Original Research Article

An Analysis of the Exchange Rate of Catfish Cultivators (A Case Study in Sindangwangi Majalengka Indonesia)

ABSTRACT

Majalengka Regency has great potential in the fisheries sector, because the availability of water in some areas is quite abundant even though it is in the dry season. The welfare of fish farmers can be seen using the Fish Farmer Exchange Rate Analysis (NTPI). The purpose of this research is to analyze NTPI catfish farmers in Majalengka Regency. The research method used is a case study method, with sampling techniques, namely purposive sampling. Primary data was obtained from catfish farmers in Sindangwangi District, Majalengka Regency and secondary data was obtained from related agencies analyzed using NTPI. The results obtained in this study are that NTPI hatcheries catfish in Sindangwangi District have NTPI 94% or NTPI<100 which means catfish hatchery cultivators are not yet at the prosperous level, while for NTPI catfish enlargement in Sindangwangi District has NTPI of 105% or NTPI>100 which means that catfish enlargement cultivators have reached a prosperous level.

Keywords : Majalengka, NTPI, Fish Cultivator, Catfish

1. INTRODUCTION

The fisheries sector has the potential to drive the economy both at the macro, national and micro levels. West Java is one of the provinces which is a fishery center in Indonesia due to the availability of abundant marine and land fisheries resources (Center for KKP Data, Statistics, and Information 2018). Majalengka Regency has great potential in the fisheries sector. Based on data from the Food Security, Agriculture and Fisheries Service of Majalengka Regency (2020), the fishing area of Majalengka Regency consists of 554.62 Ha of calm water ponds, 121.20 Ha of rice fields, 178.95 Ha of lake, 231.65 Ha of swamp, checkdam 10.40 Ha, and river 513 Ha.

Freshwater fish production data in Majalengka Regency recorded total fishery production in 2015 as many as 1,481.44 tons, in 2016 as many as 1,948.03, in 2017 as many as 1,662.23 tons, in 2018 as many as 1,427.38 tons, and in 2019 as much as 1,458.38 tons, makes it included in the four residences that produce the highest fish production in West Java.

The way to find out the welfare of fish cultivators in the Majalengka Regency is to calculate the Fish Cultivator Exchange Rate (NTPI). NTPI is the ratio between the price index received by fish farmers (It) and the price index paid by fish farmers (Ib), which is expressed in percentage terms.

The fisheries sector is considered vulnerable to poverty because most cultivators are cultivators who only have small land or only work on land owned by others. Therefore, the purpose of this research is to analyze the NTPI of catfish cultivators in the Majalengka Regency, especially in the Sindangwangi District.

2. METHODS

This research was carried out in Sindangwangi District, Majalengka Regency, West Java. This research uses case study methods with a questionnaire approach.

2.1 Types and Sources of Data

Types and sources of data used are primary data and secondary data. Primary data in this study were obtained directly in the field through direct interviews with respondents using questionnaires. Secondary data obtained from this research comes from available libraries and is related to research topics such as libraries, the internet, and other general information.

2.2 Sampling technique

The sampling technique used is purposive sampling. Purposive sampling is a data source sampling technique with certain considerations such as respondent involvement and respondents' willingness to be interviewed.
Respondents must meet several criteria, namely:
1) Catfish cultivators.
2) Fish farmers who live in Sindangwangi District, Majalengka Regency.
3) Fish farmers with at least 5 years of work experience.
4) Fish farmers who are willing to be interviewed.

2.3 Data analysis

The data analysis used in this research is quantitative descriptive analysis. Research descriptively is able to describe a phenomenon in a particular population.

The NTPI formula is as follows.

$$\mathbf{NTPI} = \frac{\mathbf{It}}{\mathbf{Ib}} \mathbf{x\ 100\%}$$

Information:
NTPI : Exchange Rate of Fish Farmers (%)
It : Price Index Received by Fish Farmers
Ib : Price Index Paid by Fish Farmers

NTPI of more than 100 means that fish farmers have higher incomes than their expenses, or have a surplus. NTPI of less than 100 means that fish farmers' means that the income of business results is equal to expenses for household consumption costs and production needs.

