

# Implementation of the Bontang City Food Security, Fisheries and Agriculture Department Program in Managing Environmentally Sound Fisheries Potential

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**Abstract** Bontang City has 70.3 percent of the sea area so that the coastal sector is one of the sectors driving the economy of its people, especially in the fisheries and marine sectors. The fisheries sector (aquaculture) also became the second mainstay of Bontang City after the industrial sector. The Implementation of the Bontang City Food Security, Fisheries and Agriculture Department Program in managing environmentally sound fisheries potential, both capture fisheries and aquaculture, has succeeded in 2017 to fill local needs. This is indicated by the improvement in the performance of capture fisheries and aquaculture and the added value of the fisheries industry, as evidence by the achievement of the fisheries production target of 132.07 percent and an increase in the number of capture fisheries and aquaculture production of 6.848,39 tons or equal to an increase of 33.70 percent compared to the amount of fisheries production in 2016. The successful implementation of the program is also supported by the availability of a good budget, which in the realization is not greater than the planned budget ceiling. However, to be able to fulfill the achievement that is more than just for local demand, which to be able to fulfill demand from outside the region as well, it is necessary to further develop the fisheries production in the city of Bontang as a raw material for the fisheries processing industry. In addition, the management of fisheries potential in Bontang City requires an adaptation of Ecosystem Approach to Fisheries Management (EAFM) and science and technology (S&T) innovation to ensure the long-term sustainability of fisheries and the marine ecosystem services provided to society, including to enhanced collaboration and coordination of marine resource management efforts.

**Keywords** Fisheries management, Fisheries potential, Capture fisheries, Aquaculture

## 1. Introduction

The fisheries sector has a strategic role in national development. In terms of natural resource potential, Indonesia is known as the largest maritime country in the world which has a coastline that is almost one fifth of the world's coastline. Indonesia's coastal area is two-thirds of the land area and its coastline is 95,161 kilometers or the second longest in the world [1]. This makes Indonesia has a relatively large potential wealth of fisheries resources. The fisheries sector also absorbs many workers, because its activities include fishing, cultivation, processing, distribution and trade.

In the 2015-2019 National Medium-Term Development Plan, development is carried out by prioritizing the role of maritime economy and the synergy of national marine

development with the aim of: the utilization of marine resources for economic development and the welfare of fisherman and coastal communities. As the implementation of these targets, the Ministry of Maritime Affairs and Fisheries in the Strategic Plan for 2015-2019 states that achieving success in the development of Indonesia as a maritime country can be reflected through increasing the sustainability of capture fisheries and aquaculture businesses.

A number of policies have been issued by the government regarding optimizing the use of marine resources, especially capture fisheries in order to remain sustainable, including: 1) Minister of Marine and Fisheries Regulation Number 10 of 2015 concerning Amendments to Minister of Marine and Fisheries Regulation Number 56/Permen-KP/2014 concerning Suspension (Moratorium) Licensing of Capture Fisheries in Fisheries Management Areas of the Republic of Indonesia, 2) Regulation of the Minister of Marine and Fisheries Number 2 of 2015 concerning Prohibition on the Use of Trawls and Seine Nets in the Fisheries Management Areas of the Republic of Indonesia, 3) Decree Minister of Fisheries and Maritime Affairs Number B.622.MEN/KP/XI/2014 concerning Requests to All

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Governors and Regents/Mayors to Manage Resources Sustainably [2]. Thus, the development of the potential of capture fisheries and aquaculture is needed as a leading sector in economic progress and national development.

Kalimantan Island has a potential transition area between land and sea (coastal), supported by a long coastline. The coastline starting from Sambas Regency in West Kalimantan to Nunukan Regency in North Kalimantan saves the potential for large natural resource wealth, including biological and non-biological potential. Biological potentials include fisheries, mangrove forests, and coral reefs, while non-biological potentials include minerals, mining materials and tourism. In this area there are also mostly poorer fishermen.

The regional development of the fisheries sector is carried out through increasing the potential of fisheries which basically can contribute in the form of income for the region through the coffers of Original Revenue (in Indonesia called PAD). For East Kalimantan Province, the development of the fisheries sector is still not optimal, due to the indicators of the lack of handling and facilities provided to fishing communities, so the price of fishery products is still high in the market due to traders taking fishery products from outside the region, not from their own fisherman, including inadequate landing facilities and available fish auctions, facilities and infrastructure for fishermen that still need to be considered, such as fishing gear and boats for fishermen. Not to mention the condition of human resources and marketing of fisheries [3].

Resources in the coastal areas of Bontang City have the potential to be the main drivers of the economy, especially after oil and gas. Therefore, the use of Bontang coastal area is multipurpose, both industrial activities and traditional communities have had an impact on the degradation of marine resources. Bontang coastal region, which is located in the east of the city of Bontang or precisely on the lips of the Makassar Strait, then attempts to be developed as a tourist attraction and marine biological resource. But Indarto research [4] states that several problems that occur in the development of coastal and marine areas in Bontang City includes: limited land and fishing ground for community business development, limited capital, means of production, marketing and processing of the business of farmers and fisherman, pest attacks and diseases, damage to forests, land and coastal ecosystems and small islands.

