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The contribution of the fisheries and marine sectors to improving regional income

Lis M. Yapanto¹, Fachruddin Z.Olilingo²

*¹Associate Professor, Faculty of Fisheries and Marine Science.
State University of Gorontalo*

*²Professor, Faculty of Economics and Business.
State University of Gorontalo*

Abstract

North Gorontalo District has potential fisheries resources. But the contribution of the fishery against Gross Regional Domestic Product (GRDP) only of 6.20%. In general, this research aims to identify and analyze the fisheries sector's assistance in the economy, knowing the base's level and exploring the fishery economic typology. The methods used are secondary data analysis. Data analysis is an analysis of Shift Share analysis, Location Quotient (LQ), and the Klassen Typology analysis. Amount of LQ, typology of the economic sector of fisheries obtained assistance based on prevailing. Constant prices put the fishing on order/rank fifth and sixth in the achieving of GRDP. The fisheries sector in Gorontalo Utara district is not a sector basis with patterns and economic structure growing with a condition relative's left behind. Five sub-districts became a priority and needed to be developed/improved.

Keywords: GRDP, the contribution of the Fisheries Sector, Location Quotient (LQ), Sector Bases, Shift Share, Klassen Typology

Introduction

An indicator of the level of success of development and community welfare in an area is Gross Regional Domestic Product (PDRB) per capita, which describes the average income that people may achieve (Sutiardi, 2001). For this reason, efforts to increase the fundamental role and contribution of a sector to GRDP and GRDP per capita need to be pursued. These efforts include optimizing the development of potential natural resources. It is necessary to select priority sectors to optimally use regional economic potentials, especially for regions with possible resources that have not been utilized properly.

North Gorontalo Regency is one of the regencies in Gorontalo Province, which has considerable fishery potential, has a sea area of 264,311.43 km², and a land area of 11,595.57 km², meaning that the Central Maluku Regency area is dominated by 95.8% sea area (BPS Gorontalo North, 2018). The potential of the fisheries sector that is owned by the North Gorontalo District (Marine and Fisheries Service of North Gorontalo District, 2018) is divided into marine fishery resource potential, marine cultivation potential, and fishery product processing potential.

The first potential is in the form of marine fishery resources; North Gorontalo Regency has the potential for relatively superior and reliable fisheries resources, consisting of a long coastline of 1,375,529 km with marine fishery production 83,304 tons. The fishing tools and means used are ring nets, drift gillnets, circular gill nets, fixed gill nets, boat charts, stick charts, fishing rods, other nets, fixed-line, troll line, handline, straight line, fishing line: squid, other fishing rods, and traps

with a total of 24,536 fishing gears. Fishery production is mostly marketed in the form of fresh fish. The development of the fishing industry can increase investment in the North Gorontalo District, which is directed at developing fisheries sector activities that are economically important.

The second potential is in the form of marine cultivation, such as seaweed, floating cages, shellfish covering an area of 3,028.4 ha with a utilization area of 85.1 ha, the potential for brackish water cultivation such as shrimp and milkfish ponds, crab ponds covering an area of 15,998.3 ha with a utilization area. 3,693.3 ha of potential for freshwater cultivation covering an area of 70.8 ha with a utilization area of 15.2 ha, potential for coral reefs surrounding an area of 6,745.4 ha, potential for mangrove forests surrounding an area of 7,057.4 ha, potential for seagrass fields covering an area of 1,879.3 ha.

The third potential is the processing of fishery products, in the form of fishery product processing businesses that are generally carried out traditionally and modernly. The processing locations are carried out in sub-districts in the way of production centers and fishery companies. The types of processed fishery products consist of dried fish (salted fish) and smoked fish.

The potential of fisheries sector resources and human resources is quite enormous, reaching 361,698 people (BPS Gorontalo Utara, 2018), which can be developed to increase economic growth and regional per capita income. Based on the existing potential, it is necessary to know the role of the fisheries sector in the development of the North Gorontalo District. For this reason, it is essential to research "Contribution of the Fisheries Sector to the Economy of North Gorontalo District.

This article describes the research that was carried out in 2012. Specifically, this study aims to: first, identify and analyze the contribution of the fisheries sector to the regional economy of North Gorontalo District; second, knowing the economic base of the fisheries sector in the economy; and thirdly, to analyze growth patterns and structures

Methods

This study uses secondary data analysis through a literature search by taking cases in North Gorontalo District, Gorontalo Province. The data used include Gross Regional Domestic Product (PDRB) of North Gorontalo District and Gorontalo Province GRDP data for 5 (five) years, namely data from 2014 to 2018. The PDRB data consists of two versions: the value of GRDP based on price applies and the amount of GRDP at constant prices for a particular year.