3. RESULT AND DISCUSSION

3.1 Characteristics of Research Locations

3.1.1 Physical Overview of the Region

Demographically Sindangwangi District has a population of 32,576 people consisting of 16,250 men and 16,326 women. The average population density is 1,026 inhabitants / km^2, with the highest density in Jerukleueut Village with a density of 1,919 people / km^2 and the lowest density in Bantaragung Village with a density of 374 people / km^2 (BPS Majalengka 2020).

Topographically and contours of sindangwangi subdistrict has a hilly area because of its location which is just below the foot of Mount Ciremai, generally in the form of land and rice fields that have a height of 169 meters above sea level with a slope of land between 15-40%. Sindangwangi District has a type of land consisting of regosol, grumosol, and latosol with soil properties that tend to have a pH of 6-7 or neutral (Sindangwangi District 2020). A map of research locations located in the Sindangwangi District can be seen in Figure 1.

expenses for household consumption and production costs are higher than their business income. While NTPI equals 100

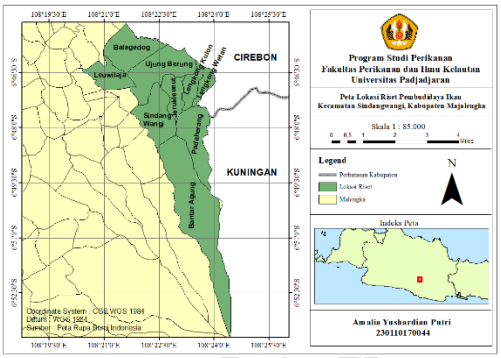

Figure 1. Research Location Map
(Source: Rupa Bumi Indonesia Map)

3.1.2 Overview of the Fishery

a) Aquaculture Business Activities

Freshwater aquaculture fisheries in Sindangwangi District have business activities such as Calm Water Ponds, Heavy Water Ponds, rice *mina,* and lakes. Aquaculture business activities in Sindangwangi District can be seen in Table 1.

b) Aquaculture Production

The superior commodities in Sindangwangi District are catfish, tilapia, and baung because they show high production results and have been developed quite well.many (Majalengka Regency Food Security, Agriculture, and Fisheries Office 2020). There are 137 fish farmers who belong to 9 groups of fish farmers in Sindangwangi District.

3.2 General Characteristics of Respondents

3.2.1 Age

The age structure according to BPS (2013), is divided into three groups, namely (a) the young age group, under 15 years old; (b) productive age group, ages 15 - 64 years; and (c) the age group, age 65 years and above. A total of 44 respondents were in the age range of 15 - 64 years or with a percentage of 97% and 1 respondent was in the age range of >65 years or with a percentage of 3% (Table 1).

3.2.2 Education

The characteristics of respondents based on education level consist of elementary, junior high, high school and college levels. The characteristics of respondents based on education level can be seen in Table 2.

3.2.3 Work Experience

Characteristics of fish farmers in Sindangwangi District have work experience for 6-10 years as many as 35 people or 78%, followed by work experience for 1-5 years as many as 6 people with a percentage of 13%, and work experience for >10 years with a percentage of 9% (table 3). Work experience has a positive relationship with work productivity.

3.2.4 Number of Family Members

The characteristics of respondents based on the number of family members consist of three groups, namely small family members (1-3 peopel), medium family members (4-6 people), and large family members (more than 6 people) (Purwanto & Taftazani 2018). The characteristics of respondents based on the number of family members can be seen in Table 4.

