Socio-Cultural Impacts Of Marine Conservation Areas In Indonesian Fishing Communities

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Abstract: Marine conservation areas in Indonesia are a challenge and a necessity, as part of the effort to balance the socio-cultural needs of the fisherman community and the wish to conserve existing resources for the future. The implemented marine conservation areas have been undertaken to protect turtles, coral reefs, and fish was positively related to the improved economic household situation. Meanwhile, this research suggests that marine conservation area, which also takes socio-cultural impacts, has the implementation to succeed in the fishing communities. The study examined the socio-cultural situation of local fishing communities in the District of Sutera, Pesisir Selatan Regency, Province of West Sumatra, Indonesia, where turtles, coral reefs, and fish conservation implemented. The collect data used observation and interviewed are applied. The result of this study will be considered socio-cultural factors and involving local communities when implemented conservation areas. The impacts of socio-cultural potential benefit on the marine conservation areas and the fishing community’s livelihoods in general.

Keywords: Fishermen, household income, local institutions, local wisdom.

1. Introduction

Conservation initiatives have been taking place in Indonesia especially one potential way perhaps even reverse population of turtles, coral reefs and species of variety of fish is to implement marine resource conservation around their habitats. Populations of turtles, coral reefs and fish were established in Indonesia [1]. The government of Indonesia has committed to establish 10 million hectares by the end of this year, and 20 million hectares by 2020. Due to strong government political will in sustainable management of marine resources and fishery, 10 million hectares of conservation areas had been finished by the end of 2009, one year earlier than planned. To date, the total marine conservation area has surpassed the target reaching 13.5 million hectares [2].

According to Government Regulation No. 60 of 2007 about Fishery Resources Conservation, Aquatic Conservation Area is a protected marine conservation area, managed by a zoning system, to achieve sustainable management of fish resources and environment. Based on the type of ecosystem in the area, Aquatic Conservation Area can consist of Inland Aquatic Conservation Area and Marine Aquatic Conservation Area. For Marine Aquatic Conservation Areas, which is managed by local governments, it is more widely known as the Regional Marine Conservation Area[3].

Marine resource conservation is defined as geographical space, dedicated and managed, to achieve the long term conservation of nature with associated ecosystem services and socio-cultural
values[1][4]. They have popular instruments globally for addressing stresses to turtles, coral reefs and fish systems such as overfishing, and at the same time to foster alternative livelihoods within the region. Studies on the west coast of Indonesia showed a high degree of residency and predictable aggregation sites in their movement patterns, which suggests that marine resource conservation type protection methods are effective for protection of these species[5][6]. In addition, turtles in west Sumatra coast have led to rapid recovery of turtles populations targeted by fishing.

Marine resource conservation commonly neglects their socio-cultural impacts, because marine resource conservation has a high potential to influence the local community. It is maybe lead to situations where the objectives of the marine resource conservation may initially conflict with the interest of local community[7] [8]. Previous research has shown that local context is important to consider in marine conservation governance and a mix of top-down and bottom-up governance instruments may sometimes be more successful than a purely top-down approach. Empirical findings coupled with theoretical perspectives have been advocating involvement of bottom-up, local governance systems in implementing conservation initiatives. One term for such governance models is collaborative management, or co-management, which emphasizes pragmatism and balance between state and market actors[1]

In general, the local community as fishermen exist in marine resource environment, but they are still in poor[9]. Poverty in a coastal community is structural poverty [10]. Mubyarto defines structural poverty as suffered by society because of the socio-economic structure of society in using sources of income that are available to them. As social beings, almost human activities are culture [11]. Culture refers to human activities made by the ecosystem, which includes the material and non-material products of the human life that transmitted from the old generation to the new generation. Culture consists of patterns of behavior acquired by human beings through symbols, achievements of human groups, and artifacts [12]. The essential of culture lies in ideas which are transmitted within a group-both, historically derived as well as selected with their attached value. Culture described traditionally transmitted patterns of meanings embodied in codes or symbols, using which people communicate their knowledge to express their attitudes toward life [13]

