ECSOFiM: Journal of Economic and Social of Fisheries and Marine. 2023. 11(01): 40-51 e-ISSN: 2528-5939
Permalink/DOI: http://dx.doi.org/10.21776/ub.ecsofim.2023.011.01.04

FACTORS INFLUENCING THE PARTICIPATION OF SMALL-SCALE FISHERMEN IN MARINE PROTECTED AREAS IN EAST JAVA

FAKTOR-FAKTOR YANG MEMPENGARUHI PARTISIPASI NELAYAN SKALA KECIL DI KAWASAN KONSERVASI LAUT DI JAWA TIMUR

Anthon Efani[*1)], Asfi Manzilati[2)], and Muhammad Faisal Riza[3)]

[1)] Faculty of Fisheries and Marine Sciences, Universitas Brawijaya, Indonesia
[2)] Faculty of Economics and Business, Universitas Brawijaya, Indonesia
[3)] Faculty of Administrative Sciences, Universitas Brawijaya, Indonesia

Received: November 17, 2022 / Accepted: October 19, 2023

ABSTRACT

Marine Protected Areas (MPA) were created to address overfishing, which can harm fishing communities and reduce the number of fish. This affects how much food is available and how happy people feel, especially for people who work as small-scale fishermen. They depend on catching fish to meet their needs. This study aimed to find out what factors affect fishermen's choice to participate in MPAs. It was done in Malang and Probolinggo Regencies in East Java, with 200 fishermen involved in the research. This research gathers information by asking people questions through a survey. The survey has a set of questions that are planned. The economist studies the probit model to determine what factors affect fishermen's choice to join MPAs. The findings indicated that factors like family members, marital status, number of fishing gear, market access, and savings did not have a noteworthy impact on the involvement of small-scale fishermen in MPAs. But, things like how old they are, how much education they have, whether they belong to a fishermen's group, if they work outside of fishing, and if they are part of a cooperative all greatly impact whether small fishermen participate in MPAs.

Keywords: participation, MPA, small-scale fishermen, Probit.

ABSTRAK

Kawasan Konservasi Laut (KKL) digagas sebagai bentuk penanggulangan eksploitasi berlebihan di sektor perikanan yang dapat memberikan dampak pada kesejahteraan masyarakat nelayan dan penurunan ketersediaan ikan. Hal ini tentunya berdampak pada ketahanan pangan dan kesejahteraan subjektif, khusTuusnya masyarakat yang berprofesi sebagai nelayan skala kecil, hal ini dikarenakan untuk memenuhi kebutuhan sehari-hari nelayan skala kecil hanya mengandalkan hasil dari tangkapan ikan. Penelitian ini memiliki tujuan untuk mengestimasi faktor-faktor yang dapat mempengaruhi keputusan nelayan berpartisipasi dalam KKL yang dilakukan di Kabupaten Malang dan Kabupaten Probolinggo, Jawa Timur dengan responden sebanyak 200 nelayan. Penelitian ini menggunakan teknik pengumpulan data survei dengan kuesioner terstruktur sebagai instrumennya. Analisis ekonometrika dari model probit diterapkan untuk mengukur faktor-faktor yang dapat mempengaruhi keputusan nelayan untuk berpartisipasi dalam KKL. Hasil penelitian menunjukkan bahwa variabel anggota keluarga, status perkawinan, jumlah alat tangkap, akses pasar, dan tabungan tidak berpengaruh signifikan terhadap partisipasi nelayan skala kecil di KKL. Namun faktor usia, pendidikan, kelompok nelayan, pekerjaan di luar perikanan, dan keterlibatan dalam koperasi berpengaruh signifikan terhadap partisipasi nelayan kecil di KKL.

Kata kunci: partisipasi, KKL, nelayan kecil, Probit.

[*] *Corresponding author: Anthon Efani, anthonefani@ub.ac.id*
Institution and its address: Faculty of Fisheries and Marine Sciences, *Universitas* Brawijaya, Indonesia.

INTRODUCTION

Development in the field of social humanities still has quite a lot of challenges that must be resolved, starting from the unachieved development of social humanities, to arts and culture (Abecasis et al., 2013; Mascia et al., 2021; Yunitawati & Clifton, 2021). This should be of particular concern considering that social humanities development has an influence in giving birth to the acceleration of economic development, infrastructure and science and technology. The strategic issues that form the basis of this research are based on priority issues that have not been optimal in the development and utilization of resources for people's welfare. Therefore, the transformation of governance (good governance) must be the main agenda as a support for the realization of development in Indonesia. One example of a strategic issue in Indonesia is the utilization of Marine Protected Areas (MPA) (Jones & Long, 2021). On the basis of these problems, it is important to conduct studies and innovations on good governance-based development.

