

# **SUPERIOR FISHING COMMODITIES IN SOUTHCOAST OF EAST JAVA, INDONESIA**

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**Abstract:** Indonesia is the largest archipelagic country in the world and has various marine resources. Fishery development is one of the priorities of East Java Province Government and the selection of the superior fishing commodities becomes important to fishery growth. The objective of this research is to select the superior fishing commodities in Southcoast of East Java Province, including eight Districts: Pacitan, Trenggalek, Tulungagung, Blitar, Malang, Lumajang, Jember, and Banyuwangi. Both Location Quotient models in quantity and value are developed and the fishing data during 2013-2017 are adopted in the study. As results, the superior fishing commodities by quantity, by value, and by both quantity and value are selected for the whole Southcoast of East Java Province and eight districts respectively. The result shows that the most fishing commodities quantities of production are Scads, Fringe scale sardinella, Short bodied mackerel, Indian oil sardinella, Skipjack tuna, Anchovies, Big eyes, Kawa kawa, Frigate tuna, and Hairtail. The biggest production is scad. The most valuable fishing commodity in Southcoast of East Java Province is hairtail with 154,324.8 million rupiah, while Tuna and Skipjack generate value amount 484,652.43 million Rupiah each year. Finally, policy implications and strategies are proposed for the superior fishing commodities in Southcoast of East Java Province.

**Keywords:** *Location Quotient Model, Southcoast of East Java Province, Superior Fishing Commodities*

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## **INTRODUCTION**

Indonesia is the largest archipelagic country in the world with 17,508 islands and 81,000 km of coastline. Seventy percent of Indonesia's territory is the sea. Huge coastal and oceanic areas have big potential for the development of various natural resources and environmental services that have not been utilized optimally. As the world's population increases and the depletion of development resources in the mainland increases, demand for marine products and services is expected to increase (Resosudarmo et.al, 2002).

The determination of superior commodities in a District is the first step towards the development of fisheries based on the concept of efficiency to achieve comparative and competitive advantage in facing trade globalization, which will be faced by

the people of Indonesia. Step toward efficiency can be reached by using commodities that have comparative advantages both in terms of supply and demand both domestically and internationally (Syafaat and Supena, 2000).

The existence of superior commodities means a country capable of producing products with distinctive attributes that are caused by the presence of domestic resource factors. Provision of quality products must be done followed by increased productivity and efficiency so that the commodity has a high competitiveness. Superior commodities are expected to provide greater income than other commodities (Sembiring, 2009).

The objective of this research is to select the superior fishing commodities of eight districts in the Southcoast of East Java Province through the

Location Quotient model and to propose policy implications of fishery development. The fishing data during 2013-2017 are used for the analysis.

## RESEARCH METHODS

To analyze the superior commodity, this research used the Location Quotient (LQ) model. All types of fishery commodities in 8 districts in Southcoast of East Java Province will be analyzed using LQ model based on fishing quantities of production. The model will be calculated as follows:

$$LQ_q = \frac{pid/pd}{pir/pr} \quad (1)$$

Where:

LQq : Location Quotient quantity of fishing production

pid : quantity of fishing commodity (i) in each district (d)

pd : quantity of all fishing commodity in each district (d)

pir : quantity of fishing commodity (i) in Southcoast of East Java

pr : quantity of all fishing commodity in Southcoast of East Java Province

Criteria for determining the superior commodity are:

- If  $LQ_q > 1$ , then commodity (i) is the superior commodity, meaning that quantity of commodity (i) can fulfill the demand of that district also able to export to other district.
- If  $LQ_q = 1$ , then commodity (i) is not the superior commodity, meaning that the quantity of commodity (i) is only sufficient to meet the needs of the district
- If  $LQ_q < 1$  then commodity (i) is not the superior commodity, it means that commodity quantity in the District cannot meet its own needs and must import from other districts (Solikin, 2018).

