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Leading commodities analysis of fisheries in bangka regency by using location quotient (LQ) methods, shift share analysis and klassen typology

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Abstract
The objectives of this research are to analyze the leading commodities of fisheries sub sector in Bangka regency. The method used in this research is descriptive method. Determination of the number of respondents used the slovin method and sampling respondents used the purposive sampling method. The analytical approach used is Location Quotient (LQ), Shift Share (SSA) analysis, and Klassen Typology. The result showed that, The capture fisheries sub sector in Bangka regency is a potential and non-base subsector, but growing faster than other sub-sectors in the Bangka Beiitung Islands Province. The results of the analysis, LQ, SSA and TK the main commodity of capture fisheries in Bangka Regency consists of 8 commodities in terms of production (tons) and production value (Rp). The types of fish are Tetengkek, Black Pomfret, Siro, Bloating, Coral Grouper, Rat Cucut, Stingray and Squid. The main commodity of fishing tools are gill nets, trawlers, fishing rods, traps and lift nets. From the results of this study it is recommended to continue to maintain the condition of fishing ground 8 species of fish caught, keep the fishing trip so that production is maintained for regional income and improve the welfare of fishermen in Bangka Regency.

Keywords: leading commodity; LQ; SSA; TK; Bangka regency

Introduction

A wide area of sea waters provides both biological and non-biological resources. One of the biological resources included in the leading commodity in capture fisheries is fish, both from the pelagic and demersal types (Sudirman, 2013). Leading commodity is a type of commodity that is the most desirable and has a high selling value and is expected to provide a large income compared to other types (Abdul Kohar and Danta, 2012). Leading commodities are expected to provide greater income compared to non-superior commodities. According to Resosudarmo *et al*. (2002), if utilized optimally and sustainably, the potential of Indonesia's marine resources can become the main capital of national development in the future. Some of the things that are driving factors are seen from Bangka Regency which is geographically or climatologically, a potential area for marine fisheries development. Unfortunately, this potential has not been accompanied by a clear and definite plan and direction for fisheries sector development to be carried out in a long-term and sustainable time. For this reason, a master plan for fisheries development in Bangka Regency is needed, which is expected to be a guideline for the implementation of fisheries development in the long term.

Bangka Regency is included in the Province of Bangka Belitung Islands which in the distribution of fishing areas is in the Fisheries Management Area (WPP) 711 South China Sea. The 711 Fisheries Management Area covers the Karimata Strait, the Natuna Sea and the South China Sea. Based on data on Gross Domestic Product (GRDP) in Bangka Regency, the fisheries subsector is part of the Agriculture, Forestry and Fisheries sector. The fisheries sub-sector in Bangka Regency experienced an average growth rate of 5.566% per year and an average contribution of 5.246% per year to the regional GRDP. Potential in the fisheries subsector includes aquaculture and capture fisheries.

Capture fisheries in Bangka Regency are more dominant than aquaculture. Sea fishing production in Bangka Regency has fluctuated. Sea fishing production in 2012 was 24,052.00 tons, in 2013 was 25,022.56, in 2014 was 26,754.33 in 2015 amounted to 26,005.42 tons, and in 2016 amounted to 26,785.55 tons (BPS Bangka Province Belitung, 2017).

Development of the marine and fisheries sector is an integral part of national development to be self-sufficient in the economic field, therefore it is necessary to plan to establish the linkages, alignment, suitability and continuity between developments carried out by the Regional Government. The development of the marine fisheries sector in Bangka Regency is currently very important in order to boost the economy in Bangka Regency. Determination of superior fishery commodity in Bangka Regency is the first step towards the development of fisheries which are based on the concept of efficiency to achieve comparative and competitive advantage in the face of trade globalization. Steps towards efficiency can be taken by using fisheries commodities that have a comparative advantage both in terms of supply and demand. In terms of supply of superior commodities, capture fisheries are characterized by superiority in growth in the biophysical, technological, and socio-economic conditions of fishermen that can be relied upon to increase income. From the demand side, leading competition, capture fisheries are characterized by strong demand in the market, both domestic and international markets (Hendayana, 2003) [4].

