Original Research Article

CONTRIBUTION OF THE FISHERY SECTOR TO REGIONAL DEVELOPMENT IN BANDUNG REGENCY, WEST JAVA PROVINCE, INDONESIA

ABSTRACT

This study aims to analyze the contribution of the fisheries sector to the Gross Regional Domestic Product (GDP) of Bandung Regency and the level of market demand in the fisheries sector in Bandung Regency. The research methods used are both quantitative and qualitative. Location Quotient analysis is used to determine the magnitude of impact of the fishery sector on regional development and shift share analysis to assess the contribution of the fisheries sector to the GRDP. The results of the Location Quotient analysis in Bandung Regency, reveal that in 2015-2019, the average value was 0.45 (< 1), indicating that the fisheries sector in Bandung Regency is a non-economic sector. The sector also records slow growth as indicated by the negative growth of the net shift value. This is indicated by the net shift value of the Bandung Regency fisheries sector experiencing negative growth.Regional development can be maximized by optimizing the fishery sector, especially in the cultivation of consumption fish and ornamental fish to meet the needs of fishery products in Bandung Regency, as well as so that the fisheries sector can become the basis of the sector in Bandung Regency.

Keywords: Economic growth, regional development, contribution of the fisheries sector, Location Quotient, Shift Share.

1. INTRODUCTION

Development is a process of realizing the ideals of the state, namely creating a prosperous society in a just and equitable manner. Development is an effort to improve the welfare of the community in various aspects of life which is carried out in a planned and sustainable manner by utilizing the ability of resources, information and advances in science and technology, social development. [1]. Regional economic development is a process that includes the formation of new institutions, development of alternative industries, improvement of the capacity of the existing workforce to produce better products and services, identification of new markets, transfer of knowledge, and development of new enterprises [2].

According to the Law of the Republic of Indonesia No. 31 of 2004 Fisheries are all activities related to the management and utilization of fish resources and their environment from pre-production, production, processing to marketing, which are carried out in a fishery business system [23]. Indonesia is the largest archipelagic country in the world and the country with

the 4th largest population in the world, Indonesia has many biological resources, potential mineral and energy resources, potential for industry and maritime services, potential for marine transportation and environmental services, as well as cultural potential. [3] Of course, with the potentials of Indonesia, the local government and the community should be able to utilize it to the maximum so that community welfare can be achieved. According to [2].Indonesia as an archipelagic country, most of which consists of the sea, has a very large and diverse fishery potential. The potential for fisheries is an economic potential that can be utilized for the future of the nation, as the backbone of national development.

Bandung Regency is geographically located at coordinates 107°22' – 108°50' East Longitude and 6°41' – 7°19' South Latitude. The total area of Bandung Regency is 176,238.67 Ha. Most of Bandung area is located between the hills and mountains that surround Bandung Regency. Administratively, Bandung Regency consists of 31 Districts. 280 Villages and 10 urban village. According to data analysis of Bandung Regency Government in 2007. Bandung Regency has an area of 1,762.39 km2. Bandung regency has a population of 3,623,790 people. with a livelihood in the agricultural sector and farm laborers. industry. trading. and services[4-6].Typologically, Bandung regency is not located on the coast, so all fisheries activities are focused on inland fisheries. Bandung Regency had the potential of inland fisheries activities of 21.884,43 tons/year.

Bandung Regency has promising aquaculture potential, seen from its total production which reaches 21,884.43 tons/year with the type of cultivation container used consisting of tarpaulin ponds and rice minarets [4]. Several fisheries categories in Bandung Regency have not been managed optimally for regional development. This must be considered and managed seriously in order to make a major contribution to regional economic development. [7]. The potential of Bandung Regency must be maximized properly in order to have a positive impact on the economic development of Bandung Regency.The potential of fishery resources in Bandung Regency shows the conditions that allow it to be developed in the context of economic development in Bandung Regency.