All types of fisheries commodities in 8 districts in Southcoast of East Java Province also will be analyzed using LQ method based on fishing value. The model will be calculated as follows:

$$LQ_v = \frac{vid/vd}{vir/vr} \quad (2)$$

Where:

LQv : Location Quotient value of fishing production

vid : Value of fishing commodity (i) in each district (d)

vd : Value of all fishing commodity in each district (d)

vir : Value of fishing commodity (i) in Southcoast of East Java Province

vr : Value of all fishing commodity in South Coast of East Java Province

Criteria for determining the superior commodity:

- If  $LQ_v > 1$ , then commodity (i) is the superior commodity, meaning that commodity (i) has been able to meet local needs and can be export to other district (d).
- If  $LQ_v = 1$ , then commodity (i) is not the superior commodity, meaning that the value of the commodity (i) is only sufficient to meet district needs.
- If  $LQ_v < 1$  then commodity (i) is not the superior commodity, it means that commodity (i) value in the district cannot cover local needs (Hardiani, 2017).

## RESULTS AND DISCUSSION

The Location quotient analysis was done to investigate the commodities which became the superior commodity in each District. This analysis uses time series production data of 96 fishing commodities in Southcoast of East Java Province during 2013 – 2017.

Pacitan District is in the west of all District in East Java Province. The LQ analysis result of this District shows that Scads, yellowfin tuna, skipjack tuna, common dolphinfish, Indo-pacific sailfish, dogfish shark, requiem sharks, sea catfish, silver pomfret, croackers, hairtail, devil rays, eagle rays, and honeycomb grouper have become the superior fishing commodity due to the LQq and LQv value of those commodities is higher than 1 (>1). Dorab wolf herring become superior fishing commodity in value due to only LQv result that higher than 1. Longtail tuna and Sea catfish become a superior commodity in production due to only LQq result that higher than 1. Dogfish shark has the biggest LQq value and Devil rays has the biggest LQv. This result means that the production and the value of those superior commodities has been able to meet local needs and can be export to other District outside Pacitan District.

The LQ analysis result of Trenggalek District shows that Bigeye scad, needlefish, scads, trevallies, fringescale sardinella, hardtail scad, bigeye tuna, frigate tuna, bullet tuna, stripped bonito, spotted chub mackerel, Indo-pacific sailfish, black marlin, Indo-pacific king mackerel, requiem sharks, thresher shark, pony fish, big eyes, croackers, hairtail, and devil rays have become the superior fishing commodity due to the LQq and LQv value of those commodities is higher than 1 (>1). Common dolphinfish, saddle grunt and barracuda become a superior fishing commodity in value due to only LQv result that higher than 1. Bullet tuna has the biggest LQq and LQv value. This result means that the production of those superior commodities has been able to meet local needs and can be export to other District outside Trenggalek District.

Table 1. Superior fishing commodity in Pacitan District

No	Commodity	LQq	LQv	Superior Commodity	
				Quantities	Values
1	Scad	1.18	2.22	x	x
2	Yellowfin tuna	4.56	2.44	x	x
3	Longtail tuna	1.36	0.75	x	
4	Skipjack tuna	2.11	1.39	x	x
5	Common dolphinfish	7.64	6.48	x	x
6	Indo-pacific sailfish	7.33	6.77	x	x
7	Dogfish shark	9.16	8.86	x	x
8	Requiem sharks	6.19	5.48	x	x
9	Sea catfish	2.11	0.96	x	
10	Silver pomfret	2.65	3.27	x	x
11	Dorab wolf herring	0.02	2.00		x
12	Senangin threadfin	8.12	6.02	x	x
13	Croackers	1.86	1.30	x	x
14	Hairtail	3.58	3.14	x	x
15	Devilrays	5.67	5.75	x	x
16	Eaglerays	1.86	1.99	x	x
17	Honeycomb grouper	1.86	1.99	x	x

Source: BPS data analyzed

The LQ analysis result of Tulungagung District shows that Anchovies, rainbow sardine, needle fish, indian mackerel, short bodied mackerel, moonfish, bigeye tuna, Southern blue tuna, kawa kawa, skipjack tuna, Common dolphinfish, black pomfret, Sea catfish, Indian halibut, blue and gold fusilier, flat fish, pony fish, barramundi, threadfin breams, four finger threadfin, hairtail, and humpback grouper, and flat fish have become the superior fishing commodity due to the LQq and LQv value of those commodities is higher than 1 (>1). Red snapper become superior fishing commodity in quantity due to only LQv result that higher than 1. Scad, frigate tuna, and orange spotted spinefoot become superior fishing commodity in value due to

only LQv result that higher than 1. Flat fish has the biggest LQ value. This result means that the production of those superior commodities has been able to meet local needs and can be export to other District outside Tulungagung District.

