

# IDENTIFICATION OF FRESH WATER FISHERIES ECONOMIC PROBLEMS (Case Study in Toba Samosir Regency)

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## ABSTRACT

The development of fisheries business in Toba Samosir Regency refers to the fisheries sub-sector and the potential of natural resources, so that the fisheries sector is one of the flagship economic development programs of the Toba Samosir Regency. The purpose of this study were 1) to analyze and identify the main economic problems of freshwater fisheries in the study area. 2) analyze the freshwater fisheries economics from the floating net cage aquaculture, agro-industry and marketing of processed fish in Toba Samosir. 3) knowing the integration between the company and the community in Toba Samosir Regency. Data retrieval is done by survey method. The results of this study are 1) The main problem of the economy of freshwater fisheries in the study area that fisheries business is not efficient, the logistics system of fish is not well organized and efficient, the purchasing power of most people is still weak, and banking procedures that so difficult to fulfill for small scale fishermen . 2) The economy of freshwater fisheries in the study area are more potential to be carried out with fish cultivation with floating net cages, and the type of industry carried out are the processing industry of fillet, suremi, and salted fish. 3) Integration between the company and the community is carried out with the Corporate Social Responsibility (CSR) Program, namely the assistance provided to community around Lake Toba is part of Corporate Social Responsibility (CSR) program by local companies. Assistance is divided into three parts, namely CSR fish consumption, CSR salty fish and animal feed CSR.

**Keywords:** Economic Problems of Fisheries, Aquaculture fish, fisheries.

## A. INTRODUCTION

Toba Samosir Regency has the potential to develop both capture and cultivation fisheries that can improve the economy of the region. Economic improvement can be done by developing tourism potential, fisheries, and livestock. In this way, the unemployment rate in Toba Samosir will decrease and economic growth and development will grow rapidly. The success of development in Toba Samosir Regency demands cooperation and support from various parties and the role of each sector. One sector that is expected to support the objectives of economic development in Toba Samosir Regency is the fisheries sector.

The Indonesian fisheries development plan stated in the revitalization of fisheries development is directed at increasing the role of fisheries sector in supporting creation advanced, efficient and resilient fisheries so as to ensure the availability of animal protein and industrial raw materials in the country, increase exports, encourage the expansion of employment opportunities, business opportunities, increase fishermen's income, and support regional development. This study aims to: 1) analyze and identify the main economic problems of freshwater fisheries in the study area. 2) analyze the freshwater fisheries economics from the floating net cage aquaculture, agro-industry and marketing of

processed fish in Toba Samosir. 3) knowing the integration between the company and the community in Toba Samosir Regency.

## B. MATERIAL AND METHODS

### Material

Data collection to see the development of freshwater fish economy in Tobasa Regency is a survey method to determine the status of the population at the time of the research (Sumanto in De'e, 2010). Sampling was carried out using random sampling method, which is that all individuals in the population have the same chance of being selected to become members of the research sample (Nurboko and Achmadi, 2005). The purpose of using this method is to facilitate researchers to take data directly to the research location.

### Location and Time of Research

The study was conducted in Toba Samosir. Research time for 2 months starts from March to April 2018.

### Methods

Data collection techniques were carried out using simple purposive sampling technique, namely by taking samples from the population based on certain criteria of consideration (Jogiyanto, 2008). Data processing is carried out by using qualitative descriptive analysis method, which is the

interpretation of data, facts and information that have been collected through intellectual understanding built on empirical experience.

### C. RESULTS AND DISCUSSION

#### Fisheries Economics in Tobasa Regency

Economic potential for larger fisheries is actually found in aquaculture fisheries. However, currently the utilization of aquaculture is still very low, only 4.88 million tons in 2010 or 8.5 percent of the total potential production of 57.6 million tons per year (Tatali et al., 2013). The potential for sustainable production of freshwater aquaculture comes from Lake Toba.

Some of the leading commodities that can be cultivated in the freshwater waters of Lake Toba are tilapia, catfish, gold, gouramy, and goldfish. The potential of aquaculture is very large, making the source of welfare for the local community through the application of aquaculture in each business unit. This includes the use of high quality

seeds, quality feed, pest and disease control, water and soil quality management, layout and construction of buildings, and biosafety. the high potential of aquaculture can be seen in the economic value of its superior commodities, namely tilapia and goldfish (Dahuri, 2011).

#### Fisheries Problems in Tobasa Regency

The problem of fisheries development in Tobasa Regency in this case is defined as all differences (gaps) between the desired conditions and the reality that occurs.