Table 1. Respondent Age Range Data

Respondent Age (Year)	Number (Person)	Percentage (%)
< 15	0	0
15-64	19	97
>65	1	3
Total	20	100

Source: Primary Data Processed (2021)

Table 2. Respondent Education Level Data

Education Level	Number (Person)	Percentage (%)
Elementary school	3	15
Junior high school	5	25
Senior high school	11	55
University	1	5
Total	20	100

Source: Primary Data Processed (2021)

Table 3. Respondents' Work Experience Data

Work Experience	Number (Person)	Percentage (%)
1-5 year	3	15
6-10 year	14	70
>10 year	3	15
Total	20	100

Source: Primary Data Processed (2021)

Table 4. Respondent Family Member Data

Number of Members	Number (Person)	Percentage (%)
Few (1-3 person)	9	45
Average (4-6 person)	11	55
Many (>6 person)	0	0
Total	20	100

Source: Primary Data Processed (2021)

3.3 Overview of Aquaculture Business in Sindangwangi District

The picture of aquaculture business in this research consists of two businesses, namely catfish hatchery efforts and catfish enlargement efforts.

3.3.1 Catfish Hatchery Business

Catfish hatchery business in Sindangwangi District is divided into two aspects, namely technical activity and economic activity.

A. Technical activity

Catfish hatchery efforts in Majalengka Regency, especially Sindangwangi District, mostly do with natural techniques but there are also those who use semi-natural techniques with the help of hormone use. Natural spawning (natural spawning) catfish is carried out in the ratio of 1 female catfish and 1 male catfish that have matured gonads with relatively the same size of brood, then the fish spawn within one night. The colonized brood will be picked up and separated into different containers to perform recovery. Eggs that have hatched are given feed in the form of a decoction of egg yolk for 1-2 days, then given silkworms as the main feed of seeds. Larval maintenance lasts for approximately 14 to 18 days until the majority of catfish fry reach a size of 2-3 cm and are ready for sale.

B. Economical activity

The economic benefits of hatchery of catfish seeding include investment costs, operational costs, and revenue.

a. Investment cost
   Investment costs are the costs that it uses can last for a relatively long time (more than a year). Investment costs are usually related to the construction or development of physical infrastructure and production capacity (Karimah et al. 2012). The investment cost of catfish hatchery business is presented in Table 5.

No.	Land area (m2)	Description	Unit	Amount	Unit price (Rp/unit)	Total	Economic Life (yr)	Depreciation (Rp/yr)	Depreciation (Rp/cycle)	Proportion of Cost (%)
1	<1000	Ponds Construction	Unit	3	4.500.000	13.500.000	8	1.687.500	153.409	92
		Main Production Equipment	Unit	0	0	0	0	0	0	0
		Manufacture of feed and goods warehouses	Unit	1	800.000	800.000	5	160.000	14.545	5
		Production Support Equipment	Unit	1	300.000	300.000	1	300.000	27.273	2
					Total	14.600.000		2.147.500	195.227	100
2	1000 - 2000	Fish	pack	1	4.000.000	4.000.000	1	4.000.000	363.636	13
		Ponds Construction	unit	6	5.000.000	30.000.000	9	3.333.333	303.030	95
		Main Production Equipment	unit	0	0	0	0	0	0	0
		Manufacture of feed and goods warehouses	unit	1	1.000.000	1.000.000	5	200.000	18.182	3
		Production Support Equipment	unit	1	500.000	500.000	1	500.000	45.455	2
					Total	31.500.000		4.033.333	366.667	100
2	>2000	Fish	pack	1	4.000.000	4.000.000	1	4.000.000	363.636	10
		Ponds Construction	unit	7	5.000.000	35.000.000	9	3.888.889	353.535	85
		Main Production Equipment	unit	0	0	0	0	0	0	0
		Manufacture of feed and goods warehouses	unit	1	2.000.000	2.000.000	5	400.000	36.364	5
		Production Support Equipment	unit	1	800.000	800.000	1	800.000	72.727	2
					Total	41.000.000		8.288.889	753.535	100

Table 5. Investment Cost of Catfish Hatchery Cultivation Business

b. Operational cost

Operarional costs are costs incurred or carried out while in the production process (Karimah et al. 2012). Operational costs in the hatchery business of catfish cultivation in Sindangwangi Subdistrict consist of two parts, namely fixed costs and non-fixed costs.

Fixed cost is the cost that is not consumable in use in one production period and costs that are not affected by the size of production (Padangarang, 2010). The fixed costs of catfish farming business are employee and electricity costs.

