



## Zoning System in Biodiversity Conservation and Marine Ecological Sustainability: An Emic Perspective of the Bajo People in Southeast Sulawesi

Ambo Upe<sup>1</sup>, Andi Tenri<sup>2</sup>, Shadrack Kipkoech Sitienei<sup>3</sup>, Ali Hadara<sup>4</sup>, Pendais Hak<sup>4</sup>, Achmad Syarahil<sup>1</sup>

<sup>1</sup>Department of Sociology, Universitas Halu Oleo, Indonesia

<sup>2</sup>Department of Sociology, Universitas Dayanu Ikhsanuddin Baubau, Indonesia

<sup>3</sup>Department of Philosophy History and Religion, Egerton University, Kenya

<sup>4</sup>Department of History Education, Universitas Halu Oleo, Indonesia

**Corresponding Author:** Ambo Upe; Email: [ambo.upe@uho.ac.id](mailto:ambo.upe@uho.ac.id)

### ARTICLE INFO

**Keywords:** Biodiversity Conservation; Local Wisdom; Marine-Ecological Sustainability; Zoning System.

*Received* : 06 September 2022

*Revised* : 28 December 2022

*Accepted* : 30 December 2022

### ABSTRACT

The spirit of fisheries modernization or known as the blue revolution is to transform traditional fishing communities into modern fishermen. This paradigm aims to utilize marine resources in a modern way to increase the income of fishing communities in particular, and the income of the State in general. However, in its implementation, the use of maritime resources tends to lead to massive exploitation, thus causing damage to biodiversity and threatening ecological sustainability. Therefore, it is necessary to manage sustainable marine resources as carried out by the Bajo people. This study aims to describe the zoning system in marine resource conservation, the values of local wisdom contained in the marine conservation system, and its benefits in ecological sustainability. Methodologically, this study uses a qualitative approach, a type of ethnography. Data was collected through a process of in-depth interviews and observations. There are three main issues in the findings of this research. First, there are three zoning systems in the management of marine resources in the Bajo community, namely: sacred zone (*Toroh Pamali*), coral conservation zone (*Tubba Dikatutuang*), and free fishing zone (*Sapa*). Second, the existence of the zoning system is based on the local wisdom values of the Bajo community in Sama Bahari Village, including social, economic, and ecological values. Third, the existence of the zoning system to date is considered quite effective in maintaining the ecological, social, and economic sustainability of the Bajo community in Wakatobi Regency, Southeast province.

### INTRODUCTION

Development based on the modernization paradigm is a global issue in third-world countries (Degterev, 2021; Tagarirofa, 2017). The modernization paradigm emphasizes economic growth in various aspects, including in the fisheries and marine sectors. Fisheries modernization, also known as the blue revolution project, began in the 1970s (Garlock et al., 2020). The blue revolution provides an understanding and mindset about the importance of modern technology. This project was developed through the penetration of capital and the shift of capital flows and the use of modern technology. The government's response to this

project can be seen from various fisheries modernization policies, including motorization, modernization of fishing gear, development of fishing port infrastructure, and various empowerment programs for fishing and coastal communities (Valentina et al., 2021).

Geographically, Indonesia is known as a maritime country consisting of islands and very rich biodiversity, but most fishermen in Indonesia are still below the poverty line (Hasanuddin et al., 2013). Some of the factors that cause fishermen's poverty include the limited quality of human resources, limited business capital and fishing technology, the difficulty of diversifying fishing,

and a wasteful lifestyle that is less future-oriented (Ginting, 2018), the mindset of fishermen who are still subsistence (Intyas & Tjahjono, 2019), the fatalistic attitude of the fishing community that life has been determined by God while humans only live and accept it (Hakim, 2019).

The rich condition of the sea that is not in line with the welfare condition of fishermen is a push and pull factor for modernization through the blue revolution project. The goal of modernization in the fisheries sector for fishing communities is to bring traditional fishing communities to modern fishing communities. The Blue Revolution presents modern technology that aims to make it easier for fishing communities to utilize the wealth of marine biological resources for food needs. In principle, the spirit of the Blue Revolution project in exploiting the potential of marine resources is to increase the efficiency and productivity of catches that are expected to create the welfare of fishing and coastal communities (Kusdiantoro et al., 2019). But in fact, the increase in the catch in large numbers is not all in line with the improvement of fishermen's welfare.