Sources of data used in this study came from agencies: BPS Gorontalo Province, BPS Gorontalo Utara District, and the Office of Marine Affairs and Fisheries in the North Gorontalo Regency. Secondary data were collected directly from related agencies, both at the district and Gorontalo provincial levels, and other supporting data relevant to the research topic or discussion. There are 3 (three) data analysis methods used in this study: fisheries sector contribution analysis, sector base analysis, and growth pattern and structure analysis.

The first method of data analysis, namely the study of the contribution of the fisheries sector, is part of the Shift share analysis, aiming to determine the size of the fisheries sector's contribution to GRDP. Suppose the change in the value of the contribution is positive. In that case, the industry has a competitive advantage and vice versa. If the difference in the contribution value is negative, the sector does not have a competitive advantage. The second analysis method, namely the basis sector analysis, is used to determine whether the fisheries sector is a primary or non-basic sector, using the Location Quotient (LQ) approach. LQ assessment criteria, namely: if $LQ < 1$, it means that the fisheries sector is not a primary activity in the area of North Gorontalo District; if $LQ > 1$,

The third method of analysis, namely the study of growth patterns and structures, was carried out using Klassen typology, which divides regions based on 2 (two) leading indicators: regional economic growth and per capita income. By determining the average economic growth as the vertical axis and the average per capita income as the horizontal axis, the observed area can be divided into four classifications, namely: advanced and rapidly growing sectors, advanced but depressed sectors, potential or developing sectors, and relatively lagging industry.

Results And Discussion

The first phase of research uses a contribution analysis tool of fisheries, producing a sector contribution that shows how much the sector's contribution is concerned with GRDP (Gross Regional Domestic Product) as a whole. The sector contribution analyzed through this approach is the fisheries sector's contribution to the GRDP of North Gorontalo District. The fisheries sector's contribution based on current prices in North Gorontalo District (Table 1) for five years (2014-2018), the fisheries sector has contributed to the formation of GRDP of North Gorontalo Regency by 6.20%.

Table 1. Contribution of Fisheries Sector at Current Price in North Gorontalo District

Year	Value of GDP in Fisheries Sector (in a million rupiah)	GRDP Sectors (in a million rupiah)	Value of All Sectors (in a million rupiah)	Fisheries Sector Contribution (%)	Changes in the Fisheries Contribution (%)	Value of Sector
2014	46,413.73		753,090.73	6.16	-	
2015	52,628.53		840,250.12	6.26	0.10	
2016	59,786.78		933,878.64	6.40	0.14	
2017	65,078.97		1,046,800.60	6.22	-0.19	
2018	70,950.08		1,186,964.97	5.98	-0.24	
Average	58,971.62		952,196.94	6.20	-0.05	

Source: Secondary data after processing, 2020

The fisheries sector's contribution to North Gorontalo District varies and tends to decline until 2014 (Figure 1). This variation is because from 2016 to 2018, there has been an increase in the fisheries sector's contribution rate due to the massive change in the fisheries sector's GRDP value based on current prices in the North Gorontalo Regency. The percentage change in the GRDP value in these two years is more significant than the percentage change in the GRDP value of all sectors in the North Gorontalo District, which was only 11.57% in 2015 and 11.14% 2016.

