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THE CONTRIBUTION OF FISHERIES SECTOR IN REGIONAL DEVELOPMENT OF BOGOR REGENCY WEST JAVA PROVINCE

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ABSTRACT

The purpose of this research is to analyze the growth of fisheries sector, the strength of the commodities market and the strength of the fishery sector base and non-fishery base in the regional development of Bogor regency. The writer uses quantitative research method to answer the problem formulation and is using secondary data that is cross section and time series which further analyzed using descriptive statistics. The data analysis covers the analysis of Growth Indices, Trade Area Capture (TAC) and the Pull Factor (PF) analysis and Minimum Requirement Approach (MRA) analysis. The results of the Growth Indices analysis show the GRDP growth of the fisheries sector in Bogor regency increased 65% within two years. The average results of the TAC analysis in 2014 – 2016 demonstrating the value of TAC is greater than the total population (5.785.671 > 5.459.402) so it can be inferred that Bogor regency is able to capturing trade opportunities of other regional fishery products and Bogor regency society has a pattern of expenditure against fishery products that are larger than the province of West Java. While the average results of PF analysis shows the value of PF amounted to 1,06 so it can be inferred that Bogor regency is able to attract customers from other regions and has specialized in terms of fishery products market. The results of the MRA analysis in Bogor regency earned a base multiplier of 6.395,8 which mean each 6.395 of the labor created by sector base will produce 0,8 the labor in sector non base. Or for every 6.395 of the labor in sector base is expected will be created 8 labor in the sector non base.

INTRODUCTION

Broadly speaking, regional development intended to promote economic growth and the competitiveness of the region, as well as decrease the inequality between regions and developing community life (BAPPENAS 2015). Gross Domestic income (GDP) is one indicator of the level of advancement of the development and prosperity of the communities in the area. Therefore, the efforts of improving the role and contribution of one sector towards the GDP or GDP per capita is continuously performed, among others, through the optimization of the use of natural resources are owned by the region (Zulfi *et al*. 2014). The use of natural resources should be prioritized on the commodity sector and have not utilized optimally. As the Prime Mover in the development of the national economy, fishery sector contributed in the development of the national economy, even in improving job opportunities, equitable distribution of income and the level of life of the nation.

Bogor regency is one of regencies in the province of West Java which has no sea, but have the potential for freshwater fisheries are reliable even predicted it can contribute to economic growth. The Mainland area of Bogor regency around 2.663,81 km² which consists of 40 subdistricts with the widest subdistrict (208,06 km²) that is Jasinga subdistrict and smallest subdistrict (16,30 km²) that is Ciomas subdistrict (BPS Kabupaten Bogor 2017).

Based on the decision letter of the Minister of Marine and Fisheries of the Republic of Indonesia Number KEP. 39/MEN/2011 and the Bogor Regent Decree Number 523.31/227/Kpts/Huk/2010 regarding the determination of the location of the development minapolitan in Bogor regency which is located in Ciseeng subdistrict scattered in eight villages (Babakan, Parigi Mekar, Putat Nutug, Ciseeng, Cibentang, Cibeuteung Udik, Cibeunteung Muara, Cihoe), Parung subdistrict scattered in six villages (Bojong Indah, Cogreg, Bojong Sempu, Waru Jaya, Waru, Pemegar Sari), Gunungsindur subdistrict scattered in six villages (Pengasingan, Cibinong, Gunungsindur, Curug, Cidokom, Pabuaran) and Kemang subdistrict scattered in six villages (Pabuaran, Kemang, Pondok Tegal, Pondon Udik, Bojong, Jampang) that includes 28 villages (Radiarta *et al*. 2012).

The relatively undeveloped technology and Bogor regency government policies that support but in practice still need coordination and alignment between related institutions, then the research was done to try to analyze the contribution of the fisheries sector in the regional development of Bogor regency. The common wisdom of fisheries sector development in the regional development of Bogor regency should be oriented in increase productivity, value added, the expansion of job opportunities and the increase in income of the fishery bussiness because in line with the mandate from local regulations Bogor Regency Number 5 of 2014 about medium-term development plan of the region (RPJMD) year 2013 – 2018 on the second mission about of improving the competitiveness of the community economy and the development business based of natural resource and tourism.

