

Original Research Article

Analysis of Competitiveness Fisheries Processing Industry in West Java, Indonesia

Abstract

The fisheries sector is one of the leading sectors in Indonesia contributing to the regional and national economy such as in West Java Province in the fishery processing sector which has advantages in each region and can lead to competitiveness. This study to analyze the competitiveness of fisheries processing industry in West Java Province. This research was carried out in January 2021 – July 2021. The method used was a literature survey method to determine the competitiveness of the fisheries processing industry in 24 Regencys/cities in West Java Province. All data are processed and analyzed descriptively. Primary data was obtained from expert judgment consisting of 12 people regarding the proportion of competitiveness of the fisheries processing industry. Secondary data is obtained from statistical data on the fisheries processing industry of West Java province from the marine and fisheries service from 2010 to 2018. The results showed that Depok City was ranked first with very high competitiveness with a final score of 28.76. Depok City has advantages in three variables, namely the facilities and infrastructure, production, and the application of science and technology. Meanwhile, Banjar City ranked last which had low competitiveness with a final score of 0.26. Banjar City does not have an advantage in each variable category because it is in the category of moderate and low competitiveness.

Keywords:

Competitiveness; fishery processing industry; West Java Province; Profile.

1. INTRODUCTION

According to the 2018 Geospatial Information Agency administrative map on the West Java administrative map[1]. West Java province has a coastline of 832.69 km (Source: Map of zoning plans for coastal areas and small islands of West Java Province). Based on the marine management authority of 0-12 miles, the sea area of West Java Province is 15,528.90 km² and has 19 small islands[2]. West Java Province in the fisheries sector has suitable land for the capture and aquaculture sector that can support the fisheries processing industry sector.

West Java Province is administratively divided into 27 regencies/cities, covering 18 regencies, namely Bogor, Sukabumi, Cianjur, Bandung, Garut, Tasikmalaya, Ciamis, Pangandaran, Kuningan, Cirebon, Majalengka, Sumedang, Indramayu, Subang, Purwakarta, Karawang, Bekasi, and West Bandung as well as 9 cities, Bogor City, Sukabumi, Bandung, Cirebon, Bekasi, Depok, Cimahi, Tasikmalaya, and Banjar City. West Java Province consists of 627 regencies, 641 villages, and 5,321 villages[2].

The potential of the fisheries sector in the province of West Java in 2018 in capture fisheries production at sea is 248,778 tons, inland public water fishery production is 15,068 and in capture fisheries production is 263,847. This can support the existence of processed fishery products that are increasingly abundant[3].

The fishery processing industry in West Java continues to experience additional variations and types of processing. According to the Ministry of Maritime Affairs and Fisheries in 2015 more than 2,000 certificates have been launched by various types of processed fishery products on a large and small scale, including fish products for export[4]. The types of fish processing followed in West Java Province are, namely fermentation, fresh product, canning, smoking, salting etc.

Marine and Fishery Industrialization is a process of changing the production system of marine and fishery resources, through a modernize integrated economic policy like macroeconomic policies, infrastructure development, business

and investment systems, science and technology, and human resources for the welfare of the people[5].

Competitiveness in productivity defined as the result (output) obtained by labor or input used[6]. Weak competitiveness is caused by uncompetitive input or labor productivity[7].

The concept of the definition of competitiveness of a country or region includes several main elements such as: (1) Improve people's standard of living, (2) Able to compete with other regions and countries, (3) Able to fulfill both domestic and international obligations, (4) Can provide employment, and (5) Sustainable development that does not burden future generations[8].

The fishery processing industry sector is very diverse, as can be seen from the large number of processed fish originating from various regions in West Java Province. The diversity of processed fish can encourage a competitive profile in the fisheries processing industry in West Java Province. Therefore, not many people know that the importance of the competitiveness of the manufacturing sector can be used as a consideration in creating increased economic productivity which will affect employment and regional income.

2. RESEARCH METHOD

This research was conducted at the Department of Marine Affairs and Fisheries of West Java Province in January 2021 – July 2021 which aims to analyze the competitiveness of the processing fishery industry in West Java Province. The method used in this study is a literature survey method to determine the competitiveness of the fisheries processing industry in 27 Regencys/cities in West Java Province. The data used in this study are secondary and primary data. Secondary data sourced from the Department of Marine Affairs and Fisheries of West Java Province in Bandung City and primary data obtained from people who are competent in their fields for expert judgment.

