Coral reefs fisheries development business strategy in Sabang City

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Abstract. Marine fisheries are an important source of food and income for people all over the world. Billions of people, most of them from developing countries, rely on fish as a major source of animal protein. Fisheries play an important role in the prevention and reduction of poverty. Fisheries provide nets that are essential to people when other work resources are unavailable. The aim of this study is the strategy for developing coral fisheries in Sabang city. The method used in research is to use the SWOT method of analysis. Fisheries development strategy in Sabang city: 1). Developing cathing tool technology to replace the previous cathing tools that are non-environmentally friendly. 2). Conducting the coral reef conservation socialization where the coral fish live. 3). Cooperating with the society in controlling fishing areas by utilizing the local culture that is still very strong in protecting the sea to avoid illegal and excessive exploitation of fish. 4). Means of transportation and distribution for the export of coral fish, which results in a high selling price. 5. The development of the added value of coral fishery products for the welfare of fishermen.

1. Introduction
Marine fisheries are an important source of food and income for people all over the world. One billion people, many around developing countries, rely on fish as their main animal protein source. Fisheries play an important role in poverty prevention and poverty reduction. Fisheries provide an important safety net for people when other sources of employment are unavailable or following natural disasters [1]. Learning on this potential, the fisheries business in Indonesia shows a very good future. Especially from increasing of export demand data from year to year. In accordance with Maritime Affairs and Fisheries Ministry’s vision, viz. Indonesia as the largest producer of marine and fishery products in 2015, and DKP's mission, namely, Improving Marine and Fishery Communities Welfare, as well as DKP's strategic objectives, i.e: 1) Strengthening integrated institutions and human resources; 2) Manage marine and fishery resources in a sustainable manner; 3) Increase knowledge-based productivity and competitiveness; 4) Expanding access to domestic and international markets [2].

Various types of fish resources in the waters should be handled wisely and carefully. Certain types of species began to experience a decline in production due to intensive fishing, but other species have enormous development opportunities. Therefore, the capture fisheries development based on superior commodities is an urgent need that must be implemented immediately [3]. Potential for capture fisheries in the Eastern Coast of Sabang City is reef fish. It’s utilized by fishermen in Sabang City, especially Eastern Coast fishermen, so, is one of main reef fish producers in Sabang City [4]. Reef fish that become the commodity are: Grouper, Snapper, Kakak Tua fish, Kuwe yellowtail fish, Lencam, Reumong,
Kurisi, Pisang-pisang, and red-eyed fish. It’s need to conduct a study on "Reef Fisheries Development Strategy in Sabang City".

2. Material and Methods

2.1. Time and Research Location
This research was carried out in Sabang City, Aceh Province in May 2021. Sabang City became a place for coral reefs fisheries business development. Data collected types in this study consisted of primary data and secondary data. Primary data is data directly collected in the field related to coral reefs fisheries development.

2.2. Method of Collecting Data
The research design of this study was to interview 10 respondents who represent a sample of the fishermen population as coral reefs fishery business actors, local fishing groups who control the conditions of the local fishing community, staff from the Sabang City Marine and Fisheries Service, including several community members and fish sellers. Primary data were collected through direct observation and in-depth interviews at locations with the dominant intensity of reef fishing activities, by filling out the prepared questionnaire. Secondary data collection was carried out through literature studies, internet, journals and the Fisheries and Marine Affairs Department of Sabang City with issues relevant to research topic. The data collected are developmental data, types of fish, appropriate fishing units.

2.3. Data Analysis

2.3.1. Coral Reefs Fishery Development Analysis (SWOT)
SWOT analysis used to formulate a strategy for developing a reef fish business that supports by identifying the factors that influence there are two types of factors, i.e. internal and external factors. Next, in analysis using IFAS matrix and EFAS matrix. First step in a SWOT analysis is to collect data. At this stage, what is done is not only collecting data, but also conducting a classification and pre-analysis process. Existing data is divided into two part, namely external and internal data. External data is obtained from the company's external environment such as market analysis, competitors, suppliers, government regulations and socio-cultural changes in society. While internal data that usually comes from within the company is usually in financial reports form, reports on human resource activities, operational and marketing activity reports. Then, next step is to create a worksheet by drawing a cross line that forms four quadrants, one each for strengths, weaknesses, opportunities, and threats.