Table 2. Superior fishing commodity in Trenggalek District

No	Commodity	LQq	LQv	Superior Commodity	
				Quantities	Values
1	Bigeye scad	4.46	4.89	x	x
2	Needle fish	1.12	1.59	x	x
3	Scad	1.45	3.47	x	x
4	Trevallies	1.71	1.31	x	x
5	Fringescale sardinella	4.29	4.12	x	x
6	Hardtail scad	5.10	5.40	x	x
7	Bigeye tuna	3.64	3.30	x	x
8	Frigate tuna	1.10	1.40	x	x
9	Bullet tuna	6.86	8.44	x	x
10	Stripped bonito	3.91	3.84	x	x
11	Spotted chub mackerel	1.45	2.37	x	x
12	Common dolphinfish	0.56	1.05		x
13	Indo-pacific sailfish	3.47	3.14	x	x
14	Black marlin	3.46	5.15	x	x
15	Indo-pacific king mackerel	4.97	5.52	x	x
16	Requiem sharks	2.11	2.94	x	x
17	Thresher shark	1.21	2.03	x	x
18	Saddle grunt	0.92	1.48		x
19	Pony fish	1.50	2.19	x	x
20	Big eyes	1.11	1.81	x	x
21	Croackers	2.15	3.21	x	x
22	Barracuda	0.26	4.63		x
23	Hairtail	1.30	1.64	x	x
24	Devilrays	1.43	2.21	x	x

Source: BPS data analyzed

The LQ analysis result of Malang District shows that Anchovies, scads, albacore, yellowfin tuna, kawa kawa, skipjack tuna, spearfish short bill, and black marlin have become the superior fishing commodity due to the LQ value of those commodities is higher than 1 (>1). Albacore has the biggest LQ value. This result means that the production of those superior commodities has been able to meet local needs and can be export to other District outside Malang District.

The LQ analysis result of Blitar District shows that Houndfish, queenfish, Indian mackerel, scads, trevallies, rainbow runner, kawa kawa, frigate tuna, spotted chub mackerel, requiem shark, tiger shark, emperors, red snapper, barracuda, starry triggerfish, greasy rockcod, gold banded job fish, and shovel nose rays have become the superior fishing commodity due to the LQ value of those commodities is higher than 1 (>1). Short bodied mackerel, stripped bonito, and narrow barred king mackerel become superior fishing commodity in value due to only LQv result that higher than 1.

Shovel nose rays has the biggest LQq and LQv value. This result means that the production of those superior commodities has been able to meet local needs and can be export to other District outside Blitar District.

Table 3. Superior fishing commodity in Tulungagung District

No	Commodity	LQq	LQv	Superior Commodity	
				Quantities	Values
1	Anchovies	3.04	1.19	x	x
2	Rainbow sardine	13.40	12.48	x	x
3	Needle fish	1.12	1.73	x	x
4	Indian mackerel	1.82	1.15	x	x
5	Short bodied mackerel	2.90	8.26	x	x
6	Scad	0.74	1.29	x	x
7	Moonfish	7.78	9.83	x	x
8	Bigeye tuna	10.83	10.95	x	x
9	Southern blue tuna	36.49	39.71	x	x
10	Kawa kawa	1.53	1.20	x	x
11	Frigate tuna	0.44	1.37	x	x
12	Skipjack tuna	1.41	1.20	x	x
13	Common dolphinfish	2.21	3.11	x	x
14	Sea catfish	5.92	6.74	x	x
15	Indian halibut	44.53	36.86	x	x
16	Blue and gold fusilier	6.93	6.65	x	x
17	Black pomfret	15.75	12.70	x	x
18	Flat fish	52.90	45.84	x	x
19	Pony fish	1.59	1.13	x	x
20	Barramundi	1.88	1.88	x	x
21	Red snapper	1.15	0.52	x	x
22	Threadfin breams	17.68	12.20	x	x
23	Four finger threadfin	6.19	15.47	x	x
24	Hairtail	2.38	2.39	x	x
25	Humpback grouper	10.13	7.74	x	x
26	Orange spotted spinefoot	0.50	3.87	x	x