Culture made social-cultural changes make an impact on the social life of society. Social-cultural changes are the transformation of culture and social organization over time. Nowadays, society is never static, and that social, political, economic, and cultural changes continuously occur [14]. Sociocultural changes are the main two aspects of economic growth and development, such as the invention of technological change that leads to operation. The potential benefit of any technology is analyzed accessing the interests of end-users. The end-users should capable of absorbing skills of using that technology is also much relevant. The fisheries sector in Indonesia occupies a significant role in social and economic development [15]. Fishing has been an occupation of coastal people of Indonesia from time immemorial. Fishing is an integral part of the country’s maritime culture and making a significant contribution to the Indonesian economy [15].

Conservation efforts that include fishermen household in related economic activities have been shown to facilitate reaching environmental objectives. For example, marine resource conservation designed to alleviate fishermen poverty in Pariaman, West Sumatra proved to have a positive effect on their economic situation [16]. However, some studies have shown that proposed alternative livelihoods, in this case marine culture, need to be accepted by coastal communities when conservation efforts are introduced, in order to be successful. Fishermen unwilling to drop fishing entirely listed economic profits as one of the major factors for not doing so[17]. Dive tourism has also proven to generate substantial economic benefits, such as the economic value generated from turtle’s areas in coast of Pariaman[3]. Tourism development may, however, lead to exclusion of small-scale local users, meaning that social justice aspects need to be considered, with particular focus on directing the benefits from increased tourism to the fishermen who actually bear the costs of conservation[5].

Along the coast of the Pesisir Selatan District, West Sumatra Province is Penyu Island is one of the several small islands located along the coast. In accordance with its name, Penyu Island is the island, which is a place to stopover in nesting for sea turtles, especially green sea turtle species. Based on
these reasons, on May 19, 2003 the government issued Decree by the Head of Regency Pesisir Selatan No. 53 Year 2003 (SK Bupati Pesisir Selatan No. 53 Tahun 2003) concerning the Establishment of Penyu Island as a marine conservation area and ecotourism region. Marine conservation area Penyu Island in Pesisir Selatan has a primary function as the protection of life support systems, preservation of diversity of flora and fauna also protect sustainability. This area can also be used for research, education, culture, and tourism, especially marine tourism. In addition, the waters surrounding Penyu Island marine conservation area can still be used by fishermen communities for productive economic development with due regard to the principles of environmentally friendly and sustainable management.

The aim of this study is twofold. First, described how the turtles, coral reefs and fish conservation have affected the local fishing community as socio-economically. Second, to analyze the existence of the Minangkabau traditional fisheries in four aspects socio-cultural impacts at the coast of the Pesisir Selatan District, West Sumatra Province, viz. spiritual wisdom, environmental sustainability wisdom, cultural tradition wisdom, and economic wisdom. This article would predict the various forms of fishermen activities concerning marine and coastal resource conservation are carried out by local fishermen, whose behaviors based on the value and culture of their local wisdom.

2. Methods

2.1 Study location

The research used a qualitative approach, with the descriptive-interpretative method[18]. Observation and in-depth interviews collected the data. As in anthropological studies, this research will produce descriptive data in the form of words, written, oral and behavioral in the fishing community. Subjects were local fishermen and the head of fishermen groups. Field research conducted by using the following steps: (1) the initial observation roomy introduction, (2) the collection of field data, (3) the analysis of field data[19]. Field data analysis carried out simultaneously in line with the findings of field data and research stage.

