected, both positively and negatively, by the sustainability of the marine ecosystem. Primary stakeholders included fishing communities, boat owners, and middlemen whose economic conditions depend on the condition of the Bali Sea ecosystem.

According to field observations, the condition of fishermen's catches near the Bali Sea was determined by erratic weather conditions, the equipment employed (e.g., small boats and traditional fishing gear), and price games played by collectors and middlemen. To deal with the price of fish, they formed social networks among fishermen in the four locations. The fishermen frequently shared information about the high price of fish in whatever place so they could reach the location even if it was too distant.

Key stakeholders were parties that had legal authority in making decisions related to marine ecosystem conservation. In this case, the Department of Fisheries and Marine Affairs became the key stakeholder that had the authority to make policies under the applicable laws. Meanwhile, supporting stakeholders were those who did not have a direct interest in the sustainability of the Balinese marine ecosystem but had concerns, including local, regional, and national NGOs.

#### ***3.2 Stakeholder mapping and function***

In maintaining the Bali Sea ecosystem, the proactive and sustainable involvement of local stakeholders, assisted by community organizations and the government, was essential [23]. Community leaders representing the local community influenced the decision-making process when there were issues. There were community leaders who had formal legal and political legitimacy, such as government leaders, and those who did not have formal legal legitimacy but had social and cultural legitimacy. About maintaining the Bali Sea ecosystem, these stakeholders influenced the community on how to preserve the environment and take marine products with marine-ecosystem-friendly equipment. They also became the mediators of conflicts over the utilization of fisheries resources and decision-making concerning the exploration of natural resources in the Bali Sea.

According to Bryson [22], there were four stakeholder positions. First, the subjects were those who cared about an activity. They had great interest but little power, encompassing fishermen groups in Les Village, Kubutambahan, Sapeken, Bintaro, West Sekotong, Pokmaswas Baywatch, and souvenir traders on Lovina Beach. These stakeholders were directly affected by ecosystem damage and various marine issues.

From the results of interviews and field observations, fishermen in Bintaro admitted that they often returned home without bringing catches, or their catches were not as big as the capital obtained. This was influenced by the uncertain season and the condition of fishing equipment that was still conventional compared to boats from migrant fishermen. The Oncor Fishermen Group (KNO) in Sapeken also not only experienced a reduced catch of marine products but also had to face conflicts with companies such as PT. KEI, which conducted oil and gas exploration in the area. They also often came into conflict over fishing areas and differences in fishing gear [17]. Migrant fishermen in the Sapeken Island area, for example, used purse seines, which made it difficult for local fishermen to get fish.

The fishermen on the four islands, although they got a small catch every day, still used traditional equipment. For coastal communities in remote island areas, the fisheries sector was the driver of economic development [12], while the economic development of coastal communities was a challenge between protecting biodiversity and maintaining access and sustainability to ecosystem benefits [3].

Second, concerning those acting as the player role category, village/local governments and community leaders (e.g., traditional and religious leaders) had great power because of the legitimacy of the local community. Moreover, the Department of Fisheries and Marine Affairs acted as a formal government institution. This institution had the authority to implement central policies, issue ship permits, and assist fishing groups in the form of training, equipment support, and capital. This institution also synergized with the village/local government because, in addition to being a government institution, it also had the same goal, namely to ensure the sustainability of the marine ecosystem and the welfare of fishermen. In addition, the capital owners/ship owners, local Sapeken entrepreneurs, and PT. Over Seas Seafood (OSS) Indonesia also had interests in marine catches, but they had a function among the fishing community. Investors usually partnered with small fishermen by providing capital and accommodating the catch. In Sapeken, PT. Over Seas Seafood (OSS) accommodated grouper catches from fishermen to be exported abroad. Meanwhile, local entrepreneurs who became members of the Sapeken Entrepreneurs Association (APS), in addition to accommodating the grouper, lobster, and ronggeng shrimp catches from fishermen to be exported abroad, also set aside some of the profits to help orphans and the poor in Sapeken. PT. OSS and local entrepreneurs had an interest in using the sea route in the Bali Sea to export the sea catch. These local entrepreneurs were also children of the islands who previously received scholarships from the local government in the “One Island One Graduate” program so that they could become the driving force of development in the islands.

