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Fulfilling the Needs of the People Living in a Conservation Area: An Overview of the Management of the Wakatobi National Park, Indonesia

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Abstract

The designation of water conservation areas, including the Wakatobi National Park (TNW), causes conflicts of interest, namely the interests of conservation and the interests of access to the utilization of marine resources. The access of residents in the Marine Protected Area (KKP) of TNW to utilize marine resources is limited by the existence of conservation regulations. The study aims to understand efforts to meet the needs of the population in the WTN MPA which can be used as material for consideration in the management of the WNP MPA. Information was collected through interviews and Focus Group Discussion (FGD) with a questionnaire tool. The study findings show that in meeting the necessities of life, residents in villages are affectedby the KKP TNW mostly by catching marine biota. These livelihoods are more influenced by natural factors (*natural capital)*and cultural factors. As the main source of livelihood for the majority of the population, fishing for marine biota is a source of conflict in the WNP MPA. Moreover, with the increasing population and the lack of alternative livelihoods, the decrease in the catch of marine biota will encourage fishermen to use more destructive fishing methods, and this is a violation of conservation regulations. For this reason, a new type of livelihood is needed that can reduce pressure on marine resources and is sustainable.

Keywords: water conservation; fishery; area management; catching marine biota; sustainable livelihood.

Introduction

Designation of conservation areas is one of the most common policies to protect areas from threats posed by human activities (Pullin et al. 2013). The fact of habitat degradation and the almost extinction of several marine species(Suwelo, 2005; WWF, 2019b) mobilize various parties concerned with the preservation of marine living resources to carry out conservation. However, the effectiveness of efforts to conserve biodiversity is still being debated(Geldmann et al., 2013), because restrictions on access to exploiting marine resources can have a high socio-economic impact on rural communities(Vezina et al., 2020).

As a social process, the designation of conservation areas is related to decisions about access, use and sustainability of resources so that each conservation determination creates social benefits and social costs. Social benefits, including clean air and water, survival of flora and fauna and economic growth. While the social costs include restrictions on the use of resources for economic purposes and the occurrence of social change(Springers, 2009).

In many cases, the conservation benefits in terms of the value of biodiversity and ecosystem services provided exceed the costs(Neudert et al., 2015). However, the benefits of conservation are shared by a large part of the global community, while local people usually bear high opportunity costs.(Hockley & Razafindralambo, 2006). So successful conservation efforts depend on creating conservation incentives for people who use natural resources(Neudert et al., 2015).

Poor people living in coastal villages depend a lot on marine resources as an effort to fulfill their daily needs(Scales & Ferguson, 2014;Jones et al., 2016). Alternatives to fulfilling the needs of life in limited coastal villages make it possible to continue to use protected resources in conservation areas without effective law enforcement(Holmes, 2007). Therefore, it is important for conservation area managers to understand the factors that drive livelihood choices in surrounding communities if conservation areas are to be managed effectively without exacerbating poverty.(Vezina et al., 2020).

Wakatobi National Park (TNW) is one of 50national parks in Indonesia located inWakatobi Regency, Province Southeast Sulawesi. A national park established in 2002 with a total area of 1.39 million ha is indicated as one of the highest priority areas for marine conservation in Indonesia.(Sopari et al., 2014). With an area that reaches 97 percent of the sea, Wakatobi National Park is a biodiversity hotspot for Indonesia's eastern waters. In this area, there are at least 396 species of hard corals and 942 species of reef fish live. In addition to the biota of the coral reef ecosystem, Wakatobi National Park is also a habitat for megafauna species such as whales, dolphins and turtles.(WWF, 2019).

The diversity and biological beauty of marine resources found in TNW is the basis for designating the area as a water, coastal and small island conservation area.(Asmara et al., 2013). The purpose of establishing a conservation area is to protect, preserve and sustainably manage marine resources, including ecosystems, types and genetics of fish in a sustainable and sustainable manner. Thus, the existence of Wakatobi National Park can be interpreted as reducing the access of residents in and around the area to utilize marine resources.