This research aims to analyze the growth of fisheries sector, analyze the strength of the commodities market of the fisheries sector and analyze the strength of the base sector and the non-base sector of the fisheries sector in the regional development of Bogor regency. The results of this research are expected to be useful as a reference in decisions or policies, particularly the local authorities as a consideration in drawing up the planning strategy for the development of fisheries sector as well as a reference to the another to add to the knowledge and insight into the information.

METHODS

The method of research done by the method of quantitative research because the data in the form of figures and analyzed using statistics. Data that has been collected further analyzed to answer the problem formulation and proposed hypothesis. The statistics used in the form of descriptive statistics were used to analyse the data in a manner described or describe the data that has been collected as-is without intending to make conclusions that apply to public or generalization (Sugiyono 2017).

Analysis of Growth Indices

Analysis of Growth Indices is used to view the growth of the fisheries GRDP in a given period. To calculate the growth indices is used the following formula (Fauzi 2010):

$$GI_i = \left(\frac{y_{it}}{y_{i.base}}\right) x\ 100$$

Description:

GI_i = The ration of economic variables will be measured on a given period divided by the same variable in the base year

Y_{it} = Economic variables that will be measured at a certain period

$Y_{i.base}$ = The same economic variables in base year

Analysis of Trade Area Capture (TAC)

Analysis of Trade Area Capture (TAC) to measure the strength of the commodities market fisheries at the same time linkages with socio-economic indicators such as income and the buying ability society. Calculation of the TAC describing population that will buy the fishery products. Formula TAC from of fishery in the area A can be formulated as follows (Shaffer *et al*. 2004):

$$TAC_a = \frac{AS_a}{PCS_{base}\left(\frac{PCI_a}{PCI_{base}}\right)}$$

Description:

AS_a = The actual sales of the fish in *a* region

PCS_{base} = Per capita sale of fish product in the base region

PCI = Per capita income, for the region to be analyzed (PCI_a) both base regions (PCI_{base})

If the numbers obtained from TAC > total population in the area which analyzed then it can be said that the number of inhabitants has a pattern of expenditure against fishery products is greater than the base region (e.g. national). Conversely, if TAC < total population then the region lost a potential trade of fishing and have a pattern of spending that is lower than national. TAC in fact measure purchases by local residents and also the inhabitants of non-residents.

Analysis of Pull Factor (PF)

Analysis of Pull Factor (PF) aims to measure the strength of interesting from the locals would a commodity, in this case the fish products. It could be said also, PF is used to separate the influence of the non-resident of the TAC. The pull Factor (PF) can be calculated using the following formula (Fauzi 2010):

$$PF_a = \frac{TAC_a}{P_a}$$

Description:

TAC_a = *Trade Area Capture* in *a* region

P_a = Total population in *a* region

If the value PF > 1 then market fishery products in A region able to attract customers from other regions. Conversely, if PF < 1 then A region losing customers againts markets of the other competitors.

Analysis of Minimum Requirement Approach (MRA)

Analysis of Minimum Requirement Approach (MRA) is used to measure how big strength of base sector by measuring base multiplier. MRA techniques drape the area that have the same characteristics as a reference (peer). These characteristics can be in the form of a commonality of potential, position or other circumstances. Minimum Requirement Approach (MRA) can be formulated as follows (Ullman & Dacey 2005):

$$X_a^i = \left(\frac{E_a^i}{E_a} - \frac{E_{min\ peer}^i}{E_{minpeer}}\right) E_a^i$$

Calculation of the MRA in this study using a variable workforce (E = *Employment*) as one of the indicators. The formula above States that the *basic employment* sectors *i* (in this case fisheries) in A region is the multiplication of the total labor of the sector *i* in A region with a difference *share* of the fishery sector with *share* a minimum share of the nearest sector (*peer*).

