

# Regulatory Impact Assessment Analysis of Regulations on Pollution Load Capacity and Carrying Capacity of Lake Toba for Aquaculture Fisheries

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**Abstract.** The Government of Indonesia has determined Lake Toba be one of the super-priority tourist destinations. In order to realize the program, the government has recently been more aggressively structuring the Lake Toba area. One of the arrangements is to lift and reduce the number of floating net cages (FNC) so that fish production is gradually reduced from 70,000 tons to 10,000 tons per year in 2023. The FNC arrangement activity caused restlessness among FNC actors because they had to drastically reduce their production or even close their business, which would be detrimental to thousands of local FNC actors. This continued situation will be related to disrupting their main source of livelihood. This study aims to analyze the Governor of North Sumatra Decree. The method used is the survey method, collecting socio-economic data directly, focus group discussions/FGD with the parties involved. Then the regulation was analyzed using the RIA method. This analysis proposes three alternative options: business, implementing the Governor's Decree No. 188.44/2013/KPTS/2017, revising the Governor's Decree with a carrying capacity of 42,000 tons/year aquaculture. It is proposed to revise the Governor's Decree.

## 1. Introduction

The central government has determined Lake Toba be one of the four super-priority tourist destinations in addition to 4 other locations. In order to realize this program, the government has recently intensified various arrangements, such as lifting and reducing the number of floating net cages (FNC) so that production is reduced from 70.000 tons currently to 10.000 tons per year in 2023. The legal basis for this arrangement is The Governor of North Sumatra

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Decree No.188.44/213/KPTS/2017 of 2017 concerning Pollution Load Carrying Capacity and Lake Toba Capacity for Aquaculture. The decree states that the capacity of Lake Toba is 10.000 tons and will be achieved in 2023 [1].

The various FNC structuring activities to reach 10.000 tons by 2023 have caused restlessness among FNC actors because they have to drastically reduce their production or even close their business, which will be very detrimental to thousands of local FNC actors. This continued situation will be related to disrupting their main source of livelihood. The Governor's Decree used is a regulatory product that has been in place since 2017. The basis of the decree is the result of research by the North Sumatra Regional Environmental Agency, which conducted research and found that the water quality of Lake Toba is polluted (mesotrophic). It carries the capacity for aquaculture ranges from between 9,900 to 81,000 tons. Furthermore, in the Governor's Decree, the capacity is set at 10.000 tons per year in 2023.

As part of the legal system, the Governor's Decree is also a regulatory instrument to provide a basic reference for implementing daily floating net cage aquaculture in Lake Toba. When compared to various general conditions, the fact is that many problematic regulations have been canceled by the Government (Ministry of Home Affairs), the majority of which are local regulations that hinder investment and create intolerance and discrimination. Therefore, it is very important to ensure a good regulatory formulation process [2].

As a public policy, regulation should be able to answer problems effectively, directly hit the core of the community's problems, be implemented effectively, fairly, give hope for improvements to the condition of the community, and from an economic perspective, can contribute to increasing regional competitiveness. The government and the community that use the waters of Lake Toba need to collaborate in the management of the waters of Lake Toba. The collaborative management model is, known as "co-management," has been widely applied to fish-rich waters in many countries such as the Americas [3].

The preparation of regulations is one of the better regulation program framework components. The existence of regulation provides legality to the local government to enforce provisions and rules to the community. It explains the community's rights to services, principles, and descriptions of the rules and regulations in service delivery that the government must comply with.

It is a common practice to review the implementation of regulations that have been passed. Through the review, it is hoped that the latest information on the status of the implementation of regulation can be known, identify obstacles to implementation in the field, recognize positive changes that have occurred, and ensure that the substance of the regulation is still under the situation on the ground or requires adjustments. One of the tools used is the Regulatory Impact Assessment (RIA) to conduct this review. In principle, RIA has been conceived as a key instrument for improving regulatory quality and good governance by ensuring more coherent and transparent policies. Making regulation more effective and efficient facilitates the interdepartmental process and often involves public consultation [4].

