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RESEARCH PAPER

Determination of Fishing Rights Allocation as a Strategy for Sustainable Fisheries Management Realisation in Indonesia

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ABSTRACT

PURPOSE: This paper aims to identify fisheries management policies that can realise sustainable fisheries and equality in the fisheries sector in Indonesia.

DESIGN/METHODOLOGY/APPROACH: The paper uses an empirical research method to examine the effectiveness of the Total Allowable Catches (TACs) system implementation and considers which policies can be used by Indonesia to protect fishery resources.

FINDINGS: This study finds that TACs have been ineffective in maintaining the sustainability of fishery resources and have caused inequity in Indonesia. It considers the extent to which Indonesia can make use of Individual Non-Transferable Quotas (INTQs).

ORIGINALITY/VALUE: The paper criticises the implementation of TACs and recommends other fisheries management strategies that can be applied in Indonesia that can achieve sustainable fisheries and equity in the fisheries sector.

KEYWORDS: Fisheries; TACs; Fishing Quota; Sustainable Development; Fisheries Management; Indonesia

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INTRODUCTION

Indonesia is an archipelagic state with a high potential for fishery resources. The estimated potential of fishery resources in 2017 was more than 12 million tonnes. The number of potential fishery resources in Indonesia continued to increase from 1997 to 2017 (Maritime and Fisheries Affairs Ministry, 2018). However, according to the Ministerial Decree of Maritime and Fisheries Affairs of the Republic Indonesia Number 50/Kempen-KP/2017 concerning Potential Estimation, Total Allowable Catches and Utilization Rates of Fishery Resources in the Fisheries Management Area of Indonesia (MMFA Decree No. 50 of 2017), several species have been over-exploited. This was caused by several factors, including the high number of illegal, unreported, and unregulated fishing (IUU fishing) crimes in Indonesian waters, the disproportionate number of fishing vessels in each Fisheries Management Area of Indonesia (FMAI), and weak supervision of overfishing activities.

IUU fishing is a serious problem in Indonesia because of its economic and environmental impact. For example, based on a study on the latest state losses due to IUU fishing conducted by the Directorate General of Marine and Fishery Resources Supervision, it is estimated that every year Indonesia suffers a loss of more than 10 Trillion Rupiah (US\$637,574,000) (Baskoro, 2014). A total of 556 fishing vessels were sunk due to the crime of IUU fishing between October 2014 and 2019 (Idris, 2020).

Additionally, IUU fishing reduces the potential of fishery resources in Indonesian waters; this has an impact on the export value of Indonesia's main fishery commodities. IUU fishing not only has impact on the potential of fishery resources, it also poses a threat of environmental damage to Indonesian waters.

The disproportionate number of fishermen in each FMAI is also a cause of the over-exploited status of several species. Based on data from the Ministry of Maritime and Fisheries Affairs, FMAIs located in eastern Indonesia have a higher estimate of fishery resources potential than those in western Indonesia. On the other hand, the number of fishermen operating in western FMAIs is higher than the number of fishermen in eastern FMAIs. The disproportionate number of fishermen in each FMAI has led to the over-exploited status of several species in all FMAIs (Hanafi, 2021).

An additional cause of over-exploited species is the weak supervision of fishing activities. The supervision referred to here is related to data on the number of catches from each fishing vessel. Further, the trans-shipment of fish is another important cause of the over-exploited status of certain species. The *modus operandi* is for fishing vessels to catch fish in Indonesian waters and then to transfer the catch to fish-carrying vessels for further transportation outside Indonesia.

Since the sustainability of fishery resources is a serious issue in the Indonesian fisheries sector, the Indonesian government has made efforts to maintain the sustainability of its fishery resources by determining Total Allowable Catches (TACs). The authority to determine the TACs is regulated in Law Number 31 of 2004 concerning Fisheries (Law No. 31 of 2004) and Law Number 45 of 2009 concerning Amendments to Law Number 31 of 2004 (Law No. 45 of 2009).

TACs are established to control the number of catches made by fishermen so that the sustainability of fishery resources is maintained. TACs are different from the allocation of fishing rights. The allocation of fishing rights is the number of catches of certain fish species that can be carried out by each fisherman or fishing vessel within a certain period and in a certain area; TACs are the total number of fish caught that can be carried out by all fishermen or fishing vessels without any allocation of fishing rights. Once the TACs were determined, the data showed that there were still several fish species with over-exploited status in all FMAIs. This demonstrates that Indonesia needs additional legal mechanisms to support TACs and, ultimately, the sustainability of fishery resources.