Several studies on the fisheries subsector have been carried out, among others, by Mudzakir *et al*. (2006) [7] who analyzed the leading fish commodity in capture fisheries in Cilacap Regency using Location Quotient (LQ); Arifin *et al*. (2013) [1] who analyzed the development of minapolitan in Gorontalo Province by using Klassen Typology (TK) and Shift Share Analysis (SSA) while Basuki *et al*. (2017) [3] analyzed the leading sectors of Sleman Regency using Shift

Share Analysis (SSA) and Location Quotient (LQ). Based on these studies, the purpose of this study is to analyze the leading commodities in the capture fisheries sub-sector in Bangka Regency with the Location Quotient (LQ) method, Shift Share Analysis (SSA), and Klassen Typology (TK).

Materials and Methods

This research was conducted in November 2018 until February 2019, located in all coastal districts of Bangka Regency, Bangka Belitung Islands Province. This research uses secondary data. Secondary data is statistical data that is available and relevant to this study. The secondary data was obtained from the Bangka Regency Fisheries Service and the Central Statistics Agency (BPS) of Bangka Regency for 5 years (time series). Secondary data taken in the study are presented in (Table 1).

Table 1: Secondary data taken in the study

No	Data Description	Source
1.	Bangka Regency in figures for 2012-2016	BPS of Bangka Regency
2.	Bangka Regency PDRB Data for 2012-2016	BPS of Bangka Regency
3.	Statistic of fisheries of Bangka Regency in 2012-2016	Bangka Regency fisheries agency
4.	Bangka Belitung in figures for 2012-2016	BPS of Bangka Belitung Province
5.	PDRB of Bangka Belitung Island Province in 2012-2016	BPS of Bangka Belitung Province
6.	Statistic of fisheries of Bangka Belitung Province in 2012-2016	DKP Bangka Belitung Province

Data processing

The data analysis method was carried out using the Klassen Typology, Location Quotient (LQ), and Shift Share Analysis (SSA) methods.

1. Location Quotient Analysis (LQ)

a. LQ Analysis of Sectors and Subsectors

In this analysis, the calculation is done that compares the ability of sector i in Bangka Regency with the ability of sector i in the Province of Bangka Belitung Islands. There are many variables that can be compared, but the general ones are value added (income level) and the number of jobs. The following is used is added value (income level). The formula is as follows.

$$LQ = \frac{xi/PDRB}{Xi / Xn}$$

Information :
xi = sector i added value in Bangka regency
PDRB = Bangka Regency gross regional domestic product
Xi = sector i added valun in Bangka Belitung Province
PNB = gross national product or GNP (Bangka Belitung Province

The term national territory can be interpreted as the parent region or superior territory. In this analysis, it is compared between Bangka Regency and Bangka Belitung Islands Province, then Province Bangka Belitung plays a role as a national territory.

According to Robinson (2006) if LQ> 1 means the role of the sector in the area is more prominent than the role of the sector nationally. Otherwise, f LQ <1 then the role of the sector in the region is smaller than the role of the sector nationally. LQ> 1 shows that the role of sector i is quite prominent in the area and often as an indication that the region has a surplus of sector i products and exports them to other regions. The area is only possible to export products to other regions or abroad because it is able to produce these products more cheaply or more efficiently. On that basis LQ> 1 implies that the region has a comparative advantage for the sector i.

a. LQ Analysis of Capture Fisheries Commodities

LQ analysis of leading fisheries commodities in Bangka Regency, is done by comparing the ability of fish commodity i in Bangka Regency with the ability of fish commodity i in Bangka Belitung Islands Province. The formula is as follows.