Most of the people in the TNW MPA have a livelihood portfolio that utilizes natural resources, including marine resources (Central Bureau of Statistics, 2022). Therefore, access to the utilization of natural resources, including marine resources, is important for poverty alleviation ((Ellis & Allison, 2004). On the other hand, in the utilization of shared resources, such as marine resources in the WNP MPA, it is necessary to have rules or management in their utilization. In addition to conservation purposes, these rules or management are also useful for eliminating conflicts between resource users.

In general, there are 2 (two) models/types of common-owned resource management, namely community-based and government-managed common-owned resource management.(Berkes, 2005). Meanwhile, the WTN KKP has implemented the two management models. So the question is how the activities of residents/communities who depend on marine resources in meeting their needs. Based on this, this study aims to examine the fulfillment of the living needs of the population in the WNP MPA.

Materials and Methods

2.1. Time and location

The study lasted for 4 (four) months, namely August to November. The study was carried out using the design with and without. This means that the study took basic data in 2 (two) communities, both those affected by the Wakatobi National Park Marine Protected Area (KKP) and non-KKP locations. Therefore, the sample study locations were selected purposively, namely locations that were influenced by MPAs and non-MMAs as control locations. In addition, the selection of study locations also took into account the representation of 4 (four) major islands in the WNP MPA, namely Wangi-Wangi Island, Kalidupa, Tomia, and Binongko Island.

The number of study locations is 24 villages, which are grouped into 13 villages affected by the MPA and 11 villages that are not. The villages affected by the KKP include: North Mola, Kapota, Liya Mawi, Mola Bahari, Laulua, Samabahari, West Waitii, Patua II, West Tonggano, Kulati, Kampo-kampo, Lagongga, and Rukuwa. While the villages as control locations are: Longa, Matahora, Buranga, Horuo, Tanomeha, Peropa, Darawa, Lamanggau, Wali, Makoro, Waloindi.

2.2. Data retrieval limitations

Data collection was carried out on households and community leaders as resource persons living in the study location. Determination of the household sample was carried out in stages (multi-stage random sampling), while the informants were selected purposively (deliberately). The required sample size is identified using a “power” analysis and ensures that the study effort is appropriate for the adequate coverage of social and geographic groups within a location. The number of household samples was selected as many as 369 respondents, and as many as 72 people were selected as sources.

2.3. Data collection method.

Household sample data were collected using the interview method assisted by a list of questions.Interviews were conducted through face-to-face and direct debriefing with the respondent.Focus group discussions (FGD) were conducted to understand marine resource governance in MPAs and in non-MMA villages. Focus group discussions were also used to document collective knowledge regarding marine resource management among local people.

2.4. Data analysis.

After being tabulated, the quantitative data collected was then analyzed by determining differences or differences from the average data, to determine differences in community conditions between villages affected by the KKP and those in non-KKP villages. Qualitative data is tabulated and described qualitatively. Data description is done to understand the relationship between one variable or parameter and other research variables(Watts, 2007).

Results and Discussion

3.1. Limitation of resident activity

Purpose of establishing Marine Protected Areas ais to protect, restore, or create valuable marine habitats for endangered species(Grip & Blomqvist, 2020). QSuch conservation goals can only be achieved by implementing management measures(Constable et al., 2000).Therefore, deepIn order to achieve conservation goals, the Indonesian government as well as community organizations and or customary institutions establish regulations in the WNP's KKP. Regulations stipulated by the central government apply throughout the TNW MPA. Meanwhile, those determined by the village government and customary institutions only apply to locations adjacent to the village. The rules, of courseoften annoyingand limit activitypublicor residents in utilizing marine resources aswell-established livelihoodspotentially have a negative impact on the well-being of the population(Barcott, 2011;Pullin et al., 2013).

Of the several regulations listed in Table 1, there is one regulation that needs attention, namely the Wakatobi Regency Government regulation regarding the prohibition of mining sea sand for the purposes of developing government infrastructure or trading it but can carry out mining if it is used to build residents' private infrastructure. This regulation was stipulated with the intention of accommodating the aspirations of the people within and around the WNP MPA. In this case, the regulation of the Wakatobi Regency Government is contrary to the Law of the Republic of Indonesia Number 27 of 2017 concerning the management of Coastal Zone and Small Islands.

