



# Analysis The Role of Fisheries Sector On Regional Development In Purwakarta District, West Java

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## KeyWords

*Fisheries Sector; Regional Development; Base Sector.*

## ABSTRACT

This research aims to analyze the growth rate of the fisheries sector in Purwakarta District in the last five years (2013-2017), analyze the role of the fisheries sector in the development of the Purwakarta District area and superior fisheries commodities in Purwakarta District. The research was conducted in Purwakarta District, West Java, starting in January 2019 until April 2019. The method of collection was carried out by survey methods, the technique of taking respondents using purposive sampling technique. This research data consists of two types of data, namely primary data and secondary data. The analysis of the data used in this research includes Shift Share Analysis, Analysis Location Quotient (LQ), Analysis Localization Index (LI), and Analysis Specialization Index (SI). The results of analysis of superior commodities using LQ analysis *Pangasius* (average LQ 3.88), Carp (average LQ 1.76) and Tilapia (average LQ 1, 57). The regional growth rate analysis showed LQ value (mean 0.38), LI (mean -0.01) and SI (average 0.00). The LQ value indicates that the fisheries sector in Purwakarta District is not a base sector. Based on analysis Shift share, the fisheries sector in Purwakarta District is a slow-growing sector.

## INTRODUCTION

The fisheries sector has the potential to grow both macro (national) and microeconomics. Macro-fisheries sector is a foreign exchange earner with export activities. Micro-based the fisheries sector has the effect of providing labor and increasing people's purchasing power along with the increase in income of business people in the fisheries sector [7, 8].

Purwakarta District is one of the districts in West Java that has a big potential for aquaculture activity. Supported by the existence of two large reservoirs in the Purwakarta District area namely, Jatiluhur Reservoir and Cirata Reservoir. Floating net cages aquaculture (KJA) is the most common aquaculture business activity in both reservoirs that can support the economic activities of the community in Purwakarta District. Based on the data from the West Java Province Fisheries Service, Aquaculture production in Purwakarta District reached 95.285 tons in 2016 with the largest production of floating nets reaching 94.480 tons. In 2015 based on the

data of Purwakarta District fish production show that the production of carp and tilapia commodities is the highest with 41.529,25 tons and 39.183,86 tons.

Gross Domestic Regional Product (GDRP) is one of the macro indicators that is often used in addition to other micro indicators such as the level of job opportunity creation and price stability. The biggest role in the formation of Purwakarta GDRP in 2017 was generated by the Manufacturing Industry business field, which reached 58,10 percent. Followed by the business field of Large Trade and Retail, Car Repairs, and Motorbikes at 11,79 percent, Construction business fields at 7,30 percent, Agriculture, Forestry and Fisheries business fields at 6,91 percent, and Transportation and Warehousing business fields of 2,45 percent. While the role of other business fields is still below 2,45 percent [9].

The economic sector has a major role in the development of the region. One of the indicators is having high growth and large employment. The fisheries sector is a very important and potential sector in national and regional economic growth both in terms of income and employment. [8, 29].

## METHODS

This research was conducted in Purwakarta District, West Java Province. The research was conducted for four months starting from January 2019 - April 2019. Divided into several steps as follows, data collection, data processing, writing and reporting of research results.

The method used in this research is descriptive quantitative. The method of data collection is done by survey method. The research data consists of two types, namely primary data and secondary data. The technique of taking respondents uses purposive sampling technique.

Primary data is collected by interviewing and field observations. Related parties include the Purwakarta District Livestock and Fisheries Service and fish farmers in Purwakarta District. Secondary data that used in this research is time-series data of the last five years (2013-2017), Obtained from the Purwakarta District Livestock and Fisheries Service, various statistical data and data relating to the development of the fisheries sector in Purwakarta District from the Central Bureau of Statistics of the Purwakarta District, Bappeda of the Purwakarta District, West Java Fisheries and Marine Services.

The data analysis used in this research is descriptive quantitative. The quantitative analysis used analysis with superior commodity methods, regional superiority and economic growth.