RESULT AND DISCUSSION

The General Circumstances of Bogor Regency

Bogor regency has a land area of 2.663,81 km^2 or about 7,53% of territory of the West Java province that the extent of 35.377,76 km^2. Astronomically, Bogor regency is located between 6° 19' North latitude and 6° 47' South latitude, as well as 106° 01' – 107° 103' East longitude. Bogor regency has a area varied morphology type, from the mainland of that is relatively low in the Southern which is about 29,28% are at an altitude of 15 – 100 mdpl, 42,62% are at an altitude of 100 – 500 mdpl, 19,53% are at an altitude of 500 – 1.000 mdpl, 8,43% are at an altitude of 1.000 – 2.000 mdpl and 0,22% are at an altitude of 2.000 – 2.500 mdpl. The administrative area of Bogor regency consists of 40 subdistricts with the widest subdistrict i.e. Jasinga subdistrict (208,06 km^2) and Cigudeg subdistrict (158,89 km^2). While the smallest subdistrict in Bogor regency is a Ciomas subdistrict (16,30 km^2).

Bogor regency has a temperature of around 26 – 33°C with an air humidity of around 40 – 99%. Average air pressure around Bogor regency 914,1 mb with an average of wind speed of about 4 knots and on average of the sun shines approximately 39,4%. The average of maximum air temperatures occurred in May about 24,1°C and average of minimum temperatures occurred in August of about 22,7°C. According to the Meteorological Agency Climatology and Geophysics Bogor, in the year 2016 there are 314 rainy days with precipitation 4.598 mm. largest rainfall occurs in April reached 558 mm with 26 days of rain. While the smallest rainfall occurs in July that is 293 mm with 29 rainy days. The average rainfall of the year 2016 reached 383,17 mm/month.

The residents of Bogor regency based on projections of the population by the year 2016 as much as 5.587.390 population consisting of 2.856.529 population male and 2.730.861 population female. While the population in 2015 as much as 5.459.668 and population in 2014 as many as 5.331.149 people. The pace of growth population in Bogor regency in the year 2015 – 2016 amounted to 2,34%, this experience increase of the rate of population growth in the year 2014 – 2015 which is only of 0,48%. While the population density in Bogor regency in the year 2016 amounted of 2.097,52 residents per km^2, while the population density in Bogor regency in the year 2015 of 2.049,57 residents per km^2. Changes in the population and the rate of population growth increased in Bogor regency is caused due to the influence of the number of births and migration or displacement of residents from other regions to the Bogor regency. There are several factors driving migration or displacement of the population in Bogor regency that is the economic factor and a factor of wage differences, therefore the purpose of population beyond the Bogor regency migrated to Bogor regency to earn a high income from the origins region so as can improve the standard of living and to improve the economic circumstances of the family.

The sector who donate biggest contribution against GRDP Bogor regency is sectors of The Processing Industry, where is the average value of a donation of 54.77% despite of the year 2014 – 2016 sectors of The Processing Industry has decreased. Meanwhile, the sector who donate the smallest contribution to GRDP Bogor regency is the sector Procurement of Water, Management of Waste and Garbage, and Recycling with an average of 0,10%. The development of the contribution of the Fisheries sector against GRDP Bogor regency on Current Prices According to The Field of Business the year 2014 – 2016 rising every year, i.e. in the year 2014 fisheries sector accounted for 1,19%, then experienced a increase of significant in the year 2015 be 1,59% and increase back in 2016 be 1,61%. Because the main contribution of the fisheries sector in Bogor regency comes from freshwater aquaculture, it is supported by the magnitude production of the fisheries branch of the fish hatchery, followed by the ornamental fish business branches and branch business of fish consumption.