Weaknesses in the management of fisheries development can be grouped into four (Mulyadi, 2007: 29), namely: technical, related to policy, relating to legal and institutional aspects, political economic conditions (macroeconomic policies) that are less conducive to fisheries development. For more details can be seen in Figure 1.

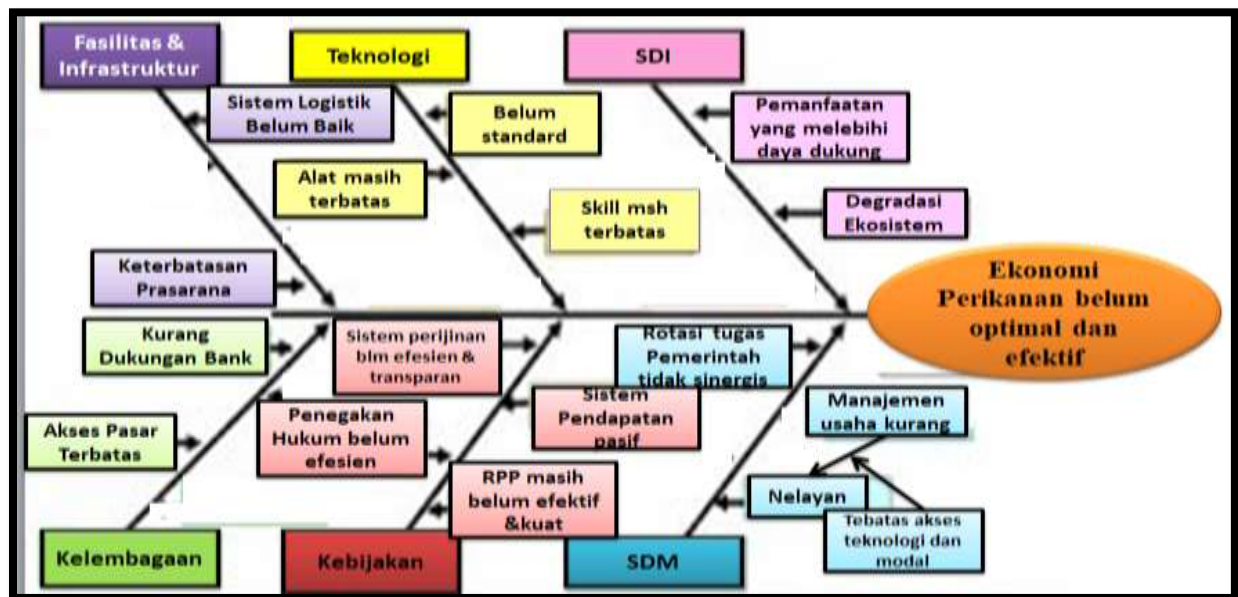


Figure 1. Results of Analysis of Fish Bone Diagrams for Fisheries Economic Problems

From the results of the analysis, a number of key issues and problems were drawn up which hampered the economic development of fisheries.

No	Issue	Problem	Potential Impact
1.	Competitiveness of fishery products that are still low	Fisheries business is not yet efficient	Public revenue will decline
2.	Underdevelopment of the domestic market for freshwater fisheries products	<ol style="list-style-type: none"> <li>1. The logistical system of fish is not well organized and efficient</li> <li>2. The purchasing power of most people is still weak</li> <li>3. The level of understanding for safeguarding the quality of fish in fishermen / fish cultivators is still lacking</li> </ol>	<ol style="list-style-type: none"> <li>1. The fisheries business will be very dependent on the importing country</li> <li>2. The quality of the community will decrease, due to the low level of fish consumption per capita.</li> <li>3. There will be use of materials that are dangerous to preserve / process fish</li> </ol>
3.	Access to capital for the development of fisheries business is limited.	<ol style="list-style-type: none"> <li>1. Banking procedures that are difficult to fulfill for small-scale fishermen</li> <li>2. Credit interest rates are still relatively high</li> </ol>	<ol style="list-style-type: none"> <li>1. The existing fishery business will not develop.</li> <li>2. There will be an unbalanced and optimal level of utilization of fish resources.</li> </ol>

### Government Program in Fisheries Business Financing

One of the roots of poverty in the community in Lake Tobasa is the limited access to capital supported by a non-conductive entrepreneurial culture based on the nature of individual, traditional and subsistence businesses. Government policy in the effort of financing micro-small businesses in the field of maritime affairs and fisheries (Mulyadi, 2007: 139), namely:

1. The Community Economic Empowerment Program is involved in every stage of the activity, starting from planning, implementation and supervision.
2. Business Development Program Small Scale Fishing oriented fishing effort to empower small, medium and its members on the location of the arrest and the concentration of villages in the area of marine fisheries department and district / city and province in Indonesia to increase production and productivity are optimized, improve quality and processing of fish, marketing and improving organizing at fishing locations and carrying out responsible fishing efforts.
3. The Community Economic Empowerment Program is a coastal community development project and fisheries resource management that aims to maintain the sustainability of coastal fisheries resources by reducing destructive and excessive fishing activities, improving the

quality of fisheries resources and their habitat, improving the quality of life of coastal communities, including women fishermen, through reducing poverty in the long term and increasing income

4. Program fishery Enterprise Group is a group that conducts business activities in the field of fisheries based on an agreement or consensus of all members are guided by the interests, needs and desires together, to be implemented and accounted together. The aim of Program fishery Enterprise Group is to increase business capability together and increase the income and welfare of members.
5. Participation of Financial Institutions The Ministry of Maritime Affairs and Fisheries cooperates with various financial institutions. The Ministry of Maritime Affairs and Fisheries cooperates with PT Bank Bukopin regarding the follow-up of the PPEM program in the future. The Ministry of Maritime Affairs and Fisheries cooperates with the Minister of Cooperatives and Business 23 Small and Medium Enterprises, Bank Bukopin, and the Indonesian Fisheries Cooperative Parent to encourage the establishment of microfinance institutions independently and professionally.

### Fisheries Business Economic Analysis

The economic situation of fishermen's businesses can be explored based on the microeconomic analysis of fishing businesses. As a business unit, fishermen are taken by a catcher unit.

For large fisheries businesses that have several catching units, the analysis is based on business units. However, because complete data from large companies are not obtained, analysis based on company units cannot be carried out so that an assessment of the economic situation and efficiency of fisheries businesses is only based on an analysis of one capture unit (Mulyadi, 2007: 85).

### **Capital of Fishermen's Business**

The value of fixed / immovable assets in one catching unit is also called capital. In general, for one capital capture unit consists of: fishing gear (trawlers and others), boats or catching boats, processing equipment or preservatives in ships, and sea transportation equipment. Assessment of the business capital of fishermen can be carried out in three ways. First, the assessment is based on the value of new tools, namely the cost of obtaining these tools according to current prices. So, by knowing the types of tools and the amount and the new price, the amount of capital can be calculated now. Second, based on the purchase price or the manufacture of tools, so how much initial investment has been carried out by fishermen, starting from here, taking into account the depreciation each year, the value of tools or capital can be calculated at the present time. Third, by estimating the value of the device at the present time, the price that will be obtained if the tools are sold.

### **1. Fisheries Production Costs**

Production costs in capture fisheries business consist of two categories, namely costs in the form of actual costs and costs that are not inputted. In this case, real expenditure consists of cash and non-cash expenses. Cash disbursements include buying fuel and oil, preservatives (ice and salt), expenses for crew meals, reparation expenses and levies and taxes. Non-cash expenses are the wages of the fishermen's crew, jobs that are generally profit sharing and paid after the proceeds are sold. Unrealistic expenses are depreciation from boats / boats, machines and catchers.

### **2. Fisherman Revenue and Profit Sharing System**

In general, the income of the cultivator fishermen is determined by profit sharing and is rarely accepted by the fixed salary / salary system received by fishermen. In the profit sharing system, the share divided is income after deducting the costs of exploitation issued at the time of operation plus the cost of selling the proceeds. So, here includes the cost of fuel, oil, ice and salt, crew costs, and payment of fees. Other costs, including the cost of exploitation, such as reparation costs, are borne by the owner of the equipment and boat. In the case of profit sharing divided is the result of the sale of caught fish. The

trick is that the fish caught by one fishing unit is sold by the owner, then the calculation of the profit sharing is done.

### **3. Floating Net Cage (KJA) Freshwater Fisheries in Tobasa Regency**

According to Sambu and Amir (2017) Floating cages (KJA) are a means of maintaining fish or aquatic biota whose skeletons are made of bamboo, wood, pralon pipes or square iron which are netted and given buoys such as plastic drums or streroform so that the container remains floating in water. Where in the cultivation of floating net cage system location selection is the main factor in the success of the business and among other factors, environmental factors are also optimal where the availability of light, salinity temperature, flow and nutrient availability. Therefore, the physical factors of a waters become one of the determinants of the success of tilapia fish farming systems in floating net cages. Environmental parameters that determine the right location for cultivation are temperature, depth, brightness, turbidity. Based on reference studies and existing research results, the researchers are interested in conducting research on the quality parameters of Kalumeme urban waters based on their physical aspects.