Non-fixed costs (variable costs) are a number of costs used to produce fish and the amount depends largely on the amount of capacity and the period of production in question. These non-fixed costs change in number and the change is proportional to the unit of activity (Padangarang, 2010). The non-fixed cost of the catfish farming business consists of feed, fertilizer / vitamin / medicine, and disinfectant.

The cost of producing catfish hatchery in Sindangwangi District can be seen in Table 6.

No.	Land Area (m^2)	Description	Total Cost (Rp)	Proportion of Cost (%)
1	<1000	Official	400.000	14
		Electricity	200.000	7
		Feed	2.000.000	69
		Fertilizer/vitamin/drug	300.000	10
		Disinfectant	-	-
	Total		2.900.000	100
2	1000-2000	Official	1.300.000	16
		Electricity	450.000	5
		Feed	6.000.000	73
		Fertilizer/vitamin/drug	500.000	6
		Disinfectant	-	-
	Total		8.250.000	100
3	>2000	Official	1.800.000	11
		Electricity	600.000	4
		Feed	14.000.000	82
		Fertilizer/vitamin/drug	600.000	4
		Disinfectant	200.000	1
	Total		17.000.000	100

Table 6. Catfish Hatchery Production Cost
Source: Primary Data Processed (2021)

c. Revenue
It is the amount of money earned from the sale of a number of outputs or in other words any income earned by the proceeds from the sale of its production (Musa and Amiludin 2005). The cost of receiving catfish hatchery business is presented in Table 7.

Table 7. Catfish Hatchery Business Revenue

No.	Land Area (m^2)	Description	Total
1	<1000	Glass Selling Price (Rp)	13.000
		Annual Sales Results (Rp)	28.250.000
		Annual Net Earner (Rp)	26.830.000
		Monthly Clean Discharge (Rp)	2.235.833
		Annual production (glass)	2.173
2	1000-2000	Glass Selling Price (Rp)	13.000
		Annual Sales Results (Rp)	69.750.000
		Annual Net Earner (Rp)	65.250.000
		Monthly Clean Discharge (Rp)	5.437.500
		Annual production (glass)	5.365
3	>2000	Glass Selling Price (Rp)	13.000
		Annual Sales Results (Rp)	123.000.000
		Annual Net Earner (Rp)	113.250.000
		Monthly Clean Discharge (Rp)	9.437.500
		Annual production (glass)	9.462

Source: Primary Data Processed (2021)

3.3.2 Catfish Cultivation Enlargement Efforts

The effort to enlarge catfish cultivation in Sindangwangi District is divided into two aspects, namely technical activity, and economic activity.

A. Technical activity

Things that need to be considered in the technical aspect are the determination of location, production capacity, layout, selection of cultivation containers, production processes, use of fish feed, fish medicine, fertilizers, probiotics, disinfectants, other chemicals, and completeness of technical studies (Kep. Men KKP 2007).

B. Economical activity

The economic sustainability of catfish farming includes investment costs, operational costs, and revenue.

a. Investment costs are the costs that it uses that can last for a relatively long time (more than a year). Investment costs are usually related to the construction or development of physical infrastructure and production capacity (Karimah et al. 2012). The cost of investing in catfish enlargement business is presented in Table 8.