Regulations close to five years old are selected for review, namely the Governor of North Sumatra Decree No. 188.44/213/KPTS/2017 concerning Pollution Load Capacity and Carrying Capacity of Lake Toba for Aquaculture. The application of RIA also aims to see the effectiveness of the RIA method in supporting the preparation of effective regulations for the development of the fisheries sector and other aspects [5].

For this reason, this study aims to analyze the Governor of North Sumatra Decree using the RIA method. This study is an input for the government on whether to stick with the current regulations or make revisions.

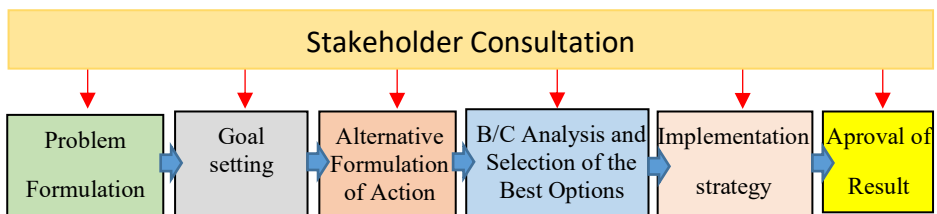
## 2. Research Methods

This activity was carried out in the Lake Toba area, North Sumatra from January 2020 until October 2021. The methods used survey methods, collecting socio-economic data directly, and focused group discussions/FGDs with the parties involved. Pollution load carrying capacity and aquaculture capacity were carried out by analyzing the water quality of Lake Toba. Furthermore, the Governor's Decree regulation was analyzed using RIA Analysis. In this analysis, there were three alternative options: business as usual, implementing the Governor's Decree No. 188.44/2013/KPTS/2017, or revising the Governor's Decree with the latest aquaculture carrying capacity.

Regulatory Impact Assessment (RIA) is an approach to analyze an **existing** or **new regulation** supported by **empirical data and communicate** to decision-makers about the **impact**, both in terms of **costs and benefits** of a regulation. The RIA approach is widely used for regulatory reform to obtain quality regulations. World Bank researchers suggest that RIA uptake in the Global South increases in making reform sustainable more well-documented [6].

The RIA approach is a systematic process consisting of logical steps, which can also be positioned as logical thinking. The diagram below is a schematic of the RIA activity steps [7].

1. Formulation of the problem. The initial stage was the mapping of issues relevant to the regulation's objectives and substance and supported by data and facts on the ground.
2. Goal setting. In simple terms, the statement of purpose was a form of negation of the problem statement.
3. Formulation of Alternative Actions. This step was to identify what action options are available to address the problem and meet the objectives. In the RIA approach, the first choice of action is "do nothing" or "do nothing", which in the next stage would be considered as the initial condition (baseline) to be compared with various other options. At this stage, it is important to involve stakeholders from various backgrounds and interests to get the broadest picture of what options are available and can be taken (Figure 1).



**Figure 1.** Schematic of RIA Activity Steps

4. Cost-Benefit Analysis. After formulating several action options, the next step was to assess the benefits to be obtained and the costs arising from each choice so that it could be decided which is the best choice. The benefit and cost analysis stage is an important part of policy decision-making regarding budget issues [8].
5. Formulation of an implementation strategy. The selection of the best course of action was a form of policy that cannot run itself once it has been set. Therefore, the next step was to formulate a strategy to implement the policy.
6. Result Approval. After all the steps above had been carried out, it was necessary to prepare a report or statement of results (RIA statement). This RIA statement would be submitted to the decision-maker, in this case the regional head who would decide whether to approve the best course of action chosen by the formulation team.

For the record, RIA places great emphasis on participatory processes; therefore, it is necessary to involve stakeholders through a public consultation process at every stage. The public or society is the party whose voice must be heard because they will ultimately receive the impact, both good and bad, of the existence of this policy.