One container for aquaculture-based aquaculture is floating net cage, and in Indonesia known as floating net cage (KJA). This system is placed in the waters, one of them in Lake Toba, Tobasa Regency and consists of several components, such as frames, net bags, buoys, inspection roads, guard houses and anchors. The frame is made of wood, bamboo, paralon or aluminum pipes, and serves as a place to hang bags of nets and the foundation of the inspection road and guard house. Mesh bags are made of polyethelene (PE) or polypropelene (PP) with various mesh sizes and various thread sizes, serving as a container for maintenance (production) and treatment of fish. The buoy is made of plastic drums or 200 liter volume iron drums or Styrofoam or cork wrapped in tarpaulin, which serves to keep the net bag floating near the surface of the water. The inspection road is located between the net pockets and serves to facilitate cultivation operations, made of boards, bamboo or wood. The guard house serves as the operator's residence to cultivate this system, and also as a warehouse or office, made of lightweight materials so that the system load is not too heavy so it can save the use of buoys. The anchor serves to tether the system to its original position, made of concrete or stone or wood stakes that are fastened to the frame using anchor mines. In Tobasa the number of floating net cages was 533 units with a total area of 9.13 ha.

Floating Net Cage Construction Fish farming in the Regency there are 2 namely :

**1. Circular Cage (CC)**

Circular CC cage made from HDPE (High Density Polyethylene) material, diameter of 18

**2. Squire Cage (SC)**

SC cage is rectangular, this type of cage is also widely used by people for fish cultivation. SC cage is 12 x 6 dimension; 6 x 6; 3 x 3, with a capacity of 12,000 fish.

meters, area of 254.34 meters<sup>2</sup>, with fish capacity of 84,000 - 96,000 fish.



**Circular Cage**



**Squire Cage**

**Gambar 2.** Kontruksi Keramba Jaring Apung budidaya ikan di Kabupaten Tobasa  
**Freshwater Fisheries Industry in Tobasa Regency**

**1. Surimi**

Surimi is a processed semi-processed fishery product in the form of frozen crushed fish meat that has undergone a washing process (leaching), pressing, adding additional ingredients (cryoprotectant), and packing. Surimi is usually made from white fleshy sea fish and is used as the starting material for making various fish jelly products, such as sausages, brain brains, nuggets, kamaboko, suji, chikuwa, ekado, imitation lobster / shrimp / crab etc.

Initially Surimi came from Japan and now has become a global product, because besides being practical in its use, surimi can also be available throughout the year with maintained quality. In Indonesia surimi is still difficult to obtain because it is generally directly exported. The undeveloped fish processing industry, the discontinuity of raw

materials, the high selling price of surimi and the level of consumption of Indonesian people towards fish protein is still very low, which is the reason why surimi products do not develop in the country.

To overcome the above problem, the Government has developed surimi process technology made from tilapia (*Oreochromis niloticus*). Tilapia, known as a white fleshy fish and very resistant to changes in the environment, because its body is dense and thick meat. Tilapia can be widely cultivated in Tobasat Regency at Lake Toba, so it is very potential to become a sustainable source of raw material for the fish processing industry.



**Figure 3.** Surimi Processing Process in Tobasa District

### 1. Salted Fish

Raw material for salted fish in Tobasa Regency comes from tilapia. The process of making salted fish here is still traditional, where there are several processes including:

**Fish Cleaning.** Fish cleaning is very important, starting with peeling the skin on the fish so that when salting can enter the meat. Then cleansing the inside of the fish's stomach, because if it is not removed it will accelerate the decay.

#### 2. Cutting Fish

Fish cutting must be done carefully, making sure all pieces are neat. A good way to cut is to do the division from head to tail, not to be cut or separated into two. After cutting, don't forget to clean it again.

#### 3. Fish salting

Fish that have been cut into wide and cleaned need to be salted. It aims for natural preservation, and makes the fish salty. In the salting process can be done by making water and salt content with a percentage of 50% clean fresh water and 50% salt. Furthermore, for the immersion process is done 1-1 / 2 days depending on the desire level of the acidity.

#### 4. Salted Fish Drying

This drying process is a very important stage, if the drying process fails, the fish that has been marinated cannot dry up to its full potential and the results will be bad. Create a drying place can be by means of wood or woven bamboo. Dry one by one fish, give enough distance so that the fish's flesh can be exposed to sunlight well and evenly. Occasionally the dried fish should be reversed to get evenly dried meat.