Various research results show that capital penetration and technology transfer through capital accumulation has an impact on the degradation of social and ecological life (Rajee & Quigley, 2017). From the social aspect, the capitalization of marine resources increasingly drags fishermen towards dependence, structural poverty, and social conflict. Meanwhile, from an ecological aspect, the exploitation of marine resources by modern fishers has had an impact on the destruction of marine and coastal ecosystems (Ahmed & Thompson, 2019). This occurs due to unlimited fishing activities with dangerous tools and materials; marine pollution by ship waste and oil spills; and industrialization in coastal areas causing large amounts of waste to enter the sea, such as cases of pollution in Jakarta bay (Azizi et al., 2021; Kunzmann et al., 2018), Malacca Strait (Robertua et al., 2019), metal pollution and Pb isotopes in seawater at the surface of Prigi Bay (Wijaya et al., 2019), pollution of plastic waste in the Coastal Water of Makassar City (Afdal et al., 2019), and various water pollution around other coastal cities (Sui et al., 2020). The exploitation of marine resources also negatively impacts the physical degradation of coastal ecosystems, such as damage to mangrove

ecosystems, coral reefs, and coastal abrasion. Cánovas-Molina & García-Frapolli (2021), identified seven socio-ecological threats of the blue revolution, namely: damage and destruction of the natural environment, waste disposal; reduced fish and shellfish populations, spatial conflicts, threats to food security, inequities in resource access; and unequal distribution of benefits.

Research publications on human relations with marine resources as described above can basically be classified into two mainstreams, namely classical ecology, and modern ecology. The classical ecological perspective regulates human activities (fishermen) at the level of meeting daily needs using traditional tools and materials based on mythological thinking. Meanwhile, the modern ecological perspective is oriented towards the exploitation of natural resources using modern technology to get maximum results in a fast time (blue revolution). Another case with this research describes the relationship between the Bajo people and their environment in a post-ecological perspective (Di Quarto & Zinzani, 2022). This perspective emphasizes the discourse of wise use of natural resources while still paying attention to the balance and sustainability of the ecosystem for the benefit of future generations.

In the context of the Bajo community in Sama Bahari Village, they have a unique environmental discourse in behaving and acting toward their environment. It is said to be unique because of the choice of moral discourse in meeting the needs of life that do not follow the demands of the grand narrative of the blue revolution. The pressure on marine ecosystems from various modernization-based human activities has caused the carrying capacity of the environment to decline (Thushari & Senevirathna, 2020), and has become a boomerang for the lives of fishing communities. If the exploitation of marine resources continues, it will threaten the future of fishermen.

Therefore, to maintain and prevent damage to the marine environment and ecosystems, conservation measures are appropriate and in line with the direction of sustainable development. The Rio de Janeiro Declaration emphasizes that sustainability is the ability of the present environment without compromising the interests of future generations (I Nyoman & Safaat, 2016). This requires the involvement of local communities in

marine resource management. Local wisdom in the community generally contains teachings to maintain and utilize natural resources sustainably (Maturbongs et al., 2017). One form of traditional knowledge that still exists is knowledge in the use of ecosystems, both as a place to live and a place to find or produce food. Thus, the existence of local wisdom is very beneficial because it directly or indirectly helps in maintaining the environment and preventing environmental damage.

The Bajo tribe is a distinctive local community that has inhabited the ocean for generations. For the Bajo people, the sea is not only a source of food and livelihood but also an integral part of their culture and heritage. The Bajo people in Wakatobi Regency, Sama Bahari Village, as a community that cannot be separated from the sea, have unique and very rich local knowledge and traditions in relation to the sea. The richness of the Bajo tribe's culture varies in various places where the Bajo tribe community is located, according to their territorial and genealogical factors. But there is one thing in common, namely that the Bajo tribe has environmental wisdom as a result of a process of adaptation to environmental changes that have occurred for generations. From a process that lasted decades, even hundreds of years eventually formed a kind of problem-solving mechanism.

Local wisdom owned by the Bajo community in Sama Bahari Village in the form of rules, taboos, and traditions that have been traditionally practiced, maintained and adhered to by the Bajo community relating to the preservation of their environment. These rules such as using traditional equipment that does not damage both in terms of transportation and fishing equipment used. The local wisdom is carried out by the Bajo community together and works together to preserve the marine environment and the balance of the marine ecosystem, as well as maintain solidarity and strengthen the relationship between the community, its existence is the result of adaptation through the process of social learning to the conditions and dynamics of the environment, both the natural environment and the social environment. Thus, local wisdom and local knowledge have been tested and are always contextualized, in line with developments and changes that occur. Therefore, this study aims to describe the zoning system in marine resource conservation, the values of local wisdom contained

in the marine conservation system, and its benefits in ecological sustainability.