2.1 Data Types and Sources

The data used in this study consisted of secondary and primary data. Primary data in the

form of expert judgment questionnaires and secondary data consisting of three types of data

sourced from the Department of Marine Affairs and Fisheries of West Java Province (Table 1).

Table 1. Types of Data and Research Data Sources

No.	Types of Data	Sources
1.	Total manpower users of fishery processing industry facilities (person).	Department of Marine Affairs and Fisheries of WestJava Province
2.	Total of Fish Processing Units fish processing industry (units).	Department of Marine Affairs and Fisheries of WestJava Province
3.	Total Production of fishery processing industry from 10 types of processing (tons).	Department of Marine Affairs and Fisheries of WestJava Province

2.2 Method of Colectting Data

The method used is a literature survey. The data used in the form of secondary data which is realized in the form of numbers and analyzed using descriptive statistical methods. The types of data used are as follows:

- a. Secondary data in the form of variable data on the competitiveness of the fisheries processing industry in West Java Province in 2018.
- b. Primary data in the form of expert judgment (expert judgment) as many as 12 respondents who have a weight comparison of variables and sub-variables.

2.3 Data Analysis Method

Data analysis was carried out by qualitative descriptive analysis. The qualitative description aims to gain a general understanding of social reality from the participant's perspective[9]. Qualitative descriptive analysis in this study to obtain an overview (profile) of the competitiveness of the fisheries processing industry in West Java Province.

2.4 Competitiveness Profile Analysis

1. Determine the variables and sub-variables that support fishery processing activities such as human resources, facilities and infrastructure, production, application of science and technology.
2. The implementation phase is data collection on the West Java Province fishery processing industry in 2018.

3. Identification of priority weights or relative importance between variables, sub-variables and main indicators.
4. Primary data collection is in the form of expert judgment which gives weight to variables and sub-variables.
5. Calculating the weight of the expert judgment questionnaire results for each variable, sub-variable and main indicator.
6. Processing the data that has been obtained during the research, secondary data, namely statistical data on the fisheries processing industry in West Java Province in 2018 to determine the competitiveness profile of each Regency/city.
7. Calculate score and value variable, sub-variable and main indicator based on secondary data and calculate its value based on the weights and scores obtained.
 - A. $Score = \frac{Data \text{ per Regency/city}}{\text{Total Data in West Java Province}} \times 100$
 - B. $Score = Weight \times score$
8. Ranking the competitiveness of the fishery processing industry among all regencies/cities in West Java Province based on the weighted value.
9. Determine the competitiveness criteria of the fisheries processing industry in West Java Province using quartiles. Competitiveness profile there are four categories of competitiveness based on quartiles. Q1 means very high competitiveness, Q2 means high competitiveness, Q3 means sufficient competitiveness, and Q4 means low competitiveness.

3. RESULTS AND DISCUSSION

3.1 Profile of the Fishery Processing Industry in West Java Province

The fishing industry in West Java Province greatly contributes to the regional economy, such as in providing jobs. Head of the 2014 Maritime Affairs and Fisheries Service, Djafar Ismail, said that large-scale fishery processing industries in the areas of Depok, Bekasi, Karawang and Bogor as well as small and medium scale industries are in Pangandaran, Cirebon, and Indramayu Regencies, where most of the income is in the fishery sector.

There are 10 types of fish processing in West Java Province, namely fermentation, pulverizing meat/surimi, freezing, pindang, fresh produce, smoking, canning, salting, reducing and other processing. the marine fish such as mackerel,

milkfish, and tuna, while in freshwater fish, namely tilapia, carp, catfish were processed.

The quantity of fish processing in West Java Province in 2018 reached 0.37 million tonnes. The largest quantity of fish processed at Depok City 29%, followed by Cirebon Regency and Indramayu Regency with 11% production.

3.2 Competitiveness of the Fisheries Processing Industry in West Java as a whole

Based on the research results, the final value of the variables in each Regency/city shows the ranking and categorization of the competitiveness of the processing industry. These results can be seen in Table 2.