Source: BPS data analyzed

Table 4. Superior fishing commodity in Malang District

No	Commodity	LQq	LQv	Superior Commodity	
				Quantities	Values
1	Anchovies	3.93	2.54	x	x
2	Scad	1.05	1.47	x	x
3	Albacore	6.75	6.18	x	x
4	Yellowfin tuna	4.60	5.55	x	x
5	Kawa kawa	4.28	3.37	x	x
6	Skipjack tuna	2.63	1.84	x	x
7	Spearfish shortbill	1.07	1.25	x	x
8	Black marlin	3.23	1.78	x	x

Source: BPS data analyzed

Table 5. Superior fishing commodity in Blitar District

No	Commodity	LQq	LQv	Superior Commodity	
				Quantities	Values
1	Houndfish	26.45	49.95	x	x
2	Queenfishes	7.57	13.85	x	x
3	Indian mackerel	24.77	32.07	x	x
4	Short bodied mackerel	0.94	2.28	x	x
5	Scad	2.35	3.13	x	x
6	Trevallies	4.42	9.44	x	x
7	Rainbow runner	3.05	6.69	x	x
8	Kawa kawa	5.50	10.16	x	x
9	Frigate tuna	1.31	3.75	x	x
10	Stripped bonito	0.99	2.97	x	x
11	Spotted chub mackerel	1.31	3.80	x	x
12	Narrow barred king mackerel	0.98	1.42	x	x
13	Requiem sharks	11.05	20.06	x	x
14	Tiger shark	31.84	55.25	x	x
15	Emperors	29.90	52.02	x	x
16	Red snapper	1.90	1.99	x	x
17	Goldbanded jobfish	31.84	55.25	x	x
18	Barracuda	1.06	2.21	x	x
20	Shovel noserays	40.34	75.69	x	x
21	Starry triggerfish	7.57	13.85	x	x
22	Greasy rockcod	2.23	2.98	x	x

Source: BPS data analyzed

Table 6. Superior fishing commodity in Lumajang District

No	Commodity	LQq	LQv	Superior Commodity	
				Quantities	Values
1	Houndfish	7.89	7.79	x	x
2	Flying fish	10.70	13.61	x	x
3	Indian mackerel	2.03	1.23	x	x
4	Short bodied mackerel	3.49	10.39	x	x
5	Indian oil sardinella	2.53	1.50	x	x
6	Trevallies	9.71	14.09	x	x
7	Hardtail scad	2.02	2.59	x	x
8	Longtail tuna	2.53	4.36	x	x
9	Frigate tuna	2.81	7.68	x	x
10	Spotted chub mackerel	5.48	7.67	x	x
11	Sea catfish	0.70	1.39	x	x
12	Indian halibut	1.39	1.64	x	x
13	Jack trevallies	1.46	1.46	x	x
14	Black pomfret	4.83	6.31	x	x
15	Silver pomfret	4.85	5.51	x	x
16	Dorab wolf herring	24.89	38.84	x	x
17	Flat fish	1.89	2.42	x	x
18	Saddle grunt	8.97	14.06	x	x
19	Emperors	3.41	4.34	x	x
20	Barramundi	1.29	1.89	x	x
21	Threadfin breams	1.22	1.27	x	x
22	Sulphur goatfish	11.10	18.37	x	x
23	Indian goatfish	5.35	7.84	x	x
24	Big eyes	14.22	18.88	x	x
25	Croackers	5.28	8.75	x	x
26	Blue lined seabass	1.20	0.53	x	x
27	Humpback grouper	3.40	2.80	x	x
28	Honeycomb grouper	6.50	4.38	x	x
29	Greasy rockcod	1.43	1.22	x	x
30	Leopard coral grouper	2.22	0.86	x	x
31	White spotted spinefoot	2.18	10.82	x	x
32	Barhed spinefoot	1.38	7.88	x	x
33	Orange spotted spinefoot	2.66	4.96	x	x