Fishery is one of the natural resources that can be renewed or recoverable, so that if it is not disturbed by life it can naturally achieve balance and be in vain if not utilized. The level of utilization of marine fisheries resource potential in Bontang City is currently very high, where a number of potential marine aquaculture have become superior commodities, such as shrimp, crabs, groupers, lobsters, red snapper, sea cucumbers, seaweed and oysters, which are in great demand by foreign market. Whereas for the utilization of capture fisheries, the sustainable potential of fish resources in coastal waters has been depleted, so that the fishermen's catch becomes lower and their income can be

said to be far from enough to improve welfare. Therefore, management and utilization of marine fisheries resources in Bontang City is needed to overcome this problem.

Bontang City Fisheries, Marine and Agriculture Department which has formed based on Mayor Bontang Regulation Number 29 of 2008 concerning Details of Main Tasks and Functions of the Fisheries, Marine and Agriculture Department, formulated a number of programs to overcome this problem through efforts to manage the potential of environmentally sound coastal and marine areas. These programs include:

- 1) Coastal Community Economic Empowerment Programs,
- 2) Community Empowerment Programs in the Supervision and Control of Marine Resources,
- 3) Increasing Awareness and Law Enforcement in the Utilization of Marine Resources Programs,
- 4) Fisheries Cultivation Development Programs,
- 5) Capture Fisheries Development Programs,
- 6) Optimization Programs and Marketing of Fisheries Production,
- 7) Marine Aquaculture Development Programs Brackish Water and Fresh Water.

These programs are of course described in various activities each year. As stated by the Head of Bontang City Fisheries, Marine and Agriculture Department: "In an effort to realize an increase in fishermen's welfare and support regional autonomy, a strategic development step for the fisheries, marine and agricultural sectors which leads to increased fisheries and agricultural productivity has implications for the welfare of fishermen and farmers" [5].

But in 2016 there was a change in the organization of regional apparatus. Through Bontang City Regulation Number 2 in 2016, Bontang City Food Security, Fisheries and Agriculture Department formed. So then to study the implementation of coastal area management in Bontang City, research was carried out on the agency.

There are some previous studies which are quite similar regarding the management of fisheries potential, but the aspects studied are different, because they generally review their management strategies or assess the potential area of their fisheries resources [6-8,2]. While this study makes the implementing institution program as the object of the research, so that it is more in the realm of the study of Public Policy Implementation, rather than the domain of Regional Development Planning or Fisheries Management.

## 2. Methods

### 2.1. Location, Objects and Research Design

This study took the location of research at the Bontang City Food Security, Fisheries and Agriculture Department and the coastal area of Bontang City. Based on the basic of philosophy, data and analysis, this study uses a qualitative research approach/method because the research data is more

concerned with the interpretation of the data found in the field to be able to analyze and describe the implementation of the program and identify its supporting factors. This research was designed to be a development planning study that was linked to the implementation of policies in the fisheries sector at the regional government level through the Regional Work Unit.

## 2.2. Data Collection Techniques

This study uses secondary data from the Strategic Plan for 2016-2021 document and the Government Performance Accountability Report of the Bontang City Food Security, Fisheries and Agriculture Department of 2017 as well as primary data sourced from the Head of Department, fishing communities and fisheries cultivators who live in the coastal areas of Bontang City, which are targeted or involved in the program implementation. The data collection techniques used includes document research, observation, interviews and triangulation. While the data analysis technique uses an interactive model by Milles, Huberman, dan Saldana [9].

## 3. Results and Discussion

### 3.1. Fisheries Potential of Bontang City and Its Problems

Geographically, Bontang City lies between 117°23' – 117°38' East Longitude and between 0°01' – 0°12' Latitude North. The coastal area which is 24.4 km long has a strategic position because it is directly facing the Makassar Strait which is the Indonesian Islands Sea Lanes II.

The administrative area of Bontang City has an area of 497.57 km<sup>2</sup> which dominated by the sea, which is an area of 347.77 km<sup>2</sup> (69.9 percent) while the land area is 149.8 km<sup>2</sup> (29.70 percent). Administratively, Bontang City is divided into three sub-districts, namely South Bontang with area of 104.40 km<sup>2</sup>, North Bontang with area of 26.20 km<sup>2</sup> and West Bontang Barat with area of 19.20 km<sup>2</sup> since the ratification of Bontang City Regulation Number 17 in 2002 and 15 sub-districts. The administrative boundaries of Bontang City are as follows:

- To the west of Teluk Pandan Sub-district Kutai Timur District;
- On the east it is bordered by the Makassar Strait;
- The south with Marangkayu Sub-district Kutai Kartanegara District and
- The north with Teluk Pandan Sub-District Kutai Timur District.