The high potential of the fisheries sector in Bandung Regency should be able to accelerate regional economic growth. The growth rate of the fishery sector is one of the objects to analyze the contribution of the fishery sector to regional development. In addition, an analysis of the strength of the economic fishery sector and market demand for fishery products in Bandung Regency also needs to be carried out to determine whether the fishery sector is an economic base sector or a non-economic basis.The results of this research are expected to be a reference and consideration for the authorities in making policies in the fisheries sector in Bandung Regency.

2. METHODOLODY

This research was conducted from March 2022 to May 2022 in Bandung Regency. Both quantitative and qualitative methods were used. The quantitative method uses data in the form of numbers and is analyzed using statistics. The data that has been obtained is then analyzed to be able to answer the proposed hypothesis. The data obtained are described as they are without intending to make conclusions that apply to the public or generalizations [8]. Qualitative methods are used to explain the situation in depth by collecting data which is then analyzed to obtain research conclusions.

This study uses primary data obtained through interviews with sources in the field. This primary data is needed to strengthen and explain the secondary data that has been obtained. Secondary data were obtained from the Department of Animal Husbandry and

Fisheries of Bandung Regency, Department of Marine and Fisheries of West Java Province, Central Bureau of Statistics of West Java, and Central Bureau of Statistics of Bandung Regency. The data collected has a time series from 2015 to 2019.

2.1 Research Location Overview

Bandung Regency is one of the regencies in West Java. According to the West Java Provincial Government. Bandung Regency is geographically located at coordinates 107°22' – 108°50' East Longitude and 6°41' – 7°19' South Latitude. The total area of Bandung Regency is 176,238.67 Ha. Most of Bandung area is located between the hills and mountains that surround Bandung Regency. The administrative boundaries of the Bandung Regency government are:

- To the north: West Bandung Regency. Bandung. and SumedangRegency;
- To the east: Sumedang Regency and Garut Regency;
- To the south: Garut Regency and Cianjur Regency;
- On the west: West Bandung Regency. Bandung City and Cimahi City

Bandung Regency has a mountainous area morphology with an average slope of 0-8%.8-15% to above 45%.

Bandung Regency is one of the regencies in West Java Province which has the characteristics of a highland in the middle because it is located in the Bandung Basin. surrounded by mountains to the north. south. west and east. Most of the area of Bandung Regency is used as agricultural land. Therefore, the agricultural sector is the leading sector in Bandung regency. In addition to the agricultural sector, other sectors that have excellent potential in Bandung Regency are the plantation sector. farm. fishery. industry and tourism [9].

2.2Data Analysis

Analysis of the data used in the study uses an approach to economic growth in a region, including:

2.2.1 Location Quotient Analysis

Location quotient (LQ) analysis is an analysis used to determine the magnitude of the role of the fisheries sector in regional development. According to [5], the mathematical formula used in the LQ method to compare the capabilities of the sectors of the region is as follows:

$$LQi = \frac{vi/vt}{Vi/Vt}$$

where.
vi : The value of GRDP sector i at the city area level. (Rp/year)
vt : Total GRDP at the city level. (Rp/year)
Vi : GRDP value of sector i at the provincial level. (Rp/year)
Vt : Total GRDP at the provincial level. (Rp/year)

2.2.2 Analysis of shift share

Shift share analysis in this study is used to see the contribution of the fisheries sector to GRDP. According to [14] the mathematical model in calculating the contribution is formulated as follows:

$$Ki = \frac{Vi}{Pi} \text{ x } 100\%$$

where :
Ki : The amount of contribution in year
i. (%)
Vi : GRDP of the fisheries sector in
year i (Rp/year)
Pi : Total GRDP in year i.
(Rp/year)
Shift Share analysis aims to determine the rate of economic growth in a region. This analysis compares the differences in the growth rates of various sectors in the region with the national region. The ratio of indicators of economic activity where the production ratio is used to see the comparison of production from the fishery sector in a certain area. The ratio consists of ri, Ri and Ra.