Table 2. Ranking of Regency/city competitiveness in West Java Province

Regency/City	X1	X2	X3	X4	Final Score	Rank	Competitiveness Category
Depok City	0,02	0,76	6,98	21,00	28,76	1	Very High
Karawang Regency	0,13	9,31	1,79	0,82	12,06	2	
Sukabumi Regency	6,59	1,42	0,99	0,01	9,01	3	
Cirebon Regency	1,69	1,24	2,83	0,10	5,86	4	
Indramayu Regency	0,82	2,03	2,73	0,20	5,78	5	
Bogor City	3,03	0,12	0,82	0,02	3,99	6	
Bogor Regency	1,82	0,71	1,26	0,04	3,82	7	
Bekasi City	2,96	0,14	0,44	0,01	3,55	8	High
Garut Regency	0,00	2,26	0,05	1,05	3,37	9	
Kota Cimahi	0,04	0,15	1,20	1,84	3,24	10	
Bekasi Regency	0,18	0,27	1,98	0,66	3,09	11	
Bandung Barat Regency	1,38	0,87	0,47	0,02	2,73	12	
Tasikmalaya Regency	1,72	0,56	0,10	0,00	2,38	13	
Cianjur Regency	0,76	0,96	0,09	0,01	1,82	14	
Cirebon City	0,25	0,27	0,87	0,20	1,59	15	Enough
Bandung Regency	0,86	0,07	0,59	0,04	1,57	16	
Majalengka Regency	0,65	0,57	0,08	0,01	1,31	17	
Sumedang Regency	0,20	0,49	0,12	0,03	0,84	18	
Bandung City	0,69	0,14	0,01	0,00	0,84	19	
Sukabumi City	0,37	0,33	0,12	0,02	0,84	20	
Pangandaran Regency	0,00	0,64	0,11	0,00	0,74	21	
Purwakarta Regency	0,06	0,24	0,17	0,16	0,63	22	Low
Kuningan Regency	0,32	0,12	0,13	0,02	0,59	23	
Ciamis Regency	0,33	0,08	0,06	0,01	0,47	24	
Tasikmalaya City	0,28	0,15	0,02	0,00	0,45	25	

Subang Regency	0,24	0,14	0,03	0,01	0,41	26
Banjar City	0,19	0,04	0,02	0,01	0,26	27

(Source: Data Processing Result 2021)

Information:

X_1 = Human Resources; X_2 = Facilities and Infrastructure; X_3 = Production; X_4 = Science and Technology

Table 2 shows that Depok City is ranked 1 in the competitiveness of West Java Province with a final score of 28.76 and is in the first quartile or a very high level of competitiveness. This was due to the fact that 3 variables were very high and high competitiveness, namely the variable amount of production, Science and Technology and facilities and infrastructure. Supported by the Depok City Office Spatial Planning and Settlement in the Preparation of Depok City Academic Manuscript 2011-2021 Depok City has 25 lakes so that it can support community activities and can contribute to the existence of products in the fisheries sector[10].

Rank 2 of the competitiveness of West Java Province, namely Karawang Regency with a final score 12.06 and in the first quartile with a very high level of competitiveness. The production of Karawang Regency in the fisheries sector in 2017 was dominated by aquaculture (ponds, ponds and rice fields) with 36,954.56 tons, while production of marine fisheries was 7,369.66 tons and the lowest was fishery in general (rivers, lakes and swamps) with 339.97 tons[11], so that it can support a very high competitiveness.

Regions with the lowest 2nd rank and are in the fourth quartile with low competitiveness include Subang Regency and Banjar City. This is because it does not have the potential of all variables so that it cannot support the sustainability of the activities of the fishery processing industry. From the resulting quartiles, it can be described that there are five regencies and two city in the very high competitiveness category. Then high competitiveness with five regencies and two cities, sufficient competitiveness four regencies and three cities and for low competitiveness there are fur regencies and two cities (Fig. 2).

3.3 Trend Analysis of Fisheries Processing Industry Competitiveness in West Java per Variable

Based on primary and secondary data obtained the final value of the variables of human resources, facilities and infrastructure, production and application of science and technology. This value can describe the level of competitiveness category and ranking of the fishery product processing industry in West Java Province.