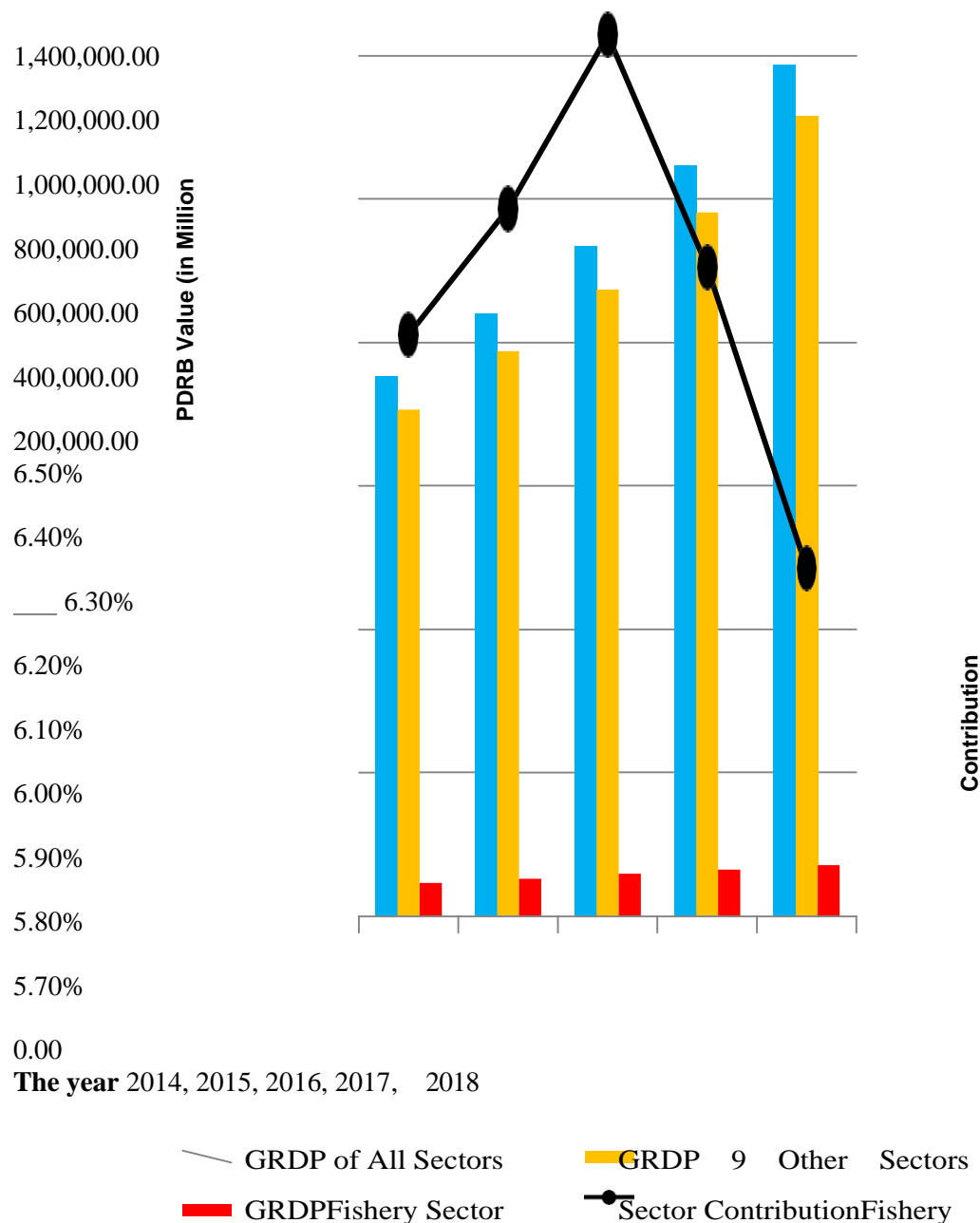


Figure 1. GRDP development and fisheries sector contribution based on current prices in North Gorontalo District

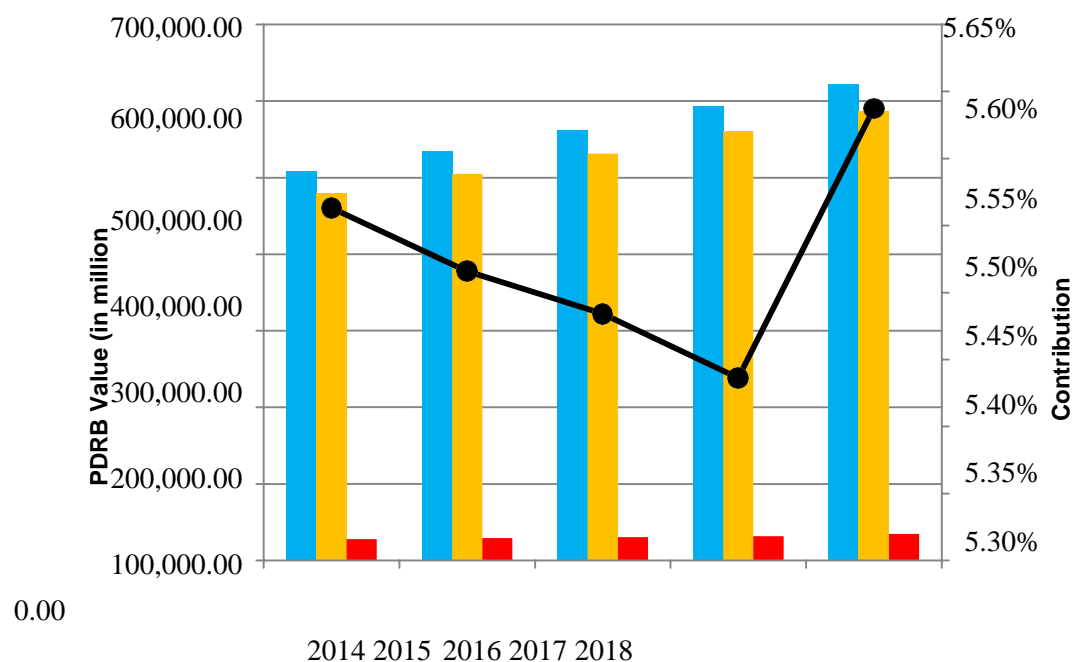
GRDP value continued to increase from 2017 to 2018; there was a decline in contributions from 2016 to 2018. This was due to the decrease in the magnitude of changes in the GRDP value in 2017 and 2018. The percentage change in the fisheries sector's GRDP value in two years is smaller than the percentage change in the GRDP value of all industries in the North Gorontalo Regency, increasing to 11.90% in 2017 13.39% in 2018.