$$LQi = \frac{Xij/Xj}{Xin / Xn}$$

Information :
LQi = LQ value of fish species i
Xij = Production of i-type fish in Bangka Regency
Xj = Total production of capture fisheries in Bangka Regency
Xin = Total production of fish species of i Bangka Belitung Province
Xn = Total capture fisheries production in Bangka Belitung Province

According to Nyoman (2008), LQ formulation structure gives several values, namely LQ> 1, LQ = 1, LQ <1. If you use the production value as material calculation, then

- LQ more than 1 (LQ> 1): which means that this type
- LQ of fish commodity (capture fisheries) is a base sector which means the production of fish species (capture fisheries) has become a consumption need in Bangka Regency and the excess can be sold in the region (export).
- LQ is equal to 1 (LQ = 1): the production of fish species (capture fisheries) is only sufficient to meet the needs in Bangka Regency.
- LQ less than 1 (LQ <1): the production of fish species (capture fisheries) is not sufficient to meet consumption needs in Bangka Regency and fulfillment is imported from other regions.

1. *Shift Share* analysis (SSA)

Shift Share is a quantitative technique for analyzing changes in the economic structure of a region to the economic structure of a wider administrative region as a reference. The formula is as follows.

$$\Delta Y = PS + P + D$$

Wherein :
PS = Eij x Rn
P = Eij (Rin-Rn)
D = Eij (Rij-Rin)

Information :
ΔY = *Shift share* i-th category analysis area
PS = *Regional Share* i-th category analysis area
P = *Proportional Shift* i-th category analysis area
D = *Differential Shift* i-th category analysis area
Eij = PDRB region analysis sector in 2012-2016
Rn = Growth in total PDRB of the reference region in the last year against the total PDRB of the reference region in the previous year
Rin = PDRB growth in the i-sector reference region in th last year to PDRB in the i-sector reference region in the previous year
Rij = PDRB growth in the i-sector analysis area last year against PDRB region i-sector analysis in the previous year

According to Muta'ali (2018), if Proportional Shift (P) is positive it means that the sector is developing, and if negative means it has decreased. Furthermore, if the Differential Shift (D) is positive, it means that competitiveness is better than the reference area. So in this study Shift Share analysis is seen based on Proportional Shift (P) and Differential Shift (D) values.

2. Klassen's Typological Analysis

Klassen Typology Analysis is used to determine the grouping of fisheries and capture fisheries sub-sectors in Bangka Regency according to their growth structure. This analysis is carried out using the Klassen Matrix, which groups the fisheries and capture fisheries sub-sector into four groups by utilizing the rate of growth and the contribution value of the subsector and commodity.

According to Mahmudi (2010) [6], to conduct a Klassen Typology analysis, the steps that need to be taken are:

1. calculate the average GRDP per sector
2. calculate the sector average
3. calculate the GDP growth rate and the growth rate of each sector
4. classifying each sector into a classic matrix

The analysis is carried out by looking at the comparison of growth and contribution of the economic sector in Bangka Regency by referring to the Klassen Matrix table. The Klassen Matrix Table is presented in (Table 2).

Table 2: Klassen Matrix

Quadrant 1 Leading sector Si > S and Ski > Sk	**Quadrant II** Developing sector Si < S and Ski > Sk
Quadrant III Potential sector Si > S and Ski < Sk	**Quadrant IV** Underdeveloped sector Si < S and Ski < Sk

Results

Analysis of Fisheries Subsector

The fisheries subsector analysis is based on the results of the Location Quotient (LQ), Shift Share Analysis (SSA), and Klassen Typology (TK) analyzes that have been carried out. The results of the fisheries sub-sector analysis can be seen in (Table 3).

Table 3: Analysis of Fisheries Subsector

No	Aspect	Parameter	Mean
1.	LQ	< 1	Not base
2.	P	Positif	Developing
3.	D	Positif	High Competitiveness
4.	Klassen Typology	Quadrant III	Potential subsector

***Source*:** Analysis results, 2019

Analysis of Commodities

The results of the analysis using the LQ, SSA and TK Methods can be seen in (Table 4).