The Circumstances of The Fisheries Sector in Bogor Regency

Total production of fisheries in Bogor regency from the year 2014 – 2016 demonstrating increases in each year. In the year 2014, total production amounted to 3.338.019,07 tons of fisheries. As for the year 2015 amounting to 3.463.050,07 tons and the fisheries production of year 2016 amounted to 4.026.479,75 tons. The percentage of the production of fisheries of Bogor regency year 2014 amount 30,83%, while in the year 2015 of 31,98% and 2016 year of 37,19%. The business branch of the very large its fishery production that is fish hatchery business branch, then followed by business branch of ornamental fish and business branch of consumption fish. This is because increased production of fish hatchery business branch is a plan from KKP year 2011 in the increasing of the aquaculture production, the role of the field of seeding becomes very important to produce fine quality seed production and high production in meeting the needs of seed for enlargement (Dedi *et al*. 2015). Fish consumption of Bogor regency in the year 2016 of 27,65 kg/capita/year. As for the year 2015, consumption of fish of 26,41 kg/capita/year and fish consumption year 2014 just 25,18 kg/capita/year. If viewed from the development of consumption fish production according to types of fish from the year 2014 – 2016, the largest production of commodities is a Catfish with a total production of 248.852,07 tons, followed by goldfish, nile tilapia, carp and silver catfish. The development a large production of catfish shows the presence of a target that catfish production will continue to be enhanced to balancing the tendency of increasing market demand (Lindawati *et al*. 2013). The total value of production in 2014 is Rp. 539.299.167.180, the value of production in 2015 rising to Rp. 583.296.309.100 and then in the year 2016 production value increase back to Rp. 635.717.541.700.

The increase in RTP that looks significant occurred in business branch of consumption fish year 2016 that is increased 1.317 peoples from 2015. RTP business branch of ornamental fish in the year 2014 amount 587 peoples, in the year 2015 amounted 607 peoples, later in the year 2016 have elevated into 753 peoples. While RTP of business branch of fish hatchery in the year 2014 amount 2.365 peoples, in the year 2015 amounted 2.424 peoples and increase in the year 2016 into 2.734 peoples. A total of RTP in Bogor regency year 2014 of 12.076 peoples, in the year 2015 of 12.275 peoples and year 2016 experienced significant increases being the 14.048 peoples. Comparison of the RTP on business branch of consumption fish of the year 2015 – 2016 amounted 14,25. While business branch of ornamental fish and business branch of fish hatchery in the year 2015 – 2016 amounted 24,05 for ornamental fish business branches and business branch of fish hatchery amounted 12,79.

An increase in the area of fisheries in Bogor regency is not too significant. The increase in area is the largest fisheries occur on areas of the business branch of fish consumption in the year 2014 covering an area of 1.985,74 Ha, and then experienced a significant increase of 115,63 Ha in the year 2015 so that it becomes 2.101,37 Ha and in the year 2016 of 2.133,48 Ha. An increase in the area of fisheries on consumption fish due to the existence an increase in the area on a quiet pool of water every year, that is in the year 2014 of 1.446,04, in the year 2015 of 1.561,67 and the year 2016 of 1.595,26. In addition to the increase in the area on a quiet pool of water, an increase in the area occurred in the year 2016 at keramba, floating nets and rice fields. Comparative area of fisheries on consumption fish business branch of the year 2015 – 2016 amounting to 1,53. While for ornamental fish business branch and fish hatchery business branch in the year 2015 – 2016 amounted to 0,69 for ornamental fish business branchess and 2,52 for fish hatchery business branches.

The facilities and infrastructure of Fisheries sector in Bogor regency is Fish Seed Hall or commonly referred to with BBI. BBI in Bogor regency located in BBI Cibening, BBI Cibitung, BBI Cijeruk and BBI Rancabungur. BBI Cibening has an area of 2,55 Ha with spacious pools 0,60 Ha and the total of pools of 32 pieces. While BBI Cibitung has an area of 2,80 Ha with spacious pools 1,93 Ha and the total of pools of 31 pieces. BBI Cijeruk and BBI Rancabungur still in the development stage. BBI Cijeruk has an area of 2,80 Ha with the total of pools of 32 pieces, while BBI Rancabungur has an area of 3,10 Ha.