## Leading Commodity Analysis

As for determining the leading commodity, LQ analysis is used using data on fish commodity production. Analysis of superior commodities can be formulated by the following equation [1]:

$$LQ = \frac{e_i}{e} \bigg/ \frac{E_i}{E}$$

Description:

- LQ : commodity LQ value analyzed
- $e_i$  : Production of fish commodities in Purwakarta District
- $e$  : Production of all commodities in Purwakarta District
- $E_i$  : Production of fish commodities in the Province West Java
- $E$  : Production of all commodities in West Java Province

## Economic Growth Analysis

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 national territory. Shift share analysis can be formulated by the following equation [1, 7]

**Changes in the production of the fisheries sector in the district or province are formulated:**

$$\Delta Y_{ij} = Y'_{ij} - Y_{ij}$$

Information:

$\Delta Y_{ij}$  : Changes in fisheries sector production in the regency or province

$Y'_{ij}$  : Production from the fisheries sector in the regency or province in the final year analysis

$Y_{ij}$  : Production from the fisheries sector in the district or province in the base year of analysis

**Percentage of Change in GDRP formulated:**

$$\% \Delta Y_{ij} = \frac{(Y'_{ij} - Y_{ij})}{Y_{ij}} \times 100\%$$

**ri**

$$ri = \frac{Y'_{ij} - Y_{ij}}{Y_{ij}}$$

Description:

$Y'_{ij}$  : Production from the sector fisheries in the district in the final year of analysis

$Y_{ij}$  : Production from the sector fisheries in the area district in the base year of Analysis

**Ri**

$$Ri = \frac{Y'_i - Y_i}{Y_i}$$

Description:

$Y'_i$  : Production from the sector provincial fisheries the final year of analysis

$Y_i$  : Production from the provincial fisheries sector in the base year of analysis

**Ra**

$$Ra = \frac{Y'_{...} - Y_{...}}{Y_{...}}$$

Description:

$Y'_{...}$  : Provincial production in the final year of analysis

$Y_{...}$  : Provincial production in the base year of analysis

Then continued calculation of component growth consists component of provincial growth (KPP), component proportional growth (PP) and component growth of region share (PPW).

## Component of Provincial Growth (KPP)

$$KPP_{ij} = (Ra) Y_{ij}$$

Description:

- KPP<sub>ij</sub> : Component of provincial growth in fisheries sector on regional  
Y<sub>ij</sub> : Production of fisheries sector for region in the base year of analysis.  
Ra : Provincial production ratio

## Component of Proportional Growth (PP)

$$PP_{ij} = (R_i - Ra) Y_{ij}$$

Description:

- PP<sub>ij</sub> : Component of Proportional growth in fisheries sector on regional  
Y<sub>ij</sub> : Production/employment opportunities from the fisheries sector in the year base analysis  
R<sub>i</sub> : Production ratio (province) from the fisheries sector  
Ra : Ratio of production (province)

If PP<sub>ij</sub> < 0, indicates that the fisheries sector in j region is slow growth. PP<sub>ij</sub> > 0, indicating the fisheries sector in the region of rapid growth.

## Components of Growth Share of Region (PPW)

$$PPW_{ij} = (r_i - R_i) Y_{ij}$$

Description:

- PPW<sub>ij</sub> : Component share growth region sector of the fisheries in the region in the base year analysis  
Y<sub>ij</sub> : Production / employment of the fisheries sector in the region in year the base analysis  
r<sub>i</sub> : Ratio of production / employment opportunities in the fisheries sector in region  
R<sub>i</sub> : Ratio of production / employment (province) from sector fishery

If PPW<sub>ij</sub> > 0, means sector / region j has good competitiveness compared to other sectors / regions for sector i. PPW<sub>ij</sub> < 0, means that sector / region j does not have good competitiveness compared to other sectors / regions.

Determined growth profile based on the percent value of the change in proportional growth component (PP<sub>ij</sub>) and growth in share area (PPW<sub>ij</sub>) and calculated the net shift.

$$PB_{ij} = PP_{ij} + PPW_{ij}$$

Description:

- PB<sub>ij</sub> : Net shift of fisheries sector in region  
PP<sub>ij</sub> : Component of Proportional Growth in fisheries sector in regency  
PPW<sub>ij</sub> : Component of Growth in District fisheries sector

If PB<sub>ij</sub> > 0, then fisheries sector growth in the region belongs to progressive groups (advanced) PB<sub>ij</sub> < 0, then the growth of the fisheries sector in the region is also slow.