Table 1. Institutions that stipulate regulations and materials limiting residents' activities in the Wakatobi National Park

Establishing institution	Material regulations that limit the activities of residents
Central government	Regulations regarding the prohibition of using fishing gear for marine biota that are not environmentally friendly, such as: explosives (bombs), poisons, anesthetics, tuba and so on
Central government	Regulations regarding the prohibition of catching protected marine species, such as: sharks, whales, turtles, dugos and napoleons, clams, dolphins, ornamental fish and lobsters
Central government	Regulations regarding the prohibition of destroying and taking marine habitats, such as coral reefs, sand, mangroves, seagrass beds
Wakatobi District Government	Regulations regarding the prohibition of throwing garbage into the sea
Wakatobi District Government	Regulations regarding the prohibition of mining sand for project purposes or for sale but can mine sand only for the purpose of building personal infrastructure
Wakatobi National Park Office	Regulations regarding the prohibition of using fishing aids, compressors
Wakatobi National Park Office	Regulations regarding the size of grouper fish that can be caught are at least 600 grams.
Companies/fish buyers	the buyer does not accept/buy fish that weighs less than 5 ounces
In an MPA-affected location	
Kulati village government	Regulations regarding the prohibition of catching fish in grouper nesting areas
Kulati village government	Rules regarding the prohibition of people from outside the Kulati village from taking sand in the Kulati Village area
Village Government of Kampo-Kampo	Regulations regarding the limits of sand mining for the need to build a house can only be carried out based on the distance of the waves

In non-KKP locations	
Dewara Fishermen Group	Regulations regarding fishing locations for marine biota which are opened and closed according to a mutually agreed schedule, and at these locations fishermen from outside the village are prohibited from catching fish
Lamanggau Village Government	Village regulation dated 1 January 2014 number 01/D4L/2003/2014 concerning coral reef monitoring
Lamanggau Village Customary Institution	Regulations regarding the division of areas with resort managers (tourist sites)
Woloindi Village Customary Institution	Regulations regarding the prohibition of taking mangrove trees
Sara Na Wali Customary Law in Wali Village	Regulations regarding the prohibition of destroying coral reefs and cutting down and taking mangrove trees
Sara Na Wali Customary Law in Wali Village	Regulations regarding the prohibition of catching octopuses and turtles
Sara Na Wali Customary Law in Wali Village	Regulations regarding the prohibition of sand mining and fishing for marine life on Yoro and Onemelangka Beaches

Supposedly, the regulations of the Wakatobi Regency Government cannot invalidate the law. However, because sand is the main material in infrastructure development so it is needed by the community, while its availability elsewhere is insufficient, it is suspected that the Wakatobi Regency Government regulation takes advantage of the leniency of the law, namely it is prohibited to carry out sand mining in areas that are technically , ecological, and social, and/or cultural cause environmental damage and/or environmental pollution, and/or harm the surrounding community. Or in other words, the community can carry out sand mining in areas that technically, ecologically and socially, and/or culturally, do not cause environmental damage and/or environmental pollution.

Even though there are various rules in WNP MPA, including restrictions on fishing equipment and regulations regarding closing seasonal marine biota fishing in several study villages, it is estimated that these regulations are difficult to enforce. There have been several conflicts as a result of parties not accepting the rules. Conflicts occur between users of marine resources and KKP managers in the WNP, and conflicts between users of marine resources. This is an indication that regulations limiting the activities of the population in meeting their basic needs are difficult to enforce.

Conflicts between the interests and authority of conserving marine natural resources and the interests of fisheries management often occur(Pita et al., 2011;Kearney et al., 2012;Laffoley et al., 2019).This is becauselack of dialogue between stakeholders representing both interests. For this reason, collaboration between stakeholders is needed in managing conservation areas and fisheries(Sopari et al., 2014;Grip & Blomqvist, 2020). Marine Protected Areas (MPAs) established for conservation purposes or as a means of managing fishery resources have different objectives, and therefore, their management must be legally separated under the jurisdiction of conservation and fisheries(Hilborn, 2016).