Table 8. Catfish Enlargement Business Investment Costs

No.	Land Area (m^2)	Description	Unit	Total	Unit Price (Rp/unit)	Total	Economic Age (yr)	Depreciation (Rp/th)	Depreciation (Rp/yr)	Proportion of Cost (%)
1	<1000	Pool Construction	Unit	4	4.500.000	18.000.000	8	2.250.000	204.545	92
		Main Production Equipment	Unit	1	350.000	350.000	1	350.000	31.818	2
		Manufacture of feed and goods warehouses	Unit	1	900.000	900.000	5	180.000	16.364	5
		Production Support Equipment	unit	1	300.000	300.000	1	300.000	27.273	2
					Total	19.550.000		3.080.000	280.000	100
2	1000 - 2000	Fish	pack	1	4.000.000	4.000.000	1	4.000.000	363.636	13
		Pool Construction	unit	6	5.000.000	30.000.000	9	3.333.333	303.030	94
		Main Production Equipment	unit	1	400000	400.000	1	400.000	36.364	1
		Manufacture of feed and goods warehouses	unit	1	1.000.000	1.000.000	5	200.000	18.182	3
		Production Support Equipment	unit	1	500.000	500.000	1	500.000	45.455	2
					Total	31.900.000		4.433.333	403.030	100
3	>2000	Fish	pack	1	4.000.000	4.000.000	1	4.000.000	363.636	9
		Pool Construction	unit	8	5.000.000	40.000.000	9	4.444.444	404.040	86
		Main Production Equipment	unit	1	450.000	450.000	1	450.000	40.909	1
		Manufacture of feed and goods warehouses	unit	1	2.000.000	2.000.000	5	400.000	36.364	4
		Production Support Equipment	unit	1	500.000	500.000	1	500.000	45.455	1
					Total	46.450.000		9.294.444	844.949	100

Source: Primary Data Processed (2021)

b. Production / Operational Costs

Production costs are costs incurred or carried out while in the production process (Karimah et al. 2012). Production costs in the hatchery business of catfish cultivation in Sindangwangi Subdistrict consist of two parts, namely fixed costs and non-fixed costs. The cost of producing catfish enlargement in Sindangwangi Subdistrict can be seen in Table 9.

Table 9. Catfish Enlargement Production Cost

No.	Land Area (m^2)	Description	Total Cost (Rp)	Proportion of Cost (%)
1	<1000	Official	450.000	16
		Electricity	200.000	7
		Feed	1.800.000	65
		Fertilizer/vitamin/drug	300.000	11
		Disinfectant	-	-
	Total		2.750.000	100
2	1000-2000	Official	1.000.000	13
		Electricity	450.000	6
		Feed	6.000.000	75
		Fertilizer/vitamin/drug	500.000	6
		Disinfectant	100.000	1
	Total		7.950.000	100
3	>2000	Official	1.700.000	10
		Electricity	600.000	4
		Feed	13.700.000	83
		Fertilizer/vitamin/drug	600.000	4
		Disinfectant	200.000	1
	Total		16.600.000	100

Source: Primary Data Processed (2021)

c. Revenue
Revenue is the amount of money earned from the sale of a certain amount of output or in other words any income earned by the proceeds from the sale of its production (Musa and Amiludin 2005). The cost of receiving catfish enlargement efforts is presented in Table 12.

Table 10. Catfish Enlargement Revenue

No.	Land area (m^2)	Description	Total
1	<1000	Selling Price (Rp)	18.000
		Annual Sales Results (Rp)	27.550.000
		Annual Net Earner (Rp)	26.350.000
		Monthly Clean Discharge (Rp)	2.195.833
		Annual production (kg)	1.531
2	1000-2000	Selling Price (Rp)	18.000
		Annual Sales Results (Rp)	95.850.000
		Annual Net Earner (Rp)	88.530.000
		Monthly Clean Discharge (Rp)	7.377.500
		Annual production (kg)	5.325
3	>2000	Selling Price (Rp)	18.000
		Annual Sales Results (Rp)	102.520.000
		Annual Net Earner (Rp)	95.640.000
		Monthly Clean Discharge (Rp)	7.970.000
		Annual production (kg)	5.696

Source: Primary Data Processed (2021)

3.4 Analysis of Fish Farmers Exchange Rate (NTPI) in Sindangwangi District

The Fish Farmer Exchange Rate (NTPI) is one of the proxies for measuring the level of welfare of fish farmers. While definitively, NTPI is the ratio between the price received by fish farmers (It) and the price paid by fish farmers (Ib) expressed in percentage form (Directorate General of Aquaculture 2015).

3.4.1 NTPI Analysis of Catfish Hatchery

NTPI hatcheries catfish in Sindangwangi District can be seen in Table 11.