Source: BPS data analyzed

The LQ analysis result of Lumajang District shows that hound fish, flying fish, Indian mackerel, short bodied mackerel, Indian oil sardinella, trevallies, hardtail scad, longtail tuna, frigate tuna, spotted chub mackerel, Indian halibut, jack trevallies, black pomfret, silver pomfret, dorab wolf

herring, flat fish, saddle grunt, emperors, barramundi, threadfin breams, sulphur goatfish, Indian goatfish, big eyes, croackers, humpback grouper, honeycomb grouper, greasy rockcod, white spotted spinefoot, barhed spinefoot, and orange spotted spinefoot have become the superior fishing commodity due to the LQ value of those commodities is higher than 1 (>1). Blue lined seabass and leopard coral grouper become superior fishing commodity in quantity due to only LQq result that higher than 1. Sea catfish become superior fishing commodity in value due to only LQv result that higher than 1. Dorab wolf Herring has the biggest LQ value. This result means that the production of those superior commodities has been able to meet local needs and can be export to other District outside Lumajang District.

The LQ analysis result of Jember District shows that Anchovies, mullets, needle fish, short bodied mackerel, Indian oil sardinella, frigate tuna, stripped bonito, skipjack tuna, narrow barred king mackerel, hammerhead sharks, thresher shark, sea catfish, Indian halibut, blue and gold fusilier, black pomfret, silver pomfret, saddle grunt, sweetlips, emperors, red snapper, Indian goatfish, red bigeye, barracuda, stingrays, shovel nose rays, white spotted wedge fish, blue lined seabass, orange spotted spinefoot and parrot fish have become the superior fishing commodity due to the LQ value of those commodities is higher than 1 (>1).

Fringe scale sardinella, bigeye tuna, leopard coral grouper, and white spotted spinefoot become superior fishing commodity in quantity due to only LQq result that higher than 1. Hound fish, barramundi, big eyes, and croackers become superior fishing commodity in value due to only LQv result that higher than 1. Hammerhead sharks has the biggest LQ value. This result means that the production of those superior commodities has been able to meet local needs and can be export to other District outside Jember District.

The LQ analysis result of Banyuwangi District shows that mullets, flying fish, indian mackerel, short bodied mackerel, indian oil sardinella, fringescale sardinella, longtail tuna, stripped bonito, narrow barred king mackerel, Jack trevallies, fals trevallies, pony fish, barramundi, red snapper, threadfin breams, goatfish, yellow tail/fusilier, blue lined seabass, humpback grouper, greasy rockcod, and leopard coral grouper have become the superior fishing commodity due to the LQ value of those

commodities is higher than 1 (>1). Bigeye scad, stripped bonito, spotted chub mackerel, spearfish short bill, sulphur goatfish, barracuda, eagle rays, and honeycomb grouper become superior fishing commodity in quantity due to only LQq result that higher than 1. Scad become superior fishing commodity in value due to only LQv result that higher than 1. Short bodied mackerel and leopard coral grouper, has the biggest LQ value. This result means that the production of those superior commodities has been able to meet local needs and can be export to another District outside Banyuwangi District.