3.2. Marine resource users.

In order to fulfill their daily needs, residents in the WNP MPA utilize natural resources, including marine resources. Based on the type of utilization of marine resources, users of marine resources, both in villages affected by KKP and in non-KKP villages, can be grouped into: fishermen (catchers of marine life), cultivators of marine species (seaweed cultivators, fish cultivators, pearl cultivators and so on).), sand and stone miners, users for tourism/tourism activities, and users for sea transportation. In addition, there are users of marine resources who are less exposed but in relatively large numbers, namely mangrove takers/loggers for firewood purposes. This activity is usually carried out illegally because, both government regulations and customary regulations have prohibited the cutting of mangroves and most users of marine resources are aware of these regulations. Logging of mangrove trees is less exposed because the motive for this activity is only subsistence to meet household needs as firewood for cooking food for daily consumption, and not for sale.

Fishermen can further be grouped into shallow sea fishermen and deep sea fishermen. Or it could be, fishermen are grouped into fishermen with environmentally friendly fishing gear and fishermen with non-environmentally friendly fishing gear. Marine species cultivators can be grouped into seaweed cultivators, fish and or shrimp cultivators (cultivators using cages, and fish and or shrimp pond cultivators), pearl cultivators. Meanwhile, sand and stone miners can be grouped into miners for personal use (own household), and miners for trading. Users of marine resources for tourism activities usually take advantage of marine resources by enjoying the beauty under the sea so they carry out diving activities. Furthermore,

In relation to management effectiveness, one of the things that must be done by the WTN MPA manager is to set clear boundaries to show that the resources in the WNP MPA are not in an open access condition.(Berkes, 2005). Thus, one of the indicators to determine the concern of marine resource users for the management of the WTN MPA is the knowledge of marine resource users about the boundaries of the

WNP MPA. The study results (Table 2) show that the proportion of marine resource users in non-KKP locations who know the boundaries of conservation areas, both external and internal boundaries, is greater than in locations affected by MPAs. This is an indication that the concern of marine resource users in non-KKP locations for the management of the WTN MPA is greater. It is suspected that this is because residents in locations affected by the MPA feel disturbed/disturbed by the existence of conservation boundaries for the management of the MPA in the TNW. They don't seem to want to know about these boundaries.(Vezina et al., 2020;Pullin et al., 2013).

Table 2. Proportion of marine resource user groups who know the boundaries of Wakatobi National Park

User Group	*Proportion of Knowing User Group*	
	External Boundary	*Internal Boundary*
In villages affected by the MPA		
Marine biota catchers (fishermen)	A number of	A number of
Marine species cultivator	A number of	A number of
Sand and stone miners	A number of	A number of
User for travel	Most of the	About half
User for transportation	A number of	A number of
In non-KKP villages		
Marine biota catchers (fishermen)	All	About half
Marine species cultivator	A number of	About half
Sand and stone miners	About half	There isn't any
User for travel	A number of	About half
User for transportation	A number of	About half

Information dissemination regarding the boundaries of the WNP MPA and its management rules was carried out massively both before and after they were enacted KKPWTN. But because for the community or residentsin locations affected by MPAs, in particular, the use of marine resources is their only means of livelihood, so they pay little heed to the boundariesWNP MPA. Especially if they observe violations committed by other users of marine resources (mainly from outside the area) who are not sanctioned or not identified. Therefore,Conservation initiatives through the establishment of MPAs will be even more effective and beneficial when policy makers understand the characteristics and behavior of coastal communities. In addition, conservation initiatives must be based on building consensus and participation of all stakeholders(Sesabo et al., 2006).

In theory, community-based management can solve the problem of decreasing quantity and quality and degradation of common property resources. The key is the ability of the local community to use shared resources to limit access to outsiders, and to regulate their own crops. Management of shared resources will be effective, if group members are confident that future harvests will be rightfully theirs, and not end up being harvested by other groups, they will have an economic incentive to self-regulate(Berkes, 2005).

3.3. Population livelihood.

DFID (1999)defines “livelihoods” consisting of capabilities, assets, and activities needed for a means of life. The type of livelihood of the population is determined by several factors, including: human capital, social capital, financial capital, physical capital, and natural capital(Kusumanti et al., 2021). With the enactment of marine resource management in the WNP MPA, it means that it has an impact on natural capital factors that can be accessed by residents, which in turn has an impact on their type of livelihood. Livelihoods of the population inWNP MPApresented in Table 3.