Thus, in terms of its contribution to the formation of GRDP in the North Gorontalo District from 2014 to 2016, fishery commodities' production and prices, which are represented in the sector's GDP value, show an increasing development. In contrast, in 2017 and 2018, the production and prices of fishery commodities showed a decline. This decline in contribution to production and prices for items or services in nine other sectors (apart from the fisheries sector) increased in 2017 and 2018. The

changes in the value of the GRDP of the other nine sectors were 12.31% and 13.68%, respectively. This suppresses the fisheries sector's contribution in GDP based on current prices in 2018, which ranks fifth (5) from nine other sectors in North Gorontalo District.

With the standard or benchmark price level in effect in 2000, it is known that there is GRDP at constant prices, namely product prices based on prices in a certain year (Tarigan, 2012). The contribution of the fisheries sector to the GRDP of North Gorontalo Regency based on constant prices (Table 2) for five years shows that the fisheries sector in North Gorontalo Regency has contributed to the formation of GRDP by 5.48%.

The fisheries sector's contribution based on constant prices in North Gorontalo District tends to decline until 2017, but there has been a significant increase in 2018 (Figure 2). The decline in the contribution rate occurred from 2014 to 2017; this decrease was caused by the small change in the fisheries sector's GRDP value at constant prices. On the other hand, the overall GRDP value change involving nine other sectors is greater than the change in the fisheries sector's GRDP value. 2014 to 2017, change in the GRDP value fisheries sector was smaller than the change in the value of the GRDP of the other nine sectors. Unlike the previous four years, the fisheries sector's contribution rate increased sharply in 2018 (Figure 2). This increase occurred due to the large change in the fisheries sector's value compared to changes in the value of the GRDP of the other nine sectors, which was only 4.63%.



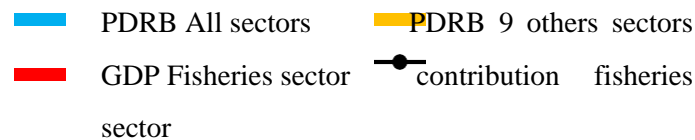
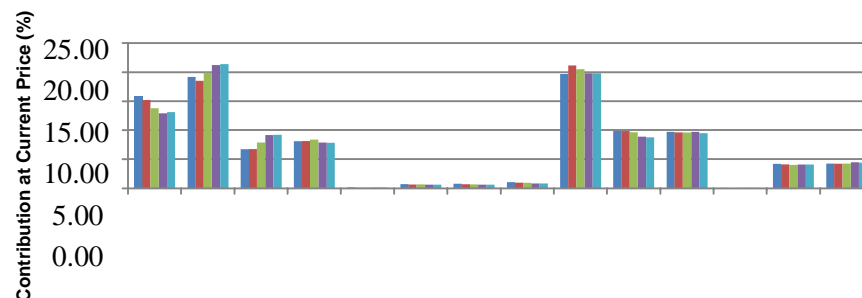


Figure 2. The development of GRDP and the contribution of the fisheries sector at constant prices in North Gorontalo District

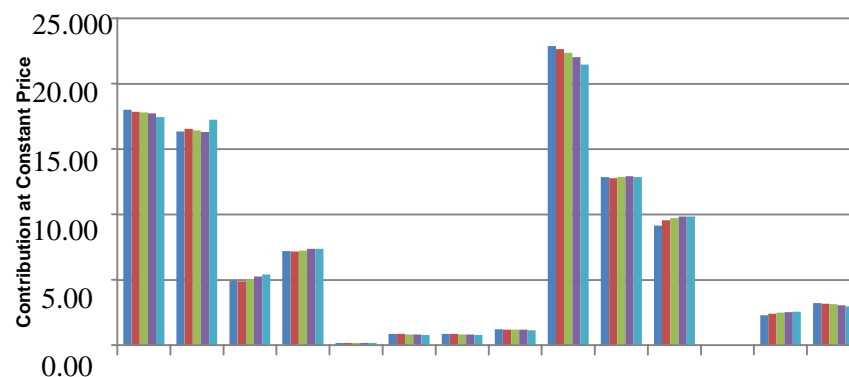
According to Tarigan (2012), the increase in income in the value of GRDP at constant prices is only caused by an increase in physical production because prices are considered constant. The increase and decrease in the fisheries sector's GRDP value or the contribution of the fisheries sector in the North Gorontalo District at constant prices illustrates the increase and decrease in production.