Not yet optimal community participation in implementing fisheries and marine resource management in the East Java region today results from the interaction of various factors. The community participation factor is one of the main factors influencing the success of the marine protected area, so it is important to conduct a study that analyzes the performance of community participation in the success of marine protected areas, especially the people who are directly affected by the establishment of marine protected areas such as small scale fishermen (Arnason, 2016). Small fishermen themselves are mentioned in several laws, including Law 45/2009 concerning fisheries, which mentions small fishermen whose livelihood is fishing to fulfill their daily needs using fishing vessels of no more than 5 (five) gross tons (GT).

Marine Protected Area (MPA) is one of the instruments designed directly for controlling natural resources by determining an area as a conservation area. This marine protected area has high benefits that are not only tangible (measurable) but also intangible (not measurable). Measurable benefits are usually classified into useful benefits, whether consumed or not, while non-measurable benefits are non-use benefits, which are more of a long-term maintenance of the ecosystem (Rebo et al., 2017). In addition, a Marine Protected Area (MPA) also benefits local communities through the abundance of fish in local waters and the maritime tourism sector (Bennett & Dearden, 2014).

The main concept of Marine Protected Area (MPA) was to handling over-exploitation in the fisheries sector. Over-exploitation can reduce the productivity of fisheries and fishermen’s income can also have impact on the welfare of fishermen (Joandani et al., 2019). In addition, one of the biggest challenges to achieve fishermen’s welfare is unsustainable condition because of over-exploitation (Kusumastanto & Wahyudin, 2012). Many positive benefits of Marine Protected Areas (MPAs) for local communities such as alternative livehoods of fishermen, community empowerment, improved governance, increased fisheries, and social, educational, and cultural benefits (Bennett & Dearden, 2014). For example, (Arnason, 2016) revealed that the Marine Protected Area (MPA) in Hawaii in 2013-2015 could accelerate ecosystem improvement, poverty could be reduced trough tourism, improved health, and women’s empowerment, increase community organizing, fishery

output, securtity, resilience and adaptation of of ownership. However, in reality Marine Protected Areas (MPAs) tend to focus on "biological success and social failure". Which is means that start from management into implementation of Marine Protected Areas (MPAs) don't pay attention the community and still tend to focuses in ecosystem sustainability or biological benefit. This situation can indicate social failures of Marine Protecrted Area (MPA) implementation such as unfair distribute of benefit, limited access to participation, and conflicts (Rossiter & Levine, 2014).

Creating a Marine Protected Area (MPA) has been good in some ways but has also caused problems. For example, people living in the area are moving away from their traditional lands and waters. This means that they have to follow the rules and boundaries of the conservation areas, which used to be open for everyone, so now there are restrictions. The effects of health and jobs, and how they affect our ability to get enough food, access to resources, our relationships with others, our sense of who we are, our traditions, the way men and women interact, and the way we are governed. These are some of the ways that protected areas can negatively affect social communities, which is why some local communities reject them. Marine Protected Areas (MPAs) goals can fail because of the unexpected social effects caused by not involving the people who use and rely on them during the planning and decision-making processes. This means that stakeholders and communities need to be included in the discussions and decisions to avoid problems.

The presence of a Marine Protected Area (MPA) can affect fishermen either positively or negatively. The Marine Protected Area (MPA) is a place where the goal is to protect and preserve the environment so that there is more fish in the water. So, deciding which parts of the ocean should be protected as Marine Protected Areas (MPA) will have an indirect effect on the way local communities live and make money. This is why protecting the oceans is important for people's lives because it will affect their access to food. Furthermore, when Marine Protected Areas are established with effective governance and management, it can help build trust and improve relationships with local communities. This, in turn, leads to better conservation outcomes.

Previous research has been done on Marine Protected Areas (MPAs) around the world. This research mainly looks at what people think about MPAs. However, there has also been research on the role of MPAs in the ecosystem in the USA and factors that affect the success of MPAs in the Philippines. To address this issue, this study will investigate how different factors influence the participation of small-scale fishermen in activities within marine protected areas in East Java. This study adds to the existing information by quickly looking at the things that affect fishermen's choices to be part of Marine Protected Areas (MPAs).

RESEARCH METHODS

Time and Place of Study

This study will use a method called Multistage sampling to choose where the research will be done. First, we will select two areas in East Java Province: Malang Regency and Probolinggo Regency. We chose these areas because they have Marine Protected Areas with different ways of

managing them. Next, the places where the sub-district samples were taken were chosen at random with the help of organizations like the Fisheries and Maritime Service, the Port Office, and groups of fishermen. After choosing 2 sub-districts, we will select 2 villages from each sub-district randomly. This way, we will have a total of 4 villages. You can find the research location in Figure 1. The research was conducted in June - August 2022.