Table 3. Livelihoods of the Population in the WNP MPA

No	Main Livelihood Types	Number of Respondents (person)	Percentage (%)
(1)	(2)	(3)	(4)
In villages affected by the MPA			
1	Going to sea (including catching fish; crustaceans and other marine products both for sale and for self-consumption)	55	31.61
2	Other	50	28,74
3	Farming (plant cultivation and or raising livestock)	36	20,69
4	Other wage-earning jobs (teachers, health workers, workers in the forestry or mining sector)	14	8.05
5	None/not suitable	12	6.90
6	Doing aquaculture (fish, shrimp, seaweed, etc; including fish fattening business)	5	2.87
7	Marine tourism (scuba, snorkel, glass-bottom boats, sailing boats, water-skiing, jet-skiing, etc.)	1	0.57
8	Collecting forest products (timber, charcoal, non-timber forest products)	1	0.57
	Amount	174	100.00

No	Main Livelihood Types	Number of Respondents (person)	Percentage (%)
(1)	(2)	(3)	(4)
In non-KKP villages			
1	Going to sea (including catching fish; crustaceans and other marine products both for sale and for self-consumption)	51	25.89
2	Other	43	21.83
3	Farming (plant cultivation and or raising livestock)	70	35,53
4	Other wage-earning jobs (teachers, health workers, workers in the forestry or mining sector)	7	3.55
5	None/not suitable	13	6,60
6	Doing aquaculture (fish, shrimp, seaweed, etc; including fish fattening business)	10	5.08
7	Marine tourism (scuba, snorkel, glass-bottom boats, sailing boats, water-ski, jet ski, etc.)	0	0
8	Collecting forest products (timber, charcoal, non-timber forest products)	3	1.52
	Amount	174	100.00

In Table 3 It can be seen that in the villages affected by the MPA, the main livelihood of the population is mostly fishing (fishing; crustaceans and marine products), then followed by the number of residents who have other livelihoods, and in third place is farming. Other livelihoods include: fish traders, entrepreneurs, food sellers, laborers, seaweed cultivators, carpenters, sand miners, red stone makers, machete makers and so on. Meanwhile, in non-KKP villages, according to the people's livelihood order, the three most were farming (35.53 percent); going to sea (25.89 percent); and others (21.83 percent). This means that a large proportion of the population in villages affected by the MPA are dependenton marine resources and lack of alternative livelihoods(Kusumanti et al., 2021). Livelihoodpopulation in villages affected by the MPAseverely constrained by a lack of natural, physical, human, financial and social assets, leading to over-exploitation of marine resources making it risky and vulnerable to depletion of marine resources(Vezina et al., 2020).

The degree of dependence of people in the WNP MPA on marine resources varies as livelihood choices depend on a complex array of ecological, economic, political and cultural factors(Scales & Ferguson, 2014). These factors include ethnic groups(Vezina et al., 2020). As the

results of the study, thatMost of the residents in the villages affected by the MPA are ethnic Bajo living on the coast and offshore. So catching marine life is a tradition passed down from generation to generation. Thus, the Bajo ethnic group is not oriented towards investing in agriculture and is very dependent on marine resources to meet their needs.

For residents inKKP TNW, pCatches of fish play an important role in meeting their needs. However, with the population growth inWNP MPA, it is estimated that this livelihood is less reliable due to decreased catches(Vezina et al., 2020). A decrease in catch will encourage fishermen to expand their fishing area (Browne et al. 2007). In addition, it can also encourage fishermen to use more destructive fishing methods (Browne et al. 2007). So that in the end it can create a poverty trap because the potential of marine resources continues to decline(Harris, 2011).

3.4. Catching marine life

Marine biological resources include mangrove forests, coral reefs, sea grass and seaweed, and marine fisheries(Dahuri et al., 1996). The use of marine resources is always based on a sustainable strategy, in which the utilization and utilization must be based on the aspect of preservation. The purpose of carrying out conservation efforts is to regulate the utilization of marine resources while still paying attention to their optimal carrying capacity. Therefore, it is necessary to carry out proper management that is oriented towards the sustainable potential of marine resources in order to prevent excessive exploitation and exploration(Darsono, 1999).