Marketing of fisheries both for ornamental fish, consumption fish and processing of fish in Bogor regency is divided into two kinds, namely: local marketing and export marketing. Marketing of ornamental fish in the Bogor regency is usually exported to other countries such as the United States, the Netherlands, Germany, Italy, Poland, Switzerland, Saudi Arabia, Iran, United Arab Emirates, Brazil, Mexico, Thailand, Singapore, Japan, South Korea and China. The purpose marketing of consumption fish only in DKI Jakarta, Tangerang, Batam, Bekasi, Depok and Sukabumi. While marketing processing of fish there are marketed locally, namely in the area of Jabodetabek, while for its export marketing to South Korea, the United States, Japan, China, Taiwan and Singapore.

The leading commodities according to the type of fish in Bogor regency consists of catfish, goldfish, nile tilapia, carp and silver catfish. Catfish is the leading commodities in Bogor regency which production is highest. The aquaculture production of leading commodities in Bogor regency during the year 2014 – 2016 always increasing each year. The commodities of catfish is most high production that is in the year 2014 amounted to 79.640,83 tons, later the year 2015 rising to 82.030,05 tons and 84.490,96 tons in the year 2016. While the leading commodities of aquaculture whose production is the lowest is silver catfish. Silver catfish production amounted to 3.148,49 tons the year 2014, in the year 2015 amounting to 3.242,94 tons and in the year 2016 of 3.340,23 tons.

The contribution of RTP in the area of minapolitan against Bogor regency year 2016 indicate that fish hatchery RTP donate the largest contributions amount of 52,30%, followed by the ornamental fish RTP of 49,40%. While RTP the public waters only donates for 19,39% against the Bogor regency. The contribution of land area (Ha) in the area of minapolitan against Bogor regency year 2016 indicate that land area of hatchery donates the largest contribution of 93,33%, and then followed by land area of aquaculture that is as big as 58,45%. While the land area public waters only donate 19.89% against the Bogor regency. The contribution of fish production in the area of minapolitan against Bogor regency year 2016 indicate that production aquaculture of fish consumption (tons) donates the largest contribution of 64,49% then followed by the production of a fish hatchery (RE) of 61,25%. While the production of public waters just donate 18.97% against the Bogor regency.

The Contribution of Fisheries Sector in Regional Development
Analysis of Growth Indices

Analysis of *Growth Indices* is used to view the growth of the fisheries GRDP Bogor regency in a certain time period. The calculation of growth indices in this research uses a variable GRDP Bogor regency on Current Prices According to The Field of Business Year 2014 – 2016 as an indicator. Data of GRDP Bogor regency on Current Prices According to The Field of Business Year 2014 – 2016 show that GRDP of fisheries sector experience increased in every year. In the 2014, GRDP of fisheries sector amounted to Rp. 1.800.291.559.738, then the year 2015 is experiencing a significant increase becomes Rp. 2.669.577.645.339 and rising again in the year 2016 becomes Rp. 2.965.140.773.679.

Table 1. The Results of Calculation of *Growth Indices* Year 2014 – 2016

Year	GRDP Fisheries Sector In The Year To The –	GRDP Fisheries Sector In The Year 2016	*Growth Indices*	GRDP Fisheries Sector (%)
	$Y_{i.base}$	Y_{it}	GI_i	
2014	1.800.291.559.738	2.965.140.773.679	165	65

The results of the calculation of Growth Indices Bogor regency year 2014 – 2016 amounting to 165. In other words, GRDP of fishery sector in Bogor regency increased 65% within two years. The increase in GRDP of fishery sector in Bogor regency allegedly due to the area of minapolitan in Bogor regency that is Ciseeng subdistrict, Parung subdistrict, Gunungsindur subdistrict and Kemang subdistrict. Where the heart minapolitan (minapolis) is located in Ciseeng subdistrict, while Parung subdistrict, Gunungsindur subdistrict and Kemang subdistrict is the area the supporters. Determination of Bogor regency as the location for the development of minapolitan has been manifested in letter of the Minister of Marine and Fisheries of the Republic of Indonesia Number KEP. 39/MEN/2011 and the Bogor Regent Decree Number 523.31/227/Kpts/Huk/2010 regarding the determination of the location of the development minapolitan in Bogor regency (Radiarta *et al*. 2012).