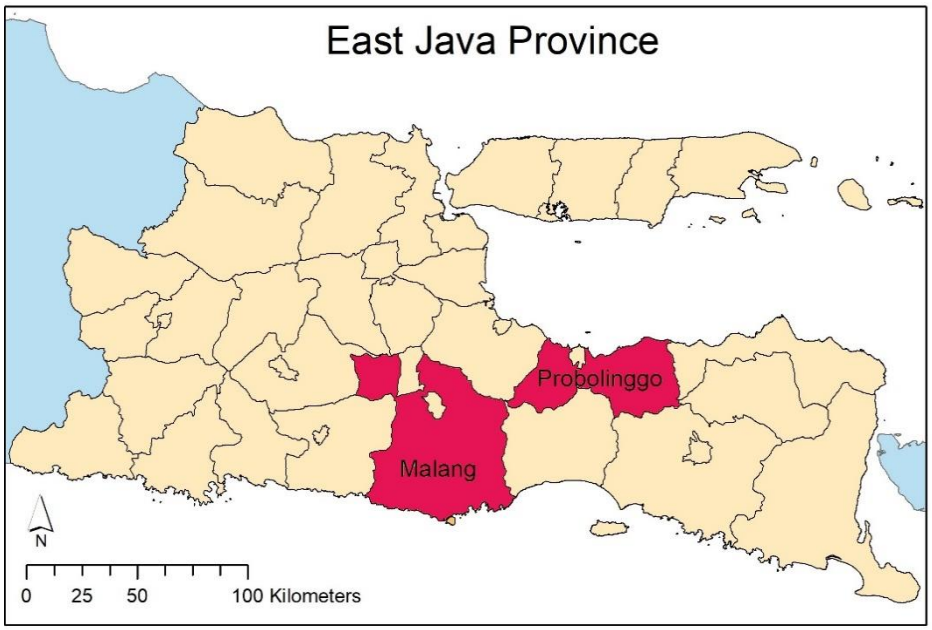


Figure 1. Research Locations

Sampling Method

Determination of fishermen respondents was carried out using simple random sampling method. First, a list of small fishermen in the two sub-districts will be made based on information from the port office, which will then be used to develop a research sampling frame. The next step, from the list of fishermen obtained, will then randomly select 50 fishermen to be respondents from each of these villages so that in total there will be 200 respondents. To obtain the same number of respondents from the four villages used as sampling, 50 respondents were taken from each village by random sampling.

Data analysis

Analyzing the factors that influence participation in MPA using the Ordered probit model approach because it is more suitable to be applied when the dependent variable used is ordinal (Rosenbaum & Rubin, 1983). This study estimates ordered probit regression by forming unobserved random variables which are written in the following equation:

$$f^* = x' \alpha + \varepsilon \quad (1)$$

Where f^* is a continuous variable and unobserved latent variable from MPA participation, x' is a vector of independent variables that influence MPA participation. α indicates the coefficient of the parameter to be measured. ε is the error term which is assumed to be normally distributed. In this study, the ordered probit model is as follows:

$$Y = x_i\beta + e\_i \quad (2)$$

Where y is the dependent variable (MPA participation category), *x* is the independent variable (socio-demographic condition) and e is N (0,1) and i = 1, 2, 3….N. Then the probability of the ordered probit model can be written as follows:

$$Prob\ [yi = j] = \varphi\ (\mu j - xi\beta) - \varphi\ (\mu j\text{-}1 - xi\beta) \quad (3)$$

Where the cumulative distribution fiction is written as φ, and *j* is the MPA participation category. The variables to be used in this study are as follows (Table 1).

Table 1. Research Variable

	Variable	Definition	Measurement
Depend	Participation in MPA	Community participation in marine protected area activities	1 = Participation 0 = Not participation
Independent	Age	Length of life since birth	Age of head of household in years
	Education level	Household education level in years	Household education level in years
	Number of family members	The number of family members in the individual	The number of family members in the individual
	Marital status	Marital status of the respondents	1 if married 0 otherwise
	Fishermen's group	Participation in fishing groups	1 participates in the fishermen's group 0 otherwise
	Work outside fishery	Have a job other than fishing	1 if you have a job other than fishing 0 otherwise
	Fishing gear	Number of fishing gear	Number of fishing gear owned (unit)
	Market access	Have market access	1 if you have market access 0 otherwise
	Cooperative	Member of the cooperative	1 if as a member of the cooperative 0 otherwise
	Saving	Have savings	1 have savings 0 otherwise