The study was done by conducting field interviews in fishing communities in Sutera Sub-District, Pesisir Selatan District, Province of West Sumatra (Fig.1). The area is the most economically important destinations for tourism in Province of West Sumatra because Penyu Island is located in between these marine resource conservation areas. In the area of Penyu Island and its surrounding, 10 species of seaweed are found to the south of the island. Conservation approach in declaring Penyu Island as a Marine Protected Area is due to its purpose as a breeding and resting places for the white Pied Imperial-pigeon (Ducula bicolor). The types of seaweed found in this region are Halimeda sp, Acaulerpa sp, Sargassum sp, Turbinaria sp, Padina australis, Laurentia sp, Udotea sp, Gracillaria sp, Eucheuma sp, Hypnea sp, and others. Around Penyu Island exist a good condition of coral reef ecosystems. The types of coral reefs found there, among others: branching, tabulate, encrusting, massive, submassive, digitate, foliose, mushroom, milepora, heliopera. In the coral reef ecosystem, a large variety reef fish species of ornamental fish and fish consumption lives in these reefs. These fish include 7 families and 25 species but the population is not too high[2]. In Penyu Island and its surrounding areas there are three kinds of turtles (local name: katungu) that are: hawksbill turtles (Eretmohelis imbricata), leatherback turtles (Dermochelis coriacea), and green turtle (Chelonia mydas)[20]. At the time of peak spawning season, the green turtle turtles land on the island each night on average 15-20 turtles, The habitat for turtle nesting in the Pesisir Selatan District is not only in Penyu Island, but there are also small islands around it, including Among Karabak Kecil Island, Karabak Besar Island, and Beringin Besar Island[21].
Fig. 1. Map displaying study case sites in Penyu island, Sutera sub-District, Pesisir Selatan District, Province of West Sumatra[2].

2.2 Interviews

To collect the data for the study 20 semi-structured interviews were conducted [22]. Interviewees were either local fishermen or other types of stakeholders with fishing-related livelihood sources. Snowball sampling was used with the help of hired field guides, making use of their local knowledge and connections to select the interviewees [23]. Out of 20 interviews, 15 were males and 5 were females. The main source of livelihoods of the interviewed individual was summarized (table 1.)

Table 1. Interviewees’ main livelihoods in the study area.

| Study Area                      | Main Source of livelihood | Number of interviewees (total n=20) |
|--------------------------------|----------------------------|-------------------------------------|
| Nagari Ampiang Perak           |                            |                                     |
| a. Kampung Alai                | Fishermen                  | 2                                   |
|                                 | Wife of fishermen          | 1                                   |
|                                 | Labour                     | 1                                   |
|                                 | Fisheries office           | 1                                   |
| b. Kampung Pasar Hamparan      | Fishermen                  | 2                                   |
|                                 | Wife of fishermen          | 1                                   |
|                                 | Labour                     | 1                                   |
|                                 | Fisheries office           | 1                                   |
| c. Kampung Padang Tae          | Fishermen                  | 2                                   |
|                                 | Wife of fishermen          | 1                                   |
|                                 | Labour                     | 1                                   |
|                                 | Fisheries office           | 1                                   |
3. Result and Discussion

Based on the census conducted in 2018, the number of residents in Sutera District is 50,516 people with 25,204 male and 25,312 female. The people of Pesisir Selatan are Minangkabau people with strong holds of its tradition which is based on the philosophy “Adat Basandi Syarak, Syarak Basandi Kitabullah” meaning to work wholeheartedly, by mobilizing all the potentials that exist. The implication of such philosophy is that all the behavior of individuals, groups and community and government is based on noble values and traditional norms and based on religious teaching. This relation to conservation effort is that based on Islamic teaching the concept of conservation exist through the prohibitions of human mischief on earth.

The coastal communities in Pesisir Selatan district in general have a livelihood similar to other coastal areas, which is based on agriculture and fisheries, either as fishermen and fish farmers. For fisheries, the number of fishermen in the Pesisir Selatan District is about 10,406 fishermen spreading over nine districts with 47 coastal villages. Number of Households (Rumah Tangga Perikanan-RTP) consists of 9,056 households; heavy water fish farmers of 900 households are organized under fishermen association. The general use of fishing gears is beach seine (pukat tepi), seine, trammel net and monofilament net. The fishing fleet type used was the boat without motor that consist of 554 vessels, and the least used are the outboard motor that is 317 units. While aquaculture activities in the Pesisir Selatan in general is not well developed. The major constraint in the implementation of aquaculture is the lack of capital, the limited knowledge in aquaculture management, and limited placement location for the cultivation of such fisheries. The type of cultivation is the seaweed, mud crab, and shrimp. The economic potential in fishery of Pesisir Selatan District reached 95,000 tons per year, consisting of 14,457.09 tons of large pelagic fish, 19,550.91 tons of small pelagic fish, 60,453.73 tons of demersal fish and 556.2 tons of shrimp species. In the Pesisir Selatan there are also export quality tuna fish. Besides of fish, also potential for the development of seaweed cultivation, such as in Tarusan, Jurai and Batang Kapas.