## Regional Excellence Analysis

### LQ Analysis

Analysis Location Quotient (LQ) is a calculation technique to find out the base and non-base sectors by comparing the percentage contribution of the fisheries sector [1, 7].

$$LQ = \frac{\frac{X_{IJ}}{X_I}}{\frac{X_J}{X_{..}}}$$

Description:

- LQ : LQ value of the sector in Purwakarta District
- $X_{IJ}$  : GDRP of the fisheries sector in Purwakarta District
- $X_I$  : GDRP of all sectors in Purwakarta District
- $X_{.J}$  : GDRP of the fisheries sector in West Java Province
- $X_{..}$  : GDRP of all sectors in West Java Province

The coefficient of LQ <1 means that the sector concerned does not have a comparative advantage. The coefficient of LQ = 1 means the sector has a comparative advantage that is equal to the average of all regions. The LQ coefficient > 1 means that the sector concerned has a comparative advantage that is more than the average or in other words, can be qualified as a base sector [7].

### LI Analysis

Analysis of Localization Index (LI) is an analytical technique that can complement or strengthen the results of LQ analysis. The LI analysis technique shows whether an activity develops in all regions (dispersion) or is relatively developed only in certain regions (localization / concentration). Analysis of localization index (LI) can be formulated by the following equation [7].

$$LI_j = 1/2 \sum_{I=1}^p \left\{ \left[ \frac{X_{IJ}}{X_J} - \frac{X_I}{X_{..}} \right] \right\}$$

Description:

- $LI_j$  : LI value of total fisheries sector area
- $X_{IJ}$  : Fisheries sector GDRP in Purwakarta
- $X_I$  : GDRP of all sectors in Purwakarta District
- $X_{.J}$  : GDRP sector in West Java Province
- $X_{..}$  : GDRP of all sectors in West Java Province

If the results of the analysis have a value close to 0, then the level of development of activities is relative in all regions (dispersed), while the analysis results has a value close to 1, meaning that the observed activity develops centrally (concentrated).

### SI Analysis

Analysis Specialization Index has a function similar to LI analysis as a complementary analysis and strengthens the results of LQ analysis. SI analysis is used to categorize that a region has diversified activities or has specialized activities [1, 7].

$$SI_I = 1/2 \sum_{J=1}^p \left\{ \left[ \frac{X_{IJ}}{X_I} - \frac{X_J}{X_{..}} \right] \right\}$$

Description:

- $SI_I$  : SI value for the total sector in Purwakarta District
- $X_{IJ}$  : Fisheries sector GDRP in Purwakarta District

- XI. : GDRP of all sectors in Purwakarta District
- X<sub>J</sub> : GDRP sector in West Java Province
- X ... : GDRP of all sectors in West Java Province

If the results of the analysis have a value close to 0 then it means that the region has various activities (diversification), while the analysis results have the value is close to 1, meaning that the observed area has a special activity [7].

## RESULTS AND DISCUSSION

Geographically, the total area of Purwakarta District is covers 971.72 Km<sup>2</sup> or around 2.81 percent of the West Java Province total area. Geographically, the Purwakarta District area is located in the northern part of West Java Province with a coordinate boundary between 107° 30 ' - 107° 40' East Longitude and 6° 25 ' - 6° 45' South Latitude. The biggest role in the formation of Purwakarta GDRP in 2017 was generated by the Manufacturing Industry business field, which reached 58.10 percent. Followed by the business field of Large Trade and Retail, Car Repairs, and Motorbikes at 11.79 percent, Construction business fields at 7.30 percent, Agriculture, Forestry and Fisheries business fields at 6.91 percent, and Transportation and business fields. Warehousing of 2.45 percent. While the role of other business fields is still below 2.45 percent [9].

Floating net cages fish production is a business branch with the highest production from 2013 to 2015, in 2013 fish production was 89.945 tons, in 2014 with 92.165 tons, and in 2015 with 98.260 tons. The fish production of the KJA business in 2016-2017 continued to decline, this was due to the number limitation of floating net cages in the Jatiluhur Reservoir starting in 2016. Based on information from Perum PJT II as the manager of the Jatiluhur Reservoir, the number of KJA from 33 thousand was reduced to 27 thousand until the end of 2018 [9].

### The Economic Condition in General

Purwakarta District GDRP in 2013-2017 can be seen in Table 1.