RESULT AND DISCUSSION

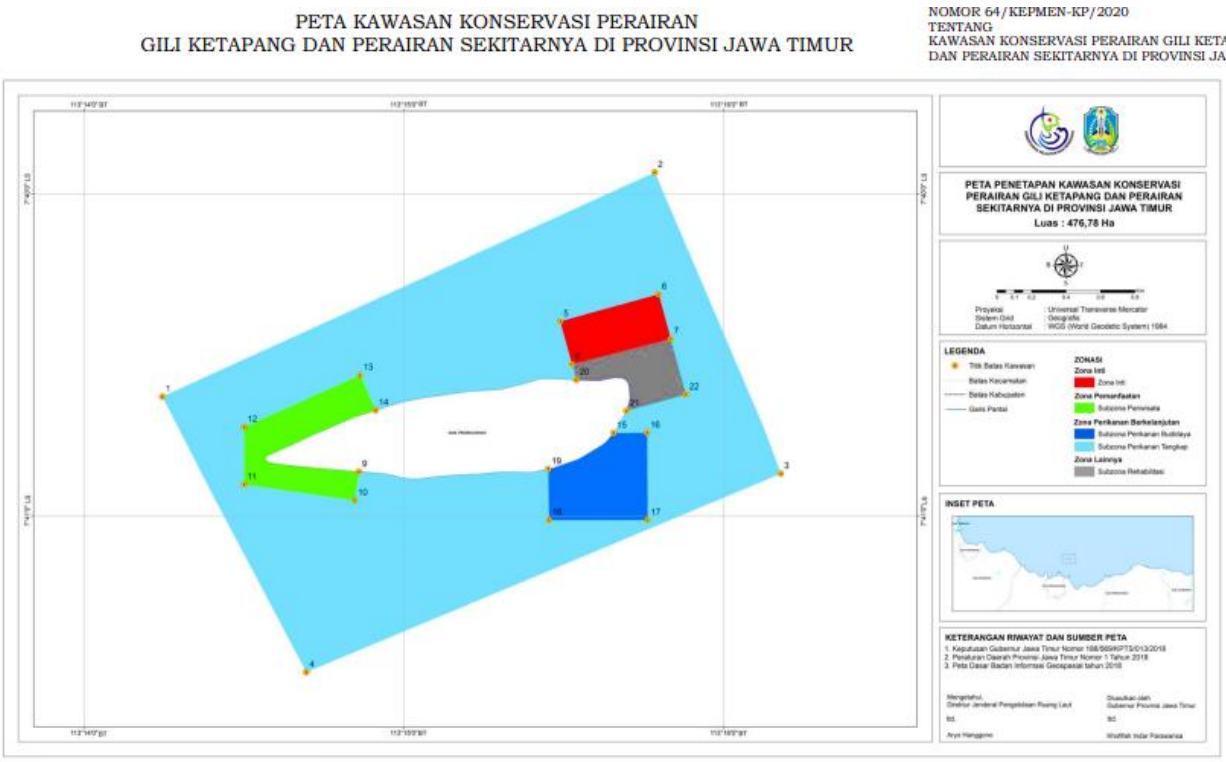
Conditions of Marine Protected Areas

Marine Protected Areas (MPAs) are areas in the ocean that are split into different parts. These parts are called core zones, utilization zones, and sustainable fisheries zones. Here is a simple explanation of Marine Protected Areas (MPA) in Probolinggo Regency and Malang Regency. The core zone is a part of a protected area along the coast and on small islands. Its purpose is to protect the environment and the living things that depend on it. Only research is allowed in this area. Utilization zone is an area that uses its natural resources for nature tourism and other environmental needs. The sustainable fisheries zone is a section of the area that people who live near the Marine Protected Area (MPA) can use while still protecting the environment.

Probolinggo Regency

To keep fish and their habitats safe in the waters of Gili Ketapang Probolinggo, the government has made rules and regulations. These rules protect different types of fish like coral reef fish, deep-

sea fish, big and small fish, and also mammals like whale sharks and pilot whales. This protection is based on a decision made by the Minister of Maritime Affairs and Fisheries of Indonesia. The decision is called Number 64/KEPMEN-KP/2020 and it is about preserving the waters of Gili Ketapang and its surroundings in East Java Province. This is how the Marine Protected Area (MPA) zones in Probolinggo are divided (Figure 2).



Source: DKP Probolinggo (2022)