The regulation chosen for review using the RIA methodology is the Governor's Decree No. 188.44/213/KPTS/2017 concerning Pollution Load Capacity and Carrying Capacity of Lake Toba for Aquaculture. This regulation was chosen because it is close to five years old and is a matter of debate.

There were at least three reasons to review an existing regulation, namely:

- The emergence of problems caused by the enactment of regulations.
- some changes or dynamics occur in the community so that regulatory changes/revisions are needed.
- Problems that the regulation is trying to solve still exist (in whole or in part).

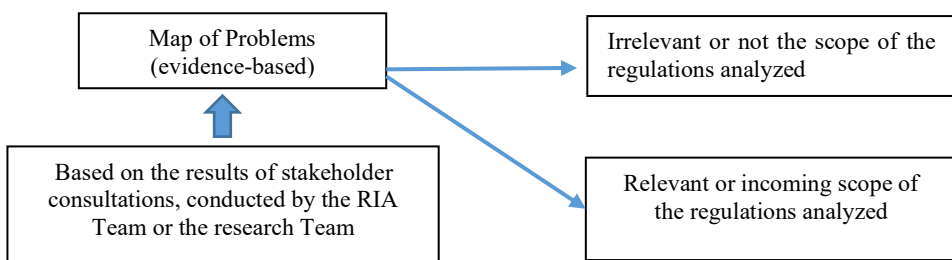
### 3. Results and Discussion

#### 3.1. Review Approach

After identifying the reasons for doing RIA, we can start the review by taking the first step of RIA, namely mapping the problems or changes in the community and the field related to the substance of the regulation. It is important to get evidence in supporting data and information that strengthens the problem or change. Mapping problems and collecting evidence can be carried out by internal parties (local governments) to oversee the implementation of these regulations. By RIA principles, mapping the problem or symptom and then formulating it into the main problem must involve a stakeholder consultation process. Namely, the parties affected by or have concerns about the regulation.

Before conducting phase two of RIA, setting goals, the next step is to assess or check the relevance of the problem map as mentioned above with the substance contained in the body or articles in the regulation being reviewed (Figure 2). There are two possible results of checking, as presented in the diagram below, as follows:

- Issues are irrelevant or not within the scope of the topic or regulatory context under review, so they can be ignored.
- Issues relevant to or related to the topic or regulatory context under review.

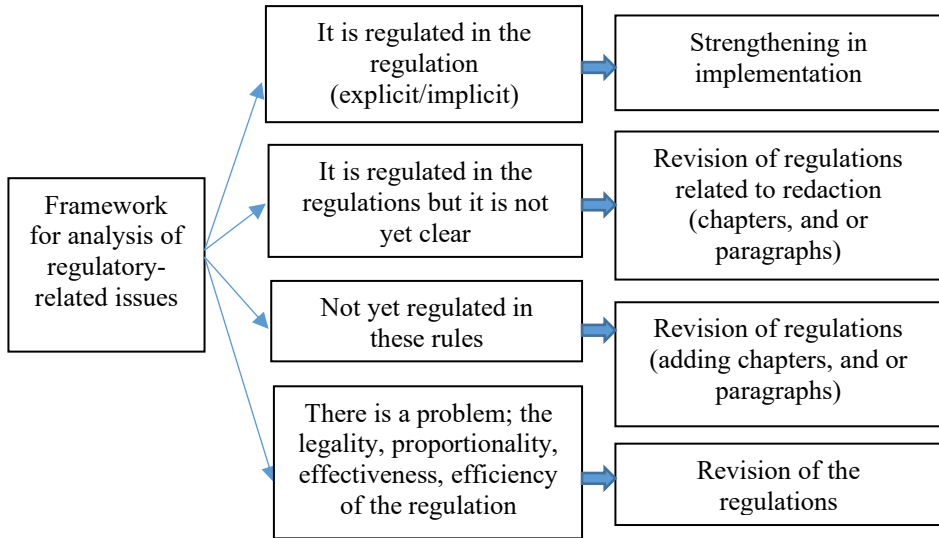


**Figure 2.** Problem Relevance Check Scheme

From the above steps obtained, a collection of problems relevant to the regulations. Next is to analyze the substance of the relevant problem categories more deeply, namely juxtaposing it with the statement of objectives and contents of the articles (body) in the regulations and conducting an assessment.