Table 4: Determination of Main Commodities of Capture Fisheries in Bangka Regency

No	Name of fish type	Value production LQ	SSA		Quadran	Information
			P	D	Klassen Matriks	
1	*Manyung*	1.505	+	-	2	Not base
2	*Ekor Kuning*	0.675	+	-	4	Not base
3	*Selar*	2.953	+	-	2	Not base
4	*Kuwe*	0.337	+	-	4	Not base
5	*Tetengkek*	4.849	-	+	1	Base
6	*Bawal Hitam*	1.568	-	+	1	Base
7	*Daun bambu/Talang-talang*	1.065	+	-	4	Not base
8	*Bentong*	7.695	-	-	2	Not base
9	*Golok-golok*	0.628	+	-	4	Not base
10	*Siro*	3.051	-	-	1	Base
11	*Tembang*	0.999	+	-	4	Not base
12	*Ikan Layaran*	7.135	-	-	2	Not base
13	*Kakap Merah*	0.728	+	-	4	Not base
14	*Kurisi*	1.391	-	-	2	Not base
15	*Tongkol Komo*	3.674	+	-	2	Not base
16	*Kembung*	1.502	-	+	1	Base
17	*Tenggiri*	0.453	-	+	3	Not base
18	*Tenggiri Papan*	3.293	-	-	2	Not base
19	*Kerapu Karang*	2.714	-	+	1	Base
20	*Kerapu Sunu*	0.328	+	-	4	Not base
21	*Alu-alu/Manggilala*	1.823	+	-	2	Not base
22	*Cucut tikus*	7.662	+	+	1	Base
23	*Cucut lanyam*	3.324	+	-	2	Not base
24	*Pari Kembang*	6.013	-	+	1	Base
25	*Pari Burung*	2.285	+	-	2	Not base
26	*Udang barong/Karang*	1.380	-	-	2	Not base
27	*Rajungan*	0.497	+	-	4	Not base

28	*Cumi-cumi*	1.223	-	+	1	Not base

***Source*:** Analysis Data, 2019

Based on the results of the analysis, the main commodity of capture fisheries obtained in Bangka Regency consists of small pelagic fish, large pelagic fish, demersal, crustaceans, and other marine animals. Main commodities of capture fisheries in Bangka Regency are presented in (Table 5).

Table 5: Leading Commodities of Fisheries in Bangka Regency

No	Name of fish type	Latin name fish	Group	Information
1.	*Tetengkek*	*Megalaspis cordyla*	Small pelagic	Base
2.	*Bawal Hitam*	*Formio niger*	Small pelagic	Base
3.	*Siro*	*Amblygaster sirm*	Small pelagic	Base
4.	*Kembung*	*Rastrelinger* sp.	Small pelagic	Base
5.	*Kerapu Karang*	*Cephalopholis bunack*	Big pelagic	Base
6.	*Cucut tikus*	*Alopias pelagicus*	Big pelagic	Base
7.	*Pari Kembang*	*Amphotistus kuhlii*	Demersal	Base
8.	*Cumi-cumi*	*Loligo* sp.	Mollusca	Base

***Source*:** Result Analysis, 2019

Type of fishing gear

The fishing gear used by fishermen to catch superior Commodity fish there are 9 different fishing gear, as follows:

Table 6: Classification types of fishing gear

No	Classification of Permen KP	Type of fishing gear	Leading commodities types of fish by catch
1	Gillnet	Bottom gillnet	*Pari Kembang*
		Drift gillnet	*Kembung, Bawal hitam, Siro*
		Trammel nets	*Udang*
2	Seine nets	*Payang*	*Bawal hitam*
3	Surrounding nets	Mini purse seine	*Tetengkek*
4	Hooks	Bottom rawai	*Pari, cucut*
5	Traps	*Bubu*	*Kerapu karang*
6	Lift nets	*Bagan tancap*	*Cumi-cumi*

***Source*:** Result analysis, 2019

Discussion

Analysis of Fisheries Subsector

Based on the results of the analysis in (Table 3), the fisheries subsector in Bangka Regency is a non-base subsector (LQ <1) but includes a growing subsector (positive P value) and has high competitiveness (positive D value) in the Bangka Belitung Islands Province. This subsector is classified as a potential subsector (Quadrant III). Referring to the statement of Mahmudi (2010) [6], under these conditions it is recommended to continue to develop the fisheries sub-sector in terms of human resource development (HR), technology updates, yield processing and infrastructure development considering that this subsector is a potential subsector.