#### 5. Salted Fish Packaging



**Figure 4.** Salted fish industry in Tobasa Regency

#### 1. Fillet fish

Freshwater fish cultivated in Floating Net Cages in Tobasa Regency are raw materials for the fish fillet industry.

One of the freshwater fish fillet companies is PT. Aqua Farm Nusantara. Fish fillets will be exported to the United States and Europe.



**Figure 5.** Flow of Fillet Fish processing

## **Marketing of Freshwater Fisheries Products in Tobasa Regency**

Production of tilapia fish fillets PT Aquafarm Nusantara located in Lake Toba and Serdang Bedagai (Sergai), North Sumatra (North Sumatra) continues to increase. Recorded until October 2013, tilapia fillet production reached 32,000 tons. The average production of tilapia fillets was exported to the main destination countries of the United States (US) and a number of countries in Europe such as the Netherlands and France. The demand continues to increase every period. In fact, even from Asian countries like China there is a demand.

## **Integration Between Companies and Communities**

### **1. Program Corporate Social Responsibility (CSR)**

CSR (Corporate Social Responsibility) is a concept or action taken by a company as a sense of corporate responsibility towards the social and the surrounding environment where the company is located, such as conducting an activity that can improve the welfare of the surrounding community and protect the environment, providing scholarships for underprivileged children in the area, funds for the maintenance of public facilities, donations to build village / community facilities that are social and useful to the community at large, especially the communities around the company are located.

Corporate Social Responsibility (CSR) is a phenomenon and strategy used by companies to accommodate the needs and interests of its stakeholders. CSR starts from an era where awareness of the long-term sustainability of a company is more important than just the profitability of a company. CSR activities will ensure business sustainability. This is caused by :

1. The decline in social disturbances that often occurs due to environmental pollution can even foster support or defense of the local community.
2. Guaranteed sustainable supply of raw materials for the long term.
3. Advantages of new business units, which were originally CSR activities designed by corporations.

The 5 pillars that cover CSR activities are:

1. Development of human resources capacity within the company's internal environment and the surrounding community environment.
2. Strengthening the community's economy around the area of the company's work area.
3. Maintenance of the relational relationship between the corporation and its social environment that is not managed properly often invites the vulnerability of the conflict.

4. Improved good corporate governance
5. Environmental preservation, both physical, social and cultural environment.

The following are the benefits of CSR for the community:

1. Increasing the welfare of the surrounding community and environmental sustainability.
2. There are scholarships for disadvantaged children in the area.
3. Increased maintenance of public facilities.
4. The existence of social development / community facilities that are social and useful to the public, especially those around the company.

### **2. Assistance from the Corporate Social Responsibility (CSR) Program to the Community**

The assistance provided to the community around Lake Toba is part of the Corporate Social Responsibility (CSR) program by local companies. Where, assistance is divided into three parts, namely CSR fish consumption, CSR salty fish and animal feed CSR. The assistance was given to the community around Lake Toba, especially those in the location of the enlargement of tilapia Aquafarmyakni Ajibata, Tobasa Regency.

For fish consumption CSR, the average assistance provided ranges from 210-450 head per day. If it is added in rupiah, the value is around Rp. 8,910,000. Assistance for consumption fish includes activities for weddings, customary death and other social activities. Then the CSR aid for salty fish is around 620 - 640 kg per day. And, if it's worth around Rp. 12.8 million per day. CSR feed for animal feed ranges from 1,530 - 1,550 kg per day or if it is around Rp 6,630,000. CSR is distributed every day, and all the assistance is given to the community around the company. While the fertilizer production began intensively carried out and recorded in early March 2014 and was handed over to the community.

The stock of organic fertilizer that is ready and will be distributed to the community is still quite a lot in the WWTP location (LTG, SLM, RKG). For solid fertilizer, approximately 45 tons are available from the 14 available reservoirs. For 2,800 liters of liquid fertilizer and still making fertilizer until now.

## **D. CONCLUSION**

The conclusion of this study are:

1. The main problem of the economy of freshwater fisheries in the study area is that fisheries business is not yet efficient, the logistic system of fish is not well organized and efficient, the purchasing power of most people is still weak,

and banking procedures that are difficult to fulfill for small-scale fishermen.

2. The economy of freshwater fisheries in the study area is more potential to be done with fish cultivation with floating net cages, and the type of industry carried out is the processing industry of fillet, suremi, and salted fish.
3. Integration between the company and the community is carried out with the Corporate Social Responsibility (CSR) Program, namely the assistance provided to the community around Lake Toba is part of the Corporate Social Responsibility (CSR) program by local companies. Where, assistance is divided into three parts, namely CSR fish consumption, CSR salty fish and animal feed CSR.

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