In this case, there are four possible conditions and what are the implications for their follow-up, as shown in the following diagram:

- The issue has been regulated in the regulations. After all, the need is strengthening for the implementation of the article related to the issue (Figure 3);



**Figure 3.** Problem Analysis Framework, Categories, and Implications

- The substance or issue of the problem has been regulated in the regulation but is not yet clear, so it requires editorial related revisions;
- The substance or issue of the problem has not been regulated in the regulations, so it requires additional explanations in the regulations (chapters, articles, and or paragraphs);
- There are legality, proportionality, effectiveness, and efficiency issues in the regulation that need to be revised.

Based on the analysis of the problem above, it is possible to revoke the regulation if conditions are found according to Law no. 12/2011 concerning the Formation of Laws and Regulations, as follows:

1. Systematics of laws and regulations change
2. The material of the legislation has changed by more than 50%
3. The essence changes

### 3.2. Review the Governor of North Sumatra Decree No. 188.44/213/KPTS/2017

The North Sumatra Provincial Government issued a Governor's Decree (SK Gub) No. 188.44/213/KPTS/2017 concerning Pollution Load Capacity and Carrying Capacity of Lake Toba for Aquaculture. This regulation, passed in August 2017, provides a legal basis for the planned development of marine cage fisheries management in Lake Toba. These regulations are expected to have major implications for the community. Among them is a target of no later than five years from enacting the regulation (2023). All parties implementing marine cage aquaculture in Lake Toba must have met the technical and administrative requirements stipulated in the regulations, namely the total production of Floating Net Cage (FNC) of 10,000 tons. In addition, this regulation is expected to accelerate the recovery of Lake Toba water back to the oligotrophic.

### 3.1.1. Review Process

The RIA process for reviewing this regulation was carried out by a research team and gathered input from several parties such as the Fisheries and Marine Service, the Environment Agency, Bappeda, and FNC actors. The regulatory review process is carried out according to the stages of RIA activities by following the problem analysis approach as above. The RIA process begins with a brief briefing to the Team on the RIA methodology. The RIA activity stage requires five meetings from February 2020 to August 2021.

### 3.1.2. Review Results

#### *Formulation of the problem*

From several meetings between the research team and with the community and private stakeholders, several data and facts in the field have been mapped, which can then be narrowed down into the formulation of the main problem as follows:

**"Lake Toba is still polluted due to several things, namely domestic waste, hotel, restaurant, cafe waste, floating net cage waste, agricultural waste, livestock waste, and forestry waste."**

After more than four years of implementing regulations, there are still problems that do not support the objectives of the regulation, so this becomes the basis for a regulatory review. Details of the problem mapping results and the supporting data can be seen in the Appendix of the RIA Report to the Governor's Decree of Lake Toba's Supporting Capacity. Any issues or problems that arise were checked for relevance to the substance of the regulation.

### 3.1.3. Goal Setting

With the statement above, a statement of objectives can be set and will determine the choice of action, which is in line with the objectives of the regulation as follows:

**"Reducing the level of water pollution of Lake Toba to meet the specified quality standards."**

### 3.1.4. Formulation of Alternative Actions

After going through a process of discussion and discussion of the issues and problems that were collected, including checking and collecting data in the field in 2021 and trying to compare them with factual conditions in the field, the research team concluded three alternative solutions to overcome the problem, as follows:

**Option I:** Do Nothing, which means not taking any action in response to the problems encountered and still applying the North Sumatra Governor's Decree of No. 188.44/213/KPTS/2017 concerning Pollution Load Capacity and Carrying Capacity of Lake Toba for Aquaculture as it is. In RIA, the "do nothing" option is a form of policy that decision-makers may choose.