In principle, those vessels that can catch large numbers of fish will be the ones that fulfil TACs. However, the establishment of TACs without the allocation of fishing rights can increase the potential for inequality in fishing activities and businesses. Since the ability to catch fish in large quantities predominantly favours large vessels above 100 gross tonnage (GT), we should consider the following (based on Article 98 of the Regulation of the Minister of Maritime and Fisheries Affairs of the Republic of Indonesia Number Per.58/PERMEN-KP/2020 concerning Capture Fisheries Business (Regulation of MMFA No. 58 of 2020)):

- Fishing vessels measuring up to 10GT are granted a permit to catch fish in waters up to 12nm.
- Fishing vessels measuring >10GT to 30GT are given fishing grounds in waters above 4nm to 12nm.
- Fishing vessels measuring >30GT to 100GT are given fishing grounds in Archipelagic Waters, the Indonesian Exclusive Economic Zone (ZEEI), or the High Seas.
- Fishing vessels measuring >100GT are given a fishing area in the ZEEI or the High Seas.
- Ships with sizes above 300GT are given a fishing ground in the ZEEI at 150nm and above or the High Seas.

Thus, according to these provisions, fishing vessels measuring 30GT to 100GT will be in the same sea zone as fishing vessels measuring >100GT. These conditions can lead to inequality because the fishing capabilities between the vessels are not comparable. It is necessary then to create a system that guarantees the sustainability of fishery resources in Indonesian waters and prevents inequality in fishing activities and fisheries business in Indonesia.

According to the background described above, two legal issues should be considered. First, what is the impact and effectiveness of determining TACs in ensuring the sustainability of fishery resources in Indonesia? Second, what fisheries management policies can be set by Indonesia as an effort to protect fishery resources and prevent inequality in the fisheries sector?

Within the current literature, some studies examine the technical protection of fish resources through the supervision of fishery activities (Fikri, 2013). Some studies focus on the protection of endangered fishery resources through conservation (Pramoda and Koeshendrajana, 2012). However, this paper examines the protection of traded fishery resources by examining the strengths

and weaknesses of the TACs system that has been implemented in Indonesia to find a better legal mechanism that not only maintains the sustainability of fish resources but also prevents inequality in fishing activities.

LITERATURE REVIEW

The authority to manage fisheries by a coastal state is exercised based on the rights to explore and exploit marine resources, regulated through the United Nations Convention on the Law of the Sea 1982 (UNCLOS, 1982). The rights of exploration and exploitation of fishery resources are obtained by the coastal state from their sovereignty or sovereign rights. It is also the case, however, that the rights of exploration and exploitation of fishery resources must be accompanied by an obligation to maintain their sustainability.

Fish products commodity has culminated in today's globalised seafood market economy and corporate cross-sector ownership, from harvesting to processing as commodities. However, lack of consideration of the ecological impact has resulted in poorly managed and largely unsustainable fisheries (Lam and Pitcher, 2012). It is therefore necessary to have a fisheries policy that considers ecological aspects.

Total Allowable Catches (TACs) are one of the instruments that can be used by a coastal state in managing their fisheries to prevent overfishing or ensure their sustainability. TACs are the total number of fish caught by all fishermen or fishing vessels without any allocation of fishing rights. The implementation of TACs must take into account international obligations in the field of fisheries as regulated in Article 61 UNCLOS 1982.

METHODOLOGY

Empirical legal research makes the law an object of research and views law not only as a prescriptive and applied scientific discipline but also as an empirical or legal reality (Sonata, 2014). Using empirical research methods, this study will consider the legal reality of the impact and effectiveness of fisheries management policies in Indonesia, especially regarding the determination of TACs by the Minister of Marine and Fisheries Affairs. The research was conducted by analysing TACs regulations and their implementation. This study also considers data related to whether the rules applied are effective in ensuring the sustainability of fish resources. The data were obtained by researching the Indonesia Ministry of Marine and Fisheries Affairs in Jakarta. The findings of the effectiveness of Indonesia's fisheries management policies are then used as the basis of an argument for finding a better legal instrument than TACs.

RESULTS

The main duty of fisheries management is to ensure that fishing does not exceed the fish population's ability to survive and does not threaten or damage the sustainability and productivity of the

fish population being managed (Supriadi and Alimuddin, 2011). Fisheries that are not managed properly are susceptible to over-fishing that can lead to the extinction of fishery resources. Fisheries management must take into account the assumption that fishery resources are shared property, asserting open access to these resources (Monintja, 2005). As a fishery management system, TACs are expected to prevent over-fishing and, if there are already over-exploited species, TACs are expected to prove this condition.