Table 7. Superior fishing commodity in Jember District

No	Commodity	LQq	LQv	Superior Commodity	
				Quantities	Values
1	Anchovies	1.96	2.95	x	x
2	Mullets	1.86	1.06	x	x
3	Houndfish	0.43	1.09		x
4	Needle fish	6.72	6.14	x	x
5	Short bodied mackerel	2.68	4.30	x	x
6	Indian oil sardinella	1.67	1.47	x	x
7	Fringescale sardinella	1.17	0.87	x	
8	Bigeye tuna	1.19	0.73	x	
9	Frigate tuna	5.07	4.92	x	x
10	Stripped bonito	1.17	1.64	x	x
11	Skipjack tuna	2.22	2.77	x	x
12	Narrow barred king mackerel	1.61	1.26	x	x
13	Hammerhead sharks	8.85	7.27	x	x
14	Thresher shark	1.31	1.29	x	x
15	Sea catfish	2.95	4.13	x	x
16	Indian halibut	1.50	1.27	x	x
17	Blue and gold fusilier	2.43	3.56	x	x
18	Black pomfret	6.87	5.00	x	x
19	Silver pomfret	3.88	2.44	x	x
20	Saddle grunt	2.15	3.00	x	x
21	Sweetlips	2.43	3.56	x	x
22	Emperors	1.64	2.41	x	x
23	Earramundi	0.96	2.81		x
24	Red snapper	3.80	3.27	x	x
25	Indian goatfish	1.22	1.51	x	x
26	Big eyes	0.72	1.69		x
27	Red bigeye	2.43	3.56	x	x
28	Croackers	0.98	1.29		x
29	Barracuda	2.14	2.12	x	x
30	Stingrays	5.30	5.36	x	x
31	Shovel noserays	2.43	2.28	x	x
32	Whitespotted wedgefish	2.43	2.28	x	x
33	Blue lined seabass	3.89	2.60	x	x
34	Leopard coral grouper	4.27	0.61	x	
35	White spotted spinefoot	1.90	0.61	x	
36	Orange spotted spinefoot	1.79	1.65	x	x
37	Parrot fish	2.43	3.56	x	x

Source: BPS data analyzed

Table 8. Superior fishing commodity in Banyuwangi District

No	Commodity	LQq	LQv	Superior Commodity	
				Quantities	Values
1	Mullets	1.95	1.66	x	x
2	Bigeye scad	1.24	0.87	x	
3	Flying fish	1.50	1.09	x	x
4	Indian mackerel	1.74	1.31	x	x
5	Short bodied mackerel	1.07	4.10	x	x
6	Scad	0.83	2.05		x
7	Indian oil sardinella	1.19	1.23	x	x
8	Fringescale sardinella	1.86	1.56	x	x
9	Longtail tuna	1.24	1.01	x	x
10	Stripped bonito	1.29	0.95	x	
11	Spotted chub mackerel	1.09	0.98	x	
12	Spearfish shortbill	1.05	0.90	x	
13	Narrow barred king mackerel	1.91	1.53	x	x
14	Jack trevallies	1.79	1.49	x	x
15	Fals trevallies	1.95	1.42	x	x
16	Pony fish	1.39	1.19	x	x
17	Barramundi	1.19	1.06	x	x
18	Red snapper	1.29	1.10	x	x
19	Threadfin breams	1.26	1.07	x	x
20	Sulphur goatfish	1.11	0.83	x	
21	Goatfish	1.38	1.03	x	x
22	Barracuda	1.02	0.70	x	
23	Eaglerays	1.25	0.93	x	
24	Yellow tail/fusilier	1.85	1.67	x	x
25	Blue lined seabass	1.52	1.41	x	x
26	Humpback grouper	1.78	1.35	x	x
27	Honeycomb grouper	1.01	0.83	x	
28	Greasy rockcod	2.11	1.73	x	x
29	Leopard coral grouper	3.14	1.82	x	x

Source: BPS data analyzed

## CONCLUSION

Superior commodities in quantity need to increase the commodity value by processing fish into manufacture product like fillets, fish paste, nugget, canned, fish stick etc. For superior commodities in value need to increase the commodities production

by adding more fishing vessels, fishing gear and fishing trip, also need to make more breeding ground or fish sanctuary. For the superior commodities in quantity and value need to increase the commodity quantity and value by adding more fishing vessels and fishing gear, also processing it into high value product or expand the market of this commodity to export market.

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