2.3.2. Operational Concept
1. Reef fish is a fish with economic value in both local and international markets that lives in the oceans and is usually cultivated in floating net cages (KJA), such as tiger grouper (Epinephelus fuscoguttatus) and mud/rat grouper (Cromileptes altivelis).
2. Strategy is a tool to achieve company goals in relation to long-term goals, follow-up programs, and resource allocation priorities.
3. Business development is a picture of the future of grouper agribusiness.
4. SWOT analysis is an analysis of the external and internal environment that affects the grouper aquaculture business development.
5. Internal factors is a factor from within a business group that includes the strengths and weaknesses of the business group.
6. External factors are factors from the environment outside the business group, both the macro environment (culture, education, sociology, demography, economy, politics, law, natural resources, government, and technology) and the micro environment, i.e. consumers, competitors, suppliers, financial institutions, and distribution channels.
7. Strengths are core competencies contained in the organization which result in the ownership of advantages and capabilities in product development by business units in the market.
8. Weaknesses are limitations (shortcomings) in terms of resources, skills and abilities that are barriers to performance that can cause losses.
9. Opportunities are changes that can be seen in advance for the near future. So, it going to provide benefits for business activities.
10. Threats are symptoms that have a negative impact on the success of the business, but are generally beyond the control of the business.

Table 1. Analysis SWOT

| External Opportunities | Treats (T) |
|------------------------|------------|
| SO Strategy            | ST Strategy|
| Strengths - Opportunities | Strengths - Threats |
| WO Strategy            | WO Strategy|
| Weaknesses - Opportunities | Weaknesses - Opportunities |

Figure 1. SWOT Analysis Diagram [5].

3. Research Results

3.1. External and Internal Factors of Coral Reefs Fishery
The way to save potential of Indonesia's marine wealth is to protect, conserve, and utilize coral reef resources in a sustainable manner and ensure its sustainability and biodiversity. Moreover, establishing it as an important ecosystem, an essential habitat for fish resources and a conservation area, needs to be done for current and future generations. In addition, rescue efforts carried out globally are also expected to strengthen international cooperation that has been carried out by Indonesia and the Coral reef triangle countries [6, 7]. This effort is also strengthened by the commitment of Indonesia Government in coral reef management and marine areas conservation at the international level. Increase reef fish production capacity whereas the strengths in the form of productive age, low marketing costs and availability of the sea although opportunities in the form of high prices, good seabed and high consumer tastes, these strengths and opportunities strongly support the increase in coral reef production volume [8, 9].

3.2. Identification and Analysis of Internal Factors
Internal factors are all conditions and factors that are in coral reef fishery area is a special competence contained in organization take the ownership of advantages and capabilities in product development by
business units in market [10]. Internal factors found in coral fisheries in Sabang City are listed in Table 2.

**Table 2. Faktor-Faktor Internal Pengembangan Perikanan Karang**

| Power (Power) | Weakness (Weakness) |
|---------------|---------------------|
| 1. Clear water quality | 1. Coral reef damage |
| 2. High diversity of reef fish | 2. Use of fish bombs |
| 3. Individual abundance of reef fish | 3. Catching fish is not environmentally friendly |
| 4. Fish price quality is good | 4. Overfishing |
| 5. Big reef fish biomass | 5. Human resource quality is still low |

**Table 3. Matrix of Internal Factors of Coral Reef Fishery Development**

| No | Parameter | Relatively | Rating | Score |
|----|-----------|------------|--------|-------|
| Power | Very clear water quality | 0.102 | 4 | 0.408 |
| | High diversity of reef fish | 0.108 | 4 | 0.432 |
| | Individual abundance of reef fish | 0.099 | 3 | 0.297 |
| | Fish price quality is good | 0.084 | 3 | 0.252 |
| | Big reef fish biomass | 0.108 | 4 | 0.432 |
| Weakness | Coral reef damage | 0.090 | 2 | 0.180 |
| | Use of fish bombs | 0.108 | 2 | 0.216 |
| | Catching fish is not environmentally friendly | 0.108 | 1 | 0.108 |
| | Overfishing | 0.099 | 2 | 0.198 |
| | Human resource quality is still low | 0.093 | 2 | 0.186 |
| Amount | 1,000 | | | 2,712 |

3.3. Identification and Analysis of External Factors

External factors are all conditions and Opportunity factors are changes seen before in the near future, it will provide benefits for coral reef fisheries development in Sabang City. External factors found in coral reef fisheries in Sabang City are listed in Table 4.