The vision of the Bontang City as stated in the Regional Medium-Term Development Plan for 2016-2021 is “Strengthening the city of Bontang as a maritime city with an industrial culture that relies on the quality of human resources and the environment for the welfare of society”. While the missions are:

- 1) Making Bontang City as a Smart City through improving the quality of human resources,

- 2) Making Bontang City as a Green City through improving the quality of the environment,
- 3) Making Bontang City as a Creative City through developing a maritime-based economy.

The condition of Bontang City fisheries can be translated into two matters, namely capture fisheries and aquaculture. Fish caught by fishermen in the Bontang City relatively only fulfill local needs, have not been able to meet regional and international needs. Thus the development of fisheries activities has a very large opportunity considering the consumption of fish both domestically and abroad continues to increase.

Fisheries resource management is estimated to be not optimal and still depends on nature, so fishing is carried out by developing modern technology that can carry out fishing activities to the waters of the Makassar Strait, which is the migration of fish with a considerable potential of fish resources. Based on Gross Regional Domestic Product data, the contribution of the fisheries sub-sector to the total Bontang regional economy is still below 2 percent.

The total amount of fisheries production in 2014 tended to increase from 2013. In 2014 the number of fisheries production (including seaweed) reached 31,660 tons consisting of 15,830 tons of cages, 30.8 tons of ponds, 38.2 tons of ponds and 15,761 tons of capture fisheries. Based on available data, the increase in the number of production is still not able to compensate in Bontang City, which increased by 46.43 percent (from 103.6 to 193.40 kg per capita) during the period 2006-2010.

Capture fisheries production in Bontang City in 2013 amounted to 14,065 tons, an increase of 12.05 percent around 15,761 tons in 2014. Furthermore if capture fisheries production was differentiated according to sub-district, then South Bontang District dominated the production level of 7,499 tons followed by North Bontang District amounting to 6,566 tons.

Aquaculture Fisheries Households in Bontang City are dominated by coastal/marine aquaculture Fisheries Households. Data in 2014 showed that the number of coastal/marine aquaculture Fisheries Households was 550 with details of 256 in South Bontang District and 294 in North Bontang District. Meanwhile, the number of cage aquaculture Fisheries Households was 67, of which 17 were in South Bontang District, 27 in North Bontang District and 23 in West Bontang District. Viewed from the scale of pond cultivation, the scale of < 0.1 hectare is the largest type in pond Fisheries Households in the city of Bontang. The number of Fisheries Households of this type in 2014 was 34 in North Bontang District, 26 in West Bontang District and 15 in South Bontang District.

Furthermore, seaweed production in Bontang City in 2014 was recorded at 14,616.9 tons, the highest among other types of cage aquaculture products (grouper, snapper, corn and other fish). Furthermore, for the type of pond cultivation fish, it is known that in 2013 and 2014 catfish species dominated with production levels of 30.5 tons and 29.6 tons

respectively.

Fisheries resources especially those found in coastal and marine waters are still not optimally exploited. Regional development policies at the central, provincial and district/city levels have tended to be oriented to the land area, so that the allocation of development resources is not carried out in a balanced manner in supporting the development of land and sea areas as a center for fisheries production.

Aquaculture development policies in Bontang City are directed towards the development of marine aquaculture business with leading fisheries commodities such as seaweed, grouper, snapper, corn and several other economically important fish species. Seaweed culture and economically important fish species need to be continuously develop, both through intensification (cultivation and post-harvest techniques, use of superior seeds and feed) and extension (inside and outside the Bontang City waters through cooperation between local governments and groups of cultivators).

The problems faced in implementing fisheries development in Bontang City can be identified as follows:

1. Relatively low quality fisheries human resources related to knowledge and skills.
2. The understanding, awareness, concern and participation of fisheries communities in managing responsible fisheries resources and environmentally sound need to be improved.
3. Decreasing the position of fish resources due to habitat damage (coral reefs and mangroves), overfishing, Illegal, Unreported and Unregulated (UII) Fishing activities and pollution of industrial and household waste.
4. Food safety of fishery products that have not met quality requirements, for example free from banned additives such as formalin are one of the problems in the context of improving the quality of fishery products.
5. Limited infrastructure and technology for aquaculture and processing of fishery products so that the production is not optimal.
6. Support for facilities and infrastructure, especially inadequate fisheries to meet the needs of fishermen in exploiting fisheries resources on 4 miles or offshore and the number of apparatus human resources that serve facilities/infrastructure operations and guidance in the field of fisheries.
7. Some fishermen are still categorized as underprivileged peoples, which among others is caused by the scale of fishing business that is still traditional that it uses small capacity motorized boats with one day fishing capabilities, so that it is limited to coastal waters which have reduced fish resources.
8. Environmental damage, natural disasters and the impact of climate change and increasing resource utilization activities in upstream and coastal areas without regard to environmental preservation rules

and pollution of industrial and household wastes that cause a decline in carrying capacity of the aquatic environment, causing low productivity of aquaculture.