**Option II:** Perform a series of actions that include:

- 1) Implementing the Governor's Decree No. 188 of 2017 concerning the Determination of the carrying capacity of Lake Toba;
- 2) Prepare the Governor's Decree on the Implementation Team of the Governor's Decree No. 188/2017 concerning the Determination of the carrying capacity of Lake Toba;

**Option III:** Perform a series of actions that include:

- 1) Revising the Governor's Decree No. 188 of 2017 concerning the Determination of the carrying capacity of Lake Toba by the results of the latest research conducted by the IPB University Team;
- 2) Prepare the Governor's Decree on the Implementation Team of the New Governor's Decree concerning the Determination of the carrying capacity of Lake Toba.

### 3.1.5. Parties affected by the policy

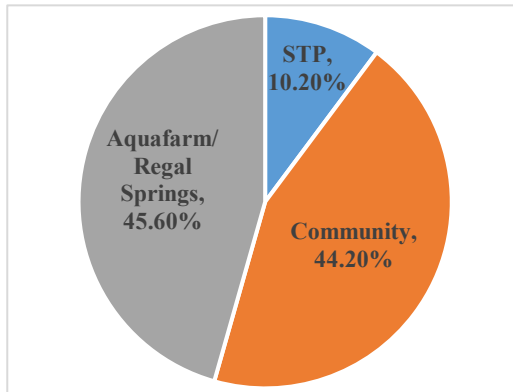
Governor's Decree No, 188.44/213/KPTS/2017 regarding the carrying capacity of Lake Toba for aquaculture has implications for the parties. The Determination of fish production is only 10,000 tons per year in Lake Toba until 2023. The parties affected by this Governor's Decree are as follows (Table 1):

**Table 1.** Parties affected by the North Sumatra Governor's Decree

The party	Forecast of the impact that will be received
<b>A. Parties directly affected</b>	
1. Company FNC actors	<ul style="list-style-type: none"> <li>● Production decline</li> <li>● Profits decreased</li> <li>● Investment loss</li> </ul>
2. Community FNC actors	<ul style="list-style-type: none"> <li>● Production decline</li> <li>● Decreased / lost income</li> <li>● Loss of initial capital</li> </ul>
3. Country and city	<ul style="list-style-type: none"> <li>● Decrease in domestic fish production</li> <li>● Decrease in regional income from taxes/levies</li> </ul>
4. Workers work	<ul style="list-style-type: none"> <li>● Loss of fieldwork</li> </ul>
5. Feed Seller	1. Decreased feed turnover
6. Fish seed seller	<ul style="list-style-type: none"> <li>● Decrease in sales of fish seeds</li> </ul>
<b>B. The affected are not directly</b>	
1. Business actors supporting FNC cultivation	<ul style="list-style-type: none"> <li>● Production decline</li> <li>● The decline in turnover and profit venture</li> </ul>
2. Tourism activities	
3. Market	
4. Sales of equipment cages	<ul style="list-style-type: none"> <li>● Decrease in business turnover</li> </ul>
5. Fish transportation Activities	<ul style="list-style-type: none"> <li>● Decrease in fish, seed, and feed transport activities</li> </ul>
6. Services stall eating, coffee, and cigarettes	<ul style="list-style-type: none"> <li>● Decrease in sales volume</li> </ul>

The parties directly affected by the implementation of The Governor's Decree are FNC owners, both FNC companies and the communities. Currently, two companies are involved in corporate FNC and 5,000 people for community FNC. Two FNC companies currently produce 45,000 tons per year, while community FNCs produce 3,000 tons per year.

The total production value of FNC in Lake Toba in 2020 is IDR 3.5 Billion (assuming the price of fish is IDR 25,000/kg). Production FNC companies all export and foreign exchange are generated from exports have reached IDR 1,474.6 Billion. Meanwhile, the production of community FNC is marketed at the local level to meet the needs of residents in 7 regencies around Lake Toba, plus the Medan city and its surrounding.