**Table 4. Internal Factors of Coral Reef Fishery Development**

| Opportunity | Threat |
|-------------|--------|
| 1. Local revenue from the fishery sector | 1. Development activities in coastal areas |
| 2. Potential reef fish resources potential. | 2. Development activities in the upstream area |
| 3. Open reef fish export market | 3. Low surveillance around the reef |
| 4. High outside investors | 4. Exploitation of coral reefs for commercial purposes |
| 5. Fishermen's economic development is high | 5. Conflict of interest about coral reefs |

**Table 5. Matrix of External Factors of Coral Reef Fishery Development**

| No | Parameter | realistic | Rating | Score |
|----|-----------|-----------|--------|-------|
| Opportunity | Local revenue from the fishery sector | 0.098 | 3 | 0.295 |
| | Potential reef fish resources | 0.107 | 3 | 0.321 |
| | Open reef fish market | 0.101 | 2 | 0.202 |
| | High outside investors | 0.098 | 2 | 0.197 |
| | Fishermen's economic development is high | 0.101 | 2 | 0.202 |
Threat

|   | Development activities in coastal areas | 0.095 | 2 | 0.191 |
|---|----------------------------------------|-------|---|-------|
| 2 | Development activities in the upstream area | 0.092 | 2 | 0.185 |
| 3 | Low surveillance around the reef | 0.095 | 1 | 0.095 |
| 4 | Exploitation of coral reefs for commercial purposes | 0.107 | 2 | 0.214 |
| 5 | Conflict of interest in the use of coral reefs | 0.104 | 1 | 0.104 |

| Amount | 1,000 | 2.007 |

3.4. Coral Fishery Development Strategy in Sabang City

After the strategic environmental conditions (strengths, weaknesses, opportunities and threats) of the coral fisheries sector in Sabang City are identified, then we’ve got the SWOT matrix to clarify the things that are strengths, weaknesses, opportunities, and threats that affect the reef fisheries business. With SWOT analysis, various alternative strategies can be obtained which can be seen in following table:

**Table 6. SWOT Matrix for Coral Fishery Development in Sabang City**

| Internal Opportunities | Threats |
|------------------------|---------|
| 1. Local revenue from the fishery sector | 1. Development activities in coastal areas |
| 2. Potential reef fish resources | 2. Development activities in the upstream area |
| 3. Open reef fish market | 6. Low surveillance around the reef |
| 4. High outside investors | 7. Exploitation of coral reefs for commercial purposes |
| 5. Fishermen’s economic development is high | 8. Conflict of interest in the use of coral reefs |

| External Strengths (Strengths) | STRATEGY (S - O) | STRATEGY (S – T) |
|--------------------------------|-----------------|-----------------|
| 1. Very clear water quality | 1. Increase Reef Fish Production Results (S3, O2) | 1. Developing fishing gear technology to replace non-environmentally friendly fishing gear (S4, T5) |
| 3. High diversity of reef fish | 2. Improving reef fish prices quality to be exports (S4, O4) | 2. Conducting socialization on coral reefs conservation where reef fish live (S2, T3) |
| 3. Individual abundance of reef fish | | |
| 4. Fish price quality is good | | |
| 5. Big reef fish biomass | | |

| Weaknesses | STRATEGY (W – O) | STRATEGY (W - T) |
|------------|-----------------|-----------------|
| 1. Coral reef damage | 1. Expanding access to social networks of fishermen groups with outsiders (W5, O4) | 1. Cooperating with community in supervising fishing areas by utilizing local culture which is still very strong in protecting the sea to avoid illegal and excessive exploitation of fish. (T3, W1,2) |
| 2. Use of fish bombs | | |
| 3. Catching fish is not environmentally friendly | | |
| 4. Overfishing | 2. Conducting outreach activities, outreach to regular assistance in every coastal village in Sabang (W3,02) | |
| 5. Human resource quality is still low | | |
The management of a fisheries constitutes a complex and sustained falling of activity in a fishing system. The success of every subsystem that makes up SDI, effort and institutional part. Fisheries management is not independent of the development activities of superior commodities aside from the type and number of fishing units. It is expected that such a high proportion of the world’s goods could be used as a sustainable measure of fisheries management so that it is expected to spur regional economies and reduce inequality.[11]

The development of reef fisheries must also take note of the present condition of coral. The decline in the production of reef fisheries must also be expected by more responsible use patterns. Based on studies on the development of reef fisheries that have highly clear waters and the high diversity of coral reef fisheries in Sabang City to promote the rise in the production of coral reef fisheries. A model for the management of coral reef fisheries with a focus on the superior kinds of commodities that could be focused on the development of the coral reef fisheries activity in Sabang City in order to improve the price of coral reef fisheries on exports as well as the development of Code Of Conduct For Responsible Fisheries.

![SWOT Diagram]

**Figure 2. Grafik SWOT**

4. Conclusion
The results from development of coral reef fisheries in Sabang City is the total Internal factors and external factors scores in the development of reef fisheries in the Sabang City each 2.71 and 2.00 make the conditions for reef fisheries stable. The result of the corel reef fisheries development strategy in Sabang city that is increased supervision of fishing areas for fishing gear that is not environmentally friendly will damage fishing grounds, transportation and distribution for reef fish trade with high selling value, added value capture fisheries products development for fishermen's welfare income.

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