9. Fisherman conflicts and fisheries crimes which are generally caused by declining fisheries resources, conflicts in fisheries space utilization, use of prohibited materials and fishing gear, seizure of fishing areas, violations of fishing trails, environmental destruction/fishing that is not environmentally friendly, and fishermen issues outside of.

As for the issues related to the development of capture fisheries in Bontang City are:

1. Inadequate infrastructure for catching the catch and not being able to accommodate ships measuring 30 GT or more, as a result of shallow shipping lines;
2. The utilization of the Fish Landing Base which has not been maximally used as a fishery production center;
3. There is still many violations committed by fishermen in making arrests (illegal fishing);
4. Fishermen's knowledge, attitudes and skills are still low, which has an impact on low business productivity;
5. There is still a lack of fuel available to go to sea;
6. Limited funding support, especially from financial institutions (banks), even though it is available, but fishermen are unable to fulfill administrative requirements such as the necessity of collateral or guarantees (land and house certificates, ownership certificates for two-wheeled vehicles or four-wheeled vehicles);
7. The collaboration between the Bontang City Government and the neighboring Regency Government (East Kutai and Kartanegara Kutai) has not been maximized in developing marine fisheries activities, given the existence of Bontang fishermen who expanded the fishing ground to the waters of East Kutai and Kartanegara Kutai Regencies.

Bontang City area has problems in the development of seaweed culture, fish and other marine biota in the form of limited marine waters. Some parts of marine waters have been restricted in use, only for the shipping lanes of natural gas carriers and fertilizers produced by the PT. Badak LNG and PT. Pupuk Kaltim. The potential of coastal and marine waters that still can be utilized for fishing activities is 9,384 hectares. Land area that can be used for multicultural activities is 1,000 hectares.

While the problems often encountered in aquaculture business in Bontang City are:

1. The limited number of seeds where the seeds are still dependent on natural seeds and from outside the region;
2. The presence of pests and diseases for the seaweed cultivation commodities, types of fish and shrimp;
3. The cultivation and post-harvest technology used is

very limited due to lack of financial support;

4. Cultivation productivity is still at the small economic scale, especially in the type of floating net cage karamba business;
5. There is lack of existing pond irrigation;
6. Cultivators attention to sustainability over the environment is still lacking;
7. There is dynamic (decrease) in the quality of marine waters (physics chemistry biology) as a culture media, which can disrupt the breeding of fish, seaweed and other marine biota. This can be in the form of pollution of the aquatic environment by industrial activities and human activities in coastal areas.

### 3.2. National Policy on Fisheries

In the utilization and management of marine and fisheries resources, attention is needed to pay attention to the carrying capacity of the sea, coastal and land areas in their ecological, economic and social relations. Availability of resources is of course a key in the utilization and management of marine and fisheries resources. Then the state also develops a pattern of sustainable use and always learns how to implement the principles of marine and fisheries management that are environmentally sustainable as well.

As for the legal based of fisheries management in Indonesia can be detailed as follows:

1. Article 33 of the Constitution of the Republic of Indonesia in 1945.
2. Article 61 of United Nation Convention of Law of the Sea in 1982.
3. United Nation Stock Agreement by FAO in 1995.
4. Code of Product for Responsible Fisheries by FAO in 1995.
5. Law of the Republic of Indonesia Number 22 of 1999 concerning Regional Government.
6. Law of the Republic of Indonesia Number 31 of 2004 concerning Fisheries.
7. Law of the Republic of Indonesia Number 32 of 2004 about Amendments of the Law of the Republic of Indonesia Number 22 of 1999 concerning Regional Government.
8. Law of the Republic of Indonesia Number 27 of 2007 concerning the Management of Coastal Areas and Small Islands.
9. Law of the Republic of Indonesia Number 45 of 2009 about Amendments of the Law of the Republic of Indonesia Number 31 of 2004 concerning Fisheries.

During the New Era of Soeharto's reign, more management of coastal and marine areas was carried out by the Central Government. This can be seen in Law of Republic of Indonesia Number 24 of 1992 concerning Spatial Planning Article 9 Paragraph 2 where it is stated that the sea area and airspace are regulated centrally according to the law. But in the Reformation Era with the birth of Law of Republic of Indonesia Number 22 of 1999 concerning Regional Governments, regencies/cities had the authority to

regulate the territorial waters in their territory as far as 4 miles from the coastline, so that there is a space for regional governments to utilize and develop regional potential, including the potential of marine and coastal resources.

Then Law of the Republic of Indonesia Number 22 of 1999 concerning Regional Government has an important meaning because it gives broad authority to the district and city to regulate and manage the interests of the community itself based on the aspirations of the local community in accordance with the laws and regulations. The region also has greater authority over resource managers in the sea and coastal areas, than in previous conditions where the management of these resources was centralized. Article 10 paragraph 2 of Law of the Republic of Indonesia Number 22 of 1999 states that the authority of regions in the sea area is:

- 1) Exploration, exploitation, conservation and management of marine wealth as limited as the sea area.
- 2) Regulation of administrative interests.
- 3) Space arrangement.
- 4) Law enforcement against regulations issued by the regions or delegated by the government.
- 5) Assistance in enforcing security and state sovereignty.