Overall, the fisheries sector's contribution to GRDP from 2014 to 2018, both based on current prices and at constant prices, places the fisheries sector in fifth and sixth rank as one of the contributing sectors (share). The policies increase production in the fisheries sector, including the capture fisheries, marine aquaculture sector, public water sector, floating related agencies carry out net cultivation sector, freshwater cultivation sector, ponds and cages, and brackish water cultivation sector. Production in the fishery sector (activities in the fisheries business field) must be prioritized and needed to be developed/increased in this district.



District in North Gorontalo Regency

0/Year 2014 2015 2016 2017 2018



District in North Gorontalo Regency

Year ■ 2014 ■ 2015 ■ 2016 ■ 2017 ■ 2018

Figure 3. Contribution of the Subdistrict Fisheries Sector in North Gorontalo District

The second stage of research uses the Location Quotient (LQ) analysis tool to identify a sector (business field) in an area, whether it belongs to a base or non-basic sector. According to Tarigan (2012), LQ compares the size of the role of a sector/industry in a region to the size of the sector/industry nationally (parent region / superior region).

Table 3. LQ Value of Fishery Sector at Current Price in North Gorontalo District

Year	GRDP Value)	Value of GRDP of All Sectors in North Gorontalo District (Pi)	GRDP Value of Sector Fisheries in Gorontalo Province (Vt)	GRDP Value of All Sectors in Gorontalo Province (Pt)	Score LQ	Change LQ value
2014	46,413.73	753,090.37	842,345.92	5,079,836.95	0.372	
2015	52,628.53	840,250.12	938,031.20	5,698,799.37	0.381	0.009
2016	59,786.78	933,878.64	1,013,551.81	6,269,709.52	0.396	0.015
2017	65,078.97	1,046,800.60	1,100,197.49	7,069,092.74	0.399	0.003
2018	70,950.08	1,186,964.97	1,258,930.43	8,084,807.43	0.384	-0.016
Average	58,971.62	1,030,611.37	952,196.94	6,440,449.20	0.386	0.003

The fisheries sector's LQ value based on the valid price for five years (2014 to 2018) ranges from 0.372 to 0.399, or the five-year average is 0.386 (Table 3). A value less than 1 ($LQ < 1$), thus the fisheries sector is a non-basic sector, meaning the fisheries sector unable to meet the needs of the district, or the role of the fisheries sector is smaller than the role of the fisheries sector at the provincial level of Gorontalo.

The fisheries sector also shows the same LQ value at constant prices for five years (Table 4). This value ranges from 0.370 to 0.373, or the five-year average is at a value of 0.370. This value is less than 1 ($LQ < 1$). Thus the fishery sector in North Gorontalo District is a non-basic sector.

The development of the LQ value in the fisheries sector at current prices and constant prices for five years (Figure 4) shows that the fisheries sector is growing more slowly than the fisheries sector's development.