Third, context setters were stakeholders who had small interests but conceived great power. Religious institutions such as Nahdlatul Ulama and Muhammadiyah had networks up to the national level. Their members were spread across various regions in Indonesia, including island regions such as Sapeken. These religious institutions did not have a direct interest in the Bali Sea but had a large role and influence in society. Both religious institutions had a role in maintaining social harmony in society based on religious values and preserving the culture of the local community. The figures in these religious institutions were influential, especially in resolving problems or social conflicts in society. Meanwhile, there was the BPD (Village Representative Body) that had the same role as other local governments but did not have a direct interest in the sustainability of the Bali Sea ecosystem.

NGOs such as the Indonesian Environmental Forum (WALHI), Greenpeace, the Indonesian Zero Waste Alliance (AZWI), ECOTON, ICEL, Gita Pertiwi, and the Environmental Rescue Front also helped to shape the setting. These non-governmental organizations (NGOs) had no interests but were deeply concerned about the preservation of the Bali Sea ecosystem. They supervised the development initiatives that had a direct influence on the marine ecosystem and occasionally carried out advocacy actions on cases of environmental damage both locally and nationally.

Fourth, Crowd was a stakeholder with limited authority and interests. It included Family Welfare Development (PKK), Karang Taruna, Community Empowerment Institution (LPM), and Bintaro Village Cooperative. These organizations played an important role in the local community. They aimed to empower local people, particularly women and youth, through a variety of activity programs, including health, integrated health posts, sports, arts, and small business development for fishers.

**Table 2.** Categories, Stakeholders, Functions and Responsibilities, and Levels

Category	Stakeholder	Functions, responsibilities, and obligations	Level
Player	Village/local government	Their functions, responsibilities, and obligations were: Carrying out village government and national government regulations, providing services to the community at the village level, improving community welfare at the village level, and resolving community problems at the village level.	Village/local

Category	Stakeholder	Functions, responsibilities, and obligations	Level
Subject	Fishermen Group of Les and Kubutambahan Villages	Local fishing groups provided as a venue for fishermen's activities. Fishermen's groups served as social capital for fishermen in addressing various maritime environmental issues, boosting member welfare, and resolving conflicts among fishermen.	Village/local
Subject	Lovina Beach Souvenir Traders Organization	They became a souvenir merchant organization on Lovina Beach, one of Buleleng's dolphin-watching tourist attractions. This organization provided a platform for resolving difficulties encountered by souvenir merchants and attempting to improve the welfare of souvenir merchants at tourist destinations.	Village/local
Crowd	Family Welfare Development (PKK)	This was a small community organization with mostly female members. This group worked to improve the lives of local women through a variety of training and mentorship initiatives. Furthermore, it had a responsibility to empower women by raising awareness of various social issues in the community.	Village/local
Crowd	Youth organization	They were a youth group that provided a platform for local youth activities. This local group was also responsible for empowering youth through good activity programs such as collaborating with the village council to create villages, keeping the environment clean, and organizing positive youth activities and sports. Even in Les Village, this youth organization worked to expand the tourism and salt industries.	Village/local
Crowd	Community Empowerment Institution (LPM)	Formal institutions that had functions and responsibilities in empowering village communities. This institution sought to improve the welfare of village communities.	Village/local
Player	Community Leaders in Kubutambahan Village and Les Village	In Kubutambahan and Les Villages, community leaders included both government officials and traditional leaders. Government officials were recognized by the community because they had political legitimacy, whereas traditional leaders were respected because they had socio-cultural legitimacy and, thus, were highly respected. The community in both places held both of them in high regard. Therefore, the village government and traditional leaders played an important role in decision-making.	Village/local
Player	Fisheries Service	A government institution that had a function in services in the field of water and marine, including shipping permit administration services to various assistance programs for fishermen.	Local/ regional
Context setter	Indonesian Environmental Forum (WALHI)	It was a national NGO that concerned on saving the environment. As the oldest environmental organization in Indonesia, it had considerable influence and a membership network throughout Indonesia including Bali. For its interest in saving the environment, it might be able to have positive relationships and provide a strong enough influence for fellow NGOs and the community.	National
Context setter	Greenpeace	Greenpeace was a fairly large international NGO and its membership network was also widespread, including in Indonesia. As an NGO concerning with the environment, it also often collaborated with WALHI in the mission of saving the environment. It Hhadas a good relationship with the community in saving the environment.	National/ International
Context setter	Alliance of Zero Waste Indonesia (AZWI)	AZWI was an alliance that actively campaigned for the correct implementation of the Zero Waste concept in order to mainstream various existing Zero Waste activities, programs, and initiatives to be implemented in various cities and regencies in Indonesia by considering the hierarchy of waste management, material life cycle, and circular economy. It also networked with WALHI and Greenpeace as well as other environmental NGOs and communities in Bali.	National
Context setter	ECOTON (ecological)	Ecological Observation and Wetlands Conservation (ECOTON) was established in 1996 as a wetland's conservation study group	National