Table 11. NTPI Catfish Hatchery

No.	Group Name	Respondent's Name	Total Revenue (Rp/mo)	Production Expenditure / mo	Household Expenses / mo	Total Expenses / mo	NTPI (%)
1	Mina Lozi Makmur	Ade Sumarna	15.017.500	9.750.000	5.000.000	14.750.000	102
2		Aman Rohman	6.437.500	4.500.000	2.300.000	6.800.000	95
3		Enah Roenah	5.273.333	4.720.000	1.800.000	6.520.000	81
4		Kosim	3.595.833	1.900.000	2.700.000	4.600.000	78
5		M. Sugiyana	3.594.167	1.050.000	1.600.000	2.650.000	136
6		Arta	3.735.833	1.420.000	2.000.000	3.420.000	109
7		Dede Taufiq	7.470.000	6.810.000	2.500.000	9.310.000	80
8	Mina Cikole	Amsi	6.045.833	3.700.000	2.100.000	5.800.000	104
9		Sutisna	3.037.500	1.050.000	2.800.000	3.850.000	79
10		Udin	3.079.167	1.800.000	2.000.000	3.800.000	81
						Average	94

Source: Primary Data Processed (2021)

Based on the table above, NTPI from 7 catfish hatchery respondents in the Mina Lozi Makmur fish farming group in Sindangwangi District there were 3 respondents (43%) who had NTPI >100, and 4 other respondents (57%) had NTPI <100. While in the Mina Cikole fish farmer group, out of 3 catfish hatchery respondents there were only 1 respondent (33%) who had NTPI >100 which can be said to be prosperous (NTPI of 104%).

Of the 10 catfish hatchery respondents in Sindangwangi District, there were 4 respondents (40%) who had NTPI >100 or could be said to be prosperous, while the other 6 respondents (60%) had NTPI <100 or could be attached to not be prosperous. The average NTPI hatchery of catfish in Sindangwangi District has NTPI of 94% or shows NTPI <100 which shows that respondents are less prosperous.

Research results Gumilar et al. (2021) regarding Exchange Rate Analysis of Fish Cultivators in Bandung Regency has an NTPI > 100, this indicates that catfish hatcheries in Bandung Regency are more prosperous than fish hatcheries cultivators in Majalengka Regency. Meanwhile, according to BPS (2021), the national NTPI is 102.83% or NTPI > 100 which indicates that fish cultivators in Indonesia can be said to be prosperous.

3.4.2 NTPI Analysis of Catfish Enlargement

NTPI catfish enlargement in Sindangwangi District can be seen in Table 12.

Table 12. NTPI Catfish Enlargement

No.	Group Name	Respondent's Name	Total Revenue (Rp/mo)	Production Expenditure / mo	Household Expenses / mo	Total Expenses / mo	NTPI (%)
1	Mekar Wangi	Agung	3.431.250	975.000	1.950.000	2.925.000	117
2		Bayu Sapto	4.041.667	1.800.000	2.050.000	3.850.000	105
3		Pupu Saepudin	4.060.417	2.225.000	2.750.000	4.975.000	82
4		Suherman	7.310.000	4.480.000	2.800.000	7.280.000	100
5	Mina Lozi Makmur	Sobari	5.995.833	1.200.000	4.800.000	6.000.000	100
6		Nana Suparman	5.900.000	2.650.000	2.000.000	4.650.000	127
7		Supriadi	10.377.500	7.320.000	3.100.000	10.420.000	100
8	Mina Cikole	Adok Karnadi	11.970.000	6.880.000	2.000.000	8.880.000	135
9		Ipung	6.229.167	2.100.000	5.000.000	7.100.000	88
10		Wira	4.101.667	1.080.000	3.000.000	4.080.000	101
						Average	105

Source: Primary Data Processed (2021)

Based on the table above, NTPI catfish enlargement in Sindangwangi District from 5 respondents of mekar Wangi fish farming group there are 4 respondents (80%) who show NTPI >100 and 1 other respondent (20%) have NTPI <100, Mina Lozi Makmur fish farming group shows 3 respondents (100%) have NTPI >100, and Mina Cikole fish farming group there is 1 respondent (50%) who have NTPI <100, and 1 other respondent (50%) have NTPI >100.