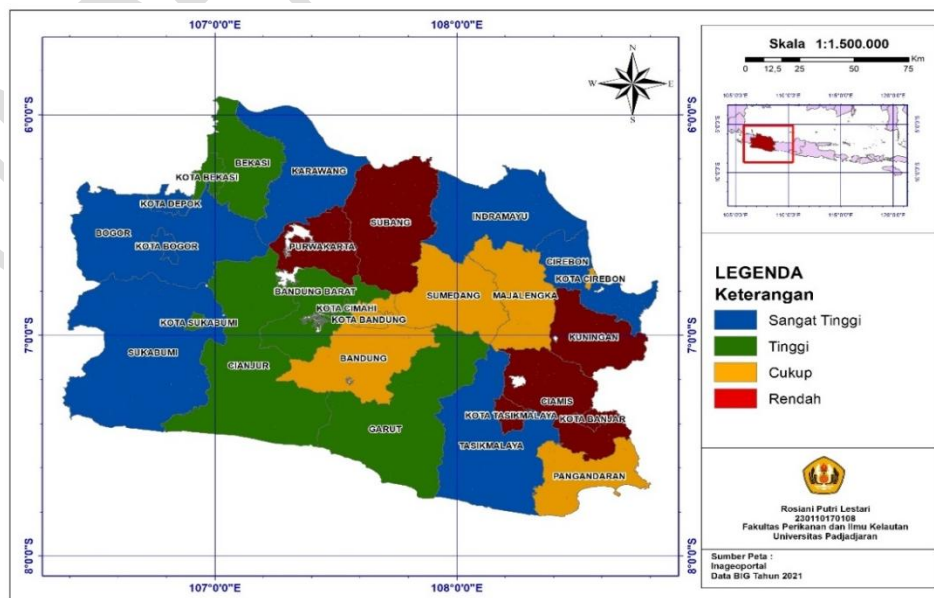


Fig. 1. Profile of competitiveness of the Fishery Processing Industry in 2018

3.3.1 Competitiveness Based on Human Resources Variable

Competitiveness data obtained, then the final value of the human resource variable in the main indicator of the number of workers shows the ranking and category of competitiveness of the West Java Province fishery processing industry. These ratings can be seen in Table 3.

Table 3 shows that Sukabumi Regency is ranked 1st in the competitiveness of human resources with a final score of 25.77 and in the first quartile with very high competitiveness. The fish processing industry workers on the southern coast of Sukabumi Regency are on average 48 years old[12]. Fish processors in West Java Province Most of them aged between the ages of 31-60 years generally come from local workers who are predominantly female and have relatively low education[13].

Bogor City was ranked 2nd in the competitiveness of human resources with a final score of 11.84 and in the first quartile it means a very high level of competitiveness with 3,463 workers. The human labour has a close relationship with the value of production. The results obtained did not increase or decrease in each regency/city in a certain year. If the production utilization rate is 80%, the absorbed workforce will increase to 12 million people, so that this figure can reduce the unemployment rate in Indonesia[14].

Regions with the second lowest ranking and low competitiveness category are Garut Regency and Pangandaran Regency. Pangandaran Regency with a final value of 0.00 due to data limitations and is a newly formed Regency as its own Regency[15] so that it has an influence on the competitiveness of human resources and only data is available in 2015.

Table 3. Competitiveness ranking in West Java Province based on Human Resources Variable

Regency/City	Human resources value	Rank	Competitiveness category
Sukabumi Regency	25,77	1	Very High
Bogor City	11,84	2	
Bekasi City	11,56	3	
Bogor Regency	7,11	4	
Tasikmalaya Regency	6,72	5	
Cirebon Regency	6,60	6	
Bandung Barat Regency	5,39	7	
Bandung Regency	3,38	8	High
Indramayu Regency	3,22	9	
Cianjur Regency	2,98	10	
Bandung City	2,68	11	
Majalengka Regency	2,55	12	
Sukabumi City	1,44	13	Enough
Ciamis Regency	1,27	14	
Kuningan Regency	1,25	15	
Tasikmalaya City	1,09	16	
Cirebon City	0,99	17	
Subang Regency	0,92	18	
Sumedang Regency	0,79	19	
Banjar City	0,75	20	
Bekasi Regency	0,70	21	
Karawang Regency	0,51	22	
Purwakarta Regency	0,25	23	Low
Cimahi City	0,15	24	
Depok City	0,08	25	