Leading commodity analysis

The capture fisheries commodities in Bangka Regency analyzed consisted of 28 types, namely Manyung, Ekor Kuning, Selar, Kuwe, Tetengkek, Bawal Hitam, Daun bambu/Talang-talang, Bentong, Golok-golok, Siro, Tembang, Ikan Layaran, Kakap Merah, Kurisi, Tongkol Komo, Kembung, Tenggiri, Tenggiri Papan, Kerapu Karang, Kerapu Sunu, Alu-alu/Manggilala, Cucut tikus/monyet, Cucut lanyam, Pari Kembang/Macan, Pari Burung, Udang barong/Karang, Rajungan, and Squid. Used the same analytical method as the fisheries sub-sector in Bangka Regency, the main commodity of the capture fisheries sub-sector is determined. Location Quotient Analysis (LQ) is calculated based on the results of production and production value, it aims to determine the basic commodity in terms of the results and production value of Bangka Regency capture fisheries. LQ value> 1 indicates that the capture fisheries commodity is a basic commodity, meaning that the commodity is surplus in Bangka Regency and can carry out export activities outside the region. On the other, LQ value <1 indicates that the capture fisheries commodity is not included as a base commodity, so in an effort to meet the needs of the commodity Bangka Regency must supply it from outside the region. Furthermore, Shift Share (SSA) analysis is used to determine the components of regional share growth. If P or D of a capture fisheries commodity is positive (> 0), then the commodity is able to compete with the same commodity as other regions. The Klassen Typology (TK) analysis is used to determine the grouping of capture fisheries commodities in the Regency according to their growth structure. This analysis is carried out using the Klassen Matrix, which classifies capture fisheries commodities into four groups by utilizing the growth rate and the value of sector contributions.

Analysis of the determination of leading fisheries commodities is also done by looking at the results of the analysis of LQ, Shift Share, and Klassen Typology of each capture fisheries commodity in Bangka Regency. Main commodities of capture fisheries are commodities that are included in the Quadrant I Klassen Matrix, are basic commodities (LQ based on yield and production value> 1). Based on the results of the research presented in Table 5, there are 8 leading capture fisheries commodities in Bangka Regency. Among them, Tetengkek fish (*Megalaspis cordyla*), Bawal Hitam (*Formio niger*), Siro (*Amblygaster sirm*), Kembung (*Rastrelinger* sp.), Kerapu Karang (*Cephalopholis bunack*), Cucut Tikus (*Alopias pelagicus*), Pari Kembang (*Amphotistus kuhlii*), and Squid (*Loligo* sp.).

Main commodities of capture fisheries in Bangka Regency consist of small pelagic, large pelagic, demersal, and crustacean groups. Small pelagic fish groups consist of 4 commodities are Tetengkek fish (*Megalaspis cordyla*), Bawal Hitam (*Formio niger*), Siro (*Amblygaster sirm*), and Kembung (*Rastrelinger* sp.). The big pelagic fish group consists of 2 commodities are Kerapu Karang (*Cephalopholis bunack*), and Cucut Tikus (*Alopias pelagicus*). Furthermore, demersal fish groups consist of 1 commodity are Pari Kembang (*Amphotistus kuhlii*). While the Mollusca group consists of 1 commodity are Squid (*Loligo* sp.).