1. ri

$$\boldsymbol{ri} = \frac{\boldsymbol{Y'ij - Yij}}{\boldsymbol{Yij}}$$

Where :
Y'ij : Production from the fishery sector in urban areas at the end of the analysis
Yij : Production from the fishery sector in the city area in the base year of analysis

2. Ri

$$\mathbf{Ri} = \frac{\boldsymbol{Y'i - Yi}}{\boldsymbol{Yi}}$$

Where :
Y'i : Production from the provincial fisheries sector at the end of the analysis
Yi : Production from the fishing sector province in the base year of analysis

3. Ra

$$\mathbf{Ra} = \frac{\boldsymbol{Y'\_ - Y\_}}{\boldsymbol{Y\_}}$$

Where :
Y'_ : Provincial fisheries sector production in the final year of analysis
Y_ : Provincial fisheries sector production in the base year of analysis

growth which consists of the Provincial Growth Component (KPP), the Proportional Growth Component (PP) and the Regional Share Growth Component (PPW).

1. Provincial Growth Component (KPP)

$$\mathbf{KPPij} = \boldsymbol{Ra}\ (\boldsymbol{Yij})$$

Where :
KPPij : Components of provincial growth in the fisheries sector for the region
Yij : Production from the fisheries sector for the region in the base year of analysis
Ra : Provincial production ratio

2. Proportional Growth Component (PP)

$$\mathbf{PPij} = (\boldsymbol{Ri} - \boldsymbol{Ra})\, \boldsymbol{Yij}$$

Where :
PPij : The component of proportional growth for the fisheries sector for the region
Yij : Production from the fishery sector for the region in the base year of analysis
Ri : Provincial production ratio from the provincial fisheries sector
Ra : Provincial production ratio
If PPij< 0 indicates that the fishery sector in region j is growing slowly, if PPij> 0 indicates that the fisheries sector in region is growing fast.

3. Regional Share Growth Component (PPW)

$$\mathbf{PPWij} = (\boldsymbol{ri} - \boldsymbol{Ra})\, \boldsymbol{Yij}$$

Where :

PPWij : Regional share growth component for the fisheries sector for the region in the base year of analysis

Yij : Production from the fisheries sector for the region in the base year of analysis

ri : Production ratio of the urban fishery sector

Ra : Provincial production ratio

If PPWij> 0 indicates that the sector in region j has competitiveness with other sectors or regions for sector i, while if PPWij< 0 indicates that the sector in region j does not have good competitiveness compared to other sectors or regions.

3. RESULTS AND DISCUSSION

3.1 Location quotient (LQ) analysis

Location quotient (LQ) analysis is an analysis used to determine the magnitude of the role of the fisheries sector in regional development. The location quotient (LQ) method is one of the common approaches used in the basic economic model as a first step to understanding the sector of activity that triggers growth. Location quotient (LQ) calculates the comparison of share of output i in the city/district and share of output of sector i in the province [15]. Based on the calculation results of the Location quotient analysis in Bandung Regency, it was found that in 2015-2019 had an average LQ value of 0.45 (<1), where this number indicates that the fisheries sector in Bandung Regency is a non-economic sector.

Table 1. LQ Value of Fisheries Sector in Bandung Regency in 2015-2019

Years	LQ Value	Description
2015	0,45	Non-Base
2016	0,43	Non-Base

2017	0,45	Non-Base
2018	0,47	Non-Base
2019	0,47	Non-Base

From the results of the calculation of the Location quotient of the fisheries sector in Bandung Regency in 2015-2019, it was found that every year the fishery sector has always been auneconomic sector with a value (LQ<1). Despite being a non-basic sector, the fisheries sector has always experienced stable growth from year to year, only in 2016 the fisheries sector experienced a decrease in the value of LQ. This indicates that the fisheries sector is unable to meet the demand within the region and is dependent on imports.