Garut Regency	0,01	26
Pangandaran Regency	0,00	27

(Source: Data Processing Results 2021)

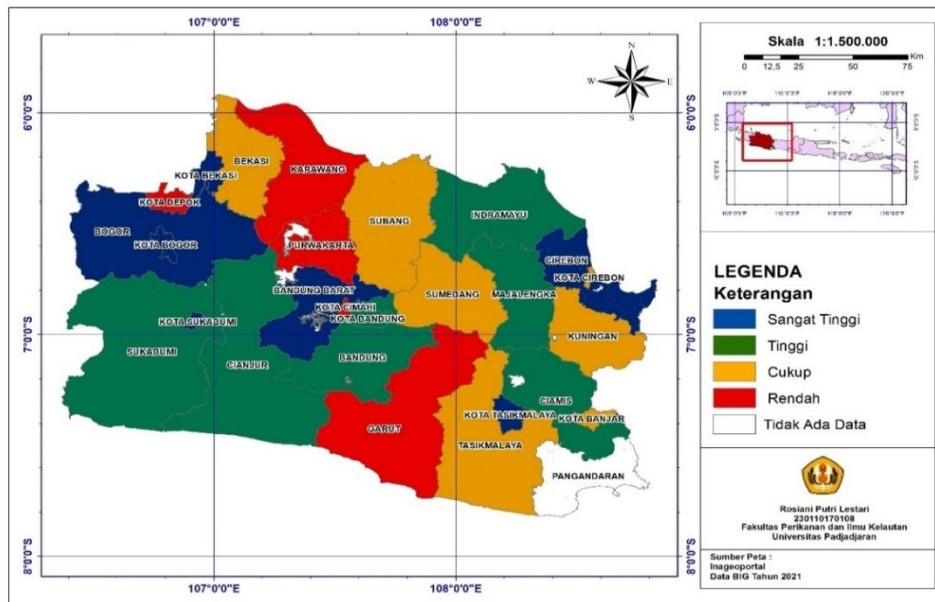


Fig. 2. Profile of Human Resources in Fisheries Processing Industry Competitiveness in 2018

From the resulting quartiles, it can be illustrated that there were five regencies and two city in the very high competitiveness category. Then for high competitiveness with five regencies and two cities, enough competitiveness with four regencies and three cities, and for low competitiveness there are four regencies and two cities (Fig. 2).

3.3.2 Competitiveness Based on Facilities and Infrastructure Variable

From the data obtained, the final value of the facilities and infrastructure variable with the main indicator being the number of Fish Processing Units which shows the ranking and category of competitiveness. The power rating can be seen in Table 4.

Table 4 shows that Karawang Regency is ranked 1 in the competitiveness of facilities and infrastructure with a final score of 38.74 with a very high competitiveness. The advantage of this fishery processing unit is that it has the potential to process fishery products. The number of fish

processing units used can trigger the development of fish processing.

Garut Regency ranked 2nd with a final score of 9.38 with very high competitiveness. Garut Regency has 579 Fish Processing Units in 2018 covering micro, small, and medium industries. Garut Regency has advantages in the fisheries sector such as Minapadi and fishery processing units[16].

The region with the second lowest ranking is Bandung Regency and Banjar Regency and is included in the fourth quartile with a low level of competitiveness. The number of Fisheries Processing Units in Bandung Regency is 18 units and Banjar Regency has 10 units of various scales.

From the resulting quartiles, it can be illustrated that there were seven regencies in the very high competitiveness category. Then for high competitiveness with five regencies and two cities, enough competitiveness with three regencies and five cities, and for low competitiveness there are three regencies and two cities (Fig. 3).