Which includes the sea area of the province is as far as 12 nautical miles measured from the coastline towards the open sea and/or towards the island waters. While the sea area of the regency and city is one third of the sea area of the province. By observing these provisions, the coastal area is the authority of the regency and city.

Coastal areas as a transition from terrestrial ecosystems to marine ecosystems are within the authority of the regions in the marine sector. In accordance with Law of the Republic of Indonesia Number 22 of 1999 which states that the sea area of the regency/city is one third of the provincial sea area means that it is 4 nautical miles from the coastline, then the coastal area is within the authority of the local district or city.

Besides that, Law of the Republic of Indonesia Number 27 of 2007 concerning the Management of Coastal Areas and Small Islands also issued. As an archipelago, coastal areas are owned by all provinces in Indonesia. Based on data on the number of districts/cities in Indonesia in 2002, 219 districts/cities (68 percent) of them had coastal areas. Districts/cities in Indonesia each have physical characteristics of coastal areas that are different from each other in the management of the region. However, until the end of 2004, planning and management of coastal areas both at the central and regional levels were more sectorial [1].

In subsequent developments, Law of the Republic of Indonesia Number 31 of 2004 revised into Law of the Republic of Indonesia Number 45 of 2009 concerning Fisheries, where it was stated that fisheries were all activities related to the management and utilization of fish resources and their environment ranging from pre-production, production, processing until marketing, which is carried out in a fisheries business system [10]. Then generally, fisheries are intended for the benefit of providing food for humans.

In the Law of the Republic of Indonesia Number 45 of 2009 about Amendments of Law of the Republic of Indonesia Number 31 of 2004 concerning Fisheries was stated that fisheries business is all businesses of individuals or legal entities to catch and cultivate (hatchery business, breeding, enlargement) of fish, including activities of storing, cooling, drying, or preserving fish with the aim of creating economic added value for business actors (commercial/business) [10]. The concept of fishery system according to Nurani includes three subsystems, namely the subsystem of fisheries business activities, fisheries port subsystems (functionality and accessibility) and the policy and institutional subsystems [6].

Fisheries business includes capture fisheries and aquaculture. Based on Law of the Republic of Indonesia Number 45 of 2009 about Amendments of Law of the Republic of Indonesia Number 31 of 2004 concerning Fisheries, fishing is an activity that aims to obtain fish in waters that are not in a condition cultivated by any means or means, including activities that use fishing vessels to loading, transporting, storing, cooling, processing, or preserving it [10]. Thus, fishing businesses working in the fishing sector are included in capture fisheries (wild fishery). While fish farming is an activity to maintain, raise and/or breed fish, and harvest the results in a controlled environment [10]. Thus, fisheries business in the form of fishery product production through cultivation is known as aquaculture.

### **3.3. Relevance of Regional Policies Regarding the Fisheries Sector to the Management of Capture Fisheries and Aquaculture**

Regency/city regional government affairs in the field of maritime affairs and fisheries for the Capture Fisheries Sub-sector has been regulated based on the Government Regulation of the Republic of Indonesia Number 38 of 2007 concerning Division of Government Affairs between the Government, Provincial Government and Regency/City Government. Then the regency/city regional government affairs in the field of marine and fisheries for the Aquaculture Sub-sector are also regulated in the Government Regulation.

District/city regional government affairs in the field of maritime affairs and fisheries for the Sub-sector of Supervision and Control include:

- 1) Supervision of utilization and protection of fisheries germplasm.
- 2) Supervision of seedlings, fish farming and systems for controlling pests and fish diseases.
- 3) Fostering, monitoring and supervising fish hatchery certification bodies.
- 4) Supervision of seed and parent quality, fish feed, fish medicine and raw materials.
- 5) Supervision of the Integrated Quality Management Program and HACCP (Hazard Analysis Critical Control Point) in processing units, transportation equipment and fisheries product storage units.
- 6) Withdrawal of fishery product export quality.

- 7) Supervising the use and protection of resources in small islands within the regency/city authority.
- 8) Supervision upon the utilization of fish resources in the sea area under the authority of regencies/cities.

### **3.4. The Implementation of the Bontang City Food Security, Fisheries and Agriculture Department Program in Managing Environmentally Sound Fisheries Potential**

Program implementation in this study was examined from three aspects, namely the aspects of the objectives, the budget aspects and aspects of achieving program output.

The Bontang City Food Security, Fisheries and Agriculture Department mid-term goals for 2016-2021 are determined as follows:

1. Increasing the fulfillment of food needs of local resource-based communities,
2. Improving the performance of capture fisheries and aquaculture and the added value of the fisheries industry,
3. Increasing production and productivity of agriculture and livestock [11].

The Bontang City Food Security, Fisheries and Agriculture Department objectives for 2016-2021 are:

1. Increasing food availability, distribution, access, diversification and food security of the community;
2. Increased score of Hope Food Pattern;
3. Increasing the level of income of fishermen and farmers;
4. Increased production and productivity of agriculture and livestock [11].