Analysis of Trade Area Capture (TAC)

Analysis of *Trade Area Capture* (TAC) can be used to describe economic activity in the fisheries (commodities) on the regional level (regency of the city and province). Analysis of the TAC aims to measure the market power of commodity fishery at the same time linkages with socio-economic indicators such as income and the buying ability society (Fauzi 2010). TAC in fact measure purchases by local residents and also the inhabitants of non-residents.

Calculation of the TAC in this research using a variable the value of the actual sales of the fish in Bogor regency (AS_a), per capita sale of fish product in West Java province (PCS_{base}), per capita income in Bogor regency (PCI_a)

and per capita income in West Java province (PCS_{base}). The results of the calculation of the TAC year 2014 – 2016, obtained a value of TAC Bogor regency of amount 5.656.099 in the year 2014, 5.788.374 in the year 2015 and 5.912.539 in the year 2016 (Table 2).

Table 2. The Results of Calculation of *Trade Area Capture* Year 2014 – 2016

Year	P_a	AS_a	PCS_{base}	PCI_a	PCI_{base}	TAC_a
2014	5.331.149	5.435.575.172.000	1.019.588	28.377.561	30.107.259	5.656.099
2015	5.459.668	5.866.924.675.000	1.074.594	30.791.594	32.644.963	5.788.374
2016	5.587.390	6.393.713.540.462	1.144.311	32.961.765	34.879.922	5.912.539
$\bar{X}$	5.459.402				$\bar{X}$	5.785.671

The results of the calculation of the TAC describing the number of inhabitants that will buy the fishery products. If seen from the results of the calculation and the average TAC in Bogor regency year 2014 – 2016, TAC Bogor regency is larger than the number of inhabitants in Bogor regency ($TAC_a > P_a$). Where in the year 2014, the TAC is greater than the total population (5.656.099 > 5.331.149), later in the year 2015 value of TAC is greater than the total population (5.788.374 > 5.459.668) and in the years 2016 value of the TAC is larger than the total population (5.912.539 > 5.587.390). Average calculation of the TAC from the year 2014 – 2016 demonstrating the value of TAC is greater than the total population (5.785.671 > 5.459.402). While the average calculation of the TAC in Bogor regency livestock sector from the year 2014 – 2016 obtained value of the TAC amounted to 5.582.665. The average value of TAC livestock sector is smaller than the average value of TAC fisheries sector, this is due to the high demand from other regions against fishery in Bogor regency in order to fill the needs in the area. The needs of catfish in the area of Jabodetabek reaches 75 tons/day, while the needs of catfish in Bogor region (city and regency) was estimated at 10 tons/day (Kunandi *et al*. 2013). According Nugroho (2017), *per capita consumption levels of fish* in Bogor Regency period of the last 5 years has experienced an increase of 26,41 kg/capita/year in the year of 2015 and *per capita consumption of fish in* society Bogor regency continue to increase with an average increase of 5,47% per year.

So it can be inferred that the Bogor regency is able to capturing trading opportunities of fisheries products in other areas and Bogor regency society has a pattern of expenditure against fishery products that are larger than the province of West Java. According to Fauzi (2010), if the numbers obtained from TAC > total population in the area which analyzed then it can be said that the number of inhabitants has a pattern of expenditure against fishery products is greater than the base region (e.g. national). Conversely, if TAC < total population then the region lost a potential trade of fishing and have a pattern of spending that is lower than national. TAC in fact measure purchases by local residents and also the inhabitants of non-residents.

Analysis of Pull Factor (PF)

Analysis of Pull Factor (PF) is used to measure the strength of interesting from a resident of the Bogor regency of a fishery commodities. Calculation of PF in this study uses the value of the TAC in the Regency of Bogor and total population in Bogor regency (Table 3).