Category	Stakeholder	Functions, responsibilities, and obligations	Level
	observation and wetlands conservation)	of Biology Study Program at UNAIR Surabaya and incorporated in 2000. ECOTON produced information related to the potential and threats of river ecosystems and water sources. This information was generated from studies, research, data exploration conducted by ECOTON with professional researchers. It also networked with WALHI and other environmental NGOs. It was active in checking river water quality with the Ekspedisi Sungai Nusantara (ESN) team and found microplastic contamination in the Bali river area.	
Context setter	ICEL	It fought for the realization of environmental justice based on the values of democracy, human rights, civilization, sustainability, rule of law, and good sustainable development governance. This organization also networked with other environmental NGOs.	National
Context setter	Gita Pertiwi	Yayasan Gita Pertiwi (GP) was a non-governmental organization (NGO) that focused on environmental conservation issues and fought for justice and gender equality. It also networked with other environmental NGOs.	National
Context setter	Pokmaswas Baywatch	The community was engaged in marine conservation, including monitoring the conservation beach of Gita Nada Sekotong Barat to Batu Putih Village (e.g., coral reef protection, monitoring fish bombing, actions that could potentially damage conservation waters, and making agency reports). This group had a good relationship with fishermen in maintaining the marine ecosystem.	Local/village
Subject	Oncor Fishermen's Group (KNO)	It was an association of fishermen using oncor boats in Sapeken. This fishermen group had a role in maintaining community harmony and preservation of marine ecosystems by catching fish using simple equipment. The oncor fishermen group also sought to improve the welfare of fishermen and maintain the social life of the community from the impact of conflict over the presence of Purse seine vessels in the waters of the Bali Sea adjacent to Sapeken Island.	Local/village
Context setter	Nahdatul Ulama at Sapeken	It was an Islamic organization that had the function and responsibility of upholding the teachings of <i>Ahlusunnah wal Jama'ah</i> and preserving Islamic traditions that upheld tolerance. It organized pesantren-based education and had autonomous bodies that took part in every layer of society.	Local/regional
Context setter	Muhammadiyah at Sapeken	It was an Islamic-based organizations that had the main function and task of upholding the pure teachings of Islam and eliminating misleading teachings. It conducted education including the study of social issues, formulating Islamic laws and <i>da'wah</i> widely, especially in Sapeken.	Local/regional
Context setter	Environmental Rescue Front NGO	It engaged in the field of saving the coastal environment. The function of this NGO was to maintain the order of the village environment and coastal ecosystems by identifying and studying environmental problems in the Sapeken area and its coastal and water areas.	Local/village
Player	PT. Over Seas Seafood (OSS) Indonesia	It was a company that did business in the field of seafood around the world, especially Indonesia as a large source of all wild and exotic tropical species. It captured, handled, and processed marine catches, one of which came from Sapeken Village fishermen.	National/international
Player	PT. KEI	It was an oil exploration company operating in Pagerungan Besar Village and adjacent to Sapeken Village. The company had a responsibility to conduct CSR programs for local communities in an effort to address the environmental, social, and economic impacts of the company's operations.	National
Players	Sapeken Community Leaders	It was a respected group in Sapeken. Community leaders consisted of various elements such as religious leaders and heads	Local/village