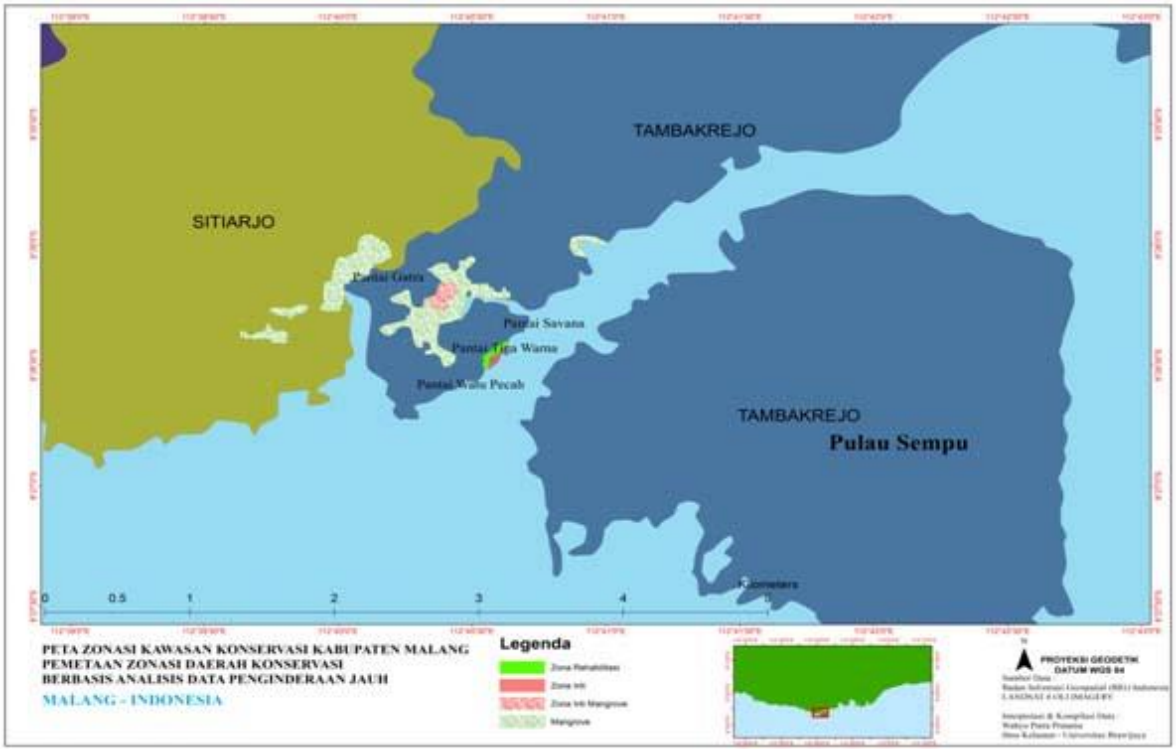
Figure 2. Zoning Map of Marine Protected Area Probolinggo

From the picture above it can be seen that the Marine Protected Area has a total area of 476.78 Ha. The details of the division of zones are as follows:

- The core zone (red zone) has an area of 15.16 Ha.
- The utilization zone is a tourism subzone with an area of 25.63 (twenty five point six three) hectares.
- A sustainable fisheries zone with an area of 421.93 Ha which includes:
  - Aquaculture sub-zone with an area of 23.50 Ha
  - Capture fisheries subzone with an area of 398.43 Ha
- The other zone is a rehabilitation subzone with an area of 14.06 Ha

Malang Regency

Zoning at CMC is divided into two core zones, a rehabilitation zone and mangrove forests, as well as a sustainable fisheries zone (Figure 3).



Source: DKP Malang (2022)

Figure 3. Zoning Map of Marine Protected Area Malang

From the picture above, it can be seen that the core zone consists of a core zone of coral reefs located on Tiga Warna Beach covering an area of 0.875 Ha and a core mangrove zone covering an area of 2.687 Ha which is located on Kondang Buntung Beach. The rehabilitation zone is located in Tiga Warna Beach which borders the mainland with the core zone of coral reefs. The rehabilitation zone has an area of 1.0198 Ha. In addition, there is an extensive mangrove forest on the coast of Sitiarjo Village covering an area of 38,884 Ha. Meanwhile, the sustainable fisheries zone is 439 hectares. Coordinates and zoning maps at CMC are presented as follows (Table 2).

Table 2. Coordinates of the Malang Marine Protected Area Zoning Map

No	Zone	Coastal Name	Coordinate	Area (Ha)
1	Core Zone	Three Color Beach	112.67, -8.44	0.87
2	Rehabilitation Zone	Three Color Beach	112.67, -8.44	1.01
3	Mangroves	The coast of Sitiarjo Village	112.67, -8.43 112.68, -8.43 112.66, -8.43 112.66, -8.43 112.66, -8.43	38.88
4	Mangrove Core Zone	Kondang Buntung	112.67, -8.43	2.68
5	Sustainable Fishing Zone	Purwodadi Bay	112.82, -8.37 112.83, -8.38 112.81, -8.39	439

Source: DKP Malang (2022)

Socio Demographic Conditions of Fishermen

The following is an overview of the socio-demographic conditions of fishing communities in East Java (Table 3).

Table 3. Socio Demographic Conditions of Fishermen

Variable	Unit	Mean	Std Dev.	Min	Max
Age	Year	44.935	11.53325	20	82
Education	Year	6.22	3.054217	0	16
Family members	Person	3.3	1.367241	2	6
Marital status	1 if married 0 otherwise	1.994949	.2362455	1	3
Fishermen Group	1 participates in the fishermen's group 0 otherwise	1	.4731749	1	1
Work Outside Fisheries	1 if you have a job other than fishing 0 otherwise	.33	.5408908	0	2
Number of Fishing Gear	Unit	1.425	.6375006	1	5
Market Access	1 if you have market access 0 otherwise	.89	.0997484	0	1
Cooperative	1 if as a member of the cooperative 0 otherwise	.36	.9607367	0	1
Savings	1 has savings 0 otherwise	.43	.4963181	0	1
MPA participation	1 = Participation 0 = Not participation	.705	.3073227	0	1

From the results of the analysis it can be seen the social demographic characteristics of fishermen. The result showed that minimum age of fishermen was 20 years and a maximum of 82 with average age 44 years. This condition because of small-scale fishermen in East Java are people who are married and have been fishermen for a long time. Field facts also show that people around the age of 20-30 rarely work as fishermen but instead look for work in other sectors. . Some fishermen who are already old are still carrying out further fishing activities, but most of them are no longer doing fishing activities due to age and physical factors.