The Sutera District is home to thousands of fishers who depend on fishing as a source of living. Fishing in this area is dominated by small-scale fishers, although some larger vessels, such as purse seiners are also found to harvest the bulk of the catch around Sumatran waters. The term small-scale is used differently across fishing nations[2]. In this area, there is 3,306 fishermen households (11%) work for the fisheries sector, while 89 % in agriculture, plantation, trade or service, public officials, and other sectors (see diagram 1). There are five main economic activities in this area, such as agriculture, small industries, trade, tourism, marine, and fishery. The domination of these five sectors shown in their high production output, primarily from agricultural commodities and household industries that reach other hinterlands, such as Pariaman, Padang Pariaman, and other areas.

This study has found that most of the interviewees perceived a decrease in their economy due to the implementation of marine conservation efforts. They had limited access to alternative livelihoods and had poor relationships with conservation authorities. Still, among all the interviewees relatively many had a good opinion about the conservation efforts and showed high degrees of compliance with them. As found in previous research, implementation of conservation may have negative socio-economic consequences for local people[6]. Access to alternative sources of income for stakeholder populations is, thus, seen as important in order to improve their situation and to ensure long-term success for conservation efforts.

The study found that the socio-cultural impacts of marine conservation, as well as the levels of compliance differed between the case sites. This highlights the importance of understanding the local
context in designing conservation activities and regulations. The availability and possibilities of alternative livelihoods may be partially explained by external geographical factors. The socio-cultural can be seen in the aspects of the local wisdom reflected in fishing activities to use the natural environment in this village as followed; beliefs in supernatural powers exclusively related to the local wisdom especially their economic life are fundamental to members of fishing community, regardless of their ethnic[10]. They believe ecology system is like the sea, mangrove; the river has spirits or souls. This belief signifies their conviction that their economic lives are not merely determined by how well they use their skills, boats and fishing gear in exploiting the sea, but also by how well they interact with the supernatural forces which are an essential part of their world. The other beliefs that are still maintained by the fishermen is a rejecting misfortune (penolak bala). This tradition carried on when sea conditions do not allow for fishing or go to sea. The weather at sea is always unpredictable and always followed by a storm that lasts longer, up to several months. These conditions make the fishermen could not go to sea, and automatically influence the economic conditions of fishermen household. Under these conditions, to request help from God is one, we conducted a ceremony starting reinforcements to perform recitals and at the same word slaughtering one cow as material offerings to be given to the sea. Institutional, traditional living in this areas is a social group recitation in homemakers and religious meeting and gathering (yasinan), still going well. Participation by households to social groups is also good. Almost all mothers engaged in routine activities of these groups. The religious meeting and gathering recitals and performed every week in rotation from house to house while gathering held every two weeks.