Relating to the goals and objectives of the development of food, fisheries and agriculture Resilience, the development strategies for Bontang City Food Security, Fisheries and Agriculture in 2016-2019 are:

1. Development and Capacity Building of Regional Fisheries, Agriculture and Livestock Communities.

Utilization of the potential of food, fisheries and agriculture and livestock optimally through regional-based development is intended so that the development of food security, fisheries and agriculture are more focused and directed.

2. Institutional strengthening, human resources and science and technology.  
Increasing competitiveness of food products, fisheries and agriculture and livestock through improve product quality that can be achieved by strengthening institutions, increasing human resources and utilizing science and technology.
3. Optimization of supervision in the use of food resources, fisheries and agriculture and community-based livestock.

Conservation area management and supervision of illegal fishing and agriculture and livestock activities are absolutely necessary to avoid the threat of degradation in the

environment of fisheries and agricultural resources. The community as an important element in managing the environment of fisheries and agricultural resources must be actively involved.

Furthermore, the policies that will be carried out in the framework of implementing the strategies for developing food security, fisheries and agriculture are:

1. Provision of infrastructure, facilities and infrastructure based on development areas for food security, fisheries and agriculture and livestock.
2. Providing effective and efficient data and information through identification and monitoring and evaluation of the development of food security, fisheries and agriculture.
3. Improve coordination of development planning with stakeholders to realize integration, synchronization and synergy in planning and budgeting.
4. Expanding employment opportunities with food security, fisheries and agriculture and livestock.
5. Increasing the campaign about the benefits of food, fisheries and agriculture and livestock products.
6. Improve facilities and infrastructure for processing food, fisheries and agriculture and livestock products.
7. Expansion of promotion of food, fisheries and agriculture and livestock products.
8. System development of partnerships and industrialization in the management and marketing of food, fisheries and agriculture and livestock products.
9. Strengthening management of processing and marketing of food, fisheries and agriculture and livestock products.

10. Improve facilities and infrastructure for the management of conservation areas for food, fisheries and agriculture and livestock.
11. Increasing the capacity of the fisheries and agricultural communities as well as livestock in the management of regional resources.
12. Increasing community participation in monitoring the use of food, fisheries and agriculture and livestock resources.
13. Improve coordination with relevant stakeholders in order to realize integration, synergy and synchronization in the process of utilizing food, fisheries and agriculture and livestock resources [11].

Strategic program plan in Strategic Plan of Bontang City Food Security, Fisheries and Agriculture Department for 2016-2021 include 25 programs. While the official programs related to fisheries directly include:

1. Capture Fisheries Development Programs.
2. Optimization Programs and Marketing of Fisheries Production.
3. Human Resource Development Program and the Empowerment of Marine and Fisheries Communities.
4. Fisheries Cultivation Development Programs.
5. Coastal Community Economic Empowerment Programs.
6. Mapping Program for Planning Space for Managing Marine, Coastal and Small Islands [11].

Table 1 shows Bontang City Food Security, Fisheries and Agriculture Department programs and activities more specifically in the fisheries field:

**Table 1.** Plan for Programs and Activities in the Field of Marine and Fisheries Government Affairs at Bontang City Food Security, Fisheries and Agriculture Department for 2016-2021

No	Programs Plan	Activities Plan
1	Office Administration Service Program.	<ol style="list-style-type: none"> <li>1. Supply of Printed and Duplicated Goods.</li> <li>2. Provision of Reading Material and Statutory Regulations.</li> <li>3. Coordination Meetings and Consultations Outsides the Region.</li> <li>4. Provision of Communication Services, Water and Electricity Resources.</li> <li>5. Provision of Correspondence Services.</li> <li>6. Supply of Office Logistics Materials.</li> <li>7. Supply of Food and Beverages.</li> <li>8. Supply of Household Appliances.</li> <li>9. Supply of Office Stationery.</li> <li>10. Provision of Maintenance Services for Official/Operational Vehicle Licenses.</li> <li>11. Provision of Office Administrative/Technical Personnel Services.</li> </ol>
2	Program to Improve Apparatus Facilities and Infrastructure.	<ol style="list-style-type: none"> <li>1. Routine/Periodic Maintenance of Official/Operational Vehicles.</li> <li>2. Routine/Periodic Maintenance of Office Buildings.</li> <li>3. Routine/Periodic Maintenance of Computers.</li> <li>4. Routine/Periodic Maintenance of Office Building Equipment.</li> </ol>
3	Program to Increase Apparatus Resource Capacity.	<ol style="list-style-type: none"> <li>1. Formal Education and Training.</li> </ol>
4	Improvement Program for Developing Performance and Financial Reporting Systems.	<ol style="list-style-type: none"> <li>1. Preparation of Financial and Performance Reports.</li> </ol>
5	Program to Improve the Quality of Public Services	<ol style="list-style-type: none"> <li>1. Profile Preparation of Regional Work Unit.</li> </ol>
6	Program for Disseminating Information on Regional Development.	<ol style="list-style-type: none"> <li>1. The Implementation of the Development Exhibition.</li> </ol>
7	Program to Improve Apparatus Discipline.	<ol style="list-style-type: none"> <li>1. Procurement of Field Work Clothes and Special Clothing.</li> </ol>