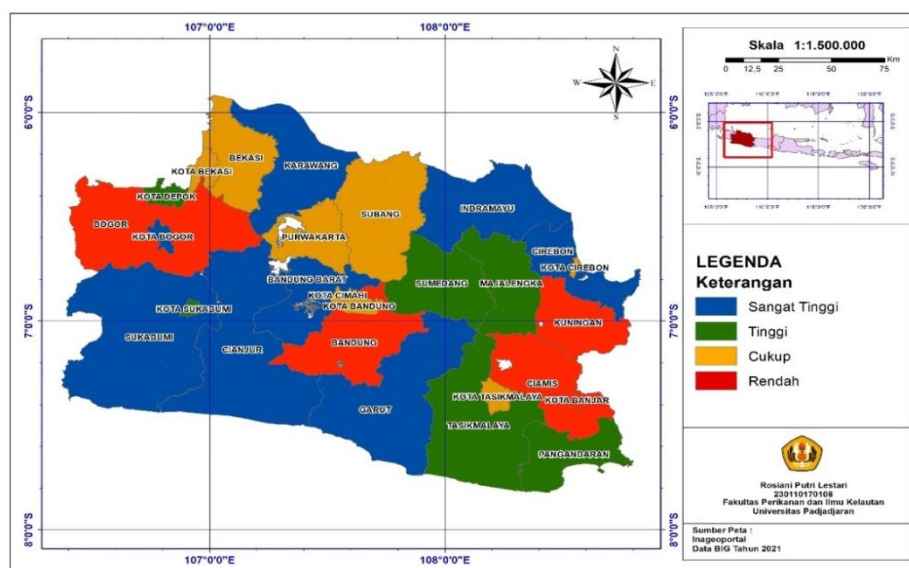


Fig. 3. Profile of facilities and infrastructure in Fisheries Processing Industry Competitiveness in 2018

Table 4. Competitiveness ranking in West Java Province based on facilities and infrastructure variable

Regency/City	Facilities and Infrastructure Value	Rank	Competitiveness category
Karawang Regency	38,74	1	Very High
Garut Regency	9,38	2	
Indramayu Regency	8,46	3	
Sukabumi Regency	5,92	4	
Cirebon Regency	5,14	5	
Cianjur Regency	3,99	6	
Bandung Barat Regency	3,60	7	
Depok City	3,14	8	High
Bogor Regency	2,93	9	
Pangandaran Regency	2,64	10	
Majalengka Regency	2,38	11	
Tasikmalaya Regency	2,32	12	
Sumedang Regency	2,03	13	
Sukabumi City	1,36	14	
Bekasi Regency	1,12	15	Enough
Cirebon City	1,10	16	
Purwakarta Regency	1,00	17	
Tasikmalaya City	0,63	18	
Cimahi City	0,63	19	
Subang Regency	0,57	20	
Bandung City	0,57	21	
Bekasi City	0,57	22	
Kuningan Regency	0,50	23	Low
Bogor City	0,49	24	
Ciamis Regency	0,34	25	
Bandung Regency	0,29	26	
Banjar City	0,16	27	

(Source: Data Processing Results 2021)

3.3.3 Competitiveness Based on Production Variable

Competitiveness data that has been calculated, obtained the final value of the production variable which shows the ranking and category of competitiveness. The rankings and categories of the production competitiveness of the fisheries processing industry can be seen in Table 5.

Table 5 shows that Depok City ranked 1st rank for production competitiveness with a final score of 29.01, and in the first quartile with very high competitiveness. Production of processed fishery in Depok City reached 108656,009 tonnes. This City of Depok received the best award in West Java Province in fishery processing in 2015. One of the fishery processing industries in Depok City is CV Sakana Indo Prima with various types of processed

surimi such as processed fish balls from various fish, fish bakwan, fish rolls, fish sticks, fish dragon legs, shrimp dragon legs and fish spring rolls.

Cirebon Regency ranked 2nd in production competitiveness with a final score of 11.77 and is in the first quartile with very high competitiveness. The production of fisheries processing in Cirebon Regency reached 0,044073 tonnes.

Regions with the second lowest ranking were Tasikmalaya City and Bandung City and occupy the fourth quartile with a low level of competitiveness. The region is located in the central part of West Java Province which is a mountainous region, so that the competitiveness of the production of the fishery processing industry is in the low category.