In the Sutera coast, an effort coastal environmental sustainability by empowering local wisdom, there are two roles. One is the purpose of the government to undertake structural changes in the framework of laws and political practices of natural resource management, in this case, the government favored the local community, such as the employment contract system and the results are also on the migration of the fishermen stricken Exclusive Economic Zone[7]. The other is, the role of non-government is the strategy of strengthening local institutions, such as the presence of investors in the tourism sea quotation, also strengthening capital and market information for small fishers. Local wisdom, traditions, and cultures in the society of the Sutera coast have an excellent opportunity to be managed and empowered again, so could to regulate the daily lives everyday people and the norms and rules that favor to an environment, in the context of coastal and marine resource management. According to several informants and sources encountered by the author, the communities in the study had high enthusiasm when the fabulous event will take place. It is also not much different from the adherence conditions to property rights, despite being in public open access. The existence of systems that have formed a strong and entrenched in society will help incorporate the mindset on how to take the best advantage of natural surroundings. Therefore, such people should become culture and tradition wealth and the most potentially beneficial in community-based management. It can be one of the essential instruments in building social forces to attempt the management and utilization of coastal and marine resources[18]. On the Sutera coast, a tradition is still carried out is the village traditional. Fishers at the village are utilizing the coconut leaves (Daun Kelapa) as a fish house. The fishermen have also built a place for fish in the Sutera shoreline although the numbers still lacking. The fishermen took the initiative to create their own fish houses, by their capabilities. The fish houses traditional usually placed not far from the shoreline. Traditionally, it could help increase the number of fish in the vicinity.

Besides the above traditions, the cultural traditions of slaughtering cattle (Festival Babantai) in Sutera District is a routine activity in the first day after of happy religious holiday after fasting (Idul Fitri), with much slaughter annually around 300 heads of cattle buffaloes and cows. This tradition provides the cows and buffaloes for the massacre in this area including the festival of sacrifice (Idul Adha) reached 321 tails. The average weight range has 200-500 kg, a price range of IDR 16 million to IDR 20 million per fish for IDR 120,000 per kilogram. The other tradition is fishermen party (Pesta Nelayan) in this village has been handed down from ancestors in the title of the slaughter reached a hundred heads. Tradition aims to describe the gratitude for the favors given by God one especially for
favors abundant fish catches in fishing communities. It also did no community cannot eat meat every year on the day of the festival of sacrifice. It is the innate dignity of village ancestors to slaughter cattle and birds as many as possible. This tradition has a positive value, which allows citizens to get fresh meat with quality assured and affordable prices, as well as the crowd atmosphere, can establish a sense of community residents. Sutera fishing communities maintained the tradition of village party because it is a tradition that is multifunctional, besides very useful to prevent the presence of meat spindles, also at the same time unifying event for the community, especially among children with an uncle.

Social strategy done by utilizing the social ties that exist in rural areas is either a local welfare agency, the relation of production to social networks based on kinship or friendship. Trust between citizens is very high[11]. Confidence high among citizens that this led to a pattern of debt among households can run well. The importance of personal belief remains in social capital. Debt became one form of livelihood strategy for low-income families. To owe them take advantage of existing social networks, such as the ties of kinship, or friendship. Debt used to meet the needs of daily life or urgent needs such as when a household member is ill. Rarely debt used for the purchase of consumer goods. Social capital is one of the mainstays for poor households. Ties of kinship and friendship strong neighborhood provide sufficient space for needy families to access social capital. The involvement of poor households in the local welfare institutions is quite high. No discrimination role in social life for poor households. Egalitarian relationship pattern which tends to lead to needy families can easily access various forms of this local institution. For poor households, social capital is an asset that is very important because through social capital they can access a variety of other forms of money.

The level of community participation, especially mothers in the group, tends to be high[25]. The level of trust and solidarity between citizens is quite high. It evidenced by the persistence of traditional institutions such as mutual aid. Levels of trust between citizens high also appear from accounts payable between residents running smoothly. People who come from the villages staff social groups in the village of Sutera. Access to resources and information from the outside is limited. Social capital is still limited in use to meet the needs of the short-term consumer, not lead to the fulfillment of a long-term productive. Social capital has not been used to support productive activities because of the limitations of human capital and financial capital. Group activities are limited to the social dimension of the religious need to develop in the direction of the economy. Productive activities can be developed jointly by the public. Levels of trust citizen have very usable to start savings and loan activities and pioneering efforts through a joint capital.

Local wisdom of the village of Sutera is one of the potentials in supporting their survival amid limited capital and equipment for fishing. The tradition of slaughtering cattle (Festival Babantai), fishermen party (Pesta Nelayan), and knowledge of the fish season is the wisdom of the local fishermen of this area used to maximize seafood productivity. The similarity of the socio-cultural background has formed the attitude of mutual cooperation and kinship among fishermen. External factors also encourage the strengthening of family functioning as an effort of dual-earner strategy. One of the ways done is by adaptation, in which local wisdom is utilized to increase the fishing productivity and to turn the seafood into processed products for the better economy of the community.