## **MATERIALS AND METHODS**

This research was conducted in Wakatobi Regency, Southeast Sulawesi Province, especially in Sama Bahari Village, Kaledupa Sub-district. The determination of this location is based on the consideration that in this village local wisdom is found in the management of marine resources in the form of the tradition of *Maduai Pinah*, *Maduai Boe*, and *Maduai Sangal*. The Bajo community of Sama Bahari Village still maintains the tradition of catching fish using traditional tools and methods (Wahyuni, et al., 2022).

Methodologically, this research uses a qualitative approach through ethnographic research (Creswell, 2014; Thaler, 2021). Ethnographic research is a qualitative research procedure that describes and interprets patterns of behavior and beliefs that have developed and been adopted by various community groups over time (Shagrir, 2017). This approach is intended to get a comprehensive picture of the local wisdom of the Bajo people (emic perspective) in preserving marine ecology. Operationally, data collection was carried out through observation and interview techniques (Muthiah et al., 2020). The observation technique was used to directly observe the equipment and activities of the Bajo tribe in the fishing process. Meanwhile, the interview technique is intended to obtain in-depth information about the values and local knowledge that underlie the activities of Bajo fishermen in conserving marine resources.

After all the data has been collected, ethnographic thematic analysis is carried out to thoroughly describe the cultural themes (Wutich et al., 2021) about the environmental wisdom of the Bajo community in their socio-economic activities. The data presentation is carried out in the form of narratives or descriptions of the results of interviews and observations (Ningi, 2022). Presentation is made in the form of indirect quotes so that it is easier for readers to understand. The final stage of the data analysis process is concludes by focusing on the research objectives.

## RESULTS AND DISCUSSION

### The Zoning System in Environmental Conservation

Basically, all living species including humans have an interdependent relationship with their environment. This process forms an ecological system, where humans interact with elements of their environment (biotic and abiotic). This process takes place functionally between humans and the environment, and vice versa. Disruption of function or damage to one or more elements in the ecological system will have an impact on the function of other subsystems. This ecological principle is also found in marine ecology as an integral part of coastal community life. The element of coastal communities that has the most important role in marine conservation is fishermen. In essence, almost all forms of local wisdom of fishing communities in Indonesia, especially in the Bajo Tribe, aim to preserve the sea. Thus, wisdom is needed in managing marine resources so that the stability of marine ecological functions is maintained. This was found in the Bajo community in Sama Bahari Village.

The Bajo community in Sama Bahari Village has local wisdom that is zoning in managing its environment that is in line with the rules for protecting conservation areas in Wakatobi Regency. The local wisdom is in the form of places that are prohibited and not prohibited from fishing. This aims to maintain the sustainability of marine resources as a source of livelihood for the Bajo community in Sama Bahari Village. The form of zoning local wisdom of the Bajo community in Sama Bahari Village is sacred zoning (*Toroh Pamali*), coral conservation zoning (*Tuba Dikatutuang*), and free fishing zoning (*Sapa*). For more details on the environmental conservation zoning system, it is presented below.

#### 1. Sacred Zone

The Bajo community in Sama Bahari Village believes that the sea is one of the sacred places controlled by the god of the sea which they know as *Mbo Madilao'*. A sacred zone is a sacred place where the Bajo fishing community is completely prohibited from fishing in a sacred place. The sacred location is at the end of Kaledupa Island, precisely at the Kaledupa-Wanci crossing border. Marine resources in *Toroh Pamali* are very abundant because the seafood is never taken

because it is a sacred place so fishermen are afraid to fish in that place. The location of *Toroh Pamali* is sacred because it is the meeting point of the shallow sea and the deep sea. The sea currents in that place never stop and always bring big waves, so the Bajo people sacred the place. If fishermen continue to fish at that location, it often costs lives.

One informant as a *Parika* (shaman) said that their parents used to sacred *Toroh Pamali* because every fisherman who went to catch in that place would drown and die. Even if there are survivors, only 1 or 2 people. This was also revealed by one Bajo fisherman who said that *Toroh Pamali* is a place feared by Bajo fishermen in Sama Bahari Village. Their understanding of sacred places is passed down from generation to generation from their ancestors, and until now they are still believed. The zoning system of the sacred area is quite effective in preserving biodiversity in Sama Bahari Village.