Most of the fishing for marine biota in the WNP's MPA is carried out in shallow seas, and some in deep sea. Regulations for catching marine biota stipulated by the TNW manager do not apply to fishing activities in the deep sea (free waters), and only apply to fishing activities within the TNW KKP boundaries. In catching marine biota, most fishermen use boats or ships as transportation, but some others catch fish on the beach near where they live. The types of boats or ships used as a means of transportation vary, from small ones in the form of canoes, katinting, trunk bodies, to large ones in the form of ships.

The tools used to catch marine biota can be broadly grouped into 2 (two), namely environmentally friendly fishing gear and non-environmentally friendly fishing gear. Environmentally friendly fishing gear in the form of: fishing line (handline, troll line and so on), nets, arrows/spears, sero, and traps. While the fishing gear is not environmentally friendly in the form of: explosives (bombs), anesthetics, tuba, and poison. In recent times, there have been fishing gear and fishing gear that were previously classified as environmentally friendly

fishing gear, which are currently categorized as non-environmentally friendly fishing gear, including traps and compressors.

Trap is considered as a fishing gear that is not environmentally friendly because in setting the trap a stone is needed as a base and at the same time as the weight of the trap. By the Wakatobi National Park Agency, the stones used for setting the traps were the result of destroying coral reef habitat so that the use of traps can be considered as an environmentally unfriendly fishing gear. The use of compressors is usually done by octopus catchers. In an effort to reach the hole where the octopus lives, which is usually on a coastal cliff, octopus catchers must dive using a compressor aid. By the Wakatobi National Park Agency, catching octopuses by diving is considered to have damaged the octopus habitat, namely by gouging out the holes where the octopuses live.

According to the information obtained, the catchers of marine biota using non-environmentally friendly fishing gear are mostly carried out by users of marine resources from outside Wakatobi Regency. However, several key informants admitted that there had been residents in the village where they lived fishing for marine biota using non-environmentally friendly fishing gear. This activity has been known by other members of the community, and given a warning not to repeat it.

Table 4 shows that frequencysomeone in the household goes to sea and the frequency with which the household sells at least part of its catch in the villageaffected by MPAs, relatively the same as innon MPA villages. Although on average, the frequency in the villageaffected by the MPAlower than the frequency in non villagesKKP. But this cannot be used as an indication that the utilization of marine resources invillageaffected by MPAs less intensively than innon villageKKP. This is because in one go to sea, sometimes it takes more than one day so the frequency of going to sea is not a measure of the intensive utilization of marine resources, as well as the frequency of selling catches.

Unlike the average frequencysomeone in the household goes to sea and the frequency with which a household sells at least part of its catch, the average frequency of households consuming fish or other marine products in the villageaffected by the MPAhigher than the frequency in non villagesKKP. This is not due to household access to consume fish side dishesvillageaffected by the MPAhigher than in non villagesKKP but more due to differences in household preferences in consuming fish. There are households that actually have great access to consuming fish side dishes, but due to preference factors, the consumption of fish side dishes in these households is 0 (zero).

Households whose proportion of income is mostly and/or all of itcomes from fishing activities in the villageaffected by the MPAmore than in non villagesKKP. This can be interpreted that marine resources invillageThose

affected by MPAs are a strategic resource as they are the main source of livelihood for more than 20 percent of households.

Invillageinfluenced by MPAs, fishing gear isthe tool most often used by the majority of the population to find fish. Meanwhile in the village of nonMPAs are gill nets. This can be used as an indication thatmost of the populationinvillagethose who are influenced by the MPA in searching for fish prefer locations in the deep sea, meanwhilemost of the populationinvillagenon-KKP in searching for fish prefer locations in shallow seas.

During which time is not suitable to go to sea, even though the average number of days go to sea in the villageaffected by MPAs, is lower than atvillagenon-KKP howeverthe average catch per day and the average daily income of fishermen in the villageinfluenced by MPAs, is higher than invillagenon-MMAF. This can be interpreted as fishermen or fish catchersin the villageinfluenced by KKP, more professional than invillagenon-MMAF. So areduring a GOOD TIME to go to sea. Average number of days out to sea in the villageaffected by MPAs, is lower than atvillagenon-KKP howeverthe average catch per day and the average daily income of fishermen in the villageinfluenced by MPAs, is higher than invillagenon-MMAF.