TACs (the total amount of fishery resources that can be caught in FMAIs while still ensuring their sustainability) are used as a mechanism to control fishing activities and the amount of fish caught so that the sustainability of fishery resources can be maintained. In other words, TACs are the total amount of catch that is allowed for a certain species, in a certain area, over a certain period. Since the accuracy of fish resources data in each fishing ground is required to determine TACs, TACs must be reviewed and updated regularly.

TACs DETERMINATION HISTORY

In 1985, the Minister of Agriculture determined TACs in Indonesia's Exclusive Economic Zone through the Minister of Agriculture Decree Number 473a/Kpts/IK.250/6/1985 concerning Determination of TACs in the Indonesian Exclusive Economic Zone (the Minister of Agriculture Decree No. 473a of 1985). In 1999, the Minister of Agriculture determined TACs through the Minister of Agriculture Decree Number 995/Kpts/IK210/6/99 concerning Fishery Resources Potential Estimation and TACs in Indonesian Waters (the Minister of Agriculture Decree No. 995/1999).

In 2011, the Minister of Maritime and Fisheries Affairs determined the estimation of fishery resources potential in each FMAI and utilisation rates by issuing the Minister of Marine and Fisheries Affairs Decree Number KEP.45/MEN/2011 (MMFA Decree No. KEP.45/MEN/2011) concerning Potential Estimation and Utilization Rates in FMAI. Indonesia did not determine TACs in 2011.

In 2016, the Minister of Marine and Fisheries Affairs determined TACs for certain fish species throughout FMAIs by issuing the Minister of Marine and Fisheries Affairs Decree Number 47/Kempen-KP/2016 concerning Potential Estimation, TACs, and Utilization Rates in FMAIs (MMFA Decree No. 47 of 2016). In MMFA Decree No. 47 of 2016, the Minister determined TACs in each FMAI and stipulated the utilisation rate for each fish species in each FMAI. The utilisation rate shows the status of each fish species in each FMAI as moderate, fully-exploited, or over-exploited.

In 2017, the Minister of Marine and Fisheries Affairs issued the Minister of Marine and Fisheries Affairs Decree Number 50/Kempen-KP/2017 concerning Potential Estimation, TACs, and Utilization Rates in FMAI (MMFA Decree No. 50 of 2017). There are several differences in utilisation rates between 2016 and 2017 as shown in Table 1.

Table 1: Utilisation Rate of Fish Resources in Indonesia

Species Group	Utilization Rates in 2016	Utilization Rates in 2017
Small Pelagic Fish	Over-exploited in 3 FMAI	Over-exploited in 3 FMAI
Large Pelagic Fish	Over-exploited in 3 FMAI	Over-exploited in 3 FMAI
Demersal Fish	Over-exploited in 3 FMAI	Over-exploited in 0 FMAI
Reef Fish	Over-exploited in 2 FMAI	Over-exploited in 6 FMAI
Penaeid Shrimp	Over-exploited in 8 FMAI	Over-exploited in 4 FMAI
Lobster	Over-exploited in 9 FMAI	Over-exploited in 6 FMAI
Crab	Over-exploited in 7 FMAI	Over-exploited in 4 FMAI
Small Crab	Over-exploited in 7 FMAI	Over-exploited in 2 FMAI
Squid	Over-exploited in 6 FMAI	Over-exploited in 9 FMAI

Source: Minister of Marine and Fisheries Affairs Decree Number 47/Kepmen-KP/2016 and Minister of Marine and Fisheries Affairs Decree Number 50/Kepmen-KP/2017

TACs have become the instrument chosen by many states to maintain the sustainability of their fishery resources, such as members of the European Union (EU). The EU manages its fishery resources through the Common Fisheries Policy (CFP), which includes the determination of TACs. EU member states divide the TACs that have been determined into several national catch quotas. The national catch quotas are then distributed to each fisherman by each EU member state.

In May 2006, a temporary rule between the United States and Canada regarding TACs came into effect (Federal Register, 2006). Another state that also implements TACs is Japan. In 1995, the Japanese government allocated 1,200 million yen (US\$8,567,400) for the assessment of fishery resources as a basis for implementing TACs (FAO, 2000a). China is highly dependent on marine resources: marine resources are a major source of China's food production, jobs, and economic activity. However, it is also noteworthy that more than 50% of China's fishery resources are reported to be over-exploited. In March 2016, the Chinese Government made The National 13th Five Year Plan for 2016-2020; this is a policy of the Chinese Government in its socio-economic development efforts. China's 13th Five Year Plan cut TACs in Chinese waters to less than 10 million tonnes in 2020, down from 13 million tonnes in 2015 (Chasis, 2017). China's 13th Five Year Plan is the first since 1978 that put issues of social justice and environmental protection as top priorities (Cao *et al.*, 2017).