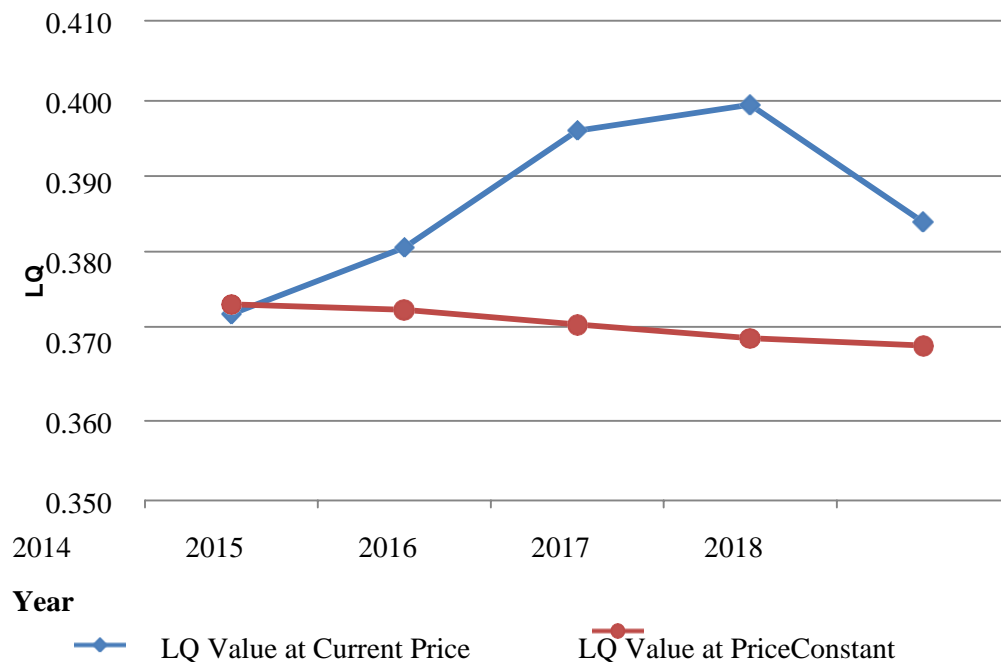


Figure 4. Development of LQ Value in the fisheries sector

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Regarding the economic base theory, the economic growth rate is determined by the amount of increase in exports. The production of 29 types of fishery products from 2014 to 2018, only four types of commodities were exported, namely tuna (*Thunnus albacores*), skipjack tuna (*Katsuwonus pelamis*), flying fish (*Decapterus ruselli*). Tiger prawns (*Peneaus monodon*). The export realization of the four types of fishery product commodities (Figure 5) from 2014 to 2016 showed a decline, both in production and in the value of production. This year, only three commodities were exported: tuna, skipjack, and tiger prawns (Department of Marine Affairs and Fisheries of North Gorontalo District 2018).

The decline in exports of fishery products is related to developing the LQ value in the fisheries sector. Thus, increasing production to meet export market demand and developing marketing strategies for four types of exported commodities must be seriously scrutinized and followed up by the government, particularly the Marine and Fisheries Service Office. According to Tarigan (2012), it is necessary to encourage growth from business sectors/fields whose products can be sold outside the region to generate income from outside the region. Assistance in providing employment and capital

assistance must be directed to business fields that produce the four types of exported fishery products, such as hand line, pole and line, and purse seine businesses.

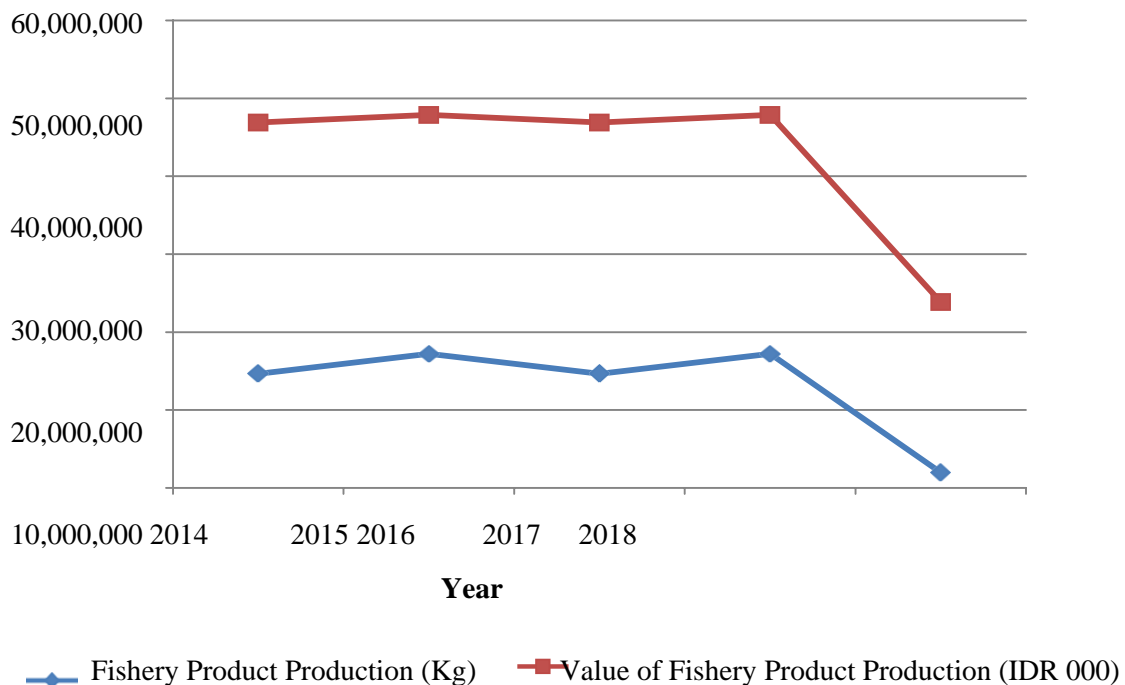
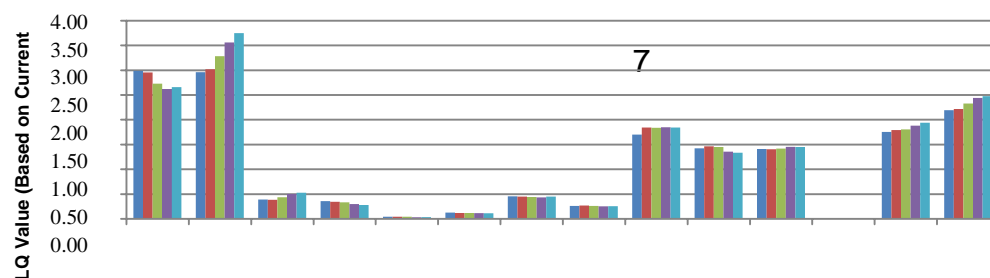