#### 2. Coral Conservation Zone

The conservation zone is a place to protect marine resources both coral reefs and fish in the process of spawning. The location of coral conservation (*Tuba Dikatutuang*) is in the waters of Sama Bahari Village, precisely in front of the Bajo community settlement and Hoga Island. The conservation zone is also made a sacred place through customary rules that are highly feared to create a sustainable marine ecosystem. Basically, there is no prohibition on fishing in this zone, but it must pay attention to local wisdom by not destroying coral reefs. The Bajo people view that violating customary rules by overfishing and destroying coral reefs will bring disaster. Therefore, before the Bajo fishing community conducts fishing in the coral conservation zone (*Tuba Dikatutuang*), they first perform the *Maduai Pinah* and *Maduai Boe* rituals offered to *Mbo Madilao'* as the guardian god of the sea. Both rituals are performed when it is difficult for the Bajo fishing community to catch fish due to the strong winds and waves in the west wind season. They consider that strong winds and waves are a sign of anger from the god of the sea.

The existence of the conservation zone is determined by traditional leaders who maintain the sacredness of local wisdom values in fishing. *Tubba Dikatutuang* is made a sacred place so fishermen are afraid to destroy it. Even if fishermen do fishing in this zone, they must comply with the rules that

have been imposed, such as only using environmentally friendly tools, not doing damage, not throwing garbage in the sea, and must pick up garbage in the sea. In addition, fishing activities in the conservation zone are limited to daily food needs, not for excessive commercial purposes. Therefore, until now, cultural rules regarding conservation zones are still maintained for the sustainability of marine ecology in Sama Bahari Village.

### 3. Free Fishing Zone

The free fishing zone (*sapa*) is a fishing ground for the Bajo community when the wave season is not strong. Bajo fishermen from various Bajo villages in the Wakatobi district including from Sama Bahari Village travel long distances to fish in the free fishing zone (*sapa*). They recognize three *sapa* as fishing destinations, namely *sapa garangang*, *sapa pamakuttaang*, and *sapa runduma*. To reach these zones, fishermen must travel for a long time (one to three weeks) because Bajo fishermen fish in several of these zones.

Because fishing activities are carried out in a very far zone and require a long time, the Bajo fishing community always maintains the *Pongka'* tradition which is carried out in the form of the *Maduai Sangal* ritual. The *Maduai Sangal* ritual is the biggest ritual when the Bajo community will travel far to look for and catch fish in the free zone (*Sapa*). This is done as a form of asking permission from the gods of the sea for safety and abundant catches. An interesting cultural message in this ritual is the delivery of traditional leaders not to use tools that are harmful to the environment. They are only allowed to bring environmentally friendly traditional fishing gear.

The fishing zoning system for the Bajo community shows an effort to balance economic interests and environmental interests. The Bajo people's relationship with nature is not in a superior position but in partnership with nature. To maintain the existence of marine ecological sustainability, traditional leaders of the Bajo community always maintain mystical awareness (*Toroh Pamali*) in breaking the pace of modernity that always ignores the sovereignty of nature. Although they recognize the free fishing zone (*sapa*), it does not mean that they are free to exploit marine resources freely. Exploitation using tools that can damage the environment means that it will bring danger to the

existence of marine ecology which means threatening the existence of their own lives.

Various rituals are performed as a form of expression of obedience to the gods of the sea, as well as an internalization process for their generation to maintain the ecosystem. In the post-ecological context, the "God of the Sea" (*Mbo Madilao'*) is a discourse that controls the socio-economic activities of the Bajo community. For the Bajo people, exploitation of marine resources will bring prosperity is a logocentrism of fisheries modernization that will damage the environment. Therefore, according to Foucault (Leff, 2017), building a sustainable future requires deconstructing the grand narrative of modernity. From a Foucauldian perspective, the power of the "God of the Sea" discourse represents the political ideology (Foster, 2018) of the Bajo people in protecting and preserving their environment.

### The Local Values of the Zoning System

Value is something abstract that is used as a guideline and basic principle in acting and behaving. Generally, the attachment of people or groups to values is relatively very strong and even emotional. Every community, tribe, and the region has its values. This means that values contain the spirit that underlies human attitudes and behavior. This is also the case in the fishing zoning system for the Bajo tribe in Sama Bahari Village. The existence of rituals in wise fishing activities is based on three main values, namely social value, economic value, and ecological value. The three values are described as follows.

#### 1. Social Value

Social value is the ability of people to organize themselves to fight for common goals through collective action. Social values are the result of a consensus that is mutually recognized as a way of life in society. Social values in the Bajo community are called *Rarambangah*, which is a value that underlies the ritual activities of fishing ceremonies that teach mutual cooperation and help fellow fishermen. Whether invited or not, they will participate in various traditional ritual activities. The social value of *Rarambangah* is the ethos underlying the Bajo tribe in implementing all rules as local wisdom in preserving the environment from threats and damage. The social value of *Rarambangah* in the Bajo community in Sama Bahari Village functions as a social glue in

maintaining the social solidarity of fellow fishermen.