The main commodity of capture fisheries in Bangka Regency must be managed well and sustainably. Based on the theory presented by Mahmudi (2010) [6] that in the condition of a superior sector that needs to be done is to maintain a source of income for intergenerational fiscal sustainability. With a high ability to manage does not mean that the existing potential must be fully exploited at this time resulting in the next generation no longer enjoying the potential income. According to Widodo and Suadi (2008), fisheries management techniques can be done in several ways, including: 1.) Setting the size of the net (from trawl or fishing gear used); 2.) Setting the size limit of fish that can be caught, landed, or marketed; 3.) Control of the fishing season; 4.) Control over fishing areas; 5.) Settings for fishing gear and equipment outside the mesh size; 6.) Improvement and improvement of biological resources; and 7.) Arrangement of total catches per species, species group, or if possible per location or region.

Every direct action related to all types of fish and other biological resources in a particular area. Fishing activities need to be regulated so that the management carried out can be sustainable. The potential potential must be maintained but not forgetting the economic aspects. The welfare of fishermen must continue to be improved by updating technology, maintaining the preservation of spawning areas and the growth of fish in order to maintain resource stocks. Given according to Kurniawan (2019) [5], stated that 90% of fishermen are small fishermen (under 10 GT) so that their lives are highly dependent on natural conditions. For that, the need for the role of all parties by promoting participatory based planning in sustainable fisheries resource management.

Conclusions

Based on the results of research and discussion can be concluded as follows are the fisheries subsector in Bangka Regency is a potential and non-base subsector, but grows faster than the same subsector or other subsectors in the Bangka Belitung Islands Province. Main commodities of capture fisheries in Bangka Regency consist of 8 commodities of capture fisheries in Bangka Regency. Among them, Tetengkek (Megalaspis cordyla), Bawal Hitam (Formio niger), Siro (Amblygaster sirm), Kembung (Rastrelinger sp.), Kerapu Karang (Cephalopholis bunack), Cucut Tikus/ Monyet (Alopias pelagicus), Pari Kembang/ Macan (Amphotistus kuhlii), dan Cumi-cumi (Loligo sp.).

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References

1. Arifin T, Kepel TL, Amri SN, Suryawati SH. Analisis Tipologi Wilayah Dalam Mendukung Pengembangan Minapolitan Di Provinsi Gorontalo. J Kebijakan Sosek KP (3) No. 1 Tahun 2013, 2013.
2. Badan Pusat Statistik. 2017. Kabupaten Bangka Dalam Angka: BPS Bangka, 2017.
3. Basuki M, Mujiraharjo FH. Analisis Sektor Unggulan Kabupaten Sleman dengan Metode Shift Share dan Location Quotient. Jurnal Sains, Teknologi dan Industri, 2017; (15):52-60. ISSN 1693-2390
4. Hendayana R. Aplikasi Metode Location Quotient (LQ) dalam Penentuan Komoditas Unggulan Nasional. Informatika Pertanian, 2003. 12(1).
5. Kurniawan K. Keragaan Unit Penangkap Ikan di Kabupaten Bangka Selatan. Aquatic Science. 2019; 1(1):20-32.
6. Mahmudi Manajemen Keuangan Daerah. Erlangga, Jakarta, 2010.
7. Mudzakir AK, Suherman A. Analisis Location Quotient (LQ) dalam Penentuan Komoditas Ikan Unggulan Perikanan Tangkap Kabupaten Cilacap. Diponegoro University Institutional Repository, 2006.
8. Muta'ali Luthfi. Dinamika Peran Sektor Pertanian dalam Pembangunan Wilayah di Indonesia. Gadjah Mada University Press, Yogyakarta, 2018
9. Ridwan, Baso N. Perencanaan Pembangunan Daerah. Alfabeta, Bandung, 2017
10. Robinson T. Ekonomi Regional (Teori dan Aplikasi). Bumi Aksara, Jakarta, 2006
11. Widodo J, Suadi. Pengelolaan Sumberdaya Perikanan Laut. Gadjah Mada University Press, Yogyakarta, 2008.