Figure 5. export realization of fishery products in North Gorontalo Regency 2014-2018

The fisheries sector in North Gorontalo Regency, is not a base sector; there are seven sub-districts which are the basis for the fisheries sector in North Gorontalo Regency namely, Kwandang, Anggrek, Gentuma and Atinggola Districts (Figure 6). These sub-districts have LQ values of more than 1 ($LQ > 1$) for five years (from 2014 to 2018), which are analyzed through the value of GRDP at both current and constant prices. Thus, fishery products' marketing in these seven sub-districts has brought in income from other regions, or the marketing reach has covered areas outside these sub-districts.



District in North Gorontalo Regency

Year 2014 2015 2016 2017 2018

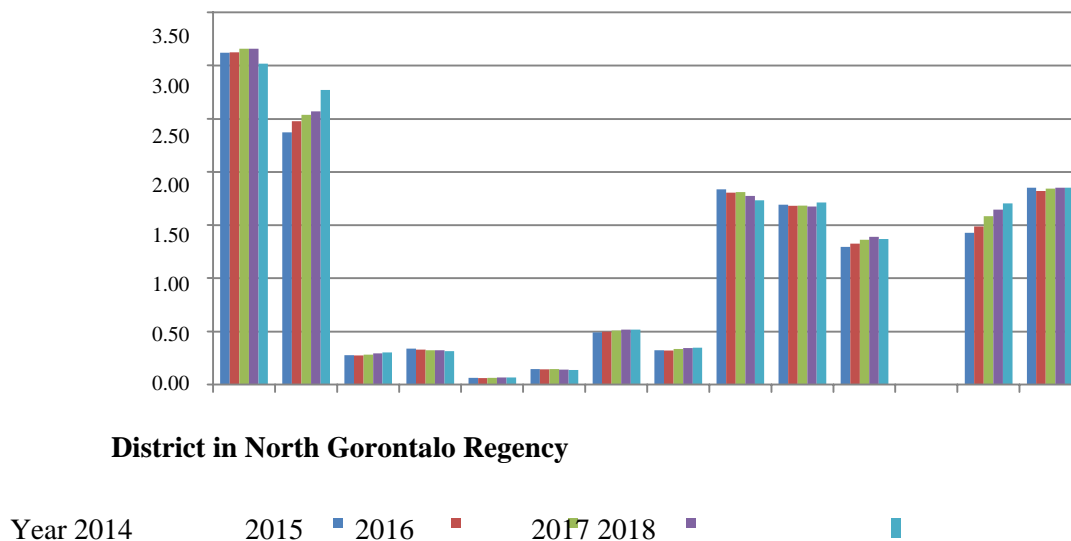


Figure 6. LQ Value of the District Fisheries Sector in North Gorontalo

District	(%)					
2014	-	101,999.45	-	549,294.18	-	447,294.72
2015	13.39	115,657.19	11.36	611,690.60	2.03	496,033.41
2016	13.60	131,388.25	8.05	660,937.62	5.55	529,549.37
2017	8.85	143,018.44	8.55	717,439.31	0.30	574,420.86
2018	9.02	155,920.88	14.43	820,949.14	-5.41	665,028.26
Avera	11.22	129,596.84	10.60	672,062.17	2.48	542,465.33

Source: Secondary data after processing, 2017

Table 5 shows the growth rate and per capita income of the fisheries sector above the current price. The growth fisheries sector ranges from 8.85% to 13.60% in five years or an average of 11.22% each year, while the growth rate of the fisheries sector in Gorontalo Province ranges from 8.05% to 14.43% for five years. or an average of 10.60% each year. The difference in the growth rate of the fisheries sector in the two regions shows that the growth rate of the fisheries sector for five years, this can be seen from the average value of the difference in the growth rate of the fisheries sector in the two regions of 2.48% (positive number).