*The selling price of live fish is IDR 25,000/kg and the total fish production is 74.584 tons per year.*

*Data GPMT Sumut 2020*

**Figure 4.** Total Tilapia Production in the Lake Toba region

Judging from the amount of investment that has been allocated either by the company or by the community can be estimated as follows for company A where the production capacity is 34,010 tons per year (the number of FNC is as many as 418 holes). In comparison, for company B the production is 7,608 tons with FNC 184 holes.

For community FNC, the value of initial capital issued is calculated based on the capital issued for each floating net hole, IDR 7.5 million. So for all FNC owned by the community, the amount of investment that has been issued is Rp. 80 billion.

### 3.1.6. Analysis of Benefit-Cost and Selection of Options Best

A cost-benefit analysis was carried out to select the best option from the three options above, in detail in the Lake Toba RIA Report. The formulation team conducted a qualitative and quantitative cost-benefit analysis. The Formulating Team agreed to choose the third option as the best option (Table 2).

**Table 2.** Benefit-Cost Analysis

<b>Scenario 1: Do Nothing (74,000 tons)</b>					
No	Group	Benefit	+0/-	Cost	+0/-
1	FNC Actors	Revenue (IDR)	2,478,443,030,000	- Operational Cost	+
2	Feed Industries	Revenue (IDR)	1,281,000,000,000		+
3	Nurseries	Revenue (IDR)	133,875,000,000	- Profit	-
4	Employments		29,300,400,000		-
5	Food Stalls	Revenue (IDR)	3,000,000,000		-
6	Material FNC		500,000,000	Water Pollution	- - -
7	Transportation		2,000,000,000		
8	Fisheries materials	plastic, gas	200,000,000		
	<b>Total</b>		<b>3,928,318,430,000</b>		
<b>Scenario 2: Governor's Decree (10,000 ton)</b>					
No	Group	Benefit	+0/-	Cost	+0/-
1	FNC Actors	Revenue (IDR)	406,327,693,560	- Operational Cost	+
2	Feed Industries	Revenue (IDR)	171,752,654,725		+
3	Nurseries	Revenue (IDR)	28,719,296,364	- Profit	-
4	Employments		3,928,510,136		-
5	Food Stalls	Revenue (IDR)	800,000,000		-
6	Material FNC		100,000,000	Water Pollution	-



7	<i>Transportation</i>		450,000,000		
8	<i>Fisheries materials</i>	<i>plastic, gas</i>	50,000,000		
	<b>Total</b>		<b>612,128,154,785</b>		
<b>Scenario 3: Analysis Result of The revision of Governors Decree (67,000 ton)</b>					
No	<b>Group</b>	<b>Benefit</b>	<b>+0/-</b>	<b>Cost</b>	<b>+0/-</b>
1	<i>FNC Actors</i>	<i>Revenue (IDR)</i>	2,264,861,527,270	<i>- Operational Cost</i>	+
2	<i>Feed Industries</i>	<i>Revenue (IDR)</i>	1,170,608,959,460		+
3	<i>Nurseries</i>	<i>Revenue (IDR)</i>	122,338,231,420	<i>- Profit</i>	-
4	<i>Employments</i>		26,775,418,230		-
5	<i>Food Stalls</i>	<i>Revenue (IDR)</i>	2,741,472,970		-
6	<i>Material FNC</i>		456,912,160	<i>Water Pollution</i>	--
7	<i>Transportation</i>		1,827,648,650		
8	<i>Fisheries materials</i>	<i>plastic, gas</i>	182,764,860		
	<b>Total</b>		<b>3,589,792,935,030</b>		

Source: primary data, 2021

Based on the analysis conducted, the best option is Alternative Action III, namely The Revision of the Governor's Decree in 2017. The arguments of this election are 1) in terms of benefits, Option III provides higher benefits (improvements in environmental quality, as well as FNC fisheries business opportunities due to government arrangements); 2) In terms of cost, there is a difference in cost implications, but the magnitude is not too significant; 3) better guarantee the sustainability of the Lake Toba management program because: strengthening the supervisory function; regulate the number of FNC; clarify the roles and responsibilities of the parties; and 4) in terms of time, option III requires additional time to revise Governor's Decree, but not too significant because the revised regulatory product is Governor's Decree which is relatively faster than revising the regulation.