Social values in the marine ecological conservation zoning system of the Bajo tribe are seen in the ritual ceremonies before going to sea including *Maduai Sangal*, *Palilibu*, and *Pongka'*. The spirit of cooperation (*Rarambangah*) is not only carried out in the ritual process before going to sea, but also carried out until they return home together, and clean the marine environment together. The social value of *Rarambangah* emphasizes cooperative efforts in protecting the marine ecosystem together so that the environment remains sustainable. The Bajo community in Sama Bahari Village considers *Rarambangah* as a normative source to organize their group members to protect their environment.

## **2. Economic Value**

There is often an assumption that the Bajo community is a community that has a high level of poverty because it is caused by low education, so they are unable to manage natural resources. However, from the internal perspective of the Bajo people, they essentially have local knowledge of managing marine resources. The local wisdom they have is enough to support their economic needs sustainably. They manage the environment wisely for long-term economic interests and avoid exploitative behavior for short-term interests. The zoning system described above is clear evidence of how the Bajo tribe seriously maintains ecological balance and sustainability.

The division of fishing zones into restricted and free zone patterns is a sustainable economic value. Although they have a free zone arrangement, it does not mean that they are free to exploit without limits, but have considerations in fishing, namely, they only catch fish in large sizes and do not use dangerous tools and materials. The Bajo community sees that fishing wisely can sustainably support their economic needs, not only to be enjoyed by one generation, but the Bajo community thinks about the needs of their children and grandchildren in the future.

Overfishing is not difficult for the Bajo community, just use tools such as bombs, potassium, trawlers, and others. This method will certainly produce abundant catches, but they do not do this because they think about the needs of their children and grandchildren. Bajo people understand

that exploitative actions will result in limited and scarce marine resources. Not only will the environment be damaged, but they will also have to travel long distances to fish. Therefore, for them, environmental sustainability in Sama Bahari Village is a must to maintain the marine resources they have sustainably.

## **3. Ecological Value**

Ecological values are patterns of behavior and relationships between living things (humans) and their environment. Humans live depending on the environment, and vice versa the environment needs humans to preserve it. In general, three ecological values underlie the relationship between humans and their environment. First, classical ecological values regulate human activities at the level of meeting daily needs using traditional tools and materials based on mythological thinking. Second, modern ecological values are oriented towards the exploitation of natural resources using modern technology to get maximum results, and in a fast time. Third, critical ecological values are oriented towards the wise use of the environment while still paying attention to the balance and sustainability of the ecosystem for the benefit of future generations.

In the context of the Bajo Tribe in Sama Bahari Village, they have a unique environmental ethic in behaving and acting towards their environment. It is said to be unique because the moral choice in fulfilling the needs of life that is not extreme follows one of the three ecological values above. On the one hand, the Bajo tribe still maintains rituals and myths in fishing, even though they have used boats from machines. On the other hand, even though they already use boats made from machines, they do not exploit, but still, pay attention to ecological balance and sustainability. The environmental ethics of the Bajo tribe in efforts to preserve the marine environment already exist in the traditional fishing tradition system and local cultural rituals, accompanied by various beliefs and myths contained in the zoning system. The local wisdom of the Bajo tribe in managing marine resources is an expression of human respect for nature, which is not only oriented toward economic value but also oriented toward preserving the natural environment.

This shows that all socio-economic activities of the Bajo community are centered on ecological values (ecocentric), not merely considerations of

meeting economic needs (de Figueiredo & Marquesan, 2022; Humaida, 2019). If these values are violated, it is not only the “anger” of Mbo Madilao’ but also the boomerang effect of the risk of modernization as intended by Ulrich Beck. According to Beck (Davoudi, 2015), the more modern a society becomes, the more unintended consequences it produces. This is the very condition that the Bajo community in Sama Bahari Village avoids.

### **Ecological Sustainability**

Almost all over the world, humans face many environmental problems. Environmental problems that occur today are quite clearly illustrated in various cases of pollution and damage to the sea, forests, atmosphere, soil, and water. Therefore, comprehensive environmental conservation efforts are needed as a series of efforts to maintain the sustainability of the carrying capacity and capacity of the environment. The issue of environmental conservation has become a concern of various countries in the world. This was marked by the “Earth Summit” in Rio De Janeiro in 1992 as the forerunner of the emergence of a discourse on environmental conservation based on traditional cultural wisdom. This global policy emphasizes the need for local community participation in environmental conservation efforts.