**Table 1.** Contributions of Each Sector in District GDRP Purwakarta 2013-2017 (Percent).

Category	Business Field	2013	2014	2015	2016	2017
A	Agriculture, Forestry and Fisheries	6.99	6.63	6.49	6.51	6.19
<b>A</b>	<b>Fisheries</b>	<b>0.34</b>	<b>0.33</b>	<b>0.32</b>	<b>0.33</b>	<b>0.31</b>
B	Mining and Excavation	0.09	0.09	0.08	0.08	0.07
C	Processing Industry	59.05	59.21	58.79	58.75	58.80
D	Procurement of Electricity and Gas Procurement of Water, Waste	0.63	0.62	0.61	0.62	0.61
E	Management, Limbah	0.03	0.03	0.03	0.03	0.03
F	Construction	6.90	6.95	7.09	6.95	7.08
G	Trade and Retail; Car Repair	12.63	12.45	12.28	12.08	12.00
H	Transportation and Warehousing Provision of Accommodation and Food	2.07	2.11	2.21	2.24	2.24
I	Drinking	1.08	1.09	1.10	1.13	1.17
J	Information and Communication	1.40	1.57	1.75	1.86	1.95
K	Financial and Insurance Services	2.09	2.08	2.15	2.26	2.22
L	Real Estate	1.27	1.27	1.28	1.26	1.28
M, N	Company Services	0.39	0.40	0.41	0.42	0.43
O	Government and Defense Administration	1.38	1.24	1.21	1.18	1.13
P	Educational Services	1.77	1.93	2.06	2.09	2.16
Q	Health and Social Services	0.36	0.40	0.43	0.45	0.47
R, S, T, U	Jasa Lainnya	1.87	1.94	2.03	2.10	2.18

Source: BPS Purwakarta District 2018 (data processed)

### Analysis of Leading Fisheries Commodities

Based on fisheries production data in Purwakarta District and in West Java, the results of calculation of aquaculture LQ are obtained in Table 2.

**Table 2.** Analysis of LQ Superior Fishery Commodities Purwakarta District

No.	Fish Species	Value LQ					Average
		2013	2014	2015	2016	2017	
1	Carp	1.48	1.47	1.45	2.04	2.37	<b>1.76</b>
2	Tilapia	1.09	1.28	1.25	1.91	2.31	<b>1.57</b>
3	Gourami	0.002	0.002	0.002	0.003	0.003	0.00
4	Catfish	0.01	0.01	0.01	0.01	0.01	0.01
5	<i>Pangasius</i>	4.5	3.9	3.2	4.0	3.8	<b>3.88</b>

Source: Purwakarta District Animal Husbandry and Fisheries Agency (data processed)

Pangasius fish is one of the superior commodity in Purwakarta District. Types of fish, namely Pangasius, Carp, and Tilapia were the most widely cultivated fish species in floating net cages. Based on data of fish production per sub-district it is known that fisheries production, especially the most cultured consumption of fish cultivation, is in the Districts of Jatiluhur, Sukatani, and Maniis. The three sub-districts were categorized as fisheries centers so that the most cultivated fish species include carp, tilapia, and Pangasius. Tilapia and carp were chosen because the type of fish is high in demand, easily cultivated and the time of cultivation is relatively fast compared to other fish. Pangasius fish mostly chosen by farmers due to has high resistant to weather changes that occur in the reservoir. besides that, maintenance costs relatively cheap, due to the Pangasius fish usually cultivated in the floating net cages were placed on the bottom of the net by utilizing the remaining food from carp or tilapia which is cultivated on the top of it [3].

### Growth of Fisheries Sector in Purwakarta District Component of Provincial Growth (KPP)

Component Provincial Growth (KPP) or Component Share is a component of economic growth that explains the extent of provincial GDRP at the district/city level [1]. The value of the component is share obtained from the results between the GDRP of Purwakarta District in the base year of analysis with the value of Ra. Figure 1 shows that the value of the provincial growth component based on the KPP fisheries sector in Purwakarta District with West Java Province has a positive value. 2013/2014 with a value of 5.822,72 showing the smallest KPP value. In 2014/2015 with a KPP value of 5.992,16, in 2015/2016 the value of KPP is the highest with 7.378,40, and in 2016/2017 with the KPP value of 6.533,24. The sector that has a positive KPP value means that it shows that regional policies affect the contribution of the fisheries sector [7].