3.1 Shift share (SS) analysis

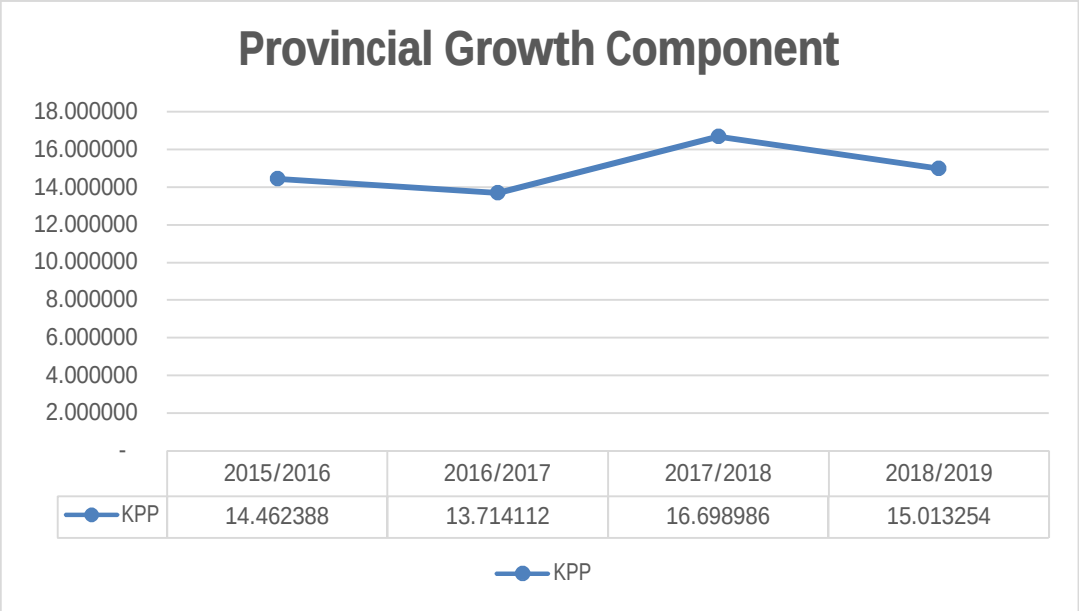
Shift share analysis is an analysis used to analyze the impact of regional growth, particularly employment growth. Historical growth trends, calculating regional growth and analyzing the effects of policies and developing a regional strategic plan can be calculated using shift share analysis [10].

Table 2. SS Value of Fisheries Sector Bandung Regency 2015-2019

Years	Provincial Growth Component (KPP)	Proportional Growth (PP)	Regional Share Growth (PPW)	Net Shift (PB)
2015/2016	14,46	-1,63	-11,79	-13,42
2016/2017	13,71	-5,58	15,18	9,59
2017/2018	15,77	-12,78	13,32	0,52
2018/2019	15,01	-0,90	3,63	2,72
Average				-0,14

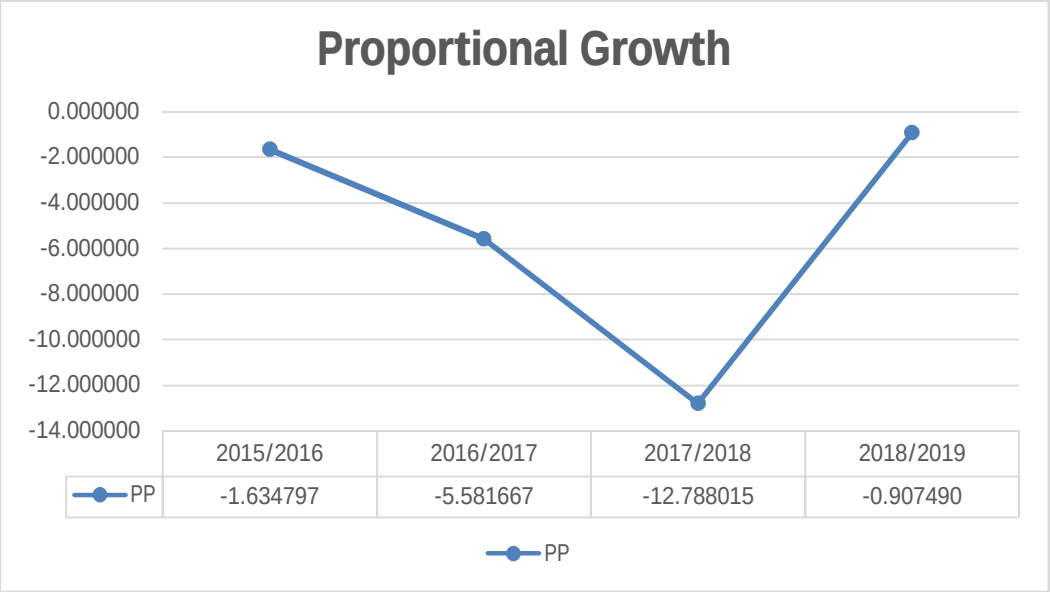
The shift share calculation in Table 2 is calculated based on GRDP every 2 years with a time series from 2015-2019. Based on the results of the shift share calculation above, it shows that the Bandung Regency fisheries sector has a fluctuating growth rate. Meanwhile, the growth of West Java province has a positive value every year. The proportional growth in 2015/2016, 2016/2017, 2017/2018 experienced negative growth, and in 2018/2019 experienced positive growth. In the growth of the regional share, it seems to experience fluctuations where in 2015/2016 it saw negative growth, then in 2016/2017 it experienced positive growth, then in 2017/2018 it experienced negative growth, then in 2018/2019 it experienced negative growth. Meanwhile, the Bandung Regency net shift showed a positive trend every year, but experienced negative growth in 2017/2018. This growth is influenced by the components of provincial growth (KPP), proportional growth (PP), and regional share growth (PPW).