Social institutions[9] embodied in the religious tradition that can strengthen the bond of kinship that exists in fishing communities of the village of Sutera. They jointly allocate time and thoughts for economic and social improvement among them. If something happens to one of the fisherman's household, then the existing social institutions helped difficulty members. Closely related to the uncertain sea conditions, the role of social overhauls also helped difficulties in the fishing, and usually, they will assist by the savings and loan system. It has been going on in the fishing communities of the Sutera tradition.

Local wisdom can be a potential for people to continue to live. The local wisdom that is commonly done by the people in this area in an effort to increase the productivity of marine products is the ritual of rejecting misfortunes commonly called Penolak Bala and cultural traditions, such as slaughtering cattle (Festival Babantai) and fishermen party (Pesta Nelayan). Local people believe humans’
activities will always coexist with the nature that has provided abundant resources to be utilized for the fulfillment of life needs. For fishermen, nature has a great influence on their lives, especially from water resources such as the availability of fish, seaweed, and other ecosystems that can be utilized for daily needs. It is necessary to express the gratitude to God for the seafood given. In addition to the ritual, the community also believes the knowledge on the adaptation of the natural environment in the form of knowledge of fish season. This knowledge is gained by heredity based on sensitivity including prediction of wind direction and fish season so the fisherman can know certain months when fish is abundant.

The study found that socio-cultural impacts can be described with the form of local wisdom in the form of mutual assistance and kinship among fishermen, such as livelihood, family lineage, and religion so that they are able to live in harmony. The mutual assistance is given both morally and materially. The 4 forms of local wisdom of the community of the village of Sutera could be potential support for the survival of the family of local fishermen. Amid the limitations, external factors, including local wisdom, can be a carrying capacity to optimize the strengthening of family functioning. In addition, the survival of the fishermen also cannot be separated from the internal factor, the family system. The running of the family system needs good cooperation especially between husband and wife working in the production sector. Based on the above explanation, the local wisdom, and the strengthening the family functioning for poverty reduction strategy cannot be separated in the life of fishermen in the village of Sutera. Both social components are interrelated in supporting the survival of fishermen. In the social system, external factors in the environment will also affect one’s actions, especially from the internal side of the family. A family with limited economies and resources cannot survive if there is neither environmental support nor internal support within family members. It can be said as a social system in the life of coastal communities.

4. Conclusion

The results of this study suggest that fishing communities place high value on their socio-cultural circumstances when faced with marine resource conservation efforts that would impact these. Existence the local wisdom tradition such as spiritual ceremony is like the cultural tradition of slaughtering cattle or the ritual rejecting dangers and such; cultural ceremony is like village party as a form of marine resource conservation includes control gear, using no harmful gears, commitment not to catch and kill the turtles and commitment not to throw rubbish into the sea and seeding and planting mangrove. Furthermore, conservation measures the coastal and marine environment carried out by local fishermen in the village of Sutera can be roughly divided into two patterns. First of all, in the sector of marine resources includes control gear, using no harmful gears, commitment not to catch and kill the turtles and commitment not to throw rubbish into the sea and seeding and planting mangrove. Furthermore, conservation measures the coastal and marine environment carried out by local fishermen in the village of Sutera can be roughly divided into two patterns. First of all, in the sector of marine resources includes control gear, using no harmful gears, commitment not to catch and kill the turtles and commitment not to throw rubbish into the sea. Secondly, in the resources sector includes planting coral reefs. Various forms of marine and coastal conservation are carried out by local fishermen in the village of Sutera seen in the behavior; not only catch fish but also maintaining and developing the fish seedlings. Pinus tree reforestation and cultivation of coral reefs around the coast. Various activities are based on the values and culture of local wisdom in the local fishermen behavior.

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