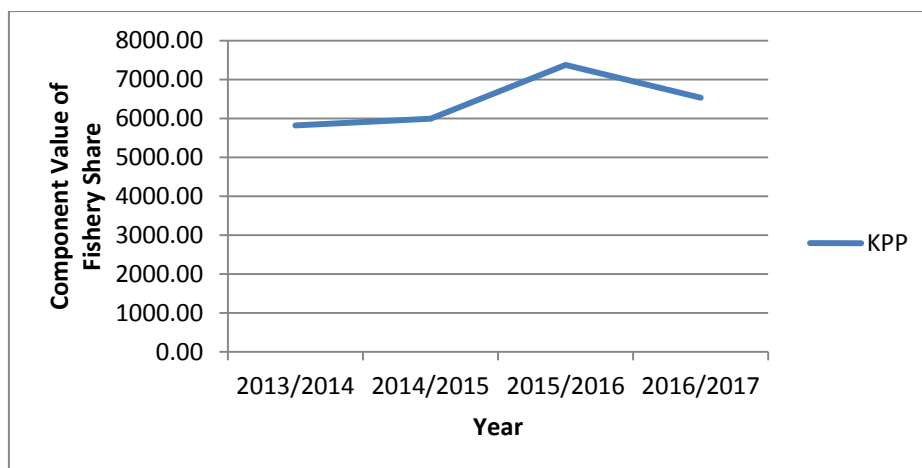


Figure 1. Component Value Trend Share

### Component of Proportional Growth (PP)

The component mix explains the relative velocity of regional growth compared to provincial growth [1, 7]. Based on proportional (PP) growth in the fisheries sector (Figure 2) in 2013/2014 and 2014/2015 contributed positively with a value of 3.600,82, and 2.214,08 indicated that in that year the growth rate of the Purwakarta District fisheries sector was faster than West Java Province with a PP value of > 0. In 2015/2016 and 2016/2017 the fisheries sector contributed negatively with the values -1.199,71 and -2.387,87 which indicated that the growth rate of the fisheries sector was slower than the Java Province. West because the PP value is < 0.

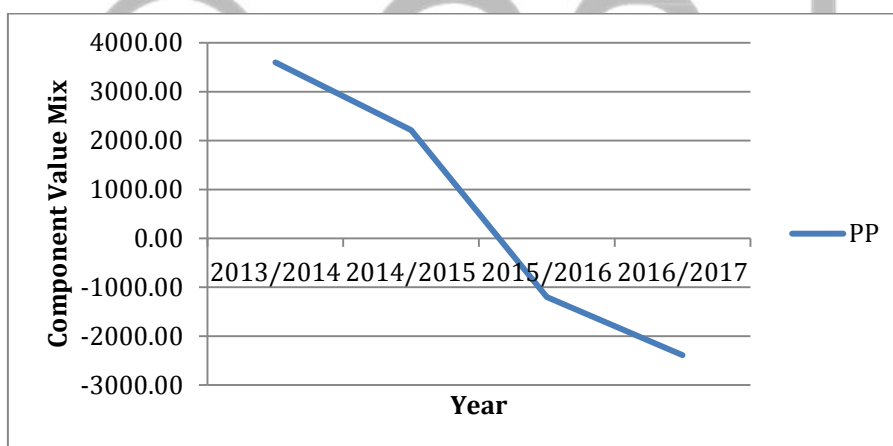


Figure 2. Component Value Trend Mix.

### Components of Growth Share of Region (PPW)

The fisheries sector in Purwakarta District has no advantages and does not have good competitiveness with other regions in West Java Province, due to the fisheries sector in Purwakarta District is mostly supported by the aquaculture while other regions in West Java Province supported by marine fisheries sector which more competitive. Regions that have a marine fishery sector are generally superior due to large production and higher selling prices compared to the freshwater fisheries sub-sector [1, 7].



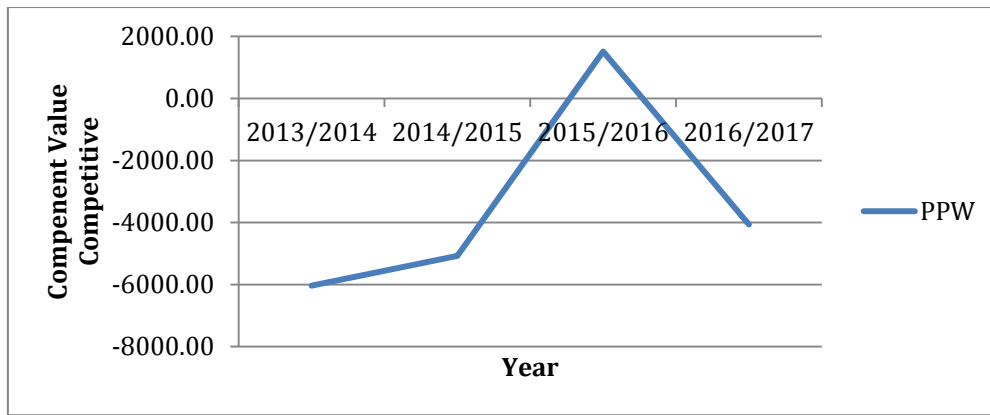


Figure 3. Trend of Component Value Competitive.