Table 3. The Results of Calculation of *Pull Factor* Year 2014 – 2016

Year	P_a	TAC_a	PF_a
2014	5.331.149	5.656.099	1,06
2015	5.459.668	5.788.374	1,06
2016	5.587.390	5.912.539	1,06
	$\bar{X}$		1,06

According Nugroho (2017), Bogor regency is the area with the potential for freshwater aquaculture is big enough in West Java province with a total production of 112.781 tons and have the leading commodities i.e. catfish, goldfish, nile tilapia, carp and silver catfish that accounted for more than 80% of total production, as well as the production of ornamental fish freshwater in Bogor regency of the year 2014 reached 235.173.740

the tail and increased to 242.520.230 the tail in the year 2015 with the leading commodities of ornamental fish in Bogor regency is a koki fish, koi, discus, guppy, betta fish, corydoras, platy coral and neon tetra fish.

So it can be inferred that the area of Bogor regency is able to attract customers from other regions and has specialized in terms market of fishery products such as catfish, goldfish, nile tilapia, carp, silver catfish, koki fish, koi, discus, guppy, betta fish, corydoras, platy coral and neon tetra fish which became the leading commodities in Bogor regency. According to Fauzi (2010), if the value PF > 1 then market fishery products in the region able to attract customers from other regions. Conversely, if PF < 1 then region losing customers againts markets of the other competitors.

Analysis of Minimum Requirement Approach (MRA)

According to Fauzi (2010), Analysis of *Minimum Requirement Approach* (MRA) may be used to describe the condition of the fishery sector macro. Analysis of MRA can measure how big strength of base sector by measuring base multiplier. Analysis of *Minimum Requirement Approach* (MRA) can be obtained the description of the influence of the fishery sector towards other sectors in Bogor regency by comparing it in an area that has the characteristics of freshwater fisheries potential in Bogor regency.

Calculation of the MRA in this study using a variable workforce (E = *Employment*) as indicator. In this case, MRA techniques relying on an area that has the same characteristics that are used as a reference or *peer*. Other regions selected as a comparison in the workforce indicator is the region developed a flagship commodities and have other potential in Bogor regency. These areas include Pamijahan subdistrict, Cibungbulang subdistrict, Ciampea subdistrict, Tenjolaya subdistrict, Dramaga subdistrict, Ciomas subdistrict, Megamendung subdistrict, Bojonggede subdistrict, Tajurhalang subdistrict, Kemang subdistrict, Rancabungur subdistrict, Parung subdistrict, Ciseeng subdistrict and Gunungsindur subdistrict. The calculation of the *share* value of labor between regions are described in Table 4 below:

Table 4. *Share* of Fisheries Sector Labor Between Subdistrict in Bogor Regency Year 2016

Subdistrict	Total Labor	Fisheries Labor	*Share* of Labor
Pamijahan	87.645	1.158	0,0132
Cibungbulang	87.393	470	0,0054
Ciampea	106.449	630	0,0059
Tenjolaya	38.127	357	0,0094
Dramaga	76.229	377	0,0049
Ciomas	121.863	303	0,0025
Megamendung	69.566	53	0,0008
Bojonggede	216.724	199	0,0009
Tajurhalang	79.790	373	0,0047
Kemang	74.321	575	0,0077
Rancabungur	35.506	312	0,0088
Parung	95.919	973	0,0101
Ciseeng	72.230	1.459	0,0202
Gunungsindur	86.603	533	0,0062

The *share* value data of acquired is seen that the region has the lowest *share* value is Megamendung subdistrict 0,0008 value. This value is the comparison of the composition of the overall labor with the labor that specifically worked on the fishery sector. While the area with the highest *share* value to fishery sector in Bogor regency of i.e. Ciseeng subdistrict amount 0,0202. This is because Ciseeng subdistrict is the centre of the area of minapolitan (minapolis) in Bogor regency and is an area that develops commodities catfish so became one of the leading commodities in Bogor regency. The *share* value of the Megamendung subdistrict made as *peer* in the

next calculation phase because it is most minimum value from the fishery. Calculation of the MRA are described in Table 5 below:

Table 5. Calculation of *Minimum Requirement Approach* Fisheries Sector Between Subdistrict in Bogor Regency Year 2016

Subdistrict	*Share* Sector	*Minimum Shares Peer*	Total *Employment* Sector	Total *Employment*	*Basic Employment*	*Base Multiplier*
Pamijahan	0,0132	0,0008	1.158	87.645	1.091,23	80,3
Cibungbulang	0,0054	0,0008	470	87.393	403,42	216,6
Ciampea	0,0059	0,0008	630	106.449	548,90	193,9
Tenjolaya	0,0094	0,0008	357	38.127	327,95	116,3
Dramaga	0,0049	0,0008	377	76.229	318,92	239,0
Ciomas	0,0025	0,0008	303	121.863	210,16	579,9
Megamendung	0,0008	0,0008	53	69.566	Reference Area (*Peer*)	
Bojonggede	0,0009	0,0008	199	216.724	33,89	6.395,8
Tajurhalang	0,0047	0,0008	373	79.790	312,21	255,6
Kemang	0,0077	0,0008	575	74.321	518,38	143,4
Rancabungur	0,0088	0,0008	312	35.506	284,95	124,6
Parung	0,0101	0,0008	973	95.919	899,92	106,6
Ciseeng	0,0202	0,0008	1.459	72.230	1.403,97	51,4
Gunungsindur	0,0062	0,0008	533	86.603	467,02	185,4

The data from the analysis results in Table 5 can be used to calculate the multiplier base from fisheries sector. This base multiplier is calculated based on the ratio between the total fishery labor divided by *basic employment*. Bojonggede subdistrict in the analysis of MRA has value basic multiplier of 6.395,8. This shows that every 6.395 labor created by the sector base will produce 0,8 labor in sector non base. Or for any 6.395 labor in sector base is expected to be created 8 labor in sector non base. In the research of Ramadona (2013), Padang city has value basic multiplier of 177,6 which indicates that every 177 labor created by the sector base will produce 0,6 labor in sector non base. Value basic multiplier Padang city smaller than basic multiplier Bojonggede subdistrict, because of Padang city including areas prone to hit by the earthquake disaster and tsunami, this is the problem of fisheries resources development in Padang city so that inhibit economic activity sectors of the fisheries (Ramadona *et al*. 2012).

CONCLUSIONS

Growth Indices Bogor regency year 2014 – 2016 amounting to 165. In other words, GRDP of fishery sector in Bogor regency increased 65% within two years. The increase in GRDP of fishery sector in Bogor regency allegedly due to the area of minapolitan in Bogor regency that is Ciseeng subdistrict, Parung subdistrict, Gunungsindur subdistrict and Kemang subdistrict. Where the heart minapolitan (minapolis) is located in Ciseeng subdistrict.

Trade Area Capture (TAC) Bogor regency year 2014 – 2016 demonstrating that the value of TAC is greater than number of inhabitants in each year. Where is the average value of TAC which indicates that the value of the TAC is greater than the total population (5.785.671 > 5.459.402). So it can be inferred that the Bogor regency is able to capturing trading opportunities of fisheries products in other areas and Bogor regency society has a pattern of expenditure against fishery products that are larger than the province of West Java. While the *Pull Factor* (PF) Bogor regency year 2014 – 2016 indicate that the average value of the PF obtained amounted to 1,06. So it can be inferred that the area of Bogor regency is able to attract customers from other regions and has specialized in terms market of fishery products such as catfish, goldfish, nile tilapia, carp, silver catfish, koki fish, koi, discus, guppy, betta fish, corydoras, platy coral and neon tetra fish which became the leading commodities in Bogor regency. According to Fauzi (2010), if the value PF > 1 then market fishery products in the region able to attract customers from other regions. Conversely, if PF < 1 then region losing customers againts markets of the other competitors.

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