Category	Stakeholder	Functions, responsibilities, and obligations	Level
		of fishing groups. They had a role in preserving the traditions, environment, and social harmony of the Sapeken Island community.	
Players	Sapeken Local Entrepreneurs	Through the Sapeken Businessmen's Association, local entrepreneurs developed the shrimp and lobster business for maximum financial gain. Some of the profits earned were used to empower fishermen through the capture of their catches so as to help the local economy. They also did provision of social assistance through a number of social programs such as distribution of basic necessities and medical expenses.	Local/village
Subject	Cooperative and Fishermen Group "Samudera Biru" at Bintaro Village	The fishermen's cooperative had a function as a forum for fishermen to associate, do activities, transaction of fishing equipment, savings and loans, to discuss various issues related to fishermen. This fishermen group in Bintaro had an agenda of activities in the form of saving or compulsory contributions.	Local/village
Crowd	Bintaro Village Cooperative	This Cooperative drove the economy of the Bintaro Village community. It, together with fishermen's groups usually cooperated to advance MSMEs owned by the surrounding community.	Local/village
Player	Collectors	This group was a forum for collecting fish caught by fishermen. The fish caught by the fishermen were sold to various regions in Indonesia	Local/village
Subject	Fishermen Group at West Sekotong Village	This fishermen group had a function as a forum for fishermen to associate, did activities, and discussed various issues surrounding fishermen. The group had a routine gathering agenda once a month to discuss various problems and obstacles in the fishing process. It was a local actor that had a very strategic role, because in addition to being an organizational forum, the group also functioned as a forum for conflict resolution between fishermen both in the waters and at sea.	Local/village
Context setter	BPD (Village Representative Body)	It was a government institution that had the function and responsibility of absorbing community aspirations based on their needs. It facilitated village and hamlet meetings with the aim of absorbing the aspirations of the community, which would later be reported to the village government.	Local/village
Player	Bugis Medang and Bajo Medang Community Leaders	They consisted of elements of village officials, religious leaders, fishermen financiers, chairman of the mosque committee, mosque imam, and traditional leaders. Community leaders in Bugis Medang and Bajo Medang villages had a function in maintaining socio-cultural values, maintaining traditions, preserving the environment, maintaining social respect in the community, and facilitating the resolution of various conflicts in the community.	Local/village
Player	Capital owner/ship owner	Capital owners or ship owners in the fisheries business chain were the capital providers of. They were commonly referred to as capital owners because economically they had large capital. Capital owners/ship owners often employed fishermen laborers or provided access to capital for small-scale fishermen, in return for this kindness, the fishermen usually sold their catches to the capital owners.	Local/village

Based on the levels, categories, functions, and responsibilities of stakeholders, the mapping of the strengths and interests of stakeholders for the sustainability of the Bali Sea ecosystem was drawn as follows:



Table 3. Stakeholder mapping

High  Low	Subject: - Les and Kubutambahan Village Fishermen Group - Lovina Beach Souvenir Traders Organization - Baywatch Community Group - Oncor Fishermen Group (KNO) - "Samudera Biru" Cooperative and Fishermen Group at Bintaro Village - Fishermen Group at West Sekotong Village	Player: - Village/local government - Community Leaders in Les and Kubutambahan Villages - Fisheries Office - PT. Over Seas Seafood (OSS) Indonesia - PT. KEI - Community Leaders of Sapeken - Collectors - Community Leaders of Bugis Medang and Bajo Medang - Capital Owners/Ship Owners - Local Entrepreneurs of Sapeken
	Kerumunan: - Family Welfare Development (PKK) - Karang Taruna - Community Empowerment Institution (LPM) - PERSIS - Bintaro Village Cooperative	Cotext Setter: - Nahdatul Ulama at Sapeken - Muhammadiyah at Sapeken - BPD (Village Representative Body) - Environmental Forum (WALHI) - Greenpeace - Zero Waste Alliance Indonesia (AZWI) - ECOTON - ICEL - Gita Pertiwi - Environmental Rescue Front
		High