This global agreement implies that all forms of human activity, both in daily life and in the development process must be based on the sustainable development paradigm. This paradigm emphasizes the balance and sustainability of resources so that they remain available and can be utilized for the present and the future. Sustainable development has three main aspects, namely ecological, social and economic aspects. These three aspects are integral to the process of marine resource utilization, and marine resource conservation measures. In short, it can be said that in essence, the management of natural resources is directed toward human welfare, while still taking into account the carrying capacity of the environment. These three aspects are in line with the values contained in the marine resource management zoning system of the Bajo tribe in Sama Bahari Village.

The sustainable development goals are directed at various sectors, including fisheries. Sustainable fisheries began to become a global

agenda with the document Code of Conduct for Responsible Fisheries (CCRF) prepared by FAO in 1995 (Moore, 2021). The concept of sustainable fisheries development has been suggested in the CCRF that responsible fisheries management is management that can ensure the sustainability of fisheries with an effort to balance the level of exploitation with fish resources. This expectation has been implemented in the fishing activities of the Bajo community in Sama Bahari Village. They have a zoning system that regulates areas that are prohibited (*Toroh Pamali* and *Tuba Dikatuang*) and areas that are allowed to fish (*Sapa*). The Bajo community of Sama Bahari Village is a community structure that cares about its environment, placing itself in accordance with its function as environmental control. With various local wisdom values that are owned, the Bajo community can maintain its marine ecosystem to remain productive in a sustainable manner.

The Bajo tribe is known for its prowess in managing marine resources for survival, utilizing all the marine potential available in the vicinity, and all the activities that the Bajo people do are dominantly above the sea, but the Bajo people do it traditionally according to their local wisdom. The values in the zoning system are effectively able to control all fishing activities so that local wisdom can maintain the marine resources of the Bajo community sustainably. The local wisdom of the Bajo community in Sama Bahari Village is quite effective as a control tool in regulating all activities of the Bajo community which aims to maintain its marine resources. In addition to the zoning system, the Bajo tribe also has local wisdom that prohibits fishermen from fishing using dangerous tools and materials. In every ritual before going to sea, traditional leaders remind them to keep using traditional tools, not destroying coral reefs, only taking fish in large sizes, and not polluting the sea. The traditional tools used by the Bajo community and considered not to damage the environment are fish arrows, spears, and fishing rods. The Bajo community in Sama Bahari Village believes that if this local wisdom is violated, it will bring disaster, not only to themselves but to the entire Bajo community in Sama Bahari Village. According to them, when the sea is managed wisely, it will provide more benefits and be sustainable.

The portrait of the socio-economic activities of the Bajo tribe that prioritizes ecological balance is in line with the perspective of sustainable fishery development, which includes four main aspects, namely ecological sustainability, socio-economic sustainability, community sustainability, and institutional sustainability (Charles, 2021). Ecological sustainability emphasizes maintaining the sustainability of fishery resource stocks so that the utilization of fishery resources does not exceed the existing carrying capacity. Meanwhile, socioeconomic sustainability focuses on efforts to sustain community welfare. In line with that, community sustainability is intended to maintain and preserve the sustainability of the community environment, so that conducive conditions are maintained.

## CONCLUSION

Based on the above discussion, three main points can be concluded in this article. First, for generations, the Bajo tribe has protected their marine environment and ecosystem from damage through a zoning system. This zoning system includes zones where fishing is prohibited and zones where fishing is allowed. The forbidden zone is also known as the sacred zone (*Toroh Pamali*), where Bajo fishermen may not fish at all because it will bring disaster to themselves. While the allowed zones include coral conservation zones (*Tuba Dikatutuang*), where Bajo fishermen are allowed to fish on condition that they comply with cultural rules, namely only using environmentally friendly tools and not overfishing. Furthermore, the zone that is allowed to fish freely is called *sapa*, where Bajo fishermen in Sama Bahari Village freely catch fish in large quantities, but still adhere to local wisdom, namely using traditional tools that are environmentally friendly and do not damage the ecosystem.