Of the 10 catfish enlargement respondents in Sindangwangi District, there are 8 respondents (80%) who have NTPI >100 or can be said to be prosperous, while 2 other respondents (20%) have NTPI <100 or can be attached to have not prospered.

Research results Gumilar et al. (2021) regarding the NTPI of catfish rearing in Bandung Regency has an NTPI>100, this result is the same as the results of research by Gumilar et al. (2021) regarding the NTPI of catfish rearing in Garut Regency (Case Study in Bayongbong District) which showed an NTPI of 111% or NTPI > 100. This shows that catfish farmers in Bandung and Garut can be said to be as prosperous as catfish farmers in Majalengka Regency.

4. CONCLUSION

Based on the results of research on the Exchange Rate Analysis of Catfish Farmers in Sindangwangi District, Majalengka Regency, it was concluded that the results of the Fish Farmer Exchange Rate (NTPI) for catfish hatcheries in Sindangwangi District had NTPI 94 or NTPI<100 which means that catfish hatchery cultivators have not been at the prosperous level, as for the Exchange Rate of Fish Farmers (NTPI) catfish enlargement in Sindangwangi District have NTPI 105 or NTPI>100 which means that catfish enlargement cultivators have reached the level of prosperity.

REFERENCES

1. Central Bureau of Statistics. 2021. NTPI (Fish Cultivator Exchange Rate) by Sector 2021. Central Jakarta: Central Bureau of Statistics.

2. Department of Marine Affairs and Fisheries. 2008. Regulation of the Minister of Marine Affairs and Fisheries Number PER.02/MEN/2008 concerning Guidelines for the Implementation of Food Security Credit in the Marine and Fisheries Sector.
3. The Department of Food Security, Agriculture and Fisheries of Majalengka Regency. 2019. Number of Fisheries Cultivators in Majalengka Regency. Department of Food Security, Agriculture, and Fisheries Majalengka Regency. Majalengka.
4. Department of Food Security, Agriculture and Fisheries of Majalengka Regency. 2020. Number of Fisheries Cultivators in Majalengka Regency. Department of Food Security, Agriculture, and Fisheries Majalengka Regency. Majalengka.
5. Department of Agriculture and Fisheries of Majalengka Regency. 2015. Production of Fishery Products Majalengka Regency. Department of Agriculture and Fisheries Majalengka Regency. Majalengka.
6. Directorate General of Aquaculture. 2015. Statistics on Export of Fishery Products. Ministry of Fisheries and Marine Affairs. Jakarta. 1278 pp.
7. Gumilar, I., Nurhayati, E., Iskandar, & Nurhayati, A. 2021. Exchange Rate Analysis of Fish Cultivators in Bandung Regency, West Java Province. AJFAR, 14(1): 17-24.
8. Gumilar, I., Syifa, R. N., Rosidah, & Handaka, A. A. 2021. Exchange Rate Analysis of Fish Cultivators in Garut Regency (Case Study of Bayongbong District). AJFAR, 14(3): 36-48.
9. Karimah, Annisa., I. Gumilar., and Z. Hasan. 2012. Prospective Analysis of Freshwater Ornamental Fish Cultivation Business in Freshwater Aquarium Park (TAAT) and Beautiful Indonesia Miniature Park (TMII) Jakarta. Journal of Fisheries and Marine Affairs, 3(3): 145-156.
10. Decree of the Minister of Fisheries and Marine Affairs. 2007. Good Fish Cultivation Method. Decree of the Minister of Fisheries and Marine Affairs No. 2 of 2007, Jakarta. 14 pp.
11. Musa, P. A & D. Y. Amiludin. 2005. Fisheries Project Planning and Evaluation. Lephas Hasanuddin University Press. Makassar.
12. Padangarang, A.M. 2010. Agribusiness Financing. Halu Oleo University. Kendari. 66 pp.
13. Purwanto, A., and B. M. Taftazani. 2018. The Effect of Number of Dependents on the Level of Economic Welfare of the Family of K3L Workers at Padjadjaran University. Journal of Social Work, 1(2):33-43.