No	Programs Plan	Activities Plan
8	Capture Fisheries Development Programs	<ol style="list-style-type: none"> <li>1. Construction of a Fish Landing Place facility.</li> <li>2. Data Collection of Capture Fisheries Statistics.</li> <li>3. Services for Small Capture Fisheries.</li> <li>4. Assistance to Small Capture Fisheries Groups.</li> <li>5. Facilitation of Assistance for Small Fishermen.</li> <li>6. Operation of Fish Landing Place.</li> </ol>
9	Optimization Programs and Marketing of Fisheries Production	<ol style="list-style-type: none"> <li>1. Post-Harvest Development and Processing of Fishery Products.</li> <li>2. Fostering Fisheries Business (Meeting Fisheries Business Enterprises).</li> <li>3. Optimization of Fisheries Business Licensing.</li> <li>4. Fostering and Promoting Fisheries and Marine Products.</li> </ol>
10	Human Resource Development Program and the Empowerment of Marine and Fisheries Communities	<ol style="list-style-type: none"> <li>1. Increasing the Competency of Fisheries Officers.</li> <li>2. Empowerment of the Marine and Fisheries Community.</li> </ol>
11	Fisheries Cultivation Development Programs	<ol style="list-style-type: none"> <li>1. Operation of the Beach Fish Seed Shop.</li> <li>2. Assistance to Fish Farmer Groups.</li> <li>3. Fisheries Development.</li> <li>4. Data Collection and Processing of Aquaculture.</li> </ol>
12	Coastal Community Economic Empowerment Programs	<ol style="list-style-type: none"> <li>1. Fostering Empowerment of Fishermen Groups</li> </ol>
13	Mapping Program for Planning Space for Managing Marine, Coastal and Small Islands.	<ol style="list-style-type: none"> <li>1. Conservation Area Management of the City of Bontang Waters.</li> </ol>

Looking at the thirteen programs, it can be seen that programs that are directly related to the potential of fisheries in the community, which are outside of the scope of service organizations include:

- 1) Capture Fisheries Development Programs,
- 2) Optimization Programs and Marketing of Fisheries Production,
- 3) Fisheries Cultivation Development Programs, and
- 4) Coastal Community Economic Empowerment Programs.

From the aspect of the budget, for the implementation of programs and activities in the field of fisheries affairs by Bontang City Food Security, Fisheries and Agriculture Department for five years (2016-2021) budgeted funds amounting to Rp.87.173.918.000. The availability of the budget for the implementation of programs and activities in the affairs of the fisheries sector by Bontang City Food Security, Fisheries and Agriculture Department is planned to increase from year to year (see table 2).

**Table 2.** Recapitulation of the Availability of Budgets/Funds for the Implementation of Programs and Activities on Fisheries Affairs by Bontang City Food Security, Fisheries and Agriculture Department

No	Year	Budget (Rp)	Percentage (%)
1	2017	13.819.155.000	15,85
2	2018	15.894.752.000	18,23
3	2019	17.362.140.000	19,92
4	2020	19.231.096.000	22,06
5	2021	20.866.775.000	23,94
Total		87.173.918.000	100,00

For the achievement of Bontang City Food Security, Fisheries and Agriculture Department in 2017, it can be seen from secondary data that the availability of the budget for the

entire fisheries program amounting to Rp.13.819.155.000,-. Then the realization of funds used in the implementation of programs and special activities for the development of capture fisheries and aquaculture is Rp.4.754.635.587,- or 34.41 percent.

Budget realization that has been used in the implementation of capture fisheries programs and activities is equal to Rp.2.834.023.337,- or 99.37 percent of the available fund ceiling (Rp.2.851.800.000,-). While the budget realization that has been used in the implementation of programs and aquaculture activities is equal to Rp.1.715.604.244,- or equal to 90.16 percent of the available fund ceiling (Rp.1.902.835.587,-). Thus, the realization of the budget used is far greater for the implementation of capture fisheries development programs than for the implementation of aquaculture development programs.

Overall value of funds, the realization of the budget that has been used is equal to Rp.4.549.627.681,- or equal to 95.69 percent of the ceiling of available funds (Rp.4.754.635.587,-). Thus, the fisheries affairs program in the Bontang City Food Security, Fisheries and Agriculture Department can be implemented with the availability of a good budget, not greater than the planned budget ceiling.

Thus, the budget planning that has been carried out by the Bontang City Food Security, Fisheries and Agriculture Department has been carried out properly, so that the implementation of various programs and activities relating to fisheries affairs in order to achieve the goals, objectives, mission and vision of the organization can be carried out well due to the strength of carrying capacity budget/funding.