Second, although the Bajo tribe in Sama Bahari Village carries out all their activities above the sea, they still maintain the balance and sustainability of the environment. They always maintain the carrying capacity of their environment wisely by strengthening local wisdom. The existence of local wisdom in preserving marine ecology for the Bajo tribe is based on the values they have held for hundreds of years from their ancestors. The local wisdom of the Bajo community

in Sama Bahari Village includes social, economic, and ecological values. Social value is called *Rarambengah* which is described in the form of cooperation, both when performing rituals before going to sea, as well as cooperation during fishing at sea. Furthermore, economic value is seen in the pattern of division of fishing locations that emphasizes ecosystem balance, not merely economic considerations. Therefore, activities to utilize marine resources always pay attention to sustainability by using environmentally friendly traditional fishing gear such as fish arrows, spears, and fishing rods. The third main value is ecological value, where all socio-economic activities of the Bajo tribe in Sama Bahari Village are based on considerations of ecological sustainability.

Third, the Bajo tribe is well known as a community that depends on the sea for its livelihood. Therefore, they always maintain the balance of the ecosystem through the mechanism of the zoning system. The fishing zoning system and the various values contained in it are quite effective in maintaining the balance and sustainability of ecosystem functions. The Bajo community in Sama Bahari Village still upholds local wisdom in their socio-economic activities. They always try to meet their needs without endangering and threatening the existence of the environment, and most importantly, they still maintain the principle of sustainability to meet the needs of future generations. The fulfillment of the needs of future generations in the Bajo community is implied in the goal of local wisdom-based marine conservation. Bajo people think that preserving the environment means preserving the survival of their children and grandchildren. Conversely, destroying the environment also means damaging and disastrous in the present and future life. This way of thinking not only maintains social balance in the Bajo community in Sama Bahari Village but also maintains ecological balance.

## REFERENCES

- Afdal, M., Werorilangi, S., Faizal, A., & Tahir, A. (2019). Studies on Microplastics Morphology Characteristics in the Coastal Water of Makassar City, South Sulawesi, Indonesia. *International Journal of Environment, Agriculture and Biotechnology*, 4(4), 1028–1033.



- Ahmed, N., & Thompson, S. (2019). The blue dimensions of aquaculture: A global synthesis. In *Science of the Total Environment* (652).
- Azizi, A., Setyowati, W. N., Fairus, S., Puspito, D. A., & Irawan, D. S. (2021). Microplastic pollution in the sediment of Jakarta Bay, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 930(1).
- Cánovas-Molina, A., & Garcíá-Frapolli, E. (2021). Socio-ecological impacts of industrial aquaculture and ways forward to sustainability. In *Marine and Freshwater Research*, 72(8), 1101–1109.
- Charles, A. T. (2021). *Sustainable Fishery System. Fish and Aquatic Resources Series 5*. Blackwell Science.
- Creswell, J. (2014). *Research design: qualitative, quantitative, and mixed methods approaches*. Sage Publication.
- Davoudi, S. (2015). From risk society to security society. In *Risk Governance: The Articulation of Hazard, Politics and Ecology*. Springer Netherlands.
- de Figueiredo, M. D., & Marquesan, F. F. S. (2022). Back to the future: ecocentrism, organization studies, and the Anthropocene. *Scandinavian Journal of Management*, 38(2).
- Degtarev, D. A. (2021). Non-western theories of development in the global capitalism era. *World Economy and International Relations*, 65(4).
- Di Quarto, F., & Zinzani, A. (2022). European environmental governance and the post-ecology perspective: a critical analysis of the Water Framework Directive. *GeoJournal*, 87(4), 2849–2861.
- Foster, E. A. (2018). Foucault and Ecology. In *After Foucault: Culture, Theory, and Criticism in the Twenty-First Century*. Cambridge University Press.
- Garlock, T., Asche, F., Anderson, J., Bjørndal, T., Kumar, G., Lorenzen, K., Ropicki, A., Smith, M. D., & Tveterås, R. (2020). A Global Blue Revolution: Aquaculture Growth Across Regions, Species, and Countries. In *Reviews in Fisheries Science and Aquaculture*, 28 (1), 107–116. Taylor and Francis Inc.
- Ginting, B. (2018). Poverty of Traditional Fisherman Percut Village Percut Sei Tuan District Deli Serdang District. *Proceedings of the International Conference on Public Policy, Social Computing and Development 2017 (ICOPOSDev 2017)*
- Hakim, M. (2019). Fatalism and Poverty in Fishing Communities. *Society*, 7(2), 150–158.
- Hasanuddin, N. L., Noor, N., & Santosa, H. R. (2013). Is it possible to eradicate poverty in the fishermen village? *International Journal of Environmental Sciences*, 4(2), 123-130.
- Humaida, N. (2019). The importance of ecocentrism to the level of environmental awareness for sustainable natural resources. *IOP Conference Series: Earth and Environmental Science*, 399(1), 1-6.
- I Nyoman, N., & Safaat, R. (2016). Access to Ecological Justice for the Marginalised People of Indonesia: Is It a Genuine or Pseudo Recognition and Protection? *Indonesia Law Review*, 6(1), 97-110.
- Intyas, C. A., & Tjahjono, A. (2019). Food Security Analysis of Smallscale Fishermen in Karanggongso, Trenggalek Regency. *ECSOFiM (Economic and Social of Fisheries and Marine Journal)*, 6(2), 183-193.
- Kunzmann, A., Arifin, Z., & Baum, G. (2018). Pollution of Coastal Areas of Jakarta Bay: Water Quality and Biological Responses. *Marine Research in Indonesia*, 43(1), 37–51.
- Kusdiantoro, Fahrudin, A., Wisudo, S. H., & Juanda, B. (2019). The economic impact of capture fisheries development in Indonesia. *AAFL Bioflux*, 12(5), 1698–1709.
- Leff, E. (2017). Power-knowledge relations in the field of political ecology - Critical epistemology of political ecology: the power in knowledge. *Ambiente & Sociedade*, 20(3), 225–2256.
- Maturbongs, E. E., Cahyanti, T. W. A., & Fitriani. (2017). Management and environmental conservation based on local wisdom. *Advanced Science Letters*, 23(3), 2512–2514.
- Moore, G. (2021). The Code of Conduct For Responsible Fisheries. In *Developments in International Fisheries Law* (pp. 85–105). Brill.