Figure 1. Graph of Provincial Growth Components (KPP) for Fisheries Sector Bandung Regency 2015-2019



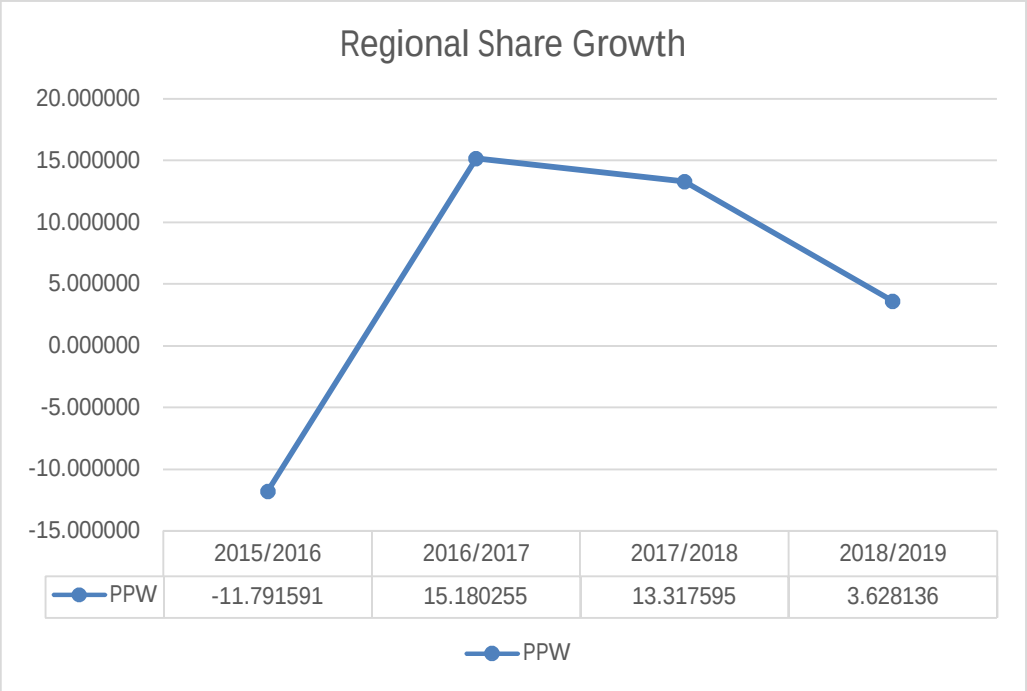
The provincial growth component is a change in gross regional domestic product (GRDP) at the provincial level caused by changes in general economic conditions [11]. The value of the provincial growth component is obtained by multiplying the GRDP of Bandung Regency in the base year of the analysis by the value of Ra. Figure 3 shows the value of the provincial growth component experiencing positive growth every year. In 2015/2016 it had a KPP value of 14,46 billion, then in 2016/2017 it had a KPP value of 13,71billion, then in 2017/2018 it had a KPP value of 16,69billion and finally the largest KPP value was in in 2018/2019 amounted to 15,017 billion. The fishery sector has a positive KPP value, meaning that the sector's regional growth rate has resulted in positive growth, in this case the GRDP growth of West Java Province has affected the GRDP growth of Bandung Regency.

Figure 2. Graph of Proportional Growth (PP) for Fisheries Sector in Bandung Regency in 2015-2019



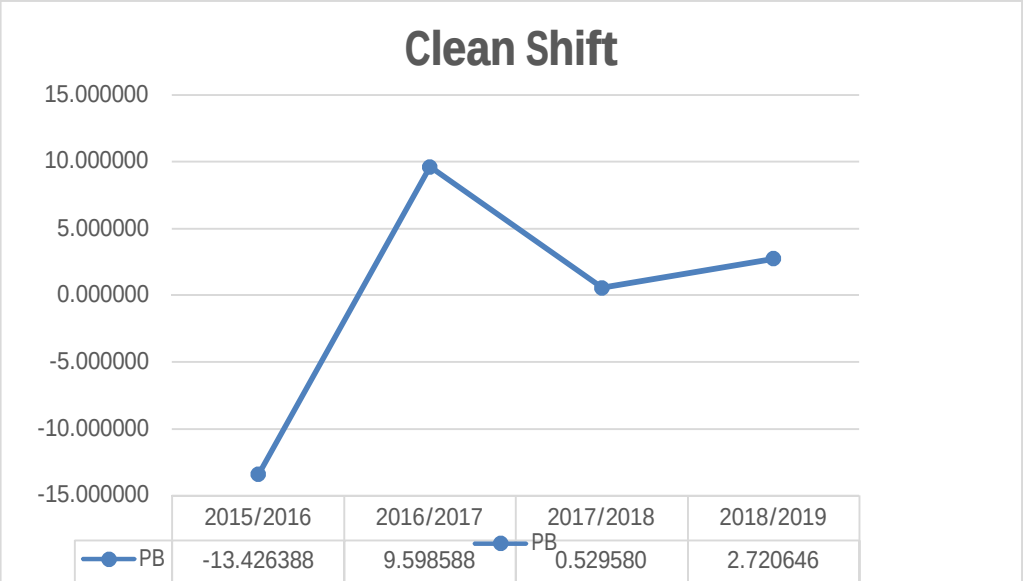
The proportional growth component (PP) explains the relative speed of regional growth compared to national growth [12]. The proportional growth value is obtained by multiplying the GRDP of Bandung Regency by the difference between the values of Ri and Ra. Figure 4 shows the value of proportional growth for its contribution to the province. Based on the results of the proportional growth of the fisheries sector from year to year, it shows a negative value, this indicates that the growth rate is decreasing. In 2015/2016 the value of PP was -1,63, then in 2016/2017 the value of PP was -5,58, then in 2017/2018 the value of PP was -12,78, and in 2018/2019 the value of PP was -0,90. This shows that Bandung Regency has a negative growth where the PP value < 0, so it can be concluded that the growth of the Bandung Regency's fisheries sector is slower than the growth rate of the West Java fisheries sector. This is because the production of the fisheries sector in Bandung Regency is much lower than the production of the fisheries sector in West Java Province.

Figure 3. Graph of Regional Share Growth (PPW) in the Fisheries Sector of Bandung Regency in 2015-2019



Regional share growth (PPW) is a component that explains whether a region has an advantage compared to the nation [16]. The regional share growth value is obtained from the product of the Bandung Regency GRDP in the base year of the analysis by the difference between the values of ri and Ri. Figure 5 shows that the growth value of the share of the Bandung Regency area in 2015/2016 has a value of -11.78 where the PPW value is < 0 or negative, then in 2015/2016 the fishery sector is included in the sector that has poor competitiveness. However, the PPW value of Bandung Regency has increased dramatically in the following years, where in 2016/2017 it has a value of 15.18, then in 2017/2018 it has a value of 13.32, and in 2018/2019 it has a value of 3.63 where PPW > 0 or positive, this shows that in that year the fishery sector in Bandung Regency has good competitiveness compared to the other sector.according to [13] the level of competitiveness determines the level of growth of a region, the higher the level of competitiveness of a commodity, the higher the influence produced by that commodity in the growth of the region.

Figure 4. Graph of the Fishery Sector Net Shift in Bandung Regency in 2015-2019



The net shift (PB) is the result of the sum of proportional growth (PP) with the growth of the fishery sector share (PPW), where if PB > 0 then it indicates that the fisheries sector is a sector that has fast growth, otherwise if PB < 0 then the sector Fisheries is a sector that has a slow growth. Figure 6 shows a graph of the net shift in the fisheries sector in Bandung Regency experiencing negative growth with an average value of -0,14 billion. This figure shows that the fisheries sector in Bandung Regency has a PB value of < 0. So, it can be concluded that the Bandung Regency fishery sector has a slow growth.

3.3 Fisheries sector development policy in Bandung Regency

The fisheries sector in Bandung Regency is very dependent on aquaculture business activities because Bandung Regency is not located on the coast and the management of inland public waters is not optimal. The main problem in the fisheries sector policy in Bandung Regency according to Nurzanah (Head of Sub-Division of Planning for the Food Security and Fisheries Office of Bandung Regency interviewed on April 25, 2022) is the high level of residential development causing a decrease in the quality of fishery carrying capacity, especially the level of water quality which has decreased due to the presence of pollution and a lot of development. The main example of this decline in water quality is in the Bojongsoang area, where Bojongsoang used to be a central area for carp nursery in Bandung Regency, however, due to the large number of residential developments, the fishing grounds in Bojongsoang are getting narrower and the water quality is decreasing. The policy carried out by the Bandung Regency government to deal with this problem is by intensifying fisheries or optimizing the existing land of concern. In this case, the Bandung Regency government introduced the concept of a pond with a tarpaulin and biofloc pond type which was considered more effective and more suitable to be applied in the Bandung Regency area where the quality and availability of water was quite low.

In addition to consumption fish cultivation, Bandung Regency is also being aggressively introduced to ornamental fish cultivation, where according to Nurzanah (Head of Sub-Division of Planning for the Food Security and Fisheries Service of Bandung Regency interviewed on April 25, 2022) ornamental fish cultivation has the potential to increase production as well as fishery sector income. in Bandung Regency. Looking at the current condition of Bandung Regency, where land is increasingly limited to establish aquaculture

ponds, ornamental fish cultivation is currently one of the optimal choices to increase production numbers in the Bandung Regency fisheries sector, because ornamental fish cultivation is considered to require less space and costs.

The policy directions carried out by the local government of Bandung Regency for the fisheries sector generally focus on:

- Increase consumption fish production with tarpaulin ponds and bio floc.
- Increased level of fish consumption.
- Development of skills of human resources working in the field of fisheries.
- Improve the welfare of farmers.
- Utilization of inland public waters.
- Integrated and sustainable development policies.

4. CONCLUSION

Based on the results of the study, it was concluded that the Bandung Regency fishery sector was classified as a non-basic sector, meaning that every year the Bandung Regency fishery sector was unable to meet the needs of its region and could not export outside the region, so it needed to be imported from outside its territory. Calculation of Location Quotient (LQ) also shows an average value of 0.45 (< 1) in the fisheries sector in Bandung Regency.
The fisheries sector in Bandung Regency has a slow growth. This is indicated by the net shift in the fisheries sector in Bandung Regency, which experienced negative growth with an average value of -0,14 billion. This figure shows that the fisheries sector in Bandung Regency has a PB value (<0). However, in the last 3 years the fisheries sector has always had a PB value > 0 which indicates that the fisheries sector in Bandung Regency is a progressive sector. With these results, it is necessary to optimize the fisheries sector in Bandung Regency with policy making by the government in order to increase economic growth in the fisheries sector.The results indicate that the fisheries sector is a sector that is continuously developed by the government to encourage regional economic growth.

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