From the aspect of achieving program output, realization of the Bontang City fisheries production in the last four years has been volatile (see table 3).



**Table 3.** Realization of Fisheries Production in the City of Bontang in 2014 to 2017

Performance Indicators	Realization			
	2014	2015	2016	2017
Increased Production and Productivity of Capture and Aquaculture Fisheries	30.487 tons	31.194 tons	20.315,70 tons	27.164,09 tons

Then the implementation of Bontang City Food Security, Fisheries and Agriculture Department programs in the management of fisheries potential in 2017 has succeeded in achieving the planned targets, through indications that performance indicators have been met from the amount of fisheries production achieved, namely increasing from the number of fisheries production in 2016 amounting to 6,848.39 tons or the same as happened an increase of 33.70 percent. Besides, the target is met at 132.07 percent.

The successful implementation of the Bontang City Food Security, Fisheries and Agriculture Department's program in managing fisheries potential in 2017 was analyzed from the achievement of planned targets, through conditions that have fulfilled the performance indicators of the number of capture fisheries and aquaculture production in Bontang City.

With the achievement of the number of fisheries production in 2017 which is better than in previous years, the potential can be further developed, including as raw material for the fisheries processing industry, which is an effort to utilize fishery products as well as an appropriate step in preserving or maintaining product quality perishable fisheries as stated by Yang et.al [12], or as giving added value to fishery products as according to Bar [12]. Thus, it is expected that the Bontang City fishery products can meet demand from outside the region and allow the storage of fishery products in a relatively longer period of time.

In addition, the management of fisheries potential in the Bontang City requires an adaptation of the ecosystem approach known as Ecosystem Approach to Fisheries Management (EAFM). As for Gorospe et al.'s research [13], science and technology (S&T) innovation plays a role in the Southeast Asia region for the purpose of filling gaps in fisheries data, improving coordination of fisheries management efforts and implementing and operation EAFM. Science and technology innovations can be applied to enhance collaboration and coordination of regional marine resource management efforts. Hence, several regional fisheries and marine conservation organizations in Southeast Asia also provide their support for EAFM and scientific and technological innovations. An EAFM is considered the preferred option and best practice for ensuring the long-term sustainability of fisheries and the marine ecosystem services provided to society [14,15]. One of the examples is the development of a strategic plan that includes ecosystem-level priorities and indicators by the countries that border the Sulu Sulawesi Sea Large Marine Ecosystem – Indonesia, Malaysia and the Philippines [16].

### 3.5. Supporting Factors of the Implementation of the Bontang City Food Security, Fisheries and Agriculture Department Program in Managing Environmentally Sound Fisheries Potential

The Implementation of the Bontang City Food Security, Fisheries and Agriculture Department Program in fisheries management supported by some factors as follows:

- 1) The existence of forms of activities that support the program, in accordance with the goals and objectives that have been set.

The formulation of various programs and activities should be a "derivative" of the formulation of the objectives of the activity, where the target of the activity is the operationalization of the objectives that have been formulated. Then the formulation of the objectives formulates further translation of the mission statement which is the operationalization of the vision formulated by the organization. Then of course the compatibility between all these elements plays an important role in the success of a program implementation, including the implementation of the Bontang City fisheries potential management program by the Food Security, Fisheries and Agriculture Department studied in this study.

- 2) The existence of an appropriate budget to implement the program.

Budgeting functions that have been carried out properly by the Bontang City Food Security, Fisheries and Agriculture Department for the management of fisheries affairs indicate that an activity or business has been carried out to formulate the details of determining needs on a currency scale and the amount of costs to be incurred in implementing programs and activities. The proper implementation of the budgeting function ultimately brings good benefits to the smooth implementation of the programs and activities carried out by the Bontang City Food Security, Fisheries and Agriculture Department.

## 4. Conclusions

The Implementation of the Bontang City Food Security, Fisheries and Agriculture Department Program in managing environmentally sound fisheries potential, both capture fisheries and aquaculture, has achieved success in 2017 to fill local needs. This is indicated by the improvement in the performance of capture fisheries and aquaculture and the added value of the fisheries industry, as evidence by the achievement of the fisheries production target of 132.07 percent and an increase in the number of capture fisheries and aquaculture production of 6.848,39 tons or equal to an increase of 33.70 percent compared to the amount of fisheries production in 2016. The successful implementation of the program is also support by the availability of a good budget, which in the realization is not greater than the planned budget ceiling.

Supporting factors for implementing the program include: the existence of forms of activities that support the program, in accordance with the goals and objectives that have been set, and the existence of an appropriate budget to implement the program.

We recommends the need to develop fisheries production in Bontang City further as a raw material for the fisheries processing industry, which is an effort to utilize fishery products as well as an appropriate step in preserving the quality of easily damaged fishery products, or providing added value to fishery products. This need to be done so that the Bontang City fishery products can fulfill the demand from outside the region better and allow the storage of fishery products in a relatively longer period of time.

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