THE TACs SYSTEM IN INDONESIA

The application of TACs is a national fishery management system chosen by many fishery-producing countries, such as Indonesia, China, United States, EU member states, Australia (AFMA), Philippines (FAO, 2000b), and several other countries. TACs were determined by Indonesia in 1985, 1999, 2016, and 2017.

In Indonesia, the implementation of the TACs system has increased the total amount of fishery resources potential; in 2017, however, data showed that there were some species that were over-exploited in each FMAI. In line with what happened in Indonesia, the ineffectiveness of implementing the TACs system was also realised by Oceana.¹ Oceana considers that TACs are ineffective and do not provide the expected results because of the lack of supervision over their implementation. Another reason is that TACs that have been determined by these states override the scientific advice given so that the implementation of TACs becomes ineffective (Oceana, n.d.).

Another impact of the TACs implementation is the creation or exacerbation of inequality in the fisheries sector. This is because Indonesia has set TACs without the determination of the fishing rights allocation. Fishing vessels measuring 30GT to 100GT will be in the same zone as vessels over 100GT. Fishing vessels measuring 30GT can catch up to 4 tonnes of fish in one trip. Fishing vessels measuring >70GT annually can produce a catch of 1,000 to 2,000 tonnes. The difference in fishing ability between fishing vessels measuring >30GT to 100GT and large vessels measuring over 100GT is significant.

FISHING RIGHTS ALLOCATION

The allocation of fishing rights in the form of a fishing quota was first introduced by the Netherlands in 1976. In 1986 New Zealand had a fishing quota regulation (Newell *et al.*, 2002). Individual fishing quotas are one form of allocation of fishing rights and are an increasingly popular mechanism used for fisheries management (Thébaud *et al.*, 2015). Fishing quotas are often discussed as an effective policy instrument to increase the profitability of the fishing industry, reduce industrial overcapacity, and promote sustainable fisheries management (Stage *et al.*, 2016). States that have regulations regarding individual fishing quotas are Australia, Canada, Iceland, Italy, Netherlands, and South Africa. As of this writing, Indonesia does not have regulations regarding individual fishing quotas.

Worldwide, the regulation of fishing quotas has proven to be a successful fisheries management tool (Milliken, 1994). The world's most popular individual fishing quota system utilises Individual Transferable Quotas (ITQs). ITQs are the allocation of fishing rights by dividing the assigned TACs each year into smaller individual quotas. ITQs can generally be traded, or in some cases leased, and are ideally determined annually (Buck, 1995).

ITQs are designed to provide exclusive and transferable rights to a portion of TACs. Typically, ITQs are in the form of a percentage of TACs. TACs can eliminate fishing competition among fishing actors (Sumaila, 2010). In some states, fishing quotas are defined differently from ITQs. The EU uses the term Transferable Fishing Concession (TFC), the African Union uses the term Wealth Based Fishing, while the United States uses the term Catch Share (WFFP, 2013).

¹Oceana is a Non-Government Organisation (NGO) that concentrates on protecting the world's oceans, including fish resources

In 2017 there was some discussion that the Government of Indonesia would determine the Fisheries Management Rights (FMR) over fishery resources in Indonesian waters. FMR is a limited privilege granted by the state to communities and/or community groups to manage, including utilising fish resources for a long period (Halim *et al.*, 2017). There are two types of FMR: First, FMR based on territorial use is usually applied to fish species with limited movement (sedentary and demersal fish). Second, FMR can be based on quota (catch shares): FMR in this sense is a form of fishing right allocation (Bonzon *et al.*, 2010).

In 1986 New Zealand introduced ITQs and allowed them to be transferred among New Zealand communities or companies. New Zealand defines ITQs as the fishing right for a certain amount and in a certain area each year; they are given to fishing actors based on their catch history. ITQs are expressed in tonnes of fishing and not as a percentage of the total TACs, and are traded one-for-one. The quota can be sold in smaller quantities, and any amount may be leased and subleased (Kerr *et al.*, 2003).