The average education of fishermen is 6 years or the equivalent of Elementary School (SD) with a minimum education of no schooling and a maximum of 16 years of education or the equivalent of S1. This fact shows that the majority of small-scale fishermen in East Java still have a low level of education, facts on the ground show that costs cause people to be reluctant to continue their education, besides that the need to obtain opinions to meet their daily needs is the main reason for not continuing their education. The average number of family members is 3 people with a minimum of 2 family members and a maximum of 6 people. This fact shows that small fishing communities do not have a large number of family members, this is because small fishing communities consider the intoxication they feel with expenses incurred based on the number of family members.

The average marital status of fishermen is married. Most of the small-scale fishermen are married people. Field facts also show that the average small-scale fisherman actually marries at a young age. Participation in fishermen's groups on average follows or joins fishermen's groups. This fact is supported by the fact that in East Java, especially in Probolinggo and Malang, there are many fishermen's groups that oversee the activities of small-scale fishermen. This participation is supported because of the benefits obtained such as information networking and training.

The average fishermen do not have a job outside of fisheries, but there are some fishermen who have jobs outside of fisheries, such as farming and doing business. In general, small-scale fishing communities in East Java only focus on fishing activities. This is because the ability

possessed by the community is limited to operating fishing gear, besides that the low level of education also makes it difficult for fishermen communities to have jobs outside of fishing activities. The average number of fishing gear used is 1 kind of fishing gear with a minimum of 1 fishing gear and a maximum of 5 fishing gear. The average fishing gear used is only fishing rods, traps, or nets. The number of fishing gear is only one type because the size of the vessels owned by small-scale fishermen is also limited, namely a maximum of 5 Gros Tons (GT) so that the load of fish that can be caught is also limited, so that one type of fishing gear is considered sufficient.

The average small fisherman also has access to the market. Even though the number of catches is not too large, these small-scale fishermen still have access to sell their catch to the market either through middlemen or collectors. Other field facts also show that some small-scale fishermen also sell their fish directly to consumers. On average fishermen do not join or become members of the cooperative. This is because cooperatives in Probolinggo and Malang are not operating properly so that many people are not members of cooperatives. In addition, the lack of knowledge of small-scale fishermen about the benefits of cooperatives also causes people not to be interested in becoming members of cooperatives. In addition, the average small fishermen in East Java also do not have savings. This is because the income they earn is only enough to meet their daily needs, so there are no funds for savings.

Factors Influencing Fishermen's Decision to Participate in MPA

The factors used to determine fishermen's decision to participate in this research in MPA are age, education, family members, marital status, fishermen's groups, employment outside of marriage, number of fishing gear, market access, cooperatives, and savings. The effect of fishermen's social demographic variables on fishermen's decisions to participate in MPA will illustrate with probit model. Table of parameter estimates from the probit model for estimating the determinants of participation in MPA can be seen in the following Table 4.

Table 4. Parameter Estimation of the Probit Model

No	Variabel	Coef.	Std. Err	z	P > z
1	Age	.021343	.0122879	1.74	**0.082***
2	Education	.0636454	.0457744	1.39	**0.064***
3	Family members	-.0923969	.1202665	-0.77	0.442
4	Marital status	-.3862071	.5432337	-0.71	0.477
5	Fishermen Group	1.426716	.4375735	3.26	**0.001*****
6	Work Outside Fisheries	-.5524335	.2371828	-2.33	**0.020****
7	Number of Fishing Gear	.2544565	.211464	1.20	0.229
8	Market Access	.3308678	.093112	3.56	0.107
9	Cooperative	-.6011192	.2002517	-3.00	**0.003****
10	Savings	-.0309291	.304833	-0.10	0.919
	_cons	.0845071	1.572524	0.05	0.957
	Number of Obs		200		
	LR Chi2 (10)		40.78		
	Prob > chi2		0.0000		
	Pseudo R2		0.843		

Note: *, **, *** denote significance at 10%, 5%, and 1%, respectively
Source: Primary Data Processed (2022)

The results of the study show that the variables of family members, marital status, number of fishing gear, market access, and savings do not have a significant effect on the participation of small

fishermen in MPA. However, age, education, fishermen's group, work outside fisheries, and involvement in cooperatives have a significant effect on the participation of small fishermen in MPA. This phenomenon occurs because according to the field conditions of fishermen in Probolinggo Regency and Malang Regency, only a few people who participate in Marine Protected Area activities have awareness. In terms of age, this has a significant effect because fishermen who are getting older have an awareness of protecting marine protected areas as their source of livelihood. In other words, fishermen who are more mature have the awareness to participate in activities or management of Marine Protected Areas. According to a study by Francis Mugizi and others in 2017, the age of people greatly impacts how involved they are in conservation efforts within their community.