Discussion

It is almost certain that with the existence of a water conservation area claim, as well as the determinationWNP MPA, causing controversy with the users of fishery resources(Pendleton et al., 2018). Marine protected areas are created for long-term interests, while fisheries management agencies or institutions usually have a mandate to maximize fisheries yields. The controversy will continue if there is no dialogue and cooperation between the two sides(Grip & Blomqvist, 2020).

Recognition of fishing rights for marine biota is a major issue in resource and environmental policies. Restrictions on catching marine biota in conservation areas, such as in the WNP MPA, often lead to conflict(Grip & Blomqvist, 2020). Although fishing rights for marine biota have historically been recognized in the United Nations Convention on the Law of the Sea (UNCLOS)(Grip & Blomqvist, 2020), but in the context of conservation of marine biota fishing activities in the WNP KKP, regulations are enforced that limit marine biota fishing activities. It should be noted that fishing activities to meet the needs of life have a long tradition in most coastal countries, while the need for the conservation of marine resources was basically first given attention by the United Nations Conference on Environment and Development in 1992.(Grip & Blomqvist, 2020).

As it is known that most of the livelihoods of residents in villages affected by the KKP are fishing, and the next sequence is other. Whereas in non-KKP villages, the livelihood of the majority of the population is

farming, and the second place is fishing. Thus, going to sea or catching marine life for the majority of the population in the TNW MPA is the main livelihood to fulfill their daily needs. Therefore, if their activities are limited by the establishment of a conservation area, then of course this must be taken into consideration by policy makers related to the management of the WNP MPA. All policies implemented must at least consider the positive and negative impacts on the population.

The study results indicate that fishermen in villages affected by the MPA are more professional than fishermen in non-KKP villages. This is presumably due to differences in fishing equipment, fishermen's knowledge and skills. If observed at a glance, this condition seems normal and ordinary. But if this condition is allowed to continue to develop, it could trigger conflict between users of marine resources, which is caused by social jealousy. Similar cases occurred in the villages of Longa and Matahora. Because the catch of deep sea fishermen is abundant so that the price of fish in the market decreases or is cheap, causing shallow sea fishermen to feel disadvantaged. Therefore, it is hoped that all those involved in policy making will pay close attention to all conditions around the WNP MPA.

Residents living around the TNW KKP, based on living habits (culture) can be grouped into residents who usually live on land, and residents who usually live on the lips or offshore. In meeting the needs of daily life, people who have a habit of living on the shoreline or offshore tend to find it difficult to obtain compared to residents who usually live on land, considering that the availability of goods to fulfill their daily needs is more numerous and complete on land than offshore. Just like residents who usually live on or offshore in the WNP MPA, they have to bring in more goods to fulfill their subsistence needs from land, such as clean water, firewood and so on. Therefore, related to the management of the WNP MPA,

Furthermore, in the framework of the successful management of the WTN MPA, the main thing that must be done immediately is to introduce it inWNP MPA with new livelihoods (Pullin et al., 2013).New livelihoods have been introduced inWNP MPA, including aquaculture and marine tourism. However, the 2 (two) new types of livelihoods that were introduced were not significant in changing the people's livelihood from fishing for marine biota. Cultivation of fishery commodities is thought to have prospects and can be adopted quickly as a new type of livelihood compared to marine tourism. This is because aquaculture has predictable risks and relatively inexpensive investment costs compared to marine tourism(Vezina et al., 2020).

Cultivation of fishery commodities is important to be promoted as a new alternative livelihood because this type of livelihood does not exploit aquatic resources and is a type of sustainable livelihood. But the cultivation of fishery commodities requires a relatively large investment

capital compared to investment in the field of catching marine biota. In addition, the cultivation of fishery commodities also requires a relatively long time to obtain results and has a relatively large risk of business failure.