In practice, when ITQs are determined, ITQs will be purchased by companies that have sophisticated fishing gear. In the end, the number of fishing boats decreased and unemployment increased. This is because the fishing quotas owned by small fishermen are sold to large companies (Acheson *et al.*, 2015). Companies preferred to buy fishing quotas from other fishermen rather than buying fish from them.

INDIVIDUAL NON-TRANSFERABLE QUOTAS IN INDONESIA

The kind of fishing quota that Indonesia should consider is different from the ITQ concept. As the name implies, ITQs are transferable, either by trading or leasing. The kind of fishing quota that Indonesia should enact is the Individual Non-Transferable Quota (INTQ). INTQs are in principle the same as ITQs that provide a quota for each fisherman for a certain fish species and a certain period; the difference between the two is that INTQs are non-transferable, either through buying or selling, or leasing.

INTQs can be determined by dividing the TACs' value by the total number of fishermen. Another way that can be done is to determine ITQs by dividing the TACs by the total number of fishing vessels. This second method does have a potential complication: when a vessel is sold to another party, there will be a question as to whether the fishing quota attached to the vessel also moves to the new owner. This problem would not arise when the new owner is also an Indonesian citizen but should be considered when the new owner is a foreign citizen or foreign company.

If the fishing quota is applied, there is a possibility that fishermen may discard some of their caught fish: in the European Union, as much as 40% of catches are discarded back into the sea to meet quota requirements (Hoppner, 2013). The FAO noted several reasons for fishermen discarding their catches, including fish that are not the target species for the catch, fish of inappropriate size, fish in damaged condition, fish of the wrong gender, poisonous or inedible fish, and lack of space onboard so that fish with high economic value will be prioritised (Clucas, 1997). The FAO estimates

that, in the period from 1999 to 2001, of the total catches of 83,805,355 tonnes, 6,824,186 tonnes were discarded (Kelleher, 2005).

INTQs are “non-transferable” so that fishing quotas cannot be transferred either by buying or selling or leasing. By not being able to transfer fishing rights, all rights holders will carry out fishing activities. While the implementation of ITQs may have the effect of reducing the number of fishing vessels and increasing unemployment due to the transfer of fishing rights from small fishermen to fish management companies, this will not occur with the implementation of INTQs. INTQs will create working partnerships between small fishermen and fish product companies. Partnership development and empowerment of fishing communities is one of the strategic policies that can be taken to ensure business continuity in the fisheries sector (Asiati and Nawawi, 2016).

Determining INTQs will make fishing activities more controlled, the sustainability of fish resources will be maintained, and it will reduce the potential for inequality between corporations and fishermen and increase the welfare of small-scale fishermen. The existence of INTQs will create equity in fishing activities. Corporations would no longer be competing with each other to exploit fishery resources because each corporation would get a fishing quota. Determination of INTQs will create legal certainty and proportionality in the fisheries business.

The determination of INTQs for each fisherman or fishing vessel is adjusted to the capacity and ability to catch fish of each fisherman or vessel. The distribution of the amount of INTQs for each fisherman or vessel is carried out based on the proportionality principle by providing equal opportunities. The provision of equal opportunities is the embodiment of the equality principle. Fishery management through the establishment of INTQs is an effort to realise sustainable fisheries management and good governance in the fisheries sector. Such fisheries management is not only based on the equitable principle, equality principle, proportionality principle, and the legal certainty principle. It should be noted that the desired results from the implementation of TACs and INTQs that have been determined will not be fulfilled if fishermen continue to catch fish even though they have fulfilled TACs and INTQs (Poos *et al.*, 2010).

INTQs can also be applied not only in Indonesia but also in other coastal states, especially archipelagic states. INTQs can be chosen by archipelagic states to ensure the sustainability of their fish resources and to create equality in fishing utilisation so they may achieve sustainable development in the fisheries sector. However, further research is required to determine what considerations should be used to determine the INTQs. Determination of INTQs should also use the precautionary approach so that the objectives of the determination can be achieved. INTQs are required to truly determine by the conditions of the fishermen with their fishing vessels.

CONCLUSIONS

The application of TACs is not effective enough to overcome the problem of over-fishing that occurs in each FMAI. Determination of INTQs is required as an effort to ensure the sustainability of fishery resources in Indonesian waters. Another advantage of determining INTQs is that

it can prevent inequity in fishing activities and can create working partnerships between fish processing corporations and small-scale fishermen. The Indonesian government makes regulations for determining INTQs that are supported by discard ban regulations. Regulatory changes that have been made should be accompanied by good and serious supervision. The implementation of the INTQs system must be supervised so that the objectives of determining INTQs can be achieved.

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