If it is related to the magnitude of the benefits obtained between the FNC business and tourism, the FNC business is much larger. The main action of the solution choice is to revise The Governor's Decree because, in the analysis, it is found that several articles need to be adjusted and strengthened. The regulatory substances that need to be revised are, among others, presented in the previous chapter [9].

### 3.1.7. Implementation Strategy

Team formulator designing strategy and activities for implementation option that has been selected.

1. Revision of the Governor's Decree 188/2017. The government will make the regulation after delivering the result of the RIA to the Governor, who is expected to support the choice of the Formulating Team, who chose the third option. Revising the Governor's Decree is not expected to take a long time because the Legal Division is a member of the Formulating Team who is aware of this step and will speed up the revision process.
2. We are issuing the Governor's Decree on the Implementation Team to manage Lake Toba's carrying capacity and load capacity. This activity is seen not require a large amount of time and money.
3. Develop a work plan for the Implementation Team of The New Governor's Decree. The action requires careful and effective scrutiny activities. The following tables are the proposed strategy and activity plan for the implementation team.

**Table 3.** Strategy and Plan of Activity Team Implementation

No	Strategy and Plan of Activity	Executor
1	Develop a plan and implement the socialization of the new Governor's Decree to the community, especially to answer problems that arise in RIA, for example, the number of FNC, location, depth, and zoning.	Bappeda
2	Carry out activities to accelerate the target of achieving the implementation of the Governor's Decree until 2023 by, among other things, referring to the Lake Toba Master Plan 2025, including location/zoning of FNC, Fulfillment of requirements;	Bappeda, Government Fishery Office, PDAM (local water company)
3	MOU PDAM and PHRI on wastewater management by hotels and restaurants	Government Tourism office

### 3.1.8. Stakeholder Consultation

The RIA Team conducted two public consultation meetings to review the Decree of the Governor of the Management regarding Lake Toba's carrying capacity and load capacity, the first when mapping the problem and the second when submitting the RIA results report. Stakeholders invited to the consultation event were: Community leaders and Village Community Empowerment Institutions (LPMD) and others, District Apparatus, Management of the Indonesian Hotel and Restaurant Association representing the private sector, and Non-Governmental Organizations (KSM).

### 3.1.9. Submission of Results to Decision Makers

The activity was held in December of 2021 by an Audience with the Governor of North Sumatra to deliver results on the Governor's Decree of RIA of Management of Carrying Capacity and Capacity of Lake Toba. The RIA team and several related parties conveyed the results of this analysis, and the next decision depends on the Governor of North Sumatra.

### 3.1.10. RIA Follow-up

Immediately after the audience with the Governor, the Fisheries Service initiated a meeting to discuss the revision of the Governor's Decree, which the RIA Team attended. In addition to the main substance proposed from the RIA review, the revision of the Governor's Decree also improves several articles in the general provisions concerning definitions. Seeing that there were quite a lot of changes, the RIA team from the Legal Department proposed to make a new decree that replaced Governor Decree no. 188/2017 concerning Management of the Carrying Capacity and Load Capacity of Lake Toba.

## 4. Conclusion

The based analysis above, it can be drawn that the Decree of the Governor needs to be reviewed back. The basis of the proposal that is the result of the analysis is that if Governor's Decree is applied to determine the production FNC only 10,000 tons per year, it will negatively impact the great against the community's economy, especially that engaged directly with the cultivation of FNC. It is estimated that there will be an economic loss of IDR 3.5 trillion per year. Subsequently, after the analysis continued, the obtained results of the power capacity of Lake Toba on aquaculture fishery amounted to 67,000 tons per year. For this reason, it is proposed that the Governor's Decree be revised its carrying capacity from 10,000 tons per year to 67,000 tons.

The research was financially supported by the LPDP Institute, the Ministry of Finance of the Republic of Indonesia, and supported by the Department of Marine Affairs and Fisheries of North Sumatra.

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