Education shows how much a person knows and how much they care about ecosystems. Based on the conditions in the fishing industry, fishermen with more education are more likely to be involved in the Marine Protected Area. On the other hand, fishermen with less schooling are less likely to be involved in Marine Protected Areas. According to a study by Rahman et al. (2021), education level greatly affects how much people participate in conservation activities. People who are part of fishing groups are more likely to be involved in Marine Protected Areas than fishing communities who are not in these groups. This is because groups of fishermen have different jobs like helping with Marine Protected Area activities. Fishermen who join these groups will get to take part in those activities. This idea is supported by Wondirad (2020), who believes that joining fishing groups helps fishing communities get involved in Marine Protected Area activities.

Work outside fisheries has a significant effect on the participation of small fishermen in MPA due to lack of free time. If fishermen have jobs outside of fisheries or alternative jobs, fishermen will have little free time to participate in conservation activities. This is in accordance with the opinion (Wondirad et al., 2020), which states that alternative or side work of fishermen is done to meet the needs of their household, so they do not have much free time to be involved in Marine Protected Area activities. This means that the more types of work other than fisheries that are done, the smaller the opportunity to participate in MPA. Cooperative is an institution that can help fishermen to increase their economy. Cooperatives have a significant effect on fishermen's participation in conservation activities because most fishermen choose to only join one group. In addition, cooperatives also greatly support the needs of fishermen so that fishermen prefer to join cooperatives. This is in line with the opinion (Arnason, 2016), which states that cooperatives can assist fishermen in increasing fishing capital, capitalizing capital and production scale, as well as expanding the distribution channel network so that the market will get bigger. This means that if fishermen join a cooperative or become part of a cooperative, there will be little opportunity to join or be involved in the Marine Protected Area.

CONCLUSION AND SUGGESTION

Conclusion

From the results of the research that has been done, the conclusions that can be obtained are that the variables of family members, marital status, number of fishing gear, market access, and

savings have no effect on the participation of small fishermen in MPA. However, age, education, fishermen's group, work outside fisheries, and involvement in cooperatives have an effect on the participation of small fishermen in MPAs. Thus, in general in East Java the level of community involvement in MPA is influenced by factors such as knowledge obtained from the level of education, networks such as involvement in fishing groups and cooperatives, as well as financial aspects.

Suggestion

The suggestions in this study are to improve increase community participation, MPA management can be done by increasing the variables that have an influence on participation of small-scale fishermen in MPA in East Java. Where to increase the education or knowledge of small-scale fishermen about the importance of MPAs, this can be done through counceling about the benefits of MPA, MPA Zones, and methods of fishing in fishing areas by the Marine Fisheries Service or Regional Government. In addition, to increase concern for the environment, fisherman groups can carry out a number of environmental care activities such as planting mangroves, cleaning beaches or participating in providing counseling on MPA management, so that small-scale fishermen become aware of the importance of MPA in supporting the sustainability of small-scale fishermen's catches, bearing in mind Small fishermen are the most affected because of MPA because their catch range is not too far from the conservation area.

REFERENCES

Abecasis, R. C., Schmidt, L., Longnecker, N., & Clifton, J. (2013). Implications of community and stakeholder perceptions of the marine environment and its conservation for MPA management in a small Azorean island. *Ocean and Coastal Management*, *84*, 208–219. https://doi.org/10.1016/j.ocecoaman.2013.08.009

Agardy, T., di Sciara, G. N., & Christie, P. (2011). Mind the gap: Addressing the shortcomings of marine protected areas through large scale marine spatial planning. *Marine Policy*, *35*(2), 226–232. https://doi.org/10.1016/j.marpol.2010.10.006

Arnason, R. (2016). Fisheries management. In *International Series in Operations Research and Management Science* (Vol. 99). https://doi.org/10.7228/manchester/9780719063862.003.0004

Barley Kincaid, K., Rose, G., & Mahudi, H. (2014). Fishers' perception of a multiple-use marine protected area: Why communities and gear users differ at Mafia Island, Tanzania. *Marine Policy*, *43*, 226–235. https://doi.org/10.1016/j.marpol.2013.06.005

Bennett, N. J., & Dearden, P. (2014). Why local people do not support conservation: Community perceptions of marine protected area livelihood impacts, governance and management in Thailand. *Marine Policy*, *44*, 107–116. https://doi.org/10.1016/j.marpol.2013.08.017

Francis Mugizi, Jim Ayorekire, & Joseph Obua. (2017). Factors That Influence Local Community Participation in Tourism in Murchison Falls Conservation Area. *Journal of Environmental Science and Engineering A*, *6*(4), 209–223. https://doi.org/10.17265/2162-5298/2017.04.005

Dinas Kelautan dan Perikanan (DKP) Kabupaten Malang. 2022. Peta Zonasi Kawasan Konservasi Kabupaten Malang, Berdasarkan Analisis Penginderaan Jauh.