Table 5. Competitiveness ranking in West Java Province based on production variable

Regency/City	Production Value	Rank	Competitiveness category
Depok City	29,01	1	Very High
Cirebon Regency	11,77	2	
Indramayu Regency	11,33	3	
Bekasi Regency	8,24	4	
Karawang Regency	7,44	5	
Bogor Regency	5,23	6	
Cimahi City	5,00	7	
Sukabumi Regency	4,11	8	High
Cirebon City	3,60	9	
Bogor City	3,42	10	
Bandung Regency	2,46	11	
Bandung Barat Regency	1,95	12	
Bekasi City	1,83	13	Enough
Purwakarta Regency	0,70	14	
Kuningan Regency	0,54	15	
Sukabumi City	0,50	16	
Sumedang Regency	0,49	17	
Pangandaran Regency	0,44	18	
Tasikmalaya Regency	0,42	19	
Cianjur Regency	0,39	20	
Majalengka Regency	0,31	21	
Ciamis Regency	0,23	22	Low
Garut Regency	0,23	23	
Subang Regency	0,13	24	
Banjar City	0,09	25	
Tasikmalaya City	0,07	26	
Bandung City	0,06	27	

(Source: Data Processing Results 2021)

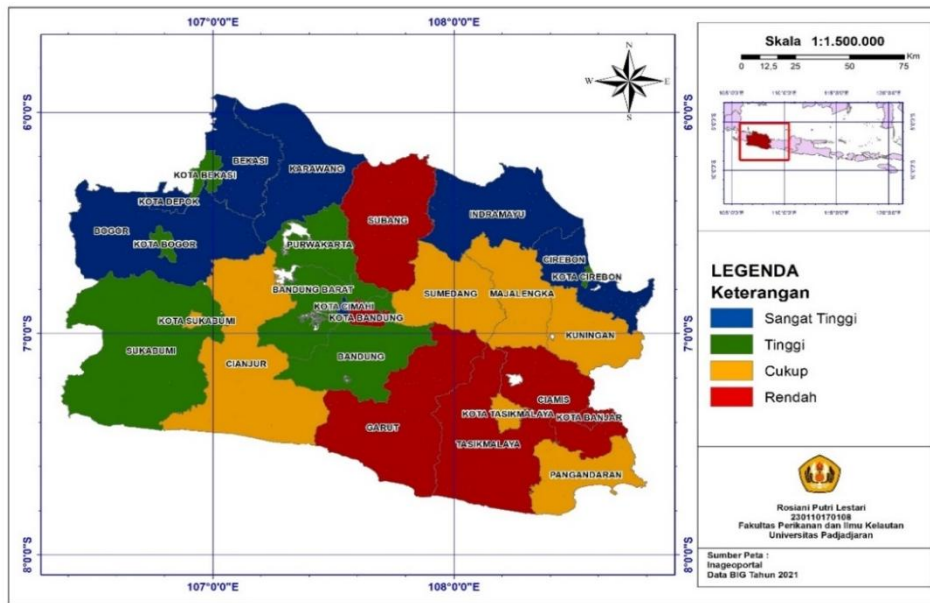


Fig. 4. Profile of production in Fisheries Processing Industry Competitiveness in 2018

From the resulting quartiles, it can be illustrated that there are five regencies and two city in the very high competitiveness category. Then for high competitiveness with four regencies and three cities, enough competitiveness with six regencies and one city, and for low competitiveness there are three regencies and three cities (Fig. 4).

3.3.4 Competitiveness Based on Science and Technology Variable

Competitiveness data that has been calculated, the final value of the Science and Technology variable is obtained with indicators of production productivity per worker showing the ranking and category of competitiveness of. Ranks in the Science and Technology of the fisheries processing industry can be seen in Table 6.