Conclusion

In meeting their needs, most of the population in the Marine Protected Area of Wakatobi National Park depends on marine resources. Fishing for marine biota is a recognized traditionin UNCLOS.It is estimated that the increasing population and population needs will further encourage greater exploitation of marine resources. On the other hand, with the establishment of the TNW KKP, the tradition of catching marine biota is limited, which means that residents mustbear the opportunity cost. This condition will lead to conflict between the WTN MPA manager and residents, and between residents as users of marine resources. Therefore, to reduce the frequency of conflicts, residents or communities in the WNP MPA should receive compensation for their sacrifices. One of the urgently needed compensations is assistance from various parties to change the livelihood of the population from catching marine biota to cultivating fishery commodities. Thanks to WWF Indonesia for funding this study, and to residents in the study locations for agreeing to provide the required data and information.

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Table 4. Utilization of marine biota resources by residents in the WNP MPA

	In villages affected by the MPA			
No	**Description**	**Maximum**	**Average**	**Minimum**
1	In the last 6 months, the number of times a person in the household went to sea (times per month)	30	7,22	0
2	In the last 6 months, the frequency of households selling at least part of their catch (times per month)	30	5,67	0
3	In the last 6 months, frequency of household consumption of fish or other marine products (times per month)	99	31.74	0

No	**Description**	**There isn't any**		**Fraction**		**About Half**		**Most of the**		**Everything**	
		Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
4	In the last 6 months, a proportion of household income has come from fishing activities	112	64,37	10	5,74	8	4.60	42	24,14	2	1.15
5	In the last 6 months, the proportion of protein consumption (side dishes) derived from fish or other marine products	4	2.39	45	26.94	19	11.38	93	55,69	6	3.60

		Fishing equipment		**Clamp Tool**		**Trap**		**Gill Nets**		**Other**	
		Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
6	In the last 6 months, the tool most often used to find fish	38	47.50	6	7.50	5	6,25	21	26,25	10	12.5

No	**Description**	**Maximum**	**Average**	**Minimum**
7	In the last 12 months, during NOT SO GOOD times to go to sea, number of days went to sea (days)	360	71.56	0
8	In the last 12 months, during NOT SO GOOD times for fishing, average catch per day (kg)	110	13.48	0
9	In the last 12 months, average earnings per day during NOT SO GOOD fishing times (IDR)	3 000 000	263 871	0
10	In the last 12 months, during which was a GOOD TIME to go to sea, number of days went to sea (days)	360	182,11	3
11	In the last 12 months, during a GOOD TIME to go to sea, average catch per day (kg)	667	38,92	0.5
12	In the last 12 months, average daily earnings during a good time to go to sea (Rp)	25 000 000	1275405,65	20 000

	In non-KKP villages			
No	**Description**	**Maximum**	**Average**	**Minimum**
1	In the last 6 months, the number of times a person in the household went to sea (times per month)	30	7.89	0
2	In the last 6 months, the frequency of households selling at least part of their catch (times per month)	30	6.30	0
3	In the last 6 months, frequency of household consumption of fish or other marine products (times per month)	99	28,72	0

No	Description	There isn't any		Fraction		About Half		Most of the		Everything	
		Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
4	In the last 6 months, a proportion of household income has come from fishing activities	138	70.05	13	6,60	7	3.55	39	19.80	0	0
5	In the last 6 months, the proportion of protein consumption (side dishes) derived from fish or other marine products	6	3.05	45	22.84	24	12,18	118	59.90	4	2.03
		Fishing equipment		**Clamp Tool**		**Trap**		**Gill Nets**		**Other**	
		Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
6	In the last 6 months, the tool most often used to find fish	25	30,12	12	14,46	3	3,62	32	38.55	11	13.25

No	Description	Maximum	Average	Minimum
7	In the last 12 months, during NOT SO GOOD times to go to sea, number of days went to sea (days)	350	85.41	0
8	In the last 12 months, during NOT SO GOOD times for fishing, average catch per day (kg)	70	10.75	0
9	In the last 12 months, average earnings per day during NOT SO GOOD fishing times (IDR)	900 000	133 206.30	0
10	In the last 12 months, during which was a GOOD TIME to go to sea, number of days went to sea (days)	365	192.73	14
11	In the last 12 months, during a GOOD TIME to go to sea, average catch per day (kg)	400	30.02	1
12	In the last 12 months, average daily earnings during a good time to go to sea (Rp)	9000 000	596746	0