### 3.3. Important roles and strategies of stakeholders in maintaining marine ecosystems

In maintaining the marine ecosystem, cooperation between stakeholders was needed [24]. With the involvement and cooperation between stakeholders, especially local stakeholders, it could produce better support [25] [26] in efforts to preserve the Bali Sea ecosystem. Table 4 shows several problems faced in maintaining the Bali Sea ecosystem. Several strategies were developed in dealing with existing problems with cooperation between stakeholders.

Fishermen who belonged to the fishermen's group dedicated to preserving the Bali Sea ecosystem by collaborating with Pokmaswas Baywatch and the local authorities. To ward off purse seine vessels, Sapeken fishermen who belonged to the Oncor Fishermen's Group (KNO) collaborated with local companies. Local entrepreneurs also built grouper, lobster, and ronggeng shrimp hatcheries to house fishermen's catches so they might be exported. Exports increased fishermen's revenue, allowing them to catch only grouper, lobster, and ronggeng shrimp that were old enough to be sold.

Fishermen's groups in Bintaro collaborated with cooperatives to boost fishermen's incomes by teaching them in fish processing and marketing. In addition, to reduce contamination, fish processing waste was converted into other food ingredients. When at sea, fishermen typically resolved their own conflicts. If the situation remained unaddressed, it would be presented to community leaders for a solution. Conflicts arose due to the function of the environment, which could not be isolated from the human dimension. There were many competing interests, especially about access to the fisheries sector, business, government, and other ecosystem users [27]. With this cooperation between stakeholders, the Bali Sea ecosystem still survived and could be an economic foundation for the surrounding fishing communities.

**Table 4.** Key Roles and Strategies for Stakeholders in Safeguarding Marine Ecosystems

Marine ecosystem issues	Indicators	Strategies
Ornamental Fish and Coral Reef Populations	Capture of ornamental fish for sale and fishing activities that had the potential to damage coral reefs	Ornamental fishing activities by diving and using simple equipment
Declining fish population	The existence of large vessels such as purse seines that could catch large amounts of fish	One of the fishermen groups, the Onkor Fishermen Group (KNO), prohibited the entry of purse seine vessels in their area.
Declining fish catches and potential conflicts between fishermen	a) Experiencing losses due to reduced fish catches b) Conflicts occurred between fishermen due to fighting over catchment areas	a. Using simple equipment to maintain the fish population b. Breeding grouper, lobster and ronggeng prawns c. Diversify businesses such as salt ponds
Fish processing waste in Bintaro	Used fish processing water can pollute the sea	Processing fish processing waste into food ingredients such as petis

#### 4. CONCLUSIONS

Stakeholder cooperation is critical to the long-term viability of marine ecosystems. A well-maintained marine ecology can help promote social peace in coastal towns. One of the driving forces behind the preservation of the Bali Sea ecosystem is the role of local communities that continue to use traditional fishing methods and equipment. This surely requires support not only from the local government but also from other stakeholders, such as regional and national governments. There are various ideas for ensuring the sustainability of the Bali Sea ecosystem, including expanding the role and involvement of coastal people and local expertise in activities in the Bali Sea, such as the use of traditional equipment. Second, enhance local institutions and stakeholder networks in attempts to conserve the Bali Sea ecosystem. Third, there are strong bans and consequences for violations of legislation governing sustainable marine ecosystem management, such as the use of purse seine vessels or tiger trawls, which have the potential to harm marine ecosystems and generate conflict with local populations and fishermen. Further research should include mapping of social capital and stakeholder networks to evaluate the extent to which stakeholder social capital plays a role in attempts to maintain maritime ecosystems. This study also advises that future studies examine stakeholder perspectives of marine ecosystem preservation. This is crucial since it is related to how stakeholders act in using and conserving maritime habitats.

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