Growth of Central	<p>Classification I</p> <p>Fast Developing and Fast-Growing Areas:</p> <ul style="list-style-type: none"> • Kecamatan Anggrek (Growth of 7,07% and The income per capita Rp. 148,485.67) 	<p>ClassificationII</p> <p>Developed area ButDepressed:</p> <ul style="list-style-type: none"> □ Atinggola District (Growth of 4.65% and Income per CapitaRp 239,311.33) • Gentuma District (Growth of 3.84%, and Income per capita of Rp 128,158.58)
	<p>Classification III</p> <p>Fast Developing Areas:</p> <ul style="list-style-type: none"> ✓ North Gorontalo District (Based on Price Current Price) • Kwandang District (Growth of 5.54%, and Income per capita income of Rp66,343.95) • Atinggola District (Growth of 7.46%, and Income per capita income of Rp61,204.05) 	<p>ClassificationIV</p> <p>Relative AreaLeft behind:</p> <ul style="list-style-type: none"> □ North Gorontalo District (Based on Constant) □ Orchid District (Growth of 2.83%, and a per capita 2,783.19) □ Gentuma District (Growth of 2.71%, and a per capita 6,274.69)
	North Gorontalo District Perapita Income	

Figure 7. Typology Scheme of the Fishery Sector in North Gorontalo District 2014 - 2018

There are differences in Klassen's typology in the North Gorontalo District's fisheries sector based on the value of GRDP at current prices and constant prices. Tarigan (2012) argues that to determine the increase in actual (real) income, the inflation factor must be issued first, and regional income with the inflation factor that has been eliminated is local income at constant prices. So the real (real) Klassen typology of the fishery sector is that the fisheries sector is currently in a relatively lagging state compared to the fisheries sector in Gorontalo Province (Figure 7).

Catch up of the fisheries sector, at least two critical indicators must be seen: the fishery sector's annual growth and the population's per capita income based on the fisheries sector's GRDP value. Of the 11 general policies that can be carried out to increase community income, which in available means improving the regional economy (Tarigan, 2012), systems that can be applied specifically for the fisheries sector in North Gorontalo District are:

1. Fishery sector products used only to meet local need⁷ should be endeavored to export, for example, by improving quality, improving marketing channels, or providing economic volumes to be marketed outside the region.
2. Efforts must be made for good and smooth transportation infrastructure and facilities.
3. Efforts should be made for the entry of investment funds from the government or the private sector.
4. People are encouraged to consume local products, and the industry is encouraged to use more local components.
5. Steps to improve human resources' quality need to be encouraged (skills/skills and moral/mental aspects).
6. Controlling population growth in North Gorontalo District

This policy should be prioritized in six sub-districts whose fisheries sector is relatively underdeveloped in North Gorontalo District. Kwandaang, Anggrek, Gentuma, and Atinggola, Sumalata sub-districts have profitable growth in the fisheries sector (classified as a fast developing area). However, they have a lower per capita income level from the fisheries sector, still need some of the above policies.

One of the sub-districts in the North Gorontalo Regency, whose fisheries sector is classified as fast-forward and fast-growing, is Kwandang, Anggerk, Gentuma, and Atinggola Districts. With the growth of the fisheries sector, this sub-district is the only area with growth and per capita income that exceeds the growth rate and per capita income of Gorontalo Utara Regency in aggregate.

CONCLUSION

The contribution of the fisheries sector of 6.20% per year based on current prices and 5.48% per year at constant prices places the fisheries sector in fifth and sixth rank in the formation of GRDP compared to 9 other sectors. The fisheries sector's contribution to the formation of GRDP is classified as low, so it is necessary to develop businesses in the fishery sector, both capture fisheries, and aquaculture.

There are 4 (four) sub-districts based on the fishery sector in the North Gorontalo Regency, including Kwandang, Anggerk, Gentuma, Atinggola Districts, which are not sector bases that need to be encouraged by the growth of fisheries commodities in local and international markets.

The fisheries sector is growing but is in a relatively underdeveloped condition, with growth and income per capita of the sector, which is small compared to the fisheries sector, classified as relatively underdeveloped, the development of fishery sector products must be prioritized. This is expected to help increase the growth of the fisheries sector.

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