- Muthiah, P., Naidu, R. S., Badzis, M., Mat Nayan, N. F., Abdul Rahim, R., & Abdul Aziz, N. H. (2020). *Qualitative Research: Data Collection and Data Analysis Techniques-2nd Edition*. Universiti Utara Malaysia Press.
- Ningi, A. I. (2022). Data Presentation in Qualitative Research: The Outcomes of the Pattern of Ideas with the Raw Data. *International Journal of Qualitative Research*, 1(3), 196–200.
- Rajee, O., & Quigley, K. (2017). Technological modernization and its impact on Agriculture, Fisheries and Fossil fuel utilization in the Asia Pacific Countries with emphasis on sustainability perspective. *International Journal of Advanced Biotechnology and Research*, 8(2).
- Robertua, V., Bryan Libertho Karyoprawiro, & Wahyuningtyas, E. M. (2019). Special Zone for Ship Washing in Transboundary Marine Pollution Reduction At Malaka Strait. *Sociae Polites*, 20(2), 103–114.
- Shagrir, L. (2017). *Journey to Ethnographic Research*. Springer.
- Sui, L., Wang, J., Yang, X., & Wang, Z. (2020). Spatial-temporal characteristics of coastline changes in Indonesia from 1990 to 2018. *Sustainability (Switzerland)*, 12(8), 1–28.
- Tagarirofa, J. (2017). Modernization Theory and “Third World” Development: an Exegesis of Theoretical Sarcasm. *International Journal of Politics and Good Governance*, VIII(82), 1–8.
- Thaler, G. M. (2021). Ethnography of environmental governance: Towards an organizational approach. *Geoforum*, 120, 122-131.
- Thushari, G. G. N., & Senevirathna, J. D. M. (2020). Plastic pollution in the marine environment. *Heliyon*, 6(8), e04709.
- Valentina, A., Wardany, K., & Anjarwati, S. (2021). Analyze Economic Empowerment of Fisherman Community in Margasari Village, East Lampung. *Indonesian Journal of Innovation and Applied Sciences (IJIAS)*, 1(2), 89-94.
- Wahyuni, I., Budiarti, Lestari, A.S., Kuraedah, S., & Kadir, S.F. (2022). Interdisciplinary Education: The Natural Learning of a Coastal Community in Southeast Sulawesi. *International Conference Transdisciplinary Paradigm on Islamic Knowledge (ICONIK 2020)*. KnE Social Sciences, 190–200.
- Wijaya, A. R., Semedi, B., Lusiana, R. A., Armid, A., & Muntholib, M. (2019). Metal contents and Pb isotopes in the surface seawater of the Gulf of Prigi, Indonesia: Detection of anthropogenic and natural sources. *Journal of the Brazilian Chemical Society*, 30(5), 915–929.
- Wutich, A., Beresford, M., SturtzSreetharan, C., Brewis, A., Trainer, S., & Hardin, J. (2021). Metatheme Analysis: A Qualitative Method for Cross-Cultural Research. *International Journal of Qualitative Methods*, 20, 1-11.