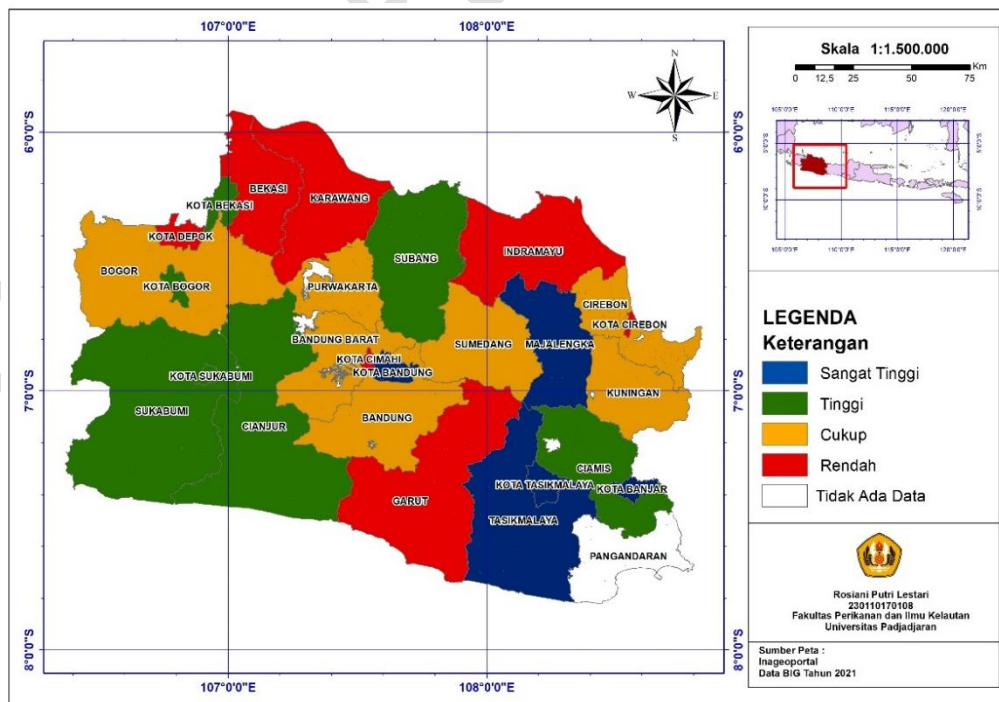


Fig. 5. Profile of science and technology in Fisheries Processing Industry Competitiveness in 2018

Table 6. Competitiveness ranking in West Java Province based on science and technology variable

Regency/City	Science and Technology Value	Rank	Competitiveness Category
Depok City	80	1	Very High
Cimahi City	7	2	
Garut Regency	4	3	
Karawang Regency	3	4	
Bekasi Regency	3	5	
Cirebon City	0,78	6	
Indramayu Regency	0,75	7	
Purwakarta Regency	0,59	8	High
Cirebon Regency	0,380	9	
Bogor Regency	0,157	10	
Bandung Regency	0,155	11	
Sumedang Regency	0,131	12	
Kuningan Regency	0,091	13	
Bandung Barat Regency	0,077	14	
Sukabumi City	0,074	15	Enough
Bogor City	0,062	16	
Ciamis Regency	0,039	17	
Sukabumi Regency	0,034	18	
Bekasi City	0,034	19	
Subang Regency	0,031	20	
Cianjur Regency	0,028	21	
Majalengka Regency	0,026	22	Low
Banjar City	0,025	23	
Tasikmalaya Regency	0,013	24	
Tasikmalaya City	0,013	25	
Bandung City	0,004	26	
Pangandaran Regency	0,000	27	

(Source: Data Processing Results 2021)

Table 6 shows that Depok City ranked 1st with a final score of 80 and in the first quartile with a very high level of competitiveness. This is due to the high amount of production. Cimahi City is ranked 2nd with a final score of 7, with a very high level of competitiveness.

Regions with the second lowest ranking are Bandung City and Pangandaran Regency with low levels of competitiveness. The city of Bandung is located in the central part of West Java Province which is a mountainous area so that the application of science and technology variables is low.

From the resulting quartiles, it can be illustrated that there were four regencies and three city in the very high competitiveness category. Then for high competitiveness with

seven regencies, enough competitiveness with four regencies and three city, and for low competitiveness there are three regencies and three cities (Fig. 5).

4. CONCLUSION

Based on the results of research that has been carried out, some conclusions are obtained as follows:

The category of very high competitiveness of the fisheries processing industry in West Java, Indonesia is obtained by the regency/city of Depok City, Karawang Regency, Sukabumi Regency, Cirebon Regency, Indramayu Regency, Bogor City, and Bogor Regency. Depok City is ranked first (1st) in the very high competitiveness of the fisheries processing

industry with a final score of 28.76. Depok City has advantages in the variables of facilities and infrastructure, production, and the application of science and technology. The region that is in the final ranking (27th) is Banjar City with a final score of 0.26. Banjar City does not have an advantage in each variable category in the competitiveness of the processing industry because it is in the category of moderate and low competitiveness.

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