Dinas Kelautan dan Perikanan (DKP) Kabupaten Probolinggo. 2022. Kawasan Konservasi Perairan Gili Ketapang dan Perairan Sekitarnya di Jawa Timur.

Jentoft, S., Pascual-Fernandez, J. J., de la Cruz Modino, R., Gonzalez-Ramallal, M., & Chuenpagdee, R. (2012). What Stakeholders Think About Marine Protected Areas: Case Studies from Spain. *Human Ecology*, *40*(2), 185–197. https://doi.org/10.1007/s10745-012-9459-6

Joandani, G. K. J., Pribadi, R., & Suryono, C. A. (2019). Kajian Potensi Pengembangan Ekowisata Sebagai Upaya Konservasi Mangrove Di Desa Pasar Banggi, Kabupaten Rembang. *Journal of*

Marine Research, *8*(1), 117–126. https://doi.org/10.14710/jmr.v8i1.24337

Jones, P. J. S., & Long, S. D. (2021). Analysis and discussion of 28 recent marine protected area governance (MPAG) case studies: Challenges of decentralisation in the shadow of hierarchy. *Marine Policy*, *127*(December 2020), 104362. https://doi.org/10.1016/j.marpol.2020.104362

Kusumastanto, T., & Wahyudin, Y. (2012). Pembinaan Nelayan Sebagai Ujung Tombak Pembangunan Perikanan Nasional. *Wawasan TRIDHARMA Majalah Ilmiah Bulanan Kopertis Wilayah IV (STT No.2009/SK/DITJEN PPG/STT/1994) - ISSN 0215-8256*, *Nomor 1*(Tahun XXV Agustus 2012), 1–16. https://www.researchgate.net/publication/256038098_Pembinaan_Nelayan_Sebagai_Ujung_Tombak_Pembangunan_Perikanan_Nasional_(Fishermen_Capacity_Building_as_a_Spearhead_of_the_National_Fisheries_Development)

Mahajan, S. L., & Daw, T. (2016). Perceptions of ecosystem services and benefits to human well-being from community-based marine protected areas in Kenya. *Marine Policy*, *74*(February), 108–119. https://doi.org/10.1016/j.marpol.2016.09.005

Mascia, M. B., Claus, C. A., & Naidoo, R. (2021). Impacts of marine protected areas on fishing communities. *Conservation Biology*, *24*(5), 1424–1429. https://doi.org/10.1111/j.1523-1739.2010.01523.x

Pollnac, R., & Seara, T. (2011). Factors influencing success of marine protected areas in the Visayas, Philippines as related to increasing protected area coverage. *Environmental Management*, *47*(4), 584–592. https://doi.org/10.1007/s00267-010-9540-0

Rahman, M. S., Toiba, H., & Huang, W. C. (2021). The impact of climate change adaptation strategies on income and food security: Empirical evidence from small-scale fishers in Indonesia. *Sustainability (Switzerland)*, *13*(14). https://doi.org/10.3390/su13147905

Rebo, D., Sungailiat, K., Bangka, K., Bangka, K., Desy, B., Dalimunthe, Y., Sulistiana, I., Fahria, I., Ekonomi, D. J., Ekonomi, F., & Belitung, K. B. (2017). Analisis Ekonomi Sumber Daya Kawasan Konservasi Laut Marine Protected Area (Mpa) Melalui Pemberdayaan Masyarakat Pesisir Dan Pengembangan Wisata Bahari. *Jurnal Pengabdian Kepada Masyarakat*, *4*(1), 25–31.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Matched Sampling for Causal Effects*, *1083*, 170–184. https://doi.org/10.1017/CBO9780511810725.016

Rossiter, J. S., & Levine, A. (2014). What makes a “successful” marine protected area? The unique context of Hawaii’s fish replenishment areas. *Marine Policy*, *44*(1), 196–203. https://doi.org/10.1016/j.marpol.2013.08.022

Wondirad, A. (2020). Ecotourism development challenges and opportunities in Wondo Genet and its environs, southern Ethiopia. *Journal of Place Management and Development*, *13*(4), 465–491. https://doi.org/10.1108/JPMD-12-2018-0109

Wondirad, A., Tolkach, D., & King, B. (2020). Stakeholder collaboration as a major factor for sustainable ecotourism development in developing countries. *Tourism Management*, *78*(November 2018), 104024. https://doi.org/10.1016/j.tourman.2019.104024

Yates, K. L. (2014). View from the wheelhouse: Perceptions on marine management from the fishing community and suggestions for improvement. *Marine Policy*, *48*, 39–50. https://doi.org/10.1016/j.marpol.2014.03.002

Yunitawati, D., & Clifton, J. (2021). Governance in the early stages of marine protected area development: A case study of Nusa Penida District Marine Conservation Area, Indonesia. *Marine Policy*, *127*(July 2019), 103653. https://doi.org/10.1016/j.marpol.2019.103653