### Profile of Growth Fisheries Sector

Based on Figure 4, the fisheries sector (a) in Purwakarta District classified into quadrant III, which means that the fisheries sector in Purwakarta District has a slow growth rate but has good competitiveness. The fisheries sector has not been able to provide a significant contribution compared to other sectors, so the policies needed to support the fisheries sector due to its potential. By knowing the fisheries sector has good competitiveness, the government must prioritize the provision of facilities and infrastructure to support one of the superior fisheries commodities in Purwakarta District, namely Nirwana (tilapia) so that it will have good competitiveness.

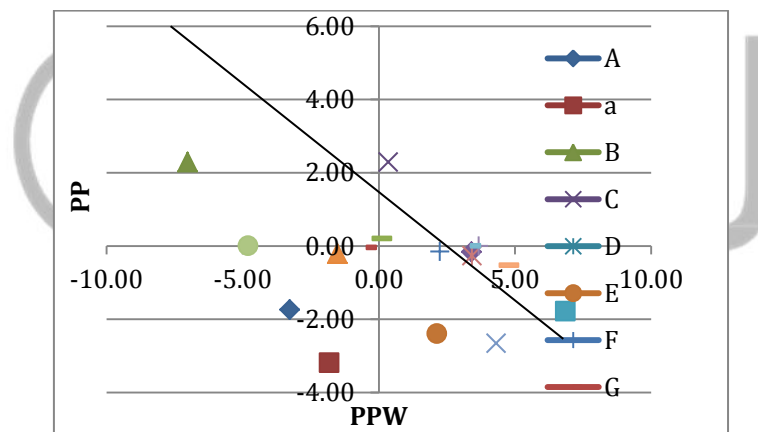


Figure 4. Profile of Growth Fisheries Sector in Purwakarta District

### Analysis of the Advantages of Area

LQ Analysis Is one of the approaches methods that commonly used in the base economic model as a first step to understanding the business category activities of Purwakarta District GDRP which are the drivers of growth. LQ analysis is also used to categorize that the fisheries sector is included in a base or non-basic sector so that it can be determined that the potential fisheries sector is developed or not. LI and SI indicators are also used to determine regional superiority due to LQ indicators often cannot show the extent of sectoral superiority in regional growth.

Table 3. Average Calculation Results Analysis of Excellence in

LQ	Value LI	Value SI
0.38	-0.01	0.01

Based on Table 3, the fisheries sector in Purwakarta District is not a base sector as indicated by the LQ value below 1. The fisheries sector shows the value of LI -0.01 means the fisheries sector is dispersed in West Java

Province and has not been a superior focus in Purwakarta District. The SI value of 0.00 (below 0.5) means that the activities of the fisheries sector in Purwakarta District are dispersed or there is no concentration/specialization in one economic activity.

The fisheries sector is not categorized as a sector-based economy due to this sector has not been able to meet fisheries needed in the region, especially in Purwakarta District. Based on interviews with the Head of the Purwakarta District Livestock and Fisheries Service Production Section that of all total fisheries production in Purwakarta District, only about 10% that meet local needed, while the remaining 90% is distributed to other regions, so the fisheries sector is still not leading sector in Purwakarta District. [1].

## CONCLUSION

Based on the research conducted on the Analysis The Role of Fisheries Sector on Regional Development In Purwakarta District, West Java it can be summarized as follows:

1. a superior fishery commodity capable of being developed in Purwakarta District According to the 2013-2017 LQ analysis is *Pangasius* (LQ 3.88 ), carp (LQ 1.76) and tilapia (LQ 1.57).
2. The growth rate of the fisheries sector in Purwakarta District from 2013 to 2017 is in quadrant III, meaning that the fisheries sector has slow growth but has good competitiveness. So from that fishery sector has a comparative advantage if developed. The role of the fisheries sector in Purwakarta District in regional development not is a base sector (LQ 0.38) so the fisheries sector is not a focus and is